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GEOMATRIX

February 28, 2001
Project No. 6452

Ms. Mirtha Capiro
Project Coordinator
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Boulevard, DRE-9J
Chicago, Illinois 60604-3590

RE: STL – North Canton Laboratory, Performance Evaluation,
Morton International Inc., Reading, Ohio
RCRA Docket No. R3013-5-00-001

Dear Ms. Capiro:

During the conference call of November 3, 2000, representatives from the U.S. Environmental Protection Agency Region 5 (USEPA), the Rohm and Haas Co. (Rohm and Haas), Geomatrix Consultants, Inc. (Geomatrix), and Severn Trent Laboratories (STL) North Canton, Ohio laboratory (STL-North Canton) discussed the results of the laboratory's performance evaluation (PE) study. The subject PE report was issued September 12, 2000 by Environmental Resource Associates (ERA) and was entitled 'WP-66 Final Customer Report.' Specific discussions addressed compounds with PE results identified as "not acceptable" or "check for errors."

The USEPA's expressed position was that the laboratory must demonstrate their ability to analyze for the target compounds specified for the facility investigation at the above referenced facility and generate a PE with "acceptable" results. Since the great majority of the target compounds analyzed in the WP-66 report had "acceptable" results, USEPA requested that a new PE sample be analyzed for the target compounds or parameters and target analytical methods which had been identified as "not acceptable" or "check for errors" in the initial PE (WP-66) (Attachment 1).

The purpose of this letter is to provide the results for PE samples subsequently analyzed by STL-North Canton since the November 3, 2000 conference call. Those results are summarized as follows:

- The parameters requiring re-analysis were alkalinity (EPA 310.1), ammonia (EPA 350.3), total phosphorus (EPA 365.2), chloride (EPA 325.2), potassium (SW-846 6010B), 1,2-dichlorobenzene (SW-846 8270C), dimethylphthalate (SW-846 8270C), Aroclor 1232 (SW-846 8082), 4-4-DDE (SW-846 8081A), dieldrin (SW-846 8081A), and heptachlor epoxide (SW-846 8081A). These parameters and methods are specified in the target list

for the referenced project, and were identified as either "not acceptable" or "check for errors" in WP-66. STL completed the PE analysis for these compounds on December 6, 2000.

- On December 19, 2000 ERA generated a report that evaluated STL's December 6, 2000 performance. "Acceptable" results were reported for chloride, potassium, 1,2-dichlorobenzene, dimethylphthalate, 4,4-DDE, dieldrin, heptachlor epoxide, and Aroclor 1232. The results for ammonia, total phosphorus, and alkalinity were, however, classified as "not acceptable." A copy of ERA's report is included with this letter (Attachment 2).

- STL-North Canton quality assurance staff examined the methods, procedures, and analysts which generated the "not acceptable" results with the objective of identifying what occurred, determining the root cause, initiating corrective action and identify actions that would prevent similar reoccurrence in the future. In the attached letter dated January 25, 2001 STL-North Canton's Quality Assurance Manager documented the findings of their review, the corrective actions performed, and their recommendation to re-run a PE sample for the three parameters in question (Attachment 3).

- On January 31, 2001, completed the analysis of the PE for alkalinity, total phosphorus, and ammonia.

- On February 15, 2001, ERA generated a report that evaluated STL's January 31, 2001 performance. As indicated in the attached report, STL's reported results correlated extremely well to the assigned value and all parameters were reported as "acceptable" (Attachment 4).

Based on their performance of PE studies on September 12, 2000, December 6, 2000 and January 31, 2001, STL-North Canton has corrected the causes of the "not acceptable" and "check for error" results, and demonstrated their ability to accurately perform the analysis of the target compounds proposed for the Rohm and Haas facility investigation in Reading, Ohio. At this time Rohm and Haas respectfully requests your approval to utilize STL-North Canton for the referenced project, and the approval of the project's Quality Assurance Project Plan so designating STL-North Canton.

If you have any questions, please feel free to contact me at (512) 494-0333.

Sincerely,
GEOMATRIX CONSULTANTS, INC.

Mark P. Hemingway
Principal Hydrogeologist

MPH/jjs

Attachments

cc: Mr. Brian Freeman, USEPA Region 5
Mr. Peter V. Palena, The Rohm and Haas Co.
Mr. Eric L. Walker, The Rohm and Haas Co.
Mr. David C. Kurland, Esq., The Rohm and Haas Co.

ATTACHMENT 1

WP66 STUDY REPORT
SEPTEMBER 12, 2000

ENVIRONMENTAL
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Study: **WP66**

ERA Laboratory Code: **R1456-08**

Laboratory Name: **STL NORTH CANTON**

Report Type: **Customer**

Report Method: **Method A**

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l	310	319	278 - 356		Acceptable	EPA 160.3
	Total Dissolved Solids	mg/l	291	301	226 - 376	251 - 351	Acceptable	EPA 160.1
	Conductivity at 25°C	µmhos	412	390	360 - 420	370 - 410	Check for Error	EPA 120.1
	Alkalinity as CaCO3	mg/l	101	81.6	73.7 - 89.2	76.3 - 86.6	Not Acceptable	EPA 310.1
	Chloride	mg/l	62.1	60.9	54.6 - 66.8	56.6 - 64.8	Acceptable	EPA 325.2
	Fluoride	mg/l	3.35	3.29	2.88 - 3.67	3.01 - 3.53	Acceptable	EPA 300.0A
	Potassium	mg/l	17.2	15.3	13.1 - 17.6	13.8 - 16.8	Check for Error	EPA 6010B
	Sodium	mg/l	79.2	76.4	69.0 - 83.7	71.4 - 81.2	Acceptable	EPA 6010B
	Sulfate	mg/l	8.77	9.80	6.93 - 12.5	7.86 - 11.6	Acceptable	EPA 300.0A
pH	pH	S.U.	8.72	8.74	8.48 - 9.00	8.57 - 8.91	Acceptable	EPA 9040B
Hardness	Total Suspended Solids	mg/l	60.0	65.4	50.1 - 70.4	53.5 - 67.0	Acceptable	EPA 160.2
	Calcium	mg/l	30.8	31.4	27.9 - 35.8	29.2 - 34.5	Acceptable	EPA 6010B
	Magnesium	mg/l	2.83	3.03	2.58 - 3.49	2.73 - 3.33	Acceptable	EPA 6010B
	Calcium hardness (CaCO3)	mg/l	88.6	80.9	68.8 - 93.0		Acceptable	SM 2340B
	Total Hardness (CaCO3)	mg/l	86.2	90.9	81.4 - 101	84.7 - 97.7	Acceptable	EPA 130.2
Demand	BOD	mg/l	10.9	20.5	10.0 - 31.0	13.5 - 27.5	Check for Error	SM 5210B
	CBOD	mg/l	12.2	17.8	7.93 - 27.6	11.2 - 24.3	Acceptable	SM 5210B
	COD	mg/l	40.3	32.9	19.8 - 43.8	23.8 - 39.8	Check for Error	EPA 410.4
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l	12.4	9.14	7.07 - 11.1	7.75 - 10.4	Not Acceptable	EPA 350.3
	Nitrate as N	mg/l	30.1	29.8	23.6 - 35.3	25.6 - 33.4	Acceptable	EPA 300.0A
	Ortho-phosphate as P	mg/l	0.682	0.663	0.550 - 0.780	0.589 - 0.742	Acceptable	EPA 365.2
Nutrients - Complex	Total phosphorus as P	mg/l	3.59	4.76	3.62 - 5.58	3.95 - 5.25	Not Acceptable	EPA 365.2
	Total kjeldahl nitrogen	mg/l	5.20	4.70	3.16 - 6.20	3.67 - 5.70	Acceptable	EPA 351.3
Cyanide	Cyanide, total	mg/l	0.740	0.749	0.520 - 0.963	0.594 - 0.889	Acceptable	EPA 9012A
Phenolics	Phenolics, total	mg/l	0.698	0.966	0.530 - 1.40	0.676 - 1.26	Acceptable	EPA 9065
Grease & Oil	Grease & Oil (Gravimetric)	mg/l	17.3	19.8	11.4 - 24.6	13.6 - 22.4	Acceptable	EPA 1664
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l	2.14	1.85	1.49 - 2.21	1.61 - 2.09	Check for Error	EPA 330.5

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l	1860	1730	1480 - 1960	1560 - 1880	Acceptable	EPA 6010B
	Antimony	µg/l	411	397	275 - 480	309 - 445	Acceptable	EPA 6010B
	Arsenic	µg/l	257	266	220 - 313	236 - 298	Acceptable	EPA 6010B
	Barium	µg/l	671	645	554 - 735		Acceptable	EPA 6010B
	Beryllium	µg/l	704	672	572 - 759	603 - 728	Acceptable	EPA 6010B
	Boron	µg/l	280	244	178 - 333		Acceptable	EPA 6010B
	Cadmium	µg/l	52.0	50.7	42.4 - 58.8	45.1 - 56.1	Acceptable	EPA 6010B
	Chromium	µg/l	147	144	123 - 164	130 - 158	Acceptable	EPA 6010B
	Cobalt	µg/l	151	156	136 - 176	142 - 169	Acceptable	EPA 6010B
	Copper	µg/l	487	485	440 - 533	455 - 518	Acceptable	EPA 6010B
	Iron	µg/l	1670	1670	1480 - 1880	1550 - 1810	Acceptable	EPA 6010B
	Lead	µg/l	2380	2380	2100 - 2650	2190 - 2560	Acceptable	EPA 6010B
	Manganese	µg/l	1830	1770	1590 - 1970	1650 - 1900	Acceptable	EPA 6010B
	Molybdenum	µg/l	113	125	105 - 144	112 - 138	Acceptable	EPA 6010B
	Nickel	µg/l	1830	1730	1570 - 1930	1630 - 1870	Acceptable	EPA 6010B
	Selenium	µg/l	630	632	501 - 732	539 - 694	Acceptable	EPA 6010B
	Silver	µg/l	298	292	250 - 335	264 - 321	Acceptable	EPA 6010B
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l	169	163	129 - 192	140 - 181	Acceptable	EPA 6010B
	Vanadium	µg/l	1030	1020	919 - 1120	953 - 1090	Acceptable	EPA 6010B
	Zinc	µg/l	1390	1350	1200 - 1510	1250 - 1460	Acceptable	EPA 6010B
Mercury	Mercury	µg/l	14.7	14.0	10.5 - 17.5	11.6 - 16.3	Acceptable	EPA 7470A
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles	Acetone	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acetonitrile	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acrylonitrile	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acrolein	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Benzene	µg/l	66.4	65.5	47.4 - 84.1	53.5 - 78.0	Acceptable	EPA 8260B
	Bromodichloromethane	µg/l	27.2	25.7	18.1 - 33.6	20.6 - 31.0	Acceptable	EPA 8260B
	Bromoform	µg/l	32.1	31.4	20.0 - 43.1	23.8 - 39.2	Acceptable	EPA 8260B
	Bromomethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	2-Butanone (MEK)	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Carbon disulfide	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Carbon tetrachloride	µg/l	24.5	24.2	15.2 - 34.2	18.3 - 31.0	Acceptable	EPA 8260B
	Chlorobenzene	µg/l	27.2	26.8	19.3 - 34.0	21.7 - 31.5	Acceptable	EPA 8260B
	Chlorodibromomethane	µg/l	63.6	66.1	43.7 - 87.8	51.1 - 80.5	Acceptable	EPA 8260B
	Chloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	2-Chloroethylvinylether	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Chloroform	µg/l	72.4	70.2	48.6 - 89.9	55.5 - 83.0	Acceptable	EPA 8260B
	Chloromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	DBCP	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dibromoethane (EDB)	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Dibromomethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichlorobenzene	µg/l	42.6	44.4	31.3 - 56.2	35.5 - 52.0	Acceptable	EPA 8260B
	1,3-Dichlorobenzene	µg/l	53.8	56.0	39.6 - 69.7	44.6 - 64.7	Acceptable	EPA 8260B
	1,4-Dichlorobenzene	µg/l	41.5	42.6	29.3 - 55.0	33.6 - 50.7	Acceptable	EPA 8260B
	Dichlorodifluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,1-Dichloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichloroethane	µg/l	33.8	32.4	22.5 - 43.4	26.0 - 39.9	Acceptable	EPA 8260B
	1,1-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	cis-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	trans-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	cis-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	trans-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Ethylbenzene	µg/l	23.3	23.1	15.6 - 30.0	18.0 - 27.6	Acceptable	EPA 8260B
	2-Hexanone	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Methylene chloride	µg/l	83.4	74.4	47.0 - 102	56.2 - 92.9	Acceptable	EPA 8260B
	MIBK	µg/l	57.6	72.0	27.5 - 112		Acceptable	EPA 8260B
	Styrene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,1,1,2-Tetrachloroethane	µg/l	133	110	40.7 - 173		Acceptable	EPA 8260B
	1,1,2,2-Tetrachloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Tetrachloroethylene	µg/l	59.8	59.9	39.6 - 76.6	45.8 - 70.5	Acceptable	EPA 8260B
	Toluene	µg/l	61.5	64.3	46.3 - 80.0	52.0 - 74.4	Acceptable	EPA 8260B
	1,1,1-Trichloroethane	µg/l	37.1	36.6	23.8 - 48.3	27.9 - 44.2	Acceptable	EPA 8260B
	1,1,2-Trichloroethane	µg/l	36.9	39.7	27.5 - 51.4		Acceptable	EPA 8260B
	Trichloroethylene	µg/l	63.3	62.4	40.5 - 80.6	47.1 - 73.9	Acceptable	EPA 8260B
	Trichlorofluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles (cont.)	1,2,3-Trichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Vinyl acetate	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Vinyl chloride	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Xylenes, total	µg/l	92.6	88.2	50.1 - 120		Acceptable	EPA 8260B

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
PCB's In H2O	Aroclor 1232	µg/l	1.88	1.42	0.611 - 1.92	0.829 - 1.70	Check for Error	EPA 8082
(Standard 1)	PCB Aroclor Identity	µg/l	1232	1232	1232	1232	Acceptable	EPA 8082
PCB's In H2O	Aroclor 1260	µg/l	1.90	1.72	0.691 - 2.32	0.963 - 2.05	Acceptable	EPA 8082
(Standard 2)	PCB Aroclor Identity	µg/l	1260	1260	1260	1260	Acceptable	EPA 8082
PCB's In Oil	Aroclor 1016/1242	mg/Kg	12.6	17.5	1.67 - 26.9	5.88 - 22.7	Acceptable	EPA 8082
(Standard 1)	PCB Aroclor Identity	mg/Kg	1016/1242	1242	1242	1242	Acceptable	EPA 8082
PCB's In Oil	Aroclor 1254	mg/Kg	36.0	39.8	6.30 - 58.0	14.9 - 49.4	Acceptable	EPA 8082
(Standard 2)	PCB Aroclor Identity	mg/Kg	1254	1254	1254	1254	Acceptable	EPA 8082

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Pesticides	Aldrin	µg/l	1.42	2.70	0.691 - 3.65	1.18 - 3.16	Acceptable	EPA 8081A
	alpha-BHC	µg/l	4.40	6.91	2.54 - 9.58		Acceptable	EPA 8081A
	beta-BHC	µg/l	3.32	5.44	1.94 - 7.95		Acceptable	EPA 8081A
	delta-BHC	µg/l	0	< 0.100			Acceptable	EPA 8081A
	gamma-BHC(Lindane)	µg/l	5.04	7.75	2.58 - 11.2		Acceptable	EPA 8081A
	alpha-Chlordane	µg/l	3.14	5.34	1.31 - 8.15		Acceptable	EPA 8081A
	gamma-Chlordane	µg/l	3.23	5.41	0.840 - 8.52		Acceptable	EPA 8081A
	4,4'-DDD	µg/l	3.16	4.86	2.39 - 6.78	3.12 - 6.05	Acceptable	EPA 8081A
	4,4'-DDE	µg/l	1.19	2.19	1.03 - 2.99	1.36 - 2.66	Check for Error	EPA 8081A
	4,4'-DDT	µg/l	1.42	2.33	1.06 - 3.17	1.41 - 2.82	Acceptable	EPA 8081A
	Dieldrin	µg/l	0.937	1.57	0.808 - 2.17	1.04 - 1.94	Check for Error	EPA 8081A
	Endrin	µg/l	5.29	7.79	2.96 - 11.2		Acceptable	EPA 8081A
	Endrin aldehyde	µg/l	0	< 0.100			Acceptable	EPA 8081A
	Endrin ketone	µg/l	0	< 0.100			Acceptable	EPA 8081A
	Endosulfan I	µg/l	2.73	4.88	2.00 - 6.93		Acceptable	EPA 8081A
	Endosulfan II	µg/l	1.08	3.20	0.686 - 5.07		Acceptable	EPA 8081A
	Endosulfan sulfate	µg/l	1.77	3.00	1.03 - 4.56		Acceptable	EPA 8081A
	Heptachlor	µg/l	1.63	3.03	0.798 - 4.22	1.37 - 3.65	Acceptable	EPA 8081A
	Heptachlor epoxide	µg/l	0.761	1.30	0.660 - 1.67	0.829 - 1.50	Check for Error	EPA 8081A
	Methoxychlor	µg/l	2.38	3.84	1.28 - 6.21		Acceptable	EPA 8081A
Chlordane	Chlordane, technical	µg/l	7.93	9.40	4.10 - 13.4	5.65 - 11.8	Acceptable	EPA 8081A
Toxaphene	Toxaphene	µg/l		3.62	0.814 - 6.19			
Herbicides	2,4-D	µg/l		6.07	D.L. - 9.43			
	Dicamba	µg/l		4.25	0.270 - 6.30			
	2,4,5-T	µg/l		6.10	0.536 - 9.01			
	Silvex	µg/l		6.72	0.347 - 9.03			

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Base Neutrals	Acenaphthene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Acenaphthylene	µg/l	17.8	18.3	6.36 - 24.3		Acceptable	EPA 8270C
	Aniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Anthracene	µg/l	21.6	20.6	10.6 - 26.8		Acceptable	EPA 8270C
	Benzidine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(a)anthracene	µg/l	24.0	25.0	14.9 - 28.5		Acceptable	EPA 8270C
	Benzo(b)fluoranthene	µg/l	15.3	15.1	6.29 - 20.2		Acceptable	EPA 8270C
	Benzo(k)fluoranthene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(g,h,i)perylene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(a)pyrene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzyl alcohol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Bromophenyl-phenylether	µg/l	124	98.3	42.4 - 126		Acceptable	EPA 8270C
	Butylbenzylphthalate	µg/l	127	111	D.L. - 176		Acceptable	EPA 8270C
	Carbazole	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Chloroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	bis(2-Chloroethoxy)methane	µg/l	119	118	46.6 - 140		Acceptable	EPA 8270C
	bis(2-Chloroethyl)ether	µg/l	0	< 10.0			Acceptable	EPA 8270C
	bis(2-Chloroisopropyl)ether	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1-Chloronaphthalene	µg/l		< 10.0				
	2-Chloronaphthalene	µg/l	18.7	18.5	6.58 - 26.2		Acceptable	EPA 8270C
	4-Chlorophenyl-phenylether	µg/l	90.4	86.9	33.8 - 110		Acceptable	EPA 8270C
	Chrysene	µg/l	26.6	25.3	12.1 - 32.3		Acceptable	EPA 8270C
	Dibenz(a,h)anthracene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Dibenzofuran	µg/l	65.3	64.9	13.0 - 88.6		Acceptable	EPA 8270C
	Di-n-butylphthalate	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,2-Dichlorobenzene	µg/l	89.8	92.4	44.5 - 82.6		Not Acceptable	EPA 8270C
	1,3-Dichlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,4-Dichlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	3,3'-Dichlorobenzidine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Diethylphthalate	µg/l	130	142	D.L. - 217		Acceptable	EPA 8270C
	Dimethylphthalate	µg/l	0	14.5	6.48 - 22.0		Not Acceptable	EPA 8270C
	2,4-Dinitrotoluene	µg/l	110	105	43.0 - 140		Acceptable	EPA 8270C
	2,6-Dinitrotoluene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Di-n-octylphthalate	µg/l	69.7	61.1	11.6 - 90.4		Acceptable	EPA 8270C
	bis(2-ethylhexyl)phthalate	µg/l	22.6	20.9	10.9 - 29.7		Acceptable	EPA 8270C
	Fluoranthene	µg/l	18.7	19.8	11.3 - 25.0		Acceptable	EPA 8270C
	Fluorene	µg/l	39.9	39.4	16.7 - 51.4		Acceptable	EPA 8270C
	Hexachlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachlorobutadiene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachlorocyclopentadiene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachloroethane	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Indeno(1,2,3-cd)pyrene	µg/l	19.8	20.0	4.97 - 23.3		Acceptable	EPA 8270C
	Isophorone	µg/l	63.4	58.1	21.9 - 76.4		Acceptable	EPA 8270C
	1-Methylnaphthalene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2-Methylnaphthalene	µg/l	0	< 10.0			Acceptable	EPA 8270C

NVLAP® Lab code: 200126-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Base Neutrals (cont.)	Naphthalene	µg/l	146	139	33.7 - 181		Acceptable	EPA 8270C
	2-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	3-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Nitrobenzene	µg/l	97.0	98.0	32.1 - 128		Acceptable	EPA 8270C
	N-Nitrosodiethylamine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	N-Nitrosodimethylamine	µg/l	10.3	13.7	D.L. - 20.7		Acceptable	EPA 8270C
	N-Nitrosodiphenylamine	µg/l	53.3	49.7	11.2 - 69.8		Acceptable	EPA 8270C
	N-Nitroso-di-n-propylamine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Phenanthrene	µg/l	24.9	24.4	15.9 - 29.3		Acceptable	EPA 8270C
	Pyrene	µg/l	31.4	30.2	9.66 - 45.2		Acceptable	EPA 8270C
	Pyridine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,2,4-Trichlorobenzene	µg/l	24.9	24.1	6.65 - 32.1		Acceptable	EPA 8270C

NVLAP®
Lab code: 200086-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Acids	Benzoic acid	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Chloro-3-methylphenol	µg/l	67.3	66.4	25.0 - 85.4		Acceptable	EPA 8270C
	2-Chlorophenol	µg/l	61.4	61.9	19.2 - 78.6		Acceptable	EPA 8270C
	2,4-Dichlorophenol	µg/l	126	118	42.5 - 142		Acceptable	EPA 8270C
	2,6-Dichlorophenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2,4-Dimethylphenol	µg/l	49.4	51.3	8.82 - 68.6		Acceptable	EPA 8270C
	4,6-Dinitro-2-methylphenol	µg/l	163	144	16.8 - 208		Acceptable	EPA 8270C
	2,4-Dinitrophenol	µg/l	95.3	138	D.L. - 179		Acceptable	EPA 8270C
	2-Methylphenol	µg/l	25.1	28.9	0.280 - 39.5		Acceptable	EPA 8270C
	3-Methylphenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Methylphenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2-Nitrophenol	µg/l	15.7	14.9	5.50 - 18.5		Acceptable	EPA 8270C
	3-Nitrophenol	µg/l		< 10.0				
	4-Nitrophenol	µg/l	0	64.6	D.L. - 92.7		Acceptable	EPA 8270C
	Pentachlorophenol	µg/l	79.9	78.0	18.4 - 108		Acceptable	EPA 8270C
	Phenol	µg/l	64.3	134	D.L. - 180		Acceptable	EPA 8270C
	2,4,5-Trichlorophenol	µg/l	72.5	75.6	31.5 - 95.7		Acceptable	EPA 8270C
	2,4,6-Trichlorophenol	µg/l	54.1	53.5	18.7 - 70.1		Acceptable	EPA 8270C

NVLAP®
Lab code: 200384-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
PAH's	Acenaphthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Acenaphthylene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Anthracene	µg/l	0	0.800	0.255 - 1.17		Not Acceptable	EPA 8310
	Benzo(a)anthracene	µg/l	1.63	2.34	0.964 - 3.20		Acceptable	EPA 8310
	Benzo(b)fluoranthene	µg/l	11.5	18.1	4.66 - 26.1		Acceptable	EPA 8310
	Benzo(k)fluoranthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Benzo(g,h,i)perylene	µg/l	1.72	2.79	D.L. - 4.13		Acceptable	EPA 8310
	Benzo(a)pyrene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Chrysene	µg/l	7.80	11.5	5.37 - 15.3		Acceptable	EPA 8310
	Dibenz(a,h)anthracene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Fluoranthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Fluorene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Indeno(1,2,3-cd)pyrene	µg/l	7.67	12.1	5.29 - 15.3		Acceptable	EPA 8310
	Naphthalene	µg/l	4.88	5.24	D.L. - 8.74		Acceptable	EPA 8310
	Phenanthrene	µg/l	14.0	15.2	4.50 - 21.9		Acceptable	EPA 8310
	Pyrene	µg/l	0	< 0.100			Acceptable	EPA 8310

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Lab code: 200326-0

ENVIRONMENTAL
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Study: **WP66**

ERA Laboratory Code: **R1456-08**

Laboratory Name: **STL NORTH CANTON**

Report Type: **Customer**

Report Method: **Method B**

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l		319	278 - 356			
	Total Dissolved Solids	mg/l		301	226 - 376	251 - 351		
	Conductivity at 25°C	µmhos	420	390	360 - 420	370 - 410	Check for Error	EPA 9050
	Alkalinity as CaCO3	mg/l		81.6	73.7 - 89.2	76.3 - 86.6		
	Chloride	mg/l	60.9	60.9	54.6 - 66.8	56.6 - 64.8	Acceptable	EPA 300.0A
	Fluoride	mg/l		3.29	2.88 - 3.67	3.01 - 3.53		
	Potassium	mg/l		15.3	13.1 - 17.6	13.8 - 16.8		
	Sodium	mg/l		76.4	69.0 - 83.7	71.4 - 81.2		
	Sulfate	mg/l		9.80	6.93 - 12.5	7.86 - 11.6		
pH	pH	S.U.		8.74	8.48 - 9.00	8.57 - 8.91		
Hardness	Total Suspended Solids	mg/l		65.4	50.1 - 70.4	53.5 - 67.0		
	Calcium	mg/l		31.4	27.9 - 35.8	29.2 - 34.5		
	Magnesium	mg/l		3.03	2.58 - 3.49	2.73 - 3.33		
	Calcium hardness (CaCO3)	mg/l		80.9	68.8 - 93.0			
	Total Hardness (CaCO3)	mg/l		90.9	81.4 - 101	84.7 - 97.7		
Demand	BOD	mg/l		20.5	10.0 - 31.0	13.5 - 27.5		
	CBOD	mg/l		17.8	7.93 - 27.6	11.2 - 24.3		
	COD	mg/l		32.9	19.8 - 43.8	23.8 - 39.8		
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l		9.14	7.07 - 11.1	7.75 - 10.4		
	Nitrate as N	mg/l		29.8	23.6 - 35.3	25.6 - 33.4		
	Ortho-phosphate as P	mg/l		0.663	0.550 - 0.780	0.589 - 0.742		
Nutrients - Complex	Total phosphorus as P	mg/l		4.76	3.62 - 5.58	3.95 - 5.25		
	Total kjeldahl nitrogen	mg/l		4.70	3.16 - 6.20	3.67 - 5.70		
Cyanide	Cyanide, total	mg/l		0.749	0.520 - 0.963	0.594 - 0.889		
Phenolics	Phenolics, total	mg/l		0.966	0.530 - 1.40	0.676 - 1.26		
Grease & Oil	Grease & Oil (Gravimetric)	mg/l		19.8	11.4 - 24.6	13.6 - 22.4		
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l		1.85	1.49 - 2.21	1.61 - 2.09		

NVLAP®
Lab code: 200366-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l		1730	1480 - 1960	1560 - 1880		
	Antimony	µg/l		397	275 - 480	309 - 445		
	Arsenic	µg/l		266	220 - 313	236 - 298		
	Barium	µg/l		645	554 - 735			
	Beryllium	µg/l		672	572 - 759	603 - 728		
	Boron	µg/l		244	178 - 333			
	Cadmium	µg/l		50.7	42.4 - 58.8	45.1 - 56.1		
	Chromium	µg/l		144	123 - 164	130 - 158		
	Cobalt	µg/l		156	136 - 176	142 - 169		
	Copper	µg/l		485	440 - 533	455 - 518		
	Iron	µg/l		1670	1480 - 1880	1550 - 1810		
	Lead	µg/l		2380	2100 - 2650	2190 - 2560		
	Manganese	µg/l		1770	1590 - 1970	1650 - 1900		
	Molybdenum	µg/l		125	105 - 144	112 - 138		
	Nickel	µg/l		1730	1570 - 1930	1630 - 1870		
	Selenium	µg/l		632	501 - 732	539 - 694		
	Silver	µg/l		292	250 - 335	264 - 321		
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l		163	129 - 192	140 - 181		
	Vanadium	µg/l		1020	919 - 1120	953 - 1090		
	Zinc	µg/l		1350	1200 - 1510	1250 - 1460		
Mercury	Mercury	µg/l		14.0	10.5 - 17.5	11.6 - 16.3		
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

NVLAP®
Lab code: 200386-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles	Acetone	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acetonitrile	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acrylonitrile	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acrolein	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Benzene	µg/l	54.8	65.5	47.4 - 84.1	53.5 - 78.0	Acceptable	EPA 8021B
	Bromodichloromethane	µg/l	23.8	25.7	18.1 - 33.6	20.6 - 31.0	Acceptable	EPA 8021B
	Bromoform	µg/l	30.6	31.4	20.0 - 43.1	23.8 - 39.2	Acceptable	EPA 8021B
	Bromomethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	2-Butanone (MEK)	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Carbon disulfide	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Carbon tetrachloride	µg/l	16.4	24.2	15.2 - 34.2	18.3 - 31.0	Check for Error	EPA 8021B
	Chlorobenzene	µg/l	22.7	26.8	19.3 - 34.0	21.7 - 31.5	Acceptable	EPA 8021B
	Chlorodibromomethane	µg/l	55.1	66.1	43.7 - 87.8	51.1 - 80.5	Acceptable	EPA 8021B
	Chloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	2-Chloroethylvinylether	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Chloroform	µg/l	57.7	70.2	48.6 - 89.9	55.5 - 83.0	Acceptable	EPA 8021B
	Chloromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	DBCP	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dibromoethane (EDB)	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Dibromomethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichlorobenzene	µg/l	35.1	44.4	31.3 - 56.2	35.5 - 52.0	Check for Error	EPA 8021B
	1,3-Dichlorobenzene	µg/l	38.6	56.0	39.6 - 69.7	44.6 - 64.7	Not Acceptable	EPA 8021B
	1,4-Dichlorobenzene	µg/l	31.4	42.6	29.3 - 55.0	33.6 - 50.7	Check for Error	EPA 8021B
	Dichlorodifluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,1-Dichloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichloroethane	µg/l	27.3	32.4	22.5 - 43.4	26.0 - 39.9	Acceptable	EPA 8021B
	1,1-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	cis-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	trans-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	cis-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	trans-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Ethylbenzene	µg/l	16.2	23.1	15.6 - 30.0	18.0 - 27.6	Check for Error	EPA 8021B
	2-Hexanone	µg/l		< 5.00				
	Methylene chloride	µg/l	53.1	74.4	47.0 - 102	56.2 - 92.9	Check for Error	EPA 8021B
	MIBK	µg/l		72.0	27.5 - 112			
	Styrene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,1,1,2-Tetrachloroethane	µg/l	96.4	110	40.7 - 173		Acceptable	EPA 8021B
	1,1,2,2-Tetrachloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Tetrachloroethylene	µg/l	44.4	59.9	39.6 - 76.6	45.8 - 70.5	Check for Error	EPA 8021B
	Toluene	µg/l	52.1	64.3	46.3 - 80.0	52.0 - 74.4	Acceptable	EPA 8021B
	1,1,1-Trichloroethane	µg/l	29.7	36.6	23.8 - 48.3	27.9 - 44.2	Acceptable	EPA 8021B
	1,1,2-Trichloroethane	µg/l	33.5	39.7	27.5 - 51.4		Acceptable	EPA 8021B
	Trichloroethylene	µg/l	47.2	62.4	40.5 - 80.6	47.1 - 73.9	Acceptable	EPA 8021B
	Trichlorofluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B

NVLAP®
Lab code: 200086-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles (cont.)	1,2,3-Trichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Vinyl acetate	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Vinyl chloride	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Xylenes, total	µg/l	66.2	88.2	50.1 - 120		Acceptable	EPA 8021B

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ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l		319	278 - 356			
	Total Dissolved Solids	mg/l		301	226 - 376	251 - 351		
	Conductivity at 25°C	µmhos		390	360 - 420	370 - 410		
	Alkalinity as CaCO3	mg/l		81.6	73.7 - 89.2	76.3 - 86.6		
	Chloride	mg/l	42.1	60.9	54.6 - 66.8	56.6 - 64.8	Not Acceptable	EPA 325.3
	Fluoride	mg/l		3.29	2.88 - 3.67	3.01 - 3.53		
	Potassium	mg/l		15.3	13.1 - 17.6	13.8 - 16.8		
	Sodium	mg/l		76.4	69.0 - 83.7	71.4 - 81.2		
	Sulfate	mg/l		9.80	6.93 - 12.5	7.86 - 11.6		
pH	pH	S.U.		8.74	8.48 - 9.00	8.57 - 8.91		
Hardness	Total Suspended Solids	mg/l		65.4	50.1 - 70.4	53.5 - 67.0		
	Calcium	mg/l		31.4	27.9 - 35.8	29.2 - 34.5		
	Magnesium	mg/l		3.03	2.58 - 3.49	2.73 - 3.33		
	Calcium hardness (CaCO3)	mg/l		80.9	68.8 - 93.0			
	Total Hardness (CaCO3)	mg/l		90.9	81.4 - 101	84.7 - 97.7		
Demand	BOD	mg/l		20.5	10.0 - 31.0	13.5 - 27.5		
	CBOD	mg/l		17.8	7.93 - 27.6	11.2 - 24.3		
	COD	mg/l		32.9	19.8 - 43.8	23.8 - 39.8		
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l		9.14	7.07 - 11.1	7.75 - 10.4		
	Nitrate as N	mg/l		29.8	23.6 - 35.3	25.6 - 33.4		
	Ortho-phosphate as P	mg/l		0.663	0.550 - 0.780	0.589 - 0.742		
Nutrients - Complex	Total phosphorus as P	mg/l		4.76	3.62 - 5.58	3.95 - 5.25		
	Total kjeldahl nitrogen	mg/l		4.70	3.16 - 6.20	3.67 - 5.70		
Cyanide	Cyanide, total	mg/l		0.749	0.520 - 0.963	0.594 - 0.889		
Phenolics	Phenolics, total	mg/l		0.966	0.530 - 1.40	0.676 - 1.26		
Grease & Oil	Grease & Oil (Gravimetric)	mg/l		19.8	11.4 - 24.6	13.6 - 22.4		
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l		1.85	1.49 - 2.21	1.61 - 2.09		

NVLAP®
Lab code: 200326-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l		1730	1480 - 1960	1560 - 1880		
	Antimony	µg/l		397	275 - 480	309 - 445		
	Arsenic	µg/l		266	220 - 313	236 - 298		
	Barium	µg/l		645	554 - 735			
	Beryllium	µg/l		672	572 - 759	603 - 728		
	Boron	µg/l		244	178 - 333			
	Cadmium	µg/l		50.7	42.4 - 58.8	45.1 - 56.1		
	Chromium	µg/l		144	123 - 164	130 - 158		
	Cobalt	µg/l		156	136 - 176	142 - 169		
	Copper	µg/l		485	440 - 533	455 - 518		
	Iron	µg/l		1670	1480 - 1880	1550 - 1810		
	Lead	µg/l		2380	2100 - 2650	2190 - 2560		
	Manganese	µg/l		1770	1590 - 1970	1650 - 1900		
	Molybdenum	µg/l		125	105 - 144	112 - 138		
	Nickel	µg/l		1730	1570 - 1930	1630 - 1870		
	Selenium	µg/l		632	501 - 732	539 - 694		
	Silver	µg/l		292	250 - 335	264 - 321		
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l		163	129 - 192	140 - 181		
	Vanadium	µg/l		1020	919 - 1120	953 - 1090		
	Zinc	µg/l		1350	1200 - 1510	1250 - 1460		
Mercury	Mercury	µg/l		14.0	10.5 - 17.5	11.6 - 16.3		
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

NVLAP®

ATTACHMENT 2

STUDY REPORT
DECEMBER 19, 2000

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

RECEIVED
DEC 20 2000

December 19, 2000

Dorothy J. Leeson
STL- N. Canton
4101 Shuffle Drive
North Canton, Ohio 44720

FAX 330-497-0772

Dear Dorothy:

On December 6, 2000, Severn Trent Laboratories' facility located in N. Canton, Ohio, participated in ERA's QuiK™ Response Performance Evaluation Program. The following results were reported to ERA by STL- North Canton, for the PE standard, lot 12060002. The Certified Values and the QuiK™ Response Acceptance Limits were not available to STL- North Canton.

If you have any questions, please contact either of the undersigned or Regan Eckenrode, Customer Service Representative, at 1-800-372-0122.

Report prepared by:

Anne Rager
Customer Service Representative

Report reviewed by:

Audrey Cornell
Customer Service Representative

Attachments

Cc: Project File Number 12060002

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

SDWA Nutrients

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA350.3

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Ammonia as N	mg/L	13.6	17.1	14.4 - 19.8	Not Acceptable

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

WasteWatR™ Demand

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA365.2

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
total phosphorus as P	mg/l	1.79	2.73	2.07 - 3.22	Not Acceptable

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

Alkalinity & Sodium

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA310.1

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Alkalinity as $CaCO_3$	mg/L	38.6	31.3	29.8 - 35.8	Not Acceptable

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

PotableWatR™ Inorganics

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
>ethod: EPA325.3/EPA6010B

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
chloride	mg/l	8.17	6.68	4.92 - 8.58	Acceptable
potassium	mg/l	42.1	36.9	31.7 - 43.0	Acceptable

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

Base/Neutrals

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA8270C

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Acenaphthene	µg/l		20.4	8.92 - 26.1	
Acenaphthylene	µg/l		54.8	21.3 - 67.7	
Aniline	µg/l		<10.0		
Anthracene	µg/l		57.2	23.3 - 74.0	
Benzidine	µg/l		<10.0		
Benzoic acid	µg/l		<10.0		
Benzo(a)anthracene	µg/l		31.2	18.5 - 35.8	
Benzo(b)fluoranthene	µg/l		22.0	11.3 - 28.3	
Benzo(k)fluoranthene	µg/l		10.5	1.39 - 19.9	
Benzo(g,h,i)perylene	µg/l		<10.0		
Benzo(a)pyrene	µg/l		<10.0		
Benzyl alcohol	µg/l		<10.0		
4-Bromophenyl-phenylether	µg/l		142	60.0 - 182	
Butylbenzylphthalate	µg/l		56.6	0.170 - 90.6	
Carbazole	µg/l		<10.0		
4-Chloroaniline	µg/l		<10.0		
bis(2-Chloroethoxy)methane	µg/l		<10.0		
bis(2-Chloroethyl)ether	µg/l		<10.0		
1-Chloronaphthalene	µg/l		<10.0		
2-Chloronaphthalene	µg/l		30.2	11.4 - 38.8	
4-Chlorophenyl-phenylether	µg/l		29.0	16.4 - 36.4	
2,2'-oxybis(1-Chloropropane)	µg/l		<10.0		
Chrysene	µg/l		40.4	17.9 - 52.2	
Dibenz(a,h)anthracene	µg/l		11.9	2.93 - 15.4	
Dibenzofuran	µg/l		88.1	8.30 - 130	
Di-n-butylphthalate	µg/l		143	16.3 - 200	
1,2-Dichlorobenzene	µg/l	74.8	121	58.2 - 121	Acceptable
1,3-Dichlorobenzene	µg/l		<10.0		
1,4-Dichlorobenzene	µg/l		<10.0		
3,3'-Dichlorobenzidine	µg/l		<10.0		

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

Base/Neutrals

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA8270C

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Diethylphthalate	µg/l		26.0	13.4 - 38.8	
Dimethylphthalate	µg/l	134	160	D.L. - 245	Acceptable
2,4-Dinitrotoluene	µg/l		88.9	35.6 - 118	
2,6-Dinitrotoluene	µg/l		56.3	21.5 - 72.1	
Di-n-octylphthalate	µg/l		65.6	12.0 - 96.8	
bis(2-Ethylhexyl)phthalate	µg/l		129	19.9 - 189	
Fluoranthene	µg/l		13.8	8.95 - 17.2	
Fluorene	µg/l		90.3	37.9 - 116	
Hexachlorobenzene	µg/l		29.3	12.7 - 38.2	
Hexachlorobutadiene	µg/l		<10.0		
Hexachlorocyclopentadiene	µg/l		117	D.L. - 150	
Hexachloroethane	µg/l		<10.0		
Indeno(1,2,3-cd)pyrene	µg/l		<10.0		
Isophorone	µg/l		<10.0		
2-Methylnaphthalene	µg/l		<10.0		
Naphthalene	µg/l		64.0	18.0 - 83.8	
2-Nitroaniline	µg/l		<10.0		
3-Nitroaniline	µg/l		<10.0		
4-Nitroaniline	µg/l		<10.0		
Nitrobenzene	µg/l		<10.0		
N-Nitrosodiethylamine	µg/l		<10.0		
N-Nitrosodimethylamine	µg/l		<10.0		
N-Nitrosodiphenylamine	µg/l		<10.0		
N-Nitroso-di-n-propylamine	µg/l		<10.0		
Phenanthrene	µg/l		<10.0		
Pyrene	µg/l		142	47.3 - 191	
Pyridine	µg/l		<10.0		
1,2,4-Trichlorobenzene	µg/l		113	33.1 - 134	

Results reported by: Dorothy J. Leeson - STL North Canton
Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards
#N/A

Final Report

Pesticides

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA8081A

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Aldrin	µg/l		2.10	0.537 - 2.84	
alpha-BHC	µg/l		2.93	1.25 - 3.96	
beta-BHC	µg/l		7.74	2.84 - 11.2	
delta-BHC	µg/l		<.100		
gamma-BHC(Lindane)	µg/l		7.54	2.51 - 10.9	
alpha-Chlordane	µg/l		<.100		
gamma-Chlordane	µg/l		3.83	1.17 - 5.40	
Chlordane, technical	µg/l		<.100		
4,4'-DDD	µg/l		6.56	3.24 - 9.15	
4,4'-DDE	µg/l	2.75	3.51	1.66 - 4.79	Acceptable
4,4'-DDT	µg/l		4.24	1.94 - 5.74	
Dieldrin	µg/l	3.15	3.82	1.97 - 5.27	Acceptable
Endrin	µg/l		4.74	1.96 - 6.47	
Endrin aldehyde	µg/l		<.100		
Endrin ketone	µg/l		<.100		
Endosulfan I	µg/l		5.07	2.08 - 7.21	
Endosulfan II	µg/l		3.08	0.659 - 4.87	
Endosulfan sulfate	µg/l		1.82	0.626 - 2.77	
Heptachlor	µg/l		1.26	0.337 - 1.75	
Heptachlor epoxide	µg/l	1.95	2.48	1.27 - 3.19	Acceptable
Methoxychlor	µg/l		8.24	3.24 - 12.1	
Toxaphene	µg/l		<.100		

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

PCB in Water

Customer: STL North Canton
Lot Number: 12060002
State ID Number: OH00048
Method: EPA8082

Parameter	Units	Reported Value	Certified Value	QuiK™ Response Limits	Comment
Aroclor 1016	ug/L		<1.00		
Aroclor 1221	ug/L		<1.00		
Aroclor 1232	ug/L	3.36	3.55	0.502 - 6.06	Acceptable
Aroclor 1242	ug/L		<1.00		
Aroclor 1248	ug/L		<1.00		
Aroclor 1254	ug/L		<1.00		
Aroclor 1260	ug/L		<1.00		

Results reported by: Dorothy J. Leeson - STL North Canton

Date of Report: 12/19/00

ATTACHMENT 3

CORRECTIVE ACTION PLAN
JANUARY 25, 2001

Opal Davis-Johnson
Quality Assurance Manager

330/966-9279 (direct)
OJohnson@stl-inc.com(email)

SEVERN TRENT SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

Tel: 330 497 9396
Fax: 330 497 0772
www.stl-inc.com

January 25, 2001

Mark Hemingway
Principal Hydrogeologist
Geomatrix Consultants, Inc.
1214 West 6th Street, Suite 201
Austin, Texas 78703

Dear Mr. Hemingway:

You have asked for further written explanations regarding the laboratory's failure of Water Pollution 66 Study and an ERA make-up PE for the following test methods: (1) Alkalinity by EPA Method 310.1, (2) Ammonia by EPA Method 350.3, and (3) Phosphorus by EPA Method 365.2. These performance evaluation samples were performed in support of the Rohm & Haas/Geomatrix Region V Project Plan.

We have examined the methods, procedures, and analysts in the cases above and our objective is to accurately identify what occurred, determine the root cause, initiate corrective action, and identify actions that can avoid similar reoccurrences in the future. Here is what we found:

Phosphorus, EPA Method 365.2 - Colorimetric, Ascorbic Acid, Single Reagent

Background:

- The laboratory performed the first set of PEs under the Water Pollution Program from ERA. The PE sample was analyzed on August 9, 2000. STL North Canton reported a result of 3.59 mg/L. The true value was 4.76 mg/L and we failed the PE with a low bias. The makeup PE was under the Water Supply Program from ERA. The PE was analyzed on December 10, 2000. This PE also failed with a low bias. The reported value was 1.79 mg/L and the true result was 2.73 mg/L. Another client PE performed the same week also failed and was biased low. The reported result was 5.22 mg/L and the true result was 7.53 mg/L. The table below summarizes this information along with associated QC data.

Date	Reported (mg/L)	True (mg/L)	Range (mg/L)	Biased	LCS, % Recovered	Limits (%)	PE
08/09/00	3.59	4.76	3.62-5.58	Low	99.7	55-125	WP
12/10/00	1.79	2.73	2.07-3.22	Low	74.8	55-125	WS
12/04/00	5.22	7.53	5.72-8.80	Low	91.1	55-125	Client

- At was initially suspected that the calibration standard was possibly contaminated. It was confirmed that the standard was not contaminated by taking an aliquot and diluting to 10 ppm. The aliquot was analyzed on an ion chromatograph. Results of 9.6 mg/L and 9.8 mg/L were obtained which is biased low approximately 4% and 2% respectively from the true value.
- It is know that the proper preparation of the glassware is critical in the procedure, and it was suspected that after the glassware was rinsed with 1:1 HCl there was insufficient rinsing with reagent water to remove the HCl. This would cause a biased low result. The analysts have been reminded and retrained on the proper techniques of glassware washing and rinsing.

- Verification of technique was performed by having two separate and different analysts perform the method together. The analysts achieved LCS recoveries of 87% and 101%.
- A review of the SOP procedure revealed that there is a possible digestion issue and the reagents used are not properly converting the non Ortho-phosphate components. The SOP is a combination of several phosphorus methods including ortho, total, and hydrolyzed phosphorus. The reagents from all of the aforementioned methods were combined in the digestion of total phosphorus.
- A review of the digestion revealed that an incomplete digestion may also have occurred due to over crowding of the hotplate. When more than five (5) beakers were placed on the hotplate, uneven heating occurred. It was also revealed that a more rigorous digestion occurred if the beaker was covered with a watch glass. This increased the rugeness of the digestion along with decreasing the amount of splattering which would cause lost sample concentration and/or cross contamination.
- The laboratory has performed a study where a persulfate digestion occurred on a hot plate with a limited (no more than five) beakers covered with watch glasses. The results from LCSs indicated recoveries of 100 – 101%. Single blinds were analyzed also with the following results:

Date	Reported (mg/L)	True (mg/L)	Biased	LCS, % Recovered	Limits (%)
01/26/01	8	8	Passed	100	55-125
01/26/01	8	8	Passed	100	55-125
01/26/01	8.3	8	Passed	101	55-125

Corrective Actions:

As a result, the following has been implemented to improve our quality processes:

- The SOP is being revised to reflect the referenced methods including the appropriate adjustments to the required reagents. The procedures have been separated to remove any misunderstanding by the analyst.
- The analysts have been retrained in laboratory techniques such as glassware washing, aliquoting, and other misc. Good Laboratory Practices.
- The analyst have been informed and signs will be posted noting that hotplates are not to be "crowded" and the maximum number of beakers/watch glass setup per hotplate is five.
- The laboratory will continue to monitor the process by introducing single and double blinds.
- The control limits will be updated in the next three – six months depending on sufficient data points being available.

<u>Alkalinity, EPA Method 310.1 – Titrimetric to pH 4.5</u>

Background:

- The laboratory performed the first set of PEs under the Water Pollution Program from ERA. The PE sample was analyzed on August 4, 2000. STL North Canton reported a result of 101 mg/L. The true value was 81.6 mg/L and we failed the PE with a high bias. The makeup PE was under the Water Supply Program from ERA. The PE was analyzed on December 9, 2000. This PE also failed with a high bias. The reported value was 38.6 mg/L and the true result was 31.3 mg/L. Another client PE performed the same week passed. The reported result was 74.1 mg/L and the true result was 67.2 mg/L. The PE passed acceptance criteria. The table below summarizes this information along with associated QC data.

Date	Reported (mg/L)	True (mg/L)	Range (mg/L)	Biased	LCS, % Recovered	Limits (%)	PE
08/04/00	101	81.6	73.7-89.2	High	117	80-120	WP
12/09/00	38.6	31.3	29.8-35.8	High	119	80-120	WS
12/07/00	74.1	67.2	60.3-74.1	Passed	113	80-120	Client

- It was determined that the unstable readings were a result of the instrument being too close to the facility's Uninterrupted Power Supply (UPS). The UPS consists of over 100 battery sources and was located on a wall directly behind the auto-titrator. The wall separating the UPS from the instrument did not contain any special shielding against the electromagnetic forces generated by the UPS unit. The auto-titrator incorporates the use of ion-selective electrodes in the measurement of pH and conductivity and are subject to fluctuation when exposed to electromagnetic forces; thus, causing unstable readings.
- The move occurred the week of December 18, 2000. Shortly after the move one of the supply lines to the auto-titrator had a kink and resulted in an in-effective rinsing of the sample titration vessel resulting on carryover from one sample to the next.
- Known sample concentrations and associated QC were titrated manually and the same high biased results occurred. The laboratory decided at this point to investigate the standardization of the titrant and the associated calculation for the normality of the titrant.
- A check of the standardization of the titrant revealed that the manufacturer had certified the titrant to be between 0.0202 – 0.0198 N. When the laboratory standardized the titrant, the result was 0.0212 and 0.0213 respectively after two (monthly) checks. It was determined that the standard was being incorrectly standardized due to the improper preparation of the primary standard. This resulted in a 5 – 7% high bias in the results.
- It was noted that the Sodium carbonate was purchased as a dried reagent; however, the laboratory did not store the reagent in a dessicator.
- Four consecutive batches of LCS resulted in 100% recoveries.

Corrective Actions:

As a result, the following has been implemented to improve our quality processes:

- The SOP is being revised to apply more specifics to the standardization process.
- The laboratory is developing a preventative maintenance program based on instrument manufacturer requirements and experience gained.
- The analysts have been retrained in laboratory techniques such as standardization, aliquoting, and other misc. Good Laboratory Practices.

Ammonia, EPA Method 350.3 – Potetiometric, Ion Selective Electrode

Background:

- The laboratory performed the first set of PEs under the Water Pollution Program from ERA. The PE sample was analyzed on August 17, 2000. STL North Canton reported a result 12.4 mg/L. The true value was 9.14 mg/L and we failed the PE with a high bias. The makeup PE was under the Water Supply Program from ERA. The PE was analyzed on December 09, 2000. This PE failed with a low bias. The reported value was 13.6 mg/L and the true result was 17.1 mg/L. Another client PE performed the same week passed. The reported result was 11 mg/L and the true result was 11.5 mg/L. This PE passed acceptance criteria. The table below summarizes this information along with associated QC data.

Date	Reported (mg/L)	True (mg/L)	Range (mg/L)	Biased	LCS, % Recovered	Limits (%)	PE
08/17/00	12.4	9.14	7.07-11.1	High	90.9	81-113	WP
12/09/00	13.6	17.1	14.4-19.8	Low	81.6	81-113	WS
12/05/00	11	11.5	8.9-13.9	Pass	93.7	81-113	Client

- A review of the EPA method and SOP states that the electrode should be in place before the addition of the NaOH adjusting solution because ammonia is lost in the basic solution. Eventhough this is both a method and SOP requirement, it was determined that the analyst was not consistent in this procedure. Not adding the reagent properly would result in low recoveries due to ammonia being lost in the basic solution. When the reagent is added prior to the electrode, internal studies have demonstrated that a low bias as much as 20% can result.
- Further review of the SOP revealed that the analyst is instructed to wait for the number on the read-out with the "ready" indicator and enter the value. It has been discovered that the "ready" indicator was not necessarily a true indication of when to record the mV reading. Due to instabilities, it may be another few moments prior to obtaining an accurate reading.
- Due to the nature of the gas membrane probe, it was determined that the environment played a role in biased high results due to contamination. It was discovered that other tests performed in the immediate vicinity by the wet chemistry group such as hardness would affect the ammonia results.
- Single blind PEs were purchased, analyzed, and were within acceptance criteria. The associated LCS recoveries were between 98 0 103% recovery. The recoveries associated with various single blinds were as follows: 101%, 104%, 110%, 112%, and 97%

Corrective Actions:

As a result, the following has been implemented to improve our quality processes:

- A new meter has been purchased and it provides a more "accurate" ready reading.
- The SOP is being revised to reflect the referenced methods. The order of addition of reagents and reviewing both the mV readings and "ready" readings will be stressed. Documented training will also occur on these points.

- The test method has been moved from the "prep area" of the laboratory to the instrument part. The laboratory is further investigating moving the apparatus to yet another part of the laboratory to achieve a "clean room" environment.
- Expanded the maintenance program to review and check the probe and membrane carefully. The date of purchase and use of the probe is critical due to its short life expectancy. The probe has an inherent error of 2-3%.
- The analysts have been retrained in laboratory techniques such as glassware washing, aliquoting, and other misc. Good Laboratory Practices.
- Due to the nature of the method requiring the utilization of a gas membrane and ion-selective electrode, many environmental conditions could affect the accuracy and precision of the method. It is recommended that if both accuracy and precision are critical to this project, another method is proposed which does not have all of the variables associated with the selective-ion method.

STL North Canton certainly regrets the difficulties that have resulted from the issues outlined in this letter. We look forward to continuing our relationship with you and standing by our promise of providing you with quality data and service. If you have any questions or comments, please feel free to contact me directly at (330) 966 - 9279.

Sincerely,

Opal Davis-Johnson
Quality Assurance Manager

Attachment
cc: Christopher Oprandi, Laboratory Director
Alesia Danford, Project Manager
Kurt Ill, Wet Chemistry Group Leader
QA Files

ATTACHMENT 4

STUDY REPORT
FEBRUARY 15, 2001

ENVIRONMENTAL
RESOURCE ASSOCIATES®
The Industry Standard™

February 15, 2001

Dorothy Leeson
STL-North Canton
4101 Shuffle Drive NW
North Canton, Ohio 44720

FAX 330-497-0772

Dear Dorothy:

On January 31, 2001, STL-North Canton located in North Canton, Ohio, participated in ERA's QuiK™ Response Performance Evaluation Program. The following results were reported to ERA by STL-North Canton for the PE standard, lot 01310101. The Certified Values and the QuiK™ Response Acceptance Limits were not available to STL-North Canton.

If you have any questions, please contact either of the undersigned or Regan Eckenrode, Customer Service Representative, at 1-800-372-0122.

Report prepared by:

Anne Rager
Customer Service Representative

Report reviewed by:

Audrey Cornell
Customer Service Representative

Attachments

Cc: Project File Number 01310101

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

WasteWatR™ Minerals

Customer: STL-North Canton
Lot Number: 01310101
State ID Number: OH00048
Method: EPA310.1

Parameter	Units	Reported Value	Assigned Value	QuiK™ Response Limits	Comment
Alkalinity as CaCO3	mg/l	72.7	71.3	64.1 - 78.4	Acceptable

Results reported by: Dorothy J. Leeson - STL-North Canton

Date of Report: 2/15/01

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

WasteWatR™ Demand

Customer: STL-North Canton
Lot Number: 01310101
State ID Number: OH00048
Method: EPA 365.2

Parameter	Units	Reported Value	Assigned Value	QuiK™ Response Limits	Comment
total phosphorus as P	mg/l	0.534	0.530	0.398 - 0.664	Acceptable

Results reported by: Dorothy J. Leeson - STL-North Canton

Date of Report: 2/15/01

ENVIRONMENTAL RESOURCE ASSOCIATES®
The Industry Standard™

QuiK™ Response PE Standards

Final Report

WasteWatR™ Nutrients

Customer: STL-North Canton
Lot Number: 01310101
State ID Number: OH00048
Method: EPA350.3

Parameter	Units	Reported Value	Assigned Value	QuiK™ Response Limits	Comment
Ammonia as N	mg/l	17.0	17.8	13.9 - 21.6	Acceptable

Results reported by: Dorothy J. Leeson - STL-North Canton

Date of Report: 2/15/01

ENVIRONMENTAL
RESOURCE ASSOCIATES®

Study: **WP66**

ERA Laboratory Code: **R1456-08**

Laboratory Name: **STL NORTH CANTON**

Report Type: **Customer**

Report Method: **Method A**

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l	310	319	278 - 356		Acceptable	EPA 160.3
	Total Dissolved Solids	mg/l	291	301	226 - 376	251 - 351	Acceptable	EPA 160.1
	Conductivity at 25°C	µmhos	412	390	360 - 420	370 - 410	Check for Error	EPA 120.1
	Alkalinity as CaCO3	mg/l	101	81.6	73.7 - 89.2	76.3 - 86.6	Not Acceptable	EPA 310.1
	Chloride	mg/l	62.1	60.9	54.6 - 66.8	56.6 - 64.8	Acceptable	EPA 325.2
	Fluoride	mg/l	3.35	3.29	2.88 - 3.67	3.01 - 3.53	Acceptable	EPA 300.0A
	Potassium	mg/l	17.2	15.3	13.1 - 17.6	13.8 - 16.8	Check for Error	EPA 6010B
	Sodium	mg/l	79.2	76.4	69.0 - 83.7	71.4 - 81.2	Acceptable	EPA 6010B
	Sulfate	mg/l	8.77	9.80	6.93 - 12.5	7.86 - 11.6	Acceptable	EPA 300.0A
pH	pH	S.U.	8.72	8.74	8.48 - 9.00	8.57 - 8.91	Acceptable	EPA 9040B
Hardness	Total Suspended Solids	mg/l	60.0	65.4	50.1 - 70.4	53.5 - 67.0	Acceptable	EPA 160.2
	Calcium	mg/l	30.8	31.4	27.9 - 35.8	29.2 - 34.5	Acceptable	EPA 6010B
	Magnesium	mg/l	2.83	3.03	2.58 - 3.49	2.73 - 3.33	Acceptable	EPA 6010B
	Calcium hardness (CaCO3)	mg/l	88.6	80.9	68.8 - 93.0		Acceptable	SM 2340B
	Total Hardness (CaCO3)	mg/l	86.2	90.9	81.4 - 101	84.7 - 97.7	Acceptable	EPA 130.2
Demand	BOD	mg/l	10.9	20.5	10.0 - 31.0	13.5 - 27.5	Check for Error	SM 5210B
	CBOD	mg/l	12.2	17.8	7.93 - 27.6	11.2 - 24.3	Acceptable	SM 5210B
	COD	mg/l	40.3	32.9	19.8 - 43.8	23.8 - 39.8	Check for Error	EPA 410.4
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l	12.4	9.14	7.07 - 11.1	7.75 - 10.4	Not Acceptable	EPA 350.3
	Nitrate as N	mg/l	30.1	29.8	23.6 - 35.3	25.6 - 33.4	Acceptable	EPA 300.0A
	Ortho-phosphate as P	mg/l	0.682	0.663	0.550 - 0.780	0.589 - 0.742	Acceptable	EPA 365.2
Nutrients - Complex	Total phosphorus as P	mg/l	3.59	4.76	3.62 - 5.58	3.95 - 5.25	Not Acceptable	EPA 365.2
	Total kjeldahl nitrogen	mg/l	5.20	4.70	3.16 - 6.20	3.67 - 5.70	Acceptable	EPA 351.3
Cyanide	Cyanide, total	mg/l	0.740	0.749	0.520 - 0.963	0.594 - 0.889	Acceptable	EPA 9012A
Phenolics	Phenolics, total	mg/l	0.698	0.966	0.530 - 1.40	0.676 - 1.26	Acceptable	EPA 9065
Grease & Oil	Grease & Oil (Gravimetric)	mg/l	17.3	19.8	11.4 - 24.6	13.6 - 22.4	Acceptable	EPA 1664
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l	2.14	1.85	1.49 - 2.21	1.61 - 2.09	Check for Error	EPA 330.5

NVLAP®
Lab code: 200086-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l	1860	1730	1480 - 1960	1560 - 1880	Acceptable	EPA 6010B
	Antimony	µg/l	411	397	275 - 480	309 - 445	Acceptable	EPA 6010B
	Arsenic	µg/l	257	266	220 - 313	236 - 298	Acceptable	EPA 6010B
	Barium	µg/l	671	645	554 - 735		Acceptable	EPA 6010B
	Beryllium	µg/l	704	672	572 - 759	603 - 728	Acceptable	EPA 6010B
	Boron	µg/l	280	244	178 - 333		Acceptable	EPA 6010B
	Cadmium	µg/l	52.0	50.7	42.4 - 58.8	45.1 - 56.1	Acceptable	EPA 6010B
	Chromium	µg/l	147	144	123 - 164	130 - 158	Acceptable	EPA 6010B
	Cobalt	µg/l	151	156	136 - 176	142 - 169	Acceptable	EPA 6010B
	Copper	µg/l	487	485	440 - 533	455 - 518	Acceptable	EPA 6010B
	Iron	µg/l	1670	1670	1480 - 1880	1550 - 1810	Acceptable	EPA 6010B
	Lead	µg/l	2380	2380	2100 - 2650	2190 - 2560	Acceptable	EPA 6010B
	Manganese	µg/l	1830	1770	1590 - 1970	1650 - 1900	Acceptable	EPA 6010B
	Molybdenum	µg/l	113	125	105 - 144	112 - 138	Acceptable	EPA 6010B
	Nickel	µg/l	1830	1730	1570 - 1930	1630 - 1870	Acceptable	EPA 6010B
	Selenium	µg/l	630	632	501 - 732	539 - 694	Acceptable	EPA 6010B
	Silver	µg/l	298	292	250 - 335	264 - 321	Acceptable	EPA 6010B
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l	169	163	129 - 192	140 - 181	Acceptable	EPA 6010B
	Vanadium	µg/l	1030	1020	919 - 1120	953 - 1090	Acceptable	EPA 6010B
	Zinc	µg/l	1390	1350	1200 - 1510	1250 - 1460	Acceptable	EPA 6010B
Mercury	Mercury	µg/l	14.7	14.0	10.5 - 17.5	11.6 - 16.3	Acceptable	EPA 7470A
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles	Acetone	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acetonitrile	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acrylonitrile	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Acrolein	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Benzene	µg/l	66.4	65.5	47.4 - 84.1	53.5 - 78.0	Acceptable	EPA 8260B
	Bromodichloromethane	µg/l	27.2	25.7	18.1 - 33.6	20.6 - 31.0	Acceptable	EPA 8260B
	Bromoform	µg/l	32.1	31.4	20.0 - 43.1	23.8 - 39.2	Acceptable	EPA 8260B
	Bromomethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	2-Butanone (MEK)	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Carbon disulfide	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Carbon tetrachloride	µg/l	24.5	24.2	15.2 - 34.2	18.3 - 31.0	Acceptable	EPA 8260B
	Chlorobenzene	µg/l	27.2	26.8	19.3 - 34.0	21.7 - 31.5	Acceptable	EPA 8260B
	Chlorodibromomethane	µg/l	63.6	66.1	43.7 - 87.8	51.1 - 80.5	Acceptable	EPA 8260B
	Chloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	2-Chloroethylvinylether	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Chloroform	µg/l	72.4	70.2	48.6 - 89.9	55.5 - 83.0	Acceptable	EPA 8260B
	Chloromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	DBCP	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dibromoethane (EDB)	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Dibromomethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichlorobenzene	µg/l	42.6	44.4	31.3 - 56.2	35.5 - 52.0	Acceptable	EPA 8260B
	1,3-Dichlorobenzene	µg/l	53.8	56.0	39.6 - 69.7	44.6 - 64.7	Acceptable	EPA 8260B
	1,4-Dichlorobenzene	µg/l	41.5	42.6	29.3 - 55.0	33.6 - 50.7	Acceptable	EPA 8260B
	Dichlorodifluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,1-Dichloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichloroethane	µg/l	33.8	32.4	22.5 - 43.4	26.0 - 39.9	Acceptable	EPA 8260B
	1,1-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	cis-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	trans-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,2-Dichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	cis-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	trans-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Ethylbenzene	µg/l	23.3	23.1	15.6 - 30.0	18.0 - 27.6	Acceptable	EPA 8260B
	2-Hexanone	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Methylene chloride	µg/l	83.4	74.4	47.0 - 102	56.2 - 92.9	Acceptable	EPA 8260B
	MIBK	µg/l	57.6	72.0	27.5 - 112		Acceptable	EPA 8260B
	Styrene	µg/l	0	< 5.00			Acceptable	EPA 8260B
	1,1,1,2-Tetrachloroethane	µg/l	133	110	40.7 - 173		Acceptable	EPA 8260B
	1,1,2,2-Tetrachloroethane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Tetrachloroethylene	µg/l	59.8	59.9	39.6 - 76.6	45.8 - 70.5	Acceptable	EPA 8260B
	Toluene	µg/l	61.5	64.3	46.3 - 80.0	52.0 - 74.4	Acceptable	EPA 8260B
	1,1,1-Trichloroethane	µg/l	37.1	36.6	23.8 - 48.3	27.9 - 44.2	Acceptable	EPA 8260B
	1,1,2-Trichloroethane	µg/l	36.9	39.7	27.5 - 51.4		Acceptable	EPA 8260B
	Trichloroethylene	µg/l	63.3	62.4	40.5 - 80.6	47.1 - 73.9	Acceptable	EPA 8260B
	Trichlorofluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8260B

NVLAP® Labcode: 200388-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Base Neutrals	Acenaphthene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Acenaphthylene	µg/l	17.8	18.3	6.36 - 24.3		Acceptable	EPA 8270C
	Aniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Anthracene	µg/l	21.6	20.6	10.6 - 26.8		Acceptable	EPA 8270C
	Benzidine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(a)anthracene	µg/l	24.0	25.0	14.9 - 28.5		Acceptable	EPA 8270C
	Benzo(b)fluoranthene	µg/l	15.3	15.1	6.29 - 20.2		Acceptable	EPA 8270C
	Benzo(k)fluoranthene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(g,h,i)perylene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzo(a)pyrene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Benzyl alcohol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Bromophenyl-phenylether	µg/l	124	98.3	42.4 - 126		Acceptable	EPA 8270C
	Butylbenzylphthalate	µg/l	127	111	D.L. - 176		Acceptable	EPA 8270C
	Carbazole	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Chloroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	bis(2-Chloroethoxy)methane	µg/l	119	118	46.6 - 140		Acceptable	EPA 8270C
	bis(2-Chloroethyl)ether	µg/l	0	< 10.0			Acceptable	EPA 8270C
	bis(2-Chloroisopropyl)ether	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1-Chloronaphthalene	µg/l		< 10.0				
	2-Chloronaphthalene	µg/l	18.7	18.5	6.58 - 26.2		Acceptable	EPA 8270C
	4-Chlorophenyl-phenylether	µg/l	90.4	86.9	33.8 - 110		Acceptable	EPA 8270C
	Chrysene	µg/l	26.6	25.3	12.1 - 32.3		Acceptable	EPA 8270C
	Dibenz(a,h)anthracene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Dibenzofuran	µg/l	65.3	64.9	13.0 - 88.6		Acceptable	EPA 8270C
	Di-n-butylphthalate	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,2-Dichlorobenzene	µg/l	89.8	92.4	44.5 - 82.6		Not Acceptable	EPA 8270C
	1,3-Dichlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,4-Dichlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	3,3'-Dichlorobenzidine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Diethylphthalate	µg/l	130	142	D.L. - 217		Acceptable	EPA 8270C
	Dimethylphthalate	µg/l	0	14.5	6.48 - 22.0		Not Acceptable	EPA 8270C
	2,4-Dinitrotoluene	µg/l	110	105	43.0 - 140		Acceptable	EPA 8270C
	2,6-Dinitrotoluene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Di-n-octylphthalate	µg/l	69.7	61.1	11.6 - 90.4		Acceptable	EPA 8270C
	bis(2-ethylhexyl)phthalate	µg/l	22.6	20.9	10.9 - 29.7		Acceptable	EPA 8270C
	Fluoranthene	µg/l	18.7	19.8	11.3 - 25.0		Acceptable	EPA 8270C
	Fluorene	µg/l	39.9	39.4	16.7 - 51.4		Acceptable	EPA 8270C
	Hexachlorobenzene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachlorobutadiene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachlorocyclopentadiene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Hexachloroethane	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Indeno(1,2,3-cd)pyrene	µg/l	19.8	20.0	4.97 - 23.3		Acceptable	EPA 8270C
	Isophorone	µg/l	63.4	58.1	21.9 - 76.4		Acceptable	EPA 8270C
	1-Methylnaphthalene	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2-Methylnaphthalene	µg/l	0	< 10.0			Acceptable	EPA 8270C

NVLAP® Lab code: 200086-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Pesticides	Aldrin	µg/l	1.42	2.70	0.691 - 3.65	1.18 - 3.16	Acceptable	EPA 8081A
	alpha-BHC	µg/l	4.40	6.91	2.54 - 9.58		Acceptable	EPA 8081A
	beta-BHC	µg/l	3.32	5.44	1.94 - 7.95		Acceptable	EPA 8081A
	delta-BHC	µg/l	0	< 0.100			Acceptable	EPA 8081A
	gamma-BHC(Lindane)	µg/l	5.04	7.75	2.58 - 11.2		Acceptable	EPA 8081A
	alpha-Chlordane	µg/l	3.14	5.34	1.31 - 8.15		Acceptable	EPA 8081A
	gamma-Chlordane	µg/l	3.23	5.41	0.840 - 8.52		Acceptable	EPA 8081A
	4,4'-DDD	µg/l	3.16	4.86	2.39 - 6.78	3.12 - 6.05	Acceptable	EPA 8081A
	4,4'-DDE	µg/l	1.19	2.19	1.03 - 2.99	1.36 - 2.66	Check for Error	EPA 8081A
	4,4'-DDT	µg/l	1.42	2.33	1.06 - 3.17	1.41 - 2.82	Acceptable	EPA 8081A
	Dieldrin	µg/l	0.937	1.57	0.808 - 2.17	1.04 - 1.94	Check for Error	EPA 8081A
	Endrin	µg/l	5.29	7.79	2.96 - 11.2		Acceptable	EPA 8081A
	Endrin aldehyde	µg/l	0	< 0.100			Acceptable	EPA 8081A
	Endrin ketone	µg/l	0	< 0.100			Acceptable	EPA 8081A
	Endosulfan I	µg/l	2.73	4.88	2.00 - 6.93		Acceptable	EPA 8081A
	Endosulfan II	µg/l	1.08	3.20	0.686 - 5.07		Acceptable	EPA 8081A
	Endosulfan sulfate	µg/l	1.77	3.00	1.03 - 4.56		Acceptable	EPA 8081A
	Heptachlor	µg/l	1.63	3.03	0.798 - 4.22	1.37 - 3.65	Acceptable	EPA 8081A
	Heptachlor epoxide	µg/l	0.761	1.30	0.660 - 1.67	0.829 - 1.50	Check for Error	EPA 8081A
	Methoxychlor	µg/l	2.38	3.84	1.28 - 6.21		Acceptable	EPA 8081A
Chlordane	Chlordane, technical	µg/l	7.93	9.40	4.10 - 13.4	5.65 - 11.8	Acceptable	EPA 8081A
Toxaphene	Toxaphene	µg/l		3.62	0.814 - 6.19			
Herbicides	2,4-D	µg/l		6.07	D.L. - 9.43			
	Dicamba	µg/l		4.25	0.270 - 6.30			
	2,4,5-T	µg/l		6.10	0.536 - 9.01			
	Silvex	µg/l		6.72	0.347 - 9.03			

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Lab code: 200368-0

ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
PCB's In H2O	Aroclor 1232	µg/l	1.88	1.42	0.611 - 1.92	0.829 - 1.70	Check for Error	EPA 8082
(Standard 1)	PCB Aroclor Identity	µg/l	1232	1232	1232	1232	Acceptable	EPA 8082
PCB's In H2O	Aroclor 1260	µg/l	1.90	1.72	0.691 - 2.32	0.963 - 2.05	Acceptable	EPA 8082
(Standard 2)	PCB Aroclor Identity	µg/l	1260	1260	1260	1260	Acceptable	EPA 8082
PCB's In Oil	Aroclor 1016/1242	mg/Kg	12.6	17.5	1.67 - 26.9	5.88 - 22.7	Acceptable	EPA 8082
(Standard 1)	PCB Aroclor Identity	mg/Kg	1016/1242	1242	1242	1242	Acceptable	EPA 8082
PCB's In Oil	Aroclor 1254	mg/Kg	36.0	39.8	6.30 - 58.0	14.9 - 49.4	Acceptable	EPA 8082
(Standard 2)	PCB Aroclor Identity	mg/Kg	1254	1254	1254	1254	Acceptable	EPA 8082

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ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles (cont.)	1,2,3-Trichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Vinyl acetate	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Vinyl chloride	µg/l	0	< 5.00			Acceptable	EPA 8260B
	Xylenes, total	µg/l	92.6	88.2	50.1 - 120		Acceptable	EPA 8260B

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WP-66 Final Customer Report

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ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Base Neutrals (cont.)	Naphthalene	µg/l	146	139	33.7 - 181		Acceptable	EPA 8270C
	2-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	3-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Nitroaniline	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Nitrobenzene	µg/l	97.0	98.0	32.1 - 128		Acceptable	EPA 8270C
	N-Nitrosodiethylamine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	N-Nitrosodimethylamine	µg/l	10.3	13.7	D.L. - 20.7		Acceptable	EPA 8270C
	N-Nitrosodiphenylamine	µg/l	53.3	49.7	11.2 - 69.8		Acceptable	EPA 8270C
	N-Nitroso-di-n-propylamine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	Phenanthrene	µg/l	24.9	24.4	15.9 - 29.3		Acceptable	EPA 8270C
	Pyrene	µg/l	31.4	30.2	9.66 - 45.2		Acceptable	EPA 8270C
	Pyridine	µg/l	0	< 10.0			Acceptable	EPA 8270C
	1,2,4-Trichlorobenzene	µg/l	24.9	24.1	6.65 - 32.1		Acceptable	EPA 8270C

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WP-66 Final Customer Report

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ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Acids	Benzoic acid	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Chloro-3-methylphenol	µg/l	67.3	66.4	25.0 - 85.4		Acceptable	EPA 8270C
	2-Chlorophenol	µg/l	61.4	61.9	19.2 - 78.6		Acceptable	EPA 8270C
	2,4-Dichlorophenol	µg/l	126	118	42.5 - 142		Acceptable	EPA 8270C
	2,6-Dichlorophenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2,4-Dimethylphenol	µg/l	49.4	51.3	8.82 - 68.6		Acceptable	EPA 8270C
	4,6-Dinitro-2-methylphenol	µg/l	163	144	16.8 - 208		Acceptable	EPA 8270C
	2,4-Dinitrophenol	µg/l	95.3	138	D.L. - 179		Acceptable	EPA 8270C
	2-Methylphenol	µg/l	25.1	28.9	0.280 - 39.5		Acceptable	EPA 8270C
	3-Methylphenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	4-Methylphenol	µg/l	0	< 10.0			Acceptable	EPA 8270C
	2-Nitrophenol	µg/l	15.7	14.9	5.50 - 18.5		Acceptable	EPA 8270C
	3-Nitrophenol	µg/l		< 10.0				
	4-Nitrophenol	µg/l	0	64.6	D.L. - 92.7		Acceptable	EPA 8270C
	Pentachlorophenol	µg/l	79.9	78.0	18.4 - 108		Acceptable	EPA 8270C
	Phenol	µg/l	64.3	134	D.L. - 180		Acceptable	EPA 8270C
	2,4,5-Trichlorophenol	µg/l	72.5	75.6	31.5 - 95.7		Acceptable	EPA 8270C
	2,4,6-Trichlorophenol	µg/l	54.1	53.5	18.7 - 70.1		Acceptable	EPA 8270C

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
PAH's	Acenaphthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Acenaphthylene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Anthracene	µg/l	0	0.800	0.255 - 1.17		Not Acceptable	EPA 8310
	Benzo(a)anthracene	µg/l	1.63	2.34	0.964 - 3.20		Acceptable	EPA 8310
	Benzo(b)fluoranthene	µg/l	11.5	18.1	4.66 - 26.1		Acceptable	EPA 8310
	Benzo(k)fluoranthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Benzo(g,h,i)perylene	µg/l	1.72	2.79	D.L. - 4.13		Acceptable	EPA 8310
	Benzo(a)pyrene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Chrysene	µg/l	7.80	11.5	5.37 - 15.3		Acceptable	EPA 8310
	Dibenz(a,h)anthracene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Fluoranthene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Fluorene	µg/l	0	< 0.100			Acceptable	EPA 8310
	Indeno(1,2,3-cd)pyrene	µg/l	7.67	12.1	5.29 - 15.3		Acceptable	EPA 8310
	Naphthalene	µg/l	4.88	5.24	D.L. - 8.74		Acceptable	EPA 8310
	Phenanthrene	µg/l	14.0	15.2	4.50 - 21.9		Acceptable	EPA 8310
	Pyrene	µg/l	0	< 0.100			Acceptable	EPA 8310

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Study: **WP66**

ERA Laboratory Code: **R1456-08**

Laboratory Name: **STL NORTH CANTON**

Report Type: **Customer**

Report Method: **Method B**

5540 Marshall St., Arvada, CO 80002 1-800-372-0122 fax 303-421-0159 info@eraqc.com www.eraqc.com

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l		319	278 - 356			
	Total Dissolved Solids	mg/l		301	226 - 376	251 - 351		
	Conductivity at 25°C	µmhos	420	390	360 - 420	370 - 410	Check for Error	EPA 9050
	Alkalinity as CaCO3	mg/l		81.6	73.7 - 89.2	76.3 - 86.6		
	Chloride	mg/l	60.9	60.9	54.6 - 66.8	56.6 - 64.8	Acceptable	EPA 300.0A
	Fluoride	mg/l		3.29	2.88 - 3.67	3.01 - 3.53		
	Potassium	mg/l		15.3	13.1 - 17.6	13.8 - 16.8		
	Sodium	mg/l		76.4	69.0 - 83.7	71.4 - 81.2		
	Sulfate	mg/l		9.80	6.93 - 12.5	7.86 - 11.6		
pH	pH	S.U.		8.74	8.48 - 9.00	8.57 - 8.91		
Hardness	Total Suspended Solids	mg/l		65.4	50.1 - 70.4	53.5 - 67.0		
	Calcium	mg/l		31.4	27.9 - 35.8	29.2 - 34.5		
	Magnesium	mg/l		3.03	2.58 - 3.49	2.73 - 3.33		
	Calcium hardness (CaCO3)	mg/l		80.9	68.8 - 93.0			
	Total Hardness (CaCO3)	mg/l		90.9	81.4 - 101	84.7 - 97.7		
Demand	BOD	mg/l		20.5	10.0 - 31.0	13.5 - 27.5		
	CBOD	mg/l		17.8	7.93 - 27.6	11.2 - 24.3		
	COD	mg/l		32.9	19.8 - 43.8	23.8 - 39.8		
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l		9.14	7.07 - 11.1	7.75 - 10.4		
	Nitrate as N	mg/l		29.8	23.6 - 35.3	25.6 - 33.4		
	Ortho-phosphate as P	mg/l		0.663	0.550 - 0.780	0.589 - 0.742		
Nutrients - Complex	Total phosphorus as P	mg/l		4.76	3.62 - 5.58	3.95 - 5.25		
	Total kjeldahl nitrogen	mg/l		4.70	3.16 - 6.20	3.67 - 5.70		
Cyanide	Cyanide, total	mg/l		0.749	0.520 - 0.963	0.594 - 0.889		
Phenolics	Phenolics, total	mg/l		0.966	0.530 - 1.40	0.676 - 1.26		
Grease & Oil	Grease & Oil (Gravimetric)	mg/l		19.8	11.4 - 24.6	13.6 - 22.4		
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l		1.85	1.49 - 2.21	1.61 - 2.09		

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l		1730	1480 - 1960	1560 - 1880		
	Antimony	µg/l		397	275 - 480	309 - 445		
	Arsenic	µg/l		266	220 - 313	236 - 298		
	Barium	µg/l		645	554 - 735			
	Beryllium	µg/l		672	572 - 759	603 - 728		
	Boron	µg/l		244	178 - 333			
	Cadmium	µg/l		50.7	42.4 - 58.8	45.1 - 56.1		
	Chromium	µg/l		144	123 - 164	130 - 158		
	Cobalt	µg/l		156	136 - 176	142 - 169		
	Copper	µg/l		485	440 - 533	455 - 518		
	Iron	µg/l		1670	1480 - 1880	1550 - 1810		
	Lead	µg/l		2380	2100 - 2650	2190 - 2560		
	Manganese	µg/l		1770	1590 - 1970	1650 - 1900		
	Molybdenum	µg/l		125	105 - 144	112 - 138		
	Nickel	µg/l		1730	1570 - 1930	1630 - 1870		
	Selenium	µg/l		632	501 - 732	539 - 694		
	Silver	µg/l		292	250 - 335	264 - 321		
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l		163	129 - 192	140 - 181		
	Vanadium	µg/l		1020	919 - 1120	953 - 1090		
	Zinc	µg/l		1350	1200 - 1510	1250 - 1460		
Mercury	Mercury	µg/l		14.0	10.5 - 17.5	11.6 - 16.3		
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

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WP-66 Final Customer Report

ERA Laboratory Code: R1456-08 **EPA ID: OH00048** **State ID:** **Report Issued: 09/12/00**

ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles	Acetone	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acetonitrile	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acrylonitrile	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Acrolein	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Benzene	µg/l	54.8	65.5	47.4 - 84.1	53.5 - 78.0	Acceptable	EPA 8021B
	Bromodichloromethane	µg/l	23.8	25.7	18.1 - 33.6	20.6 - 31.0	Acceptable	EPA 8021B
	Bromoform	µg/l	30.6	31.4	20.0 - 43.1	23.8 - 39.2	Acceptable	EPA 8021B
	Bromomethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	2-Butanone (MEK)	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Carbon disulfide	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Carbon tetrachloride	µg/l	16.4	24.2	15.2 - 34.2	18.3 - 31.0	Check for Error	EPA 8021B
	Chlorobenzene	µg/l	22.7	26.8	19.3 - 34.0	21.7 - 31.5	Acceptable	EPA 8021B
	Chlorodibromomethane	µg/l	55.1	66.1	43.7 - 87.8	51.1 - 80.5	Acceptable	EPA 8021B
	Chloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	2-Chloroethylvinylether	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Chloroform	µg/l	57.7	70.2	48.6 - 89.9	55.5 - 83.0	Acceptable	EPA 8021B
	Chloromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	DBCP	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dibromoethane (EDB)	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Dibromomethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichlorobenzene	µg/l	35.1	44.4	31.3 - 56.2	35.5 - 52.0	Check for Error	EPA 8021B
	1,3-Dichlorobenzene	µg/l	38.6	56.0	39.6 - 69.7	44.6 - 64.7	Not Acceptable	EPA 8021B
	1,4-Dichlorobenzene	µg/l	31.4	42.6	29.3 - 55.0	33.6 - 50.7	Check for Error	EPA 8021B
	Dichlorodifluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,1-Dichloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichloroethane	µg/l	27.3	32.4	22.5 - 43.4	26.0 - 39.9	Acceptable	EPA 8021B
	1,1-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	cis-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	trans-1,2-Dichloroethylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,2-Dichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	cis-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	trans-1,3-Dichloropropylene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Ethylbenzene	µg/l	16.2	23.1	15.6 - 30.0	18.0 - 27.6	Check for Error	EPA 8021B
	2-Hexanone	µg/l		< 5.00				
	Methylene chloride	µg/l	53.1	74.4	47.0 - 102	56.2 - 92.9	Check for Error	EPA 8021B
	MIBK	µg/l		72.0	27.5 - 112			
	Styrene	µg/l	0	< 5.00			Acceptable	EPA 8021B
	1,1,1,2-Tetrachloroethane	µg/l	96.4	110	40.7 - 173		Acceptable	EPA 8021B
	1,1,2,2-Tetrachloroethane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Tetrachloroethylene	µg/l	44.4	59.9	39.6 - 76.6	45.8 - 70.5	Check for Error	EPA 8021B
	Toluene	µg/l	52.1	64.3	46.3 - 80.0	52.0 - 74.4	Acceptable	EPA 8021B
	1,1,1-Trichloroethane	µg/l	29.7	36.6	23.8 - 48.3	27.9 - 44.2	Acceptable	EPA 8021B
	1,1,2-Trichloroethane	µg/l	33.5	39.7	27.5 - 51.4		Acceptable	EPA 8021B
	Trichloroethylene	µg/l	47.2	62.4	40.5 - 80.6	47.1 - 73.9	Acceptable	EPA 8021B
	Trichlorofluoromethane	µg/l	0	< 5.00			Acceptable	EPA 8021B

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WP-66 Final Customer Report

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ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Volatiles (cont.)	1,2,3-Trichloropropane	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Vinyl acetate	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Vinyl chloride	µg/l	0	< 5.00			Acceptable	EPA 8021B
	Xylenes, total	µg/l	66.2	88.2	50.1 - 120		Acceptable	EPA 8021B

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ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Minerals	Total Solids at 105°C	mg/l		319	278 - 356			
	Total Dissolved Solids	mg/l		301	226 - 376	251 - 351		
	Conductivity at 25°C	µmhos		390	360 - 420	370 - 410		
	Alkalinity as CaCO3	mg/l		81.6	73.7 - 89.2	76.3 - 86.6		
	Chloride	mg/l	42.1	60.9	54.6 - 66.8	56.6 - 64.8	Not Acceptable	EPA 325.3
	Fluoride	mg/l		3.29	2.88 - 3.67	3.01 - 3.53		
	Potassium	mg/l		15.3	13.1 - 17.6	13.8 - 16.8		
	Sodium	mg/l		76.4	69.0 - 83.7	71.4 - 81.2		
	Sulfate	mg/l		9.80	6.93 - 12.5	7.86 - 11.6		
pH	pH	S.U.		8.74	8.48 - 9.00	8.57 - 8.91		
Hardness	Total Suspended Solids	mg/l		65.4	50.1 - 70.4	53.5 - 67.0		
	Calcium	mg/l		31.4	27.9 - 35.8	29.2 - 34.5		
	Magnesium	mg/l		3.03	2.58 - 3.49	2.73 - 3.33		
	Calcium hardness (CaCO3)	mg/l		80.9	68.8 - 93.0			
	Total Hardness (CaCO3)	mg/l		90.9	81.4 - 101	84.7 - 97.7		
Demand	BOD	mg/l		20.5	10.0 - 31.0	13.5 - 27.5		
	CBOD	mg/l		17.8	7.93 - 27.6	11.2 - 24.3		
	COD	mg/l		32.9	19.8 - 43.8	23.8 - 39.8		
	TOC	mg/l		13.0	10.7 - 15.4	11.5 - 14.6		
Nutrients - Simple	Ammonia as N	mg/l		9.14	7.07 - 11.1	7.75 - 10.4		
	Nitrate as N	mg/l		29.8	23.6 - 35.3	25.6 - 33.4		
	Ortho-phosphate as P	mg/l		0.663	0.550 - 0.780	0.589 - 0.742		
Nutrients - Complex	Total phosphorus as P	mg/l		4.76	3.62 - 5.58	3.95 - 5.25		
	Total kjeldahl nitrogen	mg/l		4.70	3.16 - 6.20	3.67 - 5.70		
Cyanide	Cyanide, total	mg/l		0.749	0.520 - 0.963	0.594 - 0.889		
Phenolics	Phenolics, total	mg/l		0.966	0.530 - 1.40	0.676 - 1.26		
Grease & Oil	Grease & Oil (Gravimetric)	mg/l		19.8	11.4 - 24.6	13.6 - 22.4		
	Grease & Oil (Infrared)	mg/l		23.8	14.4 - 28.8	16.8 - 26.4		
TRC	Total Residual Chlorine	mg/l		1.85	1.49 - 2.21	1.61 - 2.09		

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ENVIRONMENTAL RESOURCE ASSOCIATES®

WP-66 Final Customer Report

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ERA Standard	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Warning Limits	Performance Evaluation	Method Description
Hexavalent Chromium	Hexavalent Chromium	µg/l		239	195 - 275			
Trace Metals	Aluminum	µg/l		1730	1480 - 1960	1560 - 1880		
	Antimony	µg/l		397	275 - 480	309 - 445		
	Arsenic	µg/l		266	220 - 313	236 - 298		
	Barium	µg/l		645	554 - 735			
	Beryllium	µg/l		672	572 - 759	603 - 728		
	Boron	µg/l		244	178 - 333			
	Cadmium	µg/l		50.7	42.4 - 58.8	45.1 - 56.1		
	Chromium	µg/l		144	123 - 164	130 - 158		
	Cobalt	µg/l		156	136 - 176	142 - 169		
	Copper	µg/l		485	440 - 533	455 - 518		
	Iron	µg/l		1670	1480 - 1880	1550 - 1810		
	Lead	µg/l		2380	2100 - 2650	2190 - 2560		
	Manganese	µg/l		1770	1590 - 1970	1650 - 1900		
	Molybdenum	µg/l		125	105 - 144	112 - 138		
	Nickel	µg/l		1730	1570 - 1930	1630 - 1870		
	Selenium	µg/l		632	501 - 732	539 - 694		
	Silver	µg/l		292	250 - 335	264 - 321		
	Strontium	µg/l		147	125 - 169	132 - 161		
	Thallium	µg/l		163	129 - 192	140 - 181		
	Vanadium	µg/l		1020	919 - 1120	953 - 1090		
	Zinc	µg/l		1350	1200 - 1510	1250 - 1460		
Mercury	Mercury	µg/l		14.0	10.5 - 17.5	11.6 - 16.3		
Tin and Titanium	Titanium	µg/l		78.9	66.7 - 90.1	70.6 - 86.2		
	Tin	µg/l		2330	1840 - 2830			

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