



Maria:

I am attaching some draft tables of groundwater data related to the ash pond investigations. Comparing the data to the 620 standards is fairly simple, and any exceedances of these standards have been noted in the tables. The non-degradation standards are harder to pin down. In general, we have upgradient and downgradient wells at each site, and in theory all we need to do is compare them to each other. But the details are trickier. For example, should we average the upgradient well data, and compare the downgradient data well-by-well, or on a UCL basis? Should only upgradient data over time be averaged (this is what is typically done at landfills)? If so, how can we do this with only one sampling event? To make things worse, the term "upgradient" isn't always clear. At Will County, for example, there is strong hydraulic evidence to suggest that *everything* is downgradient, that the ponds may be draining in multiple directions towards either the river or the canal. Comparisons there will take some thought. At Powerton, there are fairly clear gradients, but they are not all in the same direction well-to-well, and may even change seasonally over time (we have only included the ash pond investigation wells for analysis here; the wells sampled for the metal cleaning pond issue had separate analytical protocols).

The bottom line is, we will need to be somewhat thoughtful in putting together the reports for each of these sites, especially with respect to the non-degradation standard. We want to maintain as much flexibility as possible in how we define that standard, so that we can avoid an anomalous exceedance which isn't really statistically valid. The attached tables are by no means what I am recommending for inclusion in the final reports; these are just to identify for you what compounds we have present, and where. We can discuss these issues in more detail later on, and come to a consensus on the best way to present our data to the Illinois EPA.

By the way, our incoming mail server is down at the moment, so if you need to reach me today, give me a call.

Regards,

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MWG13-15_14096

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Will County Groundwater analytical table 121310.xlsx



Waukegan Groundwater analytical table 102510.xlsx



Powerton Groundwater Analytical Table 121510.xlsx



Joliet 29 Groundwater analytical table 120710.xlsx



Crawford Groundwater analytical table 120810.xlsx

Table 1
 GROUNDWATER ANALYTICAL RESULTS
 Will County, Illinois
 Midwest Generation
 21053.070
 Dec. 13 2010

Chemical Name	Sample Analysis Method	Groundwater Quality Standard (mg/L) Class 1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
			mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10	mg/L 12/13/10
Antimony	Metals 6020	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Arsenic	Metals 6020	0.05	ND	0.0052	0.002	0.0027	0.0066	0.0018	0.004	0.0067	0.0059	0.0041
Barium	Metals 6020	2.0	0.05	0.061	0.084	0.068	0.051	0.05	0.045	0.069	0.025	0.098
Beryllium	Metals 6020	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	Metals 6020	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	Metals 6020	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	Metals 6020	1.0	0.0011	ND	ND	0.0011	ND	ND	ND	ND	ND	ND
Copper	Metals 6020	0.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyanide	Dissolved 9014	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	Metals 6020	5.0	ND	ND	0.37	0.83	ND	ND	0.23	0.48	ND	0.32
Lead	Metals 6020	0.0075	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	Metals 6020	0.15	0.2	0.032	0.34	0.52	0.0079	0.073	0.12	0.33	ND	0.25
Mercury	Mercury 7470A	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	Metals 6020	0.1	0.0046	ND	0.0054	0.0048	ND	ND	0.0029	ND	ND	ND
Selenium	Metals 6020	0.05	ND	ND	ND	ND	0.017	0.0062	ND	ND	0.0036	ND
Silver	Metals 6020	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	Metals 6020	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	Metals 6020	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	Metals 6020	2	1.8	1.8	2.7	3.7	2.6	2.7	4.7	1.7	2.2	2.1
Sulfate	Dissolved 9038	400	530	430	330	1500	580	500	610	440	100	92
Chloride	Dissolved 9251	200	110	110	54	120	110	120	160	93	100	92
Nitrogen/Nitrate	Nitrogen By calc	10	ND	ND	ND	ND	0.27	ND	ND	ND	ND	ND
Total Dissolved Solids	Dissolved 2540C	1,200	1100	870	940	2500	1000	990	1300	930	800	990
Fluoride	Dissolved 4500 FC	4	0.71	0.62	0.5	0.52	0.41	0.85	0.96	0.61	0.33	0.66
Nitrogen/Nitrite	Dissolved 4500 NO2	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen/Nitrate/Nitrite	Dissolved 4500 NO3	NA	ND	ND	ND	ND	0.27	ND	ND	ND	0.44	ND

Notes:

Class 1 Groundwater Standards from 35 IAC Part 620

Bold values show exceedences of 35 IAC Part 620

ND-non detect

The groundwater flow direction at this site has yet to be established; no determinations of upgradient vs. downgradient wells can be made at this time

Table 1
GROUNDWATER ANALYTICAL RESULTS
Waukegan Station, Illinois
Midwest Generation
21053.070
Oct. 25 2010

ENGINEERING	Sample Analysis Method	Groundwater Quality Standard* (mg/L)	Upgradient Well		Downgradient Wells		
			MW-5	MW-1	MW-2	MW-3	MW-4
			mg/L	mg/L	mg/L	mg/L	mg/L
Chemical Name	Class	10/25/10	10/25/10	10/25/10	10/25/10	10/25/10	
Antimony	Metals 6020	0.006	ND	0.0052	ND	ND	ND
Arsenic	Metals 6020	0.05	ND	0.054	ND	ND	ND
Barium	Metals 6020	2.0	ND	0.023	ND	ND	ND
Beryllium	Metals 6020	0.004	ND	ND	ND	ND	ND
Cadmium	Metals 6020	0.005	ND	ND	ND	ND	ND
Chromium	Metals 6020	0.1	ND	ND	ND	ND	ND
Cobalt	Metals 6020	1.0	ND	ND	ND	ND	ND
Copper	Metals 6020	0.65	ND	ND	ND	ND	ND
Cyanide	Dissolved 9014	0.2	ND	ND	ND	ND	ND
Iron	Metals 6020	5.0	ND	ND	ND	ND	ND
Lead	Metals 6020	0.0075	ND	ND	ND	ND	ND
Manganese	Metals 6020	0.15	ND	ND	ND	ND	ND
Mercury	Mercury 7470A	0.002	ND	ND	ND	ND	ND
Nickel	Metals 6020	0.1	ND	ND	ND	ND	ND
Selenium	Metals 6020	0.05	ND	0.031	ND	ND	ND
Silver	Metals 6020	0.05	ND	ND	ND	ND	ND
Thallium	Metals 6020	0.002	ND	ND	ND	ND	ND
Zinc	Metals 6020	5.0	ND	ND	ND	ND	ND
Boron	Metals 6020	2	ND	2.6	ND	ND	ND
Sulfate	Dissolved 9038	400	920	350	230	120	250
Chloride	Dissolved 9251	200	100	39	42	53	39
Nitrogen/Nitrate	Nitrogen By calc	10	ND	ND	ND	ND	ND
Total Dissolved Solids	Dissolved 2540C	1,200	1500	460	410	280	430
Fluoride	Dissolved 4500 FC	4	0.29	0.45	0.35	0.27	0.6
Nitrogen/Nitrite	Dissolved 4500 NO2	NA	ND	ND	ND	ND	ND
Nitrogen/Nitrate/Nitrite	Dissolved 4500 NO3	NA	ND	ND	ND	ND	ND

Notes:

*Class 1 Groundwater Standards from 35 IAC Part 620

Bold values show exceedences of 35 IAC Part 620

Shaded values show exceedences of upgradient well results

ND-non detect

Table 1
GROUNDWATER ANALYTICAL RESULTS
 Powerton Station, Illinois
 Midwest Generation
 21053.070
 Dec. 13 2010

ENGINEERING	Sample Analysis Method	Groundwater Quality Standard (mg/L) Class 1	Upgradient Wells				Upgradient Well Results Average mg/L	Downgradient Wells							
			MW-1	MW-9	MW-10	MW-2		MW-3	MW-4	MW-5	MW-6	MW-7	MW-8		
			mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Chemical Name			12/15/10	12/16/10	12/15/10	12/15/10	12/15/10	12/15/10	12/15/10	12/15/10	12/15/10	12/06/10	12/15/10		
Antimony	Metals 6020	0.006	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Arsenic	Metals 6020	0.05	ND	ND	ND	--	0.0018	0.0017	ND	0.0011	0.0042	0.026	0.0052		
Barium	Metals 6020	2.0	0.044	0.038	0.24	0.107	0.042	0.038	0.055	0.053	0.11	0.55	0.11		
Beryllium	Metals 6020	0.004	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Cadmium	Metals 6020	0.005	ND	ND	ND	--	ND	ND	ND	ND	ND	0.0026	ND		
Chromium	Metals 6020	0.1	ND	ND	ND	--	ND	ND	ND	0.0044	0.006	0.0088	ND		
Cobalt	Metals 6020	1.0	ND	ND	0.0026	0.0026	ND	ND	ND	0.0025	ND	0.017	ND		
Copper	Metals 6020	0.65	ND	ND	ND	--	ND	ND	ND	ND	ND	0.14	ND		
Cyanide	Dissolved 9014	0.2	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Iron	Metals 6020	5.0	ND	ND	ND	--	ND	ND	ND	0.013	0.016	0.008	0.056		
Lead	Metals 6020	0.0075	ND	ND	ND	--	ND	ND	ND	ND	ND	0.039	ND		
Manganese	Metals 6020	0.15	ND	0.23	2.1	1.17	ND	0.0047	ND	0.51	0.68	0.35	0.15		
Mercury	Mercury 7470A	0.002	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Nickel	Metals 6020	0.1	0.01	0.01	0.015	0.012	0.0086	0.011	0.012	0.013	0.0091	0.0045	0.011		
Selenium	Metals 6020	0.05	0.0016	0.0024	0.0042	0.0027	0.017	ND	0.0022	0.0019	0.0034	0.0043	0.0036		
Silver	Metals 6020	0.05	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Thallium	Metals 6020	0.002	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Zinc	Metals 6020	5.0	ND	ND	ND	--	ND	ND	ND	ND	0.0064	0.076	ND		
Boron	Metals 6020	2	0.45	2.1	0.48	1.01	0.38	0.75	0.77	0.95	0.005	0.6	0.93		
Sulfate	Dissolved 9038	400	50	110	62	74	52	64	110	160	210	120	160		
Chloride	Dissolved 9251	200	46	25	40	37	45	39	150	150	180	170	180		
Nitrogen/Nitrate	Nitrogen Dy calc	10	7.2	2.9	3	4.37	75	94	0.34	ND	0.037	0.043	ND		
Total Dissolved Solids	Dissolved 2540C	1,200	190	500	530	407	480	480	680	740	950	860	890		
Fluoride	Dissolved 4500 FC	4	0.28	ND	ND	0.28	ND	0.3	0.3	0.27	0.65	0.47	0.77		
Nitrogen/Nitrite	Dissolved 4500 NO2	NA	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		
Nitrogen/Nitrate/Nitrite	Dissolved 4500 NO3	NA	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND		

Notes:
 *Class 1 Groundwater Standards from 35 IAC Part 620
 Bold values show exceedences of 35 IAC Part 620
 Shaded values show exceedences of upgradient well results average
 ND-non detect
 Determinations of upgradient and downgradient wells are preliminary

Table 1
GROUNDWATER ANALYTICAL RESULTS
 Joliet Station #29, Illinois
 Midwest Generation
 21053 070
 Dec. 7 2010

ENGINEERING	Sample Analysis Method	Groundwater Quality Standard (mg/L) Class I	Upgradient Wells				Upgradient Well Results Average (mg/L)	Downgradient Wells								
			MW-8	MW-9	MW-10	MW-11		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7		
			12/6/10	12/6/10	12/6/10	12/6/10		12/6/10	12/7/10	12/6/10	12/7/10	12/7/10	12/7/10	12/7/10	12/7/10	
Chemical Name																
Antimony	Metals 6020	0.006	ND	ND	ND	ND	--	0.0045	0.0125	0.604	ND	ND	ND	ND	ND	ND
Arsenic	Metals 6020	0.05	ND	ND	ND	0.0013	0.0013	0.0011	ND	ND	ND	ND	ND	ND	ND	0.001
Barium	Metals 6020	2.0	0.0054	0.031	0.05	0.064	0.038	0.13	0.82	0.089	0.065	0.061	0.075	0.13	0.13	0.13
Beryllium	Metals 6020	0.004	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	Metals 6020	0.005	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	Metals 6020	0.1	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cobalt	Metals 6020	1.0	ND	0.0047	ND	ND	0.005	ND	ND	0.0013	ND	ND	ND	ND	ND	ND
Copper	Metals 6020	0.65	ND	ND	ND	ND	--	0.00326	0.0032	ND	ND	ND	ND	ND	ND	ND
Cyanide	Dissolved 9014	0.2	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	Metals 6020	5.0	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	Metals 6020	0.0075	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	Metals 6020	0.15	0.0051	1.1	0.12	0.052	0.319	ND	ND	0.1	0.33	0.0065	0.14	0.29	0.29	0.29
Mercury	Mercury 7470A	0.002	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	Metals 6020	0.1	0.0025	0.0694	0.0052	0.0022	0.005	0.0034	0.0033	0.011	0.0067	ND	0.0056	0.0045	0.0045	0.0045
Selenium	Metals 6020	0.05	ND	ND	ND	ND	--	ND	ND	ND	0.0025	ND	0.0029	ND	ND	ND
Silver	Metals 6020	0.05	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	Metals 6020	0.002	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	Metals 6020	5.0	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Boron	Metals 6020	2	0.29	0.35	0.5	0.47	0.41	0.31	0.31	0.24	0.46	0.42	0.32	0.53	0.53	0.53
Sulfate	Dissolved 9038	400	210	1600	130	140	520	180	190	120	300	110	140	250	250	250
Chloride	Dissolved 9251	200	130	140	200	ND	157	140	140	260	270	150	130	430	430	430
Nitrogen/Nitrate	Nitrogen By calc	10	0.33	ND	0.39	0.39	0.37	ND	3.1	ND	0.81	ND	ND	ND	ND	ND
Total Dissolved Solids	Dissolved 2540C	NA	570	2600	860	770	1,225	590	600	930	1100	750	650	1200	1200	1200
Fluoride	Dissolved 4500 FC	4	0.51	0.61	0.43	0.34	0.47	0.45	0.62	0.43	0.49	0.4	0.4	0.36	0.36	0.36
Nitrogen/Nitrite	Dissolved 4500 NO2	NA	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen/Nitrate/Nitrite	Dissolved 4500 NO3	NA	0.35	ND	0.39	0.39	0.37	1.9	3.1	ND	0.81	ND	ND	ND	ND	ND

Notes:
 *Class I Groundwater Standards from 35 IAC Part 620
 Bold values show exceedences of 35 IAC Part 620
 Shaded values show exceedences of upgradient well results average
 ND-non detect