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GROUND-WATER/SURFACE-WATER INVESTIGATION PLAN PHASE 1 REMEDIAL INVESTIGATION FINAL REPORT

Volume 5 of 5
Appendices D through G

June 7, 1991

Prepared for:

Industri-Plex Site Remedial Trust
36 Commerce Way
Woburn, Massachusetts

Prepared by:

Roux Associates, Inc.
Environmental Science and Engineering, Inc.
PTI Environmental Services

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APPENDIX D

Analytical Data Validation Documentation

Section 1. Ground-Water Data Validation Documentation
Part 1. Data Validation of March 1990 Enseco-ERCO Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
275 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7215

June 5, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the organic and inorganic analytical data from ground-water samples collected from March 15, 1990 through March 22, 1990 at the Industri-Plex Site (Site) in Woburn, Massachusetts as part of the Ground-water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts. Samples were collected from twenty-one monitoring wells (OW-1, OW-1A, OW-4, OW-6, OW-7, OW-10, OW-11, OW-12, OW-13, OW-14, OW-15, OW-16, OW-17, OW-18, OW-18A, OW-19, OW-19A, OW-20, OW-21, OW-22 and OW-28).

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990) and guidelines in U.S. Environmental Protection Agency (USEPA) Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (February 1, 1988 and modified November 1, 1988) and Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The laboratory reports from ERCO are organized by ERCO project numbers, which are assigned to each set of samples received on any one day. ERCO performs their Quality Assurance/Quality Control (QA/QC) procedures for each set of samples collected on the same sampling day. ERCO considers each sampling day a different project. Therefore, because samples were collected over a five day time period, there are five separate reports (with five different sets of laboratory QA/QC documentation) from ERCO. In contrast, Roux Associates,

The results of the validation of the organic data are summarized in Table 1. All of the ground-water data is summarized in Table 2. Details of the results of the validation effort are summarized below.

Data Completeness

All analyses requested were performed by ERCO with the exception of Target Compound List (TCL) pesticides and PCBs for OW-28. Insufficient volume of water and the low yield of this well prevented the collection of the full suite of requested analyses. An attempt was made to obtain sufficient sample volume for these analyses on two separate occasions.

Holding Times

All samples were analyzed within the holding times with the exception of the volatile organic compound (VOC) analyses for wells OW-16 and OW-17. These samples were not preserved with HCl at time of collection due to strong reactions between the sample and the HCl preservative. They were analyzed eight days and nine days later respectively, which exceeds the seven day holding time for the aromatic VOCs (benzene, toluene, ethylbenzene, xylenes). The positive results and non-detects for the compounds in OW-16 and OW-17 should be considered qualitative (A). OW-17 was resampled on April 25, 1990 and analyzed within the correct holding time. The data from OW-17 is currently being validated.

GC/MS Tuning

The gas chromatograph/mass spectrometer (GC/MS) tuning performance results were all within USEPA Region I guidelines.

Calibration

Guidance from USEPA Region I for instrument calibration for volatile and semi-volatile compounds states that: 1) all response factors must be greater than or equal to 0.05; 2) all percent relative standard deviations must be less than or equal to 30 percent; and 3) all percent differences must be less than or equal to 25 percent. If the response factor for any compound is greater than 0.05, all positive values are considered estimated and non-detects are considered unusable. If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

Instrument calibration (initial and continuing calibrations) was not within limits

If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

Instrument calibration (initial and continuing calibrations) was not within limits for several of the VOCs. The continuing calibration was not within limits for acetone and methylene chloride for samples collected on March 15, 1990 and March 16, 1990 (OW-6, OW-12, OW-14, OW-17, OW-18, OW-18A, OW-19, OW-19A, OW-20). Methylene chloride was not within limits for samples collected on March 19, 1990 (OW-1A, OW-4, OW-9, OW-13, OW-15). The continuing calibration was out of limits for acetone and methylene chloride for samples collected on March 20, 1990 and March 21, 1990 (OW-1, OW-10, OW-11, OW-16, OW-21, OW-22, OW-28). Positive values for these wells and compounds should be considered qualitative.

Calibration was not within limits for several of the semi-volatile compounds. There were problems on March 15, 1990 and March 16, 1990 with benzoic acid with regard to the initial calibration and the continuing calibration. The positive values should be considered qualitative for OW-16 and unusable for OW-12 and all non-detects considered qualitative for OW-6, OW-12, OW-14, OW-17, OW-18, OW-18A, OW-19, OW-19A, OW-20. Calibration problems with 2,4-dinitrophenol and 4-nitroaniline causes non-detects to be considered qualitative for samples collected on March 15, 1990 and March 16, 1990 (OW-6, OW-12, OW-14, OW-17, OW-18, OW-18A, OW-19, OW-19A, OW-20). Non-detects for 4-nitroaniline and 3,3 diclorobenzidine should be considered qualitative for samples collected on March 19, 1990 (OW-1A, OW-4, OW-9, OW-13, OW-15) due to continuing calibration problems. Samples collected on March 20, 1990 (OW-1, OW-10, OW-11, OW-16) should be considered qualitative for non-detects for isophorone, 2,4-dinitrophenol, 4-nitroaniline, benzo(b)fluoranthene, and benzo(k)fluoranthene. Non-detects for 2,4-dinitrophenol and 4-nitroaniline should be considered qualitative for samples collected on March 21-22, 1990 (OW-1, OW-10, OW-11, OW-16, OW-21, OW-22, OW-28).

Blanks

The concentrations of compounds in laboratory, trip and field were blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below five times the highest positive blank value for that compound should be considered unusable. In the cases of methylene chloride,

acetone, toluene, 2-butanone and common phthalate esters (which are considered common lab contaminants by USEPA Region I guidelines), positive blank values were multiplied by a factor of ten, and all positive values below that action level should be unusable.

- VOC blanks contained methylene chloride in many of the lab blanks, all of the trip blanks and all of the field blanks. All methylene chloride positive values should be considered unusable (U).

- Acetone was detected in six trip blanks, three lab blanks, and one field blank. Positive acetone values in wells OW-12, OW-16, OW-18, OW-19, OW-19A, OW-20, OW-6, OW-21, and OW-28 should be considered unusable since they are at the same magnitude as the concentrations found in the blanks. OW-16 had an acetone concentration of 37,000 ug/L which is not above the action level of 45,000 ug/L (calculated by multiplying 10 times the field blank concentration of 9 ug/L and then multiplied by 500 as OW-16 was diluted by a factor of 500) and should also be considered unusable (U).

- Chloromethane was detected in trip blanks which affected samples collected on March 19, 1990 and March 21, 1990. Positive chloromethane concentrations in OW-1A and OW-21, both collected on these days and having positive chloromethane concentrations of the same magnitude as those in the trip blank, should be considered unusable (U).

- Toluene was detected at 2 ug/L in Trip Blank Number 4, sent in with samples collected on March 20, 1990. A positive toluene concentration of 1 ug/L was found in the sample for OW-11 and should be considered unusable (U).

- 1,2-dichloroethene (total), 1,1,1-trichloroethane, trichloroethane, 2-hexanone and total xylenes were all detected at estimated concentrations in various blanks. As none of these compounds were detected in any of the ground-water samples, these blank concentrations do not affect any sample results.

- Two compounds affected the semi-volatile blanks. Bis (2-ethylhexyl)phthalate was detected in the lab blank analyzed with samples collected on March 19, 1990. Three of the samples collected that day had estimated concentrations for bis(2-ethylhexyl)phthalate.

Due to the laboratory blank contamination, estimated concentrations for these samples will be recorded as non-detects at the Contract Required Detection Limit (CRDL).

- 2,6-bis(1,1-dimethyl)phenol was tentatively identified in three of the lab blanks and one of the field blanks at similar concentrations. As these concentrations are estimated, with the blank contamination, the 2,5-bis (1,1-dimethyl) phenol concentration of 9.1 ug/L for OW-22 should be considered unusable(U).

- No blank contamination was detected in the pesticide and PCB blanks.

Surrogate Recoveries

All volatile and semi-volatile compounds had surrogate recoveries within the contract required recovery ranges.

Surrogate pesticide recoveries were low for OW-20 (collected on March 16, 1990), OW-13, OW-4, OW-9 (collected on March 19, 1990), OW-10 and OW-16 (collected on March 20, 1990).

Matrix Spike/Matrix Spike Duplicates

Although requested, the matrix spike and matrix spike duplicate samples were not run by ERCO.

Field Duplicates

The field duplicate collected on March 21, 1990 at OW-21 had toluene detected at 8 ug/L in the primary sample and not detected in the replicate sample (OW-100). Therefore, both values should be considered qualitative. All other concentrations for VOCs were within the acceptable limits of less than 30 percent relative percent difference. Semi-volatile, pesticide and PCB field duplicates were all within acceptable limits.

Internal Standard Performance

All samples were within the acceptable limits, with the exception of phenanthrene for the semi-volatile analysis for OW-9. All associated compounds which are non-detects (4,6-dinitro-2-methylphenol, N-nitrosodiphynylamine, 4-bromophenyl-phenylether, hexachlorobenzene, pentachlorophenol, phenanthrene, anthracene,

di-n-butylphthalate and fluoranthene), should be considered qualitative.

Pesticide Instrument Performance

Pesticide calibrations were less than 10 percent for 4,4'DDT for samples collected on March 15, 1990, March 16, 1990 and March 19, 1990. Pesticide calibration was also out of advisory ranges for endosulfan II for samples collected on March 19, 1990 and March 21, 1990. However, as these compounds were not detected, the calibrations do not affect the validation of the samples.

Dibutylchlorendate (DBC) (a calibration standard) retention times were out of range (greater than 2 percent) for samples collected on March 19, 1990 and March 20, 1990. DBC retention times were marginally out of range (2.1 and 2.3 percent) for two samples collected on March 19, 1990. As no positive values were detected for these samples, this problem does not affect these sample results. For samples collected on March 20, 1990, the DBC percent difference was out of range for four samples, but as no other problems were identified with these samples and no positive results occurred, the sample results are not affected.

Compound Identification

No positive concentrations of pesticides and PCBs were detected so compound identification did not have to be checked.

Compound Quantitation

Compound quantitation could not be performed because, as previously discussed, matrix spike samples were not analyzed.

INORGANIC DATA

A summary of the results of the validation of the inorganic ground-water quality data are provided in Table 1. Details of the results of the validation are provided below.

Data Completeness

All analyses requested were performed by ERCO, with the exception of ferrous iron (Fe^{+2}), which was analyzed by Radian Corporation Laboratory, Austin, Texas. Insufficient volume of water in OW-28 prevented sample collection of the full suite of requested analyses. Sample collection was attempted on both March 21 and 22, 1990 for the required analyses but sample couldn't be collected for total

suspended solids, sulfate, sulfide chloride, hexavalent chromium, chemical oxygen demand, phosphate, bicarbonate and carbonate.

Holding Times

Holding times were exceeded for the following samples and analyses:

Analysis	Samples Effected	# Days Over Holding Time	Holding Time
bicarbonate, carbonate	14 Days	OW-6, OW-19 OW-19A, OW-20, FB-GW	1 day
hexavalent chromium	24 hours	OW-14, OW-18, OW-18A	3 days
		OW-6, OW-19, OW-19A, OW-20, FB-GW	2 days

All results (positive values and non-detects) for the five samples affected by the late analyses for bicarbonate and carbonate are considered qualitative(A). As the eight samples affected by the late hexavalent chromium analysis are non-detect they all should be considered unusable (U) due to the exceeded holding times.

Calibration verification

Correlation coefficients for the calibration curves were greater than 0.995 for lead, mercury and selenium on six occasions. None of the coefficients were greater than 0.999. Therefore, sample results should not be affected.

Laboratory and field blank analyses

Sulfate and bicarbonate were detected in both field blanks (FB-GW and FB-GW2). Sulfide, total phosphorus and total organic carbon were detected in FB-GW2. Positive values below the action level of five times the highest value found in a blank for these analytes should be considered unusable. Unusable

bicarbonate sample values include those from wells OW-10, OW-15 and OW-19. All sulfide values are considered unusable, with the exception of OW-16. Due to the blank contamination, the OW-16 sulfide value should be considered qualitative. Unusable total phosphorus sample values include all values with the exceptions of these from OW-16, OW-18, OW-19 and OW-22. All total organic carbon values are considered unusable with the exceptions of OW-12, OW-16 and OW-17.

Estimated positive values for total calcium, total iron, total manganese, total sodium and total zinc were found in one or both of the field blanks. However, with the exception of zinc, all action levels for these metals remained below the positive values. Total zinc action levels were higher than sample values for nine wells. The seven wells (OW-6, OW-9, OW-12, OW-15, OW-16, OW-17 and OW-21) with zinc values above the CRDL will be considered to have unusable zinc results. The two wells (OW-1, OW-4) that had estimated values, between the IDL and the CRDL, will be considered non-detect at the CRDLs.

In addition, total nickel was detected in a lab blank at 28.4 ug/L which causes positive total nickel values to be considered unusable in five wells (OW-1A, OW-16, OW-17, OW-22, OW-28).

Estimated positive values were found in field blanks for dissolved barium, dissolved calcium, dissolved iron, dissolved magnesium, dissolved sodium and dissolved zinc. The barium, calcium, and magnesium blank values and action levels are below the positive sample values.

The action levels for the dissolved iron concentrations in the blank results causes the estimated positive values to be changed to non-detects at the CRDL for the following wells: OW-1A, OW-4, OW-6, OW-10 and OW-19. Action levels for dissolved sodium are higher than the sample values for OW-14, OW-1A and OW-21 which causes them to be considered unusable.

Action levels for dissolved zinc are higher than the values for OW-12, OW-17, OW-19A, OW-19, OW-9, OW-4, OW-13, OW-15, OW-1A, OW-1, OW-21, OW-22, OW-28. The dissolved zinc values for these wells should be considered unusable.

<u>ICP Interference Check Sample Results</u>

All samples met criteria.

Matrix spike recoveries

Although requested, the matrix spike and matrix spike duplicate samples were not run by the ERCO.

Laboratory and field duplicates

Since matrix spikes were not run, laboratory duplicate (matrix spike duplicate) analyses were not performed.

Field duplicate precision was greater than the 30 percent difference recommended by USEPA Region I guidelines for the following analyses: sulfate, sulfide, total phosphorus, total zinc and dissolved zinc. Therefore, values should be considered qualitative (A) for sulfide, total phosphorus and total zinc. Sulfate and dissolved zinc had relative percent differences greater than 100 percent, so all results for these two analyses should be considered unusable.

Precision on all other analyses was within acceptable ranges.

Laboratory Control Sample Results

All samples met criteria.

Furnace Atomic Absorption Results

All samples met criteria.

Serial dilution results

Serial dilutions were performed for metals analyzed by ICP. All were within the 10 percent difference in results with the exception of total zinc for sample OW-28, collected on March 21, 1990, which had a percent difference of 14.4 percent. USEPA Region I guidance suggests that if the percent difference is greater than 15 percent, then affected data should be considered qualitative. As there is field and lab blank contamination and the percent difference is near to the 15 percent limit, the total zinc result for OW-28 should be considered qualitative.

Detection Limit Results

All samples met criteria.

Sample Results

All samples met criteria.

If you have any questions or comments, please give us a call at (516) 673-7200.

Sincerely,

Martha M. Smith

Martha M. Smith
Project Geologist

William Sarni
Vice President

Table 1-Page 1
Summary of Data Validation Recommendations

VOLATILE ORGANIC COMPOUND DATA

Data Quality	QA/QC Problems	Effected Samples
Unusable (U)	Blank contamination and instrument calibration problems	Acetone in samples OW-6, OW-12, OW-16, OW-18, OW-19, OW-19A, OW-20, OW-21, OW-28
		Methylene Chloride in samples OW-12, OW-14, OW-17, OW-18, OW-18A, OW-6, OW-19, OW-19A, OW-20, OW-1A, OW-4, OW-9, OW-15, OW-16, OW-1, OW-10, OW-11, OW-21, OW-28
	Blank contamination	Toluene in OW-11 Chloromethane in OW-1A, OW-21
Qualitative (A)	Holding time exceeded	Benzene in OW-17, OW-16 Ethylbenzene in OW-17, OW-16 Toluene in OW-17, OW-16 Xylene in OW-17, OW-16
	Instrument calibration problems	Acetone in OW-14, OW-17 Methylene Chloride in OW-13
	Poor replicate precision	Toluene in OW-21
Quantitative (B)	No problems	All remaining volatile organic compounds

Table 1-Page 2
Summary of Data Validation Recommendations

SEMI-VOLATILE ORGANIC COMPOUND DATA

Data Quality	QA/QC Problems	Effected Samples
Unusable (U)	Instrument calibration problems	Benzoic Acid in OW-12
	Tentatively Identified Compound with blank contamination	2,6-bis(1,1-dimethyl)phenol in OW-22
Qualitative (A)	Instrument calibration problems	Benzoic Acid in OW-6, OW-14, OW-17, OW-18, OW-18A, OW-16, OW-19, OW-19A, OW-20
		2,4 dinitrophenol in OW-12, OW-14, OW-17, OW-18, OW-18A, OW-6, OW-19, OW-19A, OW-20, OW-1, OW-10, OW-11, OW-16, OW-21, OW-22, OW-28
		4-nitroaniline in all samples
		3,3 dichlorobenzidine in OW-1A, OW-4, OW-9, OW-13, OW-15
		Isophorone in OW-1, OW-10, OW-11, OW-16
		Benzo(b)fluoranthene and Benzo(k)fluoranthene in OW-1, OW-10, OW-11, OW-16
Raised detection limit	Blank contamination	Bis(2-ethylhexyl)phthalate in OW-1A, OW-4, OW-13 replicate
Quantitative (B)	No problems	All remaining compounds

Table 1-Page 3
Summary of Data Validation Recommendations

PESTICIDE AND PCB DATA

Data Quality	QA/QC Problems	Effected Samples
Quantitative (B)	No problems	All pesticide and PCB compounds

Table 1-Page 4
Summary of Data Validation Recommendations

MISCELLANEOUS INORGANIC DATA

Data Quality	QA/QC Problems	Effected Samples
Unusable (U)	Holding time exceeded	Hexavalent Chromium in OW-14, OW-18, OW-18A, OW-6, OW-19, OW-19A, OW-20
	Poor replicate precision	Sulfate in all samples
	Blank contamination	Total Organic Carbon in OW-14, OW-18, OW-18A, OW-6, OW-19, OW-19A, OW-20, OW-1A, OW-4, OW-9, OW-13, OW-15, OW-1, OW-10, OW-11, OW-21, OW-22, OW-28
		Bicarbonate in OW-19
	Blank contamination and poor replicate precision	Sulfide in all samples except OW-16
		Total Phosphorus in OW-12, OW-14, OW-17, OW-18A, OW-6, OW-19A, OW-20, OW-1A, OW-4, OW-9, OW-13, OW-15, OW-1, OW-10, OW-11, OW-21
Qualitative (A)	Holding time exceeded	Bicarbonate and Carbonate in OW-6, OW-19A, OW-20
		Carbonate in OW-19
	Blank contamination	Total Organic Carbon in OW-12, OW-17, OW-16
		Sulfide in OW-16
Quantitative (B)	No problems	All remaining analytes

Table 1-Page 5
Summary of Data Validation Recommendations

METALS DATA

Data Quality	QA/QC Problems	Effected Samples
Unusable (U)	Blank contamination	Total Nickel in OW-1A, OW-16, OW-17, OW-22, OW-28
		Dissolved Iron in OW-28
		Dissolved Sodium in OW-14, OW-1A, OW-21
	Blank contamination and poor replicate precision	Total Zinc in OW-12, OW-17, OW-6, OW-9, OW-15, OW-16, OW-21
		Dissolved Zinc in all samples
Qualitative (A)	Blank contamination	Dissolved Barium in all samples
		Dissolved Calcium in all samples
		Dissolved Magnesium in all samples
		Dissolved Iron in OW-12, OW-14, OW-17, OW-18, OW-18A, OW-19A, OW-20, OW-9, OW-13, OW-15, OW-1, OW-11, OW-16, OW-21, OW-22
		Dissolved Sodium in OW-12, OW-17, OW-18, OW-18A, OW-6, OW-19, OW-19A, OW-20, OW-4, OW-9, OW-13, OW-15, OW-1, OW-10, OW-11, OW-16, OW-22, OW-28
	Poor replicate precision	Total Zinc in OW-14, OW-18, OW-18A, OW-19, OW-19A, OW-20, OW-1A, OW-13, OW-10, OW-11, OW-22, OW-28

Table 1-Page 6
Summary of Data Validation Recommendations

METALS DATA

Data Quality	QA/QC Problems	Effected Samples
Qualitative (A) and raised detection limit	Blank contamination and poor replicate precision	Total Zinc in OW-4, OW-1
Raised detection limit	Blank contamination	Dissolved Iron in OW-6, OW-19, OW-1A, OW-4
Quantitative (B)	No problems	All remaining analytes

Table 2. Summary of Analyses for Volatile Organic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	1 A	2 U	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Bromomethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Vinyl chloride	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Chloroethane	10	3 A	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Methylene chloride	5	5 U	3 U	12 U	13 U	13 U	1 U	2 U	8 U	2
Acetone	10	<10 B	<10 B	6 A	<10 U	<10 B	<10 B	<10 B	16 U	2
Carbon disulfide	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1-Dichloroethene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
trans-1,2-Dichloroethylene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Chloroform	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,2-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Butanone	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	1
1,1,1-Trichloroethane	5	<5 B	<5 B	<5 B	3 A	<5 B	<5 B	<5 B	<5 B	1
Carbon tetrachloride	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Vinyl acetate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Bromodichloromethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1,2,2-Tetrachloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,2-Dichloropropane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
trans-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Trichloroethene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Dibromochloromethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1,2-Trichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Benzene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	46 B	1
cis-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Chloroethylvinyl ether	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	2
Bromoform	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Hexanone	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	2
4-Methyl-2-pentanone	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Tetrachloroethene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	1
Toluene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1 U	4 A	1
Chlorobenzene	5	25 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Ethylbenzene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Styrene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Total xylenes	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Volatile Organic Compounds in Ground Water

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Bromomethane	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Vinyl chloride	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Chloroethane	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Methylene chloride	5	<5 A	<5 A	7 U	6 U	780 U	160 U	5 U	9 U	2
Acetone	10	<10 B	5 A	<10 A	<10 B	37000 U	<250 A	6 U	<10 B	2
Carbon disulfide	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,1-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,1-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	2 A	2 A	1
trans-1,2-Dichloroethylene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Chloroform	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,2-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
2-Butanone	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	1
1,1,1-Trichloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Carbon tetrachloride	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Vinyl acetate	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Bromodichloromethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,1,2,2-Tetrachloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,2-Dichloropropane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
trans-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Trichloroethene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Dibromochloromethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
1,1,2-Trichloroethane	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Benzene	5	4 A	4 A	<5 B	<5 B	<2500 A	2000 A	<5 B	<5 B	1
cis-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
2-Chloroethylvinyl ether	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	2
Bromoform	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
2-Hexanone	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	2
4-Methyl-2-pentanone	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	2
Tetrachloroethene	10	<10 B	<10 B	<10 B	<10 B	<5000 B	<250 B	<10 B	<10 B	1
Toluene	5	<5 B	<5 B	<5 B	<5 B	29000 A	<130 A	<5 B	<5 B	1
Chlorobenzene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Ethylbenzene	5	<5 B	<5 B	<5 B	<5 B	<2500 A	<130 A	<5 B	<5 B	1
Styrene	5	<5 B	<5 B	<5 B	<5 B	<2500 B	<130 B	<5 B	<5 B	1
Total xylenes	5	<5 B	<5 B	<5 B	<5 B	<2500 A	<130 A	<5 B	<5 B	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Volatile Organic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
Chloromethane	10	<10 B	<10 B	<10 B	1 U	<10 B	<10 B	<10 B	2
Bromomethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Vinyl chloride	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Chloroethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Methylene chloride	5	6 U	5 U	5 U	2 U	3 U	<5 U	2 U	2
Acetone	10	6 U	11 U	9 U	2 U	1 U	<10 U	9 U	2
Carbon disulfide	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1-Dichloroethene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1-Dichloroethane	5	<5 B	<5 B	5 B	<5 B	<5 B	<5 B	<5 B	1
trans-1,2-Dichloroethylene	5	<5 B	<5 B	28 B	<5 B	<5 B	<5 B	<5 B	1
Chloroform	5	<5 B	<5 B	<5 B	2 A	2 A	6 B	2 A	1
1,2-Dichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Butanone	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	1
1,1,1-Trichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Carbon tetrachloride	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Vinyl acetate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Bromodichloromethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1,2,2-Tetrachloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,2-Dichloropropane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
trans-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Trichloroethene	5	1 A	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Dibromochloromethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
1,1,2-Trichloroethane	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Benzene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
cis-1,3-Dichloropropene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Chloroethylvinyl ether	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	2
Bromoform	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
2-Hexanone	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	2
4-Methyl-2-pentanone	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	2
Tetrachloroethene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	1
Toluene	5	<5 B	<5 B	3 A	8 A	<5 B	1 B	38 B	1
Chlorobenzene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Ethylbenzene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Styrene	5	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	<5 B	1
Total xylenes	5	<5 B	<5 B	3 A	<5 B	<5 B	<5 B	<5 B	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	3 A	5
bis (2-Chloroethyl) ether	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
2-Chlorophenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
1,3-Dichlorobenzene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
1,4-Dichlorobenzene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Benzyl alcohol	10	4 A	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
1,2-Dichlorobenzene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
2-Methylphenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
bis (2-Chloroisopropyl) ether	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
4-Methylphenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
N-Nitroso-di-n-propylamine	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
Hexachloroethane	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
Nitrobenzene	10	<10 A	<10 B	<10 B	<13 B	<10 B	<10 A	<10 A	10 B	5
Isophorone	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
2-Nitrophenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
2,4-Dimethylphenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
Benzoic acid	50	<50 B	<50 B	<50 B	<63 A	<50 B	<50 B	<50 B	58 U	25
bis (2-Chloroethoxy) methane	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
2,4-Dichlorophenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
1,2,4-Trichlorobenzene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Naphthalene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
4-Chloroaniline	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobutadiene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
4-Chloro-3-methylphenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
2-Methylnaphthalene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
Hexachlorocyclopentadiene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
2,4,6-Trichlorophenol	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
2,4,5-Trichlorophenol	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	10
2-Chloronaphthalene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
2-Nitroaniline	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	10
Dimethyl phthalate	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
Acenaphthylene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
2,6-Dinitrotoluene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
3-Nitroaniline	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	10
Acenaphthene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
2,4-Dinitrophenol	50	<50 A	<50 B	<50 B	<63 B	<50 B	<50 A	<50 A	<50 A	25
4-Nitrophenol	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	15
Dibenzofuran	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
2,4-Dinitrotoluene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	10
Diethylphthalate	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
4-Chlorophenyl-phenylether	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Fluorene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
4-Nitroaniline	50	<50 A	<50 A	<50 A	<63 A	<50 A	<50 A	<50 A	<50 A	10
4,6-Dinitro-2-methylphenol	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	15

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	2 A	3 A	5
4-Bromophenyl-phenylether	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobenzene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
Pentachlorophenol	50	<50 B	<50 B	<50 B	<63 B	<50 B	<50 B	<50 B	<50 B	10
Phenanthrene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Anthracene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-butylphthalate	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Fluoranthene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Pyrene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Butylbenzylphthalate	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	5
3,3'-Dichlorobenzidine	20	<20 B	<20 A	<20 A	<25 B	<20 A	<20 B	<20 B	<20 B	5
Benzo (a) anthracene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
bis (2-Ethylhexyl) phthalate	10	<10 B	4 A	4 A	<13 B	<10 B	3 A	<10 B	<10 B	4
Chrysene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-octyl phthalate	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (b) fluoranthene	10	<10 A	<10 B	<10 B	<13 B	<10 B	<10 A	<10 A	<10 B	3
Benzo (k) fluoranthene	10	<10 A	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (a) pyrene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Indeno (1,2,3-cd) pyrene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	4
Dibenzo (a,h) anthracene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (g,h,i) perylene	10	<10 B	<10 B	<10 B	<13 B	<10 B	<10 B	<10 B	<10 B	3

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 B	<10 B	<10 B	<10 B	130 B	6 A	<13 B	<10 B	5
bis (2-Chloroethyl) ether	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
2-Chlorophenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
1,3-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
1,4-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Benzyl alcohol	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	10
1,2-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
2-Methylphenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
bis (2-Chloroisopropyl) ether	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
4-Methylphenol	10	<10 B	<10 B	<10 B	<10 B	3400 B	<10 B	<13 B	<10 B	5
N-Nitroso-di-n-propylamine	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
Hexachloroethane	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
Nitrobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Isophorone	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	5
2-Nitrophenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
2,4-Dimethylphenol	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	10
Benzoic acid	50	<50 B	<50 B	<50 A	<50 B	2000 A	<50 A	<63 A	<50 A	25
bis (2-Chloroethoxy) methane	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
2,4-Dichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
1,2,4-Trichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Naphthalene	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	3
4-Chloroaniline	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Hexachlorobutadiene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
4-Chloro-3-methylphenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
2-Methylnaphthalene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
Hexachlorocyclopentadiene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
2,4,6-Trichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
2,4,5-Trichlorophenol	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	10
2-Chloronaphthalene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
2-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	10
Dimethyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
Acenaphthylene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
2,6-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
3-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	10
Acenaphthene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
2,4-Dinitrophenol	50	<50 B	<50 B	<50 A	<50 B	<1000 A	<50 A	<63 A	<50 A	25
4-Nitrophenol	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	15
Dibenzofuran	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
2,4-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	10
Diethylphthalate	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
4-Chlorophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Fluorene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
4-Nitroaniline	50	<50 A	<50 A	<50 A	<50 A	<1000 A	<50 A	<63 A	<50 A	10
4,6-Dinitro-2-methylphenol	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	15

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
4-Bromophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Hexachlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
Pentachlorophenol	50	<50 B	<50 B	<50 B	<50 B	<1000 B	<50 B	<63 B	<50 B	10
Phenanthrene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Anthracene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Di-n-butylphthalate	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Pyrene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Butylbenzylphthalate	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	5
3,3'-Dichlorobenzidine	20	<20 B	<20 A	<20 B	<20 A	<400 B	<20 B	<25 B	<20 B	5
Benzo (a) anthracene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
bis (2-Ethylhexyl) phthalate	10	<10 B	7 A	<10 B	<10 B	64 B	<10 B	<13 B	<10 B	4
Chrysene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Di-n-octyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Benzo (b) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	3
Benzo (k) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<200 A	<10 B	<13 B	<10 B	3
Benzo (a) pyrene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Indeno (1,2,3-cd) pyrene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	4
Dibenzo (a,h) anthracene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3
Benzo (g,h,i) perylene	10	<10 B	<10 B	<10 B	<10 B	<200 B	<10 B	<13 B	<10 B	3

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
Phenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
bis (2-Chloroethyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Chlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,3-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,4-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Benzyl alcohol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
1,2-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
bis (2-Chloroisopropyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
N-Nitroso-di-n-propylamine	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachloroethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
Nitrobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Isophorone	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Nitrophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4-Dimethylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
Benzoic acid	50	<50 A	<50 A	<50 B	<50 B	<50 B	<50 B	<50 B	25
bis (2-Chloroethoxy) methane	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
2,4-Dichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,2,4-Trichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Naphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
4-Chloroaniline	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobutadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Chloro-3-methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
2-Methylnaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachlorocyclopentadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,6-Trichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,5-Trichlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	10
2-Chloronaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
2-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	10
Dimethyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
Acenaphthylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,6-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
3-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	10
Acenaphthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,4-Dinitrophenol	50	<50 A	<50 A	<50 A	<50 A	<50 B	<50 A	<50 A	25
4-Nitrophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	15
Dibenzofuran	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
2,4-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	10
Diethylphthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
4-Chlorophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Fluorene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
4-Nitroaniline	50	<50 A	<50 A	<50 A	<50 A	<50 A	<50 A	<50 A	10
4,6-Dinitro-2-methylphenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	15

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Semi-Volatile Organic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
N-Nitrosodiphenylamine (1)	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Bromophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
Pentachlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	<50 B	10
Phenanthrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-butylphthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Butylbenzylphthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	5
3,3'-Dichlorobenzidine	20	<20 B	<20 B	<20 B	<20 B	<20 B	<20 B	<20 B	5
Benzo (a) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
bis (2-Ethylhexyl) phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
Chrysene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-octyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (b) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (k) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (a) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Indeno (1,2,3-cd) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	4
Dibenzo (a,h) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3
Benzo (g,h,i) perylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	<10 B	3

(1) Cannot be seperated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Pesticide\PCB Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
beta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
delta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
gamma-BHC (Lindane)	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Aldrin	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor epoxide	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Endosulfan I	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
Dieldrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDE	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.05
Endosulfan II	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDD	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endosulfan sulfate	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
4,4'-DDT	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
Methoxychlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.06
Endrin ketone	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.08
Chlordane	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.12
Toxaphene	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.40
Aroclor-1016	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.38
Aroclor-1221	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.29
Aroclor-1232	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.40
Aroclor-1242	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.45
Aroclor-1248	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.31
Aroclor-1254	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.42
Aroclor-1260	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.25

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Pesticide\PCB Compounds in Ground Water

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
beta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
delta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
gamma-BHC (Lindane)	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Aldrin	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor epoxide	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Endosulfan I	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
Dieldrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDE	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.05
Endosulfan II	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDD	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endosulfan sulfate	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
4,4'-DDT	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
Methoxychlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.06
Endrin ketone	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.08
Chlordane	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.12
Toxaphene	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.40
Aroclor-1016	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.38
Aroclor-1221	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.29
Aroclor-1232	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.40
Aroclor-1242	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.45
Aroclor-1248	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.31
Aroclor-1254	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.42
Aroclor-1260	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Pesticide\PCB Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL							IDL
alpha-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
beta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
delta-BHC	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
gamma-BHC (Lindane)	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Aldrin	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Heptachlor epoxide	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.01
Endosulfan I	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.02
Dieldrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDE	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.05
Endosulfan II	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
4,4'-DDD	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.02
Endosulfan sulfate	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
4,4'-DDT	0.10	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	<0.10 B	0.08
Methoxychlor	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.06
Endrin ketone	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.08
Chlordane	0.05	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	<0.05 B	0.12
Toxaphene	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.40
Aroclor-1016	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.38
Aroclor-1221	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.29
Aroclor-1232	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.40
Aroclor-1242	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.45
Aroclor-1248	0.5	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	<0.5 B	0.31
Aroclor-1254	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.42
Aroclor-1260	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Total Inorganic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Inorganic Compounds (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	540 B	7150 B	<4.3 B	3810 B	686 B	<790 B	704 B	<27.0 B	20
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	60
Arsenic	2	<2 B	<2 B	<2 B	4.3 B	103 B	38.3 B	190 B	344 B	10
Barium	2	11.6 B	21.9 B	16.9 B	26.3 B	13.2 B	49.3 B	43 B	67.6 B	20
Beryllium	1	<1.0 B	1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	6.5 B	<5.0 B	<5.0 B	5
Calcium	20	162,000 B	24,200 B	38,300 B	36,600 B	139,000 B	10,400 B	37,100 B	517,000 B	5000
Chromium	3	<3.0 B	6.2 B	4.6 B	6.1 B	3.4 B	<3.0 B	5.5 B	38.9 B	10
Cobalt	7	<7.0 B	47.8 B	<7.0 B	9.3 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	50
Copper	6	9.3 B	40.1 B	<6.0 B	16.7 B	15.3 B	450 B	17.1 B	<6.0 B	25
Iron	3	716 B	2,250 B	30700 B	5320 B	66,300 B	1,080 B	17600 B	13,900 B	100
Lead	2	<2 B	3.4 B	<2 B	4.1 B	3.5 B	6.4 B	17.0 B	<2 B	5
Magnesium	37	25,300 B	6,530 B	4,390 B	11,400 B	14,800 B	1,770 B	2,750 B	107,000 B	5000
Manganese	1	1400 B	1610 B	42.5 B	273 B	389 B	66.6 B	367 B	469 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.4 B	<0.2 B	0.2
Nickel	12	<12.0 B	71.9 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	40
Potassium	900	4,440 B	7,220 B	2,670 B	3,250 B	3,330 B	2,370 B	3,020 B	8,660 B	5000
Selenium	2	<2 B	<2 B	2.0 B	<2 B	<2 B	<2 B	2.6 B	<2 B	5
Silver	3	<3.0 B	571 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	50,400 B	8,790 B	105,000 B	34,400 B	17,500 B	22,300 B	9,960 B	130,000 B	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	6.6 B	<6.0 B	8.0 B	<6.0 B	<6.0 B	<6.0 B	16.8 B	50
Zinc	8	<20 A	93.1 A	<20 A	44 U	33.1 U	3,100 A	1460 A	31.7 U	20
Tin	28	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	
Hardness (mg/L)		509 B	87.3 B	114 B	138 B	408 B	33.2 B	104 B	1,730 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Total Inorganic Compounds in Ground Water

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Inorganic Compounds (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	127 B	56.5 B	242 B	432 B	871 B	122 B	92 B	749 B	200
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	60
Arsenic	2	30.1 B	25.4 B	124 B	<2 B	2,250 B	146 B	3.3 B	9.7 B	10
Barium	2	32.7 B	28.6 B	19.4 B	31.5 B	380 B	51.3 B	18.9 B	20.5 B	200
Beryllium	1	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	5
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	27.4 B	20.3 B	5
Calcium	20	98,100 B	88,200 B	81,300 B	13,300 B	14,500 B	251,000 B	84,300 B	116,000 B	5000
Chromium	3	4.7 B	<3.0 B	6.3 B	<3.0 B	160 B	38.1 B	<3.0 B	4.7 B	10
Cobalt	7	<7.0 B	<7.0 B	8.5 B	<7.0 B	8.1 B	10.9 B	18.3 B	19.5 B	50
Copper	6	<6.0 B	<6.0 B	80.7 B	8.8 B	12.8 B	7.1 B	158 B	145 B	25
Iron	3	16,500 B	14,800 B	21,600 B	2,140 B	6710 B	16000 B	836 B	11,600 B	100
Lead	2	<2 B	<2 B	299 B	10.6 B	5.8 B	<2 B	2.0 B	13.5 B	5
Magnesium	37	11,500 B	11,200 B	4,750 B	3,040 B	206,000 B	75,900 B	8,660 B	9,480 B	5000
Manganese	1	2,020 B	1,730 B	43.7 B	124 B	27.1 B	485 B	767 B	665 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.2
Nickel	12	<12.0 B	<12.0 B	<12.0 B	<12.0 B	45.4 B	24.7 B	<12.0 B	<12.0 B	40
Potassium	900	7,220 B	6,160 B	3,470 B	2,460 B	72,600 B	31,300 B	6,670 B	5,390 B	5000
Selenium	2	<2 B	<2 B	50.5 B	<2 B	<2 B	<2 B	<2 B	5.6 B	5
Silver	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	18,600 B	19,800 B	11,800 B	73,900 B	131,000 B	757,000 B	66,100 B	33,300 B	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	192 B	25.9 B	<6.0 B	<6.0 B	50
Zinc	8	246 A	133 B	1,910 A	20.3 B	21 U	54.5 U	8,040 A	7,870 A	20
Tin	28	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	
Hardness (mg/L)		292 B	266 B	223 B	45.7 B	884 B	939 B	246 B	329 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Total Inorganic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90	
Inorganic Compounds (Concentrations in ug/L)	IDL								CRDL
Aluminum	27	124 B	530 B	609 B	3,050 B	2,680 B	40800 B	224,000 B	200
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<74.0 B	60
Arsenic	2	3.9 B	115 B	4.4 B	3.3 B	2.7 B	22.7 B	67 B	10
Barium	2	28.7 B	32.1 B	18.4 B	33.8 B	32.5 B	276 B	729 B	200
Beryllium	1	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	1.1 B	8.8 B	5
Cadmium	5	<5.0 B	12.8 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	5
Calcium	20	20,900 B	26,400 B	49,700 B	45,300 B	46,500 B	197,000 B	60,700 B	5000
Chromium	3	<3.0 B	6.4 B	3.1 B	6.7 B	4.6 B	153 B	326 B	10
Cobalt	7	48.7 B	32.4 B	<7.0 B	<7.0 B	<7.0 B	40.4 B	157 B	50
Copper	6	9.4 B	13.3 B	8.1 B	12.1 B	8.9 B	191 B	447 B	25
Iron	3	1,410 B	9,580 B	2,100 B	3,010 B	2,540 B	50,200 B	226,000 B	100
Lead	2	19.7 B	4.6 B	8.5 B	3.2 B	2.8 B	44.5 B	162 B	5
Magnesium	37	4,680 B	4,980 B	11,700 B	6,830 B	6,850 B	63,500 B	75,900 B	5000
Manganese	1	1,740 B	1290 B	128 B	1,440 B	1,460 B	3,480 B	3,920 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.3 B	0.2
Nickel	12	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	66.6 B	261 B	40
Potassium	900	4,810 B	4,710 B	3,870 B	2,840 B	2,750 B	18,300 B	38,400 B	5000
Selenium	2	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Silver	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	46,600 B	23,500 B	17,900 B	9,510 B	9,670 B	27,500 B	26,900 B	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	70.9 B	370 B	50
Zinc	8	381 A	421 A	187 A	21.7 U	16.6 U	135 A	821 A	20
Tin	28	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<56.0 B	
Hardness (mg/L)		71.4 B	86.4 B	172 B	141 B	144 B	753 B	464 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Dissolved Inorganic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Inorganic Compounds (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	399 B	5,010 B	<27.0 B	<27.0 B	<27.0 B	140 B	158 B	<27.0 B	200
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	60
Arsenic	2	<2 B	<2 B	<2 B	<2 B	2.8 B	<2 B	162 B	422 B	10
Barium	2	36.7 A	20.8 A	91.8 A	59.6 A	19.1 A	51.3 A	49.9 A	101 A	200
Beryllium	1	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	5
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	8.8 B	<5.0 B	<5.0 B	5
Calcium	20	156,000 A	22,800 A	42,500 A	37,500 A	141,000 A	10,600 A	38,900 A	491,000 A	5000
Chromium	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	35.5 B	10
Cobalt	7	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	50
Copper	6	<6.0 B	11.5 B	<6.0 B	<6.0 B	<6.0 B	321 B	<6.0 B	<6.0 B	25
Iron	3	151 A	<20 B	<20 B	<100 B	32 A	16.9 U	12,000 A	5,130 A	100
Lead	2	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Magnesium	37	24,600 A	6,120 A	4,960 A	11,000 A	15,100 A	1,700 A	2,970 A	108,000 A	5000
Manganese	1	1,330 B	1.4 B	20.2 B	1.2 B	115 B	59.1 B	423 B	400 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.2
Nickel	12	<12.0 B	20 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	40
Potassium	900	3,220 B	6,440 B	2,350 B	2,880 B	2,870 B	1,840 B	2,580 B	9,180 B	5000
Selenium	2	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Silver	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	51,100 A	11,600 U	123,000 A	41,400 A	232,000 A	25,800 A	14,600 A	150,000 A	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	22.4 B	50
Zinc	8	44.6 U	72.8 U	27.1 U	23.2 U	42.1 U	3,180 U	913 U	46.3 U	20
Tin	28	<29.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	
Hardness (mg/L)		491 B	82.1 B	118 B	139 B	414 B	33.5 B	109 B	1670 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Dissolved Inorganic Compounds in Ground Water

Well Designation: / Sample Date:		OW-13 3/19/90	OW-13* 3/19/90	OW-14 3/15/90	OW-15 3/19/90	OW-16 3/20/90	OW-17 3/15/90	OW-18 3/15/90	OW-18A 3/15/90	
Inorganic Compounds (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	200
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	43.9 B	<37.0 B	<37.0 B	<37.0 B	60
Arsenic	2	20.6 B	20.4 B	7.5 B	<2 B	2,860 B	164 B	<2 B	<2 B	10
Barium	2	66.6 A	63.2 A	28.0 A	69.6 A	245 A	51.9 A	196 A	46 A	200
Beryllium	1	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	5
Cadmium	5	<5.0 B	<5.0 B	5.5 B	<5.0 B	<5.0 B	<5.0 B	25.2 B	20.5 B	5
Calcium	20	88,900 A	88,800 A	87,900 A	11,700 A	13,900 A	236,000 A	83,300 A	122,000 A	5000
Chromium	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	138 B	26.5 B	<3.0 B	<3.0 B	10
Cobalt	7	<7.0 B	<7.0 B	10.3 B	<7.0 B	<7.0 B	<7.0 B	16.8 B	19.1 B	50
Copper	6	<6.0 B	<6.0 B	17.6 B	<6.0 B	<6.0 B	<6.0 B	122 B	35.1 B	25
Iron	3	3,080 A	3,350 A	628 A	42.2 A	870 A	831 A	577 A	42.7 A	100
Lead	2	<2 B	<2 B	16.3 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Magnesium	37	11,300 A	10,900 A	5,170 A	2,530 A	193,000 A	70,800 A	8,580 A	9,490 A	5000
Manganese	1	1,760 B	1,780 B	47.4 B	77.3 B	7.6 B	436 B	736 B	671 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.2
Nickel	12	<12.0 B	<12.0 B	<12.0 B	<12.0 B	54.1 B	<12.0 B	13.3 B	18.2 B	40
Potassium	900	6,360 B	6,380 B	3,110 B	1,520 B	69,100 B	261,000 B	6,070 B	5,660 B	5000
Selenium	2	<2 B	<2 B	15.2 B	<2 B	<2 B	<2 B	2.0 B	5.6 B	5
Silver	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	21,900 A	20,900 A	12,700 A	68,700 A	142,000 A	663,000 A	63,100 A	42,200 A	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	183 B	13.4 B	<6.0 B	<6.0 B	50
Zinc	8	38.9 U	48.3 U	2,110 U	26.6 U	97.9 U	78.5 U	8,000 U	7,220 U	20
Tin	28	<28.0 B	<28.0 B	<28.0 B	<28.0 B	59 B	<28.0 B	<28.0 B	<28.0 B	
Hardness (mg/L)		268 B	267 B	241 B	39.6 B	829 B	881 B	243 B	344 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Dissolved Inorganic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90	
Inorganic Compounds (Concentrations in ug/L)	IDL								CRDL
Aluminum	27	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	<27.0 B	200
Antimony	37	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	60
Arsenic	2	<2 B	17.7 B	<2 B	<2 B	<2 B	4.4 B	<2 B	10
Barium	2	130 A	45.3 A	42 A	42.7 A	57.8 A	196 A	91.6 A	200
Beryllium	1	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	5
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	5
Calcium	20	20,900 A	25,700 A	47,200 A	48,500 A	48,000 A	198,000 A	18,100 A	5000
Chromium	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	4.2 B	<3.0 B	10
Cobalt	7	12.6 B	25.9 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	50
Copper	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	25
Iron	3	<100 B	1,160 A	412 A	152 A	131 A	6,320 A	13.7 A	100
Lead	2	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Magnesium	37	4,710 A	4,780 A	11,300 A	6,740 A	6,650 A	52,100 A	3,260 A	5000
Manganese	1	1,060 B	1230 B	109 B	1,510 B	1,460 B	3,020 B	450 B	15
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.2
Nickel	12	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	<12.0 B	40
Potassium	900	4,310 B	4,110 B	3,290 B	2,420 B	2,360 B	10,500 B	4,990 B	5000
Selenium	2	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	<2 B	5
Silver	3	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	<3.0 B	10
Sodium	38	46,500 A	27,600 A	22,700 A	10,200 A	13,500 A	26,400 A	23,800 A	5000
Thallium	4	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	<4 B	10
Vanadium	6	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	50
Zinc	8	437 U	219 U	51 U	31.9 U	121 U	45.7 U	28.7 U	20
Tin	28	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	<28.0 B	
Hardness (mg/L)		71.6 B	83.8 B	164 B	149 B	126 B	709 B	58.6 B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Miscellaneous Inorganic Compounds in Ground Water

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90
Inorganic Compounds (Concentrations in mg/L)	IDL								
Sulfate	0.01	28.20 U	19.75 U	9.83 U	3.30 U	451.25 U	48.00 U	111.13 U	1246.50 U
Sulfide	0.004	0.004 U	0.026 U	0.025 U	0.014 U	0.022 U	0.018 U	0.015 U	0.008 U
Total Phosphorous	0.04	1.50 U	0.63 U	1.45 U	1.05 U	0.68 U	0.88 U	1.13 U	1.50 U
Bicarbonate	1.0	463 B	54.9 B	55.5 B	42.4 A	30.0 B	5.4 B	65.5 B	935 B
Carbonate	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 A	<1.0 B	<1.0 B	<1.0 B	<1.0 B
Chloride	5.0	67.7 B	<5.0 B	232 B	86.9 B	16.8 B	39.1 B	19.7 B	34.7 B
Cr+6	0.10	<0.010 B	<0.010 B	<0.010 B	<0.010 U	<0.010 B	<0.010 B	<0.010 B	<0.010 B
TOC	20.5	6.9 U	9.2 U	1.1 U	1.2 U	14.1 U	4.3 U	8.6 U	29.1 A
COD	20	33.4 B	64.7 B	49.1 B	<20 B	62.1 B	23.0 B	25.6 B	144 B
TSS	5	<5.0 B	27.0 B	55.5 B	<5.0 B	222 B	48.0 B	35.0 B	55.0 B

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Miscellaneous Inorganic Compounds in Ground Water

Well Designation: / Sample Date:		OW-13 3/19/90	OW-13* 3/19/90	OW-14 3/15/90	OW-15 3/19/90	OW-16 3/20/90	OW-17 3/15/90	OW-18 3/15/90	OW-18A 3/15/90
Inorganic Compounds (Concentrations in ug/L)	IDL								
Sulfate	0.01	4.93 U	53.98 U	6.20 U	12.93 U	0.27 U	49.15 U	155.45 U	181.00 U
Sulfide	0.004	0.022 U	0.017 U	0.010 U	0.021 U	0.113 A	0.029 U	0.012 U	0.010 U
Total Phosphorous	0.04	2.80 U	1.48 B	0.08 U	2.58 U	9.98 B	1.70 U	<0.04 B	1.38 U
Bicarbonate	1.0	347 B	351 B	35.5 B	10.0 B	11100 B	1460 B	29.6 B	67.8 B
Carbonate	1.0	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B
Chloride	5.0	17.0 B	20.8 B	15.7 B	140 B	146 B	144 B	98.4 B	47.6 B
Cr+6	0.10	<0.010 U	<0.010 B	<0.010 U	<0.010 U	<0.010 B	<0.010 B	<0.010 U	<0.010 U
TOC	20.5	7.0 B	7.4 B	5.1 U	1.3 B	2770 A	160 A	5.1 U	5.5 U
COD	20	72.5 B	33.4 B	<20 B	33.4 B	1350 B	454 B	<20 B	52.3 B
TSS	5	40.5 B	25.5 B	51.0 B	18.5 B	136 B	97.0 B	7.0 B	44.0 B

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Analyses for Miscellaneous Inorganic Compounds in Ground Water

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90
Inorganic Compounds (Concentrations in ug/L)	IDL							
Sulfate	0.01	18.35 U	7.75 U	160.93 U	47.690 U	49.830 U	565.000 U	2 U
Sulfide	0.004	0.017 U	0.016 U	0.019 U	0.007 U	<0.004 U	0.005 U	0.06 U
Total Phosphorous	0.04	<0.04 B	0.75 U	2.80 U	3.90 U	3.28 U	14.15 B	9 B
Bicarbonate	1.0	16.5 U	59.8 A	90.5 A	118 B	121 B	321 B	29.5 B
Carbonate	1.0	<1.0 A	<1.0 A	<1.0 A	<1.0 B	<1.0 B	<1.0 B	--
Chloride	5.0	42.2 B	29.9 B	48.6 B	10.9 B	11.0 B	22.6 B	--
Cr+6	0.10	<0.010 U	<0.010 U	<0.010 U	<0.010 B	<0.010 B	<0.010 B	--
TOC	20.5	3.4 U	3.4 U	5.4 U	4.7 U	4.6 U	11.5 U	8.4 U
COD	20	<20 B	<20 B	<20 B	<20 B	24.4 B	24.4 B	--
TSS	5	10.0 B	32.0 B	59.5 B	76.0 B	84.0 B	1,500 B	--

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

APPENDIX D

Analytical Data Validation Documentation

Section 1. Ground-Water Data Validation Documentation
Part 2. Data Validation of April 1990 Enseco-ERCO Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7216

June 29, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the organic and inorganic analytical data from ground-water samples collected on April 25, 1990 at the Industri-Plex Site (Site) in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts. Samples were collected from two monitoring wells (OW-7 and OW-17).

OW-17 was analyzed for volatile organic compounds (VOCs) only, while OW-7 was analyzed for the full suite of ground-water analyses presented in the GSIP work plan. OW-17 was sampled to replace a VOC sample that was collected on March 15, 1990, but not analyzed within the holding time. Monitoring well OW-7 had not been located at the time of the March ground-water sampling. One field blank (GW-FB-3) and one replicate (an OW-7 replicate which was designated OW-101) were collected for QA/QC purposes and analyzed for the full suite of ground-water analyses.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990), guidelines in the U.S. Environmental Protection Agency (USEPA) Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (February 1, 1988 and modified November 1, 1988), and Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The results of the validation are summarized in Table 1. All of the ground-water data are summarized in Table 2. Details of the results of the validation effort are summarized below.

ORGANIC DATA

Data Completeness

All requested analyses were performed by ERCO.

Holding Times

All samples were analyzed within the holding times.

GC/MS Tuning

The gas chromatograph/mass spectrometer (GC/MS) tuning performance results were all within USEPA Region I guidelines.

Calibration

Guidance from USEPA Region I for instrument calibration for volatile and semi-volatile compounds states that: 1) all response factors must be greater than or equal to 0.05; 2) all percent relative standard deviations must be less than or equal to 30 percent; and 3) all percent differences must be less than or equal to 25 percent. If the response factor for any compound is greater than 0.05, all positive values are considered estimated and non-detects are considered unusable. If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

The percent relative standard deviation for methylene chloride was 62.8 percent on the initial calibration which is above the 30 percent guideline. All methylene chloride values should be considered qualitative. 2-Butanone had a 25.4 percent difference on the continuing calibration which is above the 25 percent difference limit. However, as there are no positive values for 2-butanone, this does not affect sample results.

The percent difference was 55.1 percent for 4-nitrophenol on the continuing calibration. All 4-nitrophenol values should be considered qualitative.

Blanks

The concentrations of compounds in laboratory, trip and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below five times the highest positive blank value for that compound should be considered unusable. In the cases of methylene chloride, acetone, toluene, 2-butanone and common phthalate esters (which are considered common lab contaminants by USEPA Region I guidelines), positive blank values were multiplied by a factor of ten, and all positive values below that action level should be considered unusable.

Two compounds were detected in VOC blanks. No compounds were detected in both the semi-volatile and the pesticide/PCB blanks.

- Methylene chloride was detected at 16 ug/L in a lab blank and at 13 ug/L in the trip blank. As methylene chloride was detected in all sample results at concentrations below ten times the blank concentrations, all methylene chloride values should be considered unusable.

- Acetone was detected at 44 ug/L in the field blank, but was not detected in any samples. Sample results are not affected by this.

Surrogate Recoveries

All surrogate recoveries were within the contract required recovery ranges.

Matrix Spike/Matrix Spike Duplicates

Although requested, the matrix spike and matrix spike duplicate samples were not run by ERCO.

Field Duplicates

All organic compounds were within the acceptable limits of less than 30 percent relative percent difference for the duplicate sample.

Internal Standard Performance

All samples were within the acceptable limits.

Pesticide Instrument Performance

Retention times were within USEPA Region I guidelines.

Compound Identification

There were no pesticide and PCB compounds detected, therefore compound identification did not have to be checked.

Compound Quantitation

Compound quantitation could not be verified due to absence of matrix spike and matrix spike duplicate results.

INORGANIC DATA

A summary of results of the inorganic ground-water quality data validation is provided in Table 1. Details of the validation results are provided below.

Data Completeness

All requested analyses were performed by ERCO.

Holding Times

All holding times were met.

Calibration Verification

All criteria were met for instrument calibration verification.

Laboratory and Field Blank Analyses

Bicarbonate, chemical oxygen demand and total suspended solids were all found in the field blank (GW-FB-3). Positive sample values below the action level of five times the highest value found in a blank for these analytes should be considered unusable. Bicarbonate and chemical oxygen demand sample concentrations are all below the action level of five times the blank concentration and should be

considered unusable, however, the total suspended solids sample values are above the action level and are not affected by the blank contamination.

Total aluminum, total calcium, total iron, total manganese, total sodium and total zinc were all detected in both the field and lab blanks. Total nickel was detected in the field blank. With the exceptions of total aluminum and total zinc in the OW-7 replicate (designated OW-101), and total nickel in both the OW-7 and OW-7 replicate (designated OW-101), each of which should be considered unusable, all total metal concentrations are above the action levels and are unaffected by the blank contamination.

Dissolved calcium and dissolved iron were detected in both the field and lab blanks. Dissolved nickel was detected in the lab blank. Dissolved barium, dissolved magnesium, dissolved sodium and dissolved zinc were all detected in the field blank. All dissolved metal concentrations are above the action levels and are unaffected by the blank contamination with the exception of the dissolved zinc concentration in the OW-7 replicate (designated OW-101), which should be considered unusable.

ICP Interference Check Sample Results

All samples met the criteria.

Matrix Spike Recoveries

Although requested, the matrix spike and matrix spike duplicate samples were not run by ERCO.

Laboratory and Field Duplicates

Since matrix spikes were not run, laboratory duplicate (matrix spike duplicate) analyses were not performed.

Field duplicate precision was greater than the 30 percent difference recommended by USEPA Region I guidelines for the following analyses: total phosphorus, total organic carbon, total suspended solids, total arsenic, total iron, total lead, total nickel, total zinc, dissolved aluminum, dissolved barium, and dissolved zinc. All results for these analyses should be considered qualitative.

Laboratory Control Sample Results

All samples met the criteria.

Furnace Atomic Absorption Results

All samples met the criteria.

Serial Dilution Results

Serial dilutions were performed for metals analyzed by ICP. All were within the 10 percent difference in results with the exceptions of total chromium, total copper, total nickel, total potassium, total tin, total zinc, dissolved iron, dissolved tin and dissolved zinc. USEPA Region I guidance suggests that if the percent difference is greater than 15 percent and the result of the diluted sample is greater than that of the undiluted sample, there is probably negative interference and all results should be considered qualitative. Total potassium, total and dissolved tin, and total and dissolved zinc results should all be considered qualitative as the percent difference between the undiluted and diluted samples was greater than 15 percent and the diluted sample concentration was greater than the undiluted sample result.

Detection Limit Results

All samples met the criteria.

Sample Results

Sample quantitation could not be verified due to the absence of matrix spike and matrix spike duplicate results.

If you have any questions or comments, please give us a call at (516) 673-7200.

Sincerely,

Martha M. Smith

Martha M. Smith
Project Geologist

William Sarni
Vice President

cc: J. Yeary, Roux Associates, Inc.

Table 1. Summary of Data Validation Recommendations
Industri-Plex Site, GSIP Woburn, MA

Data Quality	QA/QC Problems	Affected Samples
Volatile Organic Compound Data		
Unusable (U)	Instrument calibration problems and blank contamination	All methylene chloride results
Quantitative (B)	No problems	All remaining compounds
Semi-Volatile Compound Data		
Qualitative (A)	Instrument calibration problems	All 4-nitrophenol results
Quantitative (B)	No problems	All remaining compounds
Pesticide/PCB Data		
Quantitative (B)	No problems	All compounds

Table 1. Summary of Data Validation Recommendations
Industri-Plex Site, GSIP Woburn, MA

Data Quality	QA/QC Problems	Affected Samples
Miscellaneous Inorganic Data		
Unusable (U)	Field blank contamination	All bicarbonate and total organic carbon results
Qualitative (A)	Poor replicate precision	All total phosphorus results
Quantitative (B)	No problems	All remaining analytes
Metals Data		
Unusable (U)	Blank contamination, poor replicate precision and serial dilution differences	All total and dissolved zinc results
	Blank contamination and poor replicate precision	All total nickel results
	Blank contamination	Total aluminum in OW-7 replicate (designated OW-101)
Qualitative (A)	Poor replicate precision	All total arsenic, total iron, total lead, dissolved aluminum and dissolved barium results
	Serial dilution differences	All total potassium, total and dissolved tin results
Quantitative (B)	No problems	All remaining metal results

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation: / Sample Date:		OW-7 4/25/90		OW-7* 4/25/90		OW-17 4/25/90		
Volatile Organic Compounds (Concentrations in ug/L)	CRQL							IDL
Chloromethane	10	< 10	B	< 10	B	< 50	B	2
Bromomethane	10	< 10	B	< 10	B	< 50	B	2
Vinyl chloride	10	< 10	B	< 10	B	< 50	B	2
Chloroethane	10	< 10	B	< 10	B	< 50	B	2
Methylene chloride	5	21	U	19	U	96	U	2
Acetone	10	< 10	B	< 10	B	< 50	B	2
Carbon disulfide	5	< 5	B	< 5	B	< 25	B	1
1,1-Dichloroethene	5	3	B	< 5	B	< 25	B	1
1,1-Dichloroethane	5	6	B	6	B	< 25	B	1
1,2-Dichloroethylene (total)	5	2	B	2	B	< 25	B	1
Chloroform	5	< 5	B	< 5	B	< 25	B	1
1,2-Dichloroethane	5	< 5	B	< 5	B	< 25	B	1
2-Butanone	10	< 10	B	< 10	B	< 50	B	1
1,1,1-Trichloroethane	5	15	B	15	B	< 25	B	1
Carbon tetrachloride	5	< 5	B	< 5	B	< 25	B	1
Vinyl acetate	10	< 10	B	< 10	B	< 50	B	2
Bromodichloromethane	5	< 5	B	< 5	B	< 25	B	1
1,2-Dichloropropane	5	< 5	B	< 5	B	< 25	B	1
1,1,2,2-Tetrachloroethane	5	< 5	B	< 5	B	< 25	B	1
cis-1,3-Dichloropropene	5	< 5	B	< 5	B	< 25	B	1
Trichloroethene	5	36	B	35	B	< 25	B	1
Dibromochloromethane	5	< 5	B	< 5	B	< 25	B	1
1,1,2-Trichloroethane	5	< 5	B	< 5	B	< 25	B	1
Benzene	5	< 5	B	< 5	B	660	B	1
trans-1,3-Dichloropropene	5	< 5	B	< 5	B	< 25	B	1
Bromoform	5	< 5	B	< 5	B	< 25	B	1
2-Hexanone	10	< 10	B	< 10	B	< 50	B	2
4-Methyl-2-pentanone	10	< 10	B	< 10	B	< 50	B	2
Tetrachloroethene	5	< 5	B	< 5	B	< 25	B	1
Toluene	5	< 5	B	< 5	B	< 25	B	1
Chlorobenzene	5	< 5	B	< 5	B	< 25	B	1
Ethylbenzene	5	< 5	B	< 5	B	< 25	B	1
Styrene	5	< 5	B	< 5	B	< 25	B	1
Total xylenes	5	< 5	B	< 5	B	13	B	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL					IDL
Phenol	10	< 10	B	< 10	B	5
bis (2-Chloroethyl) ether	10	< 10	B	< 10	B	5
2-Chlorophenol	10	< 10	B	< 10	B	5
1,3-Dichlorobenzene	10	< 10	B	< 10	B	5
1,4-Dichlorobenzene	10	< 10	B	< 10	B	5
Benzyl alcohol	10	< 10	B	< 10	B	10
1,2-Dichlorobenzene	10	< 10	B	< 10	B	5
2-Methylphenol	10	< 10	B	< 10	B	5
bis (2-Chloroisopropyl) ether	10	< 10	B	< 10	B	5
4-Methylphenol	10	< 10	B	< 10	B	5
N-Nitroso-di-n-propylamine	10	< 10	B	< 10	B	10
Hexachloroethane	10	< 10	B	< 10	B	10
Nitrobenzene	10	< 10	B	< 10	B	5
Isophorone	10	< 10	B	< 10	B	5
2-Nitrophenol	10	< 10	B	< 10	B	10
2,4-Dimethylphenol	10	< 10	B	< 10	B	10
Benzoic acid	50	< 50	B	< 50	B	25
bis (2-Chloroethoxy) methane	10	< 10	B	< 10	B	5
2,4-Dichlorophenol	10	< 10	B	< 10	B	5
1,2,4-Trichlorobenzene	10	< 10	B	< 10	B	5
Naphthalene	10	< 10	B	< 10	B	3
4-Chloroaniline	10	< 10	B	< 10	B	5
Hexachlorobutadiene	10	< 10	B	< 10	B	5
4-Chloro-3-methylphenol	10	< 10	B	< 10	B	10
2-Methylnaphthalene	10	< 10	B	< 10	B	10
Hexachlorocyclopentadiene	10	< 10	B	< 10	B	10
2,4,6-Trichlorophenol	10	< 10	B	< 10	B	10
2,4,5-Trichlorophenol	50	< 50	B	< 50	B	10
2-Chloronaphthalene	10	< 10	B	< 10	B	4
2-Nitroaniline	50	< 50	B	< 50	B	10
Dimethyl phthalate	10	< 10	B	< 10	B	4
Acenaphthylene	10	< 10	B	< 10	B	3
2,6-Dinitrotoluene	10	< 10	B	< 10	B	10
3-Nitroaniline	50	< 50	B	< 50	B	10
Acenaphthene	10	< 10	B	< 10	B	3
2,4-Dinitrophenol	50	< 50	B	< 50	B	25
4-Nitrophenol	50	< 50	A	< 50	A	15
Dibenzofuran	10	< 10	B	< 10	B	4
2,4-Dinitrotoluene	10	< 10	B	< 10	B	10
Diethylphthalate	10	< 10	B	< 10	B	4
4-Chlorophenyl-phenylether	10	< 10	B	< 10	B	5
Fluorene	10	< 10	B	< 10	B	4
4-Nitroaniline	50	< 50	B	< 50	B	10
4,6-Dinitro-2-methylphenol	50	< 50	B	< 50	B	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL					IDL
N-Nitrosodiphenylamine (1)	10	< 10	B	< 10	B	5
4-Bromophenyl-phenylether	10	< 10	B	< 10	B	5
Hexachlorobenzene	10	< 10	B	< 10	B	5
Pentachlorophenol	50	< 50	B	< 50	B	10
Phenanthrene	10	< 10	B	< 10	B	3
Anthracene	10	< 10	B	< 10	B	3
Di-n-butylphthalate	10	< 10	B	< 10	B	3
Fluoranthene	10	< 10	B	< 10	B	3
Pyrene	10	< 10	B	< 10	B	3
Butylbenzylphthalate	10	< 10	B	< 10	B	5
3,3'-Dichlorobenzidine	20	< 20	B	< 20	B	5
Benzo (a) anthracene	10	< 10	B	< 10	B	3
Chrysene	10	< 10	B	< 10	B	4
bis (2-Ethylhexyl) phthalate	10	< 10	B	< 10	B	3
Di-n-octyl phthalate	10	< 10	B	< 10	B	4
Benzo (b) fluoranthene	10	< 10	B	< 10	B	5
Benzo (k) fluoranthene	10	< 10	B	< 10	B	6
Benzo (a) pyrene	10	< 10	B	< 10	B	3
Indeno (1,2,3-cd) pyrene	10	< 10	B	< 10	B	4
Dibenzo (a,h) anthracene	10	< 10	B	< 10	B	4
Benzo (g,h,i) perylene	10	< 10	B	< 10	B	4

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL					IDL
alpha-BHC	0.05	< 0.05	B	< 0.05	B	0.01
beta-BHC	0.05	< 0.05	B	< 0.05	B	0.02
delta-BHC	0.05	< 0.05	B	< 0.05	B	0.01
gamma-BHC (Lindane)	0.05	< 0.05	B	< 0.05	B	0.01
Heptachlor	0.05	< 0.05	B	< 0.05	B	0.01
Aldrin	0.05	< 0.05	B	< 0.05	B	0.01
Heptachlor epoxide	0.05	< 0.05	B	< 0.05	B	0.01
Endosulfan I	0.05	< 0.05	B	< 0.05	B	0.02
Dieldrin	0.10	< 0.10	B	< 0.10	B	0.02
4,4'-DDE	0.10	< 0.10	B	< 0.10	B	0.02
Endrin	0.10	< 0.10	B	< 0.10	B	0.05
Endosulfan II	0.10	< 0.10	B	< 0.10	B	0.02
4,4'-DDD	0.10	< 0.10	B	< 0.10	B	0.02
Endosulfan sulfate	0.10	< 0.10	B	< 0.10	B	0.08
4,4'-DDT	0.10	< 0.10	B	< 0.10	B	0.08
Methoxychlor	0.05	< 0.05	B	< 0.05	B	0.06
Endrin ketone	0.10	< 0.10	B	< 0.10	B	0.08
alpha Chlordane	0.05	< 0.05	B	< 0.05	B	0.12
gamma Chlordane	0.05	< 0.05	B	< 0.05	B	0.12
Toxaphene	1.0	< 1.0	B	< 1.0	B	0.40
Aroclor-1016	0.5	< 0.5	B	< 0.5	B	0.38
Aroclor-1221	0.5	< 0.5	B	< 0.5	B	0.29
Aroclor-1232	0.5	< 0.5	B	< 0.5	B	0.40
Aroclor-1242	0.5	< 0.5	B	< 0.5	B	0.45
Aroclor-1248	0.5	< 0.5	B	< 0.5	B	0.31
Aroclor-1254	1.0	< 1.0	B	< 1.0	B	0.42
Aroclor-1260	1.0	< 1.0	B	< 1.0	B	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Total Metals (Concentrations in ug/L)	IDL					CRDL
Aluminum	27	273	B	117	U	200
Antimony	37	< 37	B	< 37	B	60
Arsenic	2	43.5	A	29.7	A	10
Barium	2	24	B	22.1	B	200
Beryllium	1	< 1	B	< 1	B	5
Cadmium	5	< 5	B	< 5	B	5
Calcium	20	39900	B	40100	B	5000
Chromium	3	3.3	B	< 3	B	10
Cobalt	7	< 7	B	< 7	B	50
Copper	6	6.5	B	< 6	B	25
Iron	3	8150	A	5540	A	100
Lead	2	3.7	A	< 2	A	5
Magnesium	37	9930	B	9930	B	5000
Manganese	1	322	B	322	B	15
Mercury	0.2	< 0.2	B	< 0.2	B	0.2
Nickel	12	35.7	U	12	U	40
Potassium	900	2880	A	2490	A	5000
Selenium	2	< 2	B	< 2	B	5
Silver	3	< 3	B	< 3	B	10
Sodium	38	26700	B	26500	B	5000
Thallium	4	< 4	B	< 4	B	10
Vanadium	6	< 6	B	< 6	B	50
Zinc	8	22.8	U	14.4	U	20
Tin	28	< 28	A	< 28	A	
Hardness (mg/L)		140	B	141	B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Dissolved Metals (Concentrations in ug/L)	IDL	OW-7 4/25/90		OW-7* 4/25/90		CRDL
Aluminum	27	60.4	A	< 27	A	200
Antimony	37	< 37	B	< 37	B	60
Arsenic	2	< 2	B	< 2	B	10
Barium	2	175	A	74	A	200
Beryllium	1	< 1	B	< 1	B	5
Cadmium	5	< 5	B	< 5	B	5
Calcium	20	41000	B	40200	B	5000
Chromium	3	< 3	B	< 3	B	10
Cobalt	7	< 7	B	< 7	B	50
Copper	6	< 6	B	< 6	B	25
Iron	3	172	B	175	B	100
Lead	2	< 2	B	< 2	B	5
Magnesium	37	10100	B	9850	B	5000
Manganese	1	316	B	305	B	15
Mercury	0.2	< 0.2	B	< 0.2	B	0.2
Nickel	12	< 12	B	< 12	B	40
Potassium	900	2820	B	2600	B	5000
Selenium	2	< 2	B	< 2	B	5
Silver	3	< 3	B	< 3	B	10
Sodium	38	27400	B	26400	B	5000
Thallium	4	< 4	B	< 4	B	10
Vanadium	6	< 6	B	< 6	B	50
Zinc	8	124	U	41.5	U	20
Tin	28	< 28	A	< 28	A	
Hardness (mg/L)		144	B	141	B	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*	
Sample Date:		4/25/90		4/25/90	
Miscellaneous Compounds (Concentrations in mg/L)	IDL				
Sulfate	5.0	53.0	B	51.0	B
Sulfide	0.05	< 0.05	B	< 0.05	B
Total Phosphorous	0.01	0.30	A	0.21	A
Bicarbonate	5.0	55.1	U	55.1	U
Carbonate	5.0	< 5.0	B	< 5.0	B
Chloride	3.0	76.0	B	73.0	B
Cr+6	0.010	< 0.010	B	< 0.010	B
TOC	2.0	3.0	B	2.2	B
COD	5.0	17	U	23	U
TSS	1.0	26.0	B	18.0	B

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

APPENDIX D

Analytical Data Validation Documentation

Section 1. Ground-Water Data Validation Documentation
Part 3. Data Validation of August 1990 Enseco-ERCO Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON NEW YORK 11743 516 673-7200 FAX # 516 673-7216

October 12, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, MO 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the inorganic analytical data from ground-water samples collected from August 14, 1990 through August 17, 1990 at the Industri-Plex Site (Site) in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts. Samples were collected from twenty-one monitoring wells (OW-1, OW-1A, OW-4, OW-6, OW-7, OW-10, OW-11, OW-12, OW-13, OW-14, OW-15, OW-16, OW-17, OW-18, OW-18A, OW-19, OW-19A, OW-20, OW-21, OW-22 and OW-28) and analyzed for total and dissolved arsenic, barium and zinc, sulfate, sulfide, total phosphorous, total organic carbon (TOC) and hexavalent chromium. Quality assurance/quality control (QA/QC) samples collected include two blind replicates (GW-OW-20 replicate designated GW-OW-100 and GW-OW-21 replicate designated GW-OW-101), two field blanks (GW-FB-1 and GW-FB-2) and a matrix spike sample and duplicate collected at OW-1A (GW-OW-1AMS and GW-OW-1AMSD).

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1989) and guidelines in U.S. Environmental Protection Agency (USEPA) Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The laboratory reports from ERCO are organized by ERCO project numbers, which are assigned to each set of samples received on any one day. ERCO performed their QA/QC procedures for each set of samples collected on the same sampling day. ERCO considers each sampling day a different project. Therefore, because samples were collected over a four day time period, there are four separate reports (with four different sets of laboratory QA/QC documentation) from ERCO. In contrast, Roux Associates, Inc. views all of the samples as part of a single sampling round, and the validation was performed on the entire round.

INORGANIC DATA - Ground Water

Data Completeness

All analyses requested in the letter to Henry Camp of ERCO, dated August 10, 1990 analyses were performed by ERCO. Total and dissolved arsenic were requested while sampling was in progress and confirmed in the August 20, 1990 letter to Henry Camp. These analyses were also performed.

Holding Times

All samples were analyzed within the assigned holding times.

Instrument Calibration

The standard at 2x CRDL is not within ± 20 percent of the true value for dissolved zinc in samples OW-15, OW-14, OW-1A, OW-6, OW-7, OW-19A, OW-19, OW-20 replicate, OW-20, OW-17, OW-18A and for total zinc in samples OW-15, OW-14, OW-1A, OW-9, OW-1, OW-22 and OW-16. Results near the CRDL are questionable, therefore positive results less than 3 times the CRDL and nondetected results are estimated.

Laboratory and Field Blanks

The concentrations of analytes in laboratory and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blanks, positive values below the action level of five times the highest positive blank value for that analyte is reported as non-detect at the action level. Calibration blanks that are reported as negative values indicate there is a possibility that non-detects are false. Non-detects associated with blanks with negative values greater than twice the instrument detection limit are reported as qualitative non-detects.

- Total zinc was detected in one of the field blanks (GW-FB-1) and the prep blank associated with samples OW-15, OW-14 and OW-1A; in the prep blank for samples OW-9, OW-1, OW-22 and OW-16; and in the continuing calibration blank for samples OW-18, OW-11, OW-10, OW-12, OW-13, OW-21, OW-28, OW-4 and OW-21 replicate. Positive results for OW-14, OW-18, OW-11, OW-10 and OW-13 are above the action level and are considered quantitative. The remaining samples with positive values are reported as non-detect.

- Total barium was detected in the field blank and the continuing calibration blank for samples OW-18, OW-11, OW-10, OW-12, OW-13, OW-21, OW-28, OW-4 and OW-21 replicate. The positive values for all of these samples were above the action level and are considered quantitative.

- Dissolved zinc was detected in the continuing calibration blank and the field blank associated with samples OW-15, OW-14 and OW-1A; and in the continuing calibration blank for OW-9, OW-1, OW-22, OW-16, OW-18, OW-11, OW-10, OW-12, OW-13, OW-21, OW-28, OW-4, OW-21 replicate, OW-6, OW-7, OW-19A, OW-19, OW-20 replicate, OW-20, OW-17 and OW-18A. Samples OW-14, OW-18, OW-11, OW-10, OW-19A, OW-19, OW-17 and OW-18A have positive values above the action level and are considered quantitative. The remaining sample values are reported as non-detects.

- Dissolved barium was detected in the continuing calibration blank and in all the samples. All sample values were above the action level and are considered quantitative.

ICP Interference Check Sample Results

All samples meet this criteria.

Matrix Spike Recoveries

A matrix spike was performed on the sample from OW-1A, collected on August 16, 1990. All analytes met the criteria for this parameter.

Laboratory and Field Duplicates

Field duplicates were collected on August 14, 1990 (OW-20, OW-100) and August 15, 1990 (OW-21, OW-101). All analyses had relative percent differences within the 30 percent range advised by Region I USEPA with the exception of dissolved arsenic (35.7%) and dissolved zinc, (140%) in sample GW-OW-21. All of the filtered samples for these analytes greater than the IDL are considered qualitative.

Laboratory Control Sample Analyses

All laboratory control samples met the criteria of 80 - 120 percent recoveries.

Furnace Atomic Absorption Analysis

All samples met this criteria.

ICP Serial Dilution Analysis

Serial dilution analyses were performed with each daily batch of samples and met the Region I USEPA criteria.

Instrument Detection Limits

All instrument detection limits (IDL) were reported at values below the Contract Required Detection Limit (CRDL).

Sample Result Verification

All samples met the criteria.

If you have any questions or comments, please give us a call at (516) 673-7200.

Sincerely,

Martha M. Smith
Project Hydrogeologist

William Sarni
Vice President

cc: J. Yeary, Roux Associates, Inc.

Summary of Data Validation Recommendations, Ground-Water Samples, Ground-Water/Surface-Water Investigation Plan (GSIP), Industri-Plex Site, Woburn, Massachusetts.

Inorganic Compound Data for Ground Water

Data Quality	QA/QC Problems	Affected Samples
Qualitative (J)	Instrument calibration Duplicate precision	Dissolved zinc in samples OW-1A, OW-6, OW-7, OW-14, OW-15, OW-17, OW-18A, OW-19, OW-19A, OW-20, OW-20 replicate
	Instrument calibration	Total zinc in samples OW-1, OW-1A, OW-9, OW-15, OW-22
	Duplicate precision	Dissolved zinc in samples OW-1, OW-4, OW-10, OW-11, OW-12, OW-13, OW-18, OW-21, OW-21 replicate, OW-22, OW-28
		Dissolved arsenic in samples OW-9, OW-11, OW-12, OW-13, OW-14, OW-16, OW-17, OW-18, OW-19A, OW-20, OW-20 replicate, OW-21, OW-21 replicate
Quantitative (A)	No problems	All remaining analytes

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11	
Sample Date:		8/17/90	8/16/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 A	<2.0 A	<2.0 A	<2.0 A	6.9 A	22.0 A	2.1 A	204 A	10
Barium	1	7.2 A	9.8 A	9.3 A	19.2 A	17.7 A	8.7 A	50.6 A	45.6 A	200
Zinc	6	16.4 J	27.0 J	26.3 A	20.5 A	14.8 A	18.5 J	264 A	1,640 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		8/15/90	8/15/90	8/16/90	8/16/90	8/17/90	8/14/90	8/15/90	8/14/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	60.5 A	53.4 A	15.4 A	<2.0 A	2,350 A	184 A	4.9 A	<2.0 A	10
Barium	1	41.5 A	27.6 A	29.1 A	36.1 A	319 A	50.5 A	15.1 A	45.2 A	200
Zinc	6	20.4 A	66.7 A	1,510 A	13.1 J	31.9 A	221 A	8,430 A	239 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses. Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 A	34.8 A	6.4 A	5.8 A	5.3 A	4.8 A	<2.0 A	<2.0 A	10
Barium	1	21.5 A	20.9 A	14.5 A	14.8 A	22.9 A	24.9 A	76.9 A	18.0 A	200
Zinc	6	260 A	199.0 A	15.0 A	13.8 A	26.8 A	25.7 A	50.1 J	32.5 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11	
Sample Date:		8/17/90	8/17/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 A	<2.0 A	<2.0 A	<2.0 A	<2.0 A	4.6 J	<2.0 A	198 J	10
Barium	1	8.9 A	7.2 A	10.7 A	13.8 A	18.4 A	8.9 A	36.0 A	42.2 A	200
Zinc	6	8.2 J	25.4 J	7.2 J	12.0 J	20.7 J	<6.0 A	231 J	1,600 J	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		8/15/90	8/15/90	8/17/90	8/17/90	8/17/90	8/14/90	8/15/90	8/14/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	36.4 J	43.5 J	4.1 J	<2.0 A	2,400 J	83.0 J	3.1 J	<2.0 A	10
Barium	1	40.0 A	21.9 A	31.1 A	29.1 A	194 A	23.0 A	17.9 A	24.5 A	200
Zinc	6	9.0 J	7.6 J	1,610 J	17.2 J	<6.0 A	63.2 J	8,990 J	4,130 J	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 A	22.4 J	6.8 J	7.1 J	4.0 J	2.8 J	<2.0 A	<2.0 A	10
Barium	1	26.8 A	18.4 A	12.7 A	12.1 A	20.8 A	23.6 A	72.2 A	7.5 A	200
Zinc	6	444 J	116 J	6.7 J	12.6 J	15.7 J	37.8 J	25.0 J	15.1 J	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11
Sample Date:		8/17/90	8/16/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	27.6 A	11.4 A	12.0 A	26.9 A	43.8 A	400 A	14.1 A	79.6 A
Sulfide	0.050	<0.050 A	<0.050 A	<0.050 A	0.052 A	<0.050 A	<0.050 A	<0.050 A	<0.050 A
Total Phosphorous	0.050	<0.050 A	0.13 A	<0.050 A	0.070 A	0.068 A	<0.050 A	<0.050 A	0.14 A
TOC	0.50	20.5 A	12.5 A	0.82 A	2.2 A	5.5 A	29.2 A	2.3 A	12.7 A
Hexavalent Chromium	0.010	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A
Sample Date:		8/15/90	8/15/90	8/16/90	8/16/90	8/17/90	8/14/90	8/15/90	8/14/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	1,780 A	53.9 A	274 A	16.5 A	<5.0 A	902 A	283 A	231 A
Sulfide	0.050	0.084 A	<0.050 A	<0.050 A	<0.050 A	0.20 A	<0.050 A	<0.050 A	0.12 A
Total Phosphorous	0.050	0.30 A	0.69 A	<0.050 A	0.066 A	4.5 A	0.81 A	<0.050 A	<0.050 A
TOC	0.50	40.0 A	13.3 A	10.0 A	1.5 A	2,730 A	120 A	14.6 A	13.4 A
Hexavalent Chromium	0.010	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	99.3 A	31.1 A	55.4 A	55.4 A	25.1 A	18.4 A	711 A	12.5 A
Sulfide	0.050	0.055 A	0.055 A	<0.050 A	<0.050 A	<0.050 A	<0.050 A	<0.050 A	<0.050 A
Total Phosphorous	0.050	<0.050 A	0.055 A	0.91 A	0.19 A	0.064 A	0.068 A	0.053 A	0.059 A
TOC	0.50	3.9 A	9.7 A	2.1 A	2.4 A	9.8 A	16.4 A	15.3 A	0.71 A
Hexavalent Chromium	0.010	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A	<0.010 A

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

APPENDIX D

Analytical Data Validation Documentation

Section 1. Ground-Water Data Validation Documentation
Part 4. Data Validation of March and April 1990 Radian Analyses for Ground Water and Sewer Water

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7216

August 30, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the water samples analyzed for metal speciation and collected at the Industri-Plex Site in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). Samples were collected from the monitoring wells and trunk sewer lines during March and April 1990 and analyzed for the valence states of arsenic, mercury, lead, tin, organo-mercury and organo-tin by Radian Corporation (Radian) in Austin, Texas. Ferrous iron (Fe^{+2}) was also analyzed for all locations by Radian.

Analytical methods have not been established for many of these analyses, necessitating development of methods by Radian before analyses could be performed. A discussion of these methods is included in Attachment 1.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990) and guidelines in the U.S. Environmental Protection Agency (USEPA) Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed whenever appropriate. When differing guidelines were encountered, generally the stricter guideline was followed. However, as these analyses were not performed under Contract Laboratory Program (CLP) procedures, review of the standard Quality Assurance/Quality Control (QA/QC) guidelines was not always possible.

The results of the validation of the data are summarized in Table 1. All of the ground-water data are summarized in Table 2 and the sewer water data are summarized in Table 3. No sediment or sludge samples were collected from the sewer lines as there was no solid material at any of the four sampling locations. Details of the results of the validation effort are summarized below.

Data Completeness

All requested analyses were performed by Radian with the exception of organo-mercury analyses for the ground-water field blank collected on April 25, 1990 (FB3), due to insufficient sample volume. In addition, Radian analyzed some of the samples for total arsenic, total lead, total mercury, and total tin to help the laboratory discern if they should find any of the valence states of those metals. Radian was instructed to analyze for the metal speciation regardless of whether any of the total metal was detected; therefore, total tin and total lead were not analyzed in all samples. Due to inadequate sample volume for monitoring wells OW-12, OW-13, OW-18, OW-19, OW-20 and OW-21, these wells were resampled on April 25, 1990, and analyzed for organo-mercury and organo-tin.

Holding Times

There are no established holding times for these analyses.

Calibration Verification

There were no problems with the calibration blanks with the exceptions of two preparation blanks for lead with low estimated values detected and one preparation blank for mercury (0) and mercury (II) with a low estimated value detected. However, as lead and mercury were not detected in the continuing calibration blanks, the data are not affected.

Laboratory and Field Blank Analyses

Method blanks were run with each group of samples. Three field blanks were collected with the ground-water samples and one field blank was collected with the sewer-water samples. Analytes were not detected except in the cases listed below.

Lead, as analyzed by the gas furnace method, was detected in three of the five method blanks run and both of the field blanks run. When the detection level is raised by multiplying the highest blank value (found in the ground-water field blank, FB-GW) by five times (5 X 0.059 mg/L = 0.295 mg/L), only the values for OW-14 and OW-20 are above the action level. Because of the blank contamination, these values are considered qualitative.

Lead (II) was detected in one of the field blanks (FB-GW), but as lead was not detected in any samples, sample results were not affected.

Mercury by cold vapor analysis was not detected in the method blanks. However, mercury was detected in one field blank (GW-FB3) associated with ground-water samples and the field blank (SR-FB#1) associated with the sewer-water samples. Only the ground-water sample for OW-7, collected on April 25, 1990, was affected by the field blank contamination as all other samples associated with that ground-

water field blank had non-detect values. The OW-7 value will be reported as non-detect at the action level of 0.028 mg/L. The presence of mercury in the sewer-water field blank raised the detection limit so that all positive mercury values are considered non-detect at 0.0245 mg/L. Mercury was not detected in SR-2 and SR-3 replicate samples so they remain non-detect at 0.0002 mg/L.

Mercury (II) was detected in one method blank but the associated ground-water samples are either non-detect or above the action level. Mercury (II) was also detected in one field blank associated with the ground-water samples (FB-GW) at 0.0002 mg/L. The action level changes positive values from OW-12, OW-14, OW-17 and OW-18A to non-detect at 0.001 mg/L.

Dimethyl mercury was not detected in any method blanks, but was detected in the field blank associated with the sewer-water samples (SR-FB#1) at 0.024 mg/L. This changes dimethyl mercury values for SR-1 and SR-3 replicate to be reported as non-detect at the action level of 0.12 mg/L.

ICP Interference Check Sample Results

Fifteen tin samples were the only analyses run on the ICP and all of these samples met the criteria.

Matrix Spike Recoveries

Matrix spike samples were run for all analytes except for arsenic (III) and arsenic (V), and matrix spike duplicate samples were run. Recovery values were within laboratory specified ranges (see lab reports for specific ranges) except in the following cases.

The Fe^{+2} lab spike recovery was low for sample SR-2 at 81.6 percent. This is below the laboratory control limits of 85-115 percent, but did not affect sewer-water samples as all concentrations were above the detection limit.

Lead (II) matrix spike for OW-18 had 0.0 percent recovery. The lab spike for OW-12 had a recovery of 19.4 percent. Matrix spike and matrix spike duplicate recoveries for OW-21 replicate had low recoveries of 47.2 percent and 45.5 percent respectively. Two other spike recoveries on FB-GW and OW-11 were with the acceptable range of 75-125 percent. Therefore, all lead (II) values are considered qualitative.

Mercury lab spikes on OW-6 and OW-21 were 85 and 110 percent which were within the acceptable range of 75-125 percent. However a lab spike performed on the field blank GW-FB#3 had a recovery of 183.7 percent. This recovery (183.7 percent) did not affect the data as all mercury values are non-detect.

Mercury (0) matrix spike and matrix spike duplicate recoveries were 177.5 percent and 157.5 percent respectively on samples from OW-18. A lab spike performed

on OW-11 also had a high recovery of 132.5 percent. However the matrix spike performed on the sample from OW-21 replicate had a recovery of 115 percent which is within the acceptable range of 75-115 percent. High recoveries do not affect the data as all mercury (0) values are non-detect.

Mercury (II) matrix spike recoveries were within the acceptable range of 75-115 percent on samples from OW-11 and OW-20 (75.0 and 85.0 percent recovery). The matrix spike performed on the sample from OW-21 replicate was 131 percent. This recovery does not affect results which are non-detect, however mercury (II) was detected in two ground-water samples, OW-16 and OW-21. The OW-16 value of 0.0057 mg/L was affected as it is well above the detection limit of 0.0002 mg/L. The OW-21 value of 0.0003 mg/L is considered qualitative by Radian as it is very close to the detection limit of 0.0002 mg/L, and with a high spike recovery in the replicate of OW-21, this value is considered unusable.

Matrix spikes and matrix spike duplicates were performed on three ground-water samples and one sewer-water sample for dimethyl mercury analysis. The matrix spike duplicate recovery for OW-11 was 157 percent. Matrix spike and matrix spike duplicate recoveries were not calculated for OW-18. The matrix spike and matrix spike duplicate recoveries were 6 and 2 percent, respectively. The two bench spikes performed on OW-6 samples fell within an acceptable range of 75-125 percent at 109 and 82 percent.

In addition, three lab blank samples analyzed as extracted spikes had percent recoveries of 1, '15 and 286. Extracted spikes are comparable to matrix spike as the sample is spiked before it is extracted. This evaluates extraction and analytical interferences. Bench or lab spikes are spiked samples after extraction and evaluate only analytical interferences. Three lab blank samples analyzed as bench spikes did fall within the range of 75-125 percent recovery at 118, 93 and 85.

Matrix spike and extracted spike recoveries were either above or below the range of 75-125 percent, but the bench or lab spikes were within acceptable ranges which reflects problems associated with the extraction process and not the analyses. However, as reliable results could not be obtained with the extraction method developed, all dimethyl mercury results are considered unusable.

Spikes for ethyl mercury were performed but not calculated as ethyl mercury co-eluted with other compounds, making it impossible to read the peak accurately.

Matrix spikes were performed on four ground-water samples (OW-11, OW-14, OW-19 and OW-19A) and one sewer-water sample (SR-3) for the organo-tin analyses. Matrix spike duplicates were also performed on OW-19 and SR-3 samples. The mono-methyl tin spike analyses all were within the 75-125 percent recovery range with the exception of the OW-19 matrix spike duplicate recovery which was low at 58 percent. However, all other spike recoveries were within range and since mono-methyl tin was not detected in any samples, this shouldn't affect the data.

Dimethyl tin was spiked and run twice, as mono-methyl and tri-methyl tin elute on the column at the same time. The first run was spiked and run for mono-methyl and dimethyl tin. Half of the spike recoveries were out of the 75-125 percent recovery range. The percent recoveries for OW-11, OW-19, OW-19A and for a blank spike were respectively 151 percent, 126 percent, 67 percent and 143 percent. On the second run for dimethyl and tri-methyl tin, only two of the eight samples run were out of the 75-125 percent recovery range. OW-11 had a recovery of 162 percent and OW-19A had a recovery of 70 percent. All dimethyl tin values were non-detect but should be considered qualitative due to inconsistent matrix spike recoveries.

Tri-methyl tin spike recoveries were within the 75-125 percent recovery range with the exceptions of the OW-19 spike recovery of 55 percent and the OW-11 spike recovery of 142 percent. All tri-methyl tin values were non-detect but should be considered qualitative, as not all spike recoveries were within the 75-125 percent range.

Laboratory and Field Duplicates

Laboratory duplicates were performed by Radian and all had a relative percent difference (RPD) less than 20 percent as recommended for laboratory duplicates by USEPA Region I guidance with the exceptions of lead by gas furnace which had a RPD of 22 percent for OW-19 samples and 71 percent for OW-22 samples and dimethyl mercury lab duplicate had a RPD of 136 percent.

Three field duplicates (replicates) were collected with the ground-water samples and one replicate was collected with the sewer-water samples. All replicates analyses had RPDs less than 30 percent as recommended for field replicates by USEPA Region I guidance with the exceptions of Fe^{+2}, lead, and dimethyl mercury.

Ground-water Fe^{+2} replicates for OW-13 and OW-21 had RPDs of 53 and 167 percents respectively. Fe^{+2} concentrations for SR-3, collected in April 1990, had a RPD of 35 percent. All Fe^{+2} values related to the replicates with a RPD above 30 percent should be considered qualitative. Fe^{+2} concentrations for OW-7 and OW-7 replicate, collected in April 1990 had a RPD of 9 percent. OW-7 results should be considered quantitative, as the replicate collected at that monitoring well had an RPD less than 30 percent.

Dimethyl mercury had RPDs above the 30 percent range in replicates for OW-13, OW-21 and SR-3. The RPD values were 195 percent, 90 percent and 158 percent, respectively. As previously discussed, dimethyl mercury values are already considered unusable due to matrix spike and lab duplicate problems.

Two replicate sets were analyzed for lead by the gas furnace method by Radian. OW-19 set had a relative percent difference of 22 percent which is within the 30 percent range. OW-22 replicate set had a relative percent difference of 71

percent. All lead values should be considered qualitative, as there were also problems with blank contamination.

If you have any questions or comments, please give us a call at (516) 673-7200.

Sincerely,

Martha M. Smith

Martha M. Smith
Project Hydrogeologist

William Sarni

William Sarni
Vice President

cc: J. Yeary, Roux Associates, Inc.

Table 1. Summary of Data Validation Recommendations, Ground Water and Sewer-Water Samples, Ground-Water/Surface Water Investigation Plan (GSIP), Industri-Plex Site, Woburn, MA.

Data Quality	QA/QC Problems	Affected Samples
Unusable (U)	Poor matrix spike recoveries, poor duplicate precision	Dimethyl mercury in all samples
	Poor matrix spike recovery	Mercury (II) in OW-21
Qualitative (A) and detection limits raised	Field and lab blank contamination	Lead by gas furnace in all samples
Qualitative (A)	Poor matrix spike recoveries	Lead (II) in all samples
		Dimethyl and Trimethyl Tin in all samples
	Poor replicate precision	Fe^{+2} in all samples except OW-7 and OW-7 replicate
Quantitative (B) and detection limit raised	Field blank contamination	Mercury by cold vapor in OW-7, OW-7 replicate, SR-1, SR-3, SR-4
	Lab blank contamination	Mercury (II) in OW-12, OW-14, OW-17, OW-18A
Quantitative (B)	No problems	All remaining analytes

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-1		OW-1A		OW-4		OW-6		OW-7		OW-7*		OW-9		
Sample Date:	3/20/90		3/19/90		3/19/90		3/16/90		4/25/90		4/25/90		3/19/90		IDL
Analyte (Concentrations in mg/L)															
Arsenic by gas furnace	<0.0050	B	0.0053	B	<0.0050	B	0.0081	B	0.026	B	0.021	B	0.0064	B	0.0050
Arsenic (III)	<0.005	B	<0.005	B	<0.005	B	<0.005	B	<0.0050	B	<0.0050	B	<0.005	B	0.0050
Arsenic (V)	<0.005	B	<0.005	B	<0.005	B	<0.005	B	<0.0050	B	<0.0050	B	<0.0050	B	0.0050
Lead by gas furnace	<0.295	A	<0.295	A	<0.295	A	<0.295	A	NA		NA		<0.295	A	0.0030
Lead (II)	<0.60	A	<0.60	A	<0.60	A	<0.60	A	<0.60	A	<0.60	A	<0.60	A	0.60
Iron (II)	2.6	A	<0.050	A	3.5	A	0.088	A	0.30	B	0.33	B	18	A	0.050
Mercury by cold vapor	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.028	B	<0.028	B	<0.0002	B	0.0002
Mercury (II)	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Mercury (o)	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Ethyl-mercury	<0.9	B	<0.7	B	<0.7	B	<0.9	B	<0.07	B	<0.1	B	<0.4	B	----
Di-methylmercury	0.050	U	<0.005	U	0.088	U	0.067	U	0.090	U	0.068	U	0.037	U	----
Tin by ICPES	NA		<0.60	B	<0.60	B	<0.60	B	NA		NA		<0.60	B	0.60
Mono-methyl tin	<0.025	B	<0.025	B	<0.025	B	<0.025	B	<0.025	B	<0.025	B	<0.025	B	----
Di-methyl tin	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	----
Tri-methyl tin	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-10		OW-11		OW-12		OW-12		OW-13		OW-13*		OW-14		
Sample Date:	3/20/90		3/20/90		3/15/90		4/25/90		3/19/90		3/19/90		3/15/90		IDL
Analyte (Concentrations in mg/L)															
Arsenic by gas furnace	<0.0050	B	0.035	B	0.28	B	NA		<0.0050	B	<0.0050	B	0.098	B	0.0050
Arsenic (III)	<0.005	B	<0.005	B	<0.005	B	NA		<0.005	B	<0.005	B	<0.005	B	0.0050
Arsenic (V)	<0.005	B	0.046	B	0.45	B	NA		<0.005	B	<0.005	B	<0.005	B	0.0050
Lead by gas furnace	<0.295	A	<0.295	A	<0.295	A	NA		<0.295	A	<0.295	A	0.33	A	0.0030
Lead (II)	<0.60	A	<0.60	A	<0.60	A	NA		<0.60	A	<0.60	A	<0.60	A	0.60
Iron (II)	0.34	A	8.4	A	18	A	NA		19.0	A	11	A	1.4	A	0.050
Mercury by cold vapor	<0.0002	B	<0.0002	B	<0.0002	B	NA		<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Mercury (II)	<0.0002	B	<0.0002	B	<0.001	B	NA		<0.0002	B	<0.0002	B	<0.001	B	0.0002
Mercury (o)	<0.0002	B	<0.0002	B	<0.0002	B	NA		<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Ethyl-mercury	<0.5	B	<0.8	B	NA		<0.09	B	<0.8	B	<0.4	B	<0.6	B	----
Dimethyl-mercury	NA		0.043	U	0.027	U	0.029	U	0.0074	U	0.62	U	0.0088	U	----
Tin by ICPES	NA		NA		<0.60	B	NA		<0.60	B	<0.60	B	<0.60	B	0.60
Mono-methyl tin	<0.025	B	<0.025	+A	NA		<0.025	B	<0.025	B	<0.025	B	<0.025	B	----
Di-methyl tin	<0.050	A	<0.050	+A	NA		<0.050	A	<0.050	A	<0.050	A	<0.050	A	----
Tri-methyl tin	<0.050	A	<0.050	+A	NA		<0.050	A	<0.050	A	<0.050	A	<0.050	A	----

+ - Indicates analysis from sample collected on 4/25/90
* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-15		OW-16		OW-17		OW-18		OW-18		OW-18A		OW-19		
Sample Date:	3/15/90		3/20/90		3/15/90		3/15/90		4/25/90		3/15/90		3/16/90		IDL
Analyte (Concentrations in mg/L)															
Arsenic by gas furnace	<0.0050	B	1.7	B	0.0084	B	<0.0050	B	NA		0.012	B	<0.0050	B	0.0050
Arsenic (III)	<0.005	B	0.53	B	<0.005	B	<0.005	B	NA		<0.005	B	<0.0050	B	0.0050
Arsenic (V)	<0.005	B	0.62	B	0.048	B	<0.005	B	NA		<0.005	B	<0.0050	B	0.0050
Lead by gas furnace	<0.295	A	<0.295	A	<0.295	A	<0.295	A	NA		<0.295	A	<0.295	A	0.0030
Lead (II)	<0.60	A	<0.60	A	<0.60	A	<0.60	A	NA		<0.60	A	<0.60	A	0.60
Iron (II)	0.27	A	5.3	A	1.8	A	0.83	A	NA		0.8	A	<0.050	A	0.050
Mercury by cold vapor	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	NA		<0.0002	B	<0.0002	B	0.0002
Mercury (II)	<0.0002	B	0.0057	B	<0.001	B	<0.0002	B	NA		<0.001	B	<0.0002	B	0.0002
Mercury (o)	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	NA		<0.0002	B	<0.0002	B	0.0002
Ethyl-mercury	<0.9	B	<0.5	B	<0.6	B	<0.5	B	<0.05	B	<0.4	B	<0.4	B	----
Dimethyl-mercury	0.0070	U	0.0085	U	0.043	U	0.068	U	0.021	U	0.0075	U	0.35	U	----
Tin by ICPES	<0.60	B			<0.60	B	<0.60	B	NA		<0.60	B	<0.60	B	0.60
Mono-methyl tin	<0.025	B	<0.025	B	<0.025	B	NA		<0.025	B	<0.025	B	<0.025	B	----
Di-methyl tin	<0.050	A	<0.050	A	<0.050	A	NA		<0.050	A	<0.050	A	<0.050	A	----
Tri-methyl tin	<0.050	A	<0.050	A	<0.050	A	NA		<0.050	A	<0.050	A	<0.050	A	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-19	OW-19A	OW-20	OW-20	OW-21	OW-21*	
Sample Date:	4/25/90	3/16/90	3/16/90	4/25/90	3/21/90	3/21/90	IDL
Analyte (Concentrations in mg/L)							
Arsenic by gas furnace	NA	0.0089 B	<0.0050 B	NA	<0.0050 B	<0.0050 B	0.0050
Arsenic (III)	NA	<0.005 B	<0.005 B	NA	<0.005 B	<0.005 B	0.0050
Arsenic (V)	NA	<0.005 B	<0.005 B	NA	<0.005 B	<0.005 B	0.0050
Lead by gas furnace	NA	<0.295 A	0.30 A	NA	<0.295 A	<0.295 A	0.0030
Lead (II)	NA	<0.60 A	<0.60 A	NA	<0.60 A	<0.60 A	0.60
Iron (II)	NA	2.3 A	2.2 A	NA	0.56 A	<0.050 A	0.050
Mercury by cold vapor	NA	<0.0002 B	<0.0002 B	NA	<0.0002 B	<0.0002 B	0.0002
Mercury (II)	NA	<0.0002 B	<0.0002 B	NA	0.0003 U	<0.0002 B	0.0002
Mercury (o)	NA	<0.0002 B	<0.0002 B	NA	<0.0002 B	<0.0002 B	0.0002
Ethyl-mercury	<0.1 B	<0.9 B	<0.6 B	<0.1 B	<0.6 B	<0.8 B	----
Dimethyl-mercury	<0.005 U	0.0069 U	0.10 U	0.053 U	0.096 U	<0.005 U	----
Tin by ICPES	NA	<0.60 B	<0.60 B	NA	NA	NA	0.60
Mono-methyl tin	<0.025 B	<0.025 B	NA	<0.025 B	<0.025 B	<0.31 B	----
Di-methyl tin	<0.025 A	<0.050 A	NA	<0.050 A	<0.050 A	<0.63 A	----
Tri-methyl tin	<0.025 A	<0.050 A	NA	<0.050 A	<0.050 A	<0.63 A	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-22		OW-28		
Sample Date:	3/21/90		3/21/90		IDL
Analyte (Concentrations in mg/L)					
Arsenic by gas furnace	<0.0050	B	<0.0050	B	0.0050
Arsenic (III)	<0.005	B	<0.005	B	0.0050
Arsenic (V)	<0.005	B	<0.005	B	0.0050
Lead by gas furnace	<0.295	A	<0.295	A	0.0030
Lead (II)	<0.60	A	<0.60	A	0.60
Iron (II)	12	A	4.2	A	0.050
Mercury by cold vapor	<0.0002	B	<0.0002	B	0.0002
Mercury (II)	<0.0002	B	0.0002	B	0.0002
Mercury (o)	<0.0002	B	<0.0002	B	0.0002
Ethyl-mercury	<0.7	B	<0.7	B	----
Dimethyl-mercury	0.042	U	1.1	U	----
Tin by ICPES	NA		NA		0.60
Mono-methyl tin	<0.13	B	<0.025	B	----
Di-methyl tin	<0.25	A	<0.050	A	----
Tri-methyl tin	<0.25	A	<0.050	A	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

Table 3. Summary of Sewer Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:	SR-1 4/25/90		SR-2 4/24/90		SR-3 4/26/90		SR-3* 4/26/90		SR-4 4/26/90		IDL
Analyte (Concentrations in mg/L)											
Arsenic by gas furnace	<0.0040	B	<0.0040	B	<0.0040	B	<0.0040	B	<0.0040	B	0.0050
Arsenic (III)	<0.0050	B	<0.0050	B	<0.0050	B	<0.0050	B	<0.0050	B	0.0050
Arsenic (V)	<0.0050	B	<0.0050	B	<0.0050	B	<0.0050	B	<0.0050	B	0.0050
Lead (II)	<0.60	A	<0.60	A	<0.60	A	<0.60	A	<0.60	A	0.0030
Iron (II)	0.53	A	0.85	A	10	A	7.0	A	0.22	A	0.60
Mercury by cold vapor	<0.0245	B	<0.0002	B	<0.0245	B	<0.0002	B	<0.0245	B	0.500
Mercury (II)	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Mercury (o)	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	<0.0002	B	0.0002
Ethyl-mercury	<0.07	B	<0.05	B	<0.02	B	<0.09	B	<0.02	B	0.0002
Dimethyl-mercury	<0.12	U	<0.005	U	<0.005	U	<0.12	U	<0.005	U	----
Mono-methyl tin	<0.025	B	<0.025	B	<0.025	B	<0.025	B	<0.025	B	0.60
Di-methyl tin	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	----
Tri-methyl tin	<0.050	A	<0.050	A	<0.050	A	<0.050	A	<0.050	A	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL- Instrument Detection Limit

Validation Codes:
B - Quantitative Data
A - Qualitative Data
U - Unusable Data

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July 16, 1990

Bill Sarni
Roux Associates
775 Park Avenue
Suite 255
Huntington, New York 11743

Dear Mr Sarni:

This report is a summary of the metal speciation work performed for Roux Associates on soil and groundwater collected at the Industri-Plex Site, Woburn Mass. by Radian Corporation. Enclosed with this report are tabulations of all the analytical data generated during this speciation work and the accompanying QC data.

I have listed below the main features of the speciation work that we performed.

1 Iron [Fe(II)]

The determination of Fe(II) was performed according to the procedures provided in the 17th edition of the "Standard Methods for the Examination of Water and Wastewater". This is method 3500-Fe (D)which involves color development with phenanthrolene. A detection limit of 50ppb was reported for this work.

2 Lead [Pb(II)]

The method for Pb(II) was taken from the "Dionex Ion Chromatography Cookbook" (Pg II-21, 1987 edition). The analysis uses an oxalate buffer eluent on a CS5 column to achieve the separation of the transition metals, and a postcolumn reactor and UV/VIS spectrometer for detection. There are no published detection limits, however as Cu(II) was found to be an interference, these limits were found to be 0.6ppm for the samples analyzed. Matrix spike

8501 Mo-Pac Blvd. / P.O. Box 9948 / Austin, Texas 78766 / (512)454-4797

recoveries for the method were low or zero, which tend to confirm the fact that no Pb(II) was found in the samples. This is consistent with the chemistry of Pb(II) which forms highly insoluble oxides and hydroxides at the pH of the water samples, the solids, and their extracts (the solids were extracted in the eluent used for the IC analysis which has a pH of 4.8). See for example Willard L.Lindsay "Chemical Equilibrium in Soils" John Wiley (1979) chapter 20.

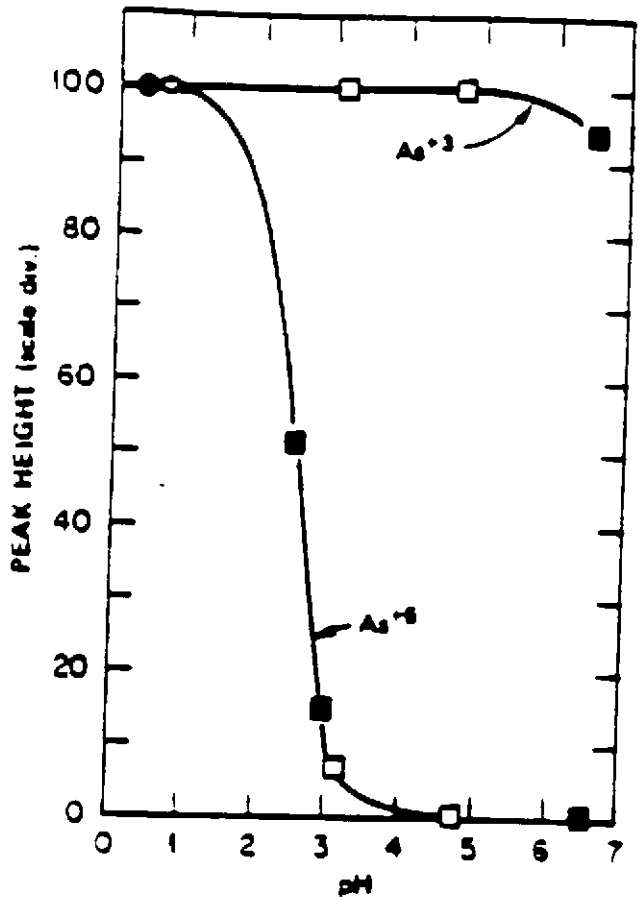
3 Arsenic [As(III) and As(V)]

Arsenic is readily analyzed by atomic absorption using the hydride generation technique. Refer to Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg70. (The As in solution is hydrogenated to form AsH_3, a gas, which is collected in a cold trap and then flashed into the flame of an atomic absorption spectrometer.) The procedure for As(III) and As(V) speciation is based upon the pH dependence of the hydrogenation reaction. As can be seen in Figure 1, As(III) may be quantitatively hydrogenated up to a pH of about 6, while As(V) is completely unreactive above pH 5. Consequently, hydrogenation in the range pH 5 to 6 yields only As(III), while hydrogenation below pH 1, yields both As(III) and As(V). The value of As(V) is then found by the difference between the total (low pH) As determination and the As(III) value. The method has a detection limit of about 5ppb, but this is a function of the sample size reacted as the total arsenic in the aliquot is retrieved and the detector response is due to this arsenic. Hence a larger aliquot will yield a lower detection limit, which is ultimately constrained only by the levels in the blank. In these studies, a 5ml aliquot was used, which corrresponded to the quoted detection limit. The As(III) standards were made up from the best available grade of As_2O_3 available (NIST 83b). There appeared to be no degradation over the time period of the analyses.

4 Organotin [Sn, CH_3SnX_3, $(CH_3)_2SnX_2$, $(CH_3)_3SnX$]

As with the arsenic, tin also undergoes hydrogenation reactions to from volatile hydrides. The hydrogenation does not displace the organic

FIGURE 1



AsH_3: Peak Height vs Buffer pH

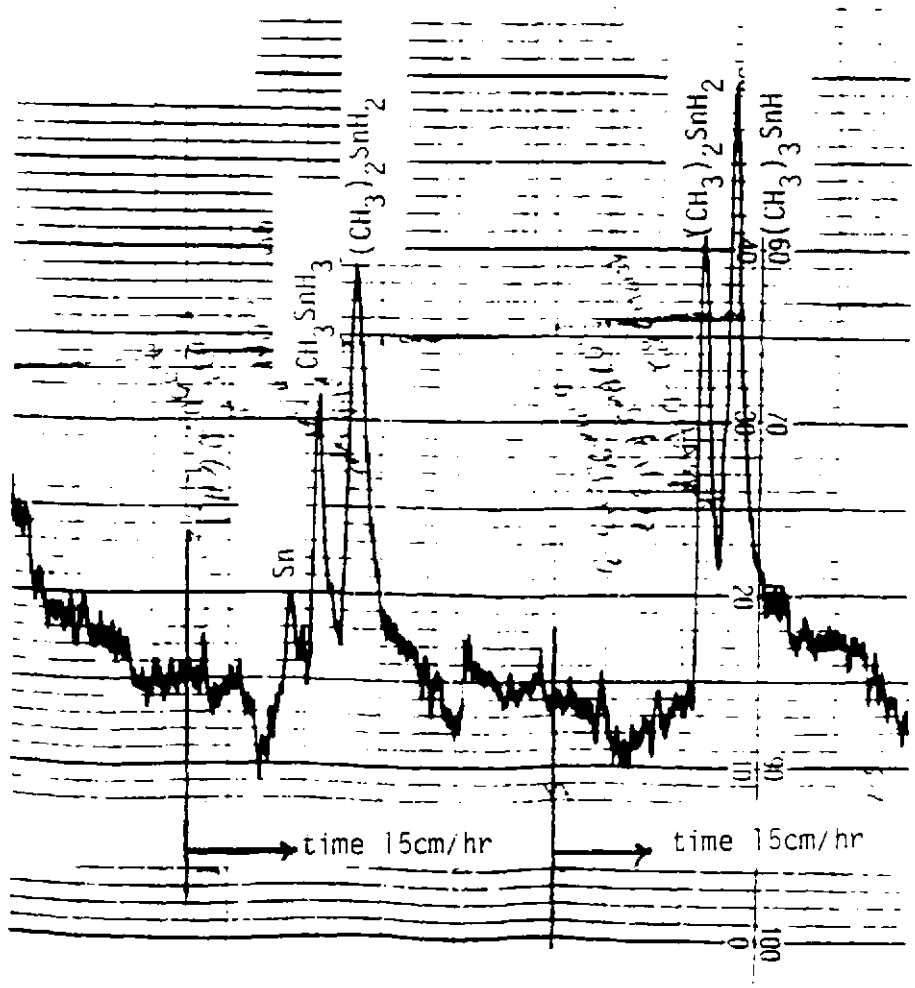
Peak height vs. pH for the reduction of As^{3+}

substituents on the tin, but will replace the "X", which is typically in the form of Cl. The method used for the Radian work is described by Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg334 and T.R. Crompton "Gas Chromatography of Organometallic Compounds", Plenum, London. pg346. The optimum pH is around 6 and all reactions were carried out in an appropriate phosphate buffer. The compounds SnH_4, CH_3SnH_3, $(CH_3)_2SnH_2$ and $(CH_3)_3SnH$ were actually detected in the AA. The four analytes were sparged from the reactor, and cryogenically focused onto a short (10") glass column packed with silanized 80 mesh glass beads, that could be heated. The heating rate was controlled to give the best peak separation. It was not possible to resolve all four peaks in one run, probably due to the low carrier gas pressure that the hydrogenation apparatus could withstand. The standards were run as SnH_4, CH_3SnH_3, and $(CH_3)_2SnH_2$ in one injection and then $(CH_3)_2SnH_2$ and $(CH_3)_3SnH$ as a second injection. A run of standards in the 50 - 100ppb Sn range is shown in Figure 2. The peak broadening may be controlled by redesigning the apparatus to withstand the high back pressures associated with the packed column. Water build up on the column also gave rise to problems and some further study of driers would improve reliability. Water build up was indicated by an increase in back pressure in the reactor, which resulted in poor peak separation. At the first appearance of a back pressure increase, a dry column was substituted. It was decided that, after preliminary scans, the absorption would not be calibrated, but that any individual sample that showed tin would be quantitated by the method of standard additions. Standards were made up from compounds purchased from Alpha Chemicals. The detection limit for Sn is 25ppb, and 50ppb for the other organotin analytes.

5a Mercury [Hg(0) and Hg(II)]

The total mercury in each sample was determined by method 7470 as described in SW 846 (3rd ed 1986). In addition the inorganic forms of mercury in the (0) and (II) oxidation states were speciated. Hg(0) is the form in which the element is analyzed by the cold vapor method, and consequently a simple sparging of the sample into the cold vapor apparatus as described in method

FIGURE 2



GC TRACE FOR Sn, CH_3SnH_3, $(CH_3)_2$ SnH_2, $(CH_3)_3SnH$

7470 should yield a value for that analyte only. Solid samples were sonicated in a deionized water slurry prior to sparging Hg(0). The QC for the Hg(0) was based upon gaseous samples from an equilibrated mercury chamber. Vapor phase QC samples were sparged from the normal mercury bottles, and as there was no step to release the vapor from the liquid phase, they tended to give a much sharper and higher peak than the normal standards. As the calibration was done on peak height basis, Hg(0) spikes were generally found to have recoveries greater than 100%. The inorganic Hg(II) may be selectively reduced by stannous chloride in the presence of strong base, with organic forms being unaffected (see Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg303). Samples were prepared by adding sodium hydroxide to an aliquot to make a 15% solution. Solid samples were sonicated in a 15% sodium hydroxide solution prior to analysis. The samples were reduced by stannous chloride and mercury detected in the normal way. Detections limits are the same as those for total mercury determinations.

5b Organomercury [(CH3)2Hg and C2H5HgCl]

An approach involving extraction into an organic solvent and subsequent separation by gas chromatography was taken. The electrophylic nature of the metal center makes electron capture an ideal detection method. Standards of dimethylmercury and ethylmercury chloride were obtained from Alpha Chemicals. A review of the literature (see for example T.R. Crompton "Gas Chromatography of Organometallic Compounds" Plenum, London pg29) indicated that the mercury compounds could be extracted from a sample acidified with HCl into toluene. This is not an acceptable method for the dimethyl- as its boiling point (around 95C) is similar to that of toluene and hence extracts could not be concentrated by evaporation. Hexane was used due to its lower boiling point. 50ml aliquotes of the samples were acidified with HCl and shaken or blended with about 50ml of hexane. The hexane extracts were then dried and reduced in volume to 5ml using a Kadurna Danish or to 1ml by allowing the hexane to evaporate from a tall test tube in a 40C oven. Blanks, blanks spikes, matrix spikes and MSD's were prepared in the same way. Discussions with vendors did

not yield much information on what columns may be best to use, and so a Porapak Q (6' glass colummn packed with 80/100 mesh Porapak Q - a standard packed column from Supelco) was initially used. The dimethylmercury was found to elute in 8.4 minutes (see Figure 3a) The trace of a typical sample is in Figure 3b and shows a peak at 8.4 minutes. The total analysis had shown no mercury to be present, hence the origin of the peak was not clear. Extraction blanks showed no response at 8.4 minutes, indicating that something in the sample was responsible for the signal. Spike recoveries from both the blank and the matrix spikes were poor adding further doubts to the identity. Analysis of the dimethylmercury standard by method 7470 showed no recovery, however photolysis of the standard prior to analysis by method 7470 showed recoveries (these were variable, probably due to the lack of temperature control on the photolysis reactor). Photolysis of selected samples showed no mercury in subsequent analysis. The data reported for the dimethylmercury is the concentration corresponding to the response observed at the 8.4 minute retention time. These should probably represent an upper value of the concentration in the sample extracts.

No peak corresponding to the ethylmercury chloride was observed on the Porapak Q column, however as there were reports in the literature of fragmentation of organomercury halides on GC columns. It was considered a possibility that the aromatic solvent played a role in stabilizing the analyte through the formation of an adduct, possibly due to electrophylic aromatic substitution. The appearance of peaks in the initial runs was eventually traced to an impurity in the toluene used to make the primary standard. It was clear that a different column system was needed to analyze the C_2H_5HgCl. The use of an OV101 column had been reported in the literature and so this was tried. The column used was a 6'column packed with 10% OV101 on 80/100 Chromosorb W-HP. This is a standard packed column from Alltech. The trace for a 0.5ppm standard is shown in Figure 4a, with the analyte having a retention time of 2.6 minutes. The C_2H_5HgCl is a solid with a sublimation temperature of 190C. The tailing in Figure 4a is due to the column temperature being below the

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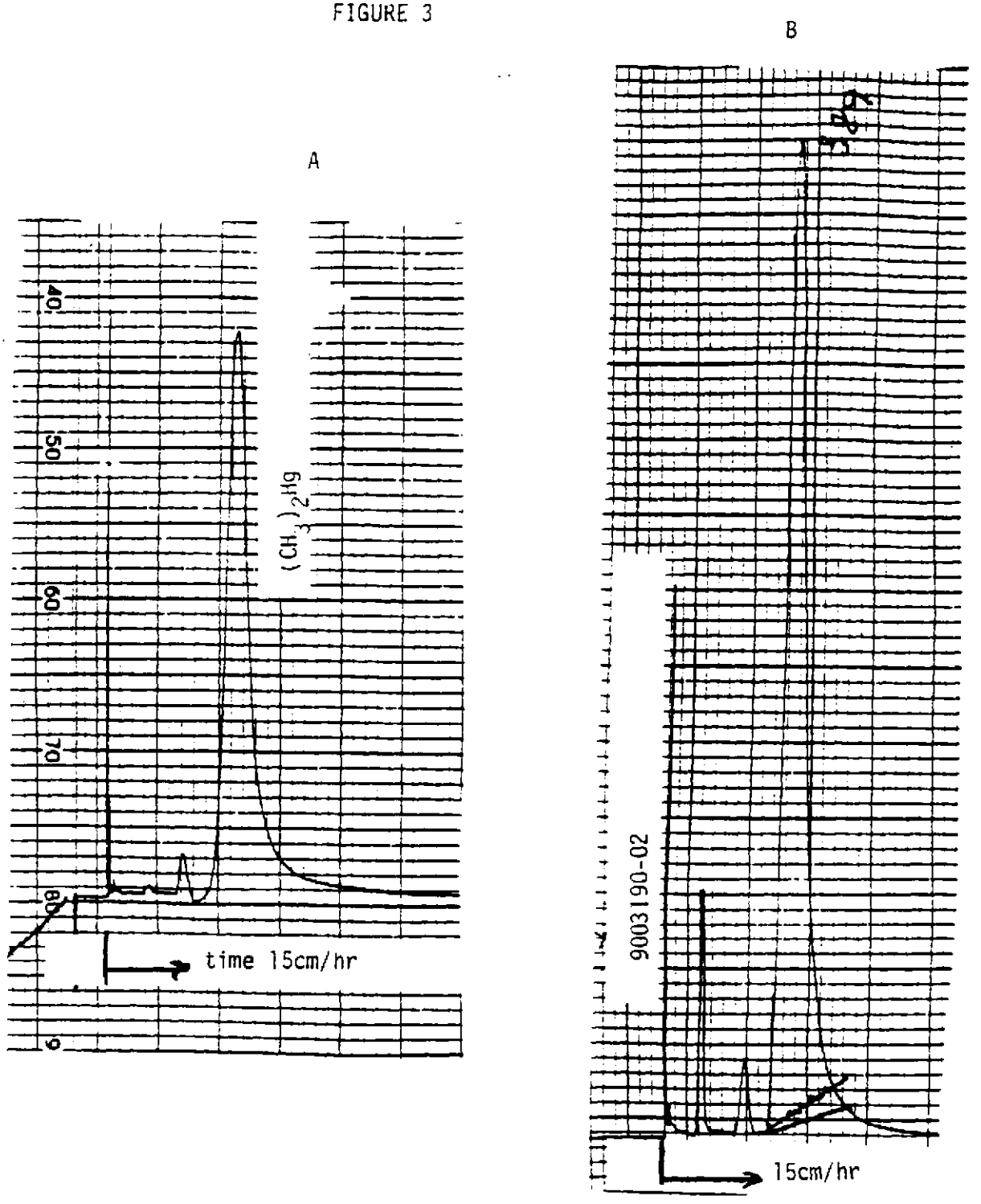
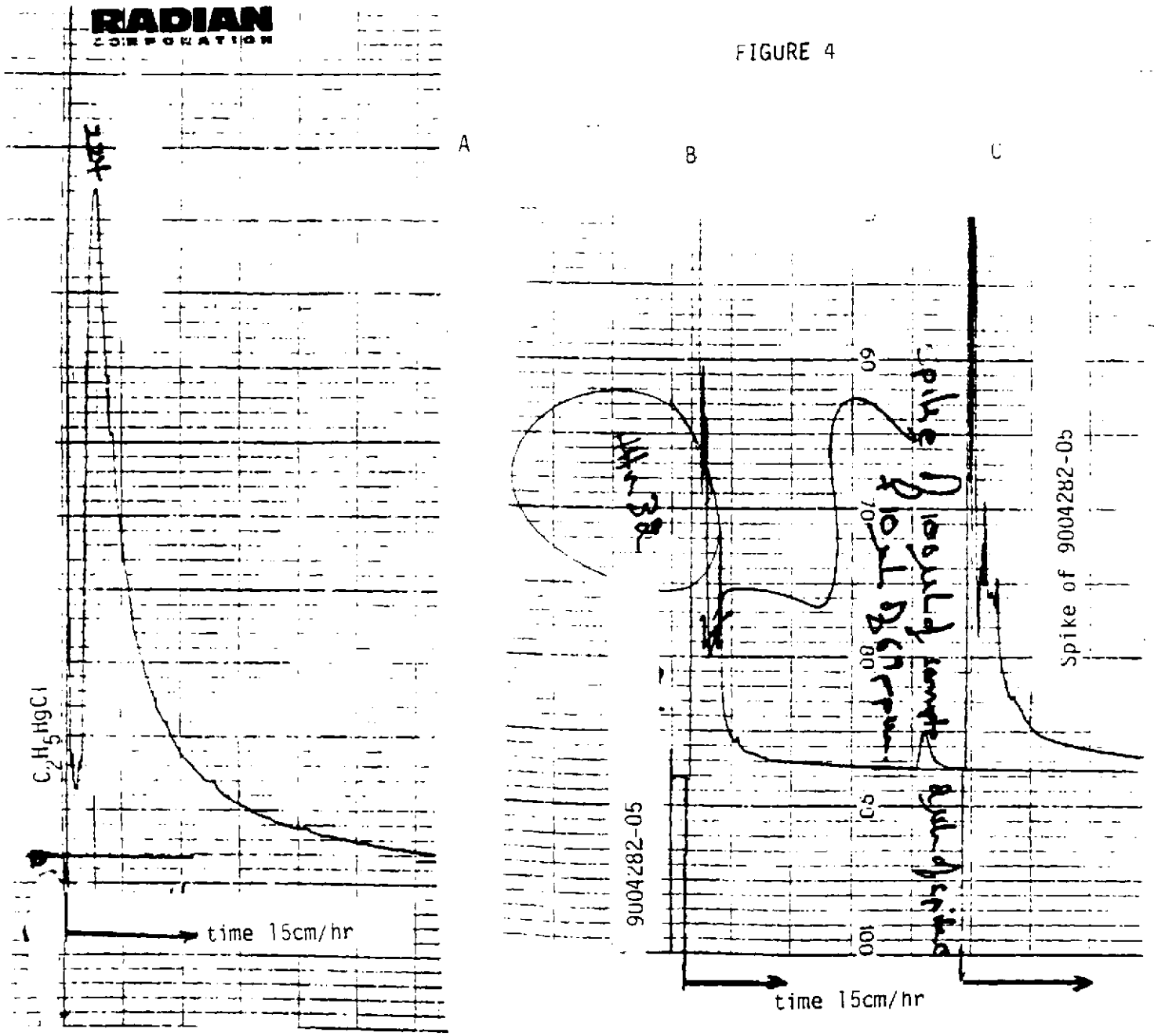
FIGURE 3



GC TRACE FOR $(CH_3)_2Hg$ (A) AND SAMPLE 9003190-02 EXTRACT (B)

FIGURE 4



GC TRACE OF C_2H_5HgCl (A), 9004282-05 EXTRACT (B), AND BENCH SPIKE OF 9004282-05 EXTRACT (C)

(Note:The sensitivity of (A) is twice that of (B) and (C))

sublimation temperature, however this lower temperature was necessary to separate the analyte peak from the injection peak. This separation proved to be insufficient to resolve the peak in the actual sample extracts, as is shown in Figures 4b and 4c. The presence of the spike can be seen by the broadening at the 2.6 minute retention time, however quantitation is impossible. Several attempts to clean up the extracts were made: Simply evaporating the extracts to dryness at 50C to evaporate other components (Figure 5 is a TGA run which indicates no weight loss from the solid up to 100C). Back extraction into base and then re-extracting into hexane is a literature reported method. Neither of these methods showed any appreciable improvement in cleaning the extracts. The data reported is an estimate of the value that may be present in the extract based upon the signal intensity at the 2.6 minute retention time.

John Shwell

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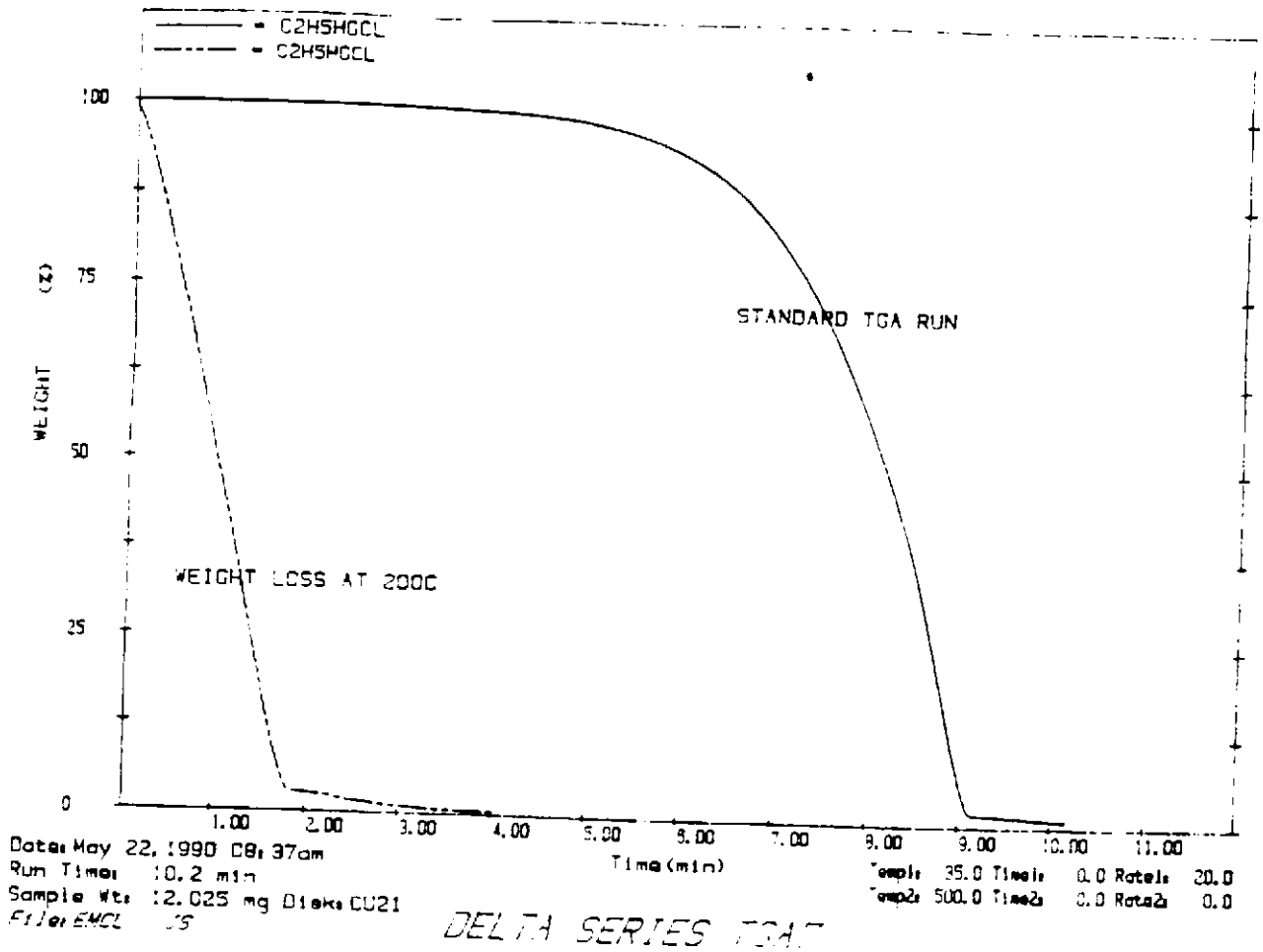
FIGURE 5



THERMOGRAVIMETRIC ANALYSIS OF C_2H_5HgCl

APPENDIX D

Analytical Data Validation Documentation

Section 2. Surface-Water and Stream-Sediment Data Validation Documentation

Part 1. Data Validation of Enseco-ERCO Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7216

October 31, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 N. Lindbergh Blvd.
St. Louis, MO 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the organic and inorganic analytical data from surface-water and stream sediment samples collected during the low-flow stream sampling on July 31, 1990 through August 3, 1990 as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts. Analyses for the chemical forms of arsenic, lead, mercury, organo-mercury, and organo-tin, in surface-water and stream sediments; ferrous iron in surface-water; and iron oxide and manganese oxide in stream sediments were performed by Radian Corporation of Austin, Texas and will be validated in a separate letter.

Samples were collected at 17 sampling locations. All locations were sampled for the full suite of analyses listed in the GSIP Work Plan, with the exceptions of surface-water samples at SW-3 and SW-16 because these sampling locations were dry. The full suite of analyses included a filtered and unfiltered sample for surface-water parameters, excluding volatile organic compounds (VOCs) and total suspended solids (TSS). A blind replicate was collected at SW-8 and designated SW-100 for the surface-water sample and SED-100 for the stream-sediment sample. One field blank for the water samples and one field blank for the sediment samples were collected. A trip blank for surface-water volatile organic compounds and the full suite of sediment analyses was included with the daily delivery of samples to ERCO.

In addition, a sediment core sample (Core #1) was collected on August 3, 1990 below the Hall's Brook Holding Area and samples from two intervals (0.2'-0.5' and 0.5'-0.9') were analyzed for the parameters requested in the GSIP Work Plan. Analytical data from these samples is included with the stream sediment samples for validation purposes and is summarized in Table 4.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990), guidelines in the U.S. Environmental Protection Agency (USEPA) Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (February 1, 1988 and modified

November 1, 1988), and Region I Laboratory Validation Functional Guidelines (June 13, 1988 and modified February 1989) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The laboratory reports, from ERCO, are organized by ERCO project numbers, which are assigned to each set of samples received on any one day. ERCO performs their Quality Assurance/Quality Control (QA/QC) procedures for each set of samples collected on the same sampling day, and considers each sampling day a different project. Therefore, because samples were collected over a four day time period, there are four separate reports (with four different sets of laboratory QA/QC documentation) from ERCO. In contrast, Roux Associates, Inc. views all of the samples as part of a single sampling round, and the validation was performed on the entire round.

The results of the validation are summarized in Table 1. Surface-water sampling data are summarized in Table 2, stream-sediment sampling data are summarized in Table 3, and Core Number 1 data are summarized in Table 4. Details of the results of the validation effort are summarized below. Organic surface-water analyses are discussed first, then organic stream sediment analyses, and similarly inorganic surface-water analyses precedes the discussion of the inorganic stream-sediment analyses.

ORGANIC DATA

Organic Data for Surface-Water Samples

The results of the validation of the organic data are summarized in Table 1. All of the surface-water data is summarized in Table 2. Details of the results of the validation effort are summarized below.

Data Completeness

All analyses requested for volatile organic compounds and semi-volatile organic compounds were performed by ERCO.

Holding Times

All samples were analyzed within the holding times with the exception of the reanalysis of filtered sample SW-15 for semi-volatiles. There were no detections in this sample, therefore sample results were not affected.

GC/MS Tuning

The gas chromatography/mass spectrometer (GC/MS) tuning performance results were all within USEPA Region I guidelines.

Calibration

Guidance from USEPA Region I for instrument calibration for volatile and semi-volatile compounds states that: 1) all response factors (RF) must be greater than or equal to 0.05; 2) all percent relative standard deviations (RSD) must be less than or equal to 30 percent; and 3) all percent differences (percent D) must be less than or equal to 25 percent. If the response factor for any compound is greater than 0.05, all positive values are considered qualitative and non-detects are considered unusable. If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

Instrument calibrations (initial and continuing calibration) were not within limits for several of the VOCs. The initial calibration average relative response factor was less than 0.05 for acetone and 2-butanone in samples SW-6, SW-12, SW-17, SW-5 and SW-4. Positive results for these compounds should be considered qualitative and non-detects should be considered unusable. The continuing calibration was outside limits for 2-butanone and 2-hexanone for SW-1, SW-2, SW-8, SW-8 replicate, SW-6, SW-12, SW-17 and SW-5. There were no positive detections of these compounds, therefore samples are not affected.

The initial calibration was not within limits for the following semi-volatile compounds. Samples collected on July 31, 1990, August 1, 1990 and August 2, 1990 were all outside initial calibration limits for 3,3-dichlorobenzidiene. The samples collected August 3, 1990 were not within limits for benzyl alcohol and 2,4-dinitrophenol. Samples SW-6, SW-12, SW-17, SW-5 and SW-4 (August 2, 1990) were not within limits for 2-fluorophenol. SW-15DL was outside the limits for fluorene. The non-detects for 3,3-dichlorobenzidiene in samples SW-6, SW-12, SW-17, SW-5 and SW-4 should be considered unusable. All other compounds are unaffected.

Continuing calibrations were not within the limits for the following semi-volatile compounds. Continuing calibration problems for hexachlorocyclopentadiene and 2-fluorophenol causes positive values to be considered qualitative for samples collected on August 1, 1990 and August 2, 1990 (SW-9, SW-10, SW-15, SW-7, SW-6, SW-12, SW-17, SW-5, SW-4). Positive values should be considered qualitative for benzoic acid, 2-fluorophenol and 4-nitroaniline, and unusable in non-detects for hexachlorocyclopentadiene for samples SW-11, SW-13 and SW-14. Samples collected on August 1, 1990 (SW-9, SW-10, SW-15, SW-7) should be considered qualitative for positive values for 4-nitroaniline, 4-nitrophenol, bis(2-chloroisopropyl)ether, 2-methylnaphthalene, 2,4,6-tribromophenol, and pyrene and unusable for non-detects for 3,3'-dichlorobenzidiene. Samples collected August 2, 1990 (SW-6, SW-12, SW-17, SW-5 and SW-4) should be considered qualitative for positive values for 2,4-dinitrophenol, 2,4,5-trichlorophenol, 2-nitroaniline, 3-nitroaniline, benzo(g,h,i)perylene and diethylphthalate and

unusable for non-detects for benzoic acid and 3,3'-dichlorobenzidiene. Samples collected August 3, 1990 (SW-2, SW-1, SW-8, SW-8 replicate) should be considered unusable for non-detects for 2,4-dinitrophenol, and positive values for benzoic acid should be considered qualitative.

Hexachlorocyclopentadiene and benzoic acid cause positive values to be qualitative in sample SW-15DL.

Blanks

The concentrations of compounds in laboratory, trip and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below five times the highest positive blank value for that compound should be considered unusable. In the cases of methylene chloride, acetone, toluene, 2-butanone and common phthalate esters (which are considered common lab contaminants by USEPA Region I guidelines), positive blank values were multiplied by a factor of ten, and all positive values below that action level should be reported as non-detects.

- VOC blanks contained methylene chloride in two lab blanks, two trip blanks and the field blank. All methylene chloride positive values in the samples were below the action level and are considered non-detect.

- Acetone was detected in the trip blank and field blank for samples SW-6, SW-12, SW-17, SW-5, and SW-4. This compound was not detected in any of the samples, thus sample results are not affected.

- The trip blank from samples collected July 31, 1990 contained chloromethane, 1,1-dichloroethane, trichloroethene and toluene. All positive concentrations for these compounds were below the Contract Required Quantitation Limit (CRQL) and below the action level therefore the samples are considered non-detect at the CRQL. SW-13 was above the CRQL and below the action level and is considered non-detect.

- The laboratory blank for August 3, 1990 (Blank 5) had a concentration of 1,1,2,2-tetrachloroethane. As this compound was not detected in the associated surface-water samples, this concentration does not affect the sample results.

- Bis(2-ethylhexyl)phthalate and diethylphthalate were detected in the laboratory blank and the field blank for samples collected on July 31, 1990 (SW-11, SW-13, SW-14). All of the samples have estimated concentrations of diethylphthalate while SW-11 and SW-14 have estimated concentrations of bis(2-ethylhexyl)phthalate. Due to the laboratory and field blank contamination, estimated concentrations will be recorded as non-detects at the CRQL.

- Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the dissolved field blank for samples collected on August 2, 1990. Di-n-butylphthalate was detected in all dissolved samples (SW-6, SW-12, SW-5, SW-17, SW-4). These sample results are less than the CRQL and less than the action level and are considered non-detect.

- N-nitrosodiphenylamine was detected at 1 ug/L in the laboratory blank for samples collected August 1, 1990. Only the filtered SW-9 sample had an estimated concentration of 1 ug/L. This sample result is below the CRQL and is considered non-detect. Diethylphthalate was also detected in this blank. None of the samples from August 1, 1990 contained this compound, thus sample results are unaffected.

Surrogate Recoveries

All volatile (except SW-11) and semi-volatile compounds had surrogate recoveries within the contract required range. SW-11 was outside the recovery range for 1,2-dichloroethane. The result was 115 while the range is 76 to 114. This compound was not detected, therefore the sample is not affected.

Matrix Spike/Matrix Spike Duplicate

The matrix spike duplicate for SW-7 sample, collected on August 1, 1990, did not meet the Relative Percent Difference (RPD) criteria for 1,1-dichloroethene, benzene, toluene or chlorobenzene. All positive results for these compounds will be considered qualitative.

The concentrations for unspiked compounds were compared with the matrix spike and matrix spike duplicate. The relative standard deviations were calculated for methylene chloride (20.4 percent), 1,2-dichloroethene (127 percent), trichloroethene (11.5 percent) and toluene (43 percent). Although there are no established limits for the RSDs for the unspiked compounds, the positive results for 1,2-dichloroethene and toluene should be considered qualitative.

Field Duplicates

The field duplicate collected on August 3, 1990 for SW-8 had acetone detected at less than 10 ug/L in the primary sample and at 3 ug/L in the replicate sample (SW-100). The relative percent difference (RPD) is 70 percent, therefore, the values are considered estimated. All other concentrations were within the limits of less than 30 percent RPD.

Internal Standard Performance

The internal standard areas did not meet the criteria of +100 percent or -50 percent in SW-12 dissolved. It was not re-extracted due to low sampling volume. All compounds associated with this sample are considered qualitative.

Compound Quantitation

All criteria were met for the samples for this parameter.

Pesticide/PCB Data

The results of the validation of the pesticide/PCB data is summarized in Table 1. All the surface-water data are summarized in Table 2. Details of the results of the validation effort are summarized below.

Data Completeness

All analyses requested for pesticide/PCB analyses were performed with the exception analyses of SW-11 dissolved.

Holding Time

All sample results exceeded the required holding times, samples collected 7/31/90 (SW-11, SW-13, SW-14) and 8/1/90 (SW-9, SW-10, SW-15, SW-7) were analyzed at 59 days and 73 days respectively with confirmation analyses for SW-11, SW-13 and SW-14 72 days after collection. Samples collected 8/2/90 (SW-6, SW-12, SW-17, SW-5, SW-4) and 8/3/90 (SW-1, SW-2, SW-8, SW-8 replicate) were analyzed 41 days after collection, but confirmation analyses occurred after 53 days and 56 days respectively. Because the holding times for either first analysis or re-analysis have exceeded the holding times by approximately 50 percent, all data are considered unusable.

Pesticide Instrument Performance

All samples met these criteria.

Calibration

The Percent Relative Standard Deviation (% RSD) of calibration factors for aldrin, endrin, DDT and dibutylchlorendate (DBC) exceeded 10 percent in samples SW-1, SW-2, SW-8, SW-8 replicate, SW-6, SW-12, SW-17, SW-5, and SW-4. The % RSD for DDT exceeded 10 percent in samples SW-9, SW-10, SW-15, and SW-7. All positive results are considered qualitative.

The 72 hour analytical sequence for standards analyses was not followed for samples SW-11, SW-13, SW-14, SW-6, SW-12, SW-17, SW-5, SW-4. Evaluation B mix was not analyzed after every ten samples for samples SW-1, SW-2, SW-8, and SW-8 replicate. The results for the above samples are considered unusable.

The Percent Difference (%D) for calibration factors is greater than 15 percent in continuing calibration for heptachlor, heptachlor epoxide, endosulfan II, 4,4-DDT, methoxychlor, aldrin, alpha-BHC, gamma-BHC and 4,4-DDE in all samples. In addition, the following compounds exceed 15 percent: endosulfate, endrin ketone,

endosulfan I, alpha chlordane, gamma chlordane and beta-BHC in samples SW-11, SW-13 and SW-14; delta BHC and endrin in samples SW-9, SW-10, SW-15, SW-7; endosulfan I, endrin ketone, alpha chlordane, gamma chlordane, endosulfate, beta-BHC in samples SW-6, SW-12, SW-17, SW-5, SW-4; and endrin ketone, endosulfan I, beta BHC, endosulfate, alpha chlordane, and gamma chlordane in samples SW-1, SW-2, SW-8, SW-8 replicate. All positive results for these compounds are considered estimated.

Blanks

No contamination was detected in the pesticide/PCB blanks.

Surrogate Recovery

Surrogate recoveries were below the contract required range for SW-1 (filtered), SW-8 (filtered), SW-8 (total), SW-8 replicate (filtered) and SW-8 replicate (total). Positive results for these samples are considered estimated.

Matrix Spike/Matrix Spike Duplicate

The percent recovery for the matrix spike for sample SW-7 was below the contract required range (CRR) for gamma BHC, aldrin, endrin, and 4,4-DDT. THe matrix spike duplicate relative percent difference (RPD) for sample SW-7 was above the CRR for gamma BHC, heptachlor, aldrin, dieldrin, endrin, 4,4-DDT. Dieldrin was also outside the percent recovery range. There are no positive results for these compounds therefore the data is not affected.

The RPD for SW-7 (filtered) was outside the CRR for gamma-BHC. However, there is no positive result for this compound and the data is not affected.

Field Duplicates

All concentrations for pesticides/PCBs in the field duplicates were within the acceptable limits.

Compound Identification

The only positive identification was Beta-BHC for samples SW-1, SW-2, SW-8, and SW-8 replicate in filtered and unfiltered samples. This compound falls within the retention time windows for both the DB-5 and the mixphase columns.

Organic Data for Sediments

The results of the validation of the organic data are summarized on Table 1. All of the stream sediment data are summarized on Table 3. Details of the results of the validation effort are summarized below.

Data Completeness

All volatile and semi-volatile organic compounds analyses were performed by ERCO.

Holding Times

Samples collected on August 2, 1990 and August 3, 1990 (SED-1, SED-2, SED-3, SED-8, SED-8 replicate, SED-6, SED-16, SED-12, SED-5, SED-17 and SED-4) were extracted within the specified holding time of seven days. Samples collected on July 31, 1990 and August 1, 1990 (SED-11, SED-13, SED-14, SED-9, SED-10, SED-15, SED-17) were extracted outside the seven day holding time for VOCs (27 days and 25 days respectively). Therefore, the positive results and non-detects are considered qualitative.

All of the semi-volatile samples exceeded the extraction time of seven days and are considered qualitative. All analyses of these compounds occurred within the required 40 days.

GC/MS Tuning

The gas chromatograph/mass spectrometer (GC/MS) tuning performance results were all within USEPA Region I guidelines.

Calibration

Guidance from USEPA Region I for instrument calibration for volatile and semi-volatile compounds states that: 1) all response factors must be greater than or equal to 0.05; 2) all percent relative standard deviations must be less than or equal to 30 percent; and 3) all percent differences must be less than or equal to 25 percent. If the response factor for any compound is greater than 0.05, all positive values are considered estimated and non-detects are considered unusable.

If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

Instrument calibration was not within limits for all compounds in the VOC sediment samples. For samples collected on July 31, 1990 and August 1, 1990 (except SED-9), the initial calibration for chloromethane was outside the required limits. The initial calibration of SED-9 was not within the limits for methylene chloride and 2-butanone. Acetone was not within the limits for all of the samples collected on August 2, 1990, August 3, 1990, and SED-9. Positive values for these compounds are considered qualitative. Continuing calibration for VOCs had differences greater than 25 percent for acetone, 2-hexanone, bromomethane,

methylene chloride, chloroethane, carbon disulfide, 1,1-dichloroethane, 1,2-dichloroethene, 2-butanone, 4-methyl-2-pentanone and chloromethane, in samples collected August 2, 1990 (except SED-6 and SED-16) and August 3, 1990 (SED-1, SED-2, SED-3, SED-8, SED-8 replicate, Core Number 1, SED-12, SED-5, SED-17 and SED-4). Positive values for these compounds are considered qualitative. For 2-butanone the negative values are also considered qualitative because the percent difference is greater than 50. Samples from July 31, 1990 and August 1, 1990 had a greater than 50 percent difference for chloromethane. All positive and non-detect values are considered qualitative. Samples from August 1, 1990 (SED-9, SED-10, SED-15, SED-7) are considered qualitative for non-detects for trans 1,3-dichloropropene and qualitative for positive values for 2-butanone, 4-methyl-2-pentanone, and cis 1,3-dichloropropene.

Calibration was not within limits for several of the semi-volatile compounds. The initial and continuing calibration of 3,3'-dichlorobenzidiene in samples collected July 31, 1990 (SED-11, SED-13, SED-14) and August 2, 1990 (SED-6, SED-12, SED-17, SED-5, SED-4, SED-7DL) had greater than 50 percent difference, thus positive values and non-detects are considered qualitative. In addition, positive values for 2,4-dinitrophenol from samples SED-9, SED-10, SED-15, SED-6, SED-12, SED-17, SED-5 and SED-4 are considered qualitative. Benzyl alcohol in samples SED-1, SED-2, SED-3, SED-8, SED-8 replicate and Core Number 1, 2-fluorophenol in samples SED-6, SED-12, SED-17, SED-5 and SED-4, SED-7-DL and 4-nitroaniline in samples SED-9, SED-10, SED-15 and SED-7 all positive values are considered qualitative.

Continuing calibration for semi-volatiles had differences greater than 50 percent for benzoic acid in samples SED-6, SED-12, SED-17, SED-5 and SED-4; 2-4-dinitrophenol and 4-nitrophenol in samples SED-1, SED-2, SED-3, SED-8, SED-8 replicate and Core Number 1. Positive values and non-detects are considered qualitative. Differences greater than 25 percent existed for benzoic acid in samples SED-9, SED-10, SED-15, SED-7DL, SED-1, SED-2, SED-3, SED-8, SED-8 replicate and Core Number 1; for hexachlorocyclopentadiene and 2-fluorophenol in samples SED-11, SED-13, SED-14, SED-9, SED-10, and SED-15; for 2,4-dinitrophenol, 2,4,5-trichlorophenol, 2-nitroaniline, 3-nitroaniline, benzo(g,h,i)perylene, and diethylphthalate in samples SED-6, SED-12, SED-17, SED-5 and SED-4; for bis(2-chloroisopropyl)ether, 2-methylnaphthalene and 2,4,6-tribromophenol in samples SED-11, SED-13 and SED-14; for pyrene and 3,3'-dichlorobenzidiene in SED-9, SED-10, and SED-15; and for 2,4,5-trichlorophenol, 2-nitroaniline, 3-nitroaniline, 2,4-dinitrotoluene, 4-nitroaniline and 2-fluorophenol in sample SED-7DL. All of these positive results for these compounds are considered qualitative.

Blanks

The concentrations of compounds in laboratory, trip and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below five times the highest positive blank value for that compound should be considered unusable. In the cases of methylene chloride,

acetone, toluene, 2-butanone and common phthalate esters (which are considered common lab contaminants by USEPA Region I guidelines), positive blank values were multiplied by a factor of ten, and all positive values below that action level should be reported as non-detects.

- Methylene chloride was detected in all of the trip blanks, in the field blank (FB-1 for SED) and in one of the lab blanks. The positive methylene chloride value for sample SED-9 are considered unusable. All other estimated concentrations will be recorded as non-detects at the CRQL.

- Acetone was detected in the laboratory blanks associated with samples collected August 2, 1990 (SED-12, SED-17, SED-5, SED-4), August 3, 1990 (SED-1, SED-2, SED-3, SED-8, SED-8 replicate, Core Number 1) and August 1, 1990 (SED-9). The positive sample results for this compound are less than the CRQL and less than the action level, thus the results are considered non-detects at the CRQL.

- Chloromethane, 1,1-dichloroethane, trichloroethane and toluene were detected at estimated concentrations in Trip Blank 1, accompanying the samples collected July 31, 1990. None of these compounds were detected in any of the sediment samples, therefore sample results are unaffected.

- Diethylphthalate and dimethylphthalate were detected in laboratory blanks from samples collected July 31, 1990 and August 1, 1990 for samples SED-11, SED-13, SED-10, and SED-15. Diethylphthalate was also found in the trip blank for July 31, 1990. All positive sample results are less than the CRQL and less than the action level, thus samples are considered non-detects at the CRQL.

Surrogate Recoveries

With the exceptions of SED-1 and SED-8, all volatile and semi-volatile compounds had surrogate recoveries within the contract required recovery range.

Samples SED-1 and SED-8 were outside the recovery range for nitrobenzene, therefore positive results for this fraction are qualitative.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate samples were run on VOCs and semi-VOCs in sample SED-7DL, and for the VOC fraction for samples SED-4, SED-2 and FB-1 for sediments.

- SED-4 matrix spike duplicate (MSD) did not meet the contract required recovery range for the relative percent difference (RPD)

criteria for 1,1-dichloroethene. This compound was not detected in SED-4, therefore the sample is not affected.

- All compounds for SED-2 and FB-1 for sediments were within the recovery range.

- SED-7DL was run due to the concentrations of bis(2-ethylhexyl)phthalate which exceeded the calibration range in SED-7. This sample had 12 out of the 22 compounds outside the contract recovery range for spike recoveries (1,4-dichlorobenzene, N-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene, 4-nitrophenol, 2,4-dinitrotoluene, and pentachlorophenol) in both the matrix spike (MS) and the MSD. All positive results for these compounds are qualitative.

- The concentrations of the unspiked compounds were used to determine the RSDs of the unspiked sample, matrix spike and matrix spike duplicate. Although there are no established limits for the RSD values of the unspiked compounds, the RSD for SED-4 should be qualified. SED-4 has a RSD of 120% for acetone. Therefore, this result is considered qualitative.

Field Duplicates

The field duplicate for SED-8 (SED-100) was collected on August 3, 1990. All compounds were within the acceptable limits of less than 50 percent relative percent difference.

Internal Standard Performance

The diluted samples SED-7DL, SED-7DLMS and SED-7DLMSD were all within the limits.

Sample Quantitation

All criteria were met for this parameter.

Pesticide/PCB Data for Sediment Samples

The results of the validation of the pesticide/PBC data is summarized in Table 1. All of the stream sediment data are summarized in Table 3. Details of the results of the validation effort are summarized below.

Data Completeness

All requested analyses were performed by ERCO.

Holding Times

All sample results exceeded the required holding times. Samples collected 7/31/90 (SED-11, SED-13, SED-14) and 8/1/90 (SED-9, SED-10, SED-15, SED-7) were analyzed after 59 days (with confirmation after 72 days) and 74 days respectively. Samples collected 8/2/90 (SED-6, SED-12, SED-16, SED-17, SED-5, SED-4) and 8/3/90 (SED-1, SED-2, SED-8, SED-8 replicate, Core 1) were analyzed after 41 days with confirmation for the former occurring after 54 days. All of the data for these samples are considered unusable. In addition, samples collected on 8/2/90 and 8/3/90 exceeded the seven day extraction period (10 days and 9 days respectively).

Pesticide Instrument Performance

All samples met this criteria.

Calibration

The Percent Relative Standard Deviation (% RSD) of calibration factors for aldrin, endrin, DDT and dibutylchlorendate (DBC) exceeded 10 percent i samples SED-1, SED-2, SED-8, SED-8 replicate, SED-6, SED-12, SED-17, SED-5, and SED-4. The % RSD for DDT exceeded 10 percent in samples SED-9, SED-10, SED-15, and SED-7. All positive results are considered qualitative.

The 72 hour analytical sequence for standards analyses was not followed for samples SED-11, SED-13, SED-14, SED-6, SED-12, SED-17, SED-5, SED-4. Evaluation B mix was not analyzed after every ten samples for samples SED-1, SED-2, SED-8, and SED-8 replicate. The results for the above samples are considered unusable.

The Percent Difference (%D) for calibration factors is greater than 15 percent in continuing calibration for heptachlor, heptachlor epoxide, endosulfan II, 4,4-DDT, methoxychlor, aldrin, alpha-BHC, gamma-BHC and 4,4-DDE in all samples. In addition, the following compounds exceed 15 percent: endosulfate, endrin ketone, endosulfan I, alpha chlordane, gamma chlordane and beta-BHC in samples SED-11, SED-13 and SED-14; delta BHC and endrin in samples SED-9, SED-10, SED-15, SED-7; endosulfan I, endrin ketone, alpha chlordane, gamma chlordane, endosulfate, beta-BHC in samples SED-6, SED-12, SED-17, SED-5, SED-4; and endrin ketone, endosulfan I, beta BHC, endosulfate, alpha chlordane, and gamma chlordane in samples SED-1, SED-2, SED-8, SED-8 replicate. All positive results for these compounds are considered estimated.

Blanks

No contamination was detected in the pesticide/PCB blanks.

Surrogate Recovery

Surrogate recoveries were outside the contract required range (CRR) with the exception of SED-10. Surrogates from samples SED-11, SED-13, SED-14, SED-9, SED-7, SED-7 MS, SED-7MSD, SED-12, SED-16, SED-17, SED-5 and SED-6 were diluted out of solution. These results should be considered qualitative. Sample SED-15 had a high recovery (186), while samples SED-1, SED-4, SED-2, SED-8, SED-8 replicate and Core 1 had recoveries below the CRR. These results are considered qualitative.

Matrix Spike/Matrix Spike Duplicates

The percent recovery for the matrix spike for sample SED-7 for heptachlor, aldrin, dieldrin, endrin and 4,4-DDT were outside the CRR. The first three compounds were above the CRR while the latter two were below the range (zero). Non detected results for endrin and 4,4-DDT are unusable. There are no positive results for heptachlor aldrin and dieldrin therefore the results are not affected.

The percent recovery for the matrix spike duplicate for SED-7 for gamma-BHC, heptachlor, aldrin, endrin and 4,4-DDT was zero. All of the non-detect results are considered unusable. The relative percent difference was above the CRR for gamma-BHC, heptachlor and aldrin. There are no positive results for these compounds therefore the results are not affected.

Field Duplicates

All concentrations for pesticides/PCBs in the field duplicates are within the acceptable limits.

Compounds Identification

There are no positive concentrations of pesticides or PCBs therefore compound identification is not required.

INORGANIC DATA-Surface-water

Data Completeness

All analyses requested were performed by ERCO.

Holding Times

All samples were analyzed within the holding times with the exception of the orthophosphate analyses for samples SW-1, SW-2, SW-4, SW-5, SW-6, SW-8, SW-8 replicate, SW-11, SW-12, SW-13, SW-14, and SW-17 which were analyzed from 3

to 7 days after sample collection. Orthophosphate has a 48 hour holding time. Orthophosphate data are considered qualitative for the samples analyzed outside of the holding time.

Total suspended solids (TSS) 7 day holding time was exceeded by one day for samples SW-1, SW-2, SW-8, and SW-8 replicate. These data are considered qualitative.

Instrument Calibrations

All the criteria were met.

Laboratory and Field Blanks

The concentrations of analytes in laboratory and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below the action level of five times the highest positive blank value for that analyte is reported as a non-detect at the action level. Calibration blanks that are reported as negative values indicate there is a possibility that non-detects are false. Non-detects associated with blanks with negative values greater than twice the instrument detection limit are reported as qualitative non-detects.

Total aluminum values were reported non-detect at the action level of 151 ug/L due to field blank contamination in SW-1, SW-2, SW-5, SW-6, SW-8, SW-11, SW-12, SW-13 and SW-17. Contamination in a calibration blank raises the detection limit to 170 ug/L in the SW-9 total aluminum analysis and causes it to be reported as non-detect.

Bicarbonate detected in the field blank at 5.4 mg/L raises the detection limit and causes positive concentrations for SW-8 and SW-8 replicate to be reported as non-detect at the action level of 27 mg/L.

Aluminum detected in a continuing calibration blank causes the detection limit to be raised for dissolved aluminum analysis in SW-7, SW-9, SW-10 and SW-15.

An initial calibration blank, and three continuing calibration blanks associated with the SW-4 dissolved aluminum analysis had negative values. Dissolved aluminum was not detected in SW-4, but is considered a qualitative non-detect.t

The total arsenic value in SW-12 is reported non-detect at 10 ug/L due to contamination in a preparation blank.

Dissolved cobalt was detected in an initial calibration blank and raises the detection limit to the action level of 20 ug/L for the associated samples SW-7, SW-9 and SW-15.

Copper detected in a preparation blank raises the detection limit to 42 ug/L for the total copper analyses in SW-5 and SW-17.

Iron was detected in a continuing calibration blank associated with the dissolved iron analysis for SW-7 causing the value to be reported as non-detect at 110 ug/L. The initial and two of the continuing calibration blanks associated with this sample had negative values, making the low reported value (in comparison to all the other samples collected) suspect and is another reason for reporting the value as a non-detect at a higher detection limit.

Potassium detected in a continuing calibration blank causes the detection limit to be raised to 2,320 ug/L in the total potassium analysis for SW-1.

Zinc detected in a preparation blank causes the total zinc values in SW-7, SW-10 and SW-15 to be reported as non-detect at 78 ug/L.

Inductively Coupled Plasma (ICP) Interference Check Sample Results

ICP interference check samples are run at the beginning and end of each analysis run to verify inter-element and background correction factors. The interference check samples consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents (aluminum, calcium, chromium, iron, and magnesium), and Solution AB consists of the analytes analyzed by the ICP with the interferents. Results for the ICP analyses of Solution AB must fall within the control limit of $\pm$20 percent of the true value of the analytes included in the solution. This criteria was met for all samples run.

Analytes not included in Solution A, but detected, indicate possible false positive or false negative values due to the interferent analytes. In samples with interferent values 50 percent or greater than those used in Solution A, analytical results must be evaluated to determine if other analytical values could be affected by an interfering analyte.

Analytes detected in the Solution A interference check sample, and containing at least one interferent value 50 percent of the result from Solution A, are considered qualitative. The total barium and sodium results in SW-11, SW-13 and SW-14 are all considered qualitative due to high calcium values. Total antimony in SW-13 and SW-14 are also considered qualitative due to high calcium values.

Matrix Spike Recoveries

A matrix spike was performed on the surface-water sample collected at SW-7 on August 1, 1990. Matrix spike results all had acceptable recoveries in the surface-water samples.

Laboratory and Field Duplicates

A laboratory duplicate was performed on the surface-water sample collected at SW-7 on August 1, 1990. The relative percent differences for all analytes was within the 20 percent range advised by Region I USEPA with the exceptions of total chromium values (relative percent difference = 33.8 percent) and total iron

(relative percent difference = 27.6 percent). All positive total chromium and total iron values are considered qualitative.

A blind replicate (field duplicate) was collected on August 3, 1990 at SW-8 and designated SW-100. All analyses had relative percent differences within the 30 percent range advised by Region I USEPA with the following exceptions.

- The relative percent difference for the unfiltered chemical oxygen demand (COD) was 46 percent.
- Total suspended solids had a relative percent difference of 66 percent.
- Total aluminum had a relative percent difference of 57 percent.
- Dissolved aluminum had a relative percent difference of 92 percent.
- Total iron had a relative percent difference of 45 percent.
- Dissolved manganese had a relative percent difference of 32 percent.
- Total zinc had a relative percent difference of 70 percent.
- Dissolved zinc had a relative percent difference of 42 percent.

Positive values for all the above mentioned analytes are considered qualitative.

Laboratory Control Sample Analysis

All laboratory control samples met the criteria of 80-120 percent recoveries with the exception of the laboratory control sample associated with the dissolved metal sample for SW-13. Chromium, iron, nickel and sodium all had percent recoveries above 120 percent. Chromium and nickel were not detected in the filtered SW-13 sample and are unaffected by high LCS recoveries. The dissolved iron and dissolved sodium results for SW-13 are considered qualitative.

Furnace Atomic Absorption Analysis

All samples met the criteria.

ICP Serial Dilution Analysis

Serial dilution analyses were performed with each daily batch of samples and met the Region I USEPA criteria with the following exceptions.

ICP serial dilution analysis percent differences were greater than 15 percent for dissolved aluminum and dissolved zinc for samples collected on July 31, 1990 (SW-11, SW-13 and SW-14). Positive results for these analyses are considered qualitative.

ICP serial dilution analysis percent differences were greater than 15 percent for total aluminum, total chromium, dissolved potassium and dissolved zinc for samples collected on August 1, 1990 (SW-7, SW-9, SW-10 and SW-15). Positive results for these analyses are considered qualitative.

ICP serial dilution analysis percent differences were greater than 15 percent for dissolved barium for samples collected on August 3, 1990 (SW-1, SW-2, SW-8, SW-8 rep.). Positive results for this analysis are considered qualitative.

Detection Limits

All instrument detection limits (IDL) were reported at values below or the same as the Contract Required Detection Limit (CRDL). ERCO flags all sample concentrations between the CRDL and IDL as estimated. From past experience and discussions with ERCO, all metal analyses with values in this range are considered qualitative.

Sample Result Verification

All samples met the criteria.

INORGANIC DATA-Stream Sediments

Data Completeness

All analyses requested were performed by ERCO.

Holding Times

Samples were analyzed within the holding times with the exceptions of some carbonate and hexavalent chromium analyses. Samples collected for carbonate analysis on August 1, 1990 (SED-7, SED-9, SED-10 and SED-15) were analyzed two to three days past the 14 day holding time. Carbonate samples collected on August 2, 1990 (SED-4, SED-5, SED-6, SED-12, SED-16 and SED-17) were analyzed eight days past the 14 day holding time.

All hexavalent chromium analyses for stream sediment samples were analyzed one to five days past the 24 hour holding time. Therefore, all hexavalent chromium data are considered qualitative. In addition, as trivalent chromium is calculated from the chromium and hexavalent chromium values, all trivalent chromium values are also considered qualitative.

Instrument Calibration

All calibration standards met the criteria.

Laboratory and Field Blanks

The concentrations of analytes in laboratory and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below the action level of five times the highest positive blank value for that analyte is reported as non-detect at the action level. Calibration blanks that are reported as negative values indicate there is possibility that non-detects are false. Non-detects associated with blanks with negative values greater than twice the instrument detection limit are reported as qualitative non-detects.

Trip blanks accompanying samples collected on July 31, 1990, August 2, 1990 and August 3, 1990 had high concentrations of calcium, magnesium, and sodium. As these analytes would be found at these levels in spring water, it is suspected that ERCO supplied bottled drinking water, normally used only for VOC trip blanks instead of deionized water. This is supported by the field blank analyses for both the water and sediment samples, which had these contaminants at an order of magnitude lower than the three suspect trip blanks. Therefore, the analytical results from these three field blanks will not be used to evaluate samples.

Beryllium was detected in a continuing calibration blank associated with samples SED-10 and SED-15. Beryllium was not detected in SED-10, but the SED-15 positive value will be reported as non-detect at 2.0 mg/kg.

Cadmium was detected in the initial calibration blank and a continuing calibration blank associated with samples collected on August 2, 1990. SED-4, SED-5 and SED-12 concentrations for cadmium will be reported as non-detect at 3.3 mg/kg.

Silver was detected in a continuing calibration blank associated with samples SED-10 and SED-15. Silver was not detected in SED-10, but the SED-15 positive values will be reported as non-detect at 3.9 mg/kg.

Sodium was detected in continuing calibration blanks associated with samples collected on July 31, 1990. Sodium sample value for SED-14 is reported as non-detect at the action level of 290 mg/kg. Sodium was also detected in continuing calibration blanks associated with samples collected on August 3, 1990. Sodium sample value for SED-2 is reported as non-detect at the action level of 102 mg/kg.

ICP Interference Check Sample Results

ICP interference check samples are run at the beginning and end of each analysis run to verify inter-element and background correction factors. The interference check samples consists of two solutions: Solution A and Solution AB. Solution A consist of the interferents (aluminum, calcium, chromium, iron, and magnesium), and Solution AB consists of the analytes analyzed by the ICP with the interferents. Results for the ICP analyses of Solution AB must fall with the control limit of $\pm$ 20 percent of the true value of the analytes included in the solution. This criteria was met for all samples run.

Analytes not included in Solution A, but detected, indicate possible false positive or false negative values due to the interferent analytes. In samples with interferent values 50 percent or greater than those used in Solution A, analytical results must be evaluated to determine if other analytical values could be affected by an interfering analyte.

Analytes detected in the Solution A interference check sample, and containing at least on interferent value 50 percent of the result from Solution A, are considered qualitative. The interference check samples run with samples collected on July 31, 1990 indicate possible interferences with the barium, cadmium, copper, manganese and vanadium analyses for SED-11. These sample results are considered qualitative.

Interference check samples run with samples collected on August 1, 1990 indicate possible interferences with the barium, lead manganese and vanadium analyses in SED-7, SED-10 and SED-15. The sodium analysis for SED-15 may also be affected by interferences. These sample results are considered qualitative.

Interference check samples run with samples collected on August 2, 1990 indicate possible interferences with the barium, cadmium, lead, manganese, potassium, vanadium, and zinc analyses for SED-6, SED-16 and SED-17. These sample results are considered qualitative.

The interference check sample run with samples collected on August 3, 1990 indicates possible interferences with the barium, manganese, and vanadium analyses for SED-2. These sample results are considered qualitative.

Matrix Spike Recoveries

A matrix spike was performed on sample SED-7, collected on August 1, 1990, and the following analytes did not have recoveries within the 75-125 percent range, as recommended by USEPA Region I criteria. Antimony and copper had percent recoveries of 28.4 and 27.7 percents respectively. All non-detect results for these analyses will be considered unusable and positive values will be considered qualitative. Barium, silver and thallium had respective recoveries of 58.3, 52.8 and 56.0 percents. All non-detects and positive values below the contract required detection limit (CRDL) are considered qualitative for these analyses.

Laboratory and Field Duplicates

Laboratory duplicate analyses was performed on sample SED-7, collected on August 1, 1990. The following analytes had relative percent differences (RPD) greater than 35 percent: antimony (66.0 percent), arsenic (45.2 percent), barium (37.2 percent), copper (63.4 percent), lead (55.9 percent), silver (59.0 percent) and tin (56.2 percent). All positive results are considered qualitative for these analyses.

A blind replicate (field duplicate) was collected on August 3, 1990 at SED-8 and designated SED-100. All analyses had relative percent differences within the 50 percent range advised by Region I USEPA with the exception of tin which had a RPD of 66 percent. Tin analyses are considered qualitative due to both the field and laboratory duplicate RPDs being out of range.

Laboratory Control Sample Analysis

All laboratory control samples met the criteria of 80-120 percent recoveries for stream-sediment samples.

Furnace Atomic Absorption Analysis

All samples met the criteria.

ICP Serial Dilution Analysis

Serial dilution analyses were performed with each daily batch of samples and met the Region I USEPA criteria with the following exceptions.

ICP serial dilution analysis percent differences were greater than 15 percent for cobalt, copper and sodium for samples collected on July 31, 1990 (SED-11, SED-13 and SED-14). Positive results for these analyses are considered qualitative.

ICP serial dilution analysis percent differences were greater than 15 percent for sodium and tin for samples collected on August 1, 1990 (SED-7, SED-9, SED-10 and SED-15). Positive results for these analyses are considered qualitative.

ICP serial dilution analysis percent differences were greater than 15 percent for sodium for samples collected on August 2, 1990 (SED-4, SED-5, SED-6, SED-12, SED-16 and SED-17). Positive results from these analyses are considered qualitative.

ICP serial dilution analysis percent differences were greater than 15 percent for sodium and zinc for samples collected on August 3, 1990 (SED-3, SED-8, SED-8 replicate and Core Number 1 samples). Positive results for these analyses are considered qualitative.

Detection Limits

All instrument detection limits (IDL) were reported at values below or the same as the Contract Required Detection Limit (CRDL). ERCO flags all sample concentrations between the CRDL and IDL as estimated. From past experience and discussions with ERCO, all metal analyses with values in this range are considered qualitative.

Sample Result Verification

All samples met the criteria.

If you have any questions or comments, please give us a call at (516) 673-7200.

Sincerely,

Linda M. Wilson

Linda Wilson
Project Scientist

Martha M. Smith

Martha M. Smith
Project Hydrogeologist

William Sarni

William Sarni
Vice-President

cc: J. Yeary, Roux Associates, Inc.
S. Clough, ES&E, Inc.
J. Dragun, Dragun Corp.

Table 1. Summary of Data Validation Recommendations, Surface-Water and Stream Sediment Samples, Ground-Water/Surface-Water Investigation Plan (GSIP), Industri-Plex Site, Woburn, MA.

Volatile Organic Compound Data for Surface Water

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Instrument calibration problems	Acetone and 2-butanone in samples SW-6, SW-12, SW-17, SW-5, SW-4
Qualitative (J)	Poor replicate precision	Acetone in sample SW-8
	MS duplicate relative percent difference	Trichloroethene, toluene and 1,2-dichloroethene in sample SW-7
Quantitative (A)	No problems	All remaining volatile organic samples

Semi-Volatile Organic Compound Data in Surface Water

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Instrument calibration problems	3,3-Dichlorobenzidiene in samples SW-9, SW-10, SW-15, SW-7, SW-6, SW-12, SW-17, SW-5, SW-4
		Hexachlorocyclopentadiene in samples SW-11, SW-13, SW-14
		2,4-Dinitrophenol in samples SW-6, SW-12, SW-17, SW-5, SW-5
		Benzoic acid in samples SW-6, SW-12, SW-17, SW-5, SW-4
Qualitative (J)	Internal standard retention times	All compounds in sample SW-12 dissolved
Quantitative (A)	No problems	All remaining semi-volatile organic samples

Pesticide/PCB Data for Surface Water

Data Quality	QA/QC Problems	Affected Samples
Unusable	Holding times Analytical Sequence	SW-11, SW-13, SW-14, SW-6, SW-12, SW-17, SW-5, SW-4, SW-1, SW-2, SW-8, SW-8 replicate
	Holding times Instrument calibration	SW-7, SW-9, SW-10, SW-15

Volatile Organic Compound Data for Sediments

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Blank contamination instrument calibration matrix spike recovery	Acetone in sample SED-4
	Blank contamination and instrument calibration problems	Acetone in samples SED-1, SED-2, SED-3, SED-5, SED-8, Core 1, SED-12
		Methylene chloride in sample SED-9
Qualitative (J)	Holding times exceeded and instrument calibration	Methylene chloride in samples SED-10, SED-13, SED-14, SED-15
		Chloromethane in sample SED-11, SED-13, SED-14, SED-9, SED-10, SED-15, SED-17
		Trans 1,3-dichloropropene in samples SED-9, SED-10, SED-15, SED-17
	Instrument Calibration	Acetone in samples SED-6, SED-9, SED-17, SED-16
		2-butanone in samples SED-1, SED-2, SED-3, SED-8, SED-8 replicate, SED-12, SED-5, SED-17, SED-4
		Methylene chloride in SED-1, SED-2, SED-3, SED-8, SED-8 replicate, Core 1
		4-methyl-2-pentanone in sample SED-5

Volatile Organic Compound Data for Sediments (con't)

Data Quality	QA/QC Problems	Affected Samples
	Holding times exceeded	All volatile organic compounds in samples SED-11, SED-13, SED-14, SED-9, SED-10, SED-15, SED-17
Quantitative (A)	No problems	All remaining volatile organic samples

Semi-Volatile Organic Data for Sediments

Data Quality	QA/QC Problems	Affected Samples
Qualitative (J)	Holding times exceeded and instrument calibration	3,3'-Dichlorobenzidiene in samples SED-11, SED-13, SED-14, SED-6, SED-12, SED-17, SED-5, SED-4
		Benzoic Acid in samples SED-6, SED-12, SED-17, SED-5, SED-4
		2,4-Dinitrophenol and 4-nitrophenol in samples SED-1, SED-2, SED-3, SED-8, SED-100, Core 1
	Holding times exceeded	All remaining samples

Pesticide/PCB Data for Stream Sediments

Data Quality	QA/QC Problems	Affected Samples
Unusable	Holding times Calibration analytical sequence Surrogate recoveries	All compounds in SED-11, SED-13, SED-14, SED-12, SED-16, SED-17, SED-6, SED-1, SED-2, SED-8, SED-8 replicate, core 1
	Matrix spike/matrix spike duplicate	Endrin, 4,4-DDT, aldrin, heptachlor, gamma BHC in sample SED-7
	Holding times Surrogate recovery	All compounds in SED-9, SED-15 and SED-7
	Holding time	SED-10

Miscellaneous Inorganic Analytical Data for Surface-Water

Data Quality	QA/QC Problems	Affected Samples
Qualitative (J)	Poor replicate precision	COD in all unfiltered surface-water samples
	Holding time exceeded	TSS in SW-1, SW-2, SW-8 and SW-8 replicate
		Orthophosphate in samples SW-11, SW-12, SW-13, SW-14, SW-17
Quantitative (A) and detection limits raised	Blank contamination	Bicarbonate in filtered surface-water samples for SW-8 and SW-8 replicate
Quantitative (A)	No problems	All remaining analytes

Metals Data for Surface Water

Data Quality	QA/QC Problems	Affected Samples
Qualitative (J) and detection limits raised	Blank contamination, ICP dilution out of range and poor replicate precision.	Total aluminum in all samples.
	Blank contamination and poor replicate precision.	Dissolved aluminum in SW-4, SW-5, SW-6, SW-7, SW-9, SW-10, SW-12, SW-14 and SW-17; total zinc in all samples.
Qualitative (J)	Analytical interferences	Total sodium and total barium in SW-11, SW-13 and SW-14; total antimoy in SW-13 and SW-14.
	ICP dilution out of range.	Dissolved barium in SW-1, SW-2, SW-8 and SW-8 replicate; Dissolved potassium in SW-7, SW-9, SW-10 and SW-15.
	Blank contamination and ICP dilution out of range	Total chromium in SW-1, SW-2, SW-6, SW-7, SW-9, SW-10, SW-13, SW-14, SW-15 and SW-17.
	ICP dilution out of range and poor replicate precision.	Dissolved aluminum in SW-11, SW-13, and SW-14; Dissolved zinc in SW-7,SW-9, SW-10, SW-11, SW-13, SW-14, SW-15.
	Poor replicate precision	Total iron in all samples; dissolved manganese in all samples; dissolved zinc in SW-1, SW-2, SW-4, SW-5, SW-8, SW-8 replicate, SW-12 and SW-17.
	Blank contamination	Dissolved copper in SW-4

Metals Data for Surface Water (cont')

Data Quality	QA/QC Problems	Affected Samples
	Laboratory control sample	Dissolved iron and dissolved sodium in sample SW-13
Quantitative (A) and detection limits raised	Blank contamination	Dissolved aluminum in SW-7, SW-9, SW-10, SW-15; total arsenic in SW-12; dissolved cobalt in SW-7, SW-9 and SW-15; total copper in SW-5 and SW-17; Dissolved iron in SW-7; total potassium in SW-1.
Quantitative (A)	No problems	All remaining analytes

Miscellaneous Inorganic Analytical Data for Stream Sediments

Data Quality	QA/QC Problems	Affected Samples
Qualitative (J)	Holding times exceeded	Hexavalent chromium in all samples; trivalent chromium in all samples
		Carbonate in samples SED-4, SED-5, SED-6, SED-7, SED-9, SED-10, SED-12, SED-15, SED-16, SED-17
Quantitative (A)	No problems	All remaining samples

Metals Data for Stream Sediments

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Matrix spike recoveries	Antimony in samples SED-2, SED-3, SED-4, SED-5, SED-6, SED-8, SED-11, SED-12, SED-13, SED-14, SED-16, SED-17
Qualitative (J)	Analytical Interferences	Barium, manganese and vanadium in samples SED-2, SED-7, SED-10, SED-5, SED-6, SED-16, SED-17; Potassium in samples SED-6, SED-16, SED-17; zinc in samples SED-6, SED-16, SED-17; lead in samples SED-7, SED-10, SED-15, SED-6, SED-16, SED-17
	ICP dilution out of range	Sodium in SED-3, SED-4, SED-6, SED-7, SED-8, SED-8 rep, SED-9, SED-10, SED-11, SED-13, SED-15, SED-16, SED-17; cobalt and copper in samples SED-11, SED-13, SED-14; tin in samples SED-7, SED-9, SED-10, SED-15; zinc in samples SED-3, SED-8, SED-8 rep, core 1
	Duplicate recoveries	Tin in SED-8; antimony, arsenic, barium, copper, lead and tin in samples SED-7, SED-9, SED-10, SED-15, SED-17; silver in samples SED-7, SED-9, SED-15
	Matrix spike recoveries	Antimony in samples SED-1, SED-7, SED-9, SED-10, SED-15; barium, silver and thallium in all samples

Metals Data for Stream Sediments (con't)

Data Quality	QA/QC Problems	Affected Samples
Quantitative	No problems	All remaining analytes

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromomethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Chloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Methylene chloride	5	<5 U	<5 U	2 A	<5 U	<5 U	7 A	<5 U	<5 U	2
Acetone	10	<10 U	20 U	<10 R	<10 U	<10 R	<10 U	<10 U	3 A	2
Carbon disulfide	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloroethylene	5	<5 U	<5 U	<5 U	<5 U	<5 U	6 J	<5 U	<5 U	1
Chloroform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Butanone	10	<10 U	<10 U	<10 R	<10 R	<10 R	<10 U	<10 U	<10 U	1
1,1,1-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Carbon tetrachloride	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Vinyl acetate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Trichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	6 A	<5 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Benzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Bromoform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
4-Methyl-2-pentanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
2-Hexanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Tetrachloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2,2-Tetrachloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Toluene	5	<5 U	<5 U	<5 U	<5 U	<5 U	2 J	<5 U	<5 U	1
Chlorobenzene	5	<5 U	<5 U	<5 U	<5 U	2 A	<5 U	<5 U	<5 U	1
Ethylbenzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Styrene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Total xylenes	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-11 8/2/90	SW-12 8/1/90	SW-13 8/1/90	SW-14 7/31/90	SW-15 8/3/90	SW-17 8/2/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromomethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Chloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Methylene chloride	5	7 A	7 A	8 A	<5 U	8 A	8 A	7 A	<5 U	2
Acetone	10	<10 U	<10 U	<10 U	<10 R	<10 U	<10 U	<10 U	<10 R	2
Carbon disulfide	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethane	5	3 A	<5 U	3 R	<5 U	8 R	1 R	<5 U	<5 U	1
1,2-Dichloroethylene	5	11 A	<5 U	2 A	<5 U	2 A	<5 U	<5 U	<5 U	1
Chloroform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Butanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 R	1
1,1,1-Trichloroethane	5	<5 U	<5 U	4 A	<5 U	9 A	<5 U	<5 U	<5 U	1
Carbon tetrachloride	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Vinyl acetate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Trichloroethene	5	11 A	3 A	3 A	<5 U	<5 U	<5 U	<5 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Benzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Bromoform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
4-Methyl-2-pentanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
2-Hexanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Tetrachloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2,2-Tetrachloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Toluene	5	<5 U	2 A	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Chlorobenzene	5	<5 U	1 A	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Ethylbenzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Styrene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Total xylenes	5	<5 U	<5 U	1 A	<5 U	<5 U	<5 U	<5 U	<5 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 R	<50 R	<50 R	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 R	<50 R	<50 U	<50 U	<50 U	<50 U	<50 R	<50 R	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 R	<10 R	<10 U	<10 U	<10 U	<10 U	<10 R	<10 R	10
Diethylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 R	<20 R	<20 R	<20 R	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Bis (2-Ethylhexyl) phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	2 A	<10 U	<10 U	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
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Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<50 R	<50 U	<50 U	<50 U	<50 R	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 R	<10 U	<10 R	<10 R	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	3 A	<10 U	3 A	3 A	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	
Semi-Volatile Organic Compounds (Unfiltered) Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	1 A	<10 U	<10 U	1 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	1 A	<10 U	<10 U	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	2 A	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 R	<20 R	<20 U	<20 R	<20 U	<20 U	<20 R	<20 R	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Bis (2-Ethylhexyl) phthalate	10	<10 U	5 A	12 A	<10 U	<10 U	1 A	4 A	<10 U	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
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Validation Codes

A - Quantitative data
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Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Semi-Volatile Organic Compounds (Filtered) Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	1 A	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenapnthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenapnthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
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IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-1 8/3/90	SW-2 8/3/90	SW-4 8/2/90	SW-5 8/2/90	SW-6 8/2/90	SW-7 8/1/90	SW-8 8/3/90	SW-8* 8/3/90	
Semi-Volatile Organic Compounds (Filtered) Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	3 A	2 A	5 A	7 A	7 A	3 A	1 A	3 A	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Bis (2-Ethylhexyl) phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	1 A	<10 U	<10 U	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
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Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15R	SW-17	
Sample Date:		8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	8/2/90	
Semi-Volatile Organic Compounds (Filtered) Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	3 A	<10 UJ	2 A	2 A	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15R 8/1/90	SW-17 8/2/90	
Semi-Volatile Organic Compounds (Filtered) Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	1 A	<10 U	1 A	<10 UJ	<10 U	1 A	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 UJ	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	5 A	4 A	11 A	20 UJ	6 A	4 A	<10 U	6 A	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 U	<20 UJ	<20 U	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
bis (2-Ethylhexyl) phthalate	10	3 A	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 UJ	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
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IDL - Instrument Detection Limit

Validation Codes

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R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date: / Pesticide\PCB Compounds (Dissolved) Concentrations in ug/L)	CRQL	SW-1 8/3/90	SW-2 8/3/90	SW-4 8/2/90	SW-5 8/2/90	SW-6 8/2/90	SW-7 8/1/90	SW-8 8/3/90	SW-8* 8/3/90	IDL
alpha-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
beta-BHC	0.05	0.11 R	0.14 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.15 R	0.15 R	0.0
delta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
gamma-BHC (Lindane)	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
Heptachlor	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
Aldrin	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
Heptachlor epoxide	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
Endosulfan I	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.0
Dieldrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
4,4'-DDE	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
Endrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
Endosulfan II	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
4,4'-DDD	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
Endosulfan sulfate	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
4,4'-DDT	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
Methoxychlor	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.0
Endrin ketone	0.05	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.0
alpha-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.0
gamma-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.1
Toxaphene	1.0	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	0.1
Aroclor-1016	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.4
Aroclor-1221	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.3
Aroclor-1232	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.2
Aroclor-1242	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.4
Aroclor-1248	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.4
Aroclor-1254	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.3
Aroclor-1260	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.2

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Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	
Pesticide\PCB Compounds (Dissolved) Concentrations in ug/L)	CRQL								IDL
alpha-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
beta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.02
delta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
gamma-BHC (Lindane)	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
Heptachlor	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
Aldrin	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
Heptachlor epoxide	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.01
Endosulfan I	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.056 R	<0.050 R	<0.050 R	0.02
Dieldrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.02
4,4'-DDE	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.02
Endrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.05
Endosulfan II	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.02
4,4'-DDD	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.02
Endosulfan sulfate	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.08
4,4'-DDT	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.08
Methoxychlor	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.06
Endrin ketone	0.05	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.11 R	<0.10 R	<0.10 R	0.08
Alpha-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.12
gamma-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.12
Toxaphene	1.0	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.1 R	<1.0 R	<1.0 R	0.40
Aroclor-1016	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.38
Aroclor-1221	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.29
Aroclor-1232	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.40
Aroclor-1242	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.45
Aroclor-1248	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.31
Aroclor-1254	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.42
Aroclor-1260	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.56 R	<0.50 R	<0.50 R	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-1 8/3/90	SW-2 8/3/90	SW-4 8/2/90	SW-5 8/2/90	SW-6 8/2/90	SW-7 8/1/90	SW-8 8/3/90	SW-8* 8/3/90	
Pesticide\PCB Compounds (Total) Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
beta-BHC	0.05	0.14 R	0.14 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.17 R	0.17 R	0.02
delta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
gamma-BHC (Lindane)	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Heptachlor	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Aldrin	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Heptachlor epoxide	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Endosulfan I	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.02
Dieldrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
4,4'-DDE	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
Endrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.05
Endosulfan II	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
4,4'-DDD	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
Endosulfan sulfate	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
4,4'-DDT	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
Methoxychlor	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.06
Endrin ketone	0.05	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
alpha-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.12
gamma-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.12
Toxaphene	1.0	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	0.40
Aroclor-1016	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.38
Aroclor-1221	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.29
Aroclor-1232	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.40
Aroclor-1242	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.45
Aroclor-1248	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.31
Aroclor-1254	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.42
Aroclor-1260	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	
Pesticide\PCB Compounds (Total) (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
beta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.02
delta-BHC	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
gamma-BHC (Lindane)	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.094 R	<0.050 R	<0.050 R	0.01
Heptachlor	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Aldrin	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Heptachlor epoxide	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.01
Endosulfan I	0.05	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	<0.050 R	0.02
Dieldrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
4,4'-DDE	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
Endrin	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.05
Endosulfan II	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
4,4'-DDD	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.02
Endosulfan sulfate	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
4,4'-DDT	0.10	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
Methoxychlor	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.06
Endrin ketone	0.05	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	<0.10 R	0.08
alpha-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.12
gamma-Chlordane	0.05	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.12
Toxaphene	1.0	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	<1.0 R	0.40
Aroclor-1016	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.38
Aroclor-1221	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.29
Aroclor-1232	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.40
Aroclor-1242	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.45
Aroclor-1248	0.5	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.31
Aroclor-1254	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.42
Aroclor-1260	1.0	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	<0.50 R	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Metals (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Aluminum	15	<15.0 U	<15.0 U	<15.0 UJ	59.6 J	137 J	<173 U	<15.0 U	40.8 J	200
Antimony	19	<19.0 U	<19.0 U	24.5 J	<19.0 U	<19.0 U	<19.0 U	<19.0 U	<19.0 U	60
Arsenic	2	<2.0 U	24.5 A	<2.0 U	13.8 A	11.4 A	2.7 J	<2.0 U	<2.0 U	10
Barium	1	17.2 J	27.0 J	27.3 J	77.6 J	106 J	55.1 J	13.4 J	15.8 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	5
Calcium	14	30,300 A	36,600 A	31,800 A	27,700 A	56,300 A	32,300 A	16,200 A	16,900 A	5000
Chromium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Cobalt	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<20 U	<3.0 U	<3.0 U	50
Copper	3	<3.0 U	<3.0 U	<3.0 UJ	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	25
Iron	3	512 A	1,670 A	403 A	802 A	759 A	<110 U	333 A	346 A	100
Lead	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Magnesium	23	4,080 J	5,960 A	4,930 J	5,850 A	11,800 A	6,830 A	3,090 J	3,250 J	5000
Manganese	1	65.4 J	925 J	97.6 J	191 J	2,860 J	1,320 J	39.8 J	54.7 J	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	24	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	40
Potassium	428	1,990 J	2,460 J	3,570 J	3,620 J	12,500 A	6,800 J	2,780 J	2,750 J	5000
Selenium	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Silver	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	2.4 J	<2.0 U	<2.0 U	<2.0 U	10
Sodium	18	10,600 A	10,800 A	66,100 A	31,600 A	89,300 A	149,000 A	33,100 A	36,000 A	5000
Thallium	4	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Vanadium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	50
Zinc	6	<6.0 U	<6.0 U	<6.0 U	47.9 A	37.3 A	29.6 J	6.6 J	10.1 J	20
Tin	17	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	--
Hardness		92,500 A	120,000 A	100,000 A	97,400 A	189,000 A	109,000 A	53,200 A	55,600 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-17	
Sample Date:		8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	8/2/90	
Metals (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Aluminum	15	<193 U	<193 U	86.8 J	191 J	56.0 J	159 J	<193 U	97.3 J	200
Antimony	19	<19.0 U	<19.0 U	<19.0 U	<19.0 U	<19.0 U	21.4 J	24.8 J	<19.0 U	60
Arsenic	2	7.7 J	3.5 J	5.4 J	11.1 A	5.6 J	7.2 J	6.3 J	17.5 A	10
Barium	1	85.7 J	54.3 J	62.6 J	23.6 J	62.6 J	62.9 J	76.1 J	29.7 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	5
Calcium	14	33,700 A	33,800 A	27,400 A	29,100 A	27,200 A	28,900 A	42,800 A	41,000 A	5000
Chromium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Cobalt	3	<20 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<20 U	<3.0 U	50
Copper	3	<3.0 U	<3.0 U	3.9 J	<3.0 U	3.9 J	4.0 J	<3.0 U	<3.0 U	25
Iron	3	1050 A	363 A	812 A	962 A	787 A	947 A	116 A	726 A	100
Lead	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Magnesium	23	5,670 A	6,570 A	4,920 J	7,160 A	4,850 J	5,180 A	9,030 A	8,350 A	5000
Manganese	1	550 J	810 J	448 J	214 J	443 J	773 J	1,840 J	280 J	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	24	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	40
Potassium	428	5,570 J	6,530 J	4,430 J	3,720 J	4,950 J	4,410 J	9,690 J	3,650 J	5000
Selenium	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Silver	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	2.2 A	<2.0 U	<2.0 U	<2.0 U	10
Sodium	18	44,000 A	53,700 A	37,900 A	34,900 A	37,500 A	37,400 A	133,000 A	31,700 A	5000
Thallium	4	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Vanadium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	50
Zinc	6	276 J	50.7 J	110 J	66.7 J	104 J	96.9 J	20.3 J	37.4 J	20
Tin	17	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	--
Hardness		107,000 A	111,000 A	88,700 A	103,000 A	87,900 A	93,500 A	144,000 A	123,000 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:		8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Metals (Total) (Concentrations in ug/L)	IDL									CRDL
Aluminum	15	<151 UJ	<151 UJ	198 J	<151 UJ	<151 UJ	646 J	<151 UJ	249 J	200
Antimony	19	<19.0 U	<19.0 U	<19.0 U	<19.0 U	<19.0 U	<33.5 U	<19.0 U	<19.0 U	60
Arsenic	2	<2.0 U	40.6 A	<2.0 U	15.1 A	17.9 A	<8.1 U	2.0 J	<2.0 U	10
Barium	1	18.5 J	26.7 J	31.0 J	22.3 J	67.7 J	<33.0 U	18.2 J	20.4 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	5
Calcium	14	28,400 A	33,300 A	29,900 A	26,400 A	55,000 A	32,500 A	14,900 A	15,300 A	5000
Chromium	3	3.6 J	3.9 J	<3.0 U	<3.0 U	11.6 J	62.6 J	<3.0 U	<3.0 U	10
Cobalt	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<4.8 U	<3.0 U	<3.0 U	50
Copper	3	<3.0 U	<3.0 U	<3.0 U	<42 U	<3.0 U	<10.2 U	5.1 A	6.3 A	25
Iron	3	1,160 J	2,940 J	924 J	1,130 J	4,880 J	1,650 J	806 J	1,280 J	100
Lead	2	2.2 J	3.0 J	4.2 J	2.9 J	2.2 J	<2.4 U	3.7 J	4.8 J	5
Magnesium	23	3,760 A	5,290 A	4,710 A	6,450 A	11,500 A	6,690 A	2,890 J	2,990 J	5000
Manganese	1	83.3 A	861 A	144 A	197 A	1,150 A	1,330 A	92.2 A	98.5 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	24	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	40
Potassium	428	<2,320 U	2,460 J	3,200 J	2,990 J	11,800 A	6,590 J	2,560 J	2,470 J	5000
Selenium	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Silver	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	10
Sodium	18	10,100 A	9,820 A	60,200 A	28,000 A	85,900 A	146,000 A	28,500 A	30,800 A	5000
Thallium	4	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Vanadium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	50
Zinc	6	20.3 J	19.3 J	14.3 J	31.7 J	15.4 J	<78 UJ	10.9 J	22.8 J	20
Tin	17	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	--
Hardness		86,400 A	109,000 A	94,300 A	93,000 A	185,000 A	109,000 A	49,100 A	50,500 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:	IDL	SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	CRDL
Metals (Total) (Concentrations in ug/L)										
Aluminum	15	<170 UJ	190 J	<151 U	<151 U	<151 U	162 J	326 J	<151 U	200
Antimony	19	20.1 J	<19.0 U	<19.0 U	<19.0 U	<19.0 U	<19.0 U	25.7 A	<19.0 U	60
Arsenic	2	8.1 J	8.2 J	8.9 J	<10 U	<10.0 U	13.9 A	15.1 A	29.6 A	10
Barium	1	32.1 A	42.2 A	29.2 J	35.1 A	30.3 A	34.9 A	58.7 A	29.7 A	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	5
Calcium	14	31,700 A	33,500 A	27,300 A	28,100 A	27,100 A	28,900 A	41,600 A	39,000 A	5000
Chromium	3	4.9 J	20.5 J	<3.0 U	<3.0 U	3.1 J	6.3 J	30.3 J	3.4 J	10
Cobalt	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	5.1 J	<3.0 U	50
Copper	3	13.5 J	11.4 J	7.3 J	<3.0 U	7.8 J	9.6 J	9.7 J	<42 U	25
Iron	3	2,400 J	1,860 J	1,700 J	446 J	1,840 J	3,030 J	2,770 J	1,890 J	100
Lead	2	4.3 J	8.6 A	3.2 J	3.6 J	4.9 J	5.9 A	12.0 U	6.3 A	5
Magnesium	23	5,220 A	6,300 A	4,810 A	5,790 A	4,780 J	5,110 A	8,650 A	7,900 A	5000
Manganese	1	536 A	338 A	462 A	200 A	455 A	821 A	1,840 A	280 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	24	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	<24.0 U	40
Potassium	428	4,250 A	6,490 A	4,450 A	3,550 A	4,350 A	4,170 A	9,320 A	3,870 A	5000
Selenium	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	5
Silver	2	<2.0 U	2.0 A	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	10
Sodium	18	39,000 A	51,700 A	36,500 J	33,400 A	36,000 J	36,600 A	129,000 A	29,000 A	5000
Thallium	4	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Vanadium	3	3.2 A	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	50
Zinc	6	276 J	<78 U	129 J	48.4 J	145 J	155 J	<78 U	25.2 J	20
Tin	17	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	<17.0 U	--
Hardness		101,000 A	110,000 A	88,000 A	98,200 A	87,400 A	93,200 A	139,000 A	130,000 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Miscellaneous Analyses (Unfiltered) (Concentrations in mg/L)									IDL
Alkalinity, Bicarb. as CaCO3	58.1 A	79.9 A	32.5 A	91.3 A	300 A	97 A	21.5 A	22.0 A	5.0
Alkalinity, Carb. as CaCO3	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	32.6 J	90.7 J	20.4 J	23.2 J	56.6 J	20.4 J	52.0 J	32.6 J	20.0
Chloride	16.8 A	11.7 A	123 A	49.3 A	108 A	177 A	60.8 A	59.3 A	6.0
Orthophosphate as P	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.010
Sulfide, total	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.05
Sulfate	28.4 A	56.4 A	23.3 A	35.1 A	49.2 A	152 A	19.5 A	19.4 A	5.0
Total Organic Carbon	8.5 A	9.1 A	5.5 A	7.8 A	15.3 A	5.6 A	10.1 A	9.9 A	0.50
Phosphorous, total	<0.050 U	0.068 A	<0.050 U	0.090 A	0.17 A	0.088 A	0.094 A	0.094 A	0.05
Total Suspended Solids	<5.0 UJ	6.0 J	5.0 A	<5.0 U	18.0 A	7.0 A	40.0 J	20.0 J	5.0
Trivalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.012 A	0.063 A	<0.010 U	<0.010 U	0.010
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-17	
Sample Date:	8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	8/2/90	
Miscellaneous Analyses (Unfiltered) (Concentrations in mg/L)									IDL
Alkalinity, Bicarb. as CaCO3	81.3 A	105 A	74.0 A	73.5 A	74.9 A	78.6 A	197 A	86.7 A	5.0
Alkalinity, Carb. as CaCO3	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	<20 UJ	28.7 J	26.0 J	26.0 J	31.5 J	20.4 J	28.7 J	23.2 J	20.0
Chloride	56.5 A	76.6 A	53.5 A	67.3 A	52.0 A	52.3 A	158 A	53.1 A	6.0
Orthophosphate as P	<0.050 U	0.061 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.010
Sulfide, total	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.05
Sulfate	67.1 A	50.7 A	53.9 A	30.4 A	53.5 A	49.5 A	98.0 A	64.1 A	5.0
Total Organic Carbon	8.6 A	9.1 A	8.4 A	5.5 A	8.8 A	9.2 A	10.6 A	9.1 A	0.50
Phosphorous, total	0.070 A	0.090 A	0.064 A	0.079 A	0.050 A	0.050 A	0.090 A	0.083 A	0.05
Total Suspended Solids	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	9.0 A	9.0 A	7.0 A	5.0
Trivalent Chromium	<0.010 U	0.021 A	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.030 A	<0.010 U	0.010
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SW-1	SW-2	SW-4	SW-5	SW-6	SW-7	SW-8	SW-8*	
Sample Date:	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	8/3/90	
Miscellaneous Analyses (Filtered) Concentrations in mg/L)									IDL
Alkalinity, Bicarb. as CaCO3	53.1 A	86.1 A	33.9 A	89.7 A	302 A	97.8 A	23.0 J	22.2 J	5.0
Alkalinity, Carb. as CaCO3	12.8 A	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	<20.0 U	<20.0 U	<20.0 U	26.0 A	53.8 A	23.2 A	24.3 A	<20.0 U	20.0
Chloride	16.7 A	11.8 A	124 A	49.4 A	107 A	176 A	58.8 A	59.6 A	6.0
Orthophosphate as P	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.010
Sulfide, dissolved	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.05
Sulfate	29.4 A	57.8 A	23.2 A	34.9 A	50.3 A	153 A	19.3 A	19.3 A	5.0
Total Organic Carbon	7.8 A	7.8 A	4.3 A	8.5 A	15.4 A	5.4 A	7.3 A	7.7 A	0.50
Phosphorous, total	<0.050 U	<0.050 U	<0.050 U	0.061 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.050
Trivalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Surface-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:	SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	SW-15 8/1/90	SW-17 8/2/90	IDL
Miscellaneous Analyses (Filtered) (Concentrations in mg/L)									
Alkalinity, Bicarb. as CaCO3	80.9 A	105 A	75.5 A	77.1 A	74.6 A	30.7 A	196 A	94.0 A	5.0
Alkalinity, Carb. as CaCO3	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	26.0 A	42.7 A	<20 U	20.4 A	<20 U	20.4 A	37.1 A	26.0 A	20.0
Chloride	56.3 A	77.3 A	53.3 A	66.6 A	51.6 A	53.2 A	168 A	54.0 A	6.0
Orthophosphate as P	0.29 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.010
Sulfide, dissolved	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.05
Sulfate	66.7 A	50.9 A	53.9 A	31.6 A	53.4 A	49.5 A	99.5 A	64.7 A	5.0
Total Organic Carbon	7.7 A	7.9 A	8.0 A	5.8 A	8.5 A	7.3 A	9.4 A	8.8 A	0.50
Phosphorous, total	<0.050 U	0.054 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	0.050
Trivalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	
Sample Date:		8/3/90	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<12 U	<12 U	<14 U	<11 U	<14 U	<240 U	<16 U	<12 U	2
Bromomethane	10	<12 U	<12 U	<14 U	<11 U	<14 U	<240 U	<16 U	<12 U	2
Vinyl chloride	10	<12 U	<12 U	<14 U	<11 U	<14 U	<240 U	<16 U	<12 U	2
Chloroethane	10	<12 U	<12 U	<14 U	<11 U	<14 U	<240 U	<16 U	<12 U	2
Methylene chloride	5	7 J	6 J	7 J	5 A	4 A	<120 U	<8 U	7 J	2
Acetone	10	20 R	10 R	12 R	8 R	20 R	230 J	<16 U	6 R	2
Carbon disulfide	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,1-Dichloroethene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,1-Dichloroethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,2-Dichloroethylene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	2 A	<6 U	1
Chloroform	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,2-Dichloroethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
2-Butanone	10	<12 UJ	<12 UJ	<14 UJ	<11 UJ	<14 UJ	<240 U	<16 U	<12 UJ	1
1,1,1-Trichloroethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Carbon tetrachloride	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Vinyl acetate	10	<12 U	<12 U	<14 U	<11 U	<14 U	<240 U	<16 U	<12 U	2
Bromodichloromethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,2-Dichloropropane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
cis-1,3-Dichloropropene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Trichloroethene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	3 A	<6 U	1
Dibromochloromethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,1,2-Trichloroethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Benzene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
trans-1,3-Dichloropropene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Bromoform	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
4-Methyl-2-pentanone	10	<12 U	<12 U	<14 U	<11 U	2 A	<240 U	<16 U	<12 U	2
2-Hexanone	10	<12 U	<12 U	<14 U	<11 U	9 A	<240 U	<16 U	<12 U	2
Tetrachloroethene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
1,1,2,2-Tetrachloroethane	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Toluene	5	6 A	<6 U	<7 U	<6 U	<7 U	250 A	<8 U	<6 U	1
Chlorobenzene	5	<6 U	<6 U	<7 U	<6 U	<7 U	440 A	<8 U	<6 U	1
Ethylbenzene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Styrene	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1
Total xylenes	5	<6 U	<6 U	<7 U	<6 U	<7 U	<120 U	<8 U	<6 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SED-8* 8/3/90	SED-9 8/1/90	SED-10 8/1/90	SED-11 7/31/90	SED-12 8/2/90	SED-13 7/31/90	SED-14 7/31/90	SED-15 8/1/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<12 U	<260 UJ	<14 UJ	<60 UJ	<13 U	<54 UJ	<13 UJ	<14 UJ	
Bromomethane	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	
Vinyl chloride	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	
Chloroethane	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	
Methylene chloride	5	7 J	46 R	3 J	<30 U	4 A	39 J	2 J	6 J	
Acetone	10	9 R	<260 UJ	<14 UJ	470 A	4 R	400 J	<13 UJ	<14 UJ	
Carbon disulfide	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
1,1-Dichloroethene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
1,1-Dichloroethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
1,2-Dichloroethylene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
Chloroform	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
1,2-Dichloroethane	5	<6 U	28 J	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
2-Butanone	10	<12 U	<260 UJ	<14 UJ	47 A	<13 UJ	71 J	<13 UJ	<14 UJ	
1,1,1-Trichloroethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
Carbon tetrachloride	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
Vinyl acetate	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	
Bromodichloromethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
1,2-Dichloropropane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
cis-1,3-Dichloropropene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	
Trichloroethene	5	<6 U	<130 UJ	<7 UJ	<30 U	2 A	<27 UJ	<6 UJ	3 J	1
Dibromochloromethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
1,1,2-Trichloroethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Benzene	5	<6 U	<130 UJ	<7 UJ	160 A	<6 U	200 J	<6 UJ	<7 UJ	1
trans-1,3-Dichloropropene	5	<6 U	2100 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Bromoform	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
4-Methyl-2-pentanone	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	2
2-Hexanone	10	<12 U	<260 UJ	<14 UJ	<60 U	<13 U	<54 UJ	<13 UJ	<14 UJ	2
Tetrachloroethene	5	<6 U	<130 UJ	2 J	<30 U	3 A	<27 UJ	<6 UJ	11 J	1
1,1,2,2-Tetrachloroethane	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Toluene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Chlorobenzene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Ethylbenzene	5	<6 U	40 J	<7 UJ	<30 U	<6 U	9 J	<6 UJ	<7 UJ	1
Styrene	5	<6 U	<130 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1
Total xylenes	5	<6 U	150 UJ	<7 UJ	<30 U	<6 U	<27 UJ	<6 UJ	<7 UJ	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-16	SED-17	
Sample Date:		8/2/90	8/2/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL			IDL
Chloromethane	10	<26 U	<12 UJ	2
Bromomethane	10	<26 U	<12 UJ	2
Vinyl chloride	10	<26 U	<12 UJ	2
Chloroethane	10	<26 U	<12 UJ	2
Methylene chloride	5	<13 U	4 J	2
Acetone	10	170 J	22 J	2
Carbon disulfide	5	<13 U	<6 UJ	1
1,1-Dichloroethene	5	<13 U	<6 UJ	1
1,1-Dichloroethane	5	<13 U	<6 UJ	1
1,2-Dichloroethylene	5	<13 U	<6 UJ	1
Chloroform	5	<13 U	<6 UJ	1
1,2-Dichloroethane	5	<13 U	<6 UJ	1
2-Butanone	10	<26 U	<12 UJ	1
1,1,1-Trichloroethane	5	<13 U	<6 UJ	1
Carbon tetrachloride	5	<13 U	<6 UJ	1
Vinyl acetate	10	<26 U	<12 UJ	2
Bromodichloromethane	5	<13 U	<6 UJ	1
1,2-Dichloropropane	5	<13 U	<6 UJ	1
cis-1,3-Dichloropropene	5	<13 U	<6 UJ	1
Trichloroethene	5	<13 U	<6 UJ	1
Dibromochloromethane	5	<13 U	<6 UJ	1
1,1,2-Trichloroethane	5	<13 U	<6 UJ	1
Benzene	5	<13 U	<6 UJ	1
trans-1,3-Dichloropropene	5	<13 U	<6 UJ	1
Bromoform	5	<13 U	<6 UJ	1
4-Methyl-2-pentanone	10	<26 U	<12 UJ	2
2-Hexanone	10	<26 U	<12 UJ	2
Tetrachloroethene	5	<13 U	<6 UJ	1
1,1,2,2-Tetrachloroethane	5	<13 U	<6 UJ	1
Toluene	5	<13 U	<6 UJ	1
Chlorobenzene	5	<13 U	<6 UJ	1
Ethylbenzene	5	<13 U	<6 UJ	1
Styrene	5	<13 U	<6 UJ	1
Total xylenes	5	<13 U	<6 UJ	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:	SED-1 8/3/90	SED-2 8/3/90	SED-3 8/3/90	SED-4 8/2/90	SED-5 8/2/90	SED-6 8/2/90	SED-7DL 8/1/90	SED-8 8/3/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
Phenol	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
bis (2-Chloroethyl) ether	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
2-Chlorophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
1,3-Dichlorobenzene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
1,4-Dichlorobenzene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Benzyl alcohol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
1,2-Dichlorobenzene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
2-Methylphenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
bis (2-Chloroisopropyl) ether	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
4-Methylphenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
N-Nitroso-di-n-propylamine	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Hexachloroethane	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Nitrobenzene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
Isophorone	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2-Nitrophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
2,4-Dimethylphenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Benzoic acid	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	10
bis (2-Chloroethoxy) methane	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2,4-Dichlorophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	25
1,2,4-Trichlorobenzene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Naphthalene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
4-Chloroaniline	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Hexachlorobutadiene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	3
4-Chloro-3-methylphenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
2-Methylnaphthalene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Hexachlorocyclopentadiene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2,4,6-Trichlorophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2,4,5-Trichlorophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2-Chloronaphthalene	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	10
2-Nitroaniline	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
Dimethyl phthalate	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	4
Acenaphthylene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
2,6-Dinitrotoluene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	4
3-Nitroaniline	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	3
Acenaphthene	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	10
2,4-Dinitrophenol	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
4-Nitrophenol	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	3
Dibenzofuran	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	25
2,4-Dinitrotoluene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	15
Diethylphthalate	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	4
4-Chlorophenyl-phenylether	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	10
Fluorene	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	4
4-Nitroaniline	10	<1100 U	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
4,6-Dinitro-2-methylphenol	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	4
	50	<5500 U	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	10
										15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7DL	SED-8	
Sample Date:		8/3/90	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	
Semi-Volatile Organic Compounds Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
4-Bromophenyl-phenylether	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Hexachlorobenzene	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
Pentachlorophenol	50	<5500 UJ	<4000 UJ	<20000 UJ	<2100 UJ	<4500 UJ	<21000 UJ	<75000 UJ	<19000 UJ	10
Phenanthrene	10	<1100 UJ	990 J	<4000 UJ	<440 UJ	910 J	1000 J	<16000 UJ	<4000 UJ	3
Anthracene	10	<1100 UJ	320 J	<4000 UJ	<440 UJ	200 J	<4300 UJ	<16000 UJ	<4000 UJ	3
Di-n-butylphthalate	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	3
Fluoranthene	10	<1100 UJ	1500 J	<4000 UJ	<440 UJ	1600 J	1200 J	<16000 UJ	<4000 UJ	3
Pyrene	10	<1100 UJ	1500 J	<4000 UJ	<440 UJ	1500 J	1200 J	<16000 UJ	<4000 UJ	3
Butylbenzylphthalate	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	5
3,3'-Dichlorobenzidine	20	<2300 UJ	<1700 UJ	<8000 UJ	<870 UJ	<1900 UJ	<8500 UJ	<31000 UJ	<7900 UJ	5
Benzo (a) anthracene	10	<1100 UJ	870 J	<4000 UJ	<440 UJ	770 J	<4300 UJ	<16000 UJ	<4000 UJ	3
Chrysene	10	<1100 UJ	880 J	<4000 UJ	<440 UJ	1100 J	<4300 UJ	<16000 UJ	<4000 UJ	3
bis (2-Ethylhexyl) phthalate	10	160 J	<830 UJ	<4000 UJ	<440 UJ	320 J	7900 J	94000 J	<4000 UJ	4
Di-n-octyl phthalate	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	3
Benzo (b) fluoranthene	10	<1100 UJ	1000 J	<4000 UJ	<440 UJ	1900 J	<4300 UJ	<16000 UJ	<4000 UJ	3
Benzo (k) fluoranthene	10	<1100 UJ	1000 J	<4000 UJ	<440 UJ	1900 J	<4300 UJ	<16000 UJ	<4000 UJ	3
Benzo (a) pyrene	10	<1100 UJ	600 J	<4000 UJ	<440 UJ	770 J	<4300 UJ	<16000 UJ	<4000 UJ	3
Indeno (1,2,3-cd) pyrene	10	<1100 UJ	410 J	<4000 UJ	<440 UJ	330 J	<4300 UJ	<16000 UJ	<4000 UJ	4
Dibenzo (a,h) anthracene	10	<1100 UJ	<830 UJ	<4000 UJ	<440 UJ	<930 UJ	<4300 UJ	<16000 UJ	<4000 UJ	3
Benzo (g,h,i) perylene	10	<1100 UJ	350 J	<4000 UJ	<440 UJ	310 J	<4300 UJ	<16000 UJ	<4000 UJ	3

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Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-8*	SED-9	SED-10	SED-11	SED-12	SED-13	SED-14	SED-15	
Sample Date:		8/3/90	8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
bis (2-Chloroethyl) ether	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
2-Chlorophenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
1,3-Dichlorobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
1,4-Dichlorobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Benzyl alcohol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
1,2-Dichlorobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
2-Methylphenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
bis (2-Chloroisopropyl) ether	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
4-Methylphenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
N-Nitroso-di-n-propylamine	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
Hexachloroethane	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
Nitrobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Isophorone	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
2-Nitrophenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
2,4-Dimethylphenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
Benzoic acid	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	25
bis (2-Chloroethoxy) methane	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
2,4-Dichlorophenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
1,2,4-Trichlorobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Naphthalene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	3
4-Chloroaniline	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Hexachlorobutadiene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
4-Chloro-3-methylphenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
2-Methylnaphthalene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
Hexachlorocyclopentadiene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
2,4,6-Trichlorophenol	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
2,4,5-Trichlorophenol	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	10
2-Chloronaphthalene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	4
2-Nitroaniline	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	10
Dimethyl phthalate	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	4
Acenaphthylene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	180 J	3
2,6-Dinitrotoluene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	10
3-Nitroaniline	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	10
Acenaphthene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	3
2,4-Dinitrophenol	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	25
4-Nitrophenol	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	15
Dibenzofuran	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	540 J	<7300 UJ	<1600 J	170 J	4
2,4-Dinitrotoluene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	2900 J	<7300 UJ	<1600 J	<880 J	10
Diethylphthalate	10	<890 UJ	<1800000 UJ	<830 UJ	2100 J	<1900 UJ	1900 J	<1600 J	<880 J	4
4-Chlorophenyl-phenylether	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Fluorene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	240 J	4
4-Nitroaniline	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	10
4,6-Dinitro-2-methylphenol	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-8*	SED-9	SED-10	SED-11	SED-12	SED-13	SED-14	SED-15	
Sample Date:		8/3/90	8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	100 J	5
4-Bromophenyl-phenylether	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Hexachlorobenzene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	5
Pentachlorophenol	50	<4300 UJ	<8900000 UJ	<4000 UJ	<37000 UJ	<9000 UJ	<35000 UJ	<7900 J	<4300 J	10
Phenanthrene	10	<890 UJ	<1800000 UJ	<830 UJ	7100 J	17000 J	2800 J	360 J	3200 J	3
Anthracene	10	<890 UJ	<1800000 UJ	<830 UJ	1500 J	2900 J	<7300 UJ	<1600 J	770 J	3
Di-n-butylphthalate	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	3
Fluoranthene	10	<890 UJ	<1800000 UJ	<830 UJ	8300 J	24000 J	3200 J	1300 J	2800 J	3
Pyrene	10	<890 UJ	<1800000 UJ	<830 UJ	6600 J	22000 J	2600 J	1100 J	2300 J	3
Butylbenzylphthalate	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	1600 J	<880 J	5
3,3'-Dichlorobenzidine	20	<1800 UJ	<3700000 UJ	<1700 UJ	<15000 UJ	<3700 UJ	<15000 UJ	3300 J	<1800 J	5
Benzo (a) anthracene	10	<890 UJ	<1800000 UJ	<830 UJ	2900 J	11000 J	1200 J	480 J	1200 J	3
Chrysene	10	890 UJ	<1800000 UJ	<830 UJ	4500 J	13000 J	1800 J	630 J	1200 J	3
bis (2-Ethylhexyl) phthalate	10	<890 UJ	<1800000 UJ	290 J	78000 J	1300 J	29000 J	360 J	5200 J	4
Di-n-octyl phthalate	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	<1900 UJ	<7300 UJ	<1600 J	<880 J	3
Benzo (b) fluoranthene	10	<890 UJ	<1800000 UJ	<830 UJ	2400 J	21000 J	1100 J	340 J	1600 J	3
Benzo (k) fluoranthene	10	<890 UJ	<1800000 UJ	<830 UJ	2400 J	21000 J	1200 J	340 J	1600 J	3
Benzo (a) pyrene	10	<890 UJ	<1800000 UJ	<830 UJ	2700 J	9900 J	1000 J	410 J	860 J	3
Indeno (1,2,3-cd) pyrene	10	<890 UJ	<1800000 UJ	<830 UJ	1900 J	4200 J	<7300 UJ	290 J	410 J	4
Dibenzo (a,h) anthracene	10	<890 UJ	<1800000 UJ	<830 UJ	<7600 UJ	2600 J	<7300 UJ	<1600 J	120 J	3
Benzo (g,h,i) perylene	10	<890 UJ	<1800000 UJ	<830 UJ	1900 J	4200 J	<7300 UJ	290 J	310 J	3

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Validation Codes

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Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-16	SED-17	
Sample Date:		8/2/90	8/2/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL			IDL
Phenol	10	<5700 UJ	<470 UJ	5
bis (2-Chloroethyl) ether	10	<5700 UJ	<470 UJ	5
2-Chlorophenol	10	<5700 UJ	<470 UJ	5
1,3-Dichlorobenzene	10	<5700 UJ	<470 UJ	5
1,4-Dichlorobenzene	10	<5700 UJ	<470 UJ	5
Benzyl alcohol	10	<5700 UJ	<470 UJ	5
1,2-Dichlorobenzene	10	<5700 UJ	<470 UJ	10
2-Methylphenol	10	<5700 UJ	<470 UJ	5
bis (2-Chloroisopropyl) ether	10	<5700 UJ	<470 UJ	5
4-Methylphenol	10	<5700 UJ	<470 UJ	5
N-Nitroso-di-n-propylamine	10	<5700 UJ	<470 UJ	5
Hexachloroethane	10	<5700 UJ	<470 UJ	10
Nitrobenzene	10	<5700 UJ	<470 UJ	10
Isophorone	10	<5700 UJ	<470 UJ	5
2-Nitrophenol	10	<5700 UJ	<470 UJ	5
2,4-Dimethylphenol	10	<5700 UJ	<470 UJ	10
Benzoic acid	50	<28000 UJ	1300 J	10
bis (2-Chloroethoxy) methane	10	<5700 UJ	<470 UJ	25
2,4-Dichlorophenol	10	<5700 UJ	<470 UJ	5
1,2,4-Trichlorobenzene	10	<5700 UJ	<470 UJ	5
Naphthalene	10	<5700 UJ	<470 UJ	3
4-Chloroaniline	10	<5700 UJ	<470 UJ	5
Hexachlorobutadiene	10	<5700 UJ	<470 UJ	5
4-Chloro-3-methylphenol	10	<5700 UJ	<470 UJ	10
2-Methylnaphthalene	10	<5700 UJ	<470 UJ	10
Hexachlorocyclopentadiene	10	<5700 UJ	<470 UJ	10
2,4,6-Trichlorophenol	10	<5700 UJ	<470 UJ	10
2,4,5-Trichlorophenol	50	<28000 UJ	<2300 UJ	10
2-Chloronaphthalene	10	<5700 UJ	<470 UJ	4
2-Nitroaniline	50	<28000 UJ	<2300 UJ	10
Dimethyl phthalate	10	<5700 UJ	<470 UJ	4
Acenaphthylene	10	<5700 UJ	<470 UJ	3
2,6-Dinitrotoluene	10	<5700 UJ	<470 UJ	10
3-Nitroaniline	50	<28000 UJ	<2300 UJ	10
Acenaphthene	10	<5700 UJ	<470 UJ	3
2,4-Dinitrophenol	50	<28000 UJ	<2300 UJ	25
4-Nitrophenol	50	<28000 UJ	<2300 UJ	15
Dibenzofuran	10	<5700 UJ	<470 UJ	4
2,4-Dinitrotoluene	10	<5700 UJ	<470 UJ	10
Diethylphthalate	10	<5700 UJ	<470 UJ	4
4-Chlorophenyl-phenylether	10	<5700 UJ	<470 UJ	5
Fluorene	10	<5700 UJ	<470 UJ	4
4-Nitroaniline	50	<28000 UJ	<2300 UJ	10
4,6-Dinitro-2-methylphenol	50	<28000 UJ	<2300 UJ	15

(1) Cannot be separated from Diphenylamine
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Validation Codes

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Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-16	SED-17	
Sample Date:		8/2/90	8/2/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL			IDL
N-Nitrosodiphenylamine (1)	10	<5700 UJ	<470 UJ	5
4-Bromophenyl-phenylether	10	<5700 UJ	<470 UJ	5
Hexachlorobenzene	10	<5700 UJ	<470 UJ	5
Pentachlorophenol	50	<28000 UJ	<2300 UJ	10
Phenanthrene	10	9900 J	<470 UJ	3
Anthracene	10	1700 J	<470 UJ	3
Di-n-butylphthalate	10	<5700 UJ	<470 UJ	3
Fluoranthene	10	22000 J	130 J	3
Pyrene	10	22000 J	120 J	3
Butylbenzylphthalate	10	<5700 UJ	<470 UJ	5
3,3'-Dichlorobenzidine	20	<11000 UJ	<940 UJ	5
Benzo (a) anthracene	10	15000 J	<470 UJ	3
Chrysene	10	13000 J	<470 UJ	3
bis (2-Ethylhexyl) phthalate	10	2500 J	110 J	4
Di-n-octyl phthalate	10	<5700 UJ	<470 UJ	3
Benzo (b) fluoranthene	10	27000 J	140 J	3
Benzo (k) fluoranthene	10	27000 J	140 J	3
Benzo (a) pyrene	10	12000 J	<470 UJ	3
Indeno (1,2,3-cd) pyrene	10	5800 J	<470 UJ	4
Dibenzo (a,h) anthracene	10	3100 J	<470 UJ	3
Benzo (g,h,i) perylene	10	5700 J	<470 UJ	3

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

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R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date: / Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL	SED-1 8/2/90	SED-2 8/2/90	SED-3 8/2/90	SED-4 8/2/90	SED-5 8/2/90	SED-6 8/2/90	SED-7 8/1/90	SED-8 8/2/90	IDL
alpha-BHC	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
beta-BHC	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.02
delta-BHC	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
gamma-BHC (Lindane)	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
Heptachlor	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
Aldrin	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
Heptachlor epoxide	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
Endosulfan I	0.05	<14 R	<10 R	<50 R	<11 R	<23 R	<21 R	<250 R	<12 R	0.01
Dieldrin	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.02
4,4'-DDE	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.02
Endrin	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.05
Endosulfan II	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.02
4,4'-DDD	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.02
Endosulfan sulfate	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.08
4,4'-DDT	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.08
Methoxychlor	0.10	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.06
Endrin ketone	0.05	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.08
alpha-Chlordane	0.05	<28 R	<20 R	<100 R	<22 R	<46 R	<42 R	<500 R	<24 R	0.12
gamma-Chlordane	0.05	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.12
Toxaphene	0.05	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.40
Aroclor-1016	1.0	<280 R	<200 R	<1000 R	<220 R	<460 R	<420 R	<5000 R	<240 R	0.38
Aroclor-1221	0.5	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.29
Aroclor-1232	0.5	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.40
Aroclor-1242	0.5	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.45
Aroclor-1248	0.5	<140 R	<100 R	<500 R	<110 R	<230 R	<210 R	<2500 R	<120 R	0.31
Aroclor-1254	1.0	<280 R	<200 R	<1000 R	<220 R	<460 R	<420 R	<5000 R	<240 R	0.42
Aroclor-1260	1.0	<280 R	<200 R	<1000 R	<220 R	<460 R	<420 R	<5000 R	<240 R	0.25

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Validation Codes

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J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:		SED-8* 8/2/90	SED-9 8/1/90	SED-10 8/1/90	SED-11 7/31/90	SED-12 8/2/90	SED-13 7/31/90	SED-14 7/31/90	SED-15 8/1/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.
beta-BHC	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.0
delta-BHC	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.0
gamma-BHC (Lindane)	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0
Heptachlor	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0
Aldrin	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.
Heptachlor epoxide	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.0
Endosulfan I	0.05	<11 R	<0.50 R	<11 R	<470 R	<23 R	<440 R	<10 R	<11 R	0.0
Dieldrin	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0
4,4'-DDE	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0.
Endrin	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0.
Endosulfan II	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0.
4,4'-DDD	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0
Endosulfan sulfate	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0
4,4'-DDT	0.10	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0.
Methoxychlor	0.05	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Endrin ketone	0.05	<22 R	<1.0 R	<21 R	<940 R	<45 R	<880 R	<21 R	<23 R	0.
alpha-Chlordane	0.05	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
gamma-Chlordane	0.05	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Toxaphene	1.0	<220 R	<10.0 R	<210 R	<9400 R	<450 R	<8800 R	<210 R	<230 R	0.
Aroclor-1016	0.5	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Aroclor-1221	0.5	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Aroclor-1232	0.5	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Aroclor-1242	0.5	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Aroclor-1248	0.5	<110 R	<5.0 R	<110 R	<4700 R	<230 R	<4400 R	<100 R	<110 R	0.
Aroclor-1254	1.0	<220 R	<5.0 R	<210 R	<9400 R	<450 R	<8800 R	<210 R	<230 R	0.
Aroclor-1260	1.0	<220 R	<5.0 R	<210 R	<9400 R	<450 R	<8800 R	<210 R	<230 R	0.

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CRQL - Contract Required Quantitation Limit
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Validation Codes

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J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-16	SED-17	
Sample Date:		8/2/90	8/2/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL			IDL
alpha-BHC	0.05	<37 R	<23 R	0.01
beta-BHC	0.05	<37 R	<23 R	0.02
delta-BHC	0.05	<37 R	<23 R	0.01
gamma-BHC (Lindane)	0.05	<37 R	<23 R	0.01
Heptachlor	0.05	<37 R	<23 R	0.01
Aldrin	0.05	<37 R	<23 R	0.01
Heptachlor epoxide	0.05	<37 R	<23 R	0.01
Endosulfan I	0.05	<37 R	<23 R	0.02
Dieldrin	0.10	<73 R	<46 R	0.02
4,4'-DDE	0.10	<73 R	<46 R	0.02
Endrin	0.10	<73 R	<46 R	0.05
Endosulfan II	0.10	<73 R	<46 R	0.02
4,4'-DDD	0.10	<73 R	<46 R	0.02
Endosulfan sulfate	0.10	<73 R	<46 R	0.08
4,4'-DDT	0.10	<73 R	<46 R	0.08
Methoxychlor	0.05	<370 R	<230 R	0.06
Endrin ketone	0.05	<73 R	<46 R	0.08
alpha-Chlordane	0.05	<370 R	<230 R	0.12
gamma-Chlordane	0.05	<370 R	<230 R	0.12
Toxaphene	1.0	<730 R	<460 R	0.40
Aroclor-1016	0.5	<370 R	<230 R	0.38
Aroclor-1221	0.5	<370 R	<230 R	0.29
Aroclor-1232	0.5	<370 R	<230 R	0.40
Aroclor-1242	0.5	<370 R	<230 R	0.45
Aroclor-1248	0.5	<370 R	<230 R	0.31
Aroclor-1254	1.0	<730 R	<460 R	0.42
Aroclor-1260	1.0	<730 R	<460 R	0.25

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	
Sample Date:		8/3/90	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/3/90	
Metals (Concentrations in mg/kg)	IDL (ug/L)									CRDL (ug/L)
Aluminum	15	6,530 A	3,620 A	19,900 A	10,200 A	4,190 A	922 A	5,400 A	3,480 A	[illegible]
Antimony	17	7.3 J	<4.8 R	<22.0 R	<5.1 R	<5.4 R	<4.8 R	375 J	<5.7 R	60
Arsenic	2	4.8 J	371 J	29.4 J	4.2 J	12.5 J	154 J	1,580 J	2.6 J	10
Barium	1	25.4 J	27.4 J	26.5 J	49.5 J	12.9 J	48.5 J	462 J	6.9 J	[illegible]
Beryllium	1	<0.35 U	0.27 A	<1.2 U	0.46 A	<0.28 U	<0.25 U	0.89 A	<0.30 U	
Cadmium	3	<1.0 U	1.2 A	<3.5 U	<3.3 U	<3.3 U	3.4 J	<0.89 U	<0.91 U	[illegible]
Calcium	14	1,550 J	675 J	1,400 J	2,220 J	1,160 J	2,350 J	1,160 J	712 J	5000
Chromium	3	28.6 A	546 A	30.4 A	27.3 A	22.2 A	95.4 A	331 A	7.6 J	[illegible]
Cobalt	3	6.2 J	3.7 J	4.4 J	9.9 J	2.8 J	2.6 J	11.9 J	1.6 J	
Copper	3	38.4 J	121 J	44.3 J	33.1 J	12.2 J	18.4 J	216 J	13.2 J	
Iron	3	9140 A	21,600 A	31,400 A	16,800 A	7,100 A	22,400 A	44,100 A	4,950 A	100
Lead	2	11.6 J	212 J	26.7 J	28.7 J	28.7 J	27.3 J	4,210 J	5.3 J	5
Magnesium	23	2,600 J	1,040 J	3,330 J	5,710 A	1,980 J	626 J	513 A	1,320 A	50[illegible]
Manganese	1	174 A	48.4 J	108 A	162 A	91.5 A	394 J	140 J	54.2 A	
Mercury	0.2	<0.2 U	0.1 A	<0.6 U	<0.1 U	<0.1 U	0.4 A	9.5 A	<0.2 U	0[illegible]
Nickel	24	<8.4 U	<6.0 U	27.7 J	20.0 J	<6.8 U	<6.0 U	9.0 A	<7.2 U	40
Potassium	428	1,040 J	287 A	1,120 J	2,160 J	407 A	329 J	419 A	366 A	5000
Selenium	2	<0.70 U	0.52 A	<2.5 U	<0.54 U	<0.57 U	<0.52 U	10.7 A	<0.61 U	
Silver	2	<0.70 UJ	1.8 J	<2.3 UJ	<0.54 UJ	<0.57 UJ	0.76 J	13.6 J	<0.60 UJ	
Sodium	18	119 A	<102 U	479 J	62.2 J	<5.1 U	356 J	240 J	134 J	50[illegible]
Thallium	4	<1.1 UJ	<0.76 UJ	<3.7 UJ	<0.81 UJ	<0.86 UJ	<0.78 UJ	38.4 A	<0.91 UJ	10
Vanadium	3	15.5 J	11.7 J	30.4 J	32.5 J	11.0 J	4.9 J	15.8 J	7.9 J	[illegible]
Zinc	6	56.3 A	189 A	71.3 J	50.9 A	88.5 A	46.7 J	384 A	15.2 J	
Tin	17	16.3 J	8.6 J	1,010 J	12.5 J	14.4 J	<4.43 U	221 J	11.9 J	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SED-8*	SED-9	SED-10	SED-11	SED-12	SED-13	SED-14	SED-15	
Sample Date:		8/3/90	8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	
Metals (Concentrations in mg/kg)	IDL (ug/L)									CRDL (ug/L)
Aluminum	15	3,380 A	15,800 A	4,390 A	14,700 A	3,340 A	6,380 A	3,480 A	5,160 A	200
Antimony	17	6.2 J	41.5 J	16.4 J	<20.6 R	<5.7 R	<20.7 R	<4.6 R	19.8 J	60
Arsenic	2	2.7 J	9,830 A	170 J	1,750 J	9.4 J	1,330 J	20.6 J	511 J	10
Barium	1	8.2 J	171 J	25.9 J	122 J	15.1 J	64.0 J	11.3 J	111 J	200
Beryllium	1	<0.28 U	3.7 J	<0.26 U	1.8 J	<0.30 U	1.2 J	0.26 A	<2.0 U	5
Cadmium	3	<0.83 U	51.5 A	2.2 A	27.4 J	<3.3 U	14.1 A	<0.73 U	2.3 J	5
Calcium	14	663 J	14,900 A	1,460 J	8,220 A	947 J	4,330 J	835 J	3,120 J	5000
Chromium	3	6.3 J	1,090 A	32.1 A	529 A	18.6 A	382 A	13.5 A	118 A	10
Cobalt	3	1.3 A	27.8 J	5.9 J	41.9 J	1.5 A	14.4 J	3.7 J	13.1 J	50
Copper	3	10.2 J	1,160 J	79.2 J	523 J	27.3 J	287 J	16.6 J	171 J	25
Iron	3	4,340 A	112,000 A	34,200 A	94,100 A	6,900 A	55,100 A	7,080 A	37,400 A	100
Lead	2	6.6 J	611 J	315 J	320 J	41.0 J	275 J	7.3 J	346 J	5
Magnesium	23	1,310 J	1,880 J	2,330 A	2,270 J	1,640 J	1,190 J	1,610 J	950 J	5000
Manganese	1	44.3 A	1,150 A	183 J	763 J	92.7 A	488 A	158 A	807 J	15
Mercury	0.2	<0.1 U	1.9 A	<0.1 U	1.7 A	<0.1 A	1.0 A	<0.3 U	0.3 A	0.2
Nickel	24	<6.6 U	<48.0 U	<6.1 U	44.8 A	<7.2 A	<26.1 U	<5.9 U	11.2 A	40
Potassium	428	372 A	2,040 J	713 J	1,290 J	584 J	1,040 J	575 J	429 J	5000
Selenium	2	<0.55 U	10.9 A	<0.53 U	7.8 A	<0.57 U	6.0 A	<0.51 U	0.86 A	5
Silver	2	<0.55 UJ	6.4 J	<0.51 UJ	<2.2 UJ	<0.60 UJ	2.7 J	<0.49 UJ	<3.9 UJ	10
Sodium	18	133 J	12,700 J	84 J	1,610 J	<5.4 A	817 J	<290 U	312 J	5000
Thallium	4	<0.83 UJ	<6.3 U	<0.80 J	<3.6 UJ	<0.85 UJ	<3.3 UJ	<0.77 UJ	<0.86 UJ	10
Vanadium	3	7.6 J	79.1 A	15.2 J	47.0 J	10.1 J	30.4 J	9.0 J	12.9 J	50
Zinc	6	17.1 J	7,940 A	223 A	5,980 A	47.7 A	2,580 A	76.1 A	437 A	20
Tin	17	23.6 J	1,230 J	16.8 J	30.0 J	9.6 J	50.4 J	8.48 J	157 J	--

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Metals (Concentrations in mg/kg)	IDL (ug/L)	SED-16 8/2/90	SED-17 8/2/90	CRDL (ug/L)
Aluminum	15	10,300 A	4,890 A	[illegible]
Antimony	17	<15.8 R	<5.3 R	60
Arsenic	2	928 J	58.6 J	[illegible]
Barium	1	175 J	438 J	[illegible]
Beryllium	1	1.1 J	<0.28 U	
Cadmium	3	23.4 J	3.5 J	[illegible]
Calcium	14	10,300 A	1,990 J	5000
Chromium	3	140 A	100 A	
Cobalt	3	35.9 J	4.2 J	
Copper	3	357 J	71.8 J	[illegible]
Iron	3	87,500 A	25,800 A	100
Lead	2	354 J	116 J	5
Magnesium	23	4,610 J	2,520 J	5[illegible]
Manganese	1	575 J	189 J	
Mercury	0.2	<0.4 U	<0.1 U	0.2
Nickel	24	26.9 J	<6.7 U	40
Potassium	428	801 J	441 J	50[illegible]
Selenium	2	41.4 A	<0.57 U	
Silver	2	<1.7 UJ	<0.56 UJ	
Sodium	18	69.6 J	8.7 J	5000
Thallium	4	<2.7 UJ	<0.86 UJ	10
Vanadium	3	159 J	16.5 J	
Zinc	6	1600 J	150 J	
Tin	17	24.9 J	5.7 J	[illegible]

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	
Sample Date:	8/3/90	8/3/90	8/3/90	8/2/90	8/2/90	8/2/90	8/1/90	8/1/90	
Miscellaneous Compounds (Dry weight units)									IDL
Total Organic Carbon (% Carbon)	0.64 A	0.47 A	0.91 A	<11.5 U	<11.5 U	14.6 A	1.2 A	0.15 A	0.010
Alkalinity, Carb. as CACO3 (mg/kg)	<6.4 U	<6.7 U	<8.2 U	<6.0 U	<6.5 UJ	<25.8 UJ	<1.7 UJ	<6.4 U	
Trivalent Chromium (mg/kg)	28.6 J	546 J	30.4 J	27.3 J	22.2 J	95.4 J	331 J	7.6 J	
Hexavalent Chromium (mg/kg)	<1.3 UJ	<1.3 UJ	<1.6 UJ	<0.60 UJ	<1.3 UJ	<5.2 UJ	<1.7 UJ	<0.64 UJ	
pH (units)	7.0 A	6.4 A	5.8 A	7.5 A	6.9 A	7.9 A	6.7 A	6.0 A	

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SED-8*	SED-9	SED-10	SED-11	SED-12	SED-13	SED-14	SED-15	
Sample Date:	8/3/90	8/1/90	8/1/90	7/31/90	8/2/90	7/31/90	7/31/90	8/1/90	
Miscellaneous Compounds (Dry weight units)									IDL
Total Organic Carbon (% Carbon)	0.40 A	20.2 A	0.23 A	15.8 A	<11.5 U	9.9 A	0.17 A	0.65 A	0.010
Alkalinity, Carb. as CACO3 (mg/kg)	<6.4 U	<39.1 UJ	<1.2 UJ	<32.9 U	<6.3 UJ	<21.9 U	<6.1 U	<7.1 U	
Trivalent Chromium (mg/kg)	6.3 J	1,090 J	32.1 J	529 J	18.6 J	382 J	13.5 J	118 J	
Hexavalent Chromium (mg/kg)	<0.64 UJ	<7.8 UJ	<0.62 UJ	<6.6 UJ	<0.63 UJ	<4.4 UJ	<1.2 UJ	<0.71 UJ	
pH (units)	5.8 A	7.4 A	7.1 A	7.0 A	6.8 A	7.1 A	6.9 A	7.3 A	

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 3. Summary of Stream Sediment Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SED-16	SED-17	
Sample Date:	8/2/90	8/2/90	
Miscellaneous Compounds (Dry weight units)			IDL
Total Organic Carbon (% Carbon)	23.0 A	<11.5 U	0.010
Alkalinity, Carb. as CACO3 (mg/kg)	<23.6 UJ	<6.3 UJ	
Trivalent Chromium (mg/kg)	140.0 J	100.0 J	
Hexavalent Chromium (mg/kg)	<4.7 UJ	<1.3 UJ	
pH (units)	6.7 A	7.5 A	

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: CORE 1
Sample Depth: 0.5-0.9
Sample Date: 8/3/90

Volatile Organic Compounds (Concentrations in ug/kg)	CRQL		IDL
Chloromethane	10	<12 U	2
Bromomethane	10	<12 U	[illegible]
Vinyl chloride	10	<12 U	
Chloroethane	10	<12 U	
Methylene chloride	5	12 J	2
Acetone	10	19 R	2
Carbon disulfide	5	<6 U	
1,1-Dichloroethene	5	<6 U	
1,1-Dichloroethane	5	<6 U	
1,2-Dichloroethylene	5	<6 U	1
Chloroform	5	<6 U	1
1,2-Dichloroethane	5	<6 U	
2-Butanone	10	<12 UJ	
1,1,1-Trichloroethane	5	<6 U	
Carbon tetrachloride	5	<6 U	1
Vinyl acetate	10	<12 U	[illegible]
Bromodichloromethane	5	<6 U	[illegible]
1,2-Dichloropropane	5	<6 U	[illegible]
cis-1,3-Dichloropropene	5	<6 U	1
Trichloroethene	5	<6 U	1
Dibromochloromethane	5	<6 U	
1,1,2-Trichloroethane	5	<6 U	
Benzene	5	<6 U	[illegible]
trans-1,3-Dichloropropene	5	<6 U	1
Bromoform	5	<6 U	1
4-Methyl-2-pentanone	10	<12 U	[illegible]
2-Hexanone	10	<12 U	2
Tetrachloroethene	5	<6 U	1
1,1,2,2-Tetrachloroethane	5	<6 U	1
Toluene	5	<6 U	[illegible]
Chlorobenzene	5	<6 U	1
Ethylbenzene	5	<6 U	[illegible]
Styrene	5	<6 U	1
Total xylenes	5	<6 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: CORE 1
Sample Depth: 0.5-0.9
Sample Date: 8/3/90

Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/kg)	CRQL		IDL
Phenol	10	<400 UJ	5
bis (2-Chloroethyl) ether	10	<400 UJ	5
2-Chlorophenol	10	<400 UJ	5
1,3-Dichlorobenzene	10	<400 UJ	5
1,4-Dichlorobenzene	10	<400 UJ	5
Benzyl alcohol	10	<400 UJ	10
1,2-Dichlorobenzene	10	<400 UJ	5
2-Methylphenol	10	<400 UJ	5
bis (2-Chloroisopropyl) ether	10	<400 UJ	5
4-Methylphenol	10	<400 UJ	5
N-Nitroso-di-n-propylamine	10	<400 UJ	10
Hexachloroethane	10	<400 UJ	10
Nitrobenzene	10	<400 UJ	5
Isophorone	10	<400 UJ	5
2-Nitrophenol	10	<400 UJ	10
2,4-Dimethylphenol	10	<400 UJ	10
Benzoic acid	50	<2000 UJ	25
bis (2-Chloroethoxy) methane	10	<400 UJ	5
2,4-Dichlorophenol	10	<400 UJ	5
1,2,4-Trichlorobenzene	10	<400 UJ	5
Naphthalene	10	<400 UJ	3
4-Chloroaniline	10	<400 UJ	5
Hexachlorobutadiene	10	<400 UJ	5
4-Chloro-3-methylphenol	10	<400 UJ	10
2-Methylnaphthalene	10	<400 UJ	10
Hexachlorocyclopentadiene	10	<400 UJ	10
2,4,6-Trichlorophenol	10	<400 UJ	10
2,4,5-Trichlorophenol	50	<2000 UJ	10
2-Chloronaphthalene	10	<400 UJ	4
2-Nitroaniline	50	<2000 UJ	10
Dimethyl phthalate	10	<400 UJ	4
Acenaphthylene	10	<400 UJ	3
2,6-Dinitrotoluene	10	<400 UJ	10
3-Nitroaniline	50	<2000 UJ	10
Acenaphthene	10	<400 UJ	3
2,4-Dinitrophenol	50	<2000 UJ	25
4-Nitrophenol	50	<2000 UJ	15
Dibenzofuran	10	<400 UJ	4
2,4-Dinitrotoluene	10	<400 UJ	10
Diethylphthalate	10	<400 UJ	4
4-Chlorophenyl-phenylether	10	<400 UJ	5
Fluorene	10	<400 UJ	4
4-Nitroaniline	50	<2000 UJ	10
4,6-Dinitro-2-methylphenol	50	<2000 UJ	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: CORE 1
Sample Depth: 0.5-0.9
Sample Date: 8/3/90

Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/kg)	CRQL		IDL
N-Nitrosodiphenylamine (1)	10	<400 UJ	[illegible]
4-Bromophenyl-phenylether	10	<400 UJ	[illegible]
Hexachlorobenzene	10	<400 UJ	[illegible]
Pentachlorophenol	50	<2000 UJ	10
Phenanthrene	10	<400 UJ	[illegible]
Anthracene	10	<400 UJ	[illegible]
Di-n-butylphthalate	10	<400 UJ	[illegible]
Fluoranthene	10	<400 UJ	[illegible]
Pyrene	10	<400 UJ	[illegible]
Butylbenzylphthalate	10	<400 UJ	[illegible]
3,3'-Dichlorobenzidine	20	<800 UJ	[illegible]
Benzo (a) anthracene	10	<400 UJ	[illegible]
Chrysene	10	<400 UJ	[illegible]
Bis (2-Ethylhexyl) phthalate	10	230 J	[illegible]
Di-n-octyl phthalate	10	<400 UJ	[illegible]
Benzo (b) fluoranthene	10	<400 UJ	[illegible]
Benzo (k) fluoranthene	10	<400 UJ	[illegible]
Benzo (a) pyrene	10	<400 UJ	[illegible]
Indeno (1,2,3-cd) pyrene	10	<400 UJ	[illegible]
Dibenzo (a,h) anthracene	10	<400 UJ	[illegible]
Benzo (g,h,i) perylene	10	<400 UJ	[illegible]

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
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R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	CORE 1	
Sample Depth:	0.5-0.9	
Sample Date:	8/3/90	
Miscellaneous Analyses (Unfiltered) (Concentrations in mg/kg)		IDL
Alkalinity, Carb. as CaCO3	<6.0 U	
Hexavalent Chromium	<0.60 UJ	6.0
pH	5.6 A	0.6
Total Organic Carbon	0.20 A	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		CORE 1	CORE 1	
Sample Depth:		0.2-0.5	0.5-0.9	
Sample Date:		8/3/90	8/3/90	
Metals (Concentrations in mg/kg)	IDL (ug/L)			CRDL (ug/L
Aluminum	15	3400 A	2500 A	200
Antimony	19	<4.5 R	<4.3 R	60
Arsenic	2	9.9 J	0.71 A	1(
Barium	1	7.8 J	7.6 J	20(
Beryllium	1	<0.24 U	0.44 A	5
Cadmium	3	<0.71 U	<0.69 U	5
Calcium	14	655 J	786 J	500
Chromium	3	13.9 A	22.3 A	1(
Cobalt	3	2.6 A	2.2 A	5(
Copper	3	18.6 J	30.7 A	25
Iron	3	6,640 A	1,180 A	100
Lead	2	5.7 A	5.3 A	5
Magnesium	23	1,620 J	938 J	5000
Manganese	1	84.3 A	35.7 A	15
Mercury	0.2	<0.1 U	<0.1 U	0.2
Nickel	24	<5.6 U	6.2 A	40
Potassium	438	497 J	341 A	5000
Selenium	2	<0.50 U	<0.49 U	5
Silver	2	<0.47 UJ	<0.46 UJ	10
Sodium	18	66.2 J	64.2 J	5000
Thallium	4	<0.75 UJ	<0.74 UJ	10
Vanadium	3	8.9 J	5.5 J	50
Zinc	6	62.6 J	109 J	20
Tin	17	9.3 A	239 A	--

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 4. Summary of Core Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		CORE 1	
Sample Depth:		0.2-0.5	
Sample Date:		8/3/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL		IDL
alpha-BHC	9.9	<9.9 R	0.01
beta-BHC	9.9	<9.9 R	0.02
delta-BHC	9.9	<9.9 R	0.01
gamma-BHC (Lindane)	9.9	<9.9 R	0.01
Heptachlor	9.9	<9.9 R	0.01
Aldrin	9.9	<9.9 R	0.01
Heptachlor epoxide	9.9	<9.9 R	0.01
Endosulfan I	9.9	<9.9 R	0.02
Dieldrin	20	<20 R	0.02
4,4'-DDE	20	<20 R	0.02
Endrin	20	<20 R	0.05
Endosulfan II	20	<20 R	0.02
4,4'-DDD	20	<20 R	0.02
Endosulfan sulfate	20	<20 R	0.08
4,4'-DDT	20	<20 R	0.08
Methoxychlor	99	<99 R	0.06
Endrin ketone	20	<20 R	0.08
alpha-Chlordane	99	<99 R	0.12
gamma-Chlordane	99	<99 R	0.12
Toxaphene	200	<200 R	0.40
Aroclor-1016	99	<99 R	0.38
Aroclor-1221	99	<99 R	0.29
Aroclor-1232	99	<99 R	0.40
Aroclor-1242	99	<99 R	0.45
Aroclor-1248	99	<99 R	0.31
Aroclor-1254	200	<200 R	0.42
Aroclor-1260	200	<200 R	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	1 J	2 R	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromomethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Chloroethane	10	3 J	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Methylene chloride	5	5 R	3 R	12 R	13 R	13 R	1 R	2 R	8 R	2
Acetone	10	<10 U	<10 U	6 J	<10 R	<10 U	<10 U	<10 U	16 R	2
Carbon disulfide	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
trans-1,2-Dichloroethylene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Chloroform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Butanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	1
1,1,1-Trichloroethane	5	<5 U	<5 U	<5 U	3 J	<5 U	<5 U	<5 U	<5 U	1
Carbon tetrachloride	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Vinyl acetate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2,2-Tetrachloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Trichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Benzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	46 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Chloroethylvinyl ether	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2
Bromoform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Hexanone	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2
4-Methyl-2-pentanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Tetrachloroethene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	1
Toluene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1 R	4 J	1
Chlorobenzene	5	25 A	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Ethylbenzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Styrene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Total xylenes	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Chloromethane	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Bromomethane	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Chloroethane	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Methylene chloride	5	<5 UJ	<5 UJ	7 R	6 R	780 R	160 R	5 R	9 R	2
Acetone	10	<10 U	5 J	<10 UJ	<10 U	37000 R	<250 UJ	6 R	<10 U	2
Carbon disulfide	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,1-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	2 J	2 J	1
trans-1,2-Dichloroethylene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Chloroform	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,2-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
2-Butanone	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	1
1,1,1-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Carbon tetrachloride	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Vinyl acetate	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,1,2,2-Tetrachloroethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Trichloroethene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Benzene	5	4 J	4 J	<5 U	<5 U	<2500 UJ	2000 J	<5 U	<5 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
2-Chloroethylvinyl ether	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	2
Bromoform	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
2-Hexanone	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	2
4-Methyl-2-pentanone	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	2
Tetrachloroethene	10	<10 U	<10 U	<10 U	<10 U	<5000 U	<250 U	<10 U	<10 U	1
Toluene	5	<5 U	<5 U	<5 U	<5 U	29000 J	<130 UJ	<5 U	<5 U	1
Chlorobenzene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Ethylbenzene	5	<5 U	<5 U	<5 U	<5 U	<2500 UJ	<130 UJ	<5 U	<5 U	1
Styrene	5	<5 U	<5 U	<5 U	<5 U	<2500 U	<130 U	<5 U	<5 U	1
Total xylenes	5	<5 U	<5 U	<5 U	<5 U	<2500 UJ	<130 UJ	<5 U	<5 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
Chloromethane	10	<10 U	<10 U	<10 U	1 R	<10 U	<10 U	<10 U	1
Bromomethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Chloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	1
Methylene chloride	5	6 R	5 R	5 R	2 R	3 R	<5 R	2 R	1
Acetone	10	6 R	11 R	9 R	2 R	1 R	<10 R	9 R	2
Carbon disulfide	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1-Dichloroethane	5	<5 U	<5 U	5 A	<5 U	<5 U	<5 U	<5 U	1
trans-1,2-Dichloroethylene	5	<5 U	<5 U	28 A	<5 U	<5 U	<5 U	<5 U	1
Chloroform	5	<5 U	<5 U	<5 U	2 J	2 J	6 A	2 J	1
1,2-Dichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Butanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	1
1,1,1-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Carbon tetrachloride	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2
Vinyl acetate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2,2-Tetrachloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Trichloroethene	5	1 J	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Benzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Chloroethylvinyl ether	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2
Bromoform	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
2-Hexanone	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	2
4-Methyl-2-pentanone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	2
Tetrachloroethene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	1
Toluene	5	<5 U	<5 U	3 J	8 J	<5 U	1 A	38 A	1
Chlorobenzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Ethylbenzene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Styrene	5	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	<5 U	1
Total xylenes	5	<5 U	<5 U	3 J	<5 U	<5 U	<5 U	<5 U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	3 J	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	4 J	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 UJ	<10 U	<10 U	<13 U	<10 U	<10 UJ	<10 J	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<63 UJ	<50 U	<50 U	<50 U	58 R	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 UJ	<50 U	<50 U	<63 U	<50 U	<50 UJ	<50 UJ	<50 UJ	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 UJ	<50 UJ	<50 UJ	<63 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	2 J	3 J	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	[illegible]
Pentachlorophenol	50	<50 U	<50 U	<50 U	<63 U	<50 U	<50 U	<50 U	<50 U	1
Phenanthrene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Anthracene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
Fluoranthene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Pyrene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	[illegible]
3,3'-Dichlorobenzidine	20	<20 U	<20 UJ	<20 UJ	<25 U	<20 UJ	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
bis (2-Ethylhexyl) phthalate	10	<10 U	4 J	4 J	<13 U	<10 U	3 J	<10 U	<10 U	
Chrysene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 UJ	<10 U	<10 U	<13 U	<10 U	<10 UJ	<10 UJ	<10 U	3
Benzo (k) fluoranthene	10	<10 UJ	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	[illegible]
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<13 U	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	130 A	6 J	<13 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<200 J	<10 U	<13 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	3400 A	<10 U	<13 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<200 J	<10 U	<13 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<200 J	<10 U	<13 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 UJ	<50 U	2000 J	<50 UJ	<63 UJ	<50 UJ	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<200 J	<10 U	<13 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<1000 A	<50 U	<63 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<1000 A	<50 U	<63 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<1000 A	<50 UJ	<63 UJ	<50 UJ	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 UJ	<50 U	<1000 UJ	<50 UJ	<63 UJ	<50 UJ	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<1000 A	<50 U	<63 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<200 A	<10 U	<13 U	<10 U	4
4-Nitroaniline	50	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<1000 UJ	<50 UJ	<63 UJ	<50 UJ	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<1000 U	<50 U	<63 U	<50 U	15

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL									IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<1000 U	<50 U	<63 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 UJ	<20 U	<20 UJ	<400 U	<20 U	<25 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
bis (2-Ethylhexyl) phthalate	10	<10 U	7 J	<10 U	<10 U	64 A	<10 U	<13 U	<10 U	4
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<200 UJ	<10 U	<13 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<200 UJ	<10 U	<13 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<200 U	<10 U	<13 U	<10 U	3

(1) Cannot be separated from Diphenylamine
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Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 UJ	<50 UJ	<50 U	<50 U	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 U	<50 UJ	<50 UJ	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	15

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Validation Codes

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Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/22/90	
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL								IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Bis (2-Ethylhexyl) phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	<10 U	3

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
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Validation Codes

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Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
beta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
delta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
gamma-BHC (Lindane)	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Aldrin	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor epoxide	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Endosulfan I	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
Dieldrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDE	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.05
Endosulfan II	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDD	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endosulfan sulfate	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
4,4'-DDT	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
Methoxychlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.06
Endrin ketone	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.08
Chlordane	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.12
Toxaphene	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.40
Aroclor-1016	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.38
Aroclor-1221	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.29
Aroclor-1232	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.40
Aroclor-1242	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.45
Aroclor-1248	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.31
Aroclor-1254	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.42
Aroclor-1260	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL									IDL
alpha-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
beta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
delta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
gamma-BHC (Lindane)	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Aldrin	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor epoxide	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Endosulfan I	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
Dieldrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDE	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.05
Endosulfan II	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDD	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endosulfan sulfate	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
4,4'-DDT	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
Methoxychlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.06
Endrin ketone	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.08
Chlordane	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.12
Toxaphene	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.40
Aroclor-1016	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.38
Aroclor-1221	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.29
Aroclor-1232	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.40
Aroclor-1242	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.45
Aroclor-1248	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.31
Aroclor-1254	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.42
Aroclor-1260	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL							IDL
alpha-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
beta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
delta-BHC	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
gamma-BHC (Lindane)	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Aldrin	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Heptachlor epoxide	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.01
Endosulfan I	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.02
Dieldrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDE	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.05
Endosulfan II	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
4,4'-DDD	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.02
Endosulfan sulfate	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
4,4'-DDT	0.10	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	0.08
Methoxychlor	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.06
Endrin ketone	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.08
Chlordane	0.05	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.12
Toxaphene	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.40
Aroclor-1016	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.38
Aroclor-1221	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.29
Aroclor-1232	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.40
Aroclor-1242	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.45
Aroclor-1248	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.31
Aroclor-1254	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.42
Aroclor-1260	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	540 A	7150 A	44.3 A	3810 A	686 A	4790 A	704 A	<27.0 U	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	60
Arsenic	2	<2 U	<2 U	<2 U	4.3 A	103 A	38.3 A	190 A	344 A	10
Barium	2	11.6 A	21.9 A	16.9 A	26.3 A	13.2 A	49.3 A	43 A	67.6 A	200
Beryllium	1	<1.0 U	1.0 A	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	6.5 A	<5.0 U	<5.0 U	5
Calcium	20	162,000 A	24,200 A	38,300 A	36,600 A	139,000 A	10,400 A	37,100 A	517,000 A	5000
Chromium	3	<3.0 U	6.2 A	4.6 A	6.1 A	3.4 A	<3.0 U	5.5 A	38.9 A	10
Cobalt	7	<7.0 U	47.8 A	<7.0 U	9.3 A	<7.0 U	<7.0 U	<7.0 U	<7.0 U	50
Copper	6	9.3 A	40.1 A	<6.0 U	16.7 A	15.3 A	450 A	17.1 A	<6.0 U	25
Iron	3	716 A	2,250 A	30700 A	5320 A	66,300 A	1,080 A	17600 A	13,900 A	100
Lead	2	<2 U	3.4 A	<2 U	4.1 A	3.5 A	6.4 A	17.0 A	<2 U	5
Magnesium	37	25,300 A	6,530 A	4,390 A	11,400 A	14,800 A	1,770 A	2,750 A	107,000 A	5000
Manganese	1	1400 A	2610 A	92.5 A	273 A	389 A	66.6 A	367 A	469 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.4 A	<0.2 U	0.2
Nickel	12	<12.0 U	71.9 A	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	40
Potassium	900	4,440 A	7,220 A	2,670 A	3,250 A	3,330 A	2,370 A	3,020 A	8,660 A	5000
Selenium	2	<2 U	<2 U	2.0 A	<2 U	<2 U	<2 U	2.6 A	<2 U	5
Silver	3	<3.0 U	571 A	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	50,400 A	8,790 A	105,000 A	34,400 A	17,500 A	22,300 A	9,960 A	130,000 A	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	6.6 A	<6.0 U	8.0 A	<6.0 U	<6.0 U	<6.0 U	16.8 A	50
Zinc	8	<20 UJ	93.1 J	<20 UJ	44 R	33.1 R	3,100 J	1460 J	31.7 R	20
Tin	28	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	
Hardness (mg/L)		509 A	87.3 A	114 A	138 A	408 A	33.2 A	104 A	1,730 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan. Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	127 A	56.5 A	242 A	432 A	871 A	122 A	92 A	749 A	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	60
Arsenic	2	30.1 A	25.4 A	124 A	<2 U	2,250 A	146 A	3.3 A	9.7 A	10
Barium	2	32.7 A	28.6 A	19.4 A	31.5 A	380 A	51.3 A	18.9 A	20.5 A	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	27.4 A	20.3 A	5
Calcium	20	98,100 A	88,200 A	81,300 A	13,300 A	14,500 A	251,000 A	84,300 A	116,000 A	5000
Chromium	3	4.7 A	<3.0 U	6.3 A	<3.0 U	160 A	38.1 A	<3.0 U	4.7 A	10
Cobalt	7	<7.0 U	<7.0 U	8.5 A	<7.0 U	8.1 A	10.9 A	18.3 A	19.5 A	50
Copper	6	<6.0 U	<6.0 U	80.7 A	8.8 A	12.8 A	7.1 A	158 A	145 A	25
Iron	3	16,500 A	14,800 A	21,600 A	2,140 A	6710 A	16000 A	836 A	11,600 A	100
Lead	2	<2 U	<2 U	299 A	10.6 A	5.8 A	<2 U	2.0 A	13.5 A	5
Magnesium	37	11,500 A	11,200 A	4,750 A	3,040 A	206,000 A	75,900 A	8,660 A	9,480 A	5000
Manganese	1	2,020 A	1,730 A	43.7 A	124 A	27.1 A	485 A	767 A	665 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	12	<12.0 U	<12.0 U	<12.0 U	<12.0 U	45.4 A	24.7 A	<12.0 U	<12.0 U	40
Potassium	900	7,220 A	6,160 A	3,470 A	2,460 A	72,600 A	31,300 A	6,670 A	5,390 A	5000
Selenium	2	<2 U	<2 U	50.5 A	<2 U	<2 U	<2 U	<2 U	5.6 A	5
Silver	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	18,600 A	19,800 A	11,800 A	73,900 A	131,000 A	757,000 A	66,100 A	33,300 A	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	<6.0 U	<6.0 U	<6.0 U	192 A	25.9 A	<6.0 U	<6.0 U	50
Zinc	8	246 J	133 A	1,910 J	20.3 A	21 R	54.5 R	8,040 J	7,870 J	20
Tin	28	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	
Hardness (mg/L)		292 A	266 A	223 A	45.7 A	884 A	939 A	246 A	329 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL								CRDL
Aluminum	27	124 A	530 A	609 A	3,050 A	2,680 A	40,800 A	224,000 A	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<74.0 U	60
Arsenic	2	3.9 A	115 A	4.4 A	3.3 A	2.7 A	22.7 A	67 A	10
Barium	2	28.7 A	32.1 A	18.4 A	33.8 A	32.5 A	276 A	729 A	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	1.1 A	8.8 A	5
Cadmium	5	<5.0 U	12.8 A	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5
Calcium	20	20,900 A	26,400 A	49,700 A	45,300 A	46,500 A	197,000 A	60,700 A	5000
Chromium	3	<3.0 U	6.4 A	3.1 A	6.7 A	4.6 A	153 A	326 A	10
Cobalt	7	48.7 A	32.4 A	<7.0 U	<7.0 U	<7.0 U	40.4 A	157 A	50
Copper	6	9.4 A	13.3 A	8.1 A	12.1 A	8.9 A	191 A	447 A	25
Iron	3	1,410 A	9,580 A	2,100 A	3,010 A	2,540 A	50,200 A	226,000 A	100
Lead	2	19.7 A	4.6 A	8.5 A	3.2 A	2.8 A	44.5 A	162 A	5
Magnesium	37	4,680 A	4,980 A	11,700 A	6,830 A	6,850 A	63,500 A	75,900 A	5000
Manganese	1	1,740 A	1290 A	128 A	1,440 A	1,460 A	3,480 A	3,920 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.3 A	0.2
Nickel	12	<12.0 A	<12.0 U	<12.0 U	<12.0 U	<12.0 U	66.6 A	261 A	40
Potassium	900	4,810 A	4,710 A	3,870 A	2,840 A	2,750 A	18,300 A	38,400 A	5000
Selenium	2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	5
Silver	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	46,600 A	23,500 A	17,900 A	9,510 A	9,670 A	27,500 A	26,900 A	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	<6.0 A	<6.0 U	<6.0 U	<6.0 U	70.9 A	370 A	50
Zinc	8	381 J	421 J	187 J	21.7 R	16.6 R	135 J	821 J	20
Tin	28	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<56.0 U	
Hardness (mg/L)		71.4 A	86.4 A	172 A	141 A	144 A	753 A	464 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12	
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	399 A	5,010 A	<27.0 U	<27.0 U	<27.0 U	140 A	158 A	<27.0 U	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	60
Arsenic	2	<2 U	<2 U	<2 U	<2 U	2.8 A	<2 U	162 A	422 A	10
Barium	2	36.7 J	20.8 J	91.8 J	59.6 J	19.1 J	51.3 J	49.9 J	101 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	8.8 A	<5.0 U	<5.0 U	5
Calcium	20	156,000 J	22,800 J	42,500 J	37,500 J	141,000 J	10,600 J	38,900 J	491,000 J	5000
Chromium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	35.5 A	10
Cobalt	7	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	50
Copper	6	<6.0 U	11.5 A	<6.0 U	<6.0 U	<6.0 U	321 A	<6.0 U	<6.0 U	25
Iron	3	151 A	<20 U	<20 U	<100 U	32 J	16.9 R	12,000 J	5,130 J	100
Lead	2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	5
Magnesium	37	24,600 J	6,120 J	4,960 J	11,000 J	15,100 J	1,700 J	2,970 J	108,000 J	5000
Manganese	1	1,330 A	1.4 A	20.2 A	1.2 A	115 A	59.1 A	423 A	400 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	12	<12.0 U	20 A	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	40
Potassium	900	3,220 A	6,440 A	2,350 A	2,880 A	2,870 A	1,840 A	2,580 A	9,180 A	5000
Selenium	2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	5
Silver	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	51,100 J	11,600 J	123,000 J	41,400 J	232,000 J	25,800 J	14,600 J	150,000 J	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	<6.0 A	<6.0 U	<6.0 U	<6.0 A	<6.0 U	<6.0 U	22.4 A	50
Zinc	8	44.6 R	72.8 R	27.1 R	23.2 R	42.1 R	3,180 R	913 R	46.3 R	20
Tin	28	<29.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	
Hardness (mg/L)		491 A	82.1 A	118 A	139 A	414 A	33.5 A	109 A	1670 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Aluminum	27	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	43.9 A	<37.0 U	<37.0 U	<37.0 U	60
Arsenic	2	20.6 A	20.4 A	7.5 A	<2 U	2,860 A	164 A	<2 U	<2 U	10
Barium	2	66.6 J	63.2 J	28.0 J	69.6 J	245 J	51.9 J	196 J	46 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	5	<5.0 U	<5.0 U	5.5 A	<5.0 U	<5.0 U	<5.0 U	25.2 A	20.5 A	5
Calcium	20	88,900 J	88,800 J	87,900 J	11,700 J	13,900 J	236,000 J	83,300 J	122,000 J	5000
Chromium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	138 A	26.5 A	<3.0 U	<3.0 U	10
Cobalt	7	<7.0 U	<7.0 U	10.3 A	<7.0 U	<7.0 U	<7.0 U	16.8 A	19.1 A	50
Copper	6	<6.0 U	<6.0 U	17.6 A	<6.0 U	<6.0 U	<6.0 U	122 A	35.1 A	25
Iron	3	3,080 J	3,350 J	628 J	42.2 J	870 J	831 J	577 J	42.7 J	100
Lead	2	<2 U	<2 U	16.3 A	<2 U	<2 U	<2 U	<2 U	<2 U	5
Magnesium	37	11,300 J	10,900 J	5,170 J	2,530 J	193,000 J	70,800 J	8,580 J	9,490 J	5000
Manganese	1	1,760 A	1,780 A	47.4 A	77.3 A	7.6 A	436 A	736 A	671 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	12	<12.0 U	<12.0 U	<12.0 U	<12.0 U	54.1 A	<12.0 U	13.3 A	18.2 A	40
Potassium	900	6,360 A	6,380 A	3,110 A	1,520 A	69,100 A	261,000 A	6,070 A	5,660 A	5000
Selenium	2	<2 U	<2 U	35.2 A	<2 U	<2 U	<2 U	2.0 A	5.6 A	5
Silver	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	21,900 J	20,900 J	12,700 J	68,700 J	142,000 J	663,000 J	63,100 J	42,200 J	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	<6.0 U	<6.0 U	<6.0 U	183 A	13.4 A	<6.0 U	<6.0 U	50
Zinc	8	38.9 R	48.3 R	2,110 R	26.6 R	97.9 R	78.5 R	8,000 R	7,220 R	20
Tin	28	<28.0 U	<28.0 U	<28.0 U	<28.0 U	59 A	<28.0 U	<28.0 U	<28.0 U	
Hardness (mg/L)		268 A	267 A	241 A	39.6 A	829 A	881 A	243 A	344 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL								CRDL
Aluminum	27	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	<27.0 U	200
Antimony	37	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	60
Arsenic	2	<2 U	17.7 A	<2 U	<2 U	<2 U	4.4 A	<2 U	10
Barium	2	130 J	45.3 J	42 J	42.7 J	57.8 J	196 J	91.6 J	200
Beryllium	1	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	5
Cadmium	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5
Calcium	20	20,900 J	25,700 J	47,200 J	48,500 J	48,000 J	198,000 J	18,100 J	5000
Chromium	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	4.2 A	<3.0 U	10
Cobalt	7	12.6 A	25.9 A	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	50
Copper	6	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	25
Iron	3	<100 U	1,160 A	412 J	152 J	131 J	6,320 J	13.7 J	100
Lead	2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	5
Magnesium	37	4,710 J	4,780 J	11,300 J	6,740 J	6,650 J	52,100 J	3,260 J	5000
Manganese	1	1,060 A	1230 A	109 A	1,510 A	1,460 A	3,020 A	450 A	15
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	12	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	<12.0 U	40
Potassium	900	4,310 A	4,110 A	3,290 A	2,420 A	2,360 A	10,500 A	4,990 A	5000
Selenium	2	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	5
Silver	3	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U	10
Sodium	38	46,500 J	27,600 J	22,700 J	10,200 J	13,500 J	26,400 J	23,800 J	5000
Thallium	4	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	<4 U	10
Vanadium	6	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	50
Zinc	8	437 R	219 R	51 R	31.9 R	121 R	45.7 R	28.7 R	20
Tin	28	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	<28.0 U	
Hardness (mg/L)		71.6 A	83.8 A	164 A	149 A	126 A	709 A	58.6 A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-9	OW-10	OW-11	OW-12
Sample Date:		3/20/90	3/19/90	3/19/90	3/16/90	3/19/90	3/20/90	3/20/90	3/15/90
Inorganic Compounds (Concentrations in mg/L)	IDL								
Sulfate	0.01	28.20 R	19.75 R	9.83 R	3.30 R	451.25 R	48.00 R	111.13 R	1246.50 R
Sulfide	0.004	0.004 R	0.026 R	0.025 R	0.014 R	0.022 R	0.018 R	0.015 R	0.008 R
Total Phosphorous	0.04	1.50 R	0.63 R	1.45 R	1.05 R	0.68 R	0.88 R	1.13 R	1.50 R
Bicarbonate	1.0	463 A	54.9 A	55.5 A	42.4 J	30.0 A	5.4 A	65.5 A	935 A
Carbonate	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Chloride	5.0	67.7 A	<5.0 U	232 A	86.9 A	16.8 A	39.1 A	19.7 A	34.7 A
Cr+6	0.10	<0.010 U	<0.010 U	<0.010 U	<0.010 R	<0.010 U	<0.010 U	<0.010 U	<0.010 U
TOC	20.5	6.9 R	9.2 R	1.1 R	1.2 R	14.1 R	4.3 R	8.6 R	29.1 J
COD	20	33.4 A	64.7 A	49.1 A	<20 U	62.1 A	23.0 A	25.6 A	144 A
TSS	5	<5.0 U	27.0 A	55.5 A	<5.0 U	222 A	48.0 A	35.0 A	55.0 A

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-13	OW-13*	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A
Sample Date:		3/19/90	3/19/90	3/15/90	3/19/90	3/20/90	3/15/90	3/15/90	3/15/90
Inorganic Compounds (Concentrations in ug/L)	IDL								
Sulfate	0.01	4.93 R	53.98 R	6.20 R	12.93 R	0.27 R	49.15 R	155.45 R	181.00 R
Sulfide	0.004	0.022 R	0.017 R	0.013 R	0.021 R	0.113 J	0.029 R	0.012 R	0.010 R
Total Phosphorous	0.04	2.80 R	1.48 R	0.08 R	2.58 R	9.98 A	1.70 R	<0.04 R	1.38 R
Bicarbonate	1.0	347 A	351 A	35.5 A	10.0 A	11100 A	1460 A	29.6 A	67.8 A
Carbonate	1.0	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Chloride	5.0	17.0 A	20.8 A	15.7 A	140 A	146 A	144 A	98.4 A	47.6 A
Cr+6	0.10	<0.010 R	<0.010 U	<0.010 R	<0.010 R	<0.010 U	<0.010 U	<0.010 R	<0.010 R
TOC	20.5	7.0 A	7.4 A	5.1 R	1.3 A	2770 J	160 J	5.1 R	5.5 A
COD	20	72.5 A	33.4 A	<20 A	33.4 A	1350 A	454 A	<20 U	52.3 A
TSS	5	40.5 A	25.5 A	51.0 A	18.5 A	136 A	97.0 A	7.0 A	44.0 A

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-21	OW-21*	OW-22	OW-28
Sample Date:		3/16/90	3/16/90	3/16/90	3/21/90	3/21/90	3/21/90	3/21/90
Inorganic Compounds (Concentrations in ug/L)	IDL							
Sulfate	0.01	18.35 R	7.75 R	160.93 R	47.690 R	49.830 R	565.000 R	2 R
Sulfide	0.004	0.017 R	0.016 R	0.019 R	0.007 R	<0.004 R	0.005 R	0.06 R
Total Phosphorous	0.04	<0.04 U	0.75 R	2.80 R	3.90 R	3.28 R	14.15 A	9 A
Bicarbonate	1.0	16.5 R	59.8 J	90.5 J	118 A	121 A	321 A	29.5 A
Carbonate	1.0	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	--
Chloride	5.0	42.2 A	29.9 A	48.6 A	10.9 A	11.0 A	22.6 A	--
Cr+6	0.10	<0.010 R	<0.010 R	<0.010 R	<0.010 U	<0.010 U	<0.010 U	--
TOC	20.5	3.4 R	3.4 R	5.4 R	4.7 R	4.6 R	11.5 R	8.4 R
COD	20	<20 U	<20 U	<20 U	<20 U	24.4 A	24.4 A	--
TSS	5	10.0 A	32.0 A	59.5 A	76.0 A	84.0 A	1,500 A	--

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Analyses for Inorganic Compounds in Soil

Sample Designation:	SS-22	SS-22	SS-28	SS-28	SS-21	SS-21	SD-21*
Sample Depth (ft):	4-6	6-12	0-7	7-9	0-2	2-8	2-8
Sample Date:	2/28/90	2/28/90	3/7/90	3/7/90	3/12/90	3/12/90	3/12/90
Inorganic Compounds (Concentrations in mg/kg)							
Iron oxide	1760 A	2320 A	3710 A	3440 A	4810 A	1660 A	1690 A
Manganese oxide (mg/L)	0.12 A	0.14 A	0.42 A	1.5 A	0.74 A	0.11 A	0.12 A
Chromium III	6.9 A	13.3 A	19.8 A	19 A	25.7 A	11.0 A	8.8 A
Chromium VI	ND A	ND A	ND A	ND A	ND A	ND A	ND A
Total Chromium	6.4 A	9.7 A	26.7 A	17.2 A	21.4 A	6.5 A	5.2 A
Total Calcium Carbonate	ND A	ND A	ND A	31.2 A	ND A	ND A	ND A
Total Organic Compounds	0.57 A	30.2 A	0.55 A	0.07 A	0.55 A	0.8% A	0.8% A
Total Suspended Solids	83.8% A	80.4% A	91.3% A	88.8% A	83.8% A	80.4% A	77.2% A
Grain size analysis **	yes	no	yes	yes	yes	yes	yes
pH (Laboratory)	6.2 A	6.8 A	4.0 A	6.3 A	4.3 A	5.3 A	5.6 A
Radian Compounds							
Arsenic	3.7 J	3.0 J	13 A	10 A	5.4 A	2.4 A	2.6 J
Arsenic III	<0.12 A	<0.12 A	<0.12 J	<0.12 J	<0.12 J	<0.12 J	<0.12 J
Arsenic V	3.75 A	2.24 A	3.66 A	2.26 A	3.65 A	2.12 A	3.90 A
Mercury II	<0.41 A	<0.037 A	<0.041 A	<0.037 A	<0.040 A	<0.042 A	<0.034 A
Mercury 0	<0.029 U	<0.026 U	<0.041 U	<0.037 U	<0.035 U	<0.039 U	<0.034 U
Lead II	<11 U	<12 U	<17 U	<12 U	<5.9 U	<5.2 U	<5.2 U
Lead by graphite furnace	1.4 A	1.2 A	7.1 A	5.3 A	18 A	3.2 A	2.4 A

* - Indicates a replicate sample of SS-21 (2'-8')
** - Performed (yes/no)

Validation Codes

A - Quantitative
J - Qualitative
R - Unusable

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11	
Sample Date:		8/17/90	8/16/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	6.9 A	22.0 A	2.1 A	204 A	10
Barium	1	7.2 A	9.8 A	9.3 A	19.2 A	17.7 A	8.7 A	50.6 A	45.6 A	200
Zinc	6	16.4 J	27.0 J	26.3 A	20.5 A	14.8 A	18.5 J	264 A	1,640 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		8/15/90	8/15/90	8/16/90	8/16/90	8/17/90	8/14/90	8/15/90	8/14/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	60.5 A	53.4 A	15.4 A	<2.0 U	2,350 A	184 A	4.9 A	<2.0 U	10
Barium	1	41.5 A	27.6 A	29.1 A	36.1 A	319 A	50.5 A	15.1 A	45.2 A	200
Zinc	6	20.4 A	66.7 A	1,510 A	13.1 J	31.9 A	221 A	8,430 A	239 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90	
Inorganic Compounds (Total) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 U	34.8 A	6.4 A	5.8 A	5.3 A	4.8 A	<2.0 U	<2.0 U	10
Barium	1	21.5 A	20.9 A	14.5 A	14.8 A	22.9 A	24.9 A	76.9 A	18.0 A	200
Zinc	6	260 A	199.0 A	15.0 A	13.8 A	26.8 A	25.7 A	50.1 J	32.5 A	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11	
Sample Date:		8/17/90	8/17/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	4.6 J	<2.0 U	198 J	10
Barium	1	8.9 A	7.2 A	10.7 A	13.8 A	18.4 A	8.9 A	36.0 A	42.2 A	200
Zinc	6	8.2 J	25.4 J	7.2 J	12.0 J	20.7 J	<6.0 U	231 J	1,600 J	20

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A	
Sample Date:		8/15/90	8/15/90	8/17/90	8/17/90	8/17/90	8/14/90	8/15/90	8/14/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	36.4 J	43.5 J	4.1 J	<2.0 U	2,400 J	83.0 J	3.1 J	<2.0 U	10
Barium	1	40.0 A	21.9 A	31.1 A	29.1 A	194 A	23.0 A	17.9 A	24.5 A	200
Zinc	6	9.0 J	7.6 J	1,610 J	17.2 J	<6.0 U	63.2 J	8,990 J	4,130 J	20

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CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

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J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28	
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90	
Inorganic Compounds (Dissolved) (Concentrations in ug/L)	IDL									CRDL
Arsenic	2	<2.0 U	22.4 J	6.8 J	7.1 J	4.0 J	2.8 J	<2.0 U	<2.0 U	10
Barium	1	26.8 A	18.4 A	12.7 A	12.1 A	20.8 A	23.6 A	72.2 A	7.5 A	200
Zinc	6	444 J	116 J	6.7 J	12.6 J	15.7 J	37.8 J	25.0 J	15.1 J	20

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CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

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R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-1	OW-1A	OW-4	OW-6	OW-7	OW-9	OW-10	OW-11
Sample Date:		8/17/90	8/16/90	8/15/90	8/14/90	8/14/90	8/17/90	8/15/90	8/15/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	27.6 A	11.4 A	12.0 A	26.9 A	43.8 A	400 A	14.1 A	79.6 A
Sulfide	0.050	<0.050 U	<0.050 U	<0.050 U	0.052 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U
Total Phosphorous	0.050	<0.050 U	0.13 A	<0.050 U	0.070 A	0.068 A	<0.050 U	<0.050 U	0.14 A
TOC	0.50	20.5 A	12.5 A	0.82 A	2.2 A	5.5 A	29.2 A	2.3 A	12.7 A
Hexavalent Chromium	0.010	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U

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CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-12	OW-13	OW-14	OW-15	OW-16	OW-17	OW-18	OW-18A
Sample Date:		8/15/90	8/15/90	8/16/90	8/16/90	8/17/90	8/14/90	8/15/90	8/14/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	1,780 A	53.9 A	274 A	16.5 A	<5.0 U	902 A	283 A	231 A
Sulfide	0.050	0.084 A	<0.050 U	<0.050 U	<0.050 U	0.20 A	<0.050 U	<0.050 U	0.12 A
Total Phosphorous	0.050	0.30 A	0.69 A	<0.050 U	0.066 A	4.5 A	0.81 A	<0.050 U	<0.050 U
TOC	0.50	40.0 A	13.3 A	10.0 A	1.5 A	2,730 A	120 A	14.6 A	13.4 A
Hexavalent Chromium	0.010	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 1. Summary of Ground-Water Analyses, Ground-Water/Surface-Water Investigation Plan, Industri-Plex Site Remedial Trust, Woburn, Massachusetts.

Well Designation:		OW-19	OW-19A	OW-20	OW-20*	OW-21	OW-21*	OW-22	OW-28
Sample Date:		8/14/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/17/90	8/15/90
Miscellaneous Compounds (Concentrations in mg/L)	IDL								
Sulfate	5.0	99.3 A	31.1 A	55.4 A	55.4 A	25.1 A	18.4 A	711 A	12.5 A
Sulfide	0.050	0.055 A	0.055 A	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U	<0.050 U
Total Phosphorous	0.050	<0.050 U	0.055 A	0.91 A	0.19 A	0.064 A	0.068 A	0.053 A	0.059 A
TOC	0.50	3.9 A	9.7 A	2.1 A	2.4 A	9.8 A	16.4 A	15.3 A	0.71 A
Hexavalent Chromium	0.010	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		OW-17		
Sample Date:		4/25/90		4/25/90		4/25/90		
Volatile Organic Compounds (Concentrations in ug/L)	CRQL							IDL
Chloromethane	10	< 10	U	< 10	U	< 50	U	2
Bromomethane	10	< 10	U	< 10	U	< 50	U	2
Vinyl chloride	10	< 10	U	< 10	U	< 50	U	2
Chloroethane	10	< 10	U	< 10	U	< 50	U	2
Methylene chloride	5	21	R	19	R	96	R	2
Acetone	10	< 10	U	< 10	U	< 50	U	2
Carbon disulfide	5	< 5	U	< 5	U	< 25	U	1
1,1-Dichloroethene	5	3	A	< 5	U	< 25	U	1
1,1-Dichloroethane	5	6	A	6	A	< 25	U	1
1,2-Dichloroethylene (total)	5	2	A	2	A	< 25	U	1
Chloroform	5	< 5	U	< 5	U	< 25	U	1
1,2-Dichloroethane	5	< 5	U	< 5	U	< 25	U	1
2-Butanone	10	< 10	U	< 10	U	< 50	U	1
1,1,1-Trichloroethane	5	15	A	15	A	< 25	U	1
Carbon tetrachloride	5	< 5	U	< 5	U	< 25	U	1
Vinyl acetate	10	< 10	U	< 10	U	< 50	U	2
Bromodichloromethane	5	< 5	U	< 5	U	< 25	U	1
1,2-Dichloropropane	5	< 5	U	< 5	U	< 25	U	1
1,1,2,2-Tetrachloroethane	5	< 5	U	< 5	U	< 25	U	1
cis-1,3-Dichloropropene	5	< 5	U	< 5	U	< 25	U	1
Trichloroethene	5	36	A	35	A	< 25	U	1
Dibromochloromethane	5	< 5	U	< 5	U	< 25	U	1
1,1,2-Trichloroethane	5	< 5	U	< 5	U	< 25	U	1
Benzene	5	< 5	U	< 5	U	660	A	1
trans-1,3-Dichloropropene	5	< 5	U	< 5	U	< 25	U	1
Bromoform	5	< 5	U	< 5	U	< 25	U	1
2-Hexanone	10	< 10	U	< 10	U	< 50	U	2
4-Methyl-2-pentanone	10	< 10	U	< 10	U	< 50	U	2
Tetrachloroethene	5	< 5	U	< 5	U	< 25	U	1
Toluene	5	< 5	U	< 5	U	< 25	U	1
Chlorobenzene	5	< 5	U	< 5	U	< 25	U	1
Ethylbenzene	5	< 5	U	< 5	U	< 25	U	1
Styrene	5	< 5	U	< 5	U	< 25	U	1
Total xylenes	5	< 5	U	< 5	U	13	U	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL					IDL
Phenol	10	< 10	U	< 10	U	5
bis (2-Chloroethyl) ether	10	< 10	U	< 10	U	5
2-Chlorophenol	10	< 10	U	< 10	U	5
1,3-Dichlorobenzene	10	< 10	U	< 10	U	5
1,4-Dichlorobenzene	10	< 10	U	< 10	U	5
Benzyl alcohol	10	< 10	U	< 10	U	10
1,2-Dichlorobenzene	10	< 10	U	< 10	U	5
2-Methylphenol	10	< 10	U	< 10	U	5
bis (2-Chloroisopropyl) ether	10	< 10	U	< 10	U	5
4-Methylphenol	10	< 10	U	< 10	U	5
N-Nitroso-di-n-propylamine	10	< 10	U	< 10	U	10
Hexachloroethane	10	< 10	U	< 10	U	10
Nitrobenzene	10	< 10	U	< 10	U	5
Isophorone	10	< 10	U	< 10	U	5
2-Nitrophenol	10	< 10	U	< 10	U	10
2,4-Dimethylphenol	10	< 10	U	< 10	U	10
Benzoic acid	50	< 50	U	< 50	U	25
bis (2-Chloroethoxy) methane	10	< 10	U	< 10	U	5
2,4-Dichlorophenol	10	< 10	U	< 10	U	5
1,2,4-Trichlorobenzene	10	< 10	U	< 10	U	5
Naphthalene	10	< 10	U	< 10	U	3
4-Chloroaniline	10	< 10	U	< 10	U	5
Hexachlorobutadiene	10	< 10	U	< 10	U	5
4-Chloro-3-methylphenol	10	< 10	U	< 10	U	10
2-Methylnaphthalene	10	< 10	U	< 10	U	10
Hexachlorocyclopentadiene	10	< 10	U	< 10	U	10
2,4,6-Trichlorophenol	10	< 10	U	< 10	U	10
2,4,5-Trichlorophenol	50	< 50	U	< 50	U	10
2-Chloronaphthalene	10	< 10	U	< 10	U	4
2-Nitroaniline	50	< 50	U	< 50	U	10
Dimethyl phthalate	10	< 10	U	< 10	U	4
Acenaphthylene	10	< 10	U	< 10	U	3
2,6-Dinitrotoluene	10	< 10	U	< 10	U	10
3-Nitroaniline	50	< 50	U	< 50	U	10
Acenaphthene	10	< 10	U	< 10	U	3
2,4-Dinitrophenol	50	< 50	U	< 50	U	25
4-Nitrophenol	50	< 50	UJ	< 50	UJ	15
Dibenzofuran	10	< 10	U	< 10	U	4
2,4-Dinitrotoluene	10	< 10	U	< 10	U	10
Diethylphthalate	10	< 10	U	< 10	U	4
4-Chlorophenyl-phenylether	10	< 10	U	< 10	U	5
Fluorene	10	< 10	U	< 10	U	4
4-Nitroaniline	50	< 50	U	< 50	U	10
4,6-Dinitro-2-methylphenol	50	< 50	U	< 50	U	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
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R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Semi-Volatile Organic Compounds (Concentrations in ug/L)	CRQL					IDL
N-Nitrosodiphenylamine (1)	10	< 10	U	< 10	U	5
4-Bromophenyl-phenylether	10	< 10	U	< 10	U	5
Hexachlorobenzene	10	< 10	U	< 10	U	5
Pentachlorophenol	50	< 50	U	< 50	U	10
Phenanthrene	10	< 10	U	< 10	U	3
Anthracene	10	< 10	U	< 10	U	3
Di-n-butylphthalate	10	< 10	U	< 10	U	3
Fluoranthene	10	< 10	U	< 10	U	3
Pyrene	10	< 10	U	< 10	U	3
Butylbenzylphthalate	10	< 10	U	< 10	U	5
3,3'-Dichlorobenzidine	20	< 20	U	< 20	U	5
Benzo (a) anthracene	10	< 10	U	< 10	U	3
Chrysene	10	< 10	U	< 10	U	4
bis (2-Ethylhexyl) phthalate	10	< 10	U	< 10	U	3
Di-n-octyl phthalate	10	< 10	U	< 10	U	4
Benzo (b) fluoranthene	10	< 10	U	< 10	U	5
Benzo (k) fluoranthene	10	< 10	U	< 10	U	6
Benzo (a) pyrene	10	< 10	U	< 10	U	3
Indeno (1,2,3-cd) pyrene	10	< 10	U	< 10	U	4
Dibenzo (a,h) anthracene	10	< 10	U	< 10	U	4
Benzo (g,h,i) perylene	10	< 10	U	< 10	U	4

(1) Cannot be separated from Diphenylamine
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CRQL - Contract Required Quantitation Limit
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Validation Codes

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R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Pesticide\PCB Compounds (Concentrations in ug/L)	CRQL					IDL
alpha-BHC	0.05	< 0.05	U	< 0.05	U	0.01
beta-BHC	0.05	< 0.05	U	< 0.05	U	0.02
delta-BHC	0.05	< 0.05	U	< 0.05	U	0.01
gamma-BHC (Lindane)	0.05	< 0.05	U	< 0.05	U	0.01
Heptachlor	0.05	< 0.05	U	< 0.05	U	0.01
Aldrin	0.05	< 0.05	U	< 0.05	U	0.01
Heptachlor epoxide	0.05	< 0.05	U	< 0.05	U	0.01
Endosulfan I	0.05	< 0.05	U	< 0.05	U	0.02
Dieldrin	0.10	< 0.10	U	< 0.10	U	0.02
4,4'-DDE	0.10	< 0.10	U	< 0.10	U	0.02
Endrin	0.10	< 0.10	U	< 0.10	U	0.05
Endosulfan II	0.10	< 0.10	U	< 0.10	U	0.02
4,4'-DDD	0.10	< 0.10	U	< 0.10	U	0.02
Endosulfan sulfate	0.10	< 0.10	U	< 0.10	U	0.08
4,4'-DDT	0.10	< 0.10	U	< 0.10	U	0.08
Methoxychlor	0.05	< 0.05	U	< 0.05	U	0.06
Endrin ketone	0.10	< 0.10	U	< 0.10	U	0.08
alpha Chlordane	0.05	< 0.05	U	< 0.05	U	0.12
gamma Chlordane	0.05	< 0.05	U	< 0.05	U	0.12
Toxaphene	1.0	< 1.0	U	< 1.0	U	0.40
Aroclor-1016	0.5	< 0.5	U	< 0.5	U	0.38
Aroclor-1221	0.5	< 0.5	U	< 0.5	U	0.29
Aroclor-1232	0.5	< 0.5	U	< 0.5	U	0.40
Aroclor-1242	0.5	< 0.5	U	< 0.5	U	0.45
Aroclor-1248	0.5	< 0.5	U	< 0.5	U	0.31
Aroclor-1254	1.0	< 1.0	U	< 1.0	U	0.42
Aroclor-1260	1.0	< 1.0	U	< 1.0	U	0.25

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CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

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J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*		
Sample Date:		4/25/90		4/25/90		
Total Metals (Concentrations in ug/L)	IDL					CRDL
Aluminum	27	273	A	117	R	200
Antimony	37	< 37	U	< 37	U	60
Arsenic	2	43.5	J	29.7	J	10
Barium	2	24	A	22.1	A	200
Beryllium	1	< 1	U	< 1	U	5
Cadmium	5	< 5	U	< 5	U	5
Calcium	20	39900	A	40100	A	5000
Chromium	3	3.3	A	< 3	U	10
Cobalt	7	< 7	U	< 7	U	50
Copper	6	6.5	A	< 6	U	25
Iron	3	8150	J	5540	J	100
Lead	2	3.7	J	< 2	UJ	5
Magnesium	37	9930	A	9930	A	5000
Manganese	1	322	A	322	A	15
Mercury	0.2	< 0.2	U	< 0.2	U	0.2
Nickel	12	35.7	R	12	R	40
Potassium	900	2880	J	2490	J	5000
Selenium	2	< 2	U	< 2	U	5
Silver	3	< 3	U	< 3	U	10
Sodium	38	26700	A	26500	A	5000
Thallium	4	< 4	U	< 4	U	10
Vanadium	6	< 6	U	< 6	U	50
Zinc	8	22.8	R	14.4	R	20
Tin	28	< 28	UJ	< 28	UJ	
Hardness (mg/L)		140	A	141	A	

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CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

	Well Designation:	OW-7		OW-7*		
	Sample Date:	4/25/90		4/25/90		
Dissolved Metals (Concentrations in ug/L)	IDL					CRDL
Aluminum	27	60.4	J	< 27	UJ	200
Antimony	37	< 37	U	< 37	U	60
Arsenic	2	< 2	U	< 2	U	10
Barium	2	175	J	74	J	200
Beryllium	1	< 1	U	< 1	U	5
Cadmium	5	< 5	U	< 5	U	5
Calcium	20	41000	A	40200	A	5000
Chromium	3	< 3	U	< 3	U	10
Cobalt	7	< 7	U	< 7	U	50
Copper	6	< 6	U	< 6	U	25
Iron	3	172	A	175	A	100
Lead	2	< 2	U	< 2	U	5
Magnesium	37	10100	A	9850	A	5000
Manganese	1	316	A	305	A	15
Mercury	0.2	< 0.2	U	< 0.2	U	0.2
Nickel	12	< 12	U	< 12	U	40
Potassium	900	2820	A	2600	A	5000
Selenium	2	< 2	U	< 2	U	5
Silver	3	< 3	U	< 3	U	10
Sodium	38	27400	A	26400	A	5000
Thallium	4	< 4	U	< 4	U	10
Vanadium	6	< 6	U	< 6	U	50
Zinc	8	124	R	41.5	R	20
Tin	28	< 28	UJ	< 28	UJ	
Hardness (mg/L)		144	A	141	A	

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:		OW-7		OW-7*	
Sample Date:		4/25/90		4/25/90	
Miscellaneous Compounds (Concentrations in mg/L)	IDL				
Sulfate	5.0	53.0	A	51.0	A
Sulfide	0.05	< 0.05	U	< 0.05	U
Total Phosphorous	0.01	0.30	J	0.21	J
Bicarbonate	5.0	55.1	R	55.1	R
Carbonate	5.0	< 5.0	U	< 5.0	U
Chloride	3.0	76.0	A	73.0	A
Cr+6	0.010	< 0.010	U	< 0.010	U
TOC	2.0	3.0	A	2.2	A
COD	5.0	17	R	23	R
TSS	1.0	26.0	A	18.0	A

* - Indicates a replicate sample
IDL - Instrument Detection Limit
-- - Not sampled

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL						IDL
Chloromethane	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Bromomethane	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Vinyl chloride	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Chloroethane	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Methylene chloride	5	<100 R	<100 R	320 R	<50 R	<100 R	2
Acetone	10	<150 UJ	160 R	480 J	680 J	110 J	2
Carbon disulfide	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
1,1-Dichloroethene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
1,1-Dichloroethane	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
1,2-Dichloroethylene (total)	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Chloroform	5	2 J	5 A	<25 U	<50 U	4 J	1
1,2-Dichloroethane	5	78 A	<5 U	<25 U	<50 U	<5 U	1
2-Butanone	10	<10 U	<10 U	23 J	<100 U	<10 U	1
1,1,1-Trichloroethane	5	1 J	<5 UJ	17 J	12 J	<5 UJ	1
Carbon tetrachloride	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Vinyl acetate	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Bromodichloromethane	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
1,2-Dichloropropane	5	<5 U	<5 U	17 J	<50 U	<5 U	1
cis-1,3-Dichloropropene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Trichloroethene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Dibromochloromethane	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
1,1,2-Trichloroethane	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Benzene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
trans-1,3-Dichloropropene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Bromoform	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
4-Methyl-2-pentanone	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
2-Hexanone	10	<10 U	<10 U	<50 U	<100 U	<10 U	2
Tetrachloroethene	5	<5 U	<5 U	9 J	<50 U	<5 U	1
1,1,2,2,-Tetrachloroethane	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Toluene	5	21 A	<5 U	290 A	240 A	<5 U	1
Chlorobenzene	5	<5 U	<5 U	<25 U	<50 U	<5 U	1
Ethylbenzene	5	1 J	<5 U	9 J	<50 U	<5 U	1
Styrene	5	2 J	<5 U	<25 U	<50 U	<5 U	1
Total xylenes	5	3 J	<5 UJ	68 J	50 J	<5 UJ	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
Phenol	10	<10 U	5 J	<10 U	<10 U	<10 U	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 UJ	7 J	5 J	<10 UJ	5
Benzyl alcohol	10	5 J	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	28 A	25 A	<10 U	5
2-Methylphenol	10	<10 U	<10 U	13 A	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	<10 U	16 A	<10 U	<10 U	<10 U	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	9 J	20 A	5 J	<10 U	10 A	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 UJ	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	15

(1) Cannot be separated from Diphenylamine
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Validation Codes

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Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<10 U	<10 U	4 J	4 J	9 J	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
bis (2-Ethylhexyl) phthalate	10	18 J	23 J	34 J	6 J	4 J	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	6
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4

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Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
Phenol	10	<10 U	<10 U	<10 U	<10 U	27 A	5
bis (2-Chloroethyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Chlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,3-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,4-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzyl alcohol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
1,2-Dichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
bis (2-Chloroisopropyl) ether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Methylphenol	10	17 A	<10 U	<10 U	<10 U	33 A	5
N-Nitroso-di-n-propylamine	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachloroethane	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Nitrobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Isophorone	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2-Nitrophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4-Dimethylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Benzoic acid	50	<50 U	<50 U	<50 U	<50 U	<50 U	25
bis (2-Chloroethoxy) methane	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
2,4-Dichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
1,2,4-Trichlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Naphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
4-Chloroaniline	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobutadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Chloro-3-methylphenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2-Methylnaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Hexachlorocyclopentadiene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,6-Trichlorophenol	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
2,4,5-Trichlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
2-Chloronaphthalene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
2-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Dimethyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Acenaphthylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,6-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
3-Nitroaniline	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Acenaphthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
2,4-Dinitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	25
4-Nitrophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	15
Dibenzofuran	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
2,4-Dinitrotoluene	10	<10 U	<10 U	<10 U	<10 U	<10 U	10
Diethylphthalate	10	<20 UJ	<20 UJ	<20 UJ	<20 UJ	<20 UJ	4
4-Chlorophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Fluorene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
4-Nitroaniline	50	<50 U	<50 UJ	<50 U	<50 U	<50 U	10
4,6-Dinitro-2-methylphenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	15

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Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
N-Nitrosodiphenylamine (1)	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
4-Bromophenyl-phenylether	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Hexachlorobenzene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Pentachlorophenol	50	<50 U	<50 U	<50 U	<50 U	<50 U	10
Phenanthrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Di-n-butylphthalate	10	<50 UJ	<50 UJ	<50 UJ	<50 UJ	<50 UJ	3
Fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Butylbenzylphthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
3,3'-Dichlorobenzidine	20	<20 U	<20 U	<20 U	<20 U	<20 U	5
Benzo (a) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Chrysene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
bis (2-Ethylhexyl) phthalate	10	<10 UJ	14 J	14 J	<10 UJ	17 J	4
Di-n-octyl phthalate	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Benzo (b) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	5
Benzo (k) fluoranthene	10	<10 U	<10 U	<10 U	<10 U	<10 U	6
Benzo (a) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	3
Indeno (1,2,3-cd) pyrene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Dibenzo (a,h) anthracene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4
Benzo (g,h,i) perylene	10	<10 U	<10 U	<10 U	<10 U	<10 U	4

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Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Pesticide/PCB Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
alpha-BHC	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.01
beta-BHC	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.02
delta-BHC	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.01
gamma-BHC (Lindane)	0.050	<0.050 U	0.081 A	<0.10 U	<0.067 U	0.17 A	0.01
Heptachlor	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.01
Aldrin	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.01
Heptachlor epoxide	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.01
Endosulfan I	0.050	<0.050 U	<0.050 U	<0.10 U	<0.067 U	<0.050 U	0.02
Dieldrin	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.02
4,4'-DDE	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.02
Endrin	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.05
Endosulfan II	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.02
4,4'-DDD	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.02
Endosulfan sulfate	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.08
4,4'-DDT	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.08
Methoxychlor	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.06
Endrin ketone	0.10	<0.10 U	<0.10 U	<0.20 U	<0.13 U	<0.10 U	0.08
alpha-Chlordane	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.12
gamma-Chlordane	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.12
Toxaphene	1.0	<1.0 U	<1.0 U	<0.50 U	<0.33 U	<1.0 U	0.40
Arochlor-1016	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.38
Arochlor-1221	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.29
Arochlor-1232	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.40
Arochlor-1242	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.45
Arochlor-1248	0.50	<0.50 U	<0.50 U	<1.0 U	<0.67 U	<0.50 U	0.31
Arochlor-1254	1.0	<1.0 U	<1.0 U	<2.0 U	<1.3 U	<1.0 U	0.42
Arochlor-1260	1.0	<1.0 U	<1.0 U	<2.0 U	<1.3 U	<1.0 U	0.25

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Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Pesticide/PCB Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
alpha-BHC	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.01
beta-BHC	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.02
delta-BHC	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.01
gamma-BHC (Lindane)	0.050	<0.050 U	0.67 A	<0.050 U	<0.10 U	<0.10 U	0.01
Heptachlor	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.01
Aldrin	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.01
Heptachlor epoxide	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.01
Endosulfan I	0.050	<0.050 U	<0.050 U	<0.050 U	<0.10 U	<0.10 U	0.02
Dieldrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.02
4,4'-DDE	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.02
Endrin	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.05
Endosulfan II	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.02
4,4'-DDD	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.02
Endosulfan sulfate	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.08
4,4'-DDT	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.08
Methoxychlor	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.06
Endrin ketone	0.10	<0.10 U	<0.10 U	<0.10 U	<0.20 U	<0.20 U	0.08
alpha-Chlordane	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.12
gamma-Chlordane	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.12
Toxaphene	1.0	<1.0 U	<1.0 U	<1.0 U	<0.50 U	<0.50 U	0.40
Arochlor-1016	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.38
Arochlor-1221	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.29
Arochlor-1232	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.40
Arochlor-1242	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.45
Arochlor-1248	0.50	<0.50 U	<0.50 U	<0.50 U	<1.0 U	<1.0 U	0.31
Arochlor-1254	1.0	<1.0 U	<1.0 U	<1.0 U	<2.0 U	<2.0 U	0.42
Arochlor-1260	1.0	<1.0 U	<1.0 U	<1.0 U	<2.0 U	<2.0 U	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water
Sample Date:	4/25/90	4/24/90	4/26/90	4/26/90	4/26/90
Miscellaneous Compounds (Unfiltered) (Concentrations in mg/L)					IDL
Alkalinity, Bicarb. as CaCO3	151 A	145 A	188 A	193 A	186 A	5.0
Alkalinity, Carb. as CaCO3	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	156 R	465 R	276 R	268 R	154 R	5.0
Chloride	129 A	131 A	170 A	158 A	132 A	3.0
Orthophosphate as P	2.8 A	1.6 A	2.4 A	3.1 A	7.1 A	0.010
Sulfide, total	0.05 A	<0.05 UJ	<0.05 U	<0.05 U	0.29 A	0.05
Sulfate	41.0 A	80.0 A	305 A	255 A	27.0 A	5.0
Total Organic Carbon	36.7 A	29.1 A	62.8 A	71.0 A	43.6 A	2.0
Phosphorous, total	4.7 J	3.6 J	2.3 J	5.5 J	6.4 J	0.10
Total Suspended Solids	91.0 J	76.0 A	840 J	810 J	172 J	1.0
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:	4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Miscellaneous Compounds (Filtered) (Concentrations in mg/L)						IDL
Alkalinity, Bicarb. as CaCO3	149 A	137 A	139 A	168 A	185 A	5.0
Alkalinity, Carb. as CaCO3	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Chemical Oxygen Demand	160 R	253 J	491 J	188 R	142 R	5.0
Chloride	128 A	131 A	154 A	160 A	126 A	3.0
Orthophosphate as P	2 J	1.3 J	1.6 J	2.8 J	3.5 J	0.010
Sulfide, dissolved	<0.05 U	<0.05 U	0.09 A	<0.05 U	0.05 A	0.05
Sulfate	40.0 A	40.0 A	293 A	255 A	50.0 A	5.0
Total Organic Carbon	42.3 J	33.9 J	102 J	50.4 J	194 J	2.0
Phosphorous, total	3.4 J	3.1 J	2.3 J	3.3 J	4.3 J	0.10
Hexavalent Chromium	<0.010 U	<0.010 U	<0.010 U	<0.010 U	<0.010 U	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/25/90	4/26/90	4/26/90	4/26/90	
Metals (total) (Concentrations in ug/L)	CRDL						IDL
Aluminum	200	233 A	352 A	2070 A	2730 A	330 A	27.0
Antimony	60	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	37.0
Arsenic	10	2.0 A	<2.0 U	5.2 A	5.8 A	2.0 A	2.0
Barium	200	28.1 A	38.1 A	96.2 A	110 A	63.3 A	2.0
Beryllium	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	1.0
Cadmium	5	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U	5.0
Calcium	5000	39800 A	38100 A	40100 A	43400 A	45300 A	20.0
Chromium	10	<3.0 U	<3.0 U	16.9 A	19.8 A	3.5 A	3.0
Cobalt	50	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	7.0
Copper	25	23.9 A	21.8 A	1360 A	1610 A	38.2 A	6.0
Iron	100	573 A	552 A	5280 A	6200 A	682 A	3.0
Lead	5	4.4 J	3.8 J	62.4 J	86.1 J	4.9 J	2.0
Magnesium	5000	5040 A	4900 A	5730 A	6090 A	5440 A	37.0
Manganese	15	87.7 A	80.4 A	220 A	226 A	74.4 A	1.0
Mercury	0.2	<0.02 A	0.2 R	1.4 A	1.4 A	0.2 R	0.2
Nickel	40	<12.0 UJ	<12.0 UJ	25.3 R	35.7 R	<12.0 UJ	12.0
Potassium	5000	7040 A	7620 A	22100 A	21600 A	9470 A	900
Selenium	5	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	2.0
Silver	10	<3.0 U	3.7 J	60.5 J	93.8 J	<3.0 U	3.0
Sodium	5000	78600 A	80800 A	252000 A	230000 A	68400 A	38.0
Thallium	10	<4.0 U	<4.0 U	<4.0 U	<4.0 U	<4.0 U	4.0
Vanadium	50	7.3 A	<6.0 U	<6.0 U	<6.0 U	8.4 A	6.0
Zinc	20	51.0 R	43.1 R	522 A	649 A	77.9 R	8.0
Tin	--	<28.0 U	<28.0 U	102 A	107 A	<29.0 U	28.0

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Metals (dissolved) (Concentrations in ug/L)	CRDL						IDL
Aluminum	200	219 R	234 R	180 R	81.4 R	196 R	27.0
Antimony	60	<37.0 U	<37.0 U	<37.0 U	<37.0 U	<37.0 U	37.0
Arsenic	10	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	2.0
Barium	200	38.9 J	28.5 J	65.6 J	36.3 J	31.5 J	2.0
Beryllium	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	1.0
Cadmium	5	<5.0 U	<5.0 U	<5.0 A	<5.0 U	<5.0 U	5.0
Calcium	5000	38100 A	37300 A	26400 A	27900 A	42100 A	20.0
Chromium	10	<3.0 U	<3.0 U	297 J	26.4 J	<3.0 U	3.0
Cobalt	50	<7.0 U	<7.0 U	<7.0 U	<7.0 U	<7.0 U	7.0
Copper	25	16.3 A	14.3 A	84.9 A	69.3 A	13.6 A	6.0
Iron	100	253 J	286 J	1300 J	443 J	192 J	3.0
Lead	5	<2.0 U	<2.0 U	3.3 A	3.3 A	<2.0 U	2.0
Magnesium	5000	4990 A	4880 A	4680 A	4840 A	5180 A	37.0
Manganese	15	72.2 J	73.7 J	209 J	141 J	57.7 J	1.0
Mercury	0.2	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.2
Nickel	40	<12.0 UJ	<12.0 UJ	89.5 J	16.4 R	<12.0 UJ	12.0
Potassium	5000	8050 A	8410 A	20900 A	20900 A	8530 A	900
Selenium	5	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U	2.0
Silver	10	3.3 A	15.1 A	3.4 A	<3.0 U	<3.0 U	3.0
Sodium	5000	81400 A	79200 A	234000 A	230000 A	75100 A	38.0
Thallium	10	<4.0 U	<4.0 U	<4.0 U	<4.0 U	<4.0 U	4.0
Vanadium	50	<6.0 U	<6.0 U	<6.0 U	<6.0 U	<6.0 U	6.0
Zinc	20	59.3 A	73.5 A	71.0 A	73.0 A	55.1 A	8.0
Tin	--	<28.0 U	<28.0 U	166 J	<29.0 U	<29.0 U	28.0

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

A - Quantitative data
J - Qualitative data
R - Unusable data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-1	OW-1A	OW-4	OW-6	OW-7	OW-7*	OW-9	
Sample Date:	3/20/90	3/19/90	3/19/90	3/16/90	4/25/90	4/25/90	3/19/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic by gas furnace	<0.0050 U	0.0053 A	<0.0050 U	0.0081 A	0.026 A	0.021 A	0.0064 A	0.0050
Arsenic (III)	<0.005 A	<0.005 U	<0.005 U	<0.005 U	<0.0050 U	<0.0050 U	<0.005 U	0.0050
Arsenic (V)	<0.005 A	<0.005 U	<0.005 U	<0.005 U	<0.0050 U	<0.0050 U	<0.0050 U	0.0050
Lead by gas furnace	<0.295 UJ	<0.295 UJ	<0.295 UJ	<0.295 UJ	NA	NA	<0.295 UJ	0.0030
Lead (II)	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	0.60
Iron (II)	2.6 J	<0.050 UJ	3.5 J	0.088 J	0.30 A	0.33 A	18 J	0.050
Mercury by cold vapor	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.028 U	<0.028 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.9 U	<0.7 U	<0.7 U	<0.9 U	<0.07 U	<0.1 U	<0.4 U	----
Di-methylmercury	0.050 R	<0.005 R	0.088 R	0.067 R	0.090 R	0.068 R	0.037 R	----
Tin by ICPES	NA	<0.60 U	<0.60 U	<0.60 U	NA	NA	<0.60 U	0.60
Mono-methyl tin	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	----
Di-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----
Tri-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-10	OW-11	OW-12	OW-12	OW-13	OW-13*	OW-14	
Sample Date:	3/20/90	3/20/90	3/15/90	4/25/90	3/19/90	3/19/90	3/15/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic by gas furnace	<0.0050 U	0.035 A	0.28 A	NA	<0.0050 U	<0.0050 U	0.098 A	0.0050
Arsenic (III)	<0.005 U	<0.005 U	<0.005 U	NA	<0.005 U	<0.005 U	<0.005 U	0.0050
Arsenic (V)	<0.005 U	0.046 A	0.45 A	NA	<0.005 U	<0.005 U	<0.005 U	0.0050
Lead by gas furnace	<0.295 UJ	<0.295 UJ	<0.295 UJ	NA	<0.295 UJ	<0.295 UJ	0.33 J	0.0030
Lead (II)	<0.60 UJ	<0.60 UJ	<0.60 UJ	NA	<0.60 UJ	<0.60 UJ	<0.60 UJ	0.60
Iron (II)	0.34 J	8.4 J	18 J	NA	19.0 J	11 J	1.4 J	0.050
Mercury by cold vapor	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	<0.0002 U	<0.001 U	NA	<0.0002 U	<0.0002 U	<0.001 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.5 U	<0.8 U	NA	<0.09 U	<0.8 U	<0.4 U	<0.6 U	----
Dimethyl-mercury	NA	0.043 R	0.027 R	0.029 R	0.0074 R	0.62 R	0.0088 R	----
Tin by ICPES	NA	NA	<0.60 U	NA	<0.60 U	<0.60 U	<0.60 U	0.60
Mono-methyl tin	<0.025 U	<0.025 UJ+	NA	<0.025 U	<0.025 U	<0.025 U	<0.025 U	----
Di-methyl tin	<0.050 UJ	<0.050 UJ+	NA	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----
Tri-methyl tin	<0.050 UJ	<0.050 UJ+	NA	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----

+ - Indicates analysis from sample collected on 4/25/90
* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-15	OW-16	OW-17	OW-18	OW-18	OW-18A	OW-19	
Sample Date:	3/15/90	3/20/90	3/15/90	3/15/90	4/25/90	3/15/90	3/16/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic by gas furnace	<0.0050 U	1.7 A	0.0084 A	<0.0050 U	NA	0.012 A	<0.0050 U	0.0050
Arsenic (III)	<0.005 U	0.53 A	<0.005 U	<0.005 U	NA	<0.005 U	<0.0050 U	0.0050
Arsenic (V)	<0.005 U	0.62 A	0.048 A	<0.005 U	NA	<0.005 U	<0.0050 U	0.0050
Lead by gas furnace	<0.295 UJ	<0.295 UJ	<0.295 UJ	<0.295 UJ	NA	<0.295 UJ	<0.295 UJ	0.0030
Lead (II)	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	NA	<0.60 UJ	<0.60 UJ	0.60
Iron (II)	0.27 J	5.3 J	1.8 J	0.83 J	NA	0.8 J	<0.050 UJ	0.050
Mercury by cold vapor	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	0.0057 A	<0.001 U	<0.0002 U	NA	<0.001 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.9 U	<0.5 U	<0.6 U	<0.5 U	<0.05 U	<0.4 U	<0.4 U	----
Dimethyl-mercury	0.0070 R	0.0085 R	0.043 R	0.068 R	0.021 R	0.0075 R	0.35 R	----
Tin by ICPES	<0.60 U		<0.60 U	<0.60 U	NA	<0.60 U	<0.60 U	0.60
Mono-methyl tin	<0.025 U	<0.025 U	<0.025 U	NA	<0.025 U	<0.025 U	<0.025 U	----
Di-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	NA	<0.050 UJ	<0.050 UJ	<0.050 UJ	----
Tri-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	NA	<0.050 UJ	<0.050 UJ	<0.050 UJ	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-19	OW-19A	OW-20	OW-20	OW-21	OW-21*	
Sample Date:	4/25/90	3/16/90	3/16/90	4/25/90	3/21/90	3/21/90	IDL
Analyte (Concentrations in mg/L)							
Arsenic by gas furnace	NA	0.0089 A	<0.0050 U	NA	<0.0050 U	<0.0050 U	0.0050
Arsenic (III)	NA	<0.005 U	<0.005 U	NA	<0.005 U	<0.005 U	0.0050
Arsenic (V)	NA	<0.005 U	<0.005 U	NA	<0.005 U	<0.005 U	0.0050
Lead by gas furnace	NA	<0.295 UJ	0.30 J	NA	<0.295 UJ	<0.295 UJ	0.0030
Lead (II)	NA	<0.60 UJ	<0.60 UJ	NA	<0.60 UJ	<0.60 UJ	0.60
Iron (II)	NA	2.3 J	2.2 J	NA	0.56 J	<0.050 UJ	0.050
Mercury by cold vapor	NA	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	NA	<0.0002 U	<0.0002 U	NA	0.0003 R	<0.0002 U	0.0002
Mercury (o)	NA	<0.0002 U	<0.0002 U	NA	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.1 U	<0.9 U	<0.6 U	<0.1 U	<0.6 U	<0.8 U	----
Dimethyl-mercury	<0.005 R	0.0069 R	0.10 R	0.053 R	0.096 R	<0.005 R	----
Tin by ICPES	NA	<0.60 U	<0.60 U	NA	NA	NA	0.60
Mono-methyl tin	<0.025 U	<0.025 UJ	NA	<0.025 U	<0.025 U	<0.31 U	----
Di-methyl tin	<0.025 UJ	<0.050 UJ	NA	<0.050 UJ	<0.050 UJ	<0.63 UJ	----
Tri-methyl tin	<0.025 UJ	<0.050 UJ	NA	<0.050 UJ	<0.050 UJ	<0.63 UJ	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Ground-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	OW-22	OW-28	
Sample Date:	3/21/90	3/21/90	IDL
Analyte (Concentrations in mg/L)			
Arsenic by gas furnace	<0.0050 U	<0.0050 U	0.0050
Arsenic (III)	<0.005 U	<0.005 U	0.0050
Arsenic (V)	<0.005 U	<0.005 U	0.0050
Lead by gas furnace	<0.295 UJ	<0.295 UJ	0.0030
Lead (II)	<0.60 UJ	<0.60 UJ	0.60
Iron (II)	12 J	4.2 J	0.050
Mercury by cold vapor	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	0.0002 A	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.7 U	<0.7 U	----
Dimethyl-mercury	0.042 R	1.1 R	----
Tin by ICPES	NA	NA	0.60
Mono-methyl tin	<0.13 U	<0.025 U	----
Di-methyl tin	<0.25 UJ	<0.050 UJ	----
Tri-methyl tin	<0.25 UJ	<0.050 UJ	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts...

Well Designation: / Sample Date:	SED-1 8/3/90	SED-2 8/3/90	SED-3 8/3/90	SED-4 8/2/90	SED-5 8/2/90	SED-6 8/2/90	SED-7 8/1/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic (III)	<0.080 R	1.6 J	0.095 J	<0.097 R	0.16 J	1.7 J	15 J	0.005
Arsenic (V)	1.6 J	46 J	2.8 J	2.3 J	8.6 J	5.3 J	520 J	0.005
Mercury by cold vapor	<0.045 U	<0.045 U	<0.045 U	<0.045 U	0.094 A	0.35 A	8.2 A	0.0002
Mercury (II)	<0.0018 U	<0.0018 U	<0.0018 U	<0.038 U	0.044 A	0.046 A	2.9 A	0.0018
Mercury (o)	<0.045 U	<0.045 U	<0.045 U	<0.045 U	<0.045 U	<0.045 U	<0.045 U	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.05 R	<0.05 U	<0.01 R	<0.05 R	<0.05 R	0.05
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.05 UJ	<0.05 UJ	<0.05 UJ	<0.5 UJ	<0.5 UJ	<0.5 UJ	<0.05 UJ	0.05
Dimethyl tin	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	1.0
Trimethyl tin	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	1.0
Free Iron oxide	420 J	1400 J	2700 J	460 J	440 J	20000 J	2800 J	0.040
Manganese oxide	19 J	5 J	<1.0 U	45 J	41 J	170 J	36 J	0.010
Lead (II)	<16 U	<18 U	<16 U	<15 UJ	<14 UJ	<15 UJ	70 A	0.61

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts. ..

Well Designation: / Sample Date: / Analyte (Concentrations in mg/L)	SED-8 8/3/90	SED-8* 8/3/90	SED-9 8/1/90	SED-10 8/1/90	SED-11 7/31/90	SED-12 8/2/90	SED-13 7/31/90	IDL
Arsenic (III)	<0.097 R	<0.092 R	11 J	0.48 J	10 J	<0.099 R	6.5 J	0.005
Arsenic (V)	0.75 J	0.73 J	110 J	23 J	120 J	3.9 J	100 J	0.005
Mercury by cold vapor	<0.045 U	<0.045 U	0.22 J	0.097 J	0.23 A	0.078 J	0.24 A	0.0002
Mercury (II)	<0.0018 U	<0.0018 U	0.12 A	0.065 A	0.032 A	0.078 A	0.16 A	0.0018
Mercury (o)	<0.045 U	<0.045 U	<0.045 U	<0.045 U	<0.045 A	<0.045 U	<0.045 U	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.13 R	<0.05 R	<0.05 R	<0.05 R	<0.05 R	0.05
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.05 UJ	<0.05 UJ	<0.05 UJ	<0.05 UJ	<0.05 J	<0.5 UJ	<0.05 UJ	0.05
Dimethyl tin	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 J	<1.0 UJ	<1.0 UJ	1.0
Trimethyl tin	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 A	<1.0 U	<1.0 U	1.0
Free Iron oxide	200 J	200 J	7900 J	950 J	14000 J	500 J	12000 J	0.040
Manganese oxide	6 J	3 J	93 J	83 J	140 J	10 J	24 J	0.010
Lead (II)	<18 U	<19 U	<16 U	<10 U	<15 A	<18 UJ	<15 U	0.61

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
- A - Quantitative Data
- J - Qualitative Data
- R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	SED-14	SED-15	SED-16	SED-17	
Sample Date:	7/31/90	8/1/90	8/2/90	8/2/90	IDL
Analyte (Concentrations in mg/L)					
Arsenic (III)	0.63 J	1.5 J	5.0 J	1.8 J	0.005
Arsenic (V)	17 J	46 J	110 J	42 J	0.005
Mercury by cold vapor	0.066 J	0.33 A	0.12 J	0.050 J	0.0002
Mercury (II)	0.050 A	0.22 A	0.15 A	0.047 A	0.0018
Mercury (o)	<0.045 U	<0.045 U	<0.045 U	<0.045 U	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.4 R	<0.3 R	0.05
Di-methylmercury	NA	NA	NA	NA	
Methyl tin	<0.05 UJ	<0.05 UJ	<0.5 UJ	<0.5 UJ	0.05
Dimethyl tin	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ	1.0
Trimethyl tin	<1.0 U	<1.0 U	<1.0 U	<1.0 A	1.0
Free Iron oxide	1000 J	6400 J	19000 J	4000 J	0.040
Manganese oxide	71 J	1200 J	61 J	47 J	0.010
Lead (II)	<15 U	<17 U	<17 UJ	<14 UJ	0.61
Iron (II)					0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation: / Sample Date:	SW-1 8/3/90	SW-2 8/3/90	SW-4 8/2/90	SW-5 8/2/90	SW-6 8/2/90	SW-7 8/1/90	SW-8 8/3/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic (III)	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	0.005
Arsenic (V)	<0.005 U	0.0075 J	0.0052 A	<0.005 U	<0.005 U	<0.005 U	<0.005 U	0.005
Mercury by cold vapor	<0.0002 U	0.0004 J	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	0.003
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	0.025
Dimethyl tin	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.05
Trimethyl tin	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.05
Lead (II)	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	0.61
Iron (II)	0.39 A	0.83 A	0.22 A	0.089 J	2.0 A	0.22 A	0.83 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts...

Well Designation: / Sample Date: / Analyte (Concentrations in mg/L)	SW-8* 8/3/90	SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	IDL
Arsenic (III)	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	0.005
Arsenic (V)	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	0.005
Mercury by cold vapor	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	0.003
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	0.025
Dimethyl tin	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.05
Trimethyl tin	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	<0.05 U	0.05
Lead (II)	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	<0.61 U	0.61
Iron (II)	0.66 A	0.54 A	0.54 A	0.44 A	0.097 J	0.93 A	1.2 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts. ..

Well Designation:	SW-15	SW-17	
Sample Date:	8/1/90	8/2/90	IDL
Analyte (Concentrations in mg/L)			
Arsenic (III)	<0.005 U	<0.005 U	0.005
Arsenic (V)	<0.005 U	<0.005 U	0.005
Mercury by cold vapor	<0.0002 U	<0.0002 U	0.0002
Mercury (II)	<0.0002 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	0.003
Di-methylmercury	NA	NA	
Methyl tin	<0.025 U	<0.025 U	0.025
Dimethyl tin	<0.05 U	<0.05 U	0.05
Trimethyl tin	<0.05 U	<0.05 U	0.05
Lead (II)	<0.61 U	<0.61 U	0.050
Iron (II)	0.32 A	0.19 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 3. Summary of Sewer Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation: / Sample Date:	SR-1 4/25/90	SR-2 4/24/90	SR-3 4/26/90	SR-3* 4/26/90	SR-4 4/26/90	IDL
Analyte (Concentrations in mg/L)						
Arsenic by gas furnace	<0.0040 U	<0.0040 U	<0.0040 U	<0.0040 U	<0.0040 U	0.0050
Arsenic (III)	<0.0050 U	<0.0050 U	<0.0050 U	<0.0050 U	<0.0050 U	0.0050
Arsenic (V)	<0.0050 U	<0.0050 U	<0.0050 U	<0.0050 U	<0.0050 U	0.0050
Lead (II)	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	<0.60 UJ	0.0030
Iron (II)	0.53 J	0.85 J	10 J	7.0 J	0.22 J	0.60
Mercury by cold vapor	<0.0245 U	<0.0002 U	<0.0245 U	<0.0002 U	<0.0245 U	0.500
Mercury (II)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Mercury (o)	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	0.0002
Ethyl-mercury	<0.07 U	<0.05 U	<0.02 U	<0.09 U	<0.02 U	0.0002
Dimethyl-mercury	<0.12 R	<0.005 R	<0.005 R	<0.12 R	<0.005 R	----
Mono-methyl tin	<0.025 U	<0.025 U	<0.025 U	<0.025 U	<0.025 U	0.60
Di-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----
Tri-methyl tin	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	<0.050 UJ	----

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

APPENDIX D

Analytical Data Validation Documentation

Section 2. Surface-Water and Stream-Sediment Data Validation Documentation

Part 2. Data Validation of Radian Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON NEW YORK 11743 516 673-7200 FAX # 516 673-7216

October 23, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the surface-water and stream-sediment samples collected at the Industri-Plex Site in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP) and analyzed for metal speciation. Samples were collected from fifteen surface water locations and seventeen stream sediment locations and analyzed for the valence states of arsenic, mercury, lead, tin, organo-mercury and organo-tin by Radian Corporation (Radian) in Austin, Texas. Dimethyl mercury was not analyzed because an analytical method that produces usable results has not yet been developed. Ferrous iron (Fe^{+2}) was also analyzed for all surface-water locations. Iron oxide and manganese oxide were also analyzed for all stream-sediment locations.

Analytical methods have not been established for many of these analyses, necessitating development of methods by Radian before analyses could be performed. A discussion of these methods is included in Attachment 1.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 23, 1989) and guidelines in the U.S. Environmental Protection Agency (USEPA) Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed whenever appropriate. When differing guidelines were encountered, generally the stricter guideline was followed. However, as these analyses were not performed under Contract Laboratory Program (CLP) procedures, review of the standard Quality Assurance/Quality Control (QA/QC) guidelines was not always possible.

The results of the validation of the data are summarized in Table 1. All of the surface-water data are summarized in Table 2 and the stream sediment data are summarized in Table 3. Details of the results of the validation effort are summarized below.

Data Completeness

All requested analyses were performed by Radian.

Holding Times

There are no established holding times for these analyses.

Calibration Verification

Arsenic (III) was outside the 90-110 percent prescribed range for both the initial and continuing calibration verification for samples collected on July 31, 1990 (SED-7, SED-9, SED-10, SED-11, SED-13, SED-14, SED-15, SW-7, SW-9, SW-10, SW-11, SW-13, SW-14, SW-15), August 2, 1990 (SED-4, SED-5, SED-6, SED-12, SED-16, SED-17, SW-4, SW-5, SW-6, SW-12, SW-17) and August 3, 1990 (SED-1, SED-2, SED-3, SED-8, SED-8 replicate, SW-1, SW-2, SW-8, SW-8 replicate). Arsenic (V) was detected in the initial calibration for these samples. All positive sample results for these for these analyses are considered qualitative.

Lead (II) was outside the prescribed range in the continuing calibration for samples collected on August 2, 1990 (SED-4, SED-5, SED-6, SED-12, SED-16, SED-17, SW-4, SW-5, SW-6, SW-12, SW-17) and August 3, 1990 (SED-1, SED-2, SED-3, SED-8, SED-8 replicate, SW-1, SW-2, SW-8, SW-8 replicate). All positive results for these days are considered qualitative.

Laboratory and Field Blank Analyses

Method blanks were run with each group of samples. One field blank was collected for each matrix. Iron oxide was detected in the three method blanks for sediment analysis. All of the sediment sample results are greater than the action level, therefore sample results are not affected. No other analytes were detected in the blanks.

ICP Interference Check Sample Results

All samples analyzed by ICP (iron oxide and manganese oxide) met this criteria.

Matrix Spike Recovery

Matrix spike and matrix spike duplicate samples were run for all analytes. Recovery ranges were within laboratory specified ranges (see laboratory reports) except in the following cases.

Mercury matrix spike and matrix spike duplicate recoveries in sample SW-1 were 126.7 and 130 percent, respectively. This does not affect the data because all mercury values in surface water are non-detect.

Ethyl mercury had matrix spike and matrix spike duplicate recoveries of 11 and 5 percent, respectively, in surface water. Because the spike recovery range is less than 30 percent, and the sample results are non-detected, all samples are considered unusable.

In the stream sediment samples, ethyl mercury had recoveries of less than 1 percent for the matrix spike and matrix spike duplicate. All sample results are non-detect and are therefore considered unusable.

Arsenic (III) recoveries in sediment samples were 2.3 and 4.4 percent. Arsenic (V) recoveries were -1.8 and -10.9 percent. All positive sample results above the IDL are considered qualitative, and all non-detects are considered unusable.

Analytical spikes for organo-tin were performed on samples SED-9, SED-1, SW-11, SW-5 (MS and MSD). All surface-water samples met the criteria of 75-125 percent recovery. However, SED-1 was below the range for methyl tin and dimethyl tin, while SED-9 was within the range. The non-detect values for dimethyl tin and methyl tin are considered qualitative.

Laboratory and Field Duplicates

Laboratory duplicates were performed by Radian and had relative percent differences (RPD) less than 20% in accordance with USEPA Region I guidance with the exceptions of manganese oxide in SED-7 (92.5 percent) and iron oxide in SED-14 (181.7 percent). All positive results for these analytes in sediment samples are considered qualitative.

Laboratory Control Samples

All samples met this criteria.

Should you have any questions, or comments, please do not hesitate to call.

Very truly yours,

Linda Wilson

Linda Wilson
Project Scientist

Martha M. Smith

Martha M. Smith
Project Hydrogeologist

William Sarni /mm

William Sarni
Vice President

Attachments

cc: J. Yeary, Roux Associates, Inc.
J. Dragun, Dragun Corporation
S. Clough, ES&E

Table 1. Summary of Data Validation Recommendations, Surface-Water and Stream Sediment Samples, Ground-Water/Surface-Water Investigation Plan (GSIP), Industri-Plex Site, Woburn, Massachusetts.

Inorganic Analytical Data for Surface Water

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Matrix spike recoveries	Ethyl mercury in all samples
Quantitative (A)	No problems	All remaining analytes

Inorganic Analytical Data for Stream Sediments

Data Quality	QA/QC Problems	Affected Samples
Unusable (R)	Matrix spike recoveries	Ethyl mercury in all samples
		Arsenic (III) in samples SED-1, SED-8, SED-8 replicate, SED-4, SED-12
Qualitative (J)	Calibration verification Matrix spike recoveries	Arsenic (V) in all samples
		Arsenic (III) in samples SED-2, SED-3, SED-9, SED-10, SED-11, SED-13, SED-14, SED-15, SED-7, SED-5, SED-6, SED-16, SED-17
	Duplicate recoveries	Manganese oxide in all samples except SED-3 Iron oxide in all samples
	Matrix spike recoveries	Methyl tin in all samples Dimethyl tin in all samples
Quantitative (A)	No problems	All remaining analytes

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts:

Well Designation: / Sample Date:	SED-1 8/3/90	SED-2 8/3/90	SED-3 8/3/90	SED-4 8/2/90	SED-5 8/2/90	SED-6 8/2/90	SED-7 8/1/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic (III)	<0.080 R	1.6 J	0.095 J	<0.097 R	0.16 J	1.7 J	15 J	0.005
Arsenic (V)	1.6 J	46 J	2.8 J	2.3 J	8.6 J	5.3 J	520 J	0.005
Mercury by cold vapor	<0.045 A	<0.045 A	<0.045 A	<0.045 A	0.094 A	0.35 A	8.2 A	0.0002
Mercury (II)	<0.0018 A	<0.0018 A	<0.0018 A	<0.038 A	0.044 A	0.046 A	2.9 A	0.0018
Mercury (o)	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.05 R	<0.05 A	<0.01 R	<0.05 R	<0.05 R	0.05
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.05 J	<0.05 J	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.05 J	0.05
Dimethyl tin	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	1.0
Trimethyl tin	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	1.0
Free Iron oxide	420 J	1400 J	2700 J	460 J	440 J	20000 J	2800 J	0.040
Manganese oxide	19 J	5 J	<1.0 A	45 J	41 J	170 J	36 J	0.010
Lead (II)	<16 A	<18 A	<16 A	<15 J	<14 J	<15 J	70 A	0.61

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation: / Sample Date:	SED-8 8/3/90	SED-8* 8/3/90	SED-9 8/1/90	SED-10 8/1/90	SED-11 7/31/90	SED-12 8/2/90	SED-13 7/31/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic (III)	<0.097 R	<0.092 R	11 J	0.48 J	10 J	<0.099 R	6.5 J	0.005
Arsenic (V)	0.75 J	0.73 J	110 J	23 J	120 J	3.9 J	100 J	0.005
Mercury by cold vapor	<0.045 A	<0.045 A	0.22 J	0.097 J	0.23 A	0.078 J	0.24 A	0.00
Mercury (II)	<0.0018 A	<0.0018 A	0.12 A	0.065 A	0.032 A	0.078 A	0.16 A	0.00
Mercury (o)	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	<0.045 A	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.13 R	<0.05 R	<0.05 R	<0.05 R	<0.05 R	0.05
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.05 J	<0.5 J	<0.05 J	0.05
Dimethyl tin	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	<1.0 J	1.0
Trimethyl tin	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	<1.0 A	1
Free Iron oxide	200 J	200 J	7900 J	950 J	14000 J	500 J	12000 J	0.0
Manganese oxide	6 J	3 J	93 J	83 J	140 J	10 J	24 J	0.010
Lead (II)	<18 A	<19 A	<16 A	<10 A	<15 A	<18 J	<15 A	0.61

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	SED-14	SED-15	SED-16	SED-17	IDL
Sample Date:	7/31/90	8/1/90	8/2/90	8/2/90	
Analyte (Concentrations in mg/L)					
Arsenic (III)	0.63 J	1.5 J	5.0 J	1.8 J	0.005
Arsenic (V)	17 J	46 J	110 J	42 J	0.005
Mercury by cold vapor	0.066 J	0.33 A	0.12 J	0.050 J	0.0002
Mercury (II)	0.050 A	0.22 A	0.15 A	0.047 A	0.0018
Mercury (o)	<0.045 A	<0.045 A	<0.045 A	<0.045 A	0.045
Ethyl-mercury	<0.05 R	<0.05 R	<0.4 R	<0.3 R	0.05
Di-methylmercury	NA	NA	NA	NA	
Methyl tin	<0.05 J	<0.05 J	<0.5 J	<0.5 J	0.05
Dimethyl tin	<1.0 J	<1.0 J	<1.0 J	<1.0 J	1.0
Trimethyl tin	<1.0 A	<1.0 A	<1.0 A	<1.0 A	1.0
Free Iron oxide	1000 J	6400 J	19000 J	4000 J	0.040
Manganese oxide	71 J	1200 J	61 J	47 J	0.010
Lead (II)	<15 A	<17 A	<17 J	<14 J	0.61
Iron (II)					0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation: / Sample Date:	SW-1 8/3/90	SW-2 8/3/90	SW-4 8/2/90	SW-5 8/2/90	SW-6 8/2/90	SW-7 8/1/90	SW-8 8/3/90	IDL
Analyte (Concentrations in mg/L)								
Arsenic (III)	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	0.005
Arsenic (V)	<0.005 A	0.0075 J	0.0052 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	0.005
Mercury by cold vapor	<0.0002 A	0.0004 J	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.0[illegible]
Mercury (II)	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.000[illegible]
Mercury (o)	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	0.0[illegible]
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	0.025
Dimethyl tin	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	0.05
Trimethyl tin	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	0.
Lead (II)	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	0.[illegible]
Iron (II)	0.39 A	0.83 A	0.22 A	0.089 J	2.0 A	0.22 A	0.83 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts:

Well Designation: / Sample Date: / Analyte (Concentrations in mg/L)	SW-8* 8/3/90	SW-9 8/1/90	SW-10 8/1/90	SW-11 7/31/90	SW-12 8/2/90	SW-13 7/31/90	SW-14 7/31/90	IDL
Arsenic (III)	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	0.005
Arsenic (V)	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	<0.005 A	0.005
Mercury by cold vapor	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.0002
Mercury (II)	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.0002
Mercury (o)	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	<0.0002 A	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	<0.003 R	0.003
Di-methylmercury	NA	NA	NA	NA	NA	NA	NA	
Methyl tin	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	<0.025 A	0.025
Dimethyl tin	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	0.05
Trimethyl tin	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	<0.05 A	0.05
Lead (II)	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	<0.61 A	0.61
Iron (II)	0.66 A	0.54 A	0.54 A	0.44 A	0.097 J	0.93 A	1.2 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

Table 2. Summary of Stream Sediment and Surface-Water Metal Speciation Performed by Radian Corporation, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Well Designation:	SW-15	SW-17	IDL
Sample Date:	8/1/90	8/2/90	
Analyte (Concentrations in mg/L)			
Arsenic (III)	<0.005 A	<0.005 A	0.005
Arsenic (V)	<0.005 A	<0.005 A	0.005
Mercury by cold vapor	<0.0002 A	<0.0002 A	0.000
Mercury (II)	<0.0002 A	<0.0002 A	0.000
Mercury (o)	<0.0002 A	<0.0002 A	0.0002
Ethyl-mercury	<0.003 R	<0.003 R	0.00
Di-methylmercury	NA	NA	
Methyl tin	<0.025 A	<0.025 A	0.025
Dimethyl tin	<0.05 A	<0.05 A	0.05
Trimethyl tin	<0.05 A	<0.05 A	0.0
			0.6
Lead (II)	<0.61 A	<0.61 A	0.050
Iron (II)	0.32 A	0.19 A	0.050

* - Indicates replicate sample.
NA - Not Analyzed
IDL - Instrument Detection Limit
Q - Outside control limits.

Validation Codes:
A - Quantitative Data
J - Qualitative Data
R - Unusable Data

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July 16, 1990

Bill Sarni
Roux Associates
775 Park Avenue
Suite 255
Huntington, New York 11743

Dear Mr Sarni:

This report is a summary of the metal speciation work performed for Roux Associates on soil and groundwater collected at the Industri-Plex Site, Woburn Mass. by Radian Corporation. Enclosed with this report are tabulations of all the analytical data generated during this speciation work and the accompanying QC data.

I have listed below the main features of the speciation work that we performed.

1 Iron [Fe(II)]

The determination of Fe(II) was performed according to the procedures provided in the 17th edition of the "Standard Methods for the Examination of Water and Wastewater". This is method 3500-Fe (D)which involves color development with phenanthrolene. A detection limit of 50ppb was reported for this work.

2 Lead [Pb(II)]

The method for Pb(II) was taken from the "Dionex Ion Chromatography Cookbook" (Pg II-21, 1987 edition). The analysis uses an oxalate buffer eluent on a CS5 column to achieve the separation of the transition metals, and a postcolumn reactor and UV/VIS spectrometer for detection. There are no published detection limits, however as Cu(II) was found to be an interference, these limits were found to be 0.6ppm for the samples analyzed. Matrix spike

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recoveries for the method were low or zero, which tend to confirm the fact that no Pb(II) was found in the samples. This is consistent with the chemistry of Pb(II) which forms highly insoluble oxides and hydroxides at the pH of the water samples, the solids, and their extracts (the solids were extracted in the eluent used for the IC analysis which has a pH of 4.8). See for example Willard L.Lindsay "Chemical Equilibrium in Soils" John Wiley (1979) chapter 20.

3 Arsenic [As(III) and As(V)]

Arsenic is readily analyzed by atomic absorption using the hydride generation technique. Refer to Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg70. (The As in solution is hydrogenated to form AsH3, a gas, which is collected in a cold trap and then flashed into the flame of an atomic absorption spectrometer.) The procedure for As(III) and As(V) speciation is based upon the pH dependence of the hydrogenation reaction. As can be seen in Figure 1, As(III) may be quantitatively hydrogenated up to a pH of about 6, while As(V) is completely unreactive above pH 5. Consequently, hydrogenation in the range pH 5 to 6 yields only As(III), while hydrogenation below pH 1, yields both As(III) and As(V). The value of As(V) is then found by the difference between the total (low pH) As determination and the As(III) value. The method has a detection limit of about 5ppb, but this is a function of the sample size reacted as the total arsenic in the aliquot is retrieved and the detector response is due to this arsenic. Hence a larger aliquot will yield a lower detection limit, which is ultimately constrained only by the levels in the blank. In these studies, a 5ml aliquot was used, which corrresponded to the quoted detection limit. The As(III) standards were made up from the best available grade of As2O3 available (NIST 83b). There appeared to be no degradation over the time period of the analyses.

4 Organotin [Sn, CH3SnX3, (CH3)2SnX2, (CH3)3SnX]

As with the arsenic, tin also undergoes hydrogenation reactions to from volatile hydrides. The hydrogenation does not displace the organic

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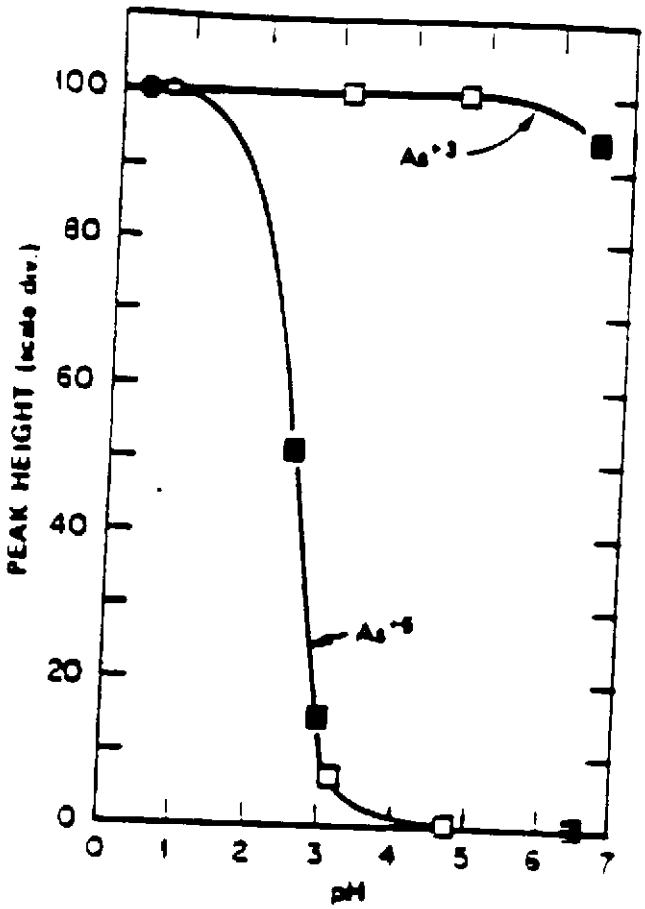
FIGURE 1



AsH_3: Peak Height vs Buffer pH

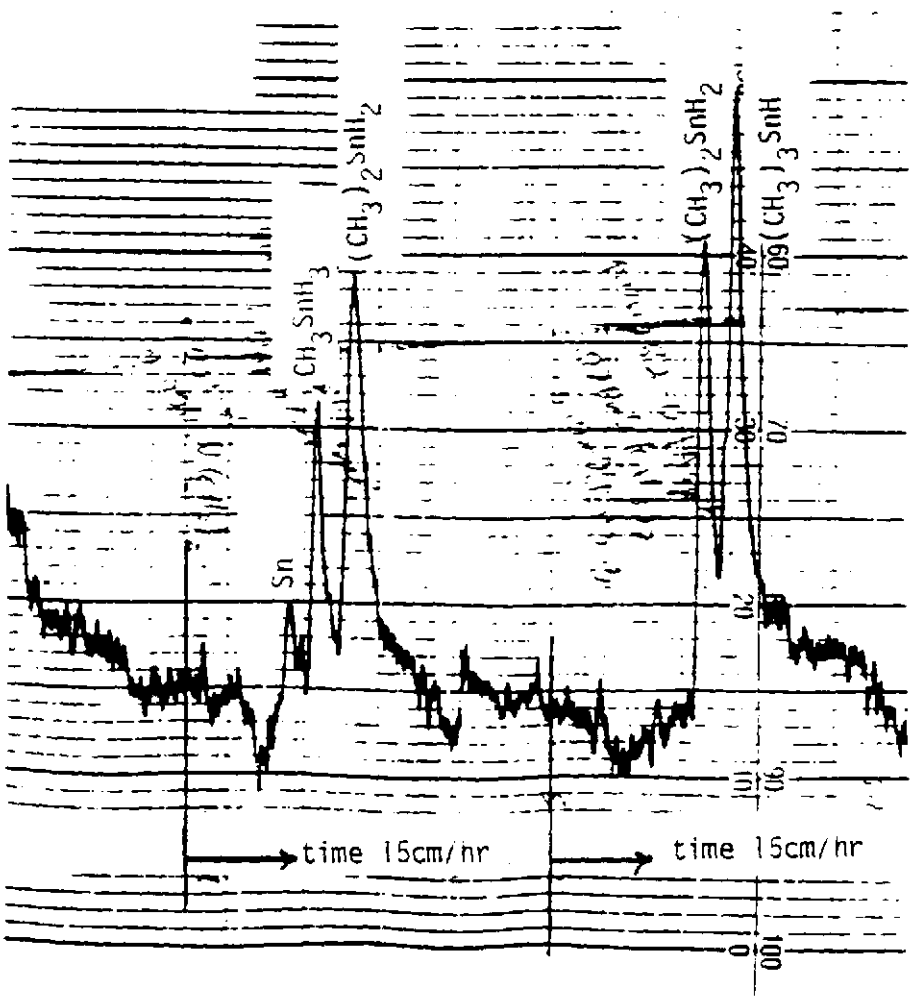
Peak height vs. pH for the reduction of As^{3+}

substituents on the tin, but will replace the "X", which is typically in the form of Cl. The method used for the Radian work is described by Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg334 and T.R. Crompton "Gas Chromatography of Organometallic Compounds", Plenum, London. pg346. The optimum pH is around 6 and all reactions were carried out in an appropriate phosphate buffer. The compounds SnH_4, CH_3SnH_3, $(CH_3)_2SnH_2$ and $(CH_3)_3SnH$ were actually detected in the AA. The four analytes were sparged from the reactor, and cryogenically focused onto a short (10") glass column packed with silanized 80 mesh glass beads, that could be heated. The heating rate was controlled to give the best peak separation. It was not possible to resolve all four peaks in one run, probably due to the low carrier gas pressure that the hydrogenation apparatus could withstand. The standards were run as SnH_4, CH_3SnH_3, and $(CH_3)_2SnH_2$ in one injection and then $(CH_3)_2SnH_2$ and $(CH_3)_3SnH$ as a second injection. A run of standards in the 50 - 100ppb Sn range is shown in Figure 2. The peak broadening may be controlled by redesigning the apparatus to withstand the high back pressures associated with the packed column. Water build up on the column also gave rise to problems and some further study of driers would improve reliability. Water build up was indicated by an increase in back pressure in the reactor, which resulted in poor peak separation. At the first appearance of a back pressure increase, a dry column was substituted. It was decided that, after preliminary scans, the absorption would not be calibrated, but that any individual sample that showed tin would be quantitated by the method of standard additions. Standards were made up from compounds purchased from Alpha Chemicals. The detection limit for Sn is 25ppb, and 50ppb for the other organotin analytes.

5a Mercury [Hg(0) and Hg(II)]

The total mercury in each sample was determined by method 7470 as described in SW 846 (3rd ed 1986). In addition the inorganic forms of mercury in the (0) and (II) oxidation states were speciated. Hg(0) is the form in which the element is analyzed by the cold vapor method, and consequently a simple sparging of the sample into the cold vapor apparatus as described in method

FIGURE 2



GC TRACE FOR Sn, CH_3SnH_3, $(CH_3)_2$ SnH_2, $(CH_3)_3SnH$

7470 should yield a value for that analyte only. Solid samples were sonicated in a deionized water slurry prior to sparging Hg(0). The QC for the Hg(0) was based upon gaseous samples from an equilibrated mercury chamber. Vapor phase QC samples were sparged from the normal mercury bottles, and as there was no step to release the vapor from the liquid phase, they tended to give a much sharper and higher peak than the normal standards. As the calibration was done on peak height basis, Hg(0) spikes were generally found to have recoveries greater than 100%. The inorganic Hg(II) may be selectively reduced by stannous chloride in the presence of strong base, with organic forms being unaffected (see Bernhard Welz "Atomic Absorption Spectroscopy" 2nd ed 1985 pg303). Samples were prepared by adding sodium hydroxide to an aliquot to make a 15% solution. Solid samples were sonicated in a 15% sodium hydroxide solution prior to analysis. The samples were reduced by stannous chloride and mercury detected in the normal way. Detections limits are the same as those for total mercury determinations.

5b Organomercury [(CH3)2Hg and C2H5HgCl]

An approach involving extraction into an organic solvent and subsequent separation by gas chromatography was taken. The electrophylic nature of the metal center makes electron capture an ideal detection method. Standards of dimethylmercury and ethylmercury chloride were obtained from Alpha Chemicals. A review of the literature (see for example T.R. Crompton "Gas Chromatography of Organometallic Compounds" Plenum, London pg29) indicated that the mercury compounds could be extracted from a sample acidified with HCl into toluene. This is not an acceptable method for the dimethyl- as its boiling point (around 95C) is similar to that of toluene and hence extracts could not be concentrated by evaporation. Hexane was used due to its lower boiling point. 50ml aliquotes of the samples were acidified with HCl and shaken or blended with about 50ml of hexane. The hexane extracts were then dried and reduced in volume to 5ml using a Kadurna Danish or to 1ml by allowing the hexane to evaporate from a tall test tube in a 40C oven. Blanks, blanks spikes, matrix spikes and MSD's were prepared in the same way. Discussions with vendors did

not yield much information on what columns may be best to use, and so a Porapak Q (6' glass colummn packed with 80/100 mesh Porapak Q - a standard packed column from Supelco) was initially used. The dimethylmercury was found to elute in 8.4 minutes (see Figure 3a) The trace of a typical sample is in Figure 3b and shows a peak at 8.4 minutes. The total analysis had shown no mercury to be present, hence the origin of the peak was not clear. Extraction blanks showed no response at 8.4 minutes, indicating that something in the sample was responsible for the signal. Spike recoveries from both the blank and the matrix spikes were poor adding further doubts to the identity. Analysis of the dimethylmercury standard by method 7470 showed no recovery, however photolysis of the standard prior to analysis by method 7470 showed recoveries (these were variable, probably due to the lack of temperature control on the photolysis reactor). Photolysis of selected samples showed no mercury in subsequent analysis. The data reported for the dimethylmercury is the concentration corresponding to the response observed at the 8.4 minute retention time. These should probably represent an upper value of the concentration in the sample extracts.

No peak corresponding to the ethylmercury chloride was observed on the Porapak Q column, however as there were reports in the literature of fragmentation of organomercury halides on GC columns. It was considered a possibility that the aromatic solvent played a role in stabilizing the analyte through the formation of an adduct, possibly due to electrophylic aromatic substitution. The appearance of peaks in the initial runs was eventually traced to an impurity in the toluene used to make the primary standard. It was clear that a different column system was needed to analyze the C2H5HgCl. The use of an OV101 column had been reported in the literature and so this was tried. The column used was a 6'column packed with 10% OV101 on 80/100 Chromosorb W-HP. This is a standard packed column from Alltech. The trace for a 0.5ppm standard is shown in Figure 4a, with the analyte having a retention time of 2.6 minutes. The C2H5HgCl is a solid with a sublimation temperature of 190C. The tailing in Figure 4a is due to the column temperature being below the

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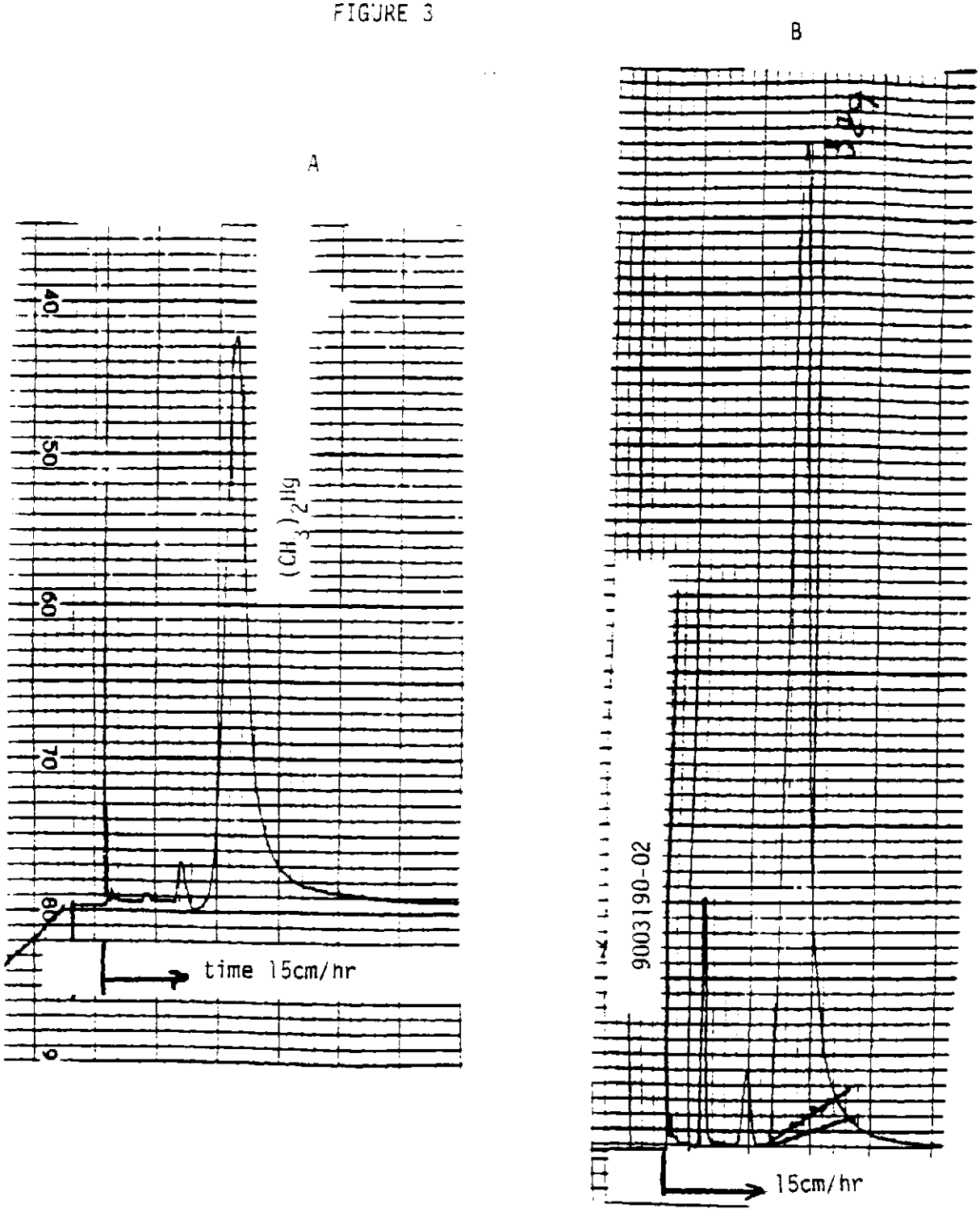
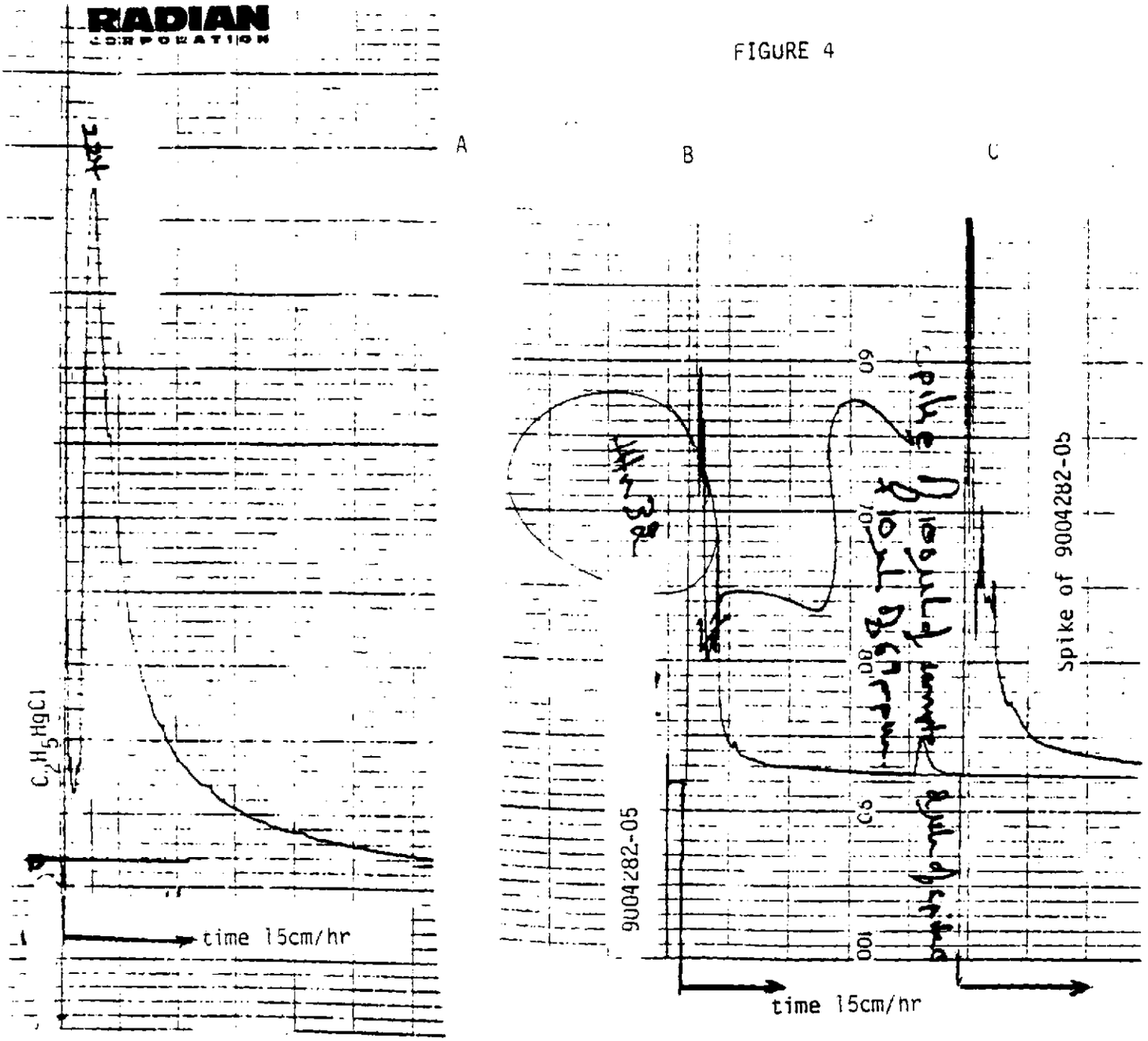
FIGURE 3



GC TRACE FOR $(CH_3)_2Hg$ (A) AND SAMPLE 9003190-02 EXTRACT (B)

FIGURE 4



GC TRACE OF C_2H_5HgCl (A), 9004282-05 EXTRACT (B), AND BENCH SPIKE OF 9004282-05 EXTRACT (C)

(Note: The sensitivity of (A) is twice that of (B) and (C))

sublimation temperature, however this lower temperature was necessary to separate the analyte peak from the injection peak. This separation proved to be insufficient to resolve the peak in the actual sample extracts, as is shown in Figures 4b and 4c. The presence of the spike can be seen by the broadening at the 2.6 minute retention time, however quantitation is impossible. Several attempts to clean up the extracts were made: Simply evaporating the extracts to dryness at 50C to evaporate other components (Figure 5 is a TGA run which indicates no weight loss from the solid up to 100C). Back extraction into base and then re-extracting into hexane is a literature reported method. Neither of these methods showed any appreciable improvement in cleaning the extracts. The data reported is an estimate of the value that may be present in the extract based upon the signal intensity at the 2.6 minute retention time.

John Shwell

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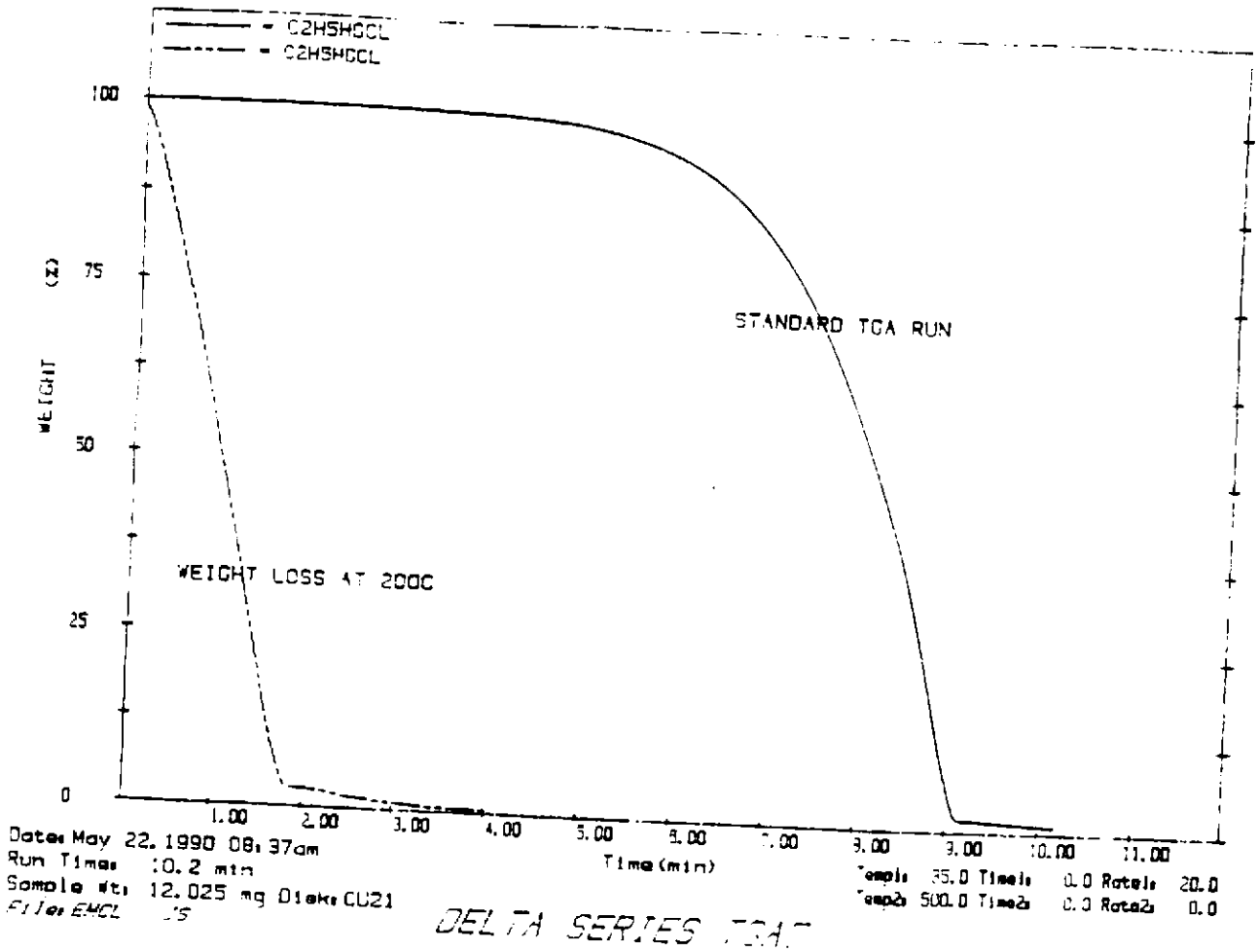
FIGURE 5



THERMOGRAVIMETRIC ANALYSIS OF C_2H_5HgCl

APPENDIX D

Analytical Data Validation Documentation

Section 3. Sewer Data Validation Documentation
Part 1. Data Validation of Enseco-ERCO Analyses

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

ROUX

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON, NEW YORK 11743 516 673-7200 FAX # 516 673-7216

July 17, 1990

Mr. Bruce S. Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the organic and inorganic analytical data from trunk sewer samples collected on April 24, 1990 through April 26, 1990 at the Industri-Plex Site (Site) in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts.

Samples were collected from four locations;(SR-1, water; SR-2, water; SR-3, water; and SR-4, water) at two sewer lines. All locations were collected for the full suite of water analyses listed in the GSIP Work Plan. A blind replicate and field blank were also collected and analyzed for the same parameters. No soil or sludge samples were collected as there was no solid material in the sewer lines at any of the four sampling locations.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990), guidelines in the U.S. Environmental Protection Agency (USEPA) Region I Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (February 1, 1988 and modified November 1, 1988), and Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1988) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The results of the validation are summarized in Table 1. All of the ground-water data are summarized in Table 2. Details of the results of the validation effort are summarized below.

ORGANIC DATA

Data Completeness

All requested analyses were performed by ERCO.

Holding Times

All samples were analyzed within the holding times. Matrix spike samples exceeded holding times.

GC/MS Tuning

The gas chromatograph/mass spectrometer (GC/MS) tuning performance results were all within USEPA Region I guidelines.

Calibration

Guidance from USEPA Region I for instrument calibration for volatile and semi-volatile compounds states that: 1) all response factors must be greater than or equal to 0.05; 2) all percent differences must be less than or equal to 30 percent; and 3) all percent differences must be less than or equal to 25 percent. If the response factor for any compound is greater than 0.05, all positive values are considered estimated and non-detects are considered unusable. If the percent relative standard deviation is greater than 30 percent, positive results for that compound are considered qualitative. If the percent relative standard deviation is greater than 50 percent, all non-detects are considered qualitative. If the percent difference is greater than 25 percent, all positive values should be considered qualitative. If the percent difference is greater than 50 percent, all non-detects are considered qualitative.

The percent relative standard deviation for methylene chloride was 62.8 percent and for bromomethane was 35.9 percent for the initial calibration which are both above the 30 percent guideline. Positive results for methylene chloride should be considered qualitative. Bromomethane was not detected in any samples, so results are not affected. The percent difference was greater than 25 percent for acetone on the continuing calibrations for samples SR-3, water and SR-3, water replicate (40.2 percent and 50 percent). These sample concentrations should be considered qualitative. The percent difference for 2-butanone was 25.4 percent for samples SR-2 and the field blank SR-FB#1, but does not affect the samples as they were both non-detects. The percent difference for calibrations for 2-butanone was 40.7

for sample SR-4, but as it wasn't detected the results are not affected. The percent difference for 2-butanone was 31.7 percent for samples SR-3 and SR-3 replicate. This only affects SR-3 as 2-butanone was not detected in SR-3 replicate. The results for SR-3 are considered qualitative. The percent difference for vinyl acetate was 31.0 percent, however this doesn't affect any results as vinyl acetate was not detected in any samples.

Semi-volatile instrument calibration problems were encountered with the following compounds: 3-Nitroaniline, 4-Nitroaniline, hexachlorocyclopentadiene, 3,3'-dichlorobenzidine, 2-fluorophenol, 4-Nitroaniline and nitrobenzene. However, these compounds were not detected in any samples. The percent difference for 4-Nitroaniline was 60.3 percent for SR-2 and SR-FB#1 samples, which were both non-detect, however these non-detects should be considered qualitative since the percent difference is greater than 50 percent.

Blanks

The concentrations of compounds in laboratory, trip and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below five times the highest positive blank value for the compound should be considered unusable. In the cases of methylene chloride, acetone, toluene, 2-butanone and common phthalate esters (which are considered common lab contaminants by USEPA Region I guidelines), positive blank values were multiplied by a factor of ten, and all positive values below that action level should be considered unusable.

- Volatile organic compound (VOC) blanks contained methylene chloride in three lab blanks, two trip blanks and the field blank. All methylene chloride positive concentrations should be considered unusable and reported as non-detect at the action level of 100 ug/L.

- Acetone was detected in a trip blank and the field blank. All positive acetone concentrations should be considered unusable and reported as non-detect at the action level of 70 ug/L.

- Several compounds affected the semi-volatile blanks. N-nitrosodiphenylamine and dimethyl phthalate were both detected at estimated levels in lab blanks, but there is no effect on the results as these compounds were not detected in any samples.

- Diethylphthalate and bis(2-ethylhexyl)phthalate were detected in both lab and filtered field blanks. All results for these compounds should be considered qualtitative and the detection limits raised to the action levels of 20 ug/L and 10 ug/L respectively.

- Di-n-butylphthalate was detected in the filtered field blank at 5 ug/L. All filtered results for di-n-butylphthalate should be considered qualitative and reported as non-detects at the action level of 50 ug/L.

Surrogate Recoveries

All VOC surrogate recoveries were within the contract required recovery ranges.

Surrogate recoveries were high for phenol-d5, a semi-volatile standard, for samples SR-3, filtered and unfiltered, and SR-100 (SR-3, replicate) filtered. However, USEPA Region I guidance advises that semi-volatile compounds are only affected when two surrogates are out of specification. Sample results are not affected by this.

Pesticide surrogate recoveries were out of range for SR-2 filtered and unfiltered; SR-FB filtered and unfiltered, SR-100(SR-3 replicate) unfiltered, and SR-4 filtered. Surrogate recovery ranges are advisory only. Lindane was detected in the SR-2 filtered and unfiltered samples and the SR-4 unfiltered sample. As no other problems occurred with the lindane analysis, results are unaffected by these surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

Matrix spike and matrix spike duplicate samples were run on the SR-4 VOC sample and all recoveries were within the Contract Laboratory Program (CLP) limits.

Matrix spike and matrix spike duplicate samples were run on the SR-2 unfiltered semi-volatile compounds sample. While recoveries were within the CLP limits, they should be considered inconclusive as the extraction was done 11 days after sample collection, instead of within the 7 day holding time.

Matrix spike and matrix spike duplicate samples were run on the SR-2 filtered pesticide/PCB sample. While recoveries were within the CLP limits, they should be considered inconclusive as the extraction was done 11 days after sample collection, instead of within the 7 day holding time.

Although requested, there were no matrix spike samples run for the unfiltered pesticide/PCB analysis and the filtered semi-volatile analyses.

Field Duplicates

One field duplicate was collected on April 26, 1990 at SR-3, and designated SR-100. Relative percent differences were above the 30 percent range advised by USEPA Region I guidance for methylene chloride, acetone, 1,1,1-trichloroethane, and total xylenes. All results should be considered qualitative for these compounds.

Semi-volatile relative percent differences were above the 30 percent range for unfiltered 1,4 dichlorobenzene, unfiltered bis(2-ethylhexyl)phthalate and filtered di-n-butylphthalate. All results for these compounds should be considered qualitative.

Internal Standard Performance

All samples were within the acceptable limits, with the exception of perylene-D12 for SR-3 unfiltered sample. However, all associated compounds were not detected and are not affected.

Pesticide Instrument Performance

Dibutylchlorendate (DBC) (a calibration standard) retention times were out of range (greater than 2 percent) for samples SR-100 (SR-3 replicate) unfiltered, collected on April 26, 1990, and SR-2 filtered and unfiltered, collected on April 24, 1990. According to ERCO, the DBC retention times shifted due to coelution with interferences. However, as DBC has a retention time of approximately 30 minutes and the only detected compound, lindane, has a retention time of approximately two minutes, the results are not affected.

Compound Identification

Lindane was positively identified in SR-2 filtered and unfiltered samples and the SR-4 unfiltered sample.

Compound Quantitation

All samples met the criteria.

INORGANIC DATA

A summary of results of the inorganic ground-water quality data validation is provided in Table 1. Please note that when referring to metals analyses, "filtered" and "dissolved" are used interchangeably and should be considered synonymous; "unfiltered" and "total" should also be considered synonymous in their usage. Details of the validation results are provided below.

Data Completeness

All requested analyses were performed by ERCO.

Holding Times

The seven day holding times for sulfide analyses were exceeded by one day for both the unfiltered and filtered samples for SR-2 and the field blank, SR-FB#1. The seven day holding time was also exceeded by one day for total suspended sediment analyses for the unfiltered samples for SR-1, SR-3, SR-3 replicate (SR-100), and SR-4. These results should be considered qualitative.

All other holding times were met.

Calibration Verification

All criteria were met for instrument calibration verification.

Laboratory and Field Blank Analyses

The concentrations of compounds in laboratory and field blanks were reviewed following USEPA Region I guidelines. If contamination was found in any blank, positive values below the action level of five times the highest positive blank value for that compound should be considered unusable.

Chemical oxygen demand (COD) and total phosphorous were detected in both the unfiltered and filtered field blanks. Total suspended sediments was detected in the unfiltered field blank. With the exception of all COD results for the unfiltered sample and the filtered analyses for SR-1, SR-3 replicate and SR-4 (which should be considered unusable), all other analyses are above the action levels and are not affected.

Aluminum, calcium, iron, nickel, sodium, and zinc were detected in both the field and lab blank for the unfiltered metals sample. Sample results are above the action levels for all analyses with the exceptions of nickel in SR-3 and zinc in SR-1, SR-2 and SR-4 which should be considered unusable. Mercury was also detected in the unfiltered field blank and sample concentrations in SR-2 and SR-4 should be considered unusable.

Aluminum was detected in the field blank for the filtered sample. All filtered (dissolved) aluminum results should be considered unusable as they are below the action level of five times the highest blank concentrations. Nickel was detected in a lab blank associated with the filtered samples which affects the sample result for SR-3 replicate. Barium, calcium and iron were detected in both the field and lab blank for the filtered metals sample, but sample results are all above the action levels for all analyses and are not affected by blank concentrations. Sodium and zinc were both detected in the field blank at low concentrations which do not affect any sample results. Antimony, beryllium, cobalt, magnesium and manganese were all detected in lab blanks associated with the filtered metals samples, but either the sample concentrations were non-detect or they were above the action level, and therefore are not affected by blank contamination.

ICP Interference Check Sample Results

All samples met the criteria.

Matrix Spike Recoveries

Although requested, the matrix spike and matrix spike duplicate samples were not run by ERCO.

Laboratory and Field Duplicates

Since matrix spikes were not run, laboratory duplicate (matrix spike duplicate) analyses were not performed.

Field duplicate precision was greater than the 30 percent difference recommended by USEPA Region I guidelines for the following analyses: filtered COD, filtered orthophosphate, filtered total organic carbon (TOC), filtered and unfiltered phosphorous, dissolved aluminum, dissolved barium, dissolved chromium, dissolved iron, dissolved manganese, dissolved nickel, dissolved tin, total lead, total nickel and total silver. All positive results for these analytes should be considered qualitative.

Laboratory Control Sample Results

All samples met the criteria.

Furnace Atomic Absorption Results

All samples met the criteria.

Serial Dilution Results

All samples met the criteria.

Detection Limit Results

All samples met the criteria.

Sample Results

Sample quantitation could not be verified due to the absence of matrix spike and matrix spike duplicate results.

If you have any questions or comments, please give us a call at (516)673-7200.

Sincerely,

Martha M. Smith

Martha M. Smith
Project Geologist

William Sarni/ms.

William Sarni
Vice President

cc: J. Yeary, Roux Associates, Inc.

Table 1 Page 1
Summary of Data Validation Recommendations

VOLATILE ORGANIC COMPOUND DATA

Data Quality	QA/QC Problems	Affected Samples
Unusable (U)	Blank contamination, instrument calibration problems, and poor replicate precision	Methylene chloride in SR-1, SR-2, SR-3 and SR-4
	Blank Contamination	Acetone in SR-2
Qualitative (A)	Blank contamination and instrument calibration problems	Acetone in SR-1, SR-3, SR-3 replicate and SR-4
	Instrument calibration problems	2-Butanone in SR-3
	Poor replicate precision	1,1,1-Trichlorethane in all samples
		Total xylenes in all samples
Raise the detection limits	Blank contamination	Methylene chloride in SR-3 replicate
Quantitative (B)	No problems	All remaining compounds

Table 1 Page 2
Summary of Data Validation Recommendations

SEMI-VOLATILE ORGANIC COMPOUND DATA

Data Quality	QA/QC Problems	Affected Samples
Qualitative (A)	Instrument calibration problems	4-Nitroaniline in SR-2, unfiltered and filtered
	Poor replicate precision	1,4-Dichlorobenzene, in all unfiltered samples
		bis(2-ethylhexyl) phthalate in all unfiltered samples
Raise the detection limits	Blank contamination and poor replicate precision	Di-n-butylphthalate in all filtered samples
		bis(2-Ethylhexyl) phthalate in all filtered samples
		Diethylphthalate in all filtered samples
Quantitative (B)	No problems	All remaining semi-volatile organic compounds

Table 1 Page 3
Summary of Data Validation Recommendations

PESTICIDE AND PCB DATA

Data Quality	QA/QC Problems	Affected Samples
Quantitative (B)	No Problems	All pesticide and PCB compounds

Table 1 Page 4
Summary of Data Validation Recommendations

MISCELLANEOUS INORGANIC DATA

Data Quality	QA/QC Problems	Affected Samples
Unusable (U)	Blank contamination and poor replicate precision	Chemical oxygen demand in SR-1 filtered, SR-3 replicate filtered, and SR-4 filtered
	Blank contamination	Chemical oxygen demand in all unfiltered samples
Qualitative (A)	Holding time exceeded	Sulfide in SR-2 filtered and unfiltered
		Total suspended sediments in SR-1 unfiltered, SR-3 unfiltered, SR-3 replicate unfiltered and SR-4 unfiltered samples
	Poor replicate precision	Phosphorous in all samples
		Orthophosphate in all filtered samples
		Total organic carbon in all filtered samples
Quantitative (B)	No problems	All remaining analytes

Table 1 Page 5
Summary of Data Validation Recommendations

METALS DATA

Data Quality	QA/QC Problems	Affected Samples
Unusable (U)	Blank contamination and poor replicate precision	Dissolved aluminum in all samples
		Total nickel in SR-3 and SR-3 replicate
	Blank contamination	Total mercury in SR-2 and SR-4
		Total zinc in SR-1, SR-2 and SR-4
	Poor replicate precision	Dissolved nickel in SR-3 replicate
Qualitative (A)	Poor replicate precision	Total lead, dissolved barium, dissolved iron, dissolved manganese in all samples
		Total silver in SR-2, SR-3 and SR-3 replicate
		Dissolved chromium in SR-3 and SR-3 replicate
		Dissolved tin in SR-3
Quantitative (B)	No problems	All remaining analytes

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Volatile Organic Compounds (Concentrations in ug/L)	CRQL						IDL
Chloromethane	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Bromomethane	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Vinyl chloride	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Chloroethane	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Methylene chloride	5	<100 U	<100 U	320 U	<50 U	<100 U	2
Acetone	10	<150 A	160 U	480 A	680 A	110 A	2
Carbon disulfide	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
1,1-Dichloroethene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
1,1-Dichloroethane	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
1,2-Dichloroethylene (total)	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Chloroform	5	2 A	5 B	<25 B	<50 B	4 A	1
1,2-Dichloroethane	5	78 B	<5 B	<25 B	<50 B	<5 B	1
2-Butanone	10	<10 B	<10 B	23 A	<100 B	<10 B	1
1,1,1-Trichloroethane	5	1 A	<5 A	17 A	12 A	<5 A	1
Carbon tetrachloride	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Vinyl acetate	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Bromodichloromethane	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
1,2-Dichloropropane	5	<5 B	<5 B	17 A	<50 B	<5 B	1
cis-1,3-Dichloropropene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Trichloroethene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Dibromochloromethane	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
1,1,2-Trichloroethane	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Benzene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
trans-1,3-Dichloropropene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Bromoform	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
4-Methyl-2-pentanone	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
2-Hexanone	10	<10 B	<10 B	<50 B	<100 B	<10 B	2
Tetrachloroethene	5	<5 B	<5 B	9 A	<50 B	<5 B	1
1,1,2,2,-Tetrachloroethane	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Toluene	5	21 B	<5 B	290 B	240 B	<5 B	1
Chlorobenzene	5	<5 B	<5 B	<25 B	<50 B	<5 B	1
Ethylbenzene	5	1 A	<5 B	9 A	<50 B	<5 B	1
Styrene	5	2 A	<5 B	<25 B	<50 B	<5 B	1
Total xylenes	5	3 A	<5 A	68 A	50 A	<5 A	1

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
Phenol	10	<10 B	5 A	<10 B	<10 B	<10 B	5
bis (2-Chloroethyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Chlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,3-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,4-Dichlorobenzene	10	<10 A	<10 A	7 A	5 A	<10 A	5
Benzyl alcohol	10	5 A	<10 B	<10 B	<10 B	<10 B	10
1,2-Dichlorobenzene	10	<10 B	<10 B	28 B	25 B	<10 B	5
2-Methylphenol	10	<10 B	<10 B	13 B	<10 B	<10 B	5
bis (2-Chloroisopropyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Methylphenol	10	<10 B	16 B	<10 B	<10 B	<10 B	5
N-Nitroso-di-n-propylamine	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachloroethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Nitrobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Isophorone	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Nitrophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4-Dimethylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Benzoic acid	50	<50 B	<50 B	<50 B	<50 B	<50 B	25
bis (2-Chloroethoxy) methane	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2,4-Dichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,2,4-Trichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Naphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
4-Chloroaniline	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobutadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Chloro-3-methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2-Methylnaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachlorocyclopentadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,6-Trichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,5-Trichlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
2-Chloronaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
2-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Dimethyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Acenaphthylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,6-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
3-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Acenaphthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,4-Dinitrophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	25
4-Nitrophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	15
Dibenzofuran	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
2,4-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Diethylphthalate	10	9 A	20 B	5 A	<10 B	10 B	4
4-Chlorophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Fluorene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
4-Nitroaniline	50	<50 B	<50 A	<50 B	<50 B	<50 B	10
4,6-Dinitro-2-methylphenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
N-Nitrosodiphenylamine (1)	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Bromophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Pentachlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Phenanthrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-butylphthalate	10	<10 B	<10 B	4 A	4 A	9 A	3
Fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Butylbenzylphthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
3,3'-Dichlorobenzidine	20	<20 B	<20 B	<20 B	<20 B	<20 B	5
Benzo (a) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Chrysene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
bis (2-Ethylhexyl) phthalate	10	18 A	23 A	34 A	6 A	4 A	4
Di-n-octyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Benzo (b) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Benzo (k) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	6
Benzo (a) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Indeno (1,2,3-cd) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Dibenzo (a,h) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Benzo (g,h,i) perylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4

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* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
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Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
Phenol	10	<10 B	<10 B	<10 B	<10 B	27 B	5
bis (2-Chloroethyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Chlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,3-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,4-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Benzyl alcohol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
1,2-Dichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
bis (2-Chloroisopropyl) ether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Methylphenol	10	17 B	<10 B	<10 B	<10 B	33 B	5
N-Nitroso-di-n-propylamine	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachloroethane	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Nitrobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Isophorone	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2-Nitrophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4-Dimethylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Benzoic acid	50	<50 B	<50 B	<50 B	<50 B	<50 B	25
bis (2-Chloroethoxy) methane	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
2,4-Dichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
1,2,4-Trichlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Naphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
4-Chloroaniline	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobutadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Chloro-3-methylphenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2-Methylnaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Hexachlorocyclopentadiene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,6-Trichlorophenol	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
2,4,5-Trichlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
2-Chloronaphthalene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
2-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Dimethyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Acenaphthylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,6-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
3-Nitroaniline	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Acenaphthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
2,4-Dinitrophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	25
4-Nitrophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	15
Dibenzofuran	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
2,4-Dinitrotoluene	10	<10 B	<10 B	<10 B	<10 B	<10 B	10
Diethylphthalate	10	<20 A	<20 A	<20 A	<20 A	<20 A	4
4-Chlorophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Fluorene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
4-Nitroaniline	50	<50 B	<50 A	<50 B	<50 B	<50 B	10
4,6-Dinitro-2-methylphenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	15

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Semi-Volatile Organic Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
N-Nitrosodiphenylamine (1)	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
4-Bromophenyl-phenylether	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Hexachlorobenzene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Pentachlorophenol	50	<50 B	<50 B	<50 B	<50 B	<50 B	10
Phenanthrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Di-n-butylphthalate	10	<50 A	<50 A	<50 A	<50 A	<50 A	3
Fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Butylbenzylphthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
3,3'-Dichlorobenzidine	20	<20 B	<20 B	<20 B	<20 B	<20 B	5
Benzo (a) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Chrysene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
bis (2-Ethylhexyl) phthalate	10	<10 A	14 A	14 A	<10 A	17 A	4
Di-n-octyl phthalate	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Benzo (b) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	5
Benzo (k) fluoranthene	10	<10 B	<10 B	<10 B	<10 B	<10 B	6
Benzo (a) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	3
Indeno (1,2,3-cd) pyrene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Dibenzo (a,h) anthracene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4
Benzo (g,h,i) perylene	10	<10 B	<10 B	<10 B	<10 B	<10 B	4

(1) Cannot be separated from Diphenylamine
* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Pesticide/PCB Compounds (Unfiltered) (Concentrations in ug/L)	CRQL						IDL
alpha-BHC	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.01
beta-BHC	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.02
delta-BHC	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.01
gamma-BHC (Lindane)	0.050	<0.050 B	0.081 B	<0.10 B	<0.067 B	0.17 B	0.01
Heptachlor	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.01
Aldrin	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.01
Heptachlor epoxide	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.01
Endosulfan I	0.050	<0.050 B	<0.050 B	<0.10 B	<0.067 B	<0.050 B	0.02
Dieldrin	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.02
4,4'-DDE	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.02
Endrin	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.05
Endosulfan II	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.02
4,4'-DDD	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.02
Endosulfan sulfate	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.08
4,4'-DDT	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.08
Methoxychlor	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.06
Endrin ketone	0.10	<0.10 B	<0.10 B	<0.20 B	<0.13 B	<0.10 B	0.08
alpha-Chlordane	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.12
gamma-Chlordane	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.12
Toxaphene	1.0	<1.0 B	<1.0 B	<0.50 B	<0.33 B	<1.0 B	0.40
Arochlor-1016	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.38
Arochlor-1221	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.29
Arochlor-1232	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.40
Arochlor-1242	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.45
Arochlor-1248	0.50	<0.50 B	<0.50 B	<1.0 B	<0.67 B	<0.50 B	0.31
Arochlor-1254	1.0	<1.0 B	<1.0 B	<2.0 B	<1.3 B	<1.0 B	0.42
Arochlor-1260	1.0	<1.0 B	<1.0 B	<2.0 B	<1.3 B	<1.0 B	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Pesticide/PCB Compounds (Filtered) (Concentrations in ug/L)	CRQL						IDL
alpha-BHC	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.01
beta-BHC	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.02
delta-BHC	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.01
gamma-BHC (Lindane)	0.050	<0.050 B	0.67 B	<0.050 B	<0.10 B	<0.10 B	0.01
Heptachlor	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.01
Aldrin	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.01
Heptachlor epoxide	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.01
Endosulfan I	0.050	<0.050 B	<0.050 B	<0.050 B	<0.10 B	<0.10 B	0.02
Dieldrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.02
4,4'-DDE	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.02
Endrin	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.05
Endosulfan II	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.02
4,4'-DDD	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.02
Endosulfan sulfate	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.08
4,4'-DDT	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.08
Methoxychlor	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.06
Endrin ketone	0.10	<0.10 B	<0.10 B	<0.10 B	<0.20 B	<0.20 B	0.08
alpha-Chlordane	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.12
gamma-Chlordane	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.12
Toxaphene	1.0	<1.0 B	<1.0 B	<1.0 B	<0.50 B	<0.50 B	0.40
Arochlor-1016	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.38
Arochlor-1221	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.29
Arochlor-1232	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.40
Arochlor-1242	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.45
Arochlor-1248	0.50	<0.50 B	<0.50 B	<0.50 B	<1.0 B	<1.0 B	0.31
Arochlor-1254	1.0	<1.0 B	<1.0 B	<1.0 B	<2.0 B	<2.0 B	0.42
Arochlor-1260	1.0	<1.0 B	<1.0 B	<1.0 B	<2.0 B	<2.0 B	0.25

* - Indicates a replicate sample
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water
Sample Date:	4/25/90	4/24/90	4/26/90	4/26/90	4/26/90
Miscellaneous Compounds (Unfiltered) (Concentrations in mg/L)					IDL
Alkalinity, Bicarb. as CaCO3	151 B	145 B	188 B	193 B	186 B	5.0
Alkalinity, Carb. as CaCO3	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	5.0
Chemical Oxygen Demand	156 U	465 U	276 U	268 U	154 U	5.0
Chloride	129 B	131 B	170 B	158 B	132 B	3.0
Orthophosphate as P	2.8 B	1.6 B	2.4 B	3.1 B	7.1 B	0.010
Sulfide, total	0.05 B	<0.05 A	<0.05 B	<0.05 B	0.29 B	0.05
Sulfate	41.0 B	80.0 B	305 B	255 B	27.0 B	5.0
Total Organic Carbon	36.7 B	29.1 B	62.8 B	71.0 B	43.6 B	2.0
Phosphorous, total	4.7 A	3.6 A	2.3 A	5.5 A	6.4 A	0.10
Total Suspended Solids	91.0 A	76.0 B	840 A	810 A	172 A	1.0
Hexavalent Chromium	<0.010 B	<0.010 B	<0.010 B	<0.010 B	<0.010 B	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:	SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water
Sample Date:	4/25/90	4/24/90	4/26/90	4/26/90	4/26/90
Miscellaneous Compounds (Filtered) (Concentrations in mg/L)					
Alkalinity, Bicarb. as CaCO3	149 B	137 B	139 B	168 B	185 B
Alkalinity, Carb. as CaCO3	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B
Chemical Oxygen Demand	160 U	253 A	491 A	188 U	142 U
Chloride	128 B	131 B	154 B	160 B	126 B
Orthophosphate as P	2 A	1.3 A	1.6 A	2.8 A	3.5 A
Sulfide, dissolved	<0.05 B	<0.05 A	0.09 B	<0.05 B	0.05 B
Sulfate	40.0 B	40.0 B	293 B	255 B	50.0 B
Total Organic Carbon	42.3 A	33.9 A	102 A	50.4 A	194 A
Phosphorous, total	3.4 A	3.1 A	2.3 A	3.3 A	4.3 A
Hexavalent Chromium	<0.010 B	<0.010 B	<0.010 B	<0.010 B	<0.010 B

	IDL
Alkalinity, Bicarb. as CaCO3	5.0
Alkalinity, Carb. as CaCO3	5.0
Chemical Oxygen Demand	5.0
Chloride	3.0
Orthophosphate as P	0.010
Sulfide, dissolved	0.05
Sulfate	5.0
Total Organic Carbon	2.0
Phosphorous, total	0.10
Hexavalent Chromium	0.010

* - Indicates a replicate sample
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/25/90	4/26/90	4/26/90	4/26/90	
Metals (total) (Concentrations in ug/L)	CRDL						IDL
Aluminum	200	233 B	352 B	2070 B	2730 B	330 B	27.0
Antimony	60	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	37.0
Arsenic	10	2.0 B	<2.0 B	5.2 B	5.8 B	2.0 B	2.0
Barium	200	28.1 B	38.1 B	96.2 B	110 B	63.3 B	2.0
Beryllium	5	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	1.0
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	5.0
Calcium	5000	39800 B	38100 B	40100 B	43400 B	45300 B	20.0
Chromium	10	<3.0 B	<3.0 B	16.9 B	19.8 B	3.5 B	3.0
Cobalt	50	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	7.0
Copper	25	23.9 B	21.8 B	1360 B	1610 B	38.2 B	6.0
Iron	100	573 B	552 B	5280 B	6200 B	682 B	3.0
Lead	5	4.4 A	3.8 A	62.4 A	86.1 A	4.9 A	2.0
Magnesium	5000	5040 B	4900 B	5730 B	6090 B	5440 B	37.0
Manganese	15	87.7 B	80.4 B	220 B	226 B	74.4 B	1.0
Mercury	0.2	<0.02 B	0.2 U	1.4 B	1.4 B	0.2 U	0.2
Nickel	40	<12.0 A	<12.0 A	25.3 U	35.7 U	<12.0 A	12.0
Potassium	5000	7040 B	7620 B	22100 B	21600 B	9470 B	900
Selenium	5	<2.0 B	<2.0 B	<2.0 B	<2.0 B	<2.0 B	2.0
Silver	10	<3.0 B	3.7 A	60.5 A	93.8 A	<3.0 B	3.0
Sodium	5000	78600 B	80800 B	252000 B	230000 B	68400 B	38.0
Thallium	10	<4.0 B	<4.0 B	<4.0 B	<4.0 B	<4.0 B	4.0
Vanadium	50	7.3 B	<6.0 B	<6.0 B	<6.0 B	8.4 B	6.0
Zinc	20	51.0 U	43.1 U	522 B	649 B	77.9 U	8.0
Tin	--	<28.0 B	<28.0 B	102 B	107 B	<29.0 B	28.0

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

Table 2. Summary of Sewer Water Analyses, Industri-Plex Site, GSIP, Woburn, Massachusetts.

Sample Designation:		SR-1-Water	SR-2-Water	SR-3-Water	SR-3-Water*	SR-4-Water	
Sample Date:		4/25/90	4/24/90	4/26/90	4/26/90	4/26/90	
Metals (dissolved) (Concentrations in ug/L)	CRDL						IDL
Aluminum	200	219 U	234 U	180 U	81.4 U	196 U	27.0
Antimony	60	<37.0 B	<37.0 B	<37.0 B	<37.0 B	<37.0 B	37.0
Arsenic	10	<2.0 B	<2.0 B	<2.0 B	<2.0 B	<2.0 B	2.0
Barium	200	38.9 A	28.5 A	65.6 A	36.3 A	31.5 A	2.0
Beryllium	5	<1.0 B	<1.0 B	<1.0 B	<1.0 B	<1.0 B	1.0
Cadmium	5	<5.0 B	<5.0 B	<5.0 B	<5.0 B	<5.0 B	5.0
Calcium	5000	38100 B	37300 B	26400 B	27900 B	42100 B	20.0
Chromium	10	<3.0 B	<3.0 B	297 A	26.4 A	<3.0 B	3.0
Cobalt	50	<7.0 B	<7.0 B	<7.0 B	<7.0 B	<7.0 B	7.0
Copper	25	16.3 B	14.3 B	84.9 B	69.3 B	13.6 B	6.0
Iron	100	253 A	286 A	1300 A	443 A	192 A	3.0
Lead	5	<2.0 B	<2.0 B	3.3 B	3.3 B	<2.0 B	2.0
Magnesium	5000	4990 B	4880 B	4680 B	4840 B	5180 B	37.0
Manganese	15	72.2 A	73.7 A	209 A	141 A	57.7 A	1.0
Mercury	0.2	<0.2 B	<0.2 B	<0.2 B	<0.2 B	<0.2 B	0.2
Nickel	40	<12.0 A	<12.0 A	89.5 A	16.4 U	<12.0 A	12.0
Potassium	5000	8050 B	8410 B	20900 B	20900 B	8530 B	900
Selenium	5	<2.0 B	<2.0 B	<2.0 B	<2.0 B	<2.0 B	2.0
Silver	10	3.3 B	15.1 B	3.4 B	<3.0 B	<3.0 B	3.0
Sodium	5000	81400 B	79200 B	234000 B	230000 B	75100 B	38.0
Thallium	10	<4.0 B	<4.0 B	<4.0 B	<4.0 B	<4.0 B	4.0
Vanadium	50	<6.0 B	<6.0 B	<6.0 B	<6.0 B	<6.0 B	6.0
Zinc	20	59.3 B	73.5 B	71.0 B	73.0 B	55.1 B	8.0
Tin	--	<28.0 B	<28.0 B	166 A	<29.0 B	<29.0 B	28.0

* - Indicates a replicate sample
CRDL - Contract Required Detection Limit
IDL - Instrument Detection Limit

Validation Codes

B - Quantitative data
A - Qualitative data
U - Unusable data

APPENDIX D

Analytical Data Validation Documentation

Section 3. Sewer Data Validation Documentation
Part 2. Data Validation of Radian Analyses
(see Appendix D, Section 1, Part 4.)

APPENDIX D

Analytical Data Validation Documentation

Section 4. Split Spoon Soil Data Validation Documentation

CONSULTING GROUND-WATER
GEOLOGISTS AND ENGINEERS
ROUX ASSOCIATES INC

ROUX

THE HUNTINGTON ATRIUM
775 PARK AVENUE
SUITE 255
HUNTINGTON NEW YORK 11743 516 673-7200 FAX # 516 673 7216

June 6, 1990

Mr. Bruce Yare
Industri-Plex Site Remedial Trust
c/o Monsanto Chemical Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167

Dear Mr. Yare:

Roux Associates, Inc. has performed a validation of the inorganic analytical data from seven split-spoon soil samples collected on February 28, 1990, March 7, 1990 and March 12, 1990 at the Industri-Plex Site (Site) in Woburn, Massachusetts as part of the Ground-Water/Surface-Water Investigation Plan (GSIP). These analyses were performed by ENSECO-ERCO (ERCO) of Cambridge, Massachusetts and Radian Corporation (Radian) of Austin, Texas.

Data validation guidelines presented by Roux Associates, Inc. in Appendix E of the GSIP Work Plan (December 21, 1990) and guidelines in U.S. Environmental Protection Agency (USEPA) Region I Laboratory Validation Functional Guidelines for Evaluating Inorganics Analyses (June 13, 1988 and modified February 1989) were followed. When differing guidelines were encountered, generally the stricter guideline was followed.

The analyses for soils were not performed under Contract Laboratory Program (CLP) because no CLP protocols exist for the requested analyses. The results of the validation of the inorganic analytical data are summarized in Table 1 and the data are summarized in Table 2. Details of the results of the validation effort are summarized below.

Data Completeness

All analyses requested were performed by ERCO and Radian with the exception of the grain size analysis for SS-22 (6'-12'). Insufficient sample volume prevented this analyses from being performed.

Calibration Verification

The required window for percent recovery for metals is 90 percent-110 percent, therefore results are considered qualitative. The continuing calibration for arsenic III had a recovery of 82.8 percent for samples SS-28 (0'-7') and SS-28 (7'-9') and 83.7 percent for samples SS-21 (0'-2'), SS-21 (2'-8') and SD-21. All sample results were below the detection limit.

Blank Analysis Results

Lead was detected in preparation blanks for SS-28 (0'-7'), SS-28 (7'-9'), SS-21 (0'-2'), SS-21 (2'-8') and SD-21. Positive values above the action level of five times the highest value found in a blank for an analyte are considered quantitative. These samples results which were greater than five times the highest blank level are all considered quantitative.

ICP Interference Check Sample Results

All samples met this criteria.

Matrix Spike Recoveries

Matrix spikes samples were run by Radian. The required limits for spike recovery is 75 percent-125 percent. The recovery for arsenic III in Sample SD-21 was 10.4 percent while the recovery for arsenic V for SD-21 was 185.7 percent. The results for these samples are considered qualitative.

Although requested, matrix spikes and matrix spike duplicates were not performed by ERCO.

Laboratory and Field Duplicates

Laboratory duplicates met the criteria on samples submitted to Radian except for arsenic in samples SS-22 (4'-6') and SS-22 (6'-12'). Therefore, these analytical results are considered qualitative.

Laboratory Control Samples

The 80 percent-120 percent criteria for solid laboratory control samples does not apply to soils.

Serial Dilution Results

All samples met this criteria.

Detection Limit Results

All samples met criteria.

Sample Results

All samples met criteria.

Should you have any questions, or comments, please do not hesitate to call.

Sincerely,

Martha M. Smith
Project Geologist

William Sarni
Vice President

Enclosures

Table 1

Summary of Data Validation Recommendations for Soils
Industri-Plex Site, GSIP, Woburn, MA

Split-Spoon Soil Inorganic Compound Data

Data Quality	QA/QC Problems	Affected Samples
Qualitative (A)	Instrument calibration problems	Arsenic in SS-28 (0'-1'), SS-28 (7'-9'), SS-21 (0'-2') SS-21 (2'-8') and SD-21.
	Matrix Spike Recovery	Arsenic III in SD-21 Arsenic V in SD-21
	Martix Spike Duplicate	Arsenic in SS-22 (4'-6'), SS-22 (6'-12')
Quantitative (B)	No problems	All remaining analytes

Table 2. Summary of Analyses for Inorganic Compounds in Soil

Sample Designation:	SS-22	SS-22	SS-28	SS-28	SS-21	SS-21	SD-21*
Sample Depth (ft):	4-6	6-12	0-7	7-9	0-2	2-8	2-8
Sample Date:	2/28/90	2/28/90	3/7/90	3/7/90	3/12/90	3/12/90	3/12/90
Inorganic Compounds (Concentrations in mg/kg)							
Iron oxide	1760 B	2320 B	3710 B	3440 B	4810 B	1660 B	1690 B
Manganese oxide (mg/L)	0.12 B	0.14 B	0.42 B	1.5 B	0.74 B	0.11 B	0.12 B
Chromium III	6.9 B	13.3 B	19.8 B	19 B	25.7 B	11.0 B	8.8 B
Chromium VI	ND B	ND B	ND B	ND B	ND B	ND B	ND B
Total Chromium	6.4 B	9.7 B	26.7 B	17.2 B	21.4 B	6.5 B	5.2 B
Total Calcium Carbonate	ND B	ND B	ND B	31.2 B	ND B	ND B	ND B
Total Organic Compounds	0.57 B	30.2 B	0.55 B	0.07 B	0.55 B	0.8% B	0.8% B
Total Suspended Solids	83.8% B	80.4% B	91.3% B	88.8% B	83.8% B	80.4% B	77.2% B
Grain size analysis **	yes B	no	yes B	yes B	yes B	yes B	yes B
pH (Laboratory)	6.2 B	6.8 B	4.0 B	6.3 B	4.3 B	5.3 B	5.6 B
Radian Compounds							
Arsenic	3.7 A	3.0 A	13 B	10 B	5.4 B	2.4 B	2.6 A
Arsenic III	<0.12 B	<0.12 B	<0.12 A	<0.12 A	<0.12 A	<0.12 A	<0.12 A
Arsenic V	3.75 B	2.24 B	3.66 B	2.26 B	3.65 B	2.12 B	3.90 B
Mercury II	<0.41 B	<0.037 B	<0.041 B	<0.037 B	<0.040 B	<0.042 B	<0.034 B
Mercury 0	<0.029 B	<0.026 B	<0.041 B	<0.037 B	<0.035 B	<0.039 B	<0.034 B
Lead II	<11 B	<12 B	<17 B	<12 B	<5.9 B	<5.2 B	<5.2 B
Lead by graphite furnace	1.4 B	1.2 B	7.1 B	5.3 B	18 B	3.2 B	2.4 B

* - Indicates a replicate sample of SS-21 (2'-8')
** - Performed (yes/no)

Validation Codes

B - Quantitative
A - Qualitative
U - Unusable