O'BRIEN & GERE
ENGINEERS, INC.

May 11, 1998

Mr. John M. Burns
Technical Committee Chair
P.O. Box 248
1186 Lower River Road
Charleston, Tennessee

Re: Frontier Chemical - Pendleton Site
Addendum to the March 1998 Semi-Annual
Ground Water Monitoring Report

File: 5829.003 #2

Dear Mr. Burns:

As you are aware, data validation activities were not complete prior to the submission of the March 1998 Semi-Annual Ground Water Monitoring Report for the second round of post-closure ground water samples collected at the Frontier Chemical - Pendleton Site, located on Town Line Road in the Town of Pendleton, Niagara County, New York. The data validation has since been completed. This addendum to the report has been prepared to present the results of the data validation, performed by Data Validation Services of North Creek, New York.

The validation was performed in accordance with guidance from the most current editions of the United States Environmental Protection Agency (USEPA) Contract Laboratory Procedures (CLP) National Functional Guideline and Organic and Inorganic Data Review, and the USEPA Standard Operating Procedures (SOPs) HW-2 and HW-6. Results of the validation indicated that the samples were processed and analyzed in compliance with protocol requirements, and with adherence to quality criteria. Most analytical results are usable with minor qualification. The only exception to this is the pesticide analyte endrin aldehyde in monitoring well 85-7R, which is not usable. Since endrin aldehyde has never been detected in any monitoring wells, this deficiency is likely inconsequential. A copy of the data validation report is included as Attachment A.

Results of the ground water analyses, along with a comparison of the results with New York State Class GA Standards, are summarized on Table 4. Table 4 is revised from that presented in the March 1998 Semi-Annual Ground Water Monitoring Report to state that data validation has been completed. It was not necessary to modify analytical results presented on Table 4 of the March 1998 Report as a result of the data validation.

O'Brien & Gere Engineers, Inc., an O'Brien & Gere company
5000 Brittonfield Parkway / P.O. Box 4873, Syracuse, New York 13221-4873
(315) 437-6100 / FAX (315) 463-7554 • http://www.obg.com
. . . and offices in major U.S. cities

If you have any questions, please do not hesitate to contact me at your convenience.

Very truly yours,

Stephen W. Anagnost, P.E.
Managing Engineer

i:/div71/projects/5829.003/5/semi2add.wpd

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
February 1998

	85-5R						URS-5D				
Parameter	7/86	8/90	2/91	10/92	6/97	2/98	8/90	2/91	10/92	6/97	2/98
VOCs (ppb)											
Acetone	NA	R	ND	ND	ND	ND	250	R	ND	ND	ND
Benzene	ND	15	ND	ND	ND	0.34 J	ND	ND	1	ND	0.25 J
2-Butanone	NA	ND	ND	ND	ND	ND	ND	R	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	NA	NA	NA	ND	0.28 J	NA	NA	NA	ND	0.31 J
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	0.24 J	ND	ND	ND	ND	0.32 J
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	R	ND	ND	ND
4-Methyl-2-Pentanone	NA	2J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	ND	2J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	0.14 J	ND	1J	ND	ND	0.19 J
Total Xylenes	NA	ND	ND	ND	ND	0.96	ND	0.5J	ND	ND	1.5
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ppb)											
bis(2-Ethlyhexyl)phthalate	ND	ND	NA	NA	ND	ND	3J	NA	NA	ND	ND
Di-n-Octylphthalate	ND	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Phenol	3	ND	NA	NA	ND	ND	ND	ND	NA	ND	ND
Metals (ppb)											
Aluminum	1,060	214	37.8B	153	ND	300	ND	ND	ND	ND	ND
Antimony	NA	ND	42.4B	ND	ND	ND	ND	31.5B	ND	ND	ND
Arsenic	NA	1B	ND	ND	ND	ND	1.3B	1B	ND	ND	ND
Barium	20	73.5B	23.4B	15	40	80	224	71.7B	32	20	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	380,000	355,000	378,000	321,000	270,000	220,000	378,000	407,000	387,000	440,000	300,000
Chromium	40	7.5B	ND	ND	ND	30	3B	ND	ND	ND	ND
Cobalt	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	61
Copper	10	ND	ND	11	ND	ND	ND	ND	8	ND	ND
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	1,020	669	915	419	140	2,300	188	143	25	ND	120
Lead	150	ND	1.2B	ND	ND	ND	ND	1.3B	12	ND	ND
Magnesium	179,000	106,000	170,000	139,000	130,000	85,000	33,300	2450B	570,000	100,000	24,000
Manganese	100	40	57.5	42	50	260	8.8B	3.5B	ND	50	10
Nickel	10	48.1	ND	ND	ND	ND	11.4B	ND	ND	90	ND
Potassium	9,500	60,700	6,280	6,400	ND	ND	22,700	16,900	8,500	ND	ND
Silver	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	126,000	132,000	120,000	100,000	93,000 J	58,000	192,000	194,000	114,000	88,000	93,000
Thallium	NA	ND	ND	ND	ND	8	ND	ND	ND	ND	ND
Vanadium	35	4B	ND	ND	ND	ND	3.8B	ND	ND	ND	ND
Zinc	75	12.9B	17.6B	ND	ND	ND	19.9B	14.7B	ND	ND	10
Pesticides (ppb)											
alpha-BHC	0.0001	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Heptachlor Epoxide	0.0005	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
4,4-DDE	ND	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
PCBs (ppb)											
PCB-1254	ND	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. I = Inorganics indicates estimated value.
4. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
5. Sample data presented for 6/97 and 2/98 sampling events is for cis-1,2-dichloroethylene.
6. NA = Not analyzed; ND = Not detected; N = Presumptives present
7. Data validation was performed in accordance with USEPA CLP National Functional Guidelines and Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
February 1998

	85-7R						URS-7D				
Parameter	7/86	8/90	2/91	10/92	6/97	2/98	8/90	2/91	10/92	6/97	2/98
VOCs (ppb)											
Acetone	NA	ND	R	ND	ND	ND	120	R	ND	ND	ND
Benzene	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J
2-Butanone	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	71	ND	ND	ND	ND	ND	0.5J	ND	ND	ND	ND
Chlorobenzene	ND	NA	NA	NA	ND	ND	NA	NA	NA	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	NA	ND	ND	ND	0.14J	0.19 J	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	1J	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37 J
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ppb)											
bis(2-Ethlyhexyl)phthalate	ND	ND	NA	NA	ND	ND	ND	ND	NA	ND	ND
Di-n-Octylphthalate	ND	ND	NA	NA	ND	ND	ND	ND	NA	ND	ND
Phenol	4	ND	NA	NA	ND	ND	ND	ND	NA	ND	ND
Metals (ppb)											
Aluminum	1,200	277	265	249	ND	ND	167B	52.5B	ND	ND	ND
Antimony	NA	28.3B	ND	ND	ND	ND	20.5B	36.3B	ND	ND	ND
Arsenic	NA	1.4B	1.7B	ND	ND	ND	ND	ND	ND	ND	ND
Barium	30	91B	143B	106	100	80	20.3B	47.2B	29	30	40
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	490,000	354,000	298,000	389,000	350,000	350,000	277,000	333,000	403,000	360,000	300,000
Chromium	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	10	ND	ND	8	ND	ND	ND	ND	8	ND	ND
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	920	586	820	435	190	310	387	283	63	ND	70
Lead	120	ND	2.6B	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	131,000	119,000	42,600	124,000	120,000	120,000	96,200	115,000	140,000	120,000	89,000
Manganese	110	40.5	31.5	30	70	80	71.2	140	86	40	30
Nickel	ND	7.4B	ND	ND	ND	ND	23.5B	ND	ND	ND	ND
Potassium	28,000	5,540	5,770	6,700	5,000	5,000	5,990	8,550	8,300	5,000	ND
Silver	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	107,000	67,900	38,900	73,100	66,000 J	67,000	82,700	68,900	78,900	66,000 J	54,000
Thallium	NA	ND	ND	ND	ND	6	ND	ND	ND	ND	ND
Vanadium	35	ND	ND	ND	ND	ND	4.2B	6.7B	ND	ND	ND
Zinc	65	ND	21.5	ND	ND	ND	5.6B	12.2B	ND	ND	ND
Pesticides (ppb)											
alpha-BHC	0.0002	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Heptachlor Epoxide	0.0007	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
4,4-DDE	ND	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
PCBs (ppb)											
PCB-1254	ND	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. I = Inorganics indicates estimated value.
4. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
5. Sample data presented for 6/97 and 2/98 sampling events is for cis-1,2-dichloroethylene.
6. NA = Not analyzed; ND = Not detected; N = Presumptives present
7. Data validation was performed in accordance with USEPA CLP National Functional Guidelines and Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
February 1998

	URS-9I					URS-9D				
Parameter	8/90	2/91	10/92	6/97	2/98	8/90	2/91	10/92	6/97	2/98
VOCs (ppb)										
Acetone	R	R	ND	ND	ND	R	R	ND	ND	ND
Benzene	ND	ND	ND	0.12J	0.29 J	ND	ND	ND	ND	1.9
2-Butanone	ND	2J	ND	ND	ND	ND	6J	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	4J	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	NA	NA	NA	ND	0.20 J	NA	NA	NA	ND	0.79
Chloroform	ND	ND	ND	ND	ND	8	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	1J	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	0.7	0.37J	0.34 J
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	1	0.66	0.59
Ethylbenzene	ND	ND	ND	ND	0.14 J	ND	ND	ND	ND	0.44 J
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	2	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.7J	ND	ND	ND	0.11 J	0.6J	ND	ND	ND	0.51
Total Xylenes	ND	ND	ND	0.29J	0.54	ND	ND	ND	ND	1.8
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	0.6	0.36J	0.24 J
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	0.26J	0.44 J
SVOCs (ppb)										
bis(2-Ethlyhexyl)phthalate	R	NA	NA	ND	ND	ND	NA	NA	ND	ND
Di-n-Octylphthalate	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Phenol	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Metals (ppb)										
Aluminum	221	197	110	ND	ND	128	64.2B	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND	28B	ND	ND	ND
Arsenic	1.7B	ND	ND	ND	ND	1.6B	ND	ND	ND	ND
Barium	30.1B	22.8B	14	30	ND	110B	38.2B	23	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	106,000	143,000	123	170,000	150,000	56,500	146,000	120,000	200,000	190,000
Chromium	8.6B	10.1	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	12.7B	ND	ND	ND	ND	5.2B	ND	ND	ND	ND
Cyanide	ND	ND	ND	ND	ND	ND	11.1B	ND	ND	ND
Iron	1,020	1,170	808	460	440	127	506	252	ND	70
Lead	ND	1B	ND	ND	ND	ND	ND	ND	ND	ND
Magnesium	54,500	71,300	63,500	70,000	69,000	29,900	70,200	60,000	58,000	73,000
Manganese	67.5	80	75	50	30	20.1	25.5	9	ND	ND
Nickel	7.6B	ND	ND	ND	ND	15.3B	ND	ND	ND	ND
Potassium	3,910B	4,250B	2,900	ND	ND	9,880	4,170B	3,600	ND	ND
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	34,500	54,000	52,400	43,000 J	45,000	27,400	37,000	42,800	48,000 J	52,000
Thallium	ND	ND	ND	ND	11	ND	ND	ND	ND	14
Vanadium	ND	9.6B	ND	ND	ND	10.7B	ND	ND	ND	ND
Zinc	19.3B	34.6	ND	ND	ND	50.5	16.7B	ND	ND	ND
Pesticides (ppb)										
alpha-BHC	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
Heptachlor Epoxide	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
4,4-DDE	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND
PCBs (ppb)										
PCB-1254	ND	NA	NA	ND	ND	ND	NA	NA	ND	ND

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. I = Inorganics indicates estimated value.
4. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
5. Sample data presented for 6/97 and 2/98 sampling events is for cis-1,2-dichloroethylene.
6. NA = Not analyzed; ND = Not detected; N = Presumptives present
7. Data validation was performed in accordance with USEPA CLP National Functional Guidelines and Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
February 1998

	88-12C					88-12D			
Parameter	8/90	2/91	10/92	6/97	2/98	8/90	2/91	6/97	2/98
VOCs (ppb)									
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	1J	0.9J	ND	0.13 J
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	6	ND	ND
Chlorobenzene	NA	NA	NA	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	2J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	0.11 J
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2,-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	R	13	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	0.48 J
Trichloroethene	ND	ND	ND	ND	ND	ND	6	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
SVOCs (ppb)									
bis(2-Ethlyhexyl)phthalate	NA	NA	NA	ND	ND	ND	NA	ND	4.3 J
Di-n-Octylphthalate	NA	NA	NA	ND	ND	5J	NA	ND	ND
Phenol	ND	ND	NA	ND	ND	ND	NA	ND	ND
Metals (ppb)									
Aluminum	481	187B	453	ND	900	ND	172B	ND	ND
Antimony	19.2B	28B	ND	ND	ND	50.7B	56.1B	ND	ND
Arsenic	10	12.3B	14	9	7	ND	1.3BW	ND	ND
Barium	11.4B	17.3	14	ND	ND	2.9B	7.9B	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	62,600	68,500	68,900	73,000	70,000	464,000	623,000E	490,000	480,000
Chromium	21	4.6B	ND	ND	10	7.6B	27.8E	10	30
Cobalt	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	4.2B	ND	5	ND	ND	ND	ND	ND	ND
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	1,530	1,040	1,560	ND	2,200	168	250	180	480
Lead	1.5B	1.2B	ND	ND	ND	ND	1.8BW	ND	ND
Magnesium	88,500	103,000	92,500	110,000	98,000	109,000	199,000E	130,000	110,000
Manganese	45.4	37.8	54	10	70	33.9	696	90	60
Nickel	14.6B	ND	ND	ND	ND	11.5B	25.5B	ND	ND
Potassium	2,520B	3,200B	3,000	ND	ND	5,310	12,000E	600	6,000
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sodium	34,600	41,100	41,300	47,000 J	43,000	66,400	474,000	140,000 J	100,000
Thallium	ND	ND	ND	ND	13	ND	ND	ND	ND
Vanadium	22.1B	10B	ND	ND	ND	51.6	2.4B	ND	ND
Zinc	10.1B	15.7B	ND	20	20	7.9B	ND	ND	10
Pesticides (ppb)									
alpha-BHC	ND	NA	NA	ND	ND	ND	NA	ND	ND
Heptachlor Epoxide	ND	NA	NA	ND	ND	ND	NA	ND	ND
4,4-DDE	ND	NA	ND	ND	ND	ND	NA	ND	ND
PCBs (ppb)									
PCB-1254	ND	NA	NA	ND	ND	ND	NA	0.19J N	ND

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. I = Inorganics indicates estimated value.
4. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
5. Sample data presented for 6/97 and 2/98 sampling events is for cis-1,2-dichloroethylene.
6. NA = Not analyzed; ND = Not detected; N = Presumptives present
7. Data validation was performed in accordance with USEPA CLP National Functional Guidelines and Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

Table 4
Frontier Chemical-Pendleton Site
Summary of Ground Water Analytical Data
February 1998

	URS-14I				URS-14D				Standard
Parameter	2/91	10/92	6/97	2/98	2/91	10/92	6/97	2/98	ug/L (ppb)
VOCs (ppb)									
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	---
Benzene	ND	ND	ND	1	ND	ND	ND	ND	1
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	---
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	---
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND	ND	---
Chlorobenzene	NA	NA	ND	0.81	NA	NA	ND	ND	5
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	7
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	---
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	5
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	0.13 J	ND	ND	ND	ND	5
Methylene Chloride	ND	ND	ND	ND	R	ND	ND	ND	5
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND	ND	---
1,1,2,2,-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	5
Toluene	ND	ND	ND	0.15 J	ND	ND	ND	ND	5
Total Xylenes	ND	ND	ND	ND	ND	ND	0.11J	0.21 J	5
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	5
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	2
SVOCs (ppb)									
bis(2-Ethlyhexyl)phthalate	NA	NA	ND	ND	R	NA	ND	ND	5
Di-n-Octylphthalate	NA	NA	ND	ND	5J	NA	ND	ND	---
Phenol	NA	NA	ND	ND	ND	NA	R	ND	1
Metals (ppb)									
Aluminum	7,140	1,170	1300	400	99.8	ND	ND	ND	---
Antimony	ND	ND	ND	ND	32.1B	ND	ND	ND	3
Arsenic	7.2B	ND	ND	ND	2B	ND	ND	ND	25
Barium	115B	47	50	40	25.5B	23	20	ND	1000
Beryllium	1.2B	ND	ND	ND	ND	ND	ND	ND	---
Cadmium	ND	ND	ND	1	ND	ND	ND	ND	5
Calcium	73,900	35,200	28,000 J	21,000	255,000	292,000	210,000	250,000	---
Chromium	30.9	ND	ND	160	10.3	7	ND	ND	50
Cobalt	5.8B	ND	ND	ND	ND	ND	ND	ND	---
Copper	18.5B	8	ND	10	ND	8	ND	ND	200
Cyanide	ND	ND	ND	ND	ND	ND	ND	10	200
Iron	10,400	2,060	1,800	2,300	357	193	ND	ND	300
Lead	7.5	ND	ND	ND	1.1B	ND	ND	ND	25
Magnesium	32,800	22,300	21,000	17,000	75,200	78,000	61,000	66,000	---
Manganese	484	145	70	60	30.8	27	ND	ND	300
Nickel	30.4B	ND	ND	170	ND	ND	ND	ND	100
Potassium	17,100	5,500	ND	25,000	4,250B	3,700	ND	ND	---
Silver	ND	ND	ND	ND	ND	ND	ND	ND	50
Sodium	44,700	42,500	58,000 J	48,000	40,700	38,700	52,000 J	49,000	20,000
Thallium	ND	ND	ND	6	ND	ND	ND	ND	---
Vanadium	16.1B	ND	ND	ND	ND	ND	ND	ND	---
Zinc	52.3	ND	10	30	26.8	ND	ND	10	---
Pesticides (ppb)									
alpha-BHC	NA	NA	ND	ND	ND	NA	ND	ND	---
Heptachlor Epoxide	NA	NA	ND	ND	ND	NA	ND	ND	0.03
4,4-DDE	NA	NA	0.032J	ND	ND	NA	ND	ND	0.2
PCBs (ppb)									
PCB-1254	NA	NA	ND	ND	NA	NA	ND	ND	0.09

Notes:

1. R = Indicates compound rejected due to blank contamination.
2. J = Indicates result is less than sample quantitation limit but greater than zero.
3. I = Inorganics indicates estimated value.
4. B = Indicates compound is less than quantitation limits but greater than or equal to instrument detection limits.
5. Sample data presented for 6/97 and 2/98 sampling events is for cis-1,2-dichloroethylene.
6. NA = Not analyzed; ND = Not detected; N = Presumptives present
7. Data validation was performed in accordance with USEPA CLP National Functional Guidelines and Organic and Inorganic Data Review, and the USEPA SOPs HW-2 and HW-6.

Attachment A

Data validation report

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

April 24, 1998

Jennifer Smith
O'Brien & Gere Engineers
5000 Brittonfield Parkway
P. O. Box 4873
Syracuse, NY 13221

RE: Validation of Frontier Chemical Site Data Packages
OBG Laboratory report for samples received February 1998

Dear Ms. Smith:

Review has been completed for the data packages generated by OBG Laboratories, pertaining to samples collected at the Frontier Chemical Site. Eleven aqueous samples were analysed for TCL/TAL parameters. Matrix spikes/duplicates, and field and trip blanks were also processed. Methodologies utilized are those of the USEPA SW846.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review and the USEPA SOPs HW-2 and HW-6. The following items were reviewed:

* Data Completeness
* Custody Documentation
* Holding Times
* Surrogate and Internal Standard Recoveries
* Matrix Spike Recoveries/Duplicate Correlations
* Preparation/Calibration Blanks
* Control Spike/Laboratory Control Samples
* Instrumental Tunes
* Calibration Standards
* Instrument IDLs
* Method Compliance
* Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, sample processing was primarily conducted with compliance to protocol requirements and with adherance to quality criteria, and most reported results are usable with minor qualification. The exception are pesticide analytes endrin aldehyde and endrin ketone, for which there are no usable results in two of the samples (due to loss from cleanup procedure). Certain edits to, and qualification of, reported results are indicated. These issues are discussed in the following analytical sections.

The laboratory summary data package, with recommended qualifiers applied in red ink to the sample result forms is attached to this narrative, and should be reviewed in conjunction with this text.

Data Completeness

Pesticide/PCB analyses for six samples were submitted as an addendum to the original report. Results for those analytes in these samples should be derived only from the addendum report forms, as noted in the pesticide/PCB section below. The analysis for metals in the field blank was also provided as an addendum.

Laboratory packages were complete as received, with the exception of the current pesticide/PCB IDLs, which will be forwarded under separate cover (attached).

Volatile Analyses

Carbon disulfide was initially detected in a trip blank at a level of 0.60 ug/L. Due to possible contamination contribution, reported detected results for this analyte in all project samples should be edited to reflect nondetection at the CRDL (i.e. "<0.5 "), or at the originally reported value (i.e. add "<"), whichever is greater.

Methylene chloride was detected in certain of the project blanks, but not in the project samples.

Matrix spikes of URS-7D involved evaluation of recoveries of all target analytes. Recoveries and duplicate correlation values were acceptable, with the exception of xylene (80% and 73%, below the recommended limit of 83%) and styrene (80% and 74%, below the recommended limit of 88%). The results for xylene in the sample are already estimated due to value below CRDL. The results for styrene in the sample should also be considered estimated ("J" qualifier), possibly biased slighty low. Spiked blank recoveries were acceptable.

Field duplicate correlation for 85-7R and Blind Duplicate was acceptable.

Due to the low response factor (0.030) observed for acetone, the results for this analyte in the samples should be considered estimated ("J").

It should be noted that the "solvent" identification in the reported volatile Tentatively Identified Compounds (TICs) refers to carbon dioxide gas. This response is rejected as a sample constituent.

The TICs reported for 88-12D should have the "N" flag (to show tentative identification) and the "J" flag (to show that the quantitative value is estimated).

Semivolatile Analyses

Although no bis(2-ethylhexyl)phthalate was observed in the associated blanks, and no validation qualification is required, the concentration reported for 88-12D is at a level typical of contamination.

The matrix spikes of URS-7D produced acceptable recoveries and duplicate correlations, with the exception of one slightly elevated recovery for an analyte not detected in the samples. Spiked blanks were also acceptable.

Field duplicate correlation for 85-7R and Blind Duplicate was acceptable.

Tentatively Identified Compounds (TICs) with retention times of 7.2', 7.3' and 7.4' should be considered as contamination (due to presence in the associated blanks), and are rejected as sample components. Additionally, TICs should be reported to only one significant figure.

The reported Method Detection Limits (MDLs) should be procedure specific (i.e. aqueous extraction versus soil extraction). However, the same extract numbers were used to generate the soil MDLs as the aqueous MDLs. This should be corrected by the laboratory, reporting only those which apply to a given method. Instrument Detection Limits are the statistics which are not extraction procedure related.

Pesticide/PCB Analyses

As noted in the case narrative, six samples (URS-9D, URS-9I, URS-7D, 85-7R, Blind Dup, and URS-14D) and the matrix spikes showed sulfur interference and underwent TBA cleanup. Results for all other samples should be derived from the initially reported data package. The results for these six samples should be derived from the addendum data package, with the following considerations:

As observed previously, endrin aldehyde failed to recover from the cleanup procedure. Additionally, the recovery of endrin ketone through the clean-up procedure was not evaluated, and may show similar recovery failure. Therefore, these compound results have been evaluated for use from the uncleaned extracts. However, the interference observed in the uncleaned extracts show no usable data for endrin aldehyde in sample 85-7R and no usable data for endrin aldehyde and endrin ketone in Blind Dup. Results for those specific analytes in the samples should be rejected ("R"). The results for these two analytes for the six samples, as derived from the uncleaned extracts, are as follows:

Sample ID	Endrin Ketone/Endrin Aldehyde detection limits, ug/L.
URS-9D	< 0.1
URS-9I	< 0.2
URS-7D	< 0.51
85-7R	EK = < 0.1; EA = Rejected
Blind Dup	EK and EA = Rejected
URS-14D	< 2.0

Additionally, response for 4,4-DDE in sample URS-14D should also be derived from the uncleaned extract (< 2.0 ug/L) due to interference present in the cleaned extract.

Accuracy and precision values (as determined from the cleaned extracts) for URS-7D were acceptable, with the exception of the endrin aldehyde (no recovery) and endrin ketone (not evaluated). The spiked blank showed acceptable recoveries before cleanup, and also showed no recovery for endrin aldehyde following cleanup.

Field duplicate correlation for 85-7R and Blind Duplicate was acceptable.

Reported method detection limits (MDLs) were outdated, and should be regenerated. Review of the sample and standard chromatography shows acceptable system sensitivity for the reported CRDLs. Although instrument detection limits (IDLs) are matrix independent, MDLs should be procedure specific (i.e. aqueous extraction versus soil extraction). However, the same extract numbers were used to generate the soil MDLs as the aqueous MDLs. This should be corrected by the laboratory, reporting only those which apply to a given method.

Metals/CN Analyses

The cyanide result for the equipment blank #4 is rejected ("R") due to the extended analysis holding time (33 days, beyond the allowable 12 days, from VTSR). With the exception of URS-14D, the samples showed nondetection. The detection of cyanide, which is at the detection limit of 10 ug/L, in URS-14D cannot be ruled out as contamination, due to the lack of data for this analyte in the field blank.

The mercury result for the equipment blank #4 is considered estimated ("J") due to the extended holding time (33 days, beyond the allowable 26 days from VTSR). Sample results, which are nondetection, are unaffected.

Detection of calcium in the equipment blank does not affect sample results, the concentrations of which were greatly in excess of that of the blank.

Accuracy and precision evaluations for URS-7D were acceptable, and LCS recoveries were within required ranges, with the exception of the recovery of antimony in the LCS associated with the equipment blank. That recovery was elevated by one percentage point, and does not affect the reported results (nondetection) of the sample.

Field duplicate results for 85-7R and Blind Duplicate showed acceptable correlations.

The serial dilution determinations for URS-7D produced acceptable correlations.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,

Judy Harry

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

This report summarizes the laboratory results for samples from Frontier Chemical - Pendleton Site, Town of Pendleton, Niagara County, NY. Immediately following the narrative is the Cross Reference Table that lists the site descriptions, sample numbers, dates collected, dates received and package numbers.

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

The coolers were received intact. When the coolers were received by the laboratory, the sample custodian(s) opened and inspected the shipments for damage, custody inconsistencies and proper preservation. The chain of custody forms documenting receipt are presented in the chain of custody section. Each sample was assigned a unique laboratory number and a custody file created. The samples were placed in a secured walk-in cooler and signed in and out by the chemists performing the tests. The sign out record, or lab chronicle, is presented in the chain of custody section.

Discrepancies noted upon receipt are documented on the case file form included in the chain of custody section. The cooler temperatures upon receipt were 4 and 5°C.

Pesticide/PCB, ICP metals, mercury and cyanide analysis requested on the chain of custody were submitted in a previous report.

METHODOLOGY

The following methods were used to perform the analyses:

PARAMETER	METHOD	REFERENCE
GCMS Volatile Organics	8260A	1
GCMS Semivolatile Organics	8270B	1

1, Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update II, January 1995.

QUALITY CONTROL

The quality control for this program includes internal standards, surrogates, matrix spike (MS), matrix spike duplicate (MSD), matrix spike blank, field blank, laboratory control sample (LCS), prep blank and QC trip blank samples. QA/QC results are summarized in the Sample Data Summary Package and are also included in the raw data.

Volatile Organics

The GC/MS Volatile instruments used a J&W DB-VRX, 75 m x 0.45 mm ID capillary column and a Vocarb 3000 trap.

Holding Times and Sample Preservation

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements. Samples had a pH of less than 2.

Laboratory Control Sample

All spike recoveries met method and/or project specific QC criteria.

MS/MSD
The following compounds did not meet matrix spike/matrix spike duplicate percent recovery and/or RPD criteria:

Sample Description	Sample #	Compound	% REC	RPD	Corrective Action
URS-7D	H1363	Xylene	X	X	1
		Styrene	X		1

1. The LCS met criteria. No corrective action was taken.

Surrogate
All surrogate recoveries met method and/or project specific QC criteria.

Internal Standards
All internal standard areas met method and/or project specific QC criteria.

Calibrations
The following initial calibration compound exceeded method average RRF criteria:

Calibration Date	Compound	Corrective Action
03/05/98	1,1,2,2-Tetrachloroethane	1

1. The program required samples to be analyzed using a 25 mL unheated purge. This compounds response is severely affected by purge volume. Heating the calibration would slightly improve the response. All other QC met criteria for this compound.

The following continuing calibration compounds exceeded method RRF criteria:

Calibration Date	Compound	Corrective Action
03/05/98	1,1,2,2-Tetrachloroethane	1

1. The program required samples to be analyzed using a 25 mL unheated purge. This compounds response is severely affected by purge volume. Heating the calibration would slightly improve the response. All other QC met criteria for this compound.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous

The following compounds were detected above the PQL in the following equipment/trip blanks:

Sample Description	Sample #	Compound	Conc.	Corrective Action
QC Trip Blank	H1597	Carbon Disulfide	.60 ug/L	1

1. The associated prep blank met criteria. Sample H1593 [URS-14I] also had carbon disulfide detected above the PQL. The trip blank and sample were reanalyzed outside of holding times to verify the carbon disulfide concentration. The carbon disulfide in the sample was confirmed. Carbon disulfide was not detected in the reanalysis of the trip blank. It is our belief that the carbon disulfide detected in the original analysis of the trip blank is due to a reaction between the acid preservation of the sample and a buildup of sulfur within the system to form carbon disulfide. Other samples had carbon disulfide detected at levels less than the PQL. These values were not confirmed.

Semivolatile Organics

The GC/MS Semivolatile instruments used a J&W DB-5MS, 30 m X 0.25 mm ID capillary column.

Holding Times

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Sample

The following compounds did not meet laboratory control sample recovery criteria:

LCS No.	Compound	Corrective Action
L030298W3	Hexachlorobenzene	1
	Benzo(b)fluoranthene	1
	Benzo(a)pyrene	1

1. This compound failed high and was not detected in the associated samples. The LCS was reanalyzed and still did not meet criteria. Both sets of data are included. No further corrective action was taken.

MS/MSD
The following compounds did not meet matrix spike/matrix spike duplicate percent recovery criteria:

Sample Description	Sample #	Compound	Corrective Action
URS-7D	H1363	3,3'-Dichlorobenzidine	1

1. The MS recovery failed high. The RPD met criteria. The LCS also met criteria. No further corrective action was taken.

Surrogates
The following samples did not meet surrogate recovery criteria:

Sample Description	Sample #	Surrogate	Corrective Action
88-12C	H1594	2,4,6-Tribromophenol	1
88-12D	H1595	2,4,6-Tribromophenol	1
Equipment Blank #1	H1596	2,4,6-Tribromophenol	1

1. Two (2) of the three (3) base/neutral and/or acid extractable surrogate recoveries passed laboratory criteria. In-house laboratory policy requires no further corrective action.

Internal Standard Areas
All internal standard areas met method and/or project specific QC criteria.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous
For calibration check standard compounds that had a linear regression performed, a percent drift was calculated between the true value of the calibration check standard and the calculated value. For compounds using an average response factor, the percent difference between the average response factor and the daily response factor was calculated. Summary sheets for both calculations are included in the raw data section.

RAW DATA

The raw data is organized in a format similar to the US EPA Contract Laboratory Program order of data requirements.

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
URS-9D	H1357	02/23/98	02/25/98	6892
URS-9I	H1358	02/23/98	02/25/98	6892
Equipment Blank #1	H1359	02/23/98	02/25/98	6892
85-5R	H1360	02/24/98	02/25/98	6892
URS-5D	H1361	02/24/98	02/25/98	6892
Equipment Blank #2	H1362	02/24/98	02/25/98	6892
URS-7D	H1363	02/24/98	02/25/98	6892
URS-7D	H1363MS	02/24/98	02/25/98	6892
URS-7D	H1363MSD	02/24/98	02/25/98	6892
URS-7D	H1363D	02/24/98	02/25/98	6892
85-7R	H1364	02/24/98	02/25/98	6892
Blind Duplicate	H1365	02/24/98	02/25/98	6892
QC Trip Blank	H1366	----------	02/25/98	6892
Equipment Blank #3	H1591	02/25/98	02/26/98	6915
URS-14D	H1592	02/25/98	02/26/98	6915
URS-14I	H1593	02/25/98	02/26/98	6915
88-12C	H1594	02/25/98	02/26/98	6915
88-12D	H1595	02/25/98	02/26/98	6915
Equipment Blank #4	H1596	02/25/98	02/26/98	6915
QC Trip Blank	H1597	----------	02/26/98	6915

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

This report summarizes the laboratory results for samples from Frontier Chemical - Pendleton Site, Town of Pendleton, Niagara County, NY. Immediately following the narrative is the Cross Reference Table that lists the site descriptions, sample numbers, dates collected, dates received and package numbers.

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

The coolers were received intact. When the coolers were received by the laboratory, the sample custodian(s) opened and inspected the shipments for damage, custody inconsistencies and proper preservation. The chain of custody forms documenting receipt are presented in the chain of custody section. Each sample was assigned a unique laboratory number and a custody file created. The samples were placed in a secured walk-in cooler and signed in and out by the chemists performing the tests. The sign out record, or lab chronicle, is presented in the chain of custody section.

Discrepancies noted upon receipt are documented on the case file form included in the chain of custody section. The cooler temperatures upon receipt were 4 and 5°C.

Volatile organic and semivolatile organics analysis requested on the chain of custody will be submitted in a separate report.

METHODOLOGY

The following methods were used to perform the analyses:

PARAMETER	METHOD	REFERENCE
Pesticides/PCBs	8081	1
ICP Metals	6010A	1
Mercury	7470A	1
Cyanide	9010A	1

1) Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update II, January 1995.

QUALITY CONTROL

The quality control for this program includes surrogates, matrix spike (MS), matrix spike duplicate (MSD), laboratory duplicate (D), matrix spike blank, field blank, laboratory control sample (LCS), prep blank and QC trip blank samples. QA/QC results are summarized in the Sample Data Summary Package and are also included in the raw data.

Pesticide/PCBs

The GC Semivolatile instruments used a DB-1701, 30 m X .53 mm ID capillary column.

Holding Times

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Samples

All spike recoveries met method and/or project specific QC criteria.

MS/MSD
The following compounds did not meet matrix spike/matrix spike duplicate RPD criteria:

Sample Description	Sample #	Compound	Corrective Action
URS-7D	H1363	Aldrin	1

1. The MS/MSD recoveries met criteria. The LCS also met criteria. The sample was analyzed at a dilution due to matrix interference. No corrective action was taken.

Surrogates
The following samples did not meet criteria for surrogate recoveries for Tetrachloro-m-xylene (TCMX) and/or Decachlorobiphenyl (DCBP):

Sample Description	Sample #	Surrogate	Corrective Action
URS-14D	H1592	TCMX/DCBP	1

1. The sample was analyzed at a dilution due to matrix interferences. This caused the surrogate to be diluted out. No corrective action was taken.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous
Samples H1358 [URS-9I], H1363 [URS-7D] and H1592 [URS-14D] have elevated detection limits due to matrix interferences.

Trace Metals

Holding Times
All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Sample
All spike recoveries met method and/or project specific QC criteria.

D/MS/MSD
The following analytes did not meet matrix spike/matrix spike duplicate percent recovery criteria:

Sample Description	Sample #	Analyte	Corrective Action
URS-7D	H1363	Calcium	1
		Magnesium	1
		Sodium	1

1. The concentration of the analyte in the sample was much greater than the concentration of the spike added. A post-digestion spike was performed as required. A matrix spike blank was also prepared which was within control limits. No further corrective action was taken.

ICP Serial Dilution
All percent differences met method and/or project specific QC criteria.

Calibrations
The following analytes did not meet continuing calibration percent recovery and/or continuing blank criteria:

Calibration Description	Date	Analyte	Corrective Action
CCB8	03/04/98	Selenium	1

1. The only associated samples were QC samples, which met criteria. No corrective action was taken.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Wet Chemistry
There were no excursions to note, all QC results were within established control limits.

RAW DATA

The raw data is organized in a format similar to the US EPA Contract Laboratory Program order of data requirements.

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
URS-9D	H1357	02/23/98	02/25/98	6892
URS-9I	H1358	02/23/98	02/25/98	6892
Equipment Blank #1	H1359	02/23/98	02/25/98	6892
85-5R	H1360	02/24/98	02/25/98	6892
URS-5D	H1361	02/24/98	02/25/98	6892
Equipment Blank #2	H1362	02/24/98	02/25/98	6892
URS-7D	H1363	02/24/98	02/25/98	6892
URS-7D	H1363MS	02/24/98	02/25/98	6892
URS-7D	H1363MSD	02/24/98	02/25/98	6892
URS-7D	H1363D	02/24/98	02/25/98	6892
85-7R	H1364	02/24/98	02/25/98	6892
Blind Duplicate	H1365	02/24/98	02/25/98	6892
QC Trip Blank	H1366	----------	02/25/98	6892
Equipment Blank #3	H1591	02/25/98	02/26/98	6915
URS-14D	H1592	02/25/98	02/26/98	6915
URS-14I	H1593	02/25/98	02/26/98	6915
88-12C	H1594	02/25/98	02/26/98	6915
88-12D	H1595	02/25/98	02/26/98	6915
Equipment Blank #4	H1596	02/25/98	02/26/98	6915
QC Trip Blank	H1597	----------	02/26/98	6915

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

Samples from the Frontier Chemical - Pendleton Site, Niagara County, NY were submitted for various analyses. During the analytical review of the original Pesticide/PCB data, matrix interference was noted in several samples. Sulfur interference was suspected. In some samples this interference resulted in the analysis of diluted sample extracts and the laboratory was unable the report to the project required detection limits. A decision was made by O'Brien & Gere Laboratories and O'Brien & Gere Engineers to attempt sample clean-up for sulfur interferences. This addendum presents the analytic data for these samples after sulfur clean-up was performed. A cross reference table is presented listing the samples that were cleaned.

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

The coolers were received intact. When the coolers were received by the laboratory, the sample custodian(s) opened and inspected the shipments for damage, custody inconsistencies and proper preservation. The chain of custody forms documenting receipt were presented in the chain of custody section of the first report. Each sample was assigned a unique laboratory number and a custody file created. The samples were placed in a secured walk-in cooler and signed in and out by the chemists performing the tests. The sign out record, or lab chronicle, was presented in the chain of custody section of the first report. The internal chain of custody record is presented in this report.

Discrepancies noted upon receipt are documented on the case file form included in the chain of custody section of the first report. The cooler temperatures upon receipt were 4 and 5°C.

METHODOLOGY

The following methods were used to perform the analyses:

PARAMETER	METHOD	REFERENCE
Pesticides/PCBs	8081	1

1) Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update II, January 1995.

QUALITY CONTROL

The quality control for this program includes surrogates, matrix spike (MS), matrix spike duplicate (MSD), laboratory duplicate (D), matrix spike blank, field blank, laboratory control sample (LCS) and prep blank and samples. QA/QC results are summarized in the Sample Data Summary Package and are also included in the raw data.

Pesticide/PCBs

The GC Semivolatile instruments used a DB-608, 30 m X .53 m ID capillary column.

Holding Times

All samples were prepared and analyzed within the method and/or QAPP specified holding time requirements.

Laboratory Control Samples

The following compounds did not meet laboratory control sample recovery criteria:

LCS No.	Compound	Corrective Action
L030298W1	Endrin Aldehyde	1

1. The samples were cleaned using TBA cleanup. This cleanup procedure will typically remove endrin aldehyde from the sample. This compound was not reported for these analytical samples. The original analysis that was not cleaned should be used for the endrin aldehyde value.

MS/MSD
The following compounds did not meet matrix spike/matrix spike duplicate percent recovery criteria:

Sample Description	Sample #	Compound	Corrective Action
URS-7D	H1363	Endrin Aldehyde	1

1. The samples were cleaned using TBA cleanup. This cleanup procedure will typically remove endrin aldehyde from the sample. See the LCS comments above. No corrective action was taken.

Surrogates
All surrogate recoveries met method and/or project specific criteria.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous
Endrin Ketone is not in the spike mix that was used, therefore was not in the LCS and MS/MSD.

RAW DATA

The raw data is organized in a format similar to the US EPA Contract Laboratory Program order of data requirements.

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
URS-9D	H1357	02/23/98	02/25/98	6892
URS-9I	H1358	02/23/98	02/25/98	6892
URS-7D	H1363	02/24/98	02/25/98	6892
URS-7D	H1363MS	02/24/98	02/25/98	6892
URS-7D	H1363MSD	02/24/98	02/25/98	6892
85-7R	H1364	02/24/98	02/25/98	6892
Blind Duplicate	H1365	02/24/98	02/25/98	6892
URS-14D	H1592	02/25/98	02/26/98	6915

NARRATIVE

INTRODUCTION/ANALYTICAL RESULTS

This report summarizes the laboratory results for samples from Frontier Chemical - Pendleton Site, Town of Pendleton, Niagara County, NY. Immediately following the narrative is the Cross Reference Table that lists the site descriptions, sample numbers, dates collected, dates received and package numbers.

CONDITION UPON RECEIPT/CHAIN OF CUSTODY

The coolers were received intact. When the coolers were received by the laboratory, the sample custodian(s) opened and inspected the shipments for damage, custody inconsistencies and proper preservation. The chain of custody forms documenting receipt are presented in the chain of custody section. Each sample was assigned a unique laboratory number and a custody file created. The samples were placed in a secured walk-in cooler and signed in and out by the chemists performing the tests. The sign out record, or lab chronicle, is presented in the chain of custody section.

Discrepancies noted upon receipt are documented on the case file form included in the chain of custody section. The cooler temperature upon receipt was 5°C.

This report contains the metals and cyanide analysis for Equipment Blank 4 that was cancelled on March 3, 1998 by Mr. Steve Anagnost of O'Brien & Gere Engineers, Inc. The metals and cyanide analyses were re-requested by Ms. Jen Smith of O'Brien & Gere Engineers, Inc. on March 25, 1998. The mercury and cyanide analyses were requested outside the prescribed holding time.

METHODOLOGY

The following methods were used to perform the analyses:

PARAMETER	METHOD	REFERENCE
ICP Metals	6010A	1
Mercury	7470A	1
Cyanide	9010A	1

1) Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update II, January 1995.
or
1) Test Methods for Evaluating Solid Wastes, SW-846 Third Edition, Final Update III, December 1996.

QUALITY CONTROL

The quality control for this program includes field blank, laboratory control sample (LCS) and prep blank samples. QA/QC results are summarized in the Sample Data Summary Package and are also included in the raw data.

Trace Metals

Holding Times

Mercury was analyzed outside of the method prescribed holding time due to analysis being requested after the holding had expired.

Laboratory Control Sample

The following analytes did not meet laboratory control sample recovery criteria:

LCS No.	Analyte	Corrective Action
L032698W1	Antimony	1

1. The LCS failed high and the compound was not detected in the associated sample. No corrective action was taken.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

Miscellaneous
The following analytes were detected in the following equipment blank:

Sample Description	Sample #	Analyte	Conc.	Corrective Action
Equipment Blank #4	H3271	Calcium	0.3 mg/L	1

1. The concentration was confirmed by an undigested analysis. No further corrective action was taken.

Wet Chemistry

Holding Times
Cyanide was analyzed outside of the method prescribed holding time due to analysis being requested after the holding time had expired.

Laboratory Control Sample
All spike recoveries met method and/or project specified QC criteria.

Calibrations
All calibrations and calibration verifications met method and/or project specific QC criteria.

Preparation Blanks
All preparation blanks met method and/or project specific QC criteria.

RAW DATA

The raw data is organized in a format similar to the US EPA Contract Laboratory Program order of data requirements.

CROSS REFERENCE TABLE

Site	Sample Number	Date Collected	Date Received	Package
Equipment Blank #4	H3281	02/25/98	02/26/98	7139

The following validated analytical data packages are separately bound:

Volume 1 of 3	**Laboratory report - water samples (pesticides/PCBs, metals, mercury, cyanide)**
Volume 1 of 3	**Laboratory report - water samples (VOCs, SVOCs)**
Volume 1 of 1	**Laboratory report - water samples Addendum (pesticides/PCBs)**
Volume 1 of 1	**Laboratory report - water samples (equipment blank) (metals, mercury, cyanide)**