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Exponent®

Operable Unit 1 Phase IA Supplemental Field Investigation Data Report for the Ventron/Velsicol Site Wood-Ridge/Carlstadt, New Jersey

Prepared for

Rohm and Haas Company
Mt. Prospect, Illinois

Exponent

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Phase IA Supplemental
Field Investigation
Data Report for the
Ventron/Velsicol Site
Wood-Ridge/Carlstadt
New Jersey

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Acronyms and Abbreviations

bgs	below ground surface
DAF	dilution attenuation factor
EPA	U.S. Environmental Protection Agency
GWQS	New Jersey Groundwater Quality Standards
IGWSCC	New Jersey Impact to Groundwater Soil Cleanup Criteria
J	estimated
MCL	EPA Maximum Contaminant Level
MDL	method detection limit
NRDCSCC	New Jersey Non-Residential Direct Contact Soil Cleanup Criteria
NJDEP	New Jersey Department of Environmental Protection
OU	Operable Unit
Phase IA SFI	Phase IA supplemental field investigation
Phase IA work plan	Phase IA work plan dated September 9, 1999
QA/QC	quality assurance and quality control
RDCSCC	New Jersey Residential Direct Contact Soil Cleanup Criteria
RI	remedial investigation
RPD	relative percent difference
Site	Ventron/Velsicol Site
SSL	EPA soil screening level for migration to groundwater
SWQS	New Jersey Surface Water Quality Standards
U	undetected at detection limit shown

Introduction

This data report presents the results of a Phase IA supplemental field investigation (Phase IA SFI) completed as part of the Phase IA remedial investigation (RI) for the Ventron/Velsicol Site (Site) located in Wood-Ridge and Carlstadt, New Jersey. Field investigation activities were conducted at the Site in general accordance with the *Work Plan for Supplemental Groundwater Sampling and Soil Assessment*, dated May 30, 2002 (Exponent 2002). The scope of work addressed comments made by the New Jersey Department of Environmental Protection (NJDEP) in a letter dated April 18, 2002 (Zervas 2002a, pers. comm.). This work plan was approved with several changes as requested by NJDEP in a letter dated August 28, 2002 (Zervas 2002b, pers. comm.). NJDEP requested further evaluation of the occurrence of mercury in groundwater and soil at the site as follows:

- Sampling of all groundwater monitoring wells using previously approved techniques (Comment 1)
- Additional assessment of the potential presence of elemental mercury in the area of the former mercury processing facility (the area of the existing Wolf and U.S. Life Warehouse buildings) (Comment 2)
- Further delineation of mercury in soil north of the former mercury processing facility (Comment 3).

NJDEP approved analysis of additional metals in the monitoring well groundwater samples as well as soil sampling procedures for the offsite boreholes (Zervas 2002c, pers. comm.). Included with this report are tables and figures summarizing the analytical results of the field investigations, as well as laboratory analytical data reports (Appendix A), borehole logs (Appendix B), and a quality assurance review of the reported data (Appendix C). After approval of this report by NJDEP, the tables and illustrations will be incorporated into a revised version of the *Operable Unit 1 Remedial Investigation Report* for the Site, dated September 2000 (Exponent 2000).

Field Activities

Except where explicitly identified, the field procedures and analytical methods specified in the agency review draft *Phase IA Work Plan*, dated September 9, 1999 (Phase IA work plan [Exponent 1999]), or previous documents referenced therein, were adhered to during the Phase IA SFI.

Groundwater Sampling

The objective of the Phase IA SFI groundwater sampling was to provide an additional set of metals data for groundwater. Groundwater samples were collected from the 15 Site monitoring wells (MW-1 through MW-15) during September 24 to 27, 2002 (Figure 1).

Groundwater surface elevations were measured to the nearest 0.01 ft in each monitoring well before purging and sampling (Table 1). The groundwater samples were generally collected using the same procedures previously employed for groundwater collection at the Site. One modification was the use of a peristaltic pump (as specified in the May 30, 2002 supplemental work plan [Exponent 2002]) because volatilization of the groundwater samples was not a concern since the samples were analyzed for selected metals only. Samples planned for mercury analysis were collected using the "clean hands" technique to minimize potential cross-contamination. Filtered (dissolved) and unfiltered samples were collected from each of the monitoring wells. The samples were filtered in the field using a disposable, 0.45 μm pore-size in-line filter.

Filtered (dissolved) and unfiltered samples were submitted to Cebam Analytical in Seattle, Washington, for low-level, total mercury analysis by U.S. Environmental Protection Agency (EPA) Method 1631. Unfiltered samples were submitted to Columbia Analytical Services in Rochester, New York, for analysis of total barium, copper, iron, lead, manganese, nickel, and vanadium by EPA Method 6010B. Unfiltered samples were also submitted to Severn Trent Services in Amherst, New York, for analysis of total arsenic, cadmium, and thallium by EPA Method 6020.

For quality assurance/quality control (QA/QC) purposes, one duplicate groundwater sample (filtered and unfiltered) was collected from monitoring well MW-7, and one equipment rinsate sample (filtered and unfiltered) was also collected. These samples were analyzed for the same constituents and by the same methods described above.

Copies of the analytical data reports are provided in Appendix A. The groundwater analytical results are summarized in Tables 2, 3, and 4 (with groundwater quality and surface water quality criteria comparisons).

Soil Sampling

The objectives of the soil assessment were to evaluate the potential presence of elemental mercury in shallow and subsurface soil adjacent to the warehouse buildings in the developed area of Operable Unit 1 (OU1), and to further delineate the offsite extent of mercury in soil to the north of this area (Figure 2). Eight onsite boreholes (B-1 through B-8) were drilled and sampled on October 8 and 9, 2002. Six offsite boreholes (B-9 through B-14) were drilled and sampled on October 9 and 10, 2002, and November 13, 2002 (Figure 3).

The boreholes were drilled by Summit Drilling of Bound Brook, New Jersey, using a hydraulic, direct-push drill rig. A geologist from Exponent provided oversight during drilling and logged the boreholes. All boreholes were drilled and sampled continuously through fill and native sandy soils until the top of the fine-grained unit was encountered (undifferentiated fine-grained deposits or varved silt and clay as described by Joseph S. Ward, Inc. [1974, 1975]). Soil sampling was facilitated using a 4-ft-long, stainless-steel core barrel sampler lined with a new, disposable, acetate liner for each sample collected. The boreholes were backfilled with bentonite grout and capped with asphalt patch or native soil material, as appropriate.

Soil samples collected from the boreholes were examined for lithology and the potential presence of elemental mercury. Logs of the boreholes are provided in Appendix B. The presence of elemental mercury was assessed in the field for each 2-ft sample interval by observations and hand lens examination, and by field screening using a portable Jerome® mercury vapor meter. The field screening results are provided on the borehole logs.

For onsite boreholes B-1 through B-8, soil samples were planned for laboratory analysis only if field mercury vapor concentrations exceeded 0.5 mg/m^3. Soil with mercury vapor concentrations in excess of 0.5 mg/m^3 was detected only in borehole B-5 from 6–10 ft below ground surface (bgs); consequently, soil samples SP0001 (6–7 ft bgs), SP0002 (7–8 ft bgs), SP0003 (8–9 ft bgs), and SP0004 (9–10 ft bgs) collected from borehole B-5 were submitted for laboratory analysis.

For offsite boreholes B-9 through B-14, soil samples were collected at 2-ft intervals. The three samples collected from 0–6 ft bgs (i.e., 0–2, 2–4, and 4–6 ft intervals) were pre-selected for laboratory analysis (although some intervals were not sampled due to insufficient sample recovery). Soil samples collected below 6 ft bgs from the offsite boreholes were archived for future analysis if the total mercury concentration in the 4–6 ft sample interval exceeded 14 mg/kg, the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) for offsite soil. The next deeper sample interval was analyzed from each borehole, if needed, until the total mercury concentration was below 14 mg/kg.

For QA/QC purposes, one duplicate soil sample was collected from the 0–2 ft sample interval from borehole B-10, and one equipment rinsate sample was also collected. All selected soil samples and the duplicate sample were analyzed for total mercury by EPA Method 7471A, and the equipment rinsate sample was analyzed for total mercury by EPA Method 7470A. Copies of the analytical data reports are provided in Appendix A. The soil analytical results are summarized in Tables 5, 6, and 7, with nonresidential direct contact (NRDCSCC), impact to groundwater (IGWSCC), and offsite RDCSCC comparisons, respectively.

One deviation from the work plan was the relocation of offsite boreholes B-10 through B-14. The boreholes were moved from their proposed locations to maintain a 25-ft offset from the railroad tracks as required by the Norfolk Southern Railroad. Relocation of the boreholes was approved by NJDEP (MacGregor 2002, pers. comm.).

Results of the Field Investigation

The results of a quality assurance review of the analytical data are provided in Appendix C. Analytical data were validated in accordance with applicable guidance specified by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (U.S. EPA 1994), the referenced method-specific quality control criteria, or in the context of the data quality objectives established for this project.

The results reported by the laboratories (Cebam Analytical, Columbia Analytical Services, and Severn Trent Services) are acceptable as reported and as qualified during the assessment of data quality. During the quality assurance review, 4 dissolved mercury results and 13 total arsenic results for groundwater were restated as undetected (*U* qualifier) due to rinsate blank contamination (the restated values were less than 5 times the concentration measured in the rinsate blank sample). Two dissolved groundwater mercury results and two soil mercury results were restated as estimated (*J* qualifier) due to low relative percent difference (RPD) between the sample and sample duplicate for both media. No results were rejected.

Groundwater Results

The monitoring well locations and historical mercury concentrations in groundwater are shown on Figure 1. Phase IA SFI groundwater surface elevations and contours are shown on Figure 3. A time series plot of historical groundwater elevations is shown on Figure 4. The Phase IA SFI groundwater analytical results are summarized in Tables 2 through 4. Table 2 presents comparison of the data to New Jersey groundwater quality standards (GWQS). Table 3 presents comparison of the data to EPA drinking water Maximum Contaminant Levels (MCLs) (as requested by NJDEP). Table 4 presents comparison of the data to New Jersey surface water quality standards (SWQS) for fresh water. Table 4 includes only the results from the Site perimeter wells. Historical groundwater levels and elevations are summarized in Table 1.

The groundwater analytical results indicated the following ranges of metals concentrations: arsenic (2.23 *U* to 41.5 μg/L), barium (20 *U* to 1,100 μg/L), cadmium (0.5 *U* to 0.841 μg/L), copper (20 *U* μg/L), iron (100 *U* to 31,700 μg/L), lead (5 *U* μg/L), manganese (10 *U* to 4,180 μg/L), dissolved mercury (0.002 *U* to 12.55 μg/L), total mercury (0.017 to 22.91 μg/L), nickel (40 *U* μg/L), thallium (0.2 *U* to 0.2973 μg/L), and vanadium (50 *U* to 62.9 μg/L).

Mercury concentrations that exceeded the GWQS (2 μg/L for total and dissolved mercury) occurred in monitoring wells MW-7 (5.83 μg/L total), MW-9 (3.86 μg/L total), and MW-13 (12.55 μg/L dissolved and 22.91 μg/L total). Monitoring wells MW-7, MW-9, and MW-13 are located around the perimeter of the Wolf Warehouse in the developed area of the Site. Other metals concentrations that exceeded the available GWQS included arsenic in wells MW-6, MW-13, and MW-15, iron in all wells except MW-10, MW-12, and MW-14, and manganese in all wells except MW-9.

The MCL and GWQS values for mercury are equivalent; therefore, mercury concentrations that exceeded the MCL also exceeded the GWQS. The only other MCL exceeded was arsenic in wells MW-6 (12.2 μg/L), MW-13 (41.5 μg/L), and MW-15 (10.9 μg/L) (MCL 10 μg/L).

Mercury concentrations in the Site perimeter monitoring wells above the SWQS (0.144 μg/L for total and dissolved mercury) occurred in monitoring wells MW-8 (0.192 μg/L dissolved and 0.583 μg/L total) and MW-15 (0.345 μg/L total only). The only other SWQS exceeded was arsenic in wells MW-6 (12.2 μg/L) and MW-15 (10.9 μg/L). It should be noted that the restated undetected values for the other perimeter wells exceeded the arsenic SWQS. The SWQS for arsenic is 0.017 μg/L.

Soil Results

The Phase IA SFI borehole locations and soil mercury concentrations are shown on Figure 3. The soil analytical results are summarized in Tables 5 through 7. Table 5 presents comparison of the data to NRDCSCC. Table 6 presents comparison of the data to RDCSCC for offsite boreholes only. Table 7 presents a comparison of the data to the U.S. EPA SSL for a dilution attenuation factor (DAF) of 1 (as requested by NJDEP).

Elemental mercury was not observed during the Phase IA SFI. Mercury vapor concentrations in soil exceeded 0.5 mg/m^3 in only one borehole, borehole B-5 from 6–8 ft bgs (0.698 mg/m^3) and 8–10 ft bgs (0.861 mg/m^3). The borehole data indicated the fine-grained deposits were encountered at depths of approximately 10–32 ft bgs. The deposits were observed at greater depths in the general area between the two warehouse buildings, and were shallower toward the northwest and southeast sides of the buildings.

Total mercury was not detected at or above the laboratory method detection limit (MDL) in three samples (B-10 at 8–10 ft bgs, B-11 at 6–8 ft bgs, and B-13 at 2–4 ft bgs). Total mercury was detected in all other soil samples at concentrations varying from 0.04 mg/kg (B-14 at 6–8 ft bgs) to 750 mg/kg (B-5 at 6–7 ft bgs).

Only one soil mercury concentration (750 mg/kg in borehole B-5 at 6–7 ft bgs) exceeded the NRDCSCC of 270 mg/kg.

Several soil mercury concentrations in offsite boreholes B-9 through B-14 exceeded the RDCSCC of 14 mg/kg as follows: B-9 at 0–2 ft bgs (240 mg/kg), B-10 at 0–2 ft bgs (13.3 *J* and 31.7 *J* mg/kg), B-10 at 4–6 ft bgs (42.8 mg/kg), B-11 at 4–6 ft bgs (16.6 mg/kg), B-13 at 0–2 ft bgs (52.6 mg/kg), B-13 at 4–6 ft bgs (172 mg/kg), B-13 at 6–8 ft bgs (52.1 mg/kg), B-13 at 8–10 ft bgs (35.0 mg/kg), B-13 at 12-14 ft bgs (31.0 mg/kg), B-14 at 0–2 ft bgs (67.1 mg/kg), and B-14 at 4–6 ft bgs (162 mg/kg).

At all offsite borehole locations except one, mercury concentrations in the deepest interval analyzed were below the RDCSCC of 14 mg/kg. At borehole B-13, the deepest two intervals were analyzed simultaneously to meet the laboratory holding time deadline. While the second deepest interval (10–12 ft bgs) had a mercury concentration of 0.75 mg/kg (below the RDCSCC), the mercury concentration in the deepest interval (31.0 mg/kg at 12–14 ft bgs)

exceeded the RDCSCC. Deeper intervals were not analyzed because the holding time was exceeded.

Soil mercury concentrations in 20 of the 26 samples analyzed exceeded the SSL of 0.1 mg/kg in boreholes as follows: B-5 at 6–7 ft bgs (750 mg/kg), 7–8 ft bgs (128 mg/kg), 8–9 ft bgs (252 mg/kg), and 9–10 ft bgs (12.3 mg/kg); B-9 at 0–2 ft bgs (240 mg/kg) and 2–4 ft bgs (0.21 mg/kg); B-10 at 0–2 ft bgs (13.3 *J* and 31.7 *J* mg/kg) and 4–6 ft bgs (42.8 mg/kg); B-11 at 0–2 ft bgs (2.8 mg/kg) and 4–6 ft bgs (16.6 mg/kg); B-12 at 0–2 ft bgs (0.33 mg/kg); B-13 at 0–2 ft bgs (52.6 mg/kg), 4–6 ft bgs (172 mg/kg), 6–8 ft bgs (52.1 mg/kg), 8–10 ft bgs (35.0 mg/kg), 10–12 ft bgs (0.75 mg/kg), and 12–14 ft bgs (31.0 mg/kg); and B-14 at 0–2 ft bgs (67.1 mg/kg) and 4–6 ft bgs (162 mg/kg).

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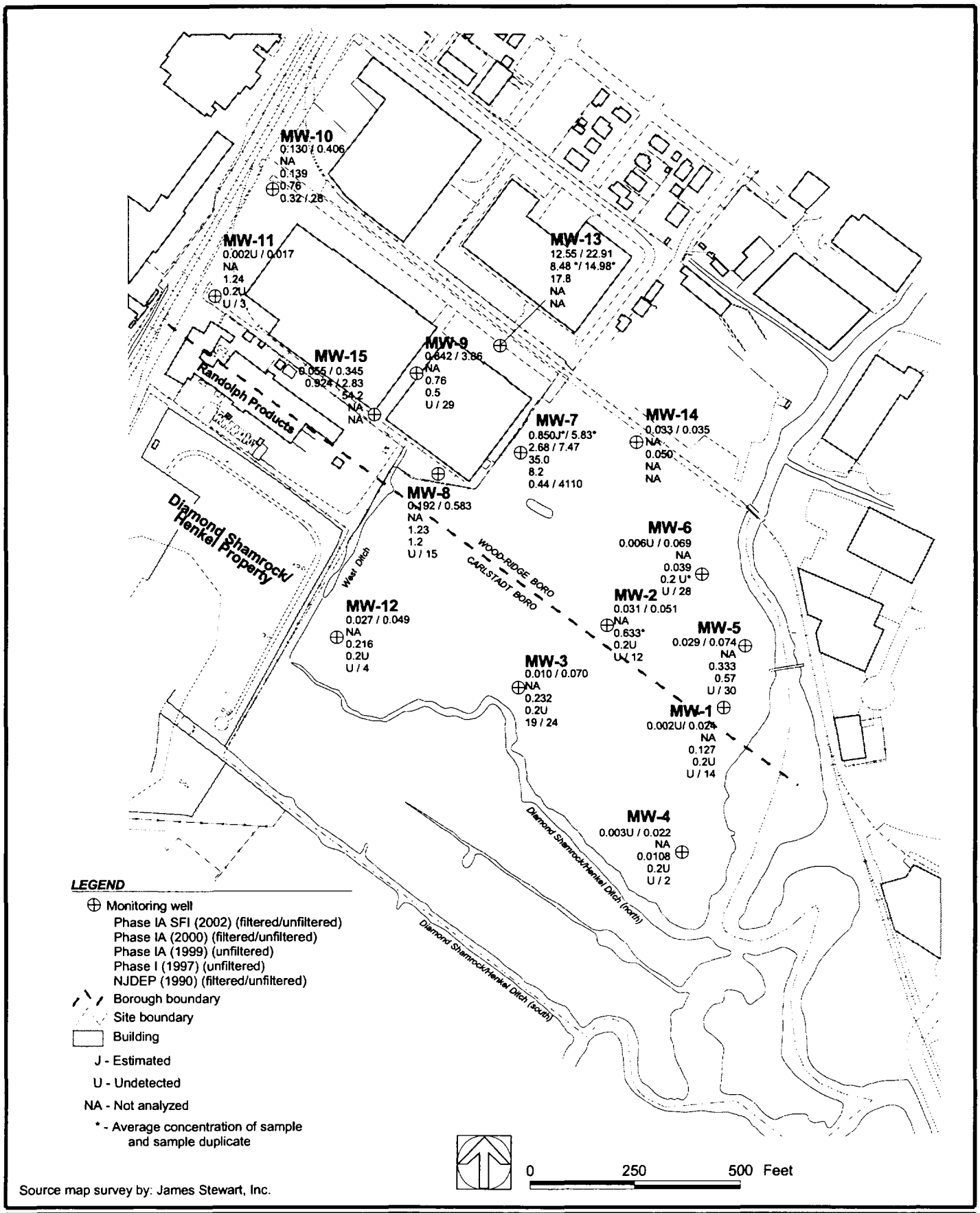

Figure 1. Mercury concentrations (μg/L) in groundwater

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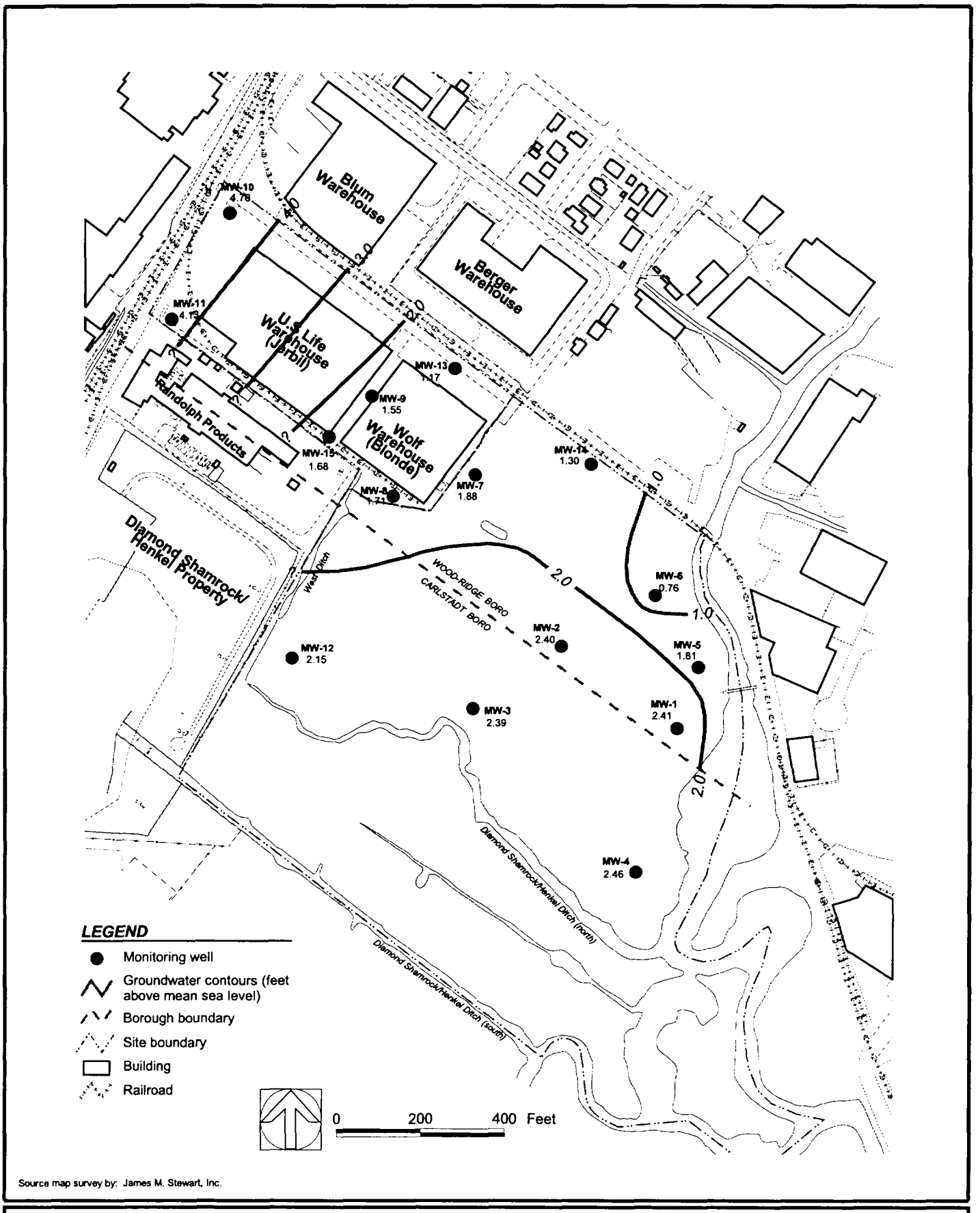

Source map survey by: James M. Stewart, Inc.

Figure 2. Groundwater surface elevations September 24, 2002

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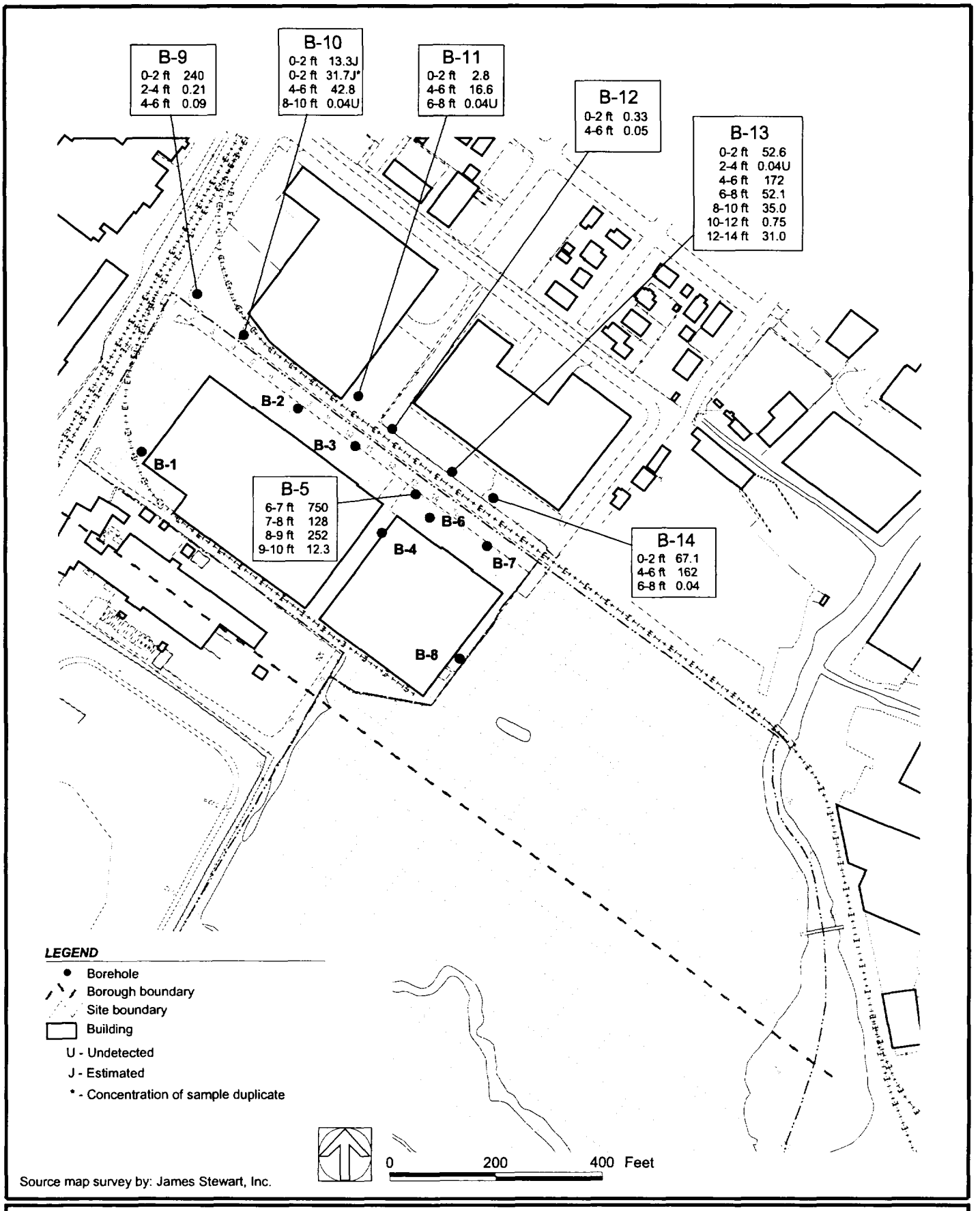

Figure 3. Borehole locations and mercury concentrations (mg/kg) in soil

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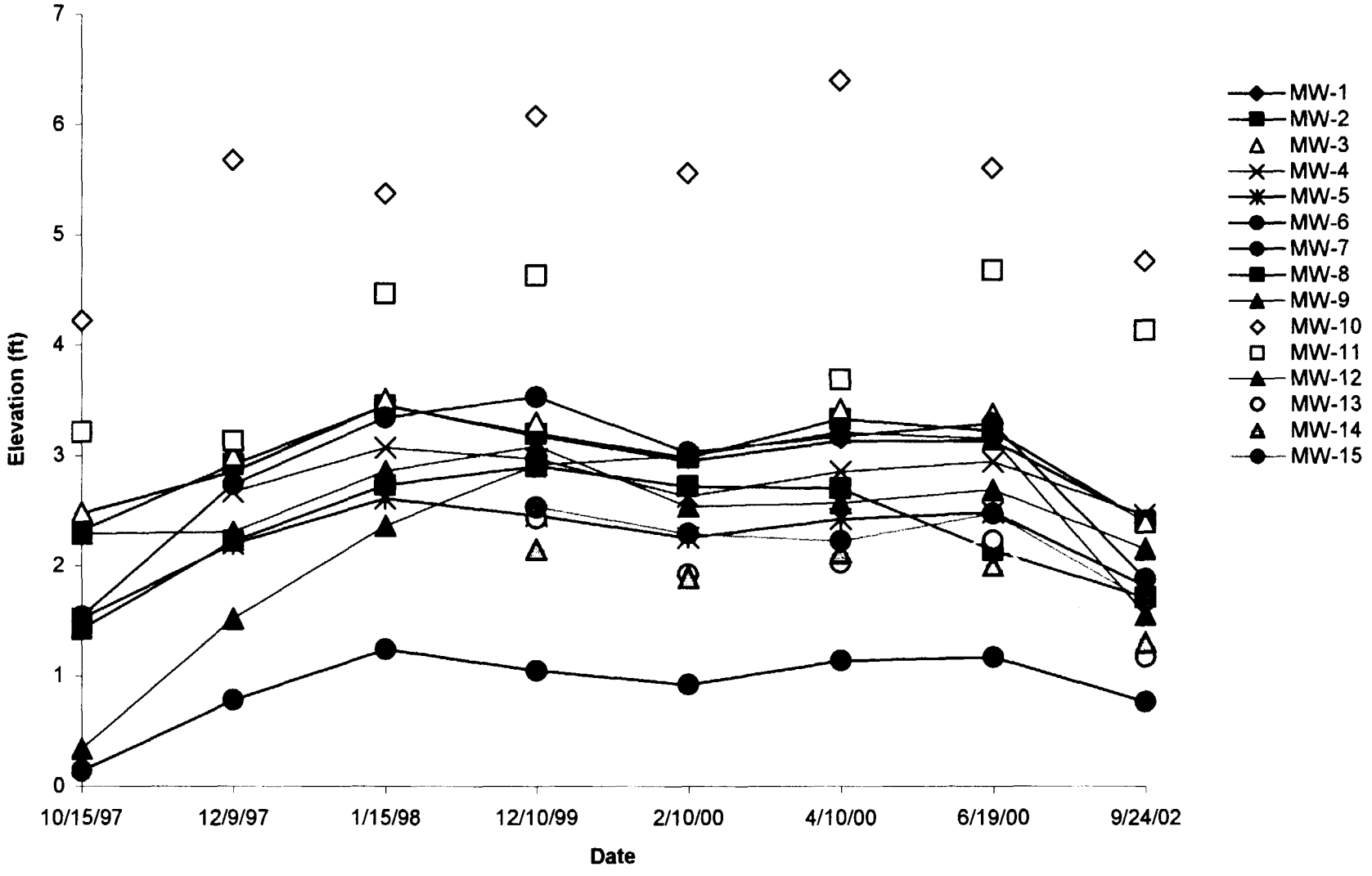

Figure 4. Groundwater surface elevation measurements, time series for each well

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Table 1. Summary of groundwater elevation measurements

Monitoring Well	Ground Elevation	Elevation of Measuring Point	October 15, 1997 Depth to Water	October 15, 1997 Groundwater Elevation	December 9, 1997 Depth to Water	December 9, 1997 Groundwater Elevation	January 15, 1998 Depth to Water	January 15, 1998 Groundwater Elevation
MW-1	8.68	11.36	8.89	2.47	8.51	2.85	7.90	3.46
MW-1A	NA	9.15	6.53	2.62	6.44	2.71	NA	NA
MW-2	10.30	12.94	10.62	2.32	10.02	2.92	9.49	3.45
MW-3	9.55	12.32	9.84	2.48	9.32	3.00	8.81	3.51
MW-4	7.90	9.89	NA	NA	7.22	2.67	6.82	3.07
MW-4A	NA	11.55	8.72	2.83	9.09	2.46	NA	NA
MW-5	8.86	10.70	9.18	1.52	8.50	2.20	8.09	2.61
MW-6	9.57	12.12	11.98	0.14	11.34	0.78	10.88	1.24
MW-7	5.35	7.19	5.65	1.54	4.45	2.74	3.85	3.34
MW-8	5.36	8.10	6.68	1.42	5.88	2.22	5.37	2.73
MW-9	4.02	6.60	6.26	0.34	5.08	1.52	4.24	2.36
MW-10	6.76	6.52	2.30	4.22	0.84	5.68	1.14	5.38
MW-11	5.06	4.83	1.62	3.21	1.70	3.13	0.36	4.47
MW-12	5.80	7.73	5.44	2.29	5.42	2.31	4.87	2.86
MW-12A		7.56	5.51	2.05	7.18	.38	NA	NA
MW-14								
MW-15								
Upstream[a]		9.13	NA	NA	10.60	- 1.47	10.77	- 1.64
Downstream[b]		9.13	NA	NA	7.58	1.55	7.56	1.57

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Table 1. (cont.)

Monitoring Well	Ground Elevation	Elevation of Measuring Point	December 10, 1999 Depth to Water[c]	December 10, 1999 Groundwater Elevation	February 10, 2000 Depth to Water	February 10, 2000 Groundwater Elevation	April 10, 2000 Depth to Water	April 10, 2000 Groundwater Elevation
MW-1	8.68	11.36	8.18	3.18	8.41	2.95	8.23	3.13
MW-1A								
MW-2	10.30	12.94	9.74	3.20	9.96	2.98	9.61	3.33
MW-3	9.55	12.32	9.02	3.30	9.29	3.03	8.90	3.42
MW-4	7.90	9.89	6.92	2.97	7.26	2.63	7.04	2.85
MW-4A								
MW-5	8.86	10.70	8.25	2.45	8.45	2.25	8.28	2.42
MW-6	9.57	12.12	11.07	1.05	11.20	0.92	10.98	1.14
MW-7	5.35	7.19	3.66	3.53	4.16	3.03	4.02	3.17
MW-8	5.36	8.10	5.20	2.90	5.38	2.72	5.40	2.70
MW-9	4.02	6.60	3.69	2.91	3.60	3.00	3.39	3.21
MW-10	6.76	6.52	0.44	6.08	0.96	5.56	0.12	6.40
MW-11	5.06	4.83	0.20	4.63	NA	NA	1.14	3.69
MW-12	5.80	7.73	4.65	3.08	5.19	2.54	5.16	2.57
MW-12A	4.46	4.07	1.64	2.43	2.15	1.92	2.05	2.02
MW-14	5.64	7.45	5.30	2.15	5.56	1.89	5.33	2.12
MW-15	4.20	4.58	2.05	2.53	2.29	2.29	2.36	2.22
Upstream[a]								
Downstream[b]								

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Table 1. (cont.)

Monitoring Well	Ground Elevation	Elevation of Measuring Point	June 19, 2000 Depth to Water	June 19, 2000 Groundwater Elevation	September 24, 2002 Depth to Water	September 24, 2002 Groundwater Elevation
MW-1	8.68	11.36	8.23	3.13	8.95	2.41
MW-1A						
MW-2	10.30	12.94	9.72	3.22	10.54	2.40
MW-3	9.55	12.32	8.94	3.38	9.93	2.39
MW-4	7.90	9.89	6.95	2.94	7.43	2.46
MW-4A						
MW-5	8.86	10.70	8.22	2.48	8.89	1.81
MW-6	9.57	12.12	10.95	1.17	11.36	0.76
MW-7	5.35	7.19	3.90	3.29	5.31	1.88
MW-8	5.36	8.10	5.96	2.14	6.39	1.71
MW-9	4.02	6.60	3.45	3.15	5.05	1.55
MW-10	6.76	6.52	0.91	5.61	1.76	4.76
MW-11	5.06	4.83	0.15	4.68	0.70	4.13
MW-12	5.80	7.73	5.04	2.69	5.58	2.15
MW-12A	4.46	4.07	1.84	2.23	2.90	1.17
MW-14	5.64	7.45	5.45	2.00	6.15	1.30
MW-15	4.20	4.58	2.11	2.47	2.90	1.68
Upstream[a]						
Downstream[b]						

Notes: All elevations in feet above mean sea level
Depth to water measurements in feet
MW-15 was converted to a flush mount type completion on 12/10/99
MW-11 was saturated with snow melt water on 2/10/00
NA - not accessible for measurement

[a] Surface water measuring point upstream of tide gate on Berry's Creek.
[b] Surface water measuring point downstream of tide gate on Berry's Creek.
[c] Post-sampling measurements.

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Table 2. Phase IA SFI groundwater analytical results with GWQS comparisons

			Sample Location and Date of Sample Collection							
Analyte	Units	NJ GWQS	MW-1 GW0302 9/24/2002	MW-2 GW0304 9/25/2002	MW-3 GW0306 9/25/2002	MW-4 GW0305 9/25/2002	MW-5 GW0303 9/25/2002	MW-6 GW0310 9/26/2002	MW-7 GW0311 9/26/2002	MW-7 (dup) GW0312 9/26/2002
Metals										
Arsenic	µg/L	8	3.21 *U*	6.67 *U*	2.52 *U*	2.82 *U*	3.01 *U*	12.2	3.55 *U*	3.33 *U*
Barium	µg/L	2,000	493	1,100	150	592	670	194	363	372
Cadmium	µg/L	4	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.831	0.851
Copper	µg/L	1,000	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*
Iron	µg/L	300	18,100	17,300	15,800	19,400	20,700	17,300	27,100	27,600
Lead	µg/L	10	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*
Manganese	µg/L	50	838	1,200	2,820	1,050	1,040	3,730	861	889
Mercury (dissolved, filtered)	µg/L	2	0.002 *U*	0.031	0.010	0.003 *U*	0.029	0.006 *U*	1.06 *J*	0.637 *J*
Mercury (total, unfiltered)	µg/L	2	0.024	0.051	0.070	0.022	0.074	0.069	6.16	5.49
Nickel	µg/L	100	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*
Thallium	µg/L	10	0.2 *U*	0.2973	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*
Vanadium	µg/L	--	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*

825840021

Table 2. (cont.)

Analyte	Units	NJ GWQS	MW-8 GW0313 9/26/2002	MW-9 GW0316 9/27/2002	MW-10 GW0315 9/27/2002	MW-11 GW0301 9/24/2002	MW-12 GW0307 9/25/2002	MW-13 GW0314 9/26/2002	MW-14 GW0309 9/26/2002	MW-15 GW0317 9/27/2002
			Sample Location and Date of Sample Collection							
Metals										
Arsenic	µg/L	8	4.89 *U*	2.83 *U*	2.9 *U*	2.23 *U*	3.25 *U*	41.5	4.42 *U*	10.9
Barium	µg/L	2,000	395	20 *U*	471	315	90.3	338	300	75.4
Cadmium	µg/L	4	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
Copper	µg/L	1,000	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*
Iron	µg/L	300	31,700	387	122	7,630	100	2,350	100 *U*	5,110
Lead	µg/L	10	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*
Manganese	µg/L	50	4,180	10 *U*	366	681	182	1,380	3,690	1,500
Mercury (dissolved, filtered)	µg/L	2	0.192	0.842	0.130	0.002 *U*	0.027	12.55	0.033	0.055
Mercury (total, unfiltered)	µg/L	2	0.583	3.86	0.406	0.017	0.049	22.91	0.035	0.345
Nickel	µg/L	100	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*
Thallium	µg/L	10	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*
Vanadium	µg/L	--	50 *U*	50 *U*	50 *U*	62.9	50 *U*	50 *U*	50 *U*	50 *U*

Note:
-- - no criterion for this analyte
U - indicates that the compound was analyzed for but not detected
J - indicates an estimated concentration
dup - duplicate sample
GWQS - Groundwater Quality Standards (NJAC 7:9-6; January 1993)
SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

825840022

Table 3. Phase IA SFI groundwater analytical results with MCL comparisons

			Sample Location and Date of Sample Collection							
			MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7 (dup)
			GW0302	GW0304	GW0306	GW0305	GW0303	GW0310	GW0311	GW0312
Analyte	Units	MCL	9/24/2002	9/25/2002	9/25/2002	9/25/2002	9/25/2002	9/26/2002	9/26/2002	9/26/2002
Metals										
Arsenic	µg/L	10	3.21 *U*	6.67 *U*	2.52 *U*	2.82 *U*	3.01 *U*	12.2	3.55 *U*	3.33 *U*
Barium	µg/L	2,000	493	1,100	150	592	670	194	363	372
Cadmium	µg/L	5	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.831	0.851
Copper	µg/L	1,300	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*
Iron	µg/L	--	18,100	17,300	15,800	19,400	20,700	17,300	27,100	27,600
Lead	µg/L	15	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*
Manganese	µg/L	--	838	1,200	2,820	1,050	1,040	3,730	861	889
Mercury (dissolved, filtered)	µg/L	2	0.002 *U*	0.031	0.010	0.003 *U*	0.029	0.006 *U*	1.06 *J*	0.637 *J*
Mercury (total, unfiltered)	µg/L	2	0.024	0.051	0.070	0.022	0.074	0.069	6.16	5.49
Nickel	µg/L	--	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*
Thallium	µg/L	2	0.2 *U*	0.2973	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*
Vanadium	µg/L	--	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*

825840023

Table 3. (cont.)

Analyte	Units	MCL	MW-8 GW0313 9/26/2002	MW-9 GW0316 9/27/2002	MW-10 GW0315 9/27/2002	MW-11 GW0301 9/24/2002	MW-12 GW0307 9/25/2002	MW-13 GW0314 9/26/2002	MW-14 GW0309 9/26/2002	MW-15 GW0317 9/27/2002
			Sample Location and Date of Sample Collection							
Metals										
Arsenic	µg/L	10	4.89 *U*	2.83 *U*	2.9 *U*	2.23 *U*	3.25 *U*	41.5	4.42 *U*	10.9
Barium	µg/L	2,000	395	20 *U*	471	315	90.3	338	300	75.4
Cadmium	µg/L	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*
Copper	µg/L	1,300	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*
Iron	µg/L	--	31,700	387	122	7,630	100	2,350	100 *U*	5,110
Lead	µg/L	15	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*
Manganese	µg/L	--	4,180	10 *U*	366	681	182	1,380	3,690	1,500
Mercury (dissolved, filtered)	µg/L	2	0.192	0.842	0.130	0.002 *U*	0.027	12.55	0.033	0.055
Mercury (total, unfiltered)	µg/L	2	0.583	3.86	0.406	0.017	0.049	22.91	0.035	0.345
Nickel	µg/L	--	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*
Thallium	µg/L	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*
Vanadium	µg/L	--	50 *U*	50 *U*	50 *U*	62.9	50 *U*	50 *U*	50 *U*	50 *U*

Note:
-- - no criterion for this analyte
U - indicates that the compound was analyzed for but not detected
J - indicates an estimated concentration
dup - duplicate sample
MCL - U.S. Environmental Protection Agency drinking water standard maximum contaminant level
SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

825840024

Table 4. Phase IA SFI groundwater analytical results for perimeter wells with SWQS comparisons

			Sample Location and Date of Sample Collection							
			MW-1	MW-3	MW-4	MW-5	MW-6	MW-8	MW-12	MW-15
		NJ	GW0302	GW0306	GW0305	GW0303	GW0310	GW0313	GW0307	GW0317
Analyte	Units	SWQS	9/24/2002	9/25/2002	9/25/2002	9/25/2002	9/26/2002	9/26/2002	9/25/2002	9/27/2002
Metals										
Arsenic	µg/L	0.017	3.21 *U*	2.52 *U*	2.82 *U*	3.01 *U*	12.2	4.89 *U*	3.25 *U*	10.9
Barium	µg/L	2,000	493	150	592	670	194	395	90.3	75.4
Cadmium	µg/L	10	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*	0.5 *U*
Copper	µg/L	--	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*	20 *U*
Iron	µg/L	--	18,100	15,800	19,400	20,700	17,300	31,700	100	5,110
Lead	µg/L	5	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*	5 *U*
Manganese	µg/L	--	838	2,820	1,050	1,040	3,730	4,180	182	1,500
Mercury (dissolved, filtered)	µg/L	0.144	0.002 *U*	0.010	0.003 *U*	0.029	0.006 *U*	0.192	0.027	0.055
Mercury (total, unfiltered)	µg/L	0.144	0.024	0.070	0.022	0.074	0.069	0.583	0.049	0.345
Nickel	µg/L	516	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*	40 *U*
Thallium	µg/L	1.7	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*	0.2 *U*
Vanadium	µg/L	--	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*	50 *U*

Note:
- -- - no criterion for this analyte
- *U* - indicates that the compound was analyzed for but not detected
- *J* - indicates an estimated concentration
- dup - duplicate sample
- SFI - supplemental field investigation
- SWQS - New Jersey Surface Water Quality Standards for freshwater (NJAC 7:9B; January 1997)

Boxed entries indicate measurements at or above the criteria value.
Shaded entries indicate detection limits at or above the criteria value.

825840025

Table 5. Phase IA SFI borehole soil analytical results with NRDCSCC comparisons

			Sample Location and Date of Sample Collection								
			B-5	B-5	B-5	B-5	B-9	B-9	B-9	B-10	B-10 (dup)
			SP0001	SP0002	SP0003	SP0004	SP0005	SP0006	SP0007	SP0013	SP0014
	Units	NJ	10/08/02	10/08/02	10/08/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02
Analyte	(dry wt.)	NRDCSCC	6 - 7 ft	7 - 8 ft	8 - 9 ft	9 - 10 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft
Conventional parameters											
Total solids	%	--	79.9	83.0	86.9	80.3	77.8	85.2	80.7	85.4	87.7
Metals											
Arsenic	mg/kg	20									
Barium	mg/kg	40,100									
Cadmium	mg/kg	100									
Chromium	mg/kg	--									
Copper	mg/kg	600									
Iron	mg/kg	--									
Lead	mg/kg	600									
Manganese	mg/kg	--									
Mercury (total)	mg/kg	270	750	128	252	12.3	240	0.21	0.09	13.3 *J*	31.7 *J*
Nickel	mg/kg	2,400									
Selenium	mg/kg	3,100									
Silver	mg/kg	4,100									
Thallium	mg/kg	2									
Zinc	mg/kg	1,500									
Volatile organic compounds											
Benzene	µg/kg	13,000									
Chlorobenzene	µg/kg	680,000									
meta & para Xylenes	µg/kg	1,000,000									
ortho-Xylene	µg/kg	1,000,000									
Toluene	µg/kg	1,000,000									

Table 5. (cont.)

Analyte	Units (dry wt.)	NJ NRDCSCC	B-10 SP0015 10/09/02 4 - 6 ft	B-10 SP0016 10/09/02 8 - 10 ft	B-11 SP0018 10/10/02 0 - 2 ft	B-11 SP0019 10/10/02 4 - 6 ft	B-11 SP0020 10/10/02 6 - 8 ft	B-12 SP0023 11/13/02 0 - 2 ft	B-12 SP0024 11/13/02 4 - 6 ft	B-13 SP0038 11/13/02 0 - 2 ft	B-13 SP0039 11/13/02 2 - 4 ft	B-13 SP0040 11/13/02 4 - 6 ft
			Sample Location and Date of Sample Collection									
Conventional parameters												
Total solids	%	--	73.1	84.7	88.5	79.0	81.1	87.1	81.0	87.5	84.4	76.7
Metals												
Arsenic	mg/kg	20										
Barium	mg/kg	40,100										
Cadmium	mg/kg	100										
Chromium	mg/kg	--										
Copper	mg/kg	600										
Iron	mg/kg	--										
Lead	mg/kg	600										
Manganese	mg/kg	--										
Mercury (total)	mg/kg	270	42.8	0.04 *U*	2.8	16.6	0.04 *U*	0.33	0.05	52.6	0.04 *U*	172
Nickel	mg/kg	2,400										
Selenium	mg/kg	3,100										
Silver	mg/kg	4,100										
Thallium	mg/kg	2										
Zinc	mg/kg	1,500										
Volatile organic compounds												
Benzene	µg/kg	13,000										
Chlorobenzene	µg/kg	680,000										
meta & para Xylenes	µg/kg	1,000,000										
ortho-Xylene	µg/kg	1,000,000										
Toluene	µg/kg	1,000,000										

825840027

Table 5. (cont.)

Analyte	Units (dry wt.)	NJ NRDCSCC	B-13 SP0041 11/13/02 6 - 8 ft	B-13 SP0042 11/13/02 8 -10 ft	B-13 SP0043 11/13/02 10 - 12 ft	B-13 SP0044 11/13/02 12 - 14 ft	B-14 SP0054 11/13/02 0 - 2 ft	B-14 SP0055 11/13/02 4 - 6 ft	B-14 SP0056 11/13/02 6 - 8 ft
			Sample Location and Date of Sample Collection						
Conventional parameters									
Total solids	%	--	78.4	78.9	83.9	83.4	79.1	82.6	80.3
Metals									
Arsenic	mg/kg	20							
Barium	mg/kg	40,100							
Cadmium	mg/kg	100							
Chromium	mg/kg	--							
Copper	mg/kg	600							
Iron	mg/kg	--							
Lead	mg/kg	600							
Manganese	mg/kg	--							
Mercury (total)	mg/kg	270	52.1	35.0	0.75	31.0	67.1	162	0.04
Nickel	mg/kg	2,400							
Selenium	mg/kg	3,100							
Silver	mg/kg	4,100							
Thallium	mg/kg	2							
Zinc	mg/kg	1,500							
Volatile organic compounds									
Benzene	µg/kg	13,000							
Chlorobenzene	µg/kg	680,000							
meta & para Xylenes	µg/kg	1,000,000							
ortho-Xylene	µg/kg	1,000,000							
Toluene	µg/kg	1,000,000							

Notes:
- -- - no criterion for this analyte
- *U* - indicates that the compound was analyzed for but not detected
- *J* - indicates an estimated concentration
- dup - duplicate sample
- NRDCSCC - Non-Residential Direct Contact Soil Cleanup Criteria (NJAC 7:26; May 1999)
- SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

825840028

Table 6. Phase IA SFI offsite borehole soil analytical results with RDCSCC comparisons

			Sample Location and Date of Sample Collection								
			B-9	B-9	B-9	B-10	B-10 (dup)	B-10	B-10	B-11	B-11
			SP0005	SP0006	SP0007	SP0013	SP0014	SP0015	SP0016	SP0018	SP0019
	Units	NJ	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	10/10/02	10/10/02
Analyte	(dry wt.)	RDCSCC	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft	0 - 2 ft	4 - 6 ft
Conventional parameters											
Total solids	%	--	77.8	85.2	80.7	85.4	87.7	73.1	84.7	88.5	79.0
Metals											
Mercury (total)	mg/kg	14	240	0.21	0.09	13.3 *J*	31.7 *J*	42.8	0.04 *U*	2.8	16.6

825840029

Table 6. (cont.)

Analyte	Units (dry wt.)	NJ RDCSCC	Sample Location and Date of Sample Collection								
			B-11 SP0020 10/10/02 6 - 8 ft	B-12 SP0023 11/13/02 0 - 2 ft	B-12 SP0024 11/13/02 4 - 6 ft	B-13 SP0038 11/13/02 0 - 2 ft	B-13 SP0039 11/13/02 2 - 4 ft	B-13 SP0040 11/13/02 4 - 6 ft	B-13 SP0041 11/13/02 6 - 8 ft	B-13 SP0042 11/13/02 8 - 10 ft	B-13 SP0043 11/13/02 10 - 12 ft
Conventional parameters											
Total solids	%	--	81.1	87.1	81.0	87.5	84.4	76.7	78.4	78.9	83.9
Metals											
Mercury (total)	mg/kg	14	0.04 *U*	0.33	0.05	52.6	0.04 *U*	172	52.1	35.0	0.75

825840030

Table 6. (cont.)

Analyte	Units (dry wt.)	NJ RDCSCC	Sample Location and Date of Sample Collection: B-13 SP0044 11/13/02 12 - 14 ft	B-14 SP0054 11/13/02 0 - 2 ft	B-14 SP0055 11/13/02 4 - 6 ft	B-14 SP0056 11/13/02 6 - 8 ft
Conventional parameters						
Total solids	%	--	83.4	79.1	82.6	80.3
Metals						
Mercury (total)	mg/kg	14	31.0	67.1	162	0.04

Notes:

--	-	no criterion for this analyte
U	-	indicates that the compound was analyzed for but not detected
J	-	indicates an estimated concentration
dup	-	duplicate sample
RDCSCC	-	Residential Direct Contact Soil Cleanup Criteria (NJAC 7:26; May 1999)
SFI	-	supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

Table 7. Phase IA SFI borehole soil analytical results with SSL comparisons

			Sample Location and Date of Sample Collection								
			B-5	B-5	B-5	B-5	B-9	B-9	B-9	B-10	B-10 (dup)
			SP0001	SP0002	SP0003	SP0004	SP0005	SP0006	SP0007	SP0013	SP0014
	Units		10/08/02	10/08/02	10/08/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02	10/09/02
Analyte	(dry wt.)	SSL	6 - 7 ft	7 - 8 ft	8 - 9 ft	9 - 10 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft
Conventional parameters											
Total solids	%	--	79.9	83.0	86.9	80.3	77.8	85.2	80.7	85.4	87.7
Metals											
Arsenic	mg/kg	1									
Barium	mg/kg	82									
Cadmium	mg/kg	0.4									
Chromium	mg/kg	2									
Copper	mg/kg	--									
Iron	mg/kg	--									
Lead	mg/kg	400									
Manganese	mg/kg	--									
Mercury (total)	mg/kg	0.1	750	128	252	12.3	240	0.21	0.09	13.3 *J*	31.7 *J*
Nickel	mg/kg	7									
Selenium	mg/kg	0.3									
Silver	mg/kg	2									
Thallium	mg/kg	0.04									
Zinc	mg/kg	620									

825840032

Table 7. (cont.)

Analyte	Units (dry wt.)	SSL	B-10 SP0015 10/09/02 4 - 6 ft	B-10 SP0016 10/09/02 8 - 10 ft	B-11 SP0018 10/10/02 0 - 2 ft	B-11 SP0019 10/10/02 4 - 6 ft	B-11 SP0020 10/10/02 6 - 8 ft	B-12 SP0023 11/13/02 0 - 2 ft	B-12 SP0024 11/13/02 4 - 6 ft	B-13 SP0038 11/13/02 0 - 2 ft	B-13 SP0039 11/13/02 2 - 4 ft
			Sample Location and Date of Sample Collection								
Conventional parameters											
Total solids	%	--	73.1	84.7	88.5	79.0	81.1	87.1	81.0	87.5	84.4
Metals											
Arsenic	mg/kg	1									
Barium	mg/kg	82									
Cadmium	mg/kg	0.4									
Chromium	mg/kg	2									
Copper	mg/kg	--									
Iron	mg/kg	--									
Lead	mg/kg	400									
Manganese	mg/kg	--									
Mercury (total)	mg/kg	0.1	42.8	0.04 *U*	2.8	16.6	0.04 *U*	0.33	0.05	52.6	0.04 *U*
Nickel	mg/kg	7									
Selenium	mg/kg	0.3									
Silver	mg/kg	2									
Thallium	mg/kg	0.04									
Zinc	mg/kg	620									

825840033

Table 7. (cont.)

Analyte	Units (dry wt.)	SSL	B-13 SP0040 11/13/02 4 - 6 ft	B-13 SP0041 11/13/02 6 - 8 ft	B-13 SP0042 11/13/02 8 -10 ft	B-13 SP0043 11/13/02 10 - 12 ft	B-13 SP0044 11/13/02 12 - 14 ft	B-14 SP0054 11/13/02 0 - 2 ft	B-14 SP0055 11/13/02 4 - 6 ft	B-14 SP0056 11/13/02 6 - 8 ft
			Sample Location and Date of Sample Collection							
Conventional parameters										
Total solids	%	--	76.7	78.4	78.9	83.9	83.4	79.1	82.6	80.3
Metals										
Arsenic	mg/kg	1								
Barium	mg/kg	82								
Cadmium	mg/kg	0.4								
Chromium	mg/kg	2								
Copper	mg/kg	--								
Iron	mg/kg	--								
Lead	mg/kg	400								
Manganese	mg/kg	--								
Mercury (total)	mg/kg	0.1	172	52.1	35.0	0.75	31.0	67.1	162	0.04
Nickel	mg/kg	7								
Selenium	mg/kg	0.3								
Silver	mg/kg	2								
Thallium	mg/kg	0.04								
Zinc	mg/kg	620								

Notes:
-- - no criterion for this analyte
U - indicates that the compound was analyzed for but not detected
J - indicates an estimated concentration
dup - duplicate sample
SFI - supplemental field investigation
SSL - soil screening level for migration to groundwater with dilution attenuation factor of 1 (U.S. EPA 1996)

Boxed entries indicate measurements at or above the criteria value.
Shaded entries indicate detection limits at or above the critia value.

825840034

Appendix A

Laboratory Analytical Data

825840035

CEBAM ANALYTICAL, INC.

RESEARCH AND TESTING CHEMISTS
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Seattle, WA 98103 Fax: (206) 632-1947
Email: liang@cebam.net , pang@cebam.net
Web site: www.cebam.net

OCT 1 1 2002

October 2, 2002

Mr. David Lamadrid
Exponent, Inc.
4000 Kruse Way Place, Bldg 2, Suite 285
Lake Oswego, OR 98035

Dear Dr. Henry:

Re: Exponent Exp-02-02 Analytical Report

Enclosed please find the Exponent Exp-02-02 Analytical Report for analysis of 34 water samples received on September 26 and 28, 2002.

Please pay attention to analytical problems described in the case narrative. For future projects, if you could estimate concentration ranges to be similar to this project, please advise us so that we can pre-analyze samples using a less sensitive method prior to analysis using EPA 1631. This would be a great help to prevent the system from contamination and get samples analyzed at optimal range of EPA 1631.

If you have any questions, please contact me.

Thank you for your projects.

Sincerely,

Lian Liang, Ph.D.
Senior Research Scientist

Enclosures:
Case narrative
Table of results
Analytical sheet
Analyzer computer printouts
COC forms

825840036

Analysis of Water Samples for Total Mercury (THg) by EPA 1631

A case narrative for Exp-02-02 Report
Project: Wood-Ridge / 8600B3N.005
Lian Liang, Cebam Analytical, October 2, 2002

1. Description and processing of samples

Thirty four water samples were received in two batches in good conditions on September 26 and 28, 2002. The inside temperature of coolers was below 2C. Samples were prepared at the same day of sample receipt, and analyzed on September 30 and October 1, 2002. Results were reported on October 2, 2002.

Most of samples contain a lot of yellow, or orange precipitate as received.

2. Sample preparation and analysis

Samples were prepared by adding BrCl directly into sample bottles. After adding BrCl, precipitate was dissolved, while formation of a lot of gas bubbles was observed. Samples were allowed to stay at room temperature for 2 days for digestion, and shaken periodically to free gas bubbles.

The digestates were analyzed by EPA 1631, oxidation, $SnCl_2$ reduction, purge, trap, and CVAFS detection.

3. QA measurements:

WS-68 PE water sample was used for QA purpose.

Matrix spike (MS), and duplicate samples were prepared and analyzed for monitoring the accuracy and precision according to EPA 1631. In addition, ongoing precision samples, lowest standard (50 pg), bubbler blanks were prepared and analyzed as requested by EPA method 1631for analysis of THg.

4. Acceptance of results

All results of QC measurements were acceptable.

5. Contamination

Method blank was found to be lower than method detection limit, indicating no significant contamination was made during analyses.

6. Analytical problems

Some samples were unexpectedly high in Hg resulting in contamination of the analytical system. It took 3 hours to decontaminate the system and get it back to work. Since Hg concentrations of samples ranged from sub-ppt to tens of ppb, to protect the system from contamination and get samples analyzed at the optimal concentration range of the method, all samples were pre-analyzed using less sensitive EPA 245.7, and then analyzed using appropriate sample sizes by EPA 1631. Some low concentration samples were analyzed using about 100 mL while the highest concentration sample was analyzed using 0.1 mL only.

Analytical Sheet							
Project: Exponent-02-02-THg							
Date: 10/1/02, Sample received on 9/26-28/02							
CF: 0.286+/-0.030(10.5%)							
BB: 75+/-30							
Sample ID		Vol. Anal.,mL	BrCl, pg	PA	CF	THg, ng/L	% Rec.
1000	PG			3384	0.302		
50	PG			291	0.231		
100	PG			412	0.297		
500	PG			1872	0.278		
2000	PG			6361	0.318		
4000	PG			14002	0.287		
EXP-02-02-15		81.2	30	471		1.03	
BB				120			
OPR1		100	20	1659		4.33	86.6
BB				61			
EXP-02-02-7		63.4	20	7011		30.97	
EXP-02-02-8		63.5	20	11378		50.59	
EXP-02-02-9		67.4	20	751		2.57	
EXP-02-02-10		68.2	20	5488		22.41	
EXP-02-02-15		106.3	40	664		1.21	
EXP-02-02-16		104.4	40	455		0.66	
CF: 0.392+/-0.011(2.7%)							
EXP-02-02-11		80.8	30	2127		9.58	
6000	PG			16077	0.375		
EXP-02-02-1		84.3	30	654		2.34	
EXP-02-02-2		89.3	30	4087		17.28	
EXP-02-02-33		98.6	40	>2M			
15000	PG			38048	0.395		
EXP-02-02-3		83.8	30	476		1.52	
EXP-02-02-4		84.5	30	5247		23.64	
EXP-02-02-5		86.2	30	6480		28.78	
EXP-02-02-6		80	30	15249		73.98	
EXP-02-02-17		95.6	40	8322		33.40	
EXP-02-02-18		88.7	30	8090		35.08	
EXP-02-02-19		93.4	40	1552		5.77	
EXP-02-02-20		83.9	30	14922		69.01	
EXP-02-02-21		96.3	40	>2M			
EXP-02-02-22		92.7	40	>2M			
BB				63			
MB		100	40	164		-0.05	
EXP-02-02-30		0.1		5919		22908.48	
EXP-02-02-29		0.2		6478		12549.88	
EXP-02-02-24		0.5		7081		5492.70	
EXP-02-02-34		0.5		4994		3856.50	
EXP-02-02-22		0.5		7934		6161.46	
EXP-02-02-33		3		6518		841.89	
EXP-02-02-21		3		8211		1063.10	
EXP-02-02-27		4		6028		583.39	
EXP-02-02-32		5		5259		406.43	
EXP-02-02-36		5		4474		344.88	
EXP-02-02-23		5		8205		637.39	

Sample ID		Vol. Anal.,mL	BrCl, pg	PA	CF	THg, ng/L	% Rec.
EXP-02-02-25		10		4965		191.69	
EXP-02-02-35		30	10	4336		55.34	
EXP-02-02-20		30	10	5030		64.41	
EXP-02-02-17		50	15	3997		30.45	
EXP-02-02-18		50	15	4214		32.15	
EXP-02-02-14		30	10	3854		49.05	
EXP-02-02-13		50	15	3526		26.76	
EXP-02-02-25+	200	10		9775		380.24	94.3
EXP-02-02-27+	500	4		10892		1060.07	95.3
EXP-02-02-1+	10.2	98	40	2948		11.08	85.7
EXP-02-02-3+	10.38	96.3	40	2972		11.38	95
EXP-02-02-31		15		5060		130.27	
EXP-02-02-12		50	15	9053		70.09	
WS-68	8.93ug/L	0.2		4520		8712.20	97.8
OPR2		100	20	1387		4.94	98.8
BB				55			
1000	PG			2569	0.401		
1000	PG			2577	0.400		
1000	PG			2650	0.388		
					0.396+/-0.007(1.8%)		

Analytical Report to Exponent

Project: Wood-Ridge / 8600B3N.005

Water -Total mercury (THg) by EPA 1631

Sample received: September 26-28, 2002

Prepared and analyzed: September 26-October 1, 2002

Report NO.: Exp-02-02 Report date: October 2, 2002

Prepared by Lian Liang Ph. D., Cebam Analytical, Inc.

Sample ID-Tag No.	Lab ID	THg, ng/L as Hg	Dup	Mean	RPD	MS	Spike level	Rec., %
GW0301-47504	EXP-02-02-01	2.34				11.08	10.2	85.7
GW0301-47505	EXP-02-02-02	17.28						
GW0302-47508	EXP-02-02-03	1.52				11.38	10.38	95
GW0302-47509	EXP-02-02-04	23.64						
GW0303-47512	EXP-02-02-05	28.78						
GW0303-47513	EXP-02-02-06	73.98						
GW0304-47518	EXP-02-02-07	30.97						
GW0304-47519	EXP-02-02-08	50.59						
GW0305-47522	EXP-02-02-09	2.57						
GW0305-47523	EXP-02-02-10	22.41						
GW0306-47526	EXP-02-02-11	9.58						
GW0306-47527	EXP-02-02-12	70.09						
GW0307-47530	EXP-02-02-13	26.76						
GW0307-47531	EXP-02-02-14	49.05						
GW0308-47536	EXP-02-02-15	1.21	1.03	1.12	15.9			
GW0308-47537	EXP-02-02-16	0.66						
GW0309-45740	EXP-02-02-17	33.40	30.45	31.92	9.2			
GW0309-45741	EXP-02-02-18	35.08	32.15	33.62	8.7			
GW0310-45744	EXP-02-02-19	5.77						
GW0310-45745	EXP-02-02-20	69.01	64.41	66.71	6.9			
GW0311-45748	EXP-02-02-21	1063.10						
GW0311-45749	EXP-02-02-22	6161.46						
GW0312-45752	EXP-02-02-23	637.39						

825840040

Sample ID-Tag No.	Lab ID	THg, ng/L as Hg	Dup	Mean	RPD	MS	Spike level	Rec., %
GW0312-45753	EXP-02-02-24	5492.70						
GW0313-45758	EXP-02-02-25	191.69				380.24	200	94.3
GW0313-45759	EXP-02-02-26	For MS						
GW0313-45760	EXP-02-02-27	583.39				1060.07	500	95.3
GW0313-45761	EXP-02-02-28	For MS						
GW0314-45764	EXP-02-02-29	12549.88						
GW0314-45765	EXP-02-02-30	22908.48						
GW0315-45768	EXP-02-02-31	130.27						
GW0315-45769	EXP-02-02-32	406.43						
GW0316-45772	EXP-02-02-33	841.89						
GW0316-45773	EXP-02-02-34	3856.50						
GW0317-45776	EXP-02-02-35	55.34						
GW0317-45777	EXP-02-02-36	344.88						
	OPR1	4.33					5.0	86.6
	OPR2	4.94					5.0	98.8
	WS-68	8712.20					8930	97.8
	MB	<0.2						
	MDL	0.2						

CHAIN OF CUSTODY RECORD/ANALYSIS REQUEST FORM

Exponent

Environmental Group

Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Project: (Name and Number) Wood-Ridge / 8600B3N.005

Exponent Contact: Betsy Henry Office: Albany NY

Ship to: CEBAM Analytical, Inc.
3927 Aurora Ave N.
Seattle, WA 98103

Lab Contact/Phone: Ms. Lian Liang / 206-632-9097

Samplers: Rick Jensen / Jerome Usente

Analyses Requested

Sample No.	Tag No.	Date	Time	Matrix	EPA 1631 Total Mercury					LAB ID	Extra Container	Archive	Remarks
GW0308	45736	26-Sep-02	0745	GW	X					Exp-02-02	-15		filtered
↓	45737		↓		X						-16		unfiltered
GW0309	45740		1240		X						-17		filtered
↓	45741		↓		X						-18		unfiltered
GW0310	45744		1335		X						-19		filtered
↓	45745		↓		X						-20		unfiltered
GW0311	45748		1705		X						-21		filtered
↓	45749		↓		X						-22		unfiltered
GW0312	45752		1715		X						-23		filtered
↓	45753		↓		X						-24		unfiltered
GW0313	45758		1755		X						-25		filtered
	45759										-26	X	↓ Use for MS, if required
	45760				X						-27		unfiltered
↓	45761		↓								-28	X	↓ Use for MS
GW0314	45764		1940		X						-29		filtered
↓	45765	↓	↓		X						-30		unfiltered
GW0315	45768	27-Sep-02	1025		X						-31		filtered
↓	45769		↓		X						-32		unfiltered
GW0316	45772		1100		X						-33		filtered
↓	45773	↓	↓	↓	X					↓	-34		unfiltered

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 27-Sep-02 1900 Received by: FedEx (Signature) Date/Time: 27-Sep-02 1900

Relinquished by: (Signature) Date/Time: Received by: P. Pang (Signature) Date/Time: 9-28-02 1140

825840042

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

3220

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Exponent

Project: (Name and Number) Wood-Ridge / 8600B3N.005

Exponent Contact: Betsy Henry Office: Albany NY

Ship to: CERAM Analytical, Inc.
3927 Aurora Ave N.
Seattle, WA 98103

Lab Contact/Phone: Ms. Liam Liang / 206-632-9097

Samplers: Rick Jensen / Jerome Lopez

Analyses Requested

Sample No.	Tag No.	Date	Time	Matrix	EPA 1631 Total Mercury					LAB ID	Extra Container	Archive	Remarks
GW0317	45776	27-Sep-02	1315	GW	X					Exp-02-02	-35		filtered
↓	45777	↓	↓	↓	X					↓	-36		unfiltered

Liam Liang 27-Sep-02

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: Liam Liang (Signature) Date/Time: 27-Sep-02 1900 Received by: FedEX (Signature) Date/Time: 27-Sep-02 1900

Relinquished by: (Signature) Date/Time: Received by: P. Parry (Signature) Date/Time: 9-28-02 1140

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

825840043

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CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Page ___ of ___

Exponent

Project: (Name and Number) Wood-Ridge / 8600B3N.005

Exponent Contact: Betsy Henry Office: NY (Albany)

Ship to: CEBAM Analytical, Inc.
3927 Aurora Ave. N.
Seattle, WA 98103

Lab Contact/Phone: Ms. Lian Liang / 206-632-9097

Samplers: Rick Jensen / Jerome Ventz

Environmental Group: Bellevue, WA (425) 643-9803; Boston, MA (781) 466-6681; Boulder, CO (303) 444-7270; Portland, OR (503) 636-4338; Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix	EPA 1631 Total Mercury						Extra Container	Archive	Remarks
GW0301	47504	24-Sep-02	~~1715~~ 1220	GW	X								EXP-02-02-1
↓	47505	↓	↓	↓	X								2
GW0302	47508	↓	1720	↓	X								3
↓	47509	↓	↓	↓	X								4
GW0303	47512	25-Sep-02	1000	↓	X								5
↓	47513	↓	↓	↓	X								6
GW0304	47518	↓	1230	↓	X								7
↓	47519	↓	↓	↓	X								8
GW0305	47522	↓	1405	↓	X								9
↓	47523	↓	↓	↓	X								10
GW0306	47526	↓	1720	↓	X								11
↓	47527	↓	↓	↓	X								12
GW0307	47530	↓	1750	↓	X								13
↓	47531	↓	↓	↓	X								14

Analyses Requested

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes _____

Priority: ☒ Normal ☐ Rush Rush time period _____

Shipped via: ☒ FedEx/UPS ☐ Courier Other _____

Condition of Samples Upon Receipt: _____

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 2015/25-Sep-02 Received by: FedEx (Signature) Date/Time: 2015 25-Sep-02

Relinquished by: _____ (Signature) Date/Time: _____ Received by: P. Pam (Signature) Date/Time: 9-26-02/0930

Temp Blank = 4.3°C

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

825840044

3217

Columbia Analytical Services inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY

October 25, 2002

Mr. Dave Lamadrid
Exponent
4000 Kruseway Place
Bldg 2, Suite 285
Lake Oswego, OR 97035

PROJECT:WOOD-RIDGE, NJ
Submission #:R2214005

Dear Mr. Lamadrid:

Enclosed are the analytical results of the analyses requested. The analytical data was provided to you on 10/24/02 per a Facsimile transmittal. All data has been reviewed prior to report submission.

Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael K. Perry

Michael Perry
Laboratory Director

Enc.

825840045

1 Mustard St. • Suite 250 • Rochester, NY 14609 • Tele:(585)288-5380 • Fax:(585)288-8475

Columbia Analytical Services Inc.

1 Mustard ST.
Suite 250
Rochester, NY 14609
(585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent
Project Reference: WOOD-RIDGE, NJ
Lab Submission # : R2214005
Project Manager : Michael Perry
Reported : 10/25/02

Report Contains a total of 144 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal.

SDG NARRATIVE

CASE NARRATIVE

COMPANY: Exponent
Project: Wood-Ridge, NJ
SDG#: GW0301
SUBMISSION #: R2214005

NYS DEC water samples were collected the week of 09/24/02 –09/27/02 and received at CAS in good condition on 09/28/02. See CAS CLP Batching sheets for a cross-reference between Client ID and CAS Job # and analyses requested. A NJ Reduced Deliverables package has been provided.

METALS ANALYSIS

Seventeen water samples were analyzed for a site-specific list of (7) Total Metals using SW-846 ICP method 6010B.

The initial and continuing calibration criteria were met for all analytes.

The matrix spike and duplicate analyses was performed on sample GW0313. The blank spike recoveries (LCS) were all within QC limits of 80 – 120 %. All Matrix Spike Recoveries were within QC limits of 75 – 125 %.. The Spiked Sample Recovery for Iron could not be accurately determined since the amount detected in the sample was greater than four times the spike amount added. The % RPD's from the duplicate analyses were all within QC limits.

No other analytical or QC problems were encountered.

SDG #: GW0301
SUBMISSION R2214005
CLIENT: Exponent
CLIENT REP: Michael Perry
PROJECT: WOOD-RIDGE, NJ

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y_x__ N____
DATE: 10/02/02
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 10/26/02
PROTOCOL: NJ Reduced
SHIPPING No.:
SUMMARY PKG: Y_x___ N

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS	% SOLIDS	REMARKS SAMPLE CONDITION
588686	GW0301	WATER	METALS BY 6010B	9/24/02	9/28/02			
588687	GW0302	WATER	METALS BY 6010B	9/24/02	9/28/02			
588688	GW0303	WATER	METALS BY 6010B	9/25/02	9/28/02			
588689	GW0304	WATER	METALS BY 6010B	9/25/02	9/28/02			
588690	GW0305	WATER	METALS BY 6010B	9/25/02	9/28/02			
588691	GW0306	WATER	METALS BY 6010B	9/25/02	9/28/02			
588692	GW0307	WATER	METALS BY 6010B	9/25/02	9/28/02			
588693	GW0308	WATER	METALS BY 6010B	9/26/02	9/28/02			
588694	GW0309	WATER	METALS BY 6010B	9/26/02	9/28/02			
588695	GW0310	WATER	METALS BY 6010B	9/26/02	9/28/02			
588696	GW0311	WATER	METALS BY 6010B	9/26/02	9/28/02			
588697	GW0312	WATER	METALS BY 6010B	9/26/02	9/28/02			
588698	GW0313 *QC	WATER	METALS BY 6010B	9/26/02	9/28/02			
588699	GW0314	WATER	METALS BY 6010B	9/26/02	9/28/02			
588700	GW0315	WATER	METALS BY 6010B	9/27/02	9/28/02			
588701	GW0316	WATER	METALS BY 6010B	9/27/02	9/28/02			
588702	GW0317	WATER	METALS BY 6010B	9/27/02	9/28/02			
			BA - 20 UG/L					
			CU - 20 UG/L					
			FE - 100 UG/L					
			MN - 10 UG/L					
			NI - 40 UG/L					
			V - 50 UG/L					
			PB - 5 UG/L					

0004

Columbia Analytical Services INC.
An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

QUALITY ETHICS SERVICE
ACL Environmental Sciences

Effective 6/28/2002

INORGANIC QUALIFIERS

C (Concentration) qualifier –

- B - if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).
- U - if the analyte was analyzed for, but not detected

Q qualifier - Specified entries and their meanings are as follows:

- E - The reported value is estimated because of the presence of interference.
- J - Estimated Value
- M - Duplicate injection precision not met.
- N - Spiked sample recovery not within control limits.
- S - The reported value was determined by the Method of Standard Additions (MSA).
- W - Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
- * - Duplicate analysis not within control limits.
- + - Correlation coefficient for the MSA is less than 0.995.

M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
NELAP Accredited
New York ID # 10145
New Jersey ID # NY004
New Hampshire ID # 294100 A/B
Rhode Island ID # 158
South Carolina ID #91012
West Virginia ID # 292

CHAINS OF CUSTODY
INTERNAL CHAINS

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Project: (Name and Number) Wood-Ridge 8600B3N.005

Exponent Contact: Betsy Henry Office: Albany NY

Ship to: Columbia Analytical Services
1 Mustard Street, Suite 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry 585-288-5380

Samplers: Rick Jensen / Jerome Wentz

Exponent
Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix	Analyses Requested: EPA 6010/7000 Total Ba, Cu, Fe, Mn, Ni, V, Pb						Extra Container	Archive	Remarks
GW0301	47502	24-Sep-02	1220	GW	X								Note: All samples are unfiltered.
GW0302	47507	↓	1720		X								
GW0303	47511	25-Sep-02	1000		X								
GW0304	47517		1230		X								
GW0305	47521		1405		X								
GW0306	47525		1720		X								
GW0307	47529	↓	1750		X								
GW0308	47533	26-Sep-02	0745		X								
GW0309 22-Sep	457389		1240		X								
GW0310	45743		1335		X								
GW0311	45747		1705		X								
GW0312	45751		1715		X								
GW0313	45756		1755		X								
GW0314	45763	↓	1940		X								
GW0315	45767	27-Sep-02	1025		X								
GW0316	45771		1100		X								
GW0317	45775	↓	1315	↓	X								
GW0313	45757	26-Sep-02	1755	GW							X		Please use for MS

[signature] 27-Sep-02

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period R22-14005

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt: 5°C

Custody Seal Intact: ☒ Yes ☐ No ☐ None

Relinquished by: [signature] (Signature) Date/Time: 27-Sep-02 1900 Received by: FedEx (Signature) Date/Time: 27-Sep-02 1900

Relinquished by: (Signature) Date/Time: Received by: [signature] CAS (Signature) Date/Time: 9/28/02 1030

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Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

3218

Cooler Receipt And Preservation Check Form

Project/Client Exponent Submission Number R2-14005.

Cooler received on 9/02 by: 9/28/02 COURIER: CAS UPS FEDEX CD&L CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did any VOA vials have significant air bubbles? YES NO N/A
5. Were **Ice** or **Ice packs** present? YES NO
6. Where did the bottles originate? CAS/ROC, ~~CLIENT~~ 9/02
7. Temperature of cooler(s) upon receipt: 5°

Is the temperature within 0° - 6° C?:	Yes	Yes	Yes	Yes	Yes
If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 9/28/02 1105

Thermometer ID: 161 or IR GUN Reading From: Temp Blank or Sample Bottle

If out of Temperature, Client Approval to Run Samples _____

Cooler Breakdown: Date: 9-30-02 by: AE

1. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3	✓				
2	H_2SO_4					
Residual Chlorine (+/-)	for TCN & Phenol					
5-9**	P/PCBs (608 only)					

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

**If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

Other Comments:

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Chain of Custody

Submission: R2214005 **Client:**

Lab ID: 588686 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886861

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:16	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588687 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886871

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:16	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588688 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886881

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:16	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588689 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886891

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:16	tmccarth	Metals	LTS	Storage	☐

Chain of Custody

Submission: R2214005 **Client:**

Lab ID: 588690 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886901

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588691 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886911

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588692 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886921

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588693 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886931

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Chain of Custody

Submission: R2214005 **Client:**

Lab ID: 588694 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886941

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588695 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886951

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588696 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886961

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588697 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886971

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Chain of Custody

Submission: R2214005 **Client:**

Lab ID: 588698 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886981

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Container: 5886982

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588699 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5886991

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588700 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5887001

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Chain of Custody

Submission: R2214005 **Client:**

Lab ID: 588701 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5887011

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

Lab ID: 588702 **Matrix** WATER

Received into CAS-Rochester Custody: 9/28/02 10:30:00 A

Container: 5887021

Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	☐
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	☐
10/14/02 14:17	tmccarth	Metals	LTS	Storage	☐

SAMPLE DATA

METALS
COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ontract: R2214005 SDG No.: GW0301

ab Code: Case No.: SAS No.:

OW No.: SW846 CLP-M Client: Exponent

Sample No.	Lab Sample ID.
GW0301	588686
GW0302	588687
GW0303	588688
GW0304	588689
GW0305	588690
GW0306	588691
GW0307	588692
GW0308	588693
GW0309	588694
GW0310	588695
GW0311	588696
GW0312	588697
GW0313	588698
GW0313D	588698D
GW0313S	588698S
GW0314	588699
GW0315	588700
GW0316	588701
GW0317	588702

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: See Attached Case Narrative

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Michael K. Perry Name: Michael K. Perry

Date: 10/25/02 Title: Laboratory Manager

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0301

Contract: R2214005

Lab Code: Case No.: SAS No.: SDG NO.: GW0301

Matrix (soil/water): WATER Lab Sample ID: 588686

Level (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	315			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	7630			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	681			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	62.9			P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

0016

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METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0302

ontract: R2214005

ab Code: Case No.: SAS No.: SDG NO.: GW0301

atrix (soil/water): WATER Lab Sample ID: 588687

evel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	493			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	18100			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	838			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

olor Before: YELLOW Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0303

tract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588688

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	670			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	20700			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	1040			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0304

ntract: R2214005

o Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588689

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	1100			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	17300			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	1200			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0305

tract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

rix (soil/water): WATER Lab Sample ID: 588690

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	592			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	19400			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	1050			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0306

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588691

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	150			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	15800			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	2820			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

olor Before: YELLOW Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0307

ntract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588692

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	90.3			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	100			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	182			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

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METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0308

ontract: R2214005

ab Code: Case No.: SAS No.: SDG NO.: GW0301

atrix (soil/water): WATER Lab Sample ID: 588693

evel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	20.0	U		P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	100	U		P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	10.0	U		P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

olor Before: YELLOW Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0309

ract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

rix (soil/water): WATER Lab Sample ID: 588694

el (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	300			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	100	U		P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	3690			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

or Before: YELLOW Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

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METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0310

ontract: R2214005

.b Code: Case No.: SAS No.: SDG NO.: GW0301

.trix (soil/water): WATER Lab Sample ID: 588695

:vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	194			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	17300			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	3730			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

olor Before: YELLOW Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0311

ract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

rix (soil/water): WATER Lab Sample ID: 588696

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	363			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	27100			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	861			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

or Before: YELLOW Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

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0026

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0312

ɔntract: R2214005

ıb Code: Case No.: SAS No.: SDG NO.: GW0301

ıtrix (soil/water): WATER Lab Sample ID: 588697

ɜvel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	372			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	27600			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	889			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

:olor Before: YELLOW Clarity Before: CLEAR Texture:

:olor After: COLORLESS Clarity After: CLEAR Artifacts:

:omments:

0027

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0313

tract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

rix (soil/water): WATER Lab Sample ID: 588698

el (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	395			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	31700			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	4180			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

or Before: YELLOW Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0314

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588699

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	338			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	2350			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	1380			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

olor Before: YELLOW Clarity Before: CLEAR Texture:

olor After: COLORLESS Clarity After: CLEAR Artifacts:

omments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0315

Contract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

Matrix (soil/water): WATER Lab Sample ID: 588700

Level (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	471			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	122			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	366			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0316

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Lab Sample ID: 588701

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	20.0	U		P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	387			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	10.0	U		P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0317

tract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

rix (soil/water): WATER Lab Sample ID: 588702

vel (low/med): LOW Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	75.4			P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	5110			P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	1500			P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	U		P

lor Before: YELLOW Clarity Before: CLEAR Texture:

lor After: COLORLESS Clarity After: CLEAR Artifacts:

mments:

0032

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METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214005

ab Code: Case No.: SAS No.: SDG NO.: GW0301

nitial Calibration Source: PE PURE

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Barium	10000.0	10171.34	101.7	10000.0	10113.63	101.1	10278.54	102.8	P
Copper	1250.0	1229.23	98.3	1250.0	1243.28	99.5	1239.99	99.2	P
Iron	5000.0	4907.94	98.2	5000.0	4979.40	99.6	4968.15	99.4	P
Lead	500.0	495.96	99.2	500.0	499.06	99.8	499.76	100.0	P
Manganese	750.0	756.50	100.9	750.0	754.92	100.7	773.13	103.1	P
Nickel	2000.0	1996.94	99.8	2000.0	2012.47	100.6	2018.79	100.9	P
Vanadium	2500.0	2443.94	97.8	2500.0	2463.81	98.6	2468.17	98.7	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

tract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

cial Calibration Source:

tinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Barium				10000.0	10308.61	103.1	10085.29	100.9	P
Copper				1250.0	1243.37	99.5	1253.61	100.3	P
Iron				5000.0	4990.33	99.8	4937.86	98.8	P
Lead				500.0	499.07	99.8	497.12	99.4	P
Manganese				750.0	766.74	102.2	751.86	100.2	P
Nickel				2000.0	2028.45	101.4	2005.06	100.3	P
Vanadium				2500.0	2478.56	99.1	2463.02	98.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

itial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Copper				1250.0	1238.06	99.0	1245.28	99.6	P
Iron				5000.0	4961.25	99.2	4988.86	99.8	P
Lead				500.0	497.59	99.5	503.31	100.7	P
Nickel				2000.0	2011.47	100.6	2026.92	101.3	P
Vanadium				2500.0	2460.86	98.4	2481.66	99.3	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

cract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

cial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper				1250.0	1246.23	99.7	1262.25	101.0	P
Iron				5000.0	4991.20	99.8	4988.75	99.8	P
Lead				500.0	501.25	100.3	502.93	100.6	P
Nickel				2000.0	2020.14	101.0	2037.73	101.9	P
Vanadium				2500.0	2479.30	99.2	2502.57	100.1	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

itial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Copper				1250.0	1274.22	101.9	1271.41	101.7	P
Iron				5000.0	5031.45	100.6	5360.87	107.2	P
Lead				500.0	499.75	99.9	505.75	101.2	P
Nickel				2000.0	2056.28	102.8	2045.43	102.3	P
Vanadium				2500.0	2525.77	101.0	2510.15	100.4	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

Contract: R2214005

Lab Code: Case No.: SAS No.: SDG No.: GW0301

CRDL Standard Source:

CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Barium				200.0	202.37	101.2	206.52	103.3
Copper				25.0	25.23	100.9	22.70	90.8
Iron				100.0	80.92	80.9	113.96	114.0
Lead				10.0	9.01	90.1	9.96	99.6
Manganese				15.0	15.62	104.1	16.03	106.9
Nickel				40.0	42.06	105.2	41.35	103.4
Vanadium				50.0	49.05	98.1	48.49	97.0

METALS

-3-

BLANKS

ntract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Barium	20.0	U	20.0	U	20.0	U	20.0	U	20.000	U	P
Copper	20.0	U	20.0	U	20.0	U	20.0	U	20.000	U	P
Iron	100.0	U	100.0	U	100.0	U	100.0	U	100.000	U	P
Lead	5.0	U	5.0	U	5.0	U	5.0	U	5.000	U	P
Manganese	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Nickel	40.0	U	40.0	U	40.0	U	40.0	U	40.000	U	P
Vanadium	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P

METALS

-3-

BLANKS

ntract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Barium			20.0	U							P
Copper			20.0	U	20.0	U	20.0	U			P
Iron			100.0	U	100.0	U	100.0	U			P
Lead			5.0	U	5.0	U	5.0	U			P
Manganese			10.0	U							P
Nickel			40.0	U	40.0	U	40.0	U			P
Vanadium			50.0	U	50.0	U	50.0	U			P

METALS

-3-

BLANKS

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Copper			20.0	U	20.0	U	20.0	U			P
Iron			100.0	U	100.0	U	100.0	U			P
Lead			5.0	U	5.0	U	5.0	U			P
Nickel			40.0	U	40.0	U	40.0	U			P
Vanadium			50.0	U	50.0	U	50.0	U			P

METALS

-3-

BLANKS

ract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

paration Blank Matrix (soil/water): WATER

paration Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Copper			20.0	U							P
Iron			100.0	U							P
Lead			5.0	U							P
Nickel			40.0	U							P
Vanadium			50.0	U							P

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-4-

ICP INTERFERENCE CHECK SAMPLE

ntract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

P ID Number: Optima ICP ICS Source: PE PURE

Concentration Units): ug/L

Analyte	True		Initial Found			Final Found		
	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Barium		500	4	537.5	107.5	4	530.5	106.1
Manganese		500	1	496.3	99.3	1	488.1	97.6

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-4-

ICP INTERFERENCE CHECK SAMPLE

Contract: R2214005

Lab Code: Case No.: SAS No.: SDG NO.: GW0301

Lab ID Number: Optima ICP 2 ICS Source: PE PURE

Concentration Units): ug/L

Analyte	True Sol.A	True Sol.AB	Initial Found Sol.A	Initial Found Sol.AB	Initial Found %R	Final Found Sol.A	Final Found Sol.AB	Final Found %R
Copper		500	-1	529.6	105.9	-2	534.7	106.9
Iron	200000	200000	187726	188268.0	94.1	188192	189176.9	94.6
Lead		50	0	48.7	97.4	0	48.5	97.0
Nickel		1000	0	929.1	92.9	1	940.4	94.0
Vanadium		500	-2	505.5	101.1	-2	507.1	101.4

METALS
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313S

ontract: R2214005

b Code: Case No.: SAS No.: SDG NO.: GW0301

trix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Barium	75 - 125	2515.8301		394.8679		2000.00	106.0		P
Copper	75 - 125	281.7583		20.0000	U	250.00	112.7		P
Iron		33285.9570		31743.0508		1000.00	~~154.3~~		P
Lead	75 - 125	495.5022		5.0000	U	500.00	99.1		P
Manganese		4792.4155		4177.2720		500.00	~~123.0~~		P
Nickel	75 - 125	521.7316		40.0000	U	500.00	104.3		P
Vanadium	75 - 125	539.5754		50.0000	U	500.00	107.9		P

OK

ok

mments:

0045

METALS
-5B-
POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313A

Contract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

Matrix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added(SA)	%R	Q	M
Barium		1946.68		394.87		2000.0	77.6		P
Copper		268.43		20.00	U	250.0	107.4		P
Iron		31912.08		31743.05		1000.0	16.9		P
Lead		468.63		5.00	U	500.0	93.7		P
Manganese		4678.69		4177.27		500.0	100.3		P
Nickel		491.65		40.00	U	500.0	98.3		P
Vanadium		508.88		50.00	U	500.0	101.8		P

Comments:

METALS

-6-

DUPLICATES

SAMPLE NO.

GW0313D

ontract: R2214005

ab Code: Case No.: SAS No.: SDG NO.: GW0301

atrix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0 % Solids for Duplicate:

Concentration Units (ug/L or mg/kg dry weight): µG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Barium		394.8679		413.0077		4.5		P
Copper		20.0000	U	20.0000	U			P
Iron		31743.0508		32790.2852		3.2		P
Lead		5.0000	U	5.0000	U			P
Manganese		4177.2720		4373.5381		4.6		P
Nickel		40.0000	U	40.0000	U			P
Vanadium		50.0000	U	50.0000	U			P

METALS
-7-
LABORATORY CONTROL SAMPLE

ract: R2214005

Code: Case No.: SAS No.: SDG NO.: GW0301

d LCS Source:

ous LCS Source: CPI

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Barium	2000.0	2111.22	105.6						
Copper	250.0	276.19	110.5						
Iron	1000.0	1051.42	105.1						
Lead	500.0	533.32	106.7						
Manganese	500.0	518.75	103.8						
Nickel	500.0	543.20	108.6						
Vanadium	500.0	518.23	103.6						

Columbia Analytical Services inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY

November 16, 2002

NOV 2 7 2002

At Exponent

Mr. Dave Lamadrid
Exponent
4000 Kruseway Place
Bldg 2, Suite 285
Lake Oswego, OR 97035

PROJECT:WOOD-RIDGE, NJ
Submission #:R2214196

Dear Mr. Lamadrid

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael K. Perry

Michael Perry
Laboratory Director

Enc.

825840094

1 Mustard St.• Suite 250 • Rochester, NY 14609 • Tele:(585)288-5380 • Fax:(585)288-8475

Columbia Analytical Services Inc.

1 Mustard ST.
Suite 250
Rochester, NY 14609
(585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent
Project Reference: WOOD-RIDGE, NJ
Lab Submission # : R2214196
Project Manager : Michael Perry
Reported : 11/16/02

Report Contains a total of 173 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal. Michael E. Perry

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SDG NARRATIVE

CASE NARRATIVE

COMPANY: Exponent
Project: Wood-Ridge, NJ
SDG#: 0930W
SUBMISSION #: R2214196

Exponent samples were collected the week of 10/07/02 and received at CAS in good condition 10/11/02 at a temperature of 3 ° C. See CAS CLP Batching sheets for a cross-reference between Client ID and CAS Job # and analyses requested.

METALS ANALYSIS

Fourteen soil samples and one water sample were analyzed for Mercury using SW-846 methods 7470/7471.

The initial and continuing calibration criteria were met for all analytes.

The matrix spike and duplicate analysis were performed on samples SP0001 and SP0016. The blank spike recoveries (LCS) were all within QC limits of 80 – 120 %. All Matrix Spike Recoveries were within QC limits of 75 – 125 %. The matrix spike recovery for sample SP0001 could not be accurately calculated due to the amount of analyte detected in the sample versus the spike amount added. The % RPD's from the duplicate analyses were all within QC limit.

No other analytical or QC problems were encountered.

SDG #:SP0002
SUBMISSION R2214196
CLIENT: Exponent
CLIENT REP: Michael Perry
PROJECT: WOODRIDGE, NJ

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y___ N__x__
DATE: 10/14/02
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 11/08/02
PROTOCOL: NJ Reduced
SHIPPING No.:
SUMMARY PKG: Y_____ N___x_

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS	% SOLIDS	REMARKS SAMPLE CONDITION
592437	SP0001	SOIL	HG + QC	10/8/02	10/11/02			
592438	SP0002	SOIL	HG	10/8/02	10/11/02			
592439	SP0003	SOIL	HG	10/8/02	10/11/02			
592440	SP0004	SOIL	HG	10/8/02	10/11/02			
592441	SP0005	SOIL	HG	10/9/02	10/11/02			
592442	SP0006	SOIL	HG	10/9/02	10/11/02			
592443	SP0007	SOIL	HG	10/9/02	10/11/02			
592444	SP0013	SOIL	HG	10/9/02	10/11/02			
592445	SP0014	SOIL	HG	10/9/02	10/11/02			
592446	SP0015	SOIL	HG	10/9/02	10/11/02			
592450	SP0018	SOIL	HG	10/10/02	10/11/02			
592453	SP0019	SOIL	HG	10/10/02	10/11/02			
592458	GW0318	WATER	HG	10/9/02	10/11/02			
599140	SP0016	SOIL	HG + QC	10/9/02	10/11/02			
599141	SP0020	SOIL	HG	10/10/02	10/11/02			

Columbia Analytical Services INC.

An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

Effective 11/4/2002

INORGANIC QUALIFIERS

C (Concentration) qualifier –

B - if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).

U - if the analyte was analyzed for, but not detected

Q qualifier - Specified entries and their meanings are as follows:

D - Spike was diluted out
E - The reported value is estimated because of the presence of interference.
J - Estimated Value
M - Duplicate injection precision not met.
N - Spiked sample recovery not within control limits.
S - The reported value was determined by the Method of Standard Additions (MSA).
W - Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
* - Duplicate analysis not within control limits.
+ - Correlation coefficient for the MSA is less than 0.995.

M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited

NELAP Accredited
New York ID # 10145
New Jersey ID # NY004
New Hampshire ID # 294100 A/B
Rhode Island ID # 158
South Carolina ID #91012
West Virginia ID # 292

CHAINS OF CUSTODY
INTERNAL CHAINS

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Project: (Name and Number) Ventron/Velsicol Wood-Ridge 8600B3N.005 0402

Exponent

Exponent Contact: David Lamadrid Office: LO

Ship to: Columbia Analytical Services
1 Mustard Street, Ste. 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry (585) 288-8475

Samplers: R22-14196

Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix		Total Mercury EPA 7471					Extra Container	Archive	Remarks
SP0001	27086	10/8/02	0945	SL		X							
SP0002	27087		0950			X							
SP0003	27088		0955			X							
SP0004	27089		1000			X							
GW0318	27090	10/9/02	0945	GW		X							
SP0005	27091		1440	SL		X							
SP0006	27092		1443			X							
SP0007	27093		1450			X							
SP0008	27094		1453									X	
SP0009	27095		1500									X	
SP0010	27096		1503									X	
SP0011	27097		1510									X	
SP0012	27098		1530									X	
SP0013	37752		1555			X							
SP0014	37753		1557			X							
SP0015	37754		1610			X							
SP0016	37755		1625									X	Release
SP0017	37756		1630									X	

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☐ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt: O.K.

Custody Seal Intact: ☒ Yes ☐ No ☐ None

Relinquished by: David Lamadrid (Signature) Date/Time: 10/10/02/1700 Received by: (Signature) Date/Time: 10-11-02 10:30

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

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CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Page 1 of 1

Project: (Name and Number) Ventron/Velsicol Wood-Ridge R22-14196

Exponent

Exponent Contact: David Lamadrid Office: LO

Ship to: Columbia Analytical Services
1 Mustard Street, Suite 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry (585) 288-8475

Samplers: David Lamadrid (David Lamadrid)

Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix		Total Mercury EPA 7471					Extra Container	Archive	Remarks
SP0018	37757	10/10/02	1040	SL		X							
SP0019	37758	↓	1055	↓		X							
SP0020	37759	↓	1057	↓								X	release
SP0021	37760	↓	1115	↓								X	
SP0022	37761	↓	1117	↓								X	

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt: intact

Custody Seal Intact: ☒ Yes ☐ No ☐ None

Relinquished by: David Lamadrid (Signature) Date/Time: 10-10-02/1700 Received by: Peggy O'Sullivan (Signature) Date/Time: 10-11-02 10:30

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

∞

825840102

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

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Cooler Receipt And Preservation Check Form

Project/Client Exponent Submission Number R2-14196.

Cooler received on 10-11-02 by: KC COURIER: CAS UPS (FEDEX) CD&L CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO	
2.	Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO	
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO	
4.	Did any VOA vials have significant air bubbles?	YES	NO	(N/A)
5.	Were Ice or Ice packs present?	(YES)	NO	
6.	Where did the bottles originate?	(CAS/ROC)	CLIENT	

7. Temperature of cooler(s) upon receipt:	3°				
Is the temperature within 0° - 6° C?:	(Yes)	Yes	Yes	Yes	Yes
If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 10-11-02 @ 10:35

Thermometer ID: 161 or (IR GUN) Reading From: Temp Blank or (Sample Bottle)

If out of Temperature, Client Approval to Run Samples _____

Cooler Breakdown: Date: 10-11-02 by: KMC

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO

4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3	X				
2	H_2SO_4					
Residual Chlorine (+/-)	for TCN & Phenol					
5-9**	P/PCBs (608 only)					

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

**If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

Other Comments:

825840103

Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 592437 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924371

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924372

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592438 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924381

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924382

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 592439 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924391

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924392

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592440 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924401

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924402

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Chain of Custody

Submission: **R2214196** ***Client:*** Exponent

Lab ID: 592441 ***Matrix*** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924411

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924412

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592442 ***Matrix*** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924421

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924422

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 592443 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924431

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	☐

Container: 5924432

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592444 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924441

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Container: 5924442

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	☐

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Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 592445 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924451

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	☐

Container: 5924452

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592446 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924461

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	☐

Container: 5924462

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 592450 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924501

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	☐

Container: 5924502

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592453 **Matrix** SOIL

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924531

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	☐

Container: 5924532

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	☐
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	☐
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	☐

Lab ID: 592458 **Matrix** WATER

Received into CAS-Rochester Custody: 10/11/02 10:30:00

Container: 5924581

Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	☐
10/28/02 8:44	dbond	Metals	Cooler 3	Analysis	☐
10/28/02 11:15	dbond	Metals	LTS	Storage	☐

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Chain of Custody

Submission: R2214196 **Client:** Exponent

Lab ID: 599140 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/6/02

Container: 5991401

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/06/02 10:24	bcollom	Sample Management	Cooler 2	Storage	☐

Container: 5991402

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/06/02 10:25	bcollom	Sample Management	Cooler 3	Storage	☐
11/07/02 7:19	dbond	Metals	Cooler 3	Analysis	☐
11/07/02 10:14	dbond	Metals	Cooler 3	Storage	☐

Lab ID: 599141 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/6/02

Container: 5991411

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/06/02 10:24	bcollom	Sample Management	Cooler 2	Storage	☐

Container: 5991412

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/06/02 10:25	bcollom	Sample Management	Cooler 3	Storage	☐
11/07/02 7:19	dbond	Metals	Cooler 3	Analysis	☐
11/07/02 10:14	dbond	Metals	Cooler 3	Storage	☐

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METALS DATA

METALS
COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ontract: R2214196 SDG No.: SP0002

ab Code: Case No.: SAS No.:

:OW No.: SW846 CLP-M Client: Exponent

Sample No.	Lab Sample ID.
SP0001	592437
SP0001D	592437D
SP0001S	592437S
SP0002	592438
SP0003	592439
SP0004	592440
SP0005	592441
SP0006	592442
SP0007	592443
SP0013	592444
SP0014	592445
SP0015	592446
SP0018	592450
SP0019	592453
GW0318	592458
SP0016	599140
SP0016D	599140D
SP0016S	599140S
SP0020	599141

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: See Attached Case Narrative

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

ignature: Michael K. Perry Name: Michael K. Perry

ate: 11/20/02 Title: Laboratory Manager

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
GW0318

ntract: R2214196

Code: Case No.: SAS No.: SDG NO.: SP0002

trix (soil/water): WATER Lab Sample ID: 592458

vel (low/med): LOW Date Received: 10/11/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	1.7			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0001

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592437

Level (low/med): LOW Date Received: 10/11/02

Solids: 79.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	750			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0002

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592438

Level (low/med): LOW Date Received: 10/11/02

Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	128			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0003

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592439

Level (low/med): LOW Date Received: 10/11/02

% Solids: 86.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	252			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0004

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592440

evel (low/med): LOW Date Received: 10/11/02

olids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	12.3			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0005

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592441

evel (low/med): LOW Date Received: 10/11/02

Solids: 77.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	240			CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

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Form I - IN

METALS

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0006

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592442

Level (low/med): LOW Date Received: 10/11/02

% Solids: 85.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.21			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0007

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592443

Level (low/med): LOW Date Received: 10/11/02

Solids: 80.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.09			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0013

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592444

evel (low/med): LOW Date Received: 10/11/02

Solids: 85.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	13.3			CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0014

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592445

Level (low/med): LOW Date Received: 10/11/02

% Solids: 87.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	31.7			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0015

ontract: R2214196

ID Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592446

evel (low/med): LOW Date Received: 10/11/02

olids: 73.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	42.8			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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Form I - IN

METALS

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0016

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 599140

evel (low/med): LOW Date Received: 11/06/02

Solids: 84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04	U		CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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Form I - IN

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0018

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592450

Level (low/med): LOW Date Received: 10/11/02

% Solids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	2.8			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0019

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 592453

evel (low/med): LOW Date Received: 10/11/02

Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	16.6			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0020

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 599141

evel (low/med): LOW Date Received: 11/06/02

Solids: 81.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04	U		CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

825840127 33

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	2.93	97.7	3.0	2.93	97.7	2.76	92.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

o Code: Case No.: SAS No.: SDG NO.: SP0002

itial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	2.99	99.7	3.00	100.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

nitial Calibration Source:

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.04	101.3	3.02	100.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

Code: Case No.: SAS No.: SDG NO.: SP0002

nitial Calibration Source:

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.05	101.7			CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.07	102.3	3.0	3.09	103.0	3.10	103.3	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

ub Code: Case No.: SAS No.: SDG NO.: SP0002

nitial Calibration Source:

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.08	102.7	3.14	104.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.14	104.7			CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

nitial Calibration Source: PE PURE

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.04	101.3	3.0	3.03	101.0	3.02	100.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

ontract: R2214196

ab Code: Case No.: SAS No.: SDG No.: SP0002

A CRDL Standard Source: CPI

CP CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.21	105.0					

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

ntract: R2214196

Code: Case No.: SAS No.: SDG No.: SP0002

CRDL Standard Source: CPI

CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.19	95.0					

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METALS
-2B-
CRDL STANDARD FOR AA AND ICP

ontract: R2214196

ab Code: Case No.: SAS No.: SDG No.: SP0002

A CRDL Standard Source: CPI

CP CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.20	100.0					

METALS

-3-

BLANKS

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury	0.20	U	0.20	U	0.20	U	0.20	U	0.033	U	CV

METALS

-3-

BLANKS

ntract: R2214196

b Code: Case No.: SAS No.: SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C		Preparation Blank	C		M
Mercury			0.20	U	0.20	U	0.20	U					CV

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Form III - IN

METALS

-3-

BLANKS

tract: R2214196

Code: Case No.: SAS No.: SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury			0.20	U							CV

METALS

-3-

BLANKS

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury	0.20	U	0.20	U	0.20	U	0.20	U	0.200	U	CV

METALS

-3-

BLANKS

tract: R2214196

Code: Case No.: SAS No.: SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury			0.20	U	0.20	U					CV

METALS

-3-

BLANKS

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C		M
Mercury	0.20	U	0.20	U	0.20	U			0.033	U		CV

METALS
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

SP0001S

ɔntract: R2214196

ɔ Code: Case No.: SAS No.: SDG NO.: SP0002

ɪtrix (soil/water): SOIL/SED Level (low/med): LOW

Solids for Sample: 79.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury		881.7456		750.4049		0.19	69126.6		CV

ɔments:

METALS
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

SP0016S

Contract: R2214196

Lab Code: Case No.: SAS No.: SDG NO.: SP0002

Matrix (soil/water): SOIL/SED Level (low/med): LOW

% Solids for Sample: 84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury	75 - 125	0.2150		0.0381	U	0.19	114.7		CV

Comments:

METALS

-6-

DUPLICATES

SAMPLE NO.

SP0001D

ntract: R2214196

b Code: Case No.: SAS No.: SDG NO.: SP0002

trix (soil/water): SOIL/SEDI Level (low/med): LOW

olids for Sample: 79.9 % Solids for Duplicate: 79.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury		750.4049		901.2842		18.3		CV

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METALS

-6-

DUPLICATES

SAMPLE NO.

SP0016D

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

atrix (soil/water): SOIL/SEDI Level (low/med): LOW

Solids for Sample: 84.7 % Solids for Duplicate: 84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury		0.0381	U	0.0375	U			CV

METALS

-7-

LABORATORY CONTROL SAMPLE

.tract: R2214196

Code: Case No.: SAS No.: SDG NO.: SP0002

.id LCS Source: ERA

.eous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.4		0.9	2.1	94.4

METALS

-7-

LABORATORY CONTROL SAMPLE

ontract: R2214196

ab Code: Case No.: SAS No.: SDG NO.: SP0002

olid LCS Source:

queous LCS Source: CPI

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits	%R
Mercury	1.0	1.01	101.0					

METALS
-7-
LABORATORY CONTROL SAMPLE

ntract: R2214196

b Code: Case No.: SAS No.: SDG NO.: SP0002

lid LCS Source: ERA

ueous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.4		0.9	2.1	96.6

GENERAL CHEMISTRY

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0001

Date Sampled : 10/08/02 09:45 **Order #:** 592437 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 10/11/02 **Submission #:** R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	79.9	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0002

Date Sampled : 10/08/02 09:50 Order #: 592438 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	83.0	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0003

Date Sampled : 10/08/02 09:55 Order #: 592439 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	86.9	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0004

Date Sampled : 10/08/02 10:00 Order #: 592440 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	80.3	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0005

Date Sampled : 10/09/02 14:40 **Order #:** 592441 **Sample Matrix:** SOIL/SEDIMENT
Date Received: 10/11/02 **Submission #:** R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	77.8	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0006

Date Sampled : 10/09/02 14:43 Order #: 592442 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	85.2	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0007

Date Sampled : 10/09/02 14:50 Order #: 592443 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	80.7	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0013

Date Sampled : 10/09/02 15:55 Order #: 592444 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	85.4	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0014

Date Sampled : 10/09/02 15:57 Order #: 592445 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	87.3	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0015

Date Sampled : 10/09/02 16:10 Order #: 592446 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	73.1	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0018

Date Sampled : 10/10/02 10:40 Order #: 592450 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	88.5	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOOD-RIDGE, NJ
Client Sample ID : SP0019

Date Sampled : 10/10/02 10:55 Order #: 592453 Sample Matrix: SOIL/SEDIMENT
Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	79.0	%	10/18/02	14:00	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOODRIDGE, NJ
Client Sample ID : SP0016

Date Sampled : 10/09/02 Order #: 599140 Sample Matrix: SOIL/SEDIMENT
Date Received: 11/06/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	84.7	%	11/08/02	11:16	1.0

COLUMBIA ANALYTICAL SERVICES

Reported: 11/16/02

Exponent
Project Reference: WOODRIDGE, NJ
Client Sample ID : SP0020

Date Sampled : 10/10/02 Order #: 599141 Sample Matrix: SOIL/SEDIMENT
Date Received: 11/06/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS	DATE ANALYZED	TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	81.1	%	11/08/02	11:16	1.0

RECEIVED

JAN - 9 2003

At Exponent

January 8, 2003

Columbia Analytical Services INC.

An Employee-Owned Company

Mr. Dave Lamadrid
Exponent
4000 Kruseway Place
Bldg. 2, Suite 285
Lake Oswego, OR 97035

PROJECT: WOOD-RIDGE, NJ
Submission #: R2214662

Dear Mr. Lamadrid:

Enclosed are additional report pages for the above referenced project. Samples SP0043 and SP0044 were inadvertently left out of the report package that was previously sent to you. Please replace or insert these pages into the previous report package. I apologize for any inconvenience this may have caused. Should you have any questions please contact me at (585) 288-5380.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael K Perry

Michael Perry
Laboratory Director

Enc.

825840167

1 Mustard Street, Suite 250 ▪ Rochester, NY 14609-6925 ▪ Telephone (716) 288-5380 ▪ Fax (716) 288-8475

Columbia Analytical Services Inc.

1 Mustard ST.
Suite 250
Rochester, NY 14609
(585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent
Project Reference: WOOD-RIDGE, NJ
Lab Submission # : R2214662
Project Manager : Michael Perry
Reported : 12/30/02

Report Contains a total of 161 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal. Michael E. Perry

825840168

SDG NARRATIVE

825840169

CASE NARRATIVE

COMPANY: Exponent
SUBMISSION #: R2214662

NYS DEC samples were collected on 11/13/02 and received at CAS on 11/14/02 at a cooler temperature of 5 °C. See the CAS CLP Batching sheet for a cross-reference between Client ID and CAS Job # and analyses requested. A NJ Reduced deliverable data validation package was prepared.

METALS ANALYSIS

Twelve soil samples were analyzed for Total Mercury by EPA SW-846 method 7471.

The Blank Spike (LCS) and Matrix spike recoveries were all acceptable.

No other analytical or QC problems were encountered.

ANALYSIS REQUEST SHEET

SDG #: SB-33A	BATCH COMPLETE: __yes_____	DATE REVISED:
SUBMISSION R2214662	DISKETTE REQUESTED: Y__X_ N____	DATE DUE: 1/08/03
CLIENT: Exponent	DATE: 12/11/02	PROTOCOL: SW846
CLIENT REP: Michael Perry	CUSTODY SEAL: PRESENT	SHIPPING No.:
PROJECT: WOOD-RIDGE, NJ	CHAIN OF CUSTODY: PRESENT	SUMMARY PKG: Y___X_ N

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS	% SOLIDS	REMARKS
601495	SP0023	SOIL	HG + QC	11/13/02	11/14/02			
601496	SP0024	SOIL	HG	11/13/02	11/14/02			
601497	SP0038	SOIL	HG	11/13/02	11/14/02			
601498	SP0039	SOIL	HG	11/13/02	11/14/02			
601499	SP0040	SOIL	HG	11/13/02	11/14/02			
601500	SP0054	SOIL	HG	11/13/02	11/14/02			
601501	SP0055	SOIL	HG	11/13/02	11/14/02			
605311	SP0041	SOIL	HG	11/13/02	12/2/2002*			
605312	SP0056	SOIL	HG	11/13/02	12/2/2002*			
606680	SP0042	SOIL	HG	11/13/02	12/6/2002*			
607619	SP0043	SOIL	HG	11/13/02	12/11/2002*			
607620	SP0044	SOIL	HG	11/13/02	12/11/2002*			
			*Date Analysis was added					
			per clients instructions.					

Columbia Analytical Services INC.
An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

Effective 11/4/2002

INORGANIC QUALIFIERS

C (Concentration) qualifier –

- B - if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).
- U - if the analyte was analyzed for, but not detected

Q qualifier - Specified entries and their meanings are as follows:

- D - Spike was diluted out
- E - The reported value is estimated because of the presence of interference.
- J - Estimated Value
- M - Duplicate injection precision not met.
- N - Spiked sample recovery not within control limits.
- S - The reported value was determined by the Method of Standard Additions (MSA).
- W - Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
- * - Duplicate analysis not within control limits.
- + - Correlation coefficient for the MSA is less than 0.995.

M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited

NELAP Accredited
New York ID # 10145
New Jersey ID # NY004
New Hampshire ID # 294100 A/B
Rhode Island ID # 158
South Carolina ID #91012
West Virginia ID # 292

CHAINS OF CUSTODY
INTERNAL CHAINS

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM 1422197062

Project: (Name and Number) Ventron/Velsicol - Wood Ridge Site 860053N.005 0402

Exponent

Exponent Contact: David Lamadrid Office: LO

Ship to: Columbia Analytical Services
1 Mustard Street, Suite 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry (585) 288-5380

Samplers: David Lamadrid

Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix		Total Mercury EPA 7471					Extra Container	Archive	Remarks
SP0023	37801	11/13/02	0935	SL		X							
SP0024	37802		0942			X						X	
SP0025	37803		0945									X	Potential analysis
SP0026	37804		0955									X	of archive samples
SP0027	37805		0957									X	based on initial
SP0028	37806		1005									X	results. Fax results
SP0029	37807		1008									X	as soon as
SP0030	37808		1015									X	available
SP0031	37809		1018									X	
SP0032	37810		1035									X	
SP0033	37811		1038									X	
SP0034	37812		1045									X	
SP0035	37813		1048									X	
SP0036	37814		1105										
SP0037	37815		1108										
SP0038	37816		1210			X							
SP0039	37817		1212			X							
SP0040	37818		1215			X							
SP0041	37819		1218									X	
SP0042	37820		1225									X	

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: [X] Normal [ ] Rush Rush time period

Shipped via: [X] FedEx/UPS [ ] Courier Other

Condition of Samples Upon Receipt: Good

Custody Seal Intact: [X] Yes [ ] No [ ] None

Relinquished by: David Lamadrid (Signature) Date/Time: 11-13-02/1700 Received by: (Signature) Date/Time: 11/14/02 930

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

825840174

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Page 1 of 1

Project: (Name and Number) Ventron/Velsicol Wood-Ridge Site 8600B3N.005 0402

Exponent

Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Exponent Contact: David Lamadrid Office: LO

Ship to: Columbia Analytical Services
1 Mustard Street, Suite 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry (585)288-5380

Samplers: David Lamadrid

Sample No.	Tag No.	Date	Time	Matrix		Total mercury EPA 7471					Extra Container	Archive	Remarks
SP0043	37821	11/13/02	1227	SL								X	
SP0044	37822		1230									X	Potential analysis
SP0045	37823		1233									X	of archive samples
SP0046	37824		1245									X	based on initial
SP0047	37825		1248									X	results. Fax
SP0048	37826		1300									X	results as soon
SP0049	37827		1320									X	as available.
SP0050	37828		1323									X	
SP0051	37829		1340									X	
SP0052	37830		1343									X	
SP0053	37831		1400									X	
SP0054	37832		1440			X							
SP0055	37833		1445			X							
SP0056	37834		1448									X	
SP0057	37835		1455									X	
SP0058	37836		1458									X	
SP0059	37837		1505									X	
SP0060	37838		1508									X	
SP0061	37839		1515									X	
SP0062	37840		1518									X	

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: David Lamadrid (Signature) Date/Time: 11-13-02/1700 Received by: [signature] (Signature) Date/Time: 11/14/02 930

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

8

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Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

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CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

FCC14660

825840176

Project: (Name and Number) Ventron/Velsicol Wood-Ridge Site 8600BJN.005

Exponent Contact: David Lamadrid Office: LO

Ship to: Columbia Analytical Services
1 Mustard Street, Suite 250
Rochester, NY 14609

Lab Contact/Phone: Mike Perry (585) 288-5380

Samplers: David Lamadrid

Exponent Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix	Analyses Requested: Total mercury EPA 7471	Extra Container	Archive	Remarks
SP0063	37841	11-13-02	1525	SL			X	
SP0064	37842	↓	1528	↓			X	
SP0065	37843		1545				X	Potential analysis of archive samples based on initial results. Fax results as soon as available
SP0066	37844		1548				X	
SP0067	37845		1605				X	
SP0068	37846	↓	1620	↓			X	

D.L. 11-13-02

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☐ Yes ☐ No ☐ None

Relinquished by: David Lamadrid (Signature) Date/Time: 11-13-02/1700 Received by: [signature] (Signature) Date/Time: 11/14/02 930

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time:

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

Cooler Receipt And Preservation Check Form

Project/Client Exponent Submission Number R2-14662.

Cooler received on 11/14/02 by [illegible] COURIER: CAS UPS FEDEX CD&L CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did any VOA vials have significant air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: 5°

Is the temperature within 0° - 6° C?:	Yes	Yes	Yes	Yes	Yes
If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 11/14/02 942

Thermometer ID: 161 or IR GUN Reading From: Temp Blank or Sample Bottle

If out of Temperature, Client Approval to Run Samples _____

Cooler Breakdown: Date: 11/14/02 by: [illegible]

1. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					
Residual Chlorine (+/-)	for TCN & Phenol					
5-9**	P/PCBs (608 only)					

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

**If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

Other Comments:

825840177

Chain of Custody

Submission: **R2214662** ***Client:*** Exponent

Lab ID: 601495 ***Matrix*** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6014951

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Container: 6014952

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Lab ID: 601496 ***Matrix*** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6014961

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Container: 6014962

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Lab ID: 601497 ***Matrix*** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6014971

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Container: 6014972

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Chain of Custody

Submission: R2214662 **Client:** Exponent

Lab ID: 601498 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6014981

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Container: 6014982

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Lab ID: 601499 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6014991

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Container: 6014992

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Lab ID: 601500 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6015001

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Container: 6015002

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Chain of Custody

Submission: R2214662 **Client:** Exponent

Lab ID: 601501 **Matrix** SOIL

Received into CAS-Rochester Custody: 11/14/02 9:30:00 A

Container: 6015011

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 3	Storage	☐
11/26/02 9:27	dbond	Metals	Cooler 3	Analysis	☐
11/26/02 10:50	dbond	Metals	Cooler 3	Storage	☐

Container: 6015012

Date of Custody	User	Dept	Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample Management	Cooler 2	Storage	☐

Lab ID: 605311 **Matrix** SOIL

Received into CAS-Rochester Custody: 12/2/02 9:30:00 AM

Container: 6053111

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample Management	Cooler 3	Storage	☐
12/05/02 7:21	dbond	Metals	Cooler 3	Analysis	☐
12/05/02 9:04	dbond	Metals	Cooler 3	Storage	☐

Container: 6053112

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample Management	Cooler 2	Storage	☐

Lab ID: 605312 **Matrix** SOIL

Received into CAS-Rochester Custody: 12/2/02 9:30:00 AM

Container: 6053121

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample Management	Cooler 2	Storage	☐

Container: 6053122

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample Management	Cooler 3	Storage	☐
12/05/02 7:22	dbond	Metals	Cooler 3	Analysis	☐
12/05/02 9:04	dbond	Metals	Cooler 3	Storage	☐

Chain of Custody

Submission: R2214662 **Client:** Exponent

Lab ID: 606680 **Matrix** SOIL

Received into CAS-Rochester Custody: 12/6/02 9:30:00 AM

Container: 6066801

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/06/02 8:56	gesmeria	Sample Management	Cooler 2	Storage	☐

Container: 6066802

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/06/02 8:56	gesmeria	Sample Management	Cooler 3	Storage	☐
12/09/02 8:47	dbond	Metals	Cooler 3	Analysis	☐

Lab ID: 607619 **Matrix** SOIL

Received into CAS-Rochester Custody: 12/11/02

Container: 6076191

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Management	Cooler 3	Storage	☐
12/11/02 10:14	dbond	Metals	Cooler 3	Analysis	☐
12/11/02 10:51	dbond	Metals	Cooler 3	Storage	☐

Container: 6076192

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Management	Cooler 2	Storage	☐

Lab ID: 607620 **Matrix** SOIL

Received into CAS-Rochester Custody: 12/11/02

Container: 6076201

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Management	Cooler 2	Storage	☐

Container: 6076202

Date of Custody	User	Dept	Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Management	Cooler 3	Storage	☐
12/11/02 10:14	dbond	Metals	Cooler 3	Analysis	☐
12/11/02 10:51	dbond	Metals	Cooler 3	Storage	☐

METALS DATA

'olumbia Analytical Services

METALS
COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

'ontract: R2214662 SDG No.: SP0023

ab Code: Case No.: SAS No.:

:OW No.: SW846 CLP-M Client: Exponent

Sample No.	Lab Sample ID.
SP0023	601495
SP0023D	601495D
SP0023S	601495S
SP0024	601496
SP0038	601497
SP0039	601498
SP0040	601499
SP0054	601500
SP0055	601501
SP0041	605311
SP0056	605312
SP0042	606680
SP0043	607619
SP0043D	607619D
SP0043S	607619S
SP0044	607620

'Were ICP interelement corrections applied? Yes/No YES

'Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

:omments: See Attached Case Narrative

: certify that this data package is in compliance with the terms and conditions of the :ontract, both technically and for completeness, for other than the conditions detailed bove. Release of the data contained in this hardcopy data package and in the :omputer-readable data submitted on diskette has been authorized by the Laboratory Manager or .he Manager's designee, as verified by the following signature.

:gnature: Michael K Perry Name: Michael K Perry

ıte: 1/8/03 Title: Laboratory Manager

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0023

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601495

Level (low/med): LOW Date Received: 11/14/02

% Solids: 87.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.33			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0024

ontract: R2214662

ab Code: Case No.: SAS No.: SDG NO.: SP0023

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601496

evel (low/med): LOW Date Received: 11/14/02

Solids: 81.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.05			CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0038

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601497

Level (low/med): LOW Date Received: 11/14/02

Solids: 87.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	52.6			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0039

ontract: R2214662

ab Code: Case No.: SAS No.: SDG NO.: SP0023

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601498

evel (low/med): LOW Date Received: 11/14/02

Solids: 84.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04	U		CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0040

ontract: R2214662

xD Code: Case No.: SAS No.: SDG NO.: SP0023

atrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601499

evel (low/med): LOW Date Received: 11/14/02

olids: 76.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	172			CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

825840188

Form I - IN

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0054

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601500

Level (low/med): LOW Date Received: 11/14/02

Solids: 79.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	67.1			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

825840189

Form I - IN

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0055

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 601501

Level (low/med): LOW Date Received: 11/14/02

% Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	162			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

825840190

Form I - IN

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0041

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 605311

Level (low/med): LOW Date Received: 12/02/02

% Solids: 78.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	52.1			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
SP0056

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 605312

Level (low/med): LOW Date Received: 12/02/02

% Solids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

825840192

Form I - IN

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0042

ntract: R2214662

b Code: Case No.: SAS No.: SDG NO.: SP0023

trix (soil/water): SOIL/SEDIMENT Lab Sample ID: 606680

vel (low/med): LOW Date Received: 12/06/02

Solids: 78.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	35.0			CV

olor Before: Clarity Before: Texture:

olor After: Clarity After: Artifacts:

omments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0043

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 607619

Level (low/med): LOW Date Received: 12/11/02

% Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.75			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0044

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDIMENT Lab Sample ID: 607620

Level (low/med): LOW Date Received: 12/11/02

% Solids: 83.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	31.0			CV

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.07	102.3	3.0	3.08	102.7	2.78	92.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.10	103.3	3.12	104.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.05	101.7			CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.04	101.3	3.0	3.03	101.0	3.06	102.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.09	103.0	3.12	104.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Mercury				3.0	3.10	103.3			CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.15	105.0	3.0	3.13	104.3	3.12	104.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.19	106.3	3.18	106.0	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

825840203

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				3.0	3.20	106.7	3.22	107.3	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	3.0	3.12	104.0	3.0	3.13	104.3	3.11	103.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

ntract: R2214662

b Code: Case No.: SAS No.: SDG No.: SP0023

CRDL Standard Source: CPI

P CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.20	100.0					

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG No.: SP0023

AA CRDL Standard Source: CPI

ICP CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.22	110.0					

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

ntract: R2214662

b Code: Case No.: SAS No.: SDG No.: SP0023

CRDL Standard Source: CPI

P CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.21	105.0					

825840208

METALS
-2B-
CRDL STANDARD FOR AA AND ICP

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG No.: SP0023

AA CRDL Standard Source: CPI

ICP CRDL Standard Source: CPI

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.2	0.22	110.0					

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury	0.20	U	0.20	U	0.20	U	0.20	U	0.033	U	CV

825840210

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury			0.20	U	0.20	U					CV

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C		Preparation Blank	C		M
Mercury	0.20	U	0.20	U	0.20	U	0.20	U		0.033	U		CV

825840212

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury			0.20	U	0.20	U					CV

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury	0.20	U	0.20	U	0.20	U	0.20	U	0.033	U	CV

METALS

-3-

BLANKS

ontract: R2214662

ab Code: Case No.: SAS No.: SDG NO.: SP0023

reparation Blank Matrix (soil/water): WATER

reparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C		Preparation Blank	C		M
Mercury			0.20	U	0.20	U	0.20	U					CV

METALS

-3-

BLANKS

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Mercury	0.20	U	0.20	U	0.20	U			0.033	U	CV

825840216

44A

METALS
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

SP0023S

ontract: R2214662

ab Code: Case No.: SAS No.: SDG NO.: SP0023

atrix (soil/water): SOIL/SED Level (low/med): LOW

Solids for Sample: 87.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury	75 - 125	0.5389		0.3317		0.18	115.5		CV

omments:

METALS
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

SP0043S

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SED Level (low/med): LOW

% Solids for Sample: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Mercury		0.9244		0.7485		0.19	94.5		CV

Comments:

825840218

45A

METALS

-6-

DUPLICATES

SAMPLE NO.

SP0023D

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDI Level (low/med): LOW

% Solids for Sample: 87.1 % Solids for Duplicate: 87.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury		0.3317		0.3203		3.5		CV

METALS

-6-

DUPLICATES

SAMPLE NO.

SP0043D

ntract: R2214662

b Code: Case No.: SAS No.: SDG NO.: SP0023

trix (soil/water): SOIL/SEDI Level (low/med): LOW

Solids for Sample: 83.9 % Solids for Duplicate: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Mercury		0.7485		0.7320		2.2		CV

METALS

-7-

LABORATORY CONTROL SAMPLE

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Solid LCS Source: ERA

Aqueous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.4		0.9	2.1	94.2

METALS
-7-
LABORATORY CONTROL SAMPLE

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Solid LCS Source: ERA

Aqueous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.3		0.9	2.1	86.6

METALS
-7-
LABORATORY CONTROL SAMPLE

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Solid LCS Source: ERA

Aqueous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.4		0.9	2.1	93.2

METALS
-7-
LABORATORY CONTROL SAMPLE

Contract: R2214662

Lab Code: Case No.: SAS No.: SDG NO.: SP0023

Solid LCS Source: ERA

Aqueous LCS Source:

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Mercury				1.5	1.3		0.9	2.1	87.2

825840224

49A

RECEIVED

OCT 18 2002

At Exponent

SEVERN TRENT SERVICES

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ANALYTICAL REPORT

Job#: A02-9633

STL Project#: NY2A8971
Site Name: Exponent, Inc.
Task: Exponent, Inc. - Woodridge Site

Mr. David Lamadrid
Exponent, Inc.
4000 Kruse Way,Bldg 2,Ste 285
Lake Oswego, OR 98035

CC: Elizabeth A. Henry, Ph.D.

STL Buffalo

Brian J. Fischer
Project Manager

Susan L. Mazur
Laboratory Director

10/16/2002

This report contains 161 pages which are individually numbered.

SAMPLE DATA SUMMARY PACKAGE

SAMPLE SUMMARY

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLED DATE	SAMPLED TIME	RECEIVED DATE	RECEIVED TIME
A2963301	GW0301	09/24/2002	12:20	09/28/2002	09:30
A2963302	GW0302	09/24/2002	17:20	09/28/2002	09:30
A2963303	GW0303	09/25/2002	10:00	09/28/2002	09:30
A2963304	GW0304	09/25/2002	12:30	09/28/2002	09:30
A2963305	GW0305	09/25/2002	14:05	09/28/2002	09:30
A2963306	GW0306	09/25/2002	17:20	09/28/2002	09:30
A2963307	GW0307	09/25/2002	17:50	09/28/2002	09:30
A2963308	GW0308	09/26/2002	07:45	09/28/2002	09:30
A2963309	GW0309	09/26/2002	12:40	09/28/2002	09:30
A2963310	GW0310	09/26/2002	13:35	09/28/2002	09:30
A2963311	GW0311	09/26/2002	17:05	09/28/2002	09:30
A2963312	GW0312	09/26/2002	17:15	09/28/2002	09:30
A2963313	GW0313	09/26/2002	17:55	09/28/2002	09:30
A2963313MS	GW0313 MS	09/26/2002	17:55	09/28/2002	09:30
A2963313SD	GW0313 SD	09/26/2002	17:55	09/28/2002	09:30
A2963314	GW0314	09/26/2002	19:40	09/28/2002	09:30
A2963315	GW0315	09/27/2002	10:25	09/28/2002	09:30
A2963316	GW0316	09/27/2002	11:00	09/28/2002	09:30
A2963317	GW0317	09/27/2002	13:15	09/28/2002	09:30

METHODS SUMMARY

Job#: A02-9633

STL Project#: NY2A8971
Site Name: Exponent, Inc.

PARAMETER	ANALYTICAL METHOD
Arsenic - Total	SW8463 6020
Cadmium - Total	SW8463 6020
Thallium - Total	SW8463 6020

References:

SW8463 "Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

NON-CONFORMANCE SUMMARY

Job#: A02-9633

STL Project#: NY2A8971
Site Name: Exponent, Inc.

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A02-9633
Sample Cooler(s) were received at the following temperature(s); 4 °C
All samples were received in good condition.

Metals Data

No deviations from protocol were encountered during the analytical procedures.

****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."

Susan L. Mazur
Laboratory Director

10/16/02
Date

DATA COMMENT PAGE

ORGANIC DATA QUALIFIERS

ND or U	Indicates compound was analyzed for, but not detected.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
C	This flag applies to pesticide results where the identification has been confirmed by GC/MS.
B	This flag is used when the analyte is found in the associated blank, as well as in the sample.
E	This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at the secondary dilution factor.
N	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where the identification is based on the Mass Spectral library search. It is applied to all TIC results.
P	This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on the data page and flagged with a "P".
A	This flag indicates that a TIC is a suspected aldol-condensation product.
1	Indicates coelution.
*	Indicates analysis is not within the quality control limits.

INORGANIC DATA QUALIFIERS

ND or U	Indicates element was analyzed for, but not detected. Report with the detection limit value.
J or B	Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
N	Indicates spike sample recovery is not within the quality control limits.
K	Indicates the post digestion spike recovery is not within the quality control limits.
S	Indicates value determined by the Method of Standard Addition.
M	Indicates duplicate injection results exceeded quality control limits.
W	Post digestion spike for Furnace AA analysis is out of quality control limits (85-115%) while sample absorbance is less than 50% of spike absorbance.
E	Indicates a value estimated or not reported due to the presence of interferences.
H	Indicates analytical holding time exceedance. The value obtained should be considered an estimate.
*	Indicates analysis is not within the quality control limits.
+	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0301

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229954

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.230			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

STL BUFFALO

EXPONENT, INC.

000008

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0302

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229955

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.210			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

000009

SAMPLE NO.

GW0303

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229956

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.010			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

000010

SAMPLE NO.

GW0304

:ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229957

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	6.670			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2973			M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: YELLOW Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

000011

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0305

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229958

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.820			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

000012

SAMPLE NO.

GW0306

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229959

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.520			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0307

ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229960

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.250			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0308

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229961

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.990			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

000015

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0309

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

trix (soil/water): WATER Lab Sample ID: AD229962

vel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.420			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0310

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229963

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	12.2			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0311

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229964

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.550			M
7440-43-9	Cadmium	0.8312			M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0312

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229965

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.330			M
7440-43-9	Cadmium	0.8508			M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0313

ɔntract: NY02-258

ɹb Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

ɹatrix (soil/water): WATER Lab Sample ID: AD229966

ɹevel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.890			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: YELLOW Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0314

:ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

latrix (soil/water): WATER Lab Sample ID: AD229969

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	41.5			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0315

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229970

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.900			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0316

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229971

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.830			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0317

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229972

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.9			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-5A-

SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313 MS

Contract: NY02-258

Lab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic	75 - 125	26.8151		4.8893		20.00	110		M
Cadmium	75 - 125	21.6648		0.5000	U	20.00	108		M
Thallium	75 - 125	20.5875		0.2000	U	20.00	103		M

Comments: _____

EXPONENT, INC.

-5A-

SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313 SD

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic	75 - 125	25.8377		4.8893		20.00	105		M
Cadmium	75 - 125	21.4163		0.5000	U	20.00	107		M
Thallium	75 - 125	20.3189		0.2000	U	20.00	102		M

mments:

EXPONENT, INC.

-5B-

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313A

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic		26.8794		4.8893		20.00	110.0		M
Cadmium		22.1285		0.5000	U	20.00	110.6		M
Thallium		20.6224		0.2000	U	20.00	103.1		M

Comments:

EXPONENT, INC.
-6-
DUPLICATES

SAMPLE NO.

GW0313 SD

ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		26.8151		25.8377		3.7		M
Cadmium		21.6648		21.4163		1.2	✓	M
Thallium		20.5875		20.3189		1.3		M

EXPONENT, INC.

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BLANKS

Contract: NY02-258

Lab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic	1.0000	U	1.0000	U	1.0000	U	1.0000	U	1.0000	U	M
Cadmium	0.5000	U	0.5000	U	0.5000	U	0.5000	U	0.5000	U	M
Thallium	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	M

EXPONENT, INC.

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BLANKS

Contract: NY02-258

Lab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic			1.0000	U							M
Cadmium			0.5000	U							M
Thallium			0.2000	U							M

SAMPLE DATA PACKAGE

SDG NARRATIVE

SAMPLE SUMMARY

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLED DATE	SAMPLED TIME	RECEIVED DATE	RECEIVED TIME
A2963301	GW0301	09/24/2002	12:20	09/28/2002	09:30
A2963302	GW0302	09/24/2002	17:20	09/28/2002	09:30
A2963303	GW0303	09/25/2002	10:00	09/28/2002	09:30
A2963304	GW0304	09/25/2002	12:30	09/28/2002	09:30
A2963305	GW0305	09/25/2002	14:05	09/28/2002	09:30
A2963306	GW0306	09/25/2002	17:20	09/28/2002	09:30
A2963307	GW0307	09/25/2002	17:50	09/28/2002	09:30
A2963308	GW0308	09/26/2002	07:45	09/28/2002	09:30
A2963309	GW0309	09/26/2002	12:40	09/28/2002	09:30
A2963310	GW0310	09/26/2002	13:35	09/28/2002	09:30
A2963311	GW0311	09/26/2002	17:05	09/28/2002	09:30
A2963312	GW0312	09/26/2002	17:15	09/28/2002	09:30
A2963313	GW0313	09/26/2002	17:55	09/28/2002	09:30
A2963313MS	GW0313 MS	09/26/2002	17:55	09/28/2002	09:30
A2963313SD	GW0313 SD	09/26/2002	17:55	09/28/2002	09:30
A2963314	GW0314	09/26/2002	19:40	09/28/2002	09:30
A2963315	GW0315	09/27/2002	10:25	09/28/2002	09:30
A2963316	GW0316	09/27/2002	11:00	09/28/2002	09:30
A2963317	GW0317	09/27/2002	13:15	09/28/2002	09:30

METHODS SUMMARY

Job#: A02-9633

STL Project#: NY2A8971
Site Name: Exponent, Inc.

PARAMETER	ANALYTICAL METHOD
Arsenic - Total	SW8463 6020
Cadmium - Total	SW8463 6020
Thallium - Total	SW8463 6020

References:

SW8463 "Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

NON-CONFORMANCE SUMMARY

Job#: A02-9633

STL Project#: NY2A8971
Site Name: Exponent, Inc.

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A02-9633
Sample Cooler(s) were received at the following temperature(s); 4 °C
All samples were received in good condition.

Metals Data

No deviations from protocol were encountered during the analytical procedures.

****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."

Susan L. Mazur
Laboratory Director

10/16/02
Date

CHAIN OF CUSTODY DOCUMENTATION

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Project: (Name and Number) Wood-Ridge 8600B3N.005

Exponent Contact: Betsy Henry Office: Albany NY

Ship to: Severn Trent Laboratories
10 Hazelwood Drive
Amherst, NY 14228

Lab Contact/Phone: Brian Fisher / 716-691-2600

Samplers: Rick Jensen / Jerome Wentz

Exponent
Environmental Group
Bellevue, WA (425) 643-9803
Boston, MA (781) 466-6681
Boulder, CO (303) 444-7270
Portland, OR (503) 636-4338
Washington, D.C. (301) 577-7830

Sample No.	Tag No.	Date	Time	Matrix	Total As, Tl (EPA 200.8) Total Cd (EPA 6020)						Extra Container	Archive	Remarks
GW0301	47503	24 Sep 02	1220	GW	X								Note: All samples are unfiltered
GW0302	47506	↓	1720		X								
GW0303	47510	25 Sep 02	1000		X								
GW0304	47516		1230		X								
GW0305	47520		1405		X								
GW0306	47524		1720		X								
GW0307	47528	↓	1750		X								
GW0308	47532	26 Sep 02	0745		X								
GW0309	45738		1290		X								
GW0310	45742		1335		X								
GW0311	45746		1705		X								
GW0312	45750		1715		X								
GW0313	45754		1755		X								
↓	45755		↓								X		Please use for MS
GW0314	45762	↓	1940		X								
GW0315	45766	27-Sep-02	1025		X								BSH 10/1/02 → All Analysis To Be Performed Via Method 6020 Per Discussion w/ Client (DL) on 10/1/02
GW0316	45770		1100		X								
GW0317	45774	↓	1315	↓	X								

Matrix Code: GW - Groundwater SL - Soil SD - Sediment SW - Surface water
OTHER - Please identify codes

Priority: ☒ Normal ☐ Rush Rush time period

Shipped via: ☒ FedEx/UPS ☐ Courier Other

Condition of Samples Upon Receipt:

Custody Seal Intact: ☒ Yes ☐ No ☐ None

Relinquished by: (Signature) Date/Time: 27-Sep-02 1900 Received by: FedEx (Signature) Date/Time: 27-Sep-02 1900

Relinquished by: (Signature) Date/Time: Received by: (Signature) Date/Time: 09/28/02 0930

Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File

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METALS DATA

EXPONENT, INC.
COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE

Contract: NY02-258 SDG No.: A02-9633

Lab Code: STLNY Case No.: SAS No.:

SOW No.: SW8463 3RD ED

Sample ID.	Lab Sample No.
GW0301	A2963301
GW0302	A2963302
GW0303	A2963303
GW0304	A2963304
GW0305	A2963305
GW0306	A2963306
GW0307	A2963307
GW0308	A2963308
GW0309	A2963309
GW0310	A2963310
GW0311	A2963311
GW0312	A2963312
GW0313	A2963313
GW0313 MS	A2963313S
GW0313 SD	A2963313SD
GW0314	A2963314
GW0315	A2963315

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan L Mazur Name: Susan L. Mazur

Date: 10/16/02 Title: Laboratory Director

EXPONENT, INC.

COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE

Contract: NY02-258 SDG No.: A02-9633

Lab Code: STLNY Case No.: SAS No.:

SDW No.: SW8463 3RD ED

Sample ID.	Lab Sample No.
GW0316	A2963316
GW0317	A2963317

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Susan L Mazur Name: Susan L. Mazur

Date: 10/16/02 Title: Laboratory Director

EXPONENT, INC.

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0301

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229954

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.230			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0302

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229955

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.210			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0303

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229956

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.010			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0304

ntract: NY02-258

Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229957

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	6.670			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2973			M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: YELLOW Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0305

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229958

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.820			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0306

ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229959

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.520			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0307

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229960

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.250			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0308

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229961

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.990			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0309

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229962

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.420			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0310

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229963

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	12.2			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0311

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229964

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.550			M
7440-43-9	Cadmium	0.8312			M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0312

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229965

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.330			M
7440-43-9	Cadmium	0.8508			M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0313

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229966

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.890			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: YELLOW Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0314

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229969

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	41.5			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: YELLOW Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0315

'ontract: NY02-258

ab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229970

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.900			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0316

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

atrix (soil/water): WATER Lab Sample ID: AD229971

evel (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.830			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0317

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Lab Sample ID: AD229972

Level (low/med): LOW Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.9			M
7440-43-9	Cadmium	0.5000	U		M
7440-28-0	Thallium	0.2000	U		M

Color Before: COLORLESS Clarity Before: CLEAR Texture: NONE

Color After: COLORLESS Clarity After: CLR/FIL Artifacts:

Comments:

EXPONENT, INC.
-2A-
INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: NY02-258

o Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

itial Calibration Source: _____

ntinuing Calibration Source:

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Arsenic	25	25.2	100.8	25	25.0	100.0	25.5	102.0	M
Cadmium	25	25.2	100.8	25	24.9	99.6	25.2	100.8	M
Thallium	25	24.7	98.8	25	24.7	98.8	26.3	105.2	M

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

EXPONENT, INC.

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

:ontract: NY02-258

ab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

nitial Calibration Source: _____

:ontinuing Calibration Source:

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Arsenic				25	25.5	102.0	24.8	99.2	M
Cadmium				25	25.2	100.8	25.1	100.4	M
Thallium				25	25.6	102.4	27.3	109.2	M

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

EXPONENT, INC.

-3-

BLANKS

Contract: NY02-258

Lab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic	1.0000	U	1.0000	U	1.0000	U	1.0000	U	1.0000	U	M
Cadmium	0.5000	U	0.5000	U	0.5000	U	0.5000	U	0.5000	U	M
Thallium	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	M

TL BUFFALO

EXPONENT, INC.

-3-

BLANKS

ontract: NY02-258

ab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

reparation Blank Matrix (soil/water): WATER

reparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Arsenic			1.0000	U							M
Cadmium			0.5000	U							M
Thallium			0.2000	U							M

EXPONENT, INC.
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313 MS

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

trix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic	75 - 125	26.8151		4.8893		20.00	110		M
Cadmium	75 - 125	21.6648		0.5000	U	20.00	108		M
Thallium	75 - 125	20.5875		0.2000	U	20.00	103		M

ments:

EXPONENT, INC.
-5A-
SPIKE SAMPLE RECOVERY

SAMPLE NO.
GW0313 SD

:ontract: NY02-258

ab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

atrix (soil/water): WATER Level (low/med): LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Arsenic	75 - 125	25.8377		4.8893		20.00	105		M
Cadmium	75 - 125	21.4163		0.5000	U	20.00	107		M
Thallium	75 - 125	20.3189		0.2000	U	20.00	102		M

omments: _____

EXPONENT, INC.
-5B-

POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.
GW0313A

ntract: NY02-258

b Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

trix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added(SA)	%R	Q	M
Arsenic		26.8794		4.8893		20.00	110.0		M
Cadmium		22.1285		0.5000	U	20.00	110.6		M
Thallium		20.6224		0.2000	U	20.00	103.1		M

nments:

EXPONENT, INC.
-6-
DUPLICATES

SAMPLE NO.

GW0313 SD

Contract: NY02-258

Lab Code: STLNY Case No.: SAS No.: SDG NO.: A02-9633

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		26.8151		25.8377		3.7		M
Cadmium		21.6648		21.4163		1.2		M
Thallium		20.5875		20.3189		1.3		M

EXPONENT, INC.

LABORATORY CONTROL SAMPLE

Contract: NY02-258

Lab Code: STLNY Case No.: _____ SAS No.: _____ SDG NO.: A02-9633

Solid LCS Source: _____

Aqueous LCS Source: _____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Arsenic	20.00	21.1545	105.8						
Cadmium	20.00	21.1043	105.5						
Thallium	20.00	21.2321	106.2						

Appendix B

Borehole Logs

825840292

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-1

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION
0							Asphaltic concrete
							Subbase
1			1.4	0.004		SC	Clayey, fine SAND w/ fine to coarse gravel, red (2.5YR 4/6), clay 20-30%, damp.
2		70%					
3			3.4	0.011			
4							
5			2.9	0.000		ML ▽	SILT, olive-gray (5Y 4/2), moist. Becomes wet @ 5'.
6		90%					Color change to yellow-brown (10YR 5/6) @ 5.7' BGS w/ olive-brown (2.5Y 5/3) mottling.
7			1.2	0.000		CL	CLAY, brown (7.5Y 5/3) w/ slight yellow-brown (10YR 5/6) mottling, moist to wet. Color change to brown (10YR 5/3) @ 7.5' BGS w/ trace silt.
8							
9			1.2	0.005			
10		75%				SP	Fine SAND w/ trace silt, brown (10YR 5/3), wet, increased silt with depth.
11			1.2	0.003			
12							
13			6.7	0.003		SM	Grades to slightly silty, fine SAND, brown (10YR 5/3), silt 10-20%, wet.
14		75%					
15			1.6	0.000			
16							
17			5.2	0.000			
18		80%				CL	CLAY, dark gray-brown (2.5Y 4/2), very firm, moist.
19			1.6	0.003			
20							Total depth @ 20' BGS.

WELL CONSTRUCTION DETAIL (not applicable)

BACKFILLED w/ BENTONITE GROUT

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840293

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-2

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1			15.6	0.009		CL	Slightly sandy CLAY, very dark brown (7.5Y 2.5/2), damp.	
2		90%					Color change to red (2.5Y 4/6) w/ hard clay chunks.	
3			12.6	0.004		ML	SILT, olive-gray (5Y 4/2), moist to wet.	
4								
5			- -	0.005		▽	Becomes wet @ 5' BGS. Color change to yellow-brown (10YR 5/6) w/ slight light olive-brown (2.5Y 5/3) mottling, wet.	
6		80%						
						CL	CLAY layer, same color as above.	
7			2.1	0.000		SM/ ML	Silty fine SAND/ sandy SILT, brown (10YR 4/3) w/ some yellow-brown (10YR 5/6) mottling, wet.	
8								
9			1.2	0.004				
10		75%						
11			2.1	0.000		ML	Clayey SILT, dark gray-brown (2.5Y 4/2), wet.	
12								
13			1.2	0.000				
14		20%				CL	Driller reports harder drilling @ 14' BGS. CLAY, dark gray (10YR 4/1), moist to wet, very firm.	
15			- -	- -				
16							Total depth @ 16' BGS.	
17								
18								
19								
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840294

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-3

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1				0.000		CL	Sandy CLAY, fine to medium sand 10-20%, very dark brown (7.5Y 2.5/2), abundant brick, wood, gravel chunks, very minor fine grain size white flecks, damp.	
2		95%						
3				0.004		ML	SILT, olive-gray (5Y 4/2), moist.	
4							Color change to yellow-brown (10YR 5/6) w/ some light olive-brown (2.5Y 5/3) mottling, some black staining near color change @ 3.8' BGS.	
5				0.000				
6		70%						
7				0.000		CL	CLAY layer, same color as above.	
						ML	Sandy SILT, fine sand 20-30%, brown (10YR 4/3), slight yellow-brown mottling (10YR 4/6), wet.	
8								
9				0.000		SM	Silty fine SAND, silt 20-30%, gray (5Y 5/1), wet.	
10		25%						
11							CLAY layer, 1" thick.	
12								
13				0.000				
14		25%				SP	Fine to medium SAND, predominantly fine-grained, dark gray (2.5Y 4/1), uniform, wet.	
15								
16								
17			1.2	0.000		SP/CL	Bedded SAND (beds up to 2" thick), dark gray (2.5Y 4/1) and CLAY, banded brown (7.5YR 5/3) and gray (2.5Y 5/1), wet.	
18		100%						
19			33.4	0.000				
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840295

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-3

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21			13.2	0.003		SP/CL	Bedded SAND (beds up to 2" thick), dark gray (2.5Y 4/1) and CLAY, banded brown (7.5YR 5/3) and gray (2.5Y 5/1), wet.	BACKFILLED w/ BENTONITE GROUT
22		60%				CL	CLAY, dark gray (10YR 4/1), very firm, moist to wet.	
23			2.1	0.000				
24							Total depth @ 24' BGS.	
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840296

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-4

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
1			1.4	0.024		ML	Sandy SILT w/ some fine gravel, red (10YR 4/6). Color change to dark brown (10YR 3/3) w/ white crystalline grains scattered throught, damp to moist.	
2		100%					SILT, dark brown (10YR 3/3), quickly grades to olive-gray (5Y 5/2), moist.	
3			1.4	0.007				
4								
5			1.2	0.013		▽	Color change to yellow-brown (10YR 5/6) w/ light olive-brown (2.5Y 5/3) mottling, wet.	
6		100%						
7			0.8	0.007		SM	Silty CLAY layer, 1" thick, color as above. Silty fine SAND, yellow-brown (10YR 5/6) w/ light olive-brown (2.5Y 5/3) mottling, wet.	
8						SP	Fine to medium SAND, predominantly fine-grained, olive (5Y 5/3), wet.	
9			2.0	0.011				
10		80%					Color change to gray (5Y 5/1).	
11			6.1	0.009				
12								
13			13.8	0.010				
14		80%						
15			1.2	0.000				
16								
17			0.9	0.009				
18		30%						
19			--	--				
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840297

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-4

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21			0.9	0.005		SP	Fine to medium SAND, predominantly fine-grained, gray (5Y 5/1), wet.	BACKFILLED w/ BENTONITE GROUT
22		70%						
23			1.4	0.008		CL	CLAY, gray (2.5Y 5/1), medium to high plasticity, 1" thick sand layer, wet.	
24							Total depth @ 24' BGS.	
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840298

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-5

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	
1			0.6	0.038		SM	Silty fine SAND w/ fine gravel, dark red-brown (5YR 2.5/2), abundant brick debris, damp to moist. As above w/ wood debris from 1.6-2' BGS.	
2		100%						
3			0.4	0.000		ML	SILT, very dark brown (10YR 3/3), quickly grades to mottled light olive-brown (2.5Y 5/3) and olive-yellow (2.5Y 6/8), slightly micaceous, moist.	
4								
5		100%	0.0	0.156		▽	As above, wet.	BACKFILLED w/ BENTONITE GROUT
6	SP0001					SP	Fine to medium SAND, yellow-brown (10YR 5/6), wet. ⧗ Indicates sample was analyzed.	
7	SP0002		2.1	0.698				
8								
9	SP0003 SP0004		1.7	0.861				
10		100%					Fine SAND, light olive-brown (2.5Y 5/4), minor medium grained sand, scattered thin layers (<1/2" thick) w/ trace silt, wet.	
11			- -	0.119				
12								
13			1.7	0.003				
14		90%						
15			0.8	0.015				
16								
17			2.8	0.026				
18		90%						
19			7.1	0.000			Fine to medium SAND, predominantly fine-grained, dark gray (2.5Y 4/1), wet.	
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840299

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-5

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21			0.4	0.010		SP	Fine to medium SAND, predominantly fine-grained, dark gray (2.5Y 4/1), wet.	
22		80%						BACKFILLED w/ BENTONITE GROUT
23			1.2	0.008				
24								
25			0.0	0.015				
26		70%						
27			0.4	0.008		CL/ CH	CLAY, gray (10YR 6/1), medium to high plasticity, wet. Sand layer, gray (10YR 6/1), 1" thick @ 27' BGS.	
28							Total depth @ 28' BGS.	
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840300

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-6

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION
0							Asphaltic concrete
1			0.4	0.014		GW	Fine to coarse GRAVEL w/ trace fine silt.
2		25%					
3			--	--		ML	SILT, mottled light olive-brown (2.5Y 5/3) and olive-yellow (2.5Y 6/8), wet.
4							
5			0.0	0.083			
6		80%					
7			0.4	0.036		SM	Silty fine SAND, silt 10-20%, yellow-brown (10YR 5/6), wet.
8							
9			0.4	0.103		SP	Fine to medium SAND, dark gray (5YR 4/1), wet.
10		80%					
11			0.9	0.259		SM	Silty fine SAND, silt: 5-15%, dark gray (5YR 4/1), wet.
12							
13			7.4	0.093		SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine grained, few scattered thin layers (<1/4" thick) w/ trace silt, wet.
14		50%					
15			--	--			
16							
17			--	0.044			
18		100%					
19			--	0.056			
20							

WELL CONSTRUCTION DETAIL (not applicable)

BACKFILLED w/ BENTONITE GROUT

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840301

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-6

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21			0.1	0.333		SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine-grained, few scattered thin layers (1/4" thick) w/ trace silt, wet.	BACKFILLED w/ BENTONITE GROUT
22		20%						
23			--	--				
24								
25			0.6	0.133			Grades to olive-brown (2.5Y 4/3).	
26		70%						
27			0.9	0.014		CL/CH	CLAY, gray (10YR 6/1), medium to high plasticity, wet.	
28							Total depth @ 28' BGS.	
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 8 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840302

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-7

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1			1.2	0.008		CL	CLAY, reddish brown (5YR 4/3), damp to moist.	
2		100%						
3			2.1	0.004				
4								
5			1.0	0.006			Gravelly layer from 4.8 to 5' BGS.	
						ML	SILT, olive-gray (5Y 4/2) w/ slight yellowish mottling, moist to wet, few rootlets at contact.	
6		100%				▽	Wet @ 6.3' BGS.	
7			1.2	0.004				
						CL	CLAY, color as above.	
8						SP	Fine to medium SAND, olive-brown (2.5Y 4/3), predominantly fine-grained, trace silt, wet.	
9			6.3	0.003				
10		80%						
11			37.7	0.000		SM	Increased SILT w/ depth to 5-15% (silty sand).	
12								
13			5.0	0.003		SP	Fine to medium SAND, brown (7.5YR 4/3), predominantly fine grained, few thin (<1/4" thick) clay layers of the same color, wet.	
14		75%						
15			25.8	0.000				
16							CLAY layer, 2" thick @ 16' BGS.	
17			6.3	0.003				
18		80%						
19			5.8	0.005				
20							CLAY layer, 2" thick @ 19.7' BGS.	

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840303

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-7

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20						SP	Fine to medium SAND, brown (7.5YR 4/3), predominantly fine-grained, few thin clay layers of same color (<1/4" thick), wet.	
21			4.2	0.008		CL/ CH	CLAY, brown (7.5YR 4/3), medium-high plasticity, single 1/2" thick sand layer, wet.	BACKFILLED w/ BENTONITE GROUT
22		50%						
23			--	--				
24							Total depth @ 24' BGS.	
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840304

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-8

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
1			1.6	0.046		CL	Sandy CLAY, mottled dark red-brown (5YR 3/4), dark brown (7.5YR 3/3) and black (5Y 2.5/1) w/ some fine gravel and scattered broken brick, wood "pieces" from 2.2-3' BGS, damp to moist.	
2		100%						
3			11.0	0.225			CLAY, lime green (no soil color index) w/ thin layer of paper material, clay layer, bright light tan (no soil color index), moist.	
4								
5			33.9	0.018		PT	Organic layer @ 4.7' BGS, abundant fibrous roots and rootlets, very dark red-brown (2.5Y 5/3), moist.	
6		100%				ML	Slightly fine, sandy SILT, light olive-brown (2.5Y 5/4), moist.	
7			2.1	0.026		SM	Wet @ 6.3' BGS, grades to silty fine SAND, olive-gray (5Y 4/2), (10-20% silt).	
8						CL / SP	CLAY, mottled lt olive-brown (2.5Y 5/3) and olive-yellow (2.5Y 6/8), moist, low to medium plasticity.	
9			1.6	0.438			Fine to med. SAND, yellow-brown (10YR 5/6),predominantly fine-grained, trace silt, wet.	
10		70%						
11			1.6	0.028		SM	Color change to brown (10YR 4/3) @ 11.3' BGS. Grades to brown (10YR 5/3), increasing silt (to 20-30%) w/ depth (silty sand).	
12								
13			1.6	0.009				
14		100%						
15			0.9	0.004		CL/ CH	CLAY, grayish brown (10YR 5/2), few thin sand layers from 14.7-16.0 BGS, medium-high plasticity, wet.	
16								
17			1.2	0.009				
18		100%						
19			1.2	0.004				
20							Total depth @ 20' BGS.	

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840305

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-9

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION
0							Asphaltic concrete
1	SP0005	100%	76.7	0.004		SC	Clayey SAND, fine to coarse sand, clay 20-30% very dark brown (7.5Y 2.5/2), some scattered fine gravel, damp.
2						CL	CLAY, dark brown (7.5YR 3/2), trace fine sand, some fine gravel and brick, damp.
3	SP0006	20%	25.8	0.000		ML	Clayey SILT, brown (10YR 4/3), moist. ⧗ Indicates sample was analyzed.
4						OL	CLAY, black (10YR 2/1), moist, organic odor.
5	SP0007	100%	6.3	0.000		ML	SILT, olive-gray (5Y 4/2), moist.
6							
7	SP0008	10%	60.0	0.000			
8							
9	SP0009	100%	6.3	0.000		SM	Silty fine SAND, yellow-brown (10YR 5/6), silt 10-20%, wet.
10							
11	SP0010	20%	2.5	0.000		SP/CL	Bedded fine to medium SAND, yellow-brown (10YR 5/6) and clay, yellow-brown (10YR 5/6), wet, beds up to 4" thick.
12							
13	SP0011	100%	1.2	0.000			
14							
15		0%				CL	CLAY, yellow-brown, moist, firm.
16							
17	SP0012	100%	1.2	0.000		CL/CH	CLAY, grayish brown (2.5Y 5/2), medium to high plasticity, few (2-1/4" thick) sand layers, wet.
18							
19							
20							Total depth @ 20' BGS.

WELL CONSTRUCTION DETAIL (not applicable)

BACKFILLED w/ BENTONITE GROUT

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840306

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-10

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1	SP0013 SP0014*	100%	2.1	0.000		CL	Sandy CLAY, red (2.5YR 4/6) w/ fine gravel, sand 10-20%, minor wood debris, damp.	
2							⧗ Indicates sample was analyzed.	
3		5%	25.8	0.000				
4						▽	Becomes wet @ 4' BGS.	
5	SP0015	100%	1.2	0.000		SC	Clayey, fine to coarse SAND, gray (10YR 4/1), abundant glass and white clayey material, wet.	
						OL	CLAY (2" thick), black (10YR 2/1), organic odor.	
6						ML	SILT, olive-gray (5Y 4/2), wet.	
7		0%	--	--				
8							Fine sandy SILT, yellow-brown (10YR 5/6) and grayish brown (2.5Y 5/2), sand 10-20%, wet.	
9	SP0016	100%	2.1	0.000				
10						CL/ CH	CLAY, grayish-brown (2.5Y 5/2), medium-high plasticity, wet.	
11	SP0017	80%	2.1	0.000				
12							Total depth @ 12' BGS. * Indicates duplicate sample	
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 9 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840307

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-11

Ground surface: Soil

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0								
1	SP0018	100%		0.008		ML	Clayey SILT, dark olive-brown (2.5Y 3/3), some root fragments, minor asphalt from 0.7-0.9' BGS, damp to moist.	BACKFILLED w/ BENTONITE GROUT
						CL	CLAY, red (7.5YR 3/3), hard solid clay chunks, damp to moist. ⧗ Indicates sample was analyzed.	
2								
3		5%						
4								
5	SP0019	100%		0.004		ML	Clayey SILT, very dark gray-brown (10YR 3/2), moist. SILT @ 5.5' BGS, olive-gray (5Y 4/2), moist.	
6								
7	SP0020	80%		0.000		▽	Color change to yellow-brown (10YR 5/6) w/ faint grayish brown (2.5Y 5/2) mottling. Wet @ 6.8' BGS.	
8								
9	SP0021	100%		0.003			Some black iron oxide staining from 8.7-9.2' BGS.	
10						SP	Fine to medium SAND, predominantly fine-grained, trace fines, wet. Color change to grayish brown @ 10' BGS.	
11	SP0022	100%		0.003		CL	CLAY, dark gray-brown (2.5Y 4/2), wet.	
12							Total depth @ 12' BGS.	
13								
14								
15								
16								
17								
18								
19								
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 10 October 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 1

825840308

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-12

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	
							Subbase	
1	SP0023	100%		0.000		CL	Sandy CLAY, red (2.5YR 4/6), fine sand 5-15%, few fine gravels, moist. ⧗ Indicates sample was analyzed.	
2								
3		0%						
4						ML	SILT, dark brown (7.5YR 3/2), moist to wet.	
5	SP0024	100%		0.000		▽	Color change to yellow-brown (10YR 5/6) w/ some slight olive-brown (2.5Y 5/3) mottling, moist to wet. Wet @ 4.7' BGS.	BACKFILLED w/ BENTONITE GROUT
6								
7	SP0025	90%		0.000			As above, becomes clayey SILT @ 7.4' BGS.	
8								
9	SP0026	100%		0.000		SM	Silty fine SAND, yellow-brown (10YR 5/6), silt 10-20%, increasing silt w/ depth, wet.	
10						CL	Grades to silty CLAY, dark gray-brown (10YR 3/2), wet.	
11	SP0027	80%		0.000		SP	Very fine to fine SAND, dark gray (2.5Y 4/1), wet.	
12								
13	SP0028	100%		0.000			As above w/ scattered clay layers (1/8-1/4" thick), gray (2.5Y 4/1).	
14								
15	SP0029	30%		0.000				
16								
17	SP0030	100%		0.000			Clay layers increase in number and thickness (up to 4" thick), clay is mottled gray (2.5Y 4/1) and brown (7.5YR 5/3), medium to high plasticity.	
18								
19	SP0031	70%		0.000				
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840309

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-12

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SP0032	100%		0.000		SP	Very fine to fine SAND, dark gray (2.5Y 4/1), uniform, wet w/ clay layers (up to 4" thick), clay is mottled gray (2.5Y 4/1) and brown (7.5YR 5/3), medium to high plasticity.	BACKFILLED w/ BENTONITE GROUT
22								
23	SP0033	100%		0.000				
24								
25	SP0034	100%		0.000				
26								
27	SP0035	20%		0.000				
28						SP/ CL	As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.	
29	SP0036	100%		0.000				
30								
31	SP0037	20%		0.000				
32								
33						CL	Grades to CLAY w/ sand (as above) layers up to 2" thick.	
34								
35								
36								
37								
38								
39								
40							Total depth @ 40' BGS.	

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840310

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-13

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1	SP0038	100%		0.003		CL	Slightly sandy CLAY, red (2.5YR 4/6), fine sand 5-15%, damp to moist, some hard concretions, increased moisture with depth.	
2							⧗ Indicates sample was analyzed.	
3	SP0039	60%		0.000				
4								
5	SP0040	100%		0.000				
6						ML	Slightly clayey SILT, dark brown (7.5YR 3/2), black at contact (approx. 2" thick), moist to wet.	
7	SP0041	100%		0.017		▽	Wet @ 6.3' BGS. SILT yellow-brown (10YR 5/6) with slight olive-brown (2.5Y 5/3) mottling, some iron-oxide flecks, wet.	
8								
9	SP0042	100%		0.000				
10						CL	Silty CLAY, same color as above.	
11	SP0043	70%		0.000		SP	Very fine to fine SAND, yellow-brown (10YR 5/6), wet.	
12								
13	SP0044	100%		0.215			Color change to light olive-brown (2.5Y 5/4), few thin (1/4" thick) scattered sand layers with trace fines.	
14								
15	SP0045	70%		0.082				
16								
17	SP0046	100%		0.110				
18								
19	SP0047	30%		0.094				
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840311

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-13

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SP0048	70%		0.092		SP	Very fine to fine SAND, light olive-brown (2.5Y 5/4), few thin (1/4" thick) scattered layers with trace fines.	
22								
23		0%		--				
24								BACKFILLED w/ BENTONITE GROUT
25	SP0049	100%		0.023				
26								
27	SP0050	80%		0.000				
28								
29	SP0051	100%		0.110				
30						CL/CH	CLAY, gray (2.5Y 4/1), medium high plasticity, wet.	
31	SP0052	30%		0.000		SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine-grained, wet.	
32								
33	SP0053	100%		0.081		CL/CH	CLAY, gray (10YR 6/1), medium high plasticity, wet.	
34								
35		5%		--				
36							Total depth @ 36' BGS.	
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840312

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-14

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
0							Asphaltic concrete	BACKFILLED w/ BENTONITE GROUT
							Subbase	
1	SP0054	75%		0.004		CL	Sandy CLAY, dark red-brown (5YR 2.5/2), fine sand 10-20%, some fine gravel, few hard concretions, moist.	
2							⧗ Indicates sample was analyzed.	
3		0%		--				
4								
5	SP0055	100%		0.005		ML	Silt layer 1.5" thick at contact, dark brown (7.5YR 3/2), some organic matter (rootlets), moist to wet.	
6						▽	Color change to yellow-brown (10YR 5/6) @ 4.9' BGS w/ some olive-brown (2.5Y 5/3) mottling, some iron-oxide flecks. Wet @ 6' BGS.	
7	SP0056	20%		0.000				
8								
9	SP0057	100%		0.000				
10						CL	Silty CLAY, same appearance as above.	
						SP	Very fine to fine SAND, yellow-brown (10YR 5/6), wet.	
11	SP0058	100%		0.000				
12							Occasional thin clay layers (< 1/4" thick), dark gray (5YR 4/1).	
13	SP0059	100%		0.000				
14								
15	SP0060	30%		0.000				
16							Color change to dark gray (2.5Y 4/1).	
17	SP0061	100%		0.003				
18								
19	SP0062	20%		0.000				
20								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 1 of 2

825840313

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole : B-14

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20								
21	SP0063	100%		0.191		SP	Very fine to fine SAND, dark gray-brown (2.5Y 4/2) w/ occasional thin clay layers (< 1/4" thick), wet.	
22								
23	SP0064	40%		0.068				
24								BACKFILLED w/ BENTONITE GROUT
25	SP0065	100%		0.043				
26								
27	SP0066	20%		0.008				
28								
29	SP0067	80%		0.008				
30								
31		0%		--				
32								
33	SP0068	100%		0.010		CL/ CH	CLAY, gray (10YR 6/1), medium high plasticity, wet.	
34								
35		20%		--				
36							Total depth @ 36' BGS.	
37								
38								
39								
40								

Drilled By: Summit Drilling

Drill Method: Push probe

Drill Date: 13 November 2002

Well Casing Elevation: NA

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Sheet: 2 of 2

825840314

Appendix C

Quality Assurance Review

825840315

Quality Assurance Review

Introduction

A quality assurance review was completed by Exponent for total solids and metals analyses on groundwater and soil samples collected during the Phase 1A supplemental field investigation (SFI) at the Ventron/Velsicol site located in Wood-Ridge and Carlstadt, New Jersey. Groundwater samples were collected from September 24–27, 2002 and soil samples were collected from October 8–10, 2002 and November 13, 2002. Overall, the data reported are of good quality. A total of 4 results were qualified as estimated (*J*) and 17 results were restated as undetected (*U*). No results were rejected (*R*). The quality assurance review was conducted to verify that the laboratory quality assurance and quality control procedures were documented and that the quality of the data is sufficient to support the use of the data for their intended purposes. The quality assurance review included evaluating the applicable quality control results reported by the laboratory. The data validation procedures, the analytical methods used to complete the analyses, and the results of the quality assurance review are presented below.

Data Validation Procedures

Data validation procedures included evaluating the sample results and applicable quality control results reported by the laboratory. The data were subjected to an abbreviated data validation review using guidelines specified by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (U.S. EPA 1994). For the abbreviated validation, the following laboratory deliverables were reviewed:

- Case narratives discussing analytical problems (if any) and procedures
- Chain-of-custody documentation to verify completeness of data
- Sample preparation logs or laboratory summary result forms to verify analytical holding time constraints were met
- Initial and continuing calibration results to assess instrument performance
- Method blank, continuing calibration blank, and equipment rinsate blank results to determine whether an analyte reported as detected in any sample was the result of possible contamination at the laboratory or contamination during field sampling
- Laboratory control sample (LCS) analyses (i.e., blank spikes) and matrix spike (MS) analyses to assess analytical accuracy

- Laboratory duplicate sample, matrix spike duplicate (MSD), and/or duplicate LCS results, as applicable, to assess analytical precision
- Analytical results for analyses performed.

The abbreviated data validation included review of the summary of quality control results reported by the laboratory. Ten percent of the laboratory data reported was verified (e.g., calculations and transcriptions and review of instrument printouts and bench sheets). The laboratory case narratives did not indicate any significant problems with data that were not reviewed. In addition, results for applicable field duplicate samples were evaluated to provide additional information in support of the quality assurance review.

Data qualifiers were assigned during the quality assurance reviews if applicable control limits were not met, in accordance with functional guidelines (U.S. EPA 1994) and the quality control requirements stated in the methods.

Analytical Methods

Analyses were completed according to the following procedures:

- Unfiltered barium, copper, iron, lead, manganese, nickel, and vanadium in 16 groundwater samples and one equipment rinsate blank by inductively coupled plasma-atomic emission spectrometry using U.S. EPA SW-846 Method 6010B (U.S. EPA 1997). Analyses were performed by Columbia Analytical Services, Inc., Rochester, New York.
- Unfiltered arsenic, cadmium, and thallium in 16 groundwater samples and one equipment rinsate blank by inductively coupled plasma-mass spectrometry using U.S. EPA SW-846 Method 6020 (U.S. EPA 1997). Analyses were performed by Severn Trent Services, Inc., Amherst, New York.
- Unfiltered and filtered mercury in 16 groundwater samples and one equipment rinsate blank by cold vapor atomic fluorescence spectrometry using EPA Method 1631C (U.S. EPA 2001). Analyses were performed by Cebam Analytical, Inc., Seattle, Washington.
- Total mercury in 26 soil samples by cold vapor atomic absorption spectrometry using U.S. EPA SW-846 Method 7471A (U.S. EPA 1997) and total mercury on one equipment rinsate blank using U.S. EPA SW-846 Method 7470A (U.S. EPA 1997). In addition, all soil samples were analyzed for total solids using EPA Method 160.0 (U.S. EPA 1983). Analyses were performed by Columbia Analytical Services, Inc., Rochester, New York.

Data Quality Assessment

The laboratory data were evaluated in terms of completeness, holding times, instrument performance, bias, and precision. The results of the quality control procedures used during sample analyses are discussed below.

Completeness

Results reported by the laboratory were 100-percent complete.

Holding Times and Sample Preservation

All analytical holding time constraints and sample preservation requirements were met for all samples.

Calibration

The calibration of the analytical instruments, as documented by the laboratory, was acceptable. No changes in instrument performance that would have resulted in the degradation of data quality were indicated during any analytical sequence.

Initial and Continuing Calibration

Initial and continuing calibrations, as documented by the laboratory, were completed for all applicable target analytes and met the criteria for acceptable performance (Table 1) and frequency of analysis.

Initial and Continuing Calibration Blanks

The initial and continuing calibration blank analyses, as documented by the laboratory, met the criteria for acceptable performance (Table 1).

Laboratory Method Blank Analyses

No target analytes were detected in the laboratory method (e.g., preparation) blanks and met the criteria for acceptable performance (Table 1).

Accuracy

The accuracy of the analytical results is evaluated in the following sections in terms of analytical bias (MS/MSD and LCS recoveries) and precision (duplicate sample analyses and/or MSD analyses).

Matrix Spike Recoveries

The recoveries reported by the laboratory for MS/MSD analyses, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

Laboratory Control Sample Recoveries

The recoveries reported by the laboratory for all LCS recoveries, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

Precision

Results for all duplicate sample and/or MS/MSD analyses, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

Field Quality Control Samples

Field quality control samples consisted of one set of field duplicate samples and an equipment rinsate blank for each sampling event, with the exception of samples collected on November 13, 2002. The results of the field quality control samples are discussed below.

Field Duplicate Samples

For the field duplicate sample analyses, the precision of all target analytes reported as detected was generally acceptable. The relative percent difference for mercury in the groundwater field duplicate pair and the soil field duplicate pair was above the 35 percent validation control limit. The following action was taken:

- Results reported for dissolved mercury in the groundwater samples GW0311 and GW0312 were qualified as estimated (assigned a *J* qualifier)
- Results reported for mercury in the soil samples SP0013 and SP0014 were qualified as estimated (assigned a *J* qualifier).

These qualified data may exhibit a greater degree of uncertainty than unqualified data.

Equipment Rinsate Blanks

No target analytes were reported as detected in the equipment rinsate blanks, with two exceptions. Total arsenic and dissolved mercury were reported as detected in the equipment rinsate blanks. The following actions were taken:

- Thirteen groundwater results reported for total arsenic were restated as undetected (a *U* qualifier was assigned to the concentration reported)
- Four groundwater results reported for dissolved mercury were restated as undetected (a *U* qualifier was assigned to the concentration reported).

Table 1. Acceptable performance[a]

	EPA SW-846 6010B[b] (ICP-AES)	EPA SW-846 6020[b] (ICP-MS)	EPA Method 1631C[c] (CVAFS)	EPA SW-846 7470A/7471A[c] (CVAA)
Initial Calibration	90–110 %R	90–110 %R	80–120%	80–120%
Continuing Calibration	90–110 %R	90–110 %R	80–120%	80–120%
Initial and Continuing Calibration Blanks	<IDL	<IDL	<IDL	<IDL
Laboratory Method Blanks	<IDL	<IDL	<IDL	<IDL
Matrix Spike Recoveries	75–125 %R	75–125 %R	75–125 %R	75–125 %R
Laboratory Control Samples	80–120 %R	80–120 %R	80–120 %R	80–120 %R
Precision	±25 RPD	±25 RPD	±25 RPD	±25 RPD

Note: CVAA - cold vapor atomic absorption
CVAFS - cold vapor atomic fluorescence spectrometry
EPA - U.S. Environmental Protection Agency
ICP-AES - inductively coupled plasma-atomic emission spectrometry
ICP/MS - inductively coupled plasma-mass spectrometry
IDL - instrument detection limit
%R - percent recovery
RPD - relative percent difference
[a] Criteria listed below were used for validation purposes only.
[b] U.S. EPA 1997.
[c] U.S. EPA 2001.

References

U.S. EPA. 1983. Methods for chemical analysis of water and wastes. EPA 600/4-79-020. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

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U.S. EPA. 1997. Test methods for evaluating solid waste. SW-846. Version 2.0. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 2001. Method 1631, Revision C: mercury in water by oxidation, purge and trap, and cold vapor atomic fluorescence spectrometry. EPA-821-R-01-024. March 2001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.