APPENDIX G

Summary of Quality Assurance Crosscheck Analyses

TABLE G-1
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 22, March 2010

Analyte	*Matrix*	*Units*	*Reported Value*	*Reference Value*	*Acceptance Range*	*Accept?*[b]	*Analyzed by:*
MAPEP - 10 - GrF22, Air Filter - Gross Alpha/Beta							
Gross alpha	Air Filter	Bq/sample	0.189	0.427	>0.0–0.854	Yes	ELAB
Gross beta	Air Filter	Bq/sample	1.35	1.29	0.65–1.94	Yes	ELAB
MAPEP - 10 - RdF22, Air Filter - Radiological							
Am-241	Air Filter	Bq/sample	0.2637	0.146	0.102–0.190	No	GEL
Cs-137	Air Filter	Bq/sample	3.070	1.53	1.07–1.99	No	GEL
Co-60	Air Filter	Bq/sample	5.187	2.473	1.731–3.215	No	GEL
Pu-238	Air Filter	Bq/sample	0.010	0.0010	[c]	Yes	GEL
Pu-239/240	Air Filter	Bq/sample	0.164	0.0832	0.0582–0.1082	No	GEL
Sr-90	Air Filter	Bq/sample	-0.004	[d]	[d]	Yes	GEL
U-233/234	Air Filter	Bq/sample	0.137	0.068	0.048–0.088	No	GEL
U-238	Air Filter	Bq/sample	0.147	0.071	0.050–0.092	No	GEL
MAPEP - 10 - GrW22, Water - Gross Alpha/Beta							
Gross alpha	Water	Bq/L	0.516	0.676	>0.0–1.352	Yes	ELAB
Gross beta	Water	Bq/L	3.16	3.09	1.55–4.64	Yes	ELAB
Gross alpha	Water	Bq/L	0.559	0.676	>0.0–1.352	Yes	GEL
Gross beta	Water	Bq/L	3.110	3.09	1.55–4.64	Yes	GEL
MAPEP - 10 - MaW22, Water - Radiological							
Cs-137	Water	Bq/L	60.1	60.6	42.4–78.8	Yes	ELAB
Co-60	Water	Bq/L	-0.0394	[d]	[d]	Yes	ELAB
H-3	Water	Bq/L	98.4	90.8	63.6–118.0	Yes	ELAB
Sr-90	Water	Bq/L	0.129	[d]	[d]	Yes	ELAB
Am-241	Water	Bq/L	1.0323	1.30	0.91–1.69	Pass	GEL
Cs-137	Water	Bq/L	63.1	60.6	42.4–78.8	Yes	GEL
Co-60	Water	Bq/L	-0.021	[d]	[d]	Yes	GEL
H-3	Water	Bq/L	107	90.8	63.6–118.0	Yes	GEL
Pu-238	Water	Bq/L	1.213	1.93	1.35–2.51	No	GEL
Pu-239/240	Water	Bq/L	0.026	0.009	[d]	Yes	GEL
Sr-90	Water	Bq/L	-0.01	[d]	[d]	Yes	GEL
Tc-99	Water	Bq/L	-0.4	[d]	[d]	Yes	GEL
U-233/234	Water	Bq/L	1.163	1.22	0.85–1.59	Yes	GEL
U-238	Water	Bq/L	1.223	1.25	0.88–1.63	Yes	GEL

ELAB - WVDP Environmental Laboratory
GEL - GEL Laboratories, LLC
Note: This report includes only those matrix/analyte combinations performed in support of the analysis of environmental samples collected as part of the WVDP monitoring program or special investigations.
[a] MAPEP monitors performance and requests corrective action as required.
[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.
[c] Not detected, reported as a statistically zero result.
[d] Although no actual value or acceptance range was provided, the results were assessed by MAPEP as acceptable.

TABLE G-1 *(continued)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 22, March 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP - 10 - MaW22, Water - Inorganic							
Antimony	Water	mg/L	0.903	0.8711	0.6098–1.1324	Yes	GEL
Arsenic	Water	mg/L	<0.030	<0.01	[c]	Yes	GEL
Barium	Water	mg/L	3.65	3.6278	2.5395–4.7161	Yes	GEL
Beryllium	Water	mg/L	0.127	0.1243	0.0870–0.1616	Yes	GEL
Cadmium	Water	mg/L	0.628	0.6281	0.4397–0.8165	Yes	GEL
Chromium	Water	mg/L	0.813	0.7920	0.5544–1.0296	Yes	GEL
Cobalt	Water	mg/L	1.96	1.8546	1.2982–2.4110	Yes	GEL
Copper	Water	mg/L	3.28	3.1509	2.2056–4.0962	Yes	GEL
Lead	Water	mg/L	2.87	2.8511	1.9958–3.7064	Yes	GEL
Nickel	Water	mg/L	<0.005	<0.01	[d]	Yes	GEL
Selenium	Water	mg/L	0.568	0.5881	0.4117–0.7645	Yes	GEL
Thallium	Water	mg/L	4.45	4.3639	3.0547–5.6731	Yes	GEL
Uranium - total	Water	mg/L	0.107	0.101	0.071–0.131	Yes	GEL
Vanadium	Water	mg/L	<0.005	<0.01	[d]	Yes	GEL
Zinc	Water	mg/L	4.27	4.3366	3.0356–5.6376	Yes	GEL
MAPEP - 10 - MaS22, Soil - Inorganic							
Antimony	Soil	mg/kg	<1.0	<1.0	[d]	Yes	GEL
Arsenic	Soil	mg/kg	83.9	79.51	55.66–103.36	Yes	GEL
Barium	Soil	mg/kg	171	180.95	126.67–235.24	Yes	GEL
Beryllium	Soil	mg/kg	50.1	51.36	35.95–66.77	Yes	GEL
Cadmium	Soil	mg/kg	6.43	7.11	4.98–9.24	Yes	GEL
Chromium	Soil	mg/kg	57.2	61.89	43.32–80.46	Yes	GEL
Cobalt	Soil	mg/kg	76.0	89.7	62.8–116.6	Yes	GEL
Copper	Soil	mg/kg	125	116.05	81.24–150.87	Yes	GEL
Lead	Soil	mg/kg	42.6	40.05	28.04–52.07	Yes	GEL
Mercury	Soil	mg/kg	0.653	0.6243	0.4370–0.8116	Yes	GEL
Nickel	Soil	mg/kg	140	164.3	115.0–213.6	Yes	GEL
Selenium	Soil	mg/kg	6.42	6.15	4.31–8.00	Yes	GEL
Silver	Soil	mg/kg	48.3	45.19	31.63–58.75	Yes	GEL
Thallium	Soil	mg/kg	163	200.15	140.11–260.20	Yes	GEL
Uranium - total	Soil	mg/kg	3.60	5.1	3.6–6.6	Pass	GEL
Vanadium	Soil	mg/kg	116	113.43	79.40–147.46	Yes	GEL
Zinc	Soil	mg/kg	174	162.76	113.93–211.59	Yes	GEL

GEL - GEL Laboratories, LLC

Note: This report includes only those matrix/analyte combinations performed in support of the analysis of environmental samples collected as part of the WVDP monitoring program or special investigations.

[a] MAPEP monitors performance and requests corrective action as required.

[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.

[c] The detection limit is greater than the CLP limit.

[d] Although no actual value or acceptance range was provided, the results were assessed by MAPEP as acceptable.

TABLE G-1 *(continued)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 22, March 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP - 10 - MaS22, Soil - Radiological							
Am-241	Soil	Bq/kg	0.07	[c]	[c]	Yes	GEL
Cs-137	Soil	Bq/kg	831.7	779	545–1013	Yes	GEL
Co-60	Soil	Bq/kg	670.3	622	435–809	Yes	GEL
Pu-238	Soil	Bq/kg	17.9	24.1	16.9–31.3	Pass	GEL
Pu-239/240	Soil	Bq/kg	0.21	[c]	[c]	Yes	GEL
K-40	Soil	Bq/kg	638.7	559	391–727	Yes	GEL
Sr-90	Soil	Bq/kg	261.0	288	202–374	Yes	GEL
Tc-99	Soil	Bq/kg	-3.0	[c]	[c]	Yes	GEL
U-233/234	Soil	Bq/kg	65.27	60	42–78	Yes	GEL
U-238	Soil	Bq/kg	70.23	64	45–83	Yes	GEL
MAPEP - 10 - RdV22, Vegetation - Radiological							
Am-241	Veg	Bq/sample	0.179	0.225	0.158–0.293	Pass	GEL
Cs-137	Veg	Bq/sample	2.185	3.06	2.14–3.98	Pass	GEL
Co-60	Veg	Bq/sample	3.076	3.27	2.29–4.25	Yes	GEL
Pu-238	Veg	Bq/sample	0.149	0.160	0.112–0.208	Yes	GEL
Pu-239/240	Veg	Bq/sample	0.0026	0.0008	[d]	Yes	GEL
Sr-90	Veg	Bq/sample	0.033	[c]	[c]	Yes	GEL
U-233/234	Veg	Bq/sample	0.184	0.216	0.151–0.281	Yes	GEL
U-238	Veg	Bq/sample	0.184	0.223	0.156–0.290	Yes	GEL
MAPEP - 10 - OrW22, Water - Organic Compounds							
Heptachlor	Water	µg/L	5.33	10.16	3.91–16.40	Yes	GEL
1,2,4-Trichlorobenzene	Water	µg/L	26.9	42.51	11.89–73.13	Yes	GEL
1,2-Dichlorobenzene	Water	µg/L	44.1	54.26	9.46–99.07	Yes	GEL
1,3-Dichlorobenzene	Water	µg/L	29.5	38.15	7.57–68.73	Yes	GEL
1,4-Dichlorobenzene	Water	µg/L	16.5	22.33	3.24–43.22	Yes	GEL
2,4,5-Trichlorophenol	Water	µg/L	88.2	108.01	46.65–169.38	Yes	GEL
2,4,6-Trichlorophenol	Water	µg/L	40.1	51.94	20.57–83.31	Yes	GEL
2,4-Dichlorophenol	Water	µg/L	62.8	73.46	29.85–117.07	Yes	GEL
2,4-Dimethylphenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
2,4-Dinitrophenol	Water	µg/L	112	133.36	19.87–260.12	Yes	GEL
2,4-Dinitrotoluene	Water	µg/L	74.9	90.74	42.14–139.34	Yes	GEL
2,6-Dichlorophenol	Water	µg/L	106	129.71	57.21–202.21	Yes	GEL
2,6-Dinitrotoluene	Water	µg/L	63.0	80.34	39.80–120.88	Yes	GEL
2-Chloronaphthalene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
2-Chlorophenol	Water	µg/L	48.9	54.00	20.96–87.03	Yes	GEL
2-Methylnaphthalene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL

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Note: This report includes only those matrix/analyte combinations performed in support of the analysis of environmental samples collected as part of the WVDP monitoring program or special investigations.

[a] MAPEP monitors performance and requests corrective action as required.

[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.

[c] Although no actual value or acceptance range was provided, the results were assessed by MAPEP as acceptable.

[d] Not detected, reported as a statistically zero result.

TABLE G-1 *(concluded)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 22, March 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP - 10 - OrW22, Water - Organic Compounds							
2-Methylphenol	Water	µg/L	42.5	50.91	13.37–88.45	Yes	GEL
2-Nitrophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
3 Methyl and 4-Methylphenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4,6-Dinitro-2-methylphenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4-Bromophenyl-phenylether	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4-Chloro-3-methylphenol	Water	µg/L	112	133.48	62.68–204.28	Yes	GEL
4-Chlorophenyl-phenylether	Water	µg/L	35.4	53.56	24.71–82.42	Yes	GEL
4-Nitrophenol	Water	µg/L	49.8	89.51	16.19–217.29	Yes	GEL
Acenaphthene	Water	µg/L	12.8	21.80	11.45–32.15	Yes	GEL
Acenaphthylene	Water	µg/L	19.2	29.25	13.49–45.01	Yes	GEL
Anthracene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Benzo(a)anthracene	Water	µg/L	12.2	19.30	9.61–28.99	Yes	GEL
Benzo(a)pyrene	Water	µg/L	24.6	39.45	14.91–63.98	Yes	GEL
Benzo(b)fluoranthene	Water	µg/L	16.3	28.24	11.00–45.48	Yes	GEL
Benzo(g,h,i)perylene	Water	µg/L	23.1	32.86	11.10–54.62	Yes	GEL
Benzo(k)fluoranthene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
bis(2-chloroethoxy)methane	Water	µg/L	39.8	47.79	23.48–72.10	Yes	GEL
bis(2-chloroethyl)ether	Water	µg/L	102	119.39	42.89–195.88	Yes	GEL
bis(2-chloroisopropyl)ether	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Bis(2-ethylhexyl)phthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Butylbenzylphthalate	Water	µg/L	43.4	43.72	5.56–81.87	Yes	GEL
Chrysene	Water	µg/L	13.4	20.84	9.80–31.87	Yes	GEL
Di-n-butylphthalate	Water	µg/L	48.7	58.30	23.24–93.37	Yes	GEL
Di-n-octylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Dibenzo(a,h)anthracene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Dibenzofuran	Water	µg/L	49.1	64.36	28.37–100.35	Yes	GEL
Diethylphthalate	Water	µg/L	86.7	97.79	23.48–172.09	Yes	GEL
Dimethylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Fluoranthene	Water	µg/L	45.0	[c]	[c]	No	GEL
Fluorene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Hexachlorobenzene	Water	µg/L	23.9	38.34	18.95–57.72	Yes	GEL
Hexachlorobutadiene	Water	µg/L	56.1	77.48	14.05–140.91	Yes	GEL
Hexachlorocyclopentadiene	Water	µg/L	83.8	80.85	13.72–178.15	Yes	GEL
Hexachloroethane	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Indeno(1,2,3-c,d)pyrene	Water	µg/L	15.9	21.85	3.27–40.42	Yes	GEL
Isophorone	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Napthalene	Water	µg/L	33.2	43.99	16.91–71.07	Yes	GEL
Nitrobenzene	Water	µg/L	58.1	69.76	28.54–110.97	Yes	GEL
Pentachlorophenol	Water	µg/L	39.3	42.10	10.60–73.60	Yes	GEL
Phenanthrene	Water	µg/L	37.7	50.55	28.18–72.91	Yes	GEL
Phenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Pyrene	Water	µg/L	43.7	59.63	22.88–96.37	Yes	GEL

GEL - GEL Laboratories, LLC

[a] MAPEP monitors performance and requests corrective action as required.

[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.

[c] Although no actual value or acceptable range was provided, the results were assessed by MAPEP as acceptable.

TABLE G-2
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 23, September 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP – 10 – GrF23, Air Filter – Gross Alpha/Beta							
Gross Alpha	Air Filter	Bq/sample	-0.000817	[c]	[c]	Yes	ELAB
Gross Beta	Air Filter	Bq/sample	0.515	0.50	0.25–0.75	Yes	ELAB
MAPEP – 10 – RdF23, Air Filter – Radiological							
Am–241	Air Filter	Bq/sample	0.0917	0.115	0.081–0.150	Pass	GEL
Cs–137	Air Filter	Bq/sample	-0.019	[c]	[c]	Yes	GEL
Co–60	Air Filter	Bq/sample	2.97	2.92	2.04–3.80	Yes	GEL
Pu–238	Air Filter	Bq/sample	0.049	0.0489	0.0342–0.0636	Yes	GEL
Pu–239/240	Air Filter	Bq/sample	0.076	0.082	0.057–0.107	Yes	GEL
Sr–90	Air Filter	Bq/sample	0.854	1.01	0.71–1.31	Yes	GEL
U–233/234	Air Filter	Bq/sample	0.124	0.122	0.085–0.159	Yes	GEL
U–238	Air Filter	Bq/sample	0.122	0.127	0.089–0.165	Yes	GEL
MAPEP – 10 – GrW23, Water – Gross Alpha/Beta							
Gross Alpha	Water	Bq/L	1.34	1.92	0.58–3.26	Yes	ELAB
Gross Beta	Water	Bq/L	4.37	4.39	2.20–6.59	Yes	ELAB
Gross Alpha	Water	Bq/L	1.67	1.92	0.58–3.26	Yes	GEL
Gross Beta	Water	Bq/L	4.407	4.39	2.20–6.59	Yes	GEL
MAPEP – 10 – MaW23, Water – Radiological							
Cs–137	Water	Bq/L	44.2	44.2	30.9–57–5	Yes	ELAB
Co–60	Water	Bq/L	28.1	28.3	19.8–36.8	Yes	ELAB
H–3	Water	Bq/L	456	453.4	317.4–589.4	Yes	ELAB
Sr–90	Water	Bq/L	10.0	8.3	5.8–10.8	Pass	ELAB
Am–241	Water	Bq/L	0.0004	[c]	[c]	Yes	GEL
Cs–137	Water	Bq/L	45.5	44.2	30.9–57.5	Yes	GEL
Co–60	Water	Bq/L	29.10	28.3	19.8–36.8	Yes	GEL
H–3	Water	Bq/L	429.3	453.4	317.4–589.4	Yes	GEL
Pu–238	Water	Bq/L	0.866	1.81	1.27–2.35	No	GEL
Pu–239/240	Water	Bq/L	1.220	1.35	0.95–1.76	Yes	GEL
Sr–90	Water	Bq/L	7.03	8.3	5.8–10.8	Yes	GEL
Tc–99	Water	Bq/L	33.3	33.6	23.5–43.7	Yes	GEL
U–233/234	Water	Bq/L	1.937	2.01	1.41–2.61	Yes	GEL
U–238	Water	Bq/L	2.043	2.07	1.45–2.69	Yes	GEL

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Note: This report includes only those matrix/analyte combinations performed in support of the analysis of environmental samples collected as part of the WVDP monitoring program or special investigations.
[a] MAPEP monitors performance and requests corrective action as required.
[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.
[c] Although no actual value or acceptable range was provided, the results were assessed by MAPEP as acceptable.

TABLE G-2 *(continued)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 23, September 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP – 10 – MaW23, Water – Inorganic							
Antimony	Water	mg/L	1.51	1.359	0.951–1.767	Yes	GEL
Arsenic	Water	mg/L	2.19	1.969	1.378–2.560	Yes	GEL
Barium	Water	mg/L	2.35	2.260	1.582–2.938	Yes	GEL
Beryllium	Water	mg/L	<0.001	<0.005	[c]	Yes	GEL
Cadmium	Water	mg/L	0.285	0.2731	0.1912–0.3550	Yes	GEL
Chromium	Water	mg/L	1.85	1.74	1.22–2.26	Yes	GEL
Cobalt	Water	mg/L	<0.005	<0.025	[c]	Yes	GEL
Copper	Water	mg/L	1.46	1.298	0.909–1.687	Yes	GEL
Lead	Water	mg/L	<0.01	<0.010	[c]	Yes	GEL
Mercury	Water	mg/L	<0.0002	<0.0002	[c]	Yes	GEL
Nickel	Water	mg/L	7.57	7.37	5.16–9.58	Yes	GEL
Selenium	Water	mg/L	0.227	0.2280	0.1596–0.2964	Yes	GEL
Thallium	Water	mg/L	1.95	1.915	1.341–2.490	Yes	GEL
Uranium – total	Water	mg/L	0.189	0.168	0.118–0.218	Yes	GEL
Vanadium	Water	mg/L	7.36	6.71	4.70–8.72	Yes	GEL
Zinc	Water	mg/L	4.12	3.92	2.74–5.10	Yes	GEL
MAPEP – 10 – MaS23, Soil – Inorganic							
Antimony	Soil	mg/kg	5.98	[d]	[d]	Yes	GEL
Arsenic	Soil	mg/kg	30.6	26.8	18.8–34.8	Yes	GEL
Barium	Soil	mg/kg	323	336	235–437	Yes	GEL
Beryllium	Soil	mg/kg	52.6	57.0	39.9–74.1	Yes	GEL
Cadmium	Soil	mg/kg	15.8	17.41	12.19–22.63	Yes	GEL
Chromium	Soil	mg/kg	56.6	65.4	45.8–85.0	Yes	GEL
Cobalt	Soil	mg/kg	96.4	107.4	75.2–139.6	Yes	GEL
Copper	Soil	mg/kg	88.1	82.9	58.0–107.8	Yes	GEL
Lead	Soil	mg/kg	67.0	66.0	46.2–85.8	Yes	GEL
Mercury	Soil	mg/kg	0.103	0.0965	0.676–0.1255	Yes	GEL
Nickel	Soil	mg/kg	102	116.4	81.5–151.3	Yes	GEL
Selenium	Soil	mg/kg	16	18.26	12.78–23.74	Yes	GEL
Silver	Soil	mg/kg	64.2	62.0	43.4–80.6	Yes	GEL
Thallium	Soil	mg/kg	80	90.6	63.4–117.8	Yes	GEL
Uranium – total	Soil	mg/kg	20.143	23.4	16.4–30.4	Yes	GEL
Vanadium	Soil	mg/kg	89.5	91.1	63.8–118.4	Yes	GEL
Zinc	Soil	mg/kg	199	207	145–269	Yes	GEL

GEL - GEL Laboratories, LLC
[a] MAPEP monitors performance and requests corrective action as required.
[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.
[c] Although no actual value or acceptable range was provided, the results were assessed by MAPEP as acceptable.
[d] Analyte was not evaluated by MAPEP.

TABLE G-2 *(continued)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 23, September 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP – 10 – MaS23, Soil – Radiological							
Am–241	Soil	Bq/kg	63.27	87	61–113	Pass	GEL
Cs–137	Soil	Bq/kg	685	670	469–871	Yes	GEL
Co–60	Soil	Bq/kg	360	343	240–446	Yes	GEL
Pu–238	Soil	Bq/kg	12.4	64	45–83	No	GEL
Pu–239/240	Soil	Bq/kg	21.87	71	50–92	No	GEL
K–40	Soil	Bq/kg	774	699	489–909	Yes	GEL
Sr–90	Soil	Bq/kg	4.6	[c]	[c]	Yes	GEL
Tc–99	Soil	Bq/kg	272.3	325	228–423	Yes	GEL
U–233/234	Soil	Bq/kg	266.33	278	195–361	Yes	GEL
U–238	Soil	Bq/kg	275.33	289	202–376	Yes	GEL
MAPEP – 10 – RdV23, Vegetation – Radiological							
Am–241	Veg	Bq/sample	0.210	0.270	0.189–0.351	Pass	GEL
Cs–137	Veg	Bq/sample	4.759	5.88	4.12–7.64	Yes	GEL
Co–60	Veg	Bq/sample	-0.019	[c]	[c]	Yes	GEL
Pu–238	Veg	Bq/sample	0.258	0.221	0.155–0.287	Yes	GEL
Pu–239/240	Veg	Bq/sample	0.0068	0.0010	[d]	Yes	GEL
Sr–90	Veg	Bq/sample	2.790	2.63	1.84–3.42	Yes	GEL
U–233/234	Veg	Bq/sample	0.392	0.320	0.224–0.416	Pass	GEL
U–238	Veg	Bq/sample	0.405	0.330	0.231–0.429	Pass	GEL
MAPEP – 10 – OrW23, Water – Organic Compounds							
Heptachlor	Water	µg/L	<0.02	[c]	[c]	Yes	GEL
1,2,4–Trichlorobenzene	Water	µg/L	28.8	31.58	8.02–55.15	Yes	GEL
1,2–Dichlorobenzene	Water	µg/L	78.7	91.30	17.94–164.66	Yes	GEL
1,3–Dichlorobenzene	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
1,4–Dichlorobenzene	Water	µg/L	45.2	55.06	8.49–102.60	Yes	GEL
2,4,5–Trichlorophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
2,4,6–Trichlorophenol	Water	µg/L	98.7	84.65	34.28–135.01	Yes	GEL
2,4–Dichlorophenol	Water	µg/L	43.2	37.60	13.64–61.56	Yes	GEL
2,4–Dimethylphenol	Water	µg/L	53.3	47.42	11.62–83.21	Yes	GEL
2,4–Dinitrophenol	Water	µg/L	<18.9	[c]	[c]	Yes	GEL
2,4–Dinitrotoluene	Water	µg/L	48.7	44.65	19.01–70.28	Yes	GEL
2,6–Dichlorophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
2,6–Dinitrotoluene	Water	µg/L	102	104.23	52.11–156.35	Yes	GEL
2–Chloronaphthalene	Water	µg/L	22.5	23.49	8.72–38.26	Yes	GEL
2–Chlorophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
2–Methylnaphthalene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL

GEL - GEL Laboratories, LLC
[a] MAPEP monitors performance and requests corrective action as required.
[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.
[c] Although no actual value or acceptable range was provided, the results were assessed by MAPEP as acceptable.
[d] Not detected, reported as a statistically zero result.

TABLE G-2 *(concluded)*
Crosscheck Sample Comparisons From the DOE Mixed Analyte Performance Evaluation Program (MAPEP)[a]; Study 23, September 2010

Analyte	Matrix	Units	Reported Value	Reference Value	Acceptance Range	Accept?[b]	Analyzed by:
MAPEP – 10 – OrW23, Water – Organic Compounds							
2–Methylphenol	Water	µg/L	36.6	39.01	10.18–67.84	Yes	GEL
2–Nitrophenol	Water	µg/L	110	91.31	28.59–154.03	Yes	GEL
3 Methyl and 4–Methylphenol	Water	µg/L	86.8	81.56	12.15–157.11	Yes	GEL
4,6–Dinitro–2–methylphenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4–Bromophenyl–phenylether	Water	µg/L	73.1	80.75	31.72–129.79	Yes	GEL
4–Chloro–3–methylphenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4–Chlorophenyl–phenylether	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
4–Nitrophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Acenaphthene	Water	µg/L	18.3	21.70	11.40–32.00	Yes	GEL
Acenaphthylene	Water	µg/L	18.7	19.52	8.51–30.53	Yes	GEL
Anthracene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Benzo(a)anthracene	Water	µg/L	16.5	14.85	7.21–22.48	Yes	GEL
Benzo(a)pyrene	Water	µg/L	22.0	20.07	7.49–32.66	Yes	GEL
Benzo(b)fluoranthene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Benzo(g,h,i)perylene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Benzo(k)fluoranthene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
bis(2–chloroethoxy)methane	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
bis(2–chloroethyl)ether	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
bis(2–chloroisopropyl)ether	Water	µg/L	155	137.69	45.31–230.07	Yes	GEL
Bis(2–ethylhexyl)phthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Butylbenzylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Chrysene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Di–n–butylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Di–n–octylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Dibenzo(a,h)anthracene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Dibenzofuran	Water	µg/L	53.3	54.65	24.13–85.17	Yes	GEL
Diethylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Dimethylphthalate	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Fluoranthene	Water	µg/L	102	106.72	57.48–155.97	Yes	GEL
Fluorene	Water	µg/L	83.2	87.74	47.11–128.36	Yes	GEL
Hexachlorobenzene	Water	µg/L	21.2	28.03	13.30–42.76	Yes	GEL
Hexachlorobutadiene	Water	µg/L	86.2	108.93	21.25–196.62	Yes	GEL
Hexachlorocyclopentadiene	Water	µg/L	103	107.07	17.94–230.30	Yes	GEL
Hexachloroethane	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Indeno(1,2,3–c,d)pyrene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Isophorone	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Napthalene	Water	µg/L	<0.943	[c]	[c]	Yes	GEL
Nitrobenzene	Water	µg/L	128	105.23	42.91–167.55	Yes	GEL
Pentachlorophenol	Water	µg/L	<9.43	[c]	[c]	Yes	GEL
Phenanthrene	Water	µg/L	26.3	29.61	16.66–42.55	Yes	GEL
Phenol	Water	µg/L	36.4	62.59	11.13–150.16	Yes	GEL
Pyrene	Water	µg/L	42.8	46.78	17.61–75.95	Yes	GEL

GEL - GEL Laboratories, LLC

[a] MAPEP monitors performance and requests corrective action as required.

[b] "Yes" - Result acceptable; "Pass" - Result acceptable with warning; "No" - Result not acceptable.

[c] Although no actual value or acceptable range was provided, the results were assessed by MAPEP as acceptable.

TABLE G-3
Comparisons of Results From Crosscheck Samples Analyzed for Water Quality Parameters as Part of the EPA's 2010 Discharge Monitoring Report - Quality Assurance (DMR-QA) Study 30 (August 2010) for the National Pollutant Discharge Elimination System (NPDES)

Analyte	Units	Reported Value	Reference Value	Acceptance Range [a]	Accept? [b]	Analyzed by:
Aluminum	µg/L	988	915	734–1090	Yes	TestAmerica
Ammonia (as N)	mg/L	8.71	10.6	7.86–13.2	Yes	TestAmerica
Antimony	µg/L	295	283	192–343	Yes	TestAmerica
Arsenic	µg/L	460	445	372–522	Yes	TestAmerica
Barium	µg/L	1,730	1,650	1,430–1,860	Yes	TestAmerica
Biochemical oxygen demand	mg/L	25.9	28.0	13.9–42.2	Yes	TestAmerica
Cadmium	µg/L	268	258	220–294	Yes	TestAmerica
Chlorine (total residual)	µg/L	190	173	113–233	Yes	WWTF
Chromium (total)	µg/L	740	718	626–811	Yes	TestAmerica
Chromium (hexavalent)	µg/L	422	472	384–556	Yes	TestAmerica
Cobalt	µg/L	276	268	235–301	Yes	TestAmerica
Copper	µg/L	341	348	314–384	Yes	TestAmerica
Cyanide, total	mg/L	0.377	0.340	0.179–0.508	Yes	TestAmerica
Iron	µg/L	2,150	2,050	1,820–2,310	Yes	TestAmerica
Lead	µg/L	1,730	1,680	1,480–1,880	Yes	TestAmerica
Manganese	µg/L	360	344	308–383	Yes	TestAmerica
Mercury	µg/L	3.64	3.74	2.32–5.19	Yes	GEL
Nickel	µg/L	876	844	759–943	Yes	TestAmerica
Nitrate (as N)	mg/L	10.8	10.9	8.47–13.1	Yes	TestAmerica
Nitrite (as N)	mg/L	0.970	0.955	0.763–1.14	Yes	TestAmerica
Oil & Grease (Gravimetric)	mg/L	65.9	80.0	55.5–94.1	Yes	TestAmerica
pH	SU	6.38	6.30	6.10–6.50	Yes	ELAB
Phosphorus (total, as P)	mg/L	7.06	6.79	5.60–8.04	Yes	TestAmerica
Selenium	µg/L	332	323	254–375	Yes	TestAmerica
Silver	µg/L	235	228	196–262	Yes	TestAmerica
Sulfate	mg/L	92.4	90.0	74.6–103	Yes	TestAmerica
Settleable solids	mL/L	23.0	18.5	14.1–24.0	Yes	WWTF
Suspended solids (total)	mg/L	32.4	40.4	30.3–47.0	Yes	TestAmerica
Total dissolved solids	mg/L	302	298	224–372	Yes	ELAB
Total Kjeldahl nitrogen (as N)	mg/L	20.9	25.7	17.0–33.1	Yes	TestAmerica
Vanadium	µg/L	525	506	443–566	Yes	TestAmerica
Zinc	µg/L	1,500	1,430	1,230–1,640	Yes	TestAmerica

ELAB - WVDP Environmental Laboratory
GEL - GEL Laboratories, LLC
TestAmerica - TestAmerica Laboratories, Inc., Buffalo
WWTF - WVDP Wastewater Treatment Facility Laboratory
Note: Samples provided by National Environmental Laboratory Accreditation Conference (NELAC)-accredited providers.
[a] Acceptance limits are determined by NELAC-accredited providers.
[b] "Yes" - Result acceptable; "Pass" - Result acceptable but outside warning limits; "No" - Result not acceptable.

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