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1	ITEM #	SOURCE		DESCRIPTION	FILE NO.	FACILITY	RESPONSIBILITY		ATE ADDE	IG DUE DA	RR DUE DA	OMPL DAT	STATUS
2		DOC/MTNG	DATE				CO.	INITIAL					
3	9	KO & MC Site \	9/20/10	Update PIM with Eileen's Ghent contact information	14.1000	--	B&V	MW	09/21/10	09/24/10		09/21/10	Complete
4	8	KO & MC Site \	9/20/10	Determine if a Monday, 2 pm EST project conference ca	14.1000	--	B&V	TH/MW	09/21/10	09/23/10		09/21/10	Complete
5	3	KO & MC Site \	9/20/10	Provide DVD copy of Phase I Report	14.1000	--	B&V	TH	09/21/10	09/24/10		09/22/10	Complete
6	17	Email 14.1000	9/20/10	Provide E.ON comments on Kick Off Meeting and Mill C	14.1000	--	E.ON	ES	09/21/10	09/24/10		09/24/10	Complete
7	2	KO & MC Site \	9/20/10	Determine dates for Ghent kick-off meeting	14.1000	Ghent	E.ON	ES	09/21/10	09/23/10		09/27/10	Complete
8	5	KO & MC Site \	9/20/10	Provide engineering cost estimate at end of each month	14.1000	n--	B&V	TH	09/21/10	09/30/10		09/28/10	Complete
9	6	KO & MC Site \	9/20/10	Create IBackup FTP site for large file transfer	14.1000	--	B&V	KL	09/21/10	09/24/10		09/29/10	Complete
10	10	KO & MC Site \	9/20/10	Prepare data inventory and information request	14.1000	Mill Creek	B&V	MW/JC	09/21/10	09/24/10		09/29/10	Complete
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5	Set received on 9/22	
6	Final issued on 9/24	
7	Scheduled for October 6&7	
8	Sent 9/28.	
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	A	B	C	D	E
1	E.ON	E.ON U.S. SERVICES INC. COMPANY			
2	AB	Alex Betz			
3	ES	Eileen Saunders			
4	GB	Greg Black			
5	GR	Gary Revlett			
6					
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16	BV	Black & Veatch (B&V)			
17	TH	Tim Hillman			
18	KL	Kyle Lucas			
19	AM	Anand Mahabaleshwarker			
20	MK	Mike King			
21	RL	Rick Lausman			
22	MW	M.R. Wehrly			
23	MH	Monty Hintz			
24	JB	Jim Bayless			
25	JC	Jonathan Crabtree			

From: Hillman, Timothy M.
To: Saunders, Eileen
CC: Jackson, Audrey; 168908 E.ON-AQC; Crabtree, Jonathan D.; Wehrly, M. R.; Lucas, Kyle J.; Betz, Alex
Sent: 10/1/2010 10:25:07 AM
Subject: 168908.41.0100 101001 Mill Creek Engineering Data Request
Attachments: Mill Creek Priority List for Info Req 092910.xls

Eileen,

Attached is a revised Mill Creek Data Request list incorporating a priority-based schedule. We have taken the 092910 Mill Creek Data Request list sent to you earlier and created a spreadsheet to reflect all the requests in order of priority. There are 4 priority levels. The first being due at the end of next week, October 8th, and then each consecutive one is a week apart. This allows for all information to be provided by the end of October so that B&V will be able to support the AQC validation and be prepared to start conceptual design in November.

Regards,

Tim Hillman | Project Manager
Power Generation - Environmental Services
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: **(913) 458-7928**
Email: **hillmantm@bv.com**

From: Saunders, Eileen [mailto:Eileen.Saunders@eon-us.com]
Sent: Thursday, September 30, 2010 12:24 PM
To: Hillman, Timothy M.
Cc: Jackson, Audrey; 168908 E.ON-AQC; Crabtree, Jonathan D.; Wehrly, M. R.; Lucas, Kyle J.; Betz, Alex
Subject: RE: 168908.41.0100 100929 Mill Creek Engineering Data Request

Tim,

Alex and I just completed a meeting where we discussed our process for collecting this data. One thing that would be helpful is if B&V provided a schedule of when you need the information. If you recall, during Phase 1, we were given specific deadlines for data submittal. Alex and I need to plan our resources so a timeline would be helpful.

Thank you,

Eileen

From: Hillman, Timothy M. [mailto:HillmanTM@bv.com]
Sent: Wednesday, September 29, 2010 10:26 AM
To: Saunders, Eileen
Cc: Jackson, Audrey; 168908 E.ON-AQC; Crabtree, Jonathan D.; Wehrly, M. R.; Lucas, Kyle J.; Betz, Alex
Subject: 168908.41.0100 100929 Mill Creek Engineering Data Request

Eileen,

Please find attached our Engineering Data Request for Mill Creek. We have spent a considerable amount of time researching, cross-referencing with data we already have, and narrowing this list to only those items essential to our work. While the list may look longer than the draft you reviewed earlier, there are very few new requests, just additional detail on some of the more open-ended requests we previously listed. I have also attached for your information, the "Mill Creek Data Index", which is our current inventory of information that we already have on file for Mill Creek. Native and PDF formats of both documents are

included.

In a separate email, we will be sending instructions for the use of the iBackup accounts to begin transferring data.

Please don't hesitate to call if you have any questions. I request that you copy M.R Wehrly and Jonathan Crabtree (both copied on this email) on any questions related to this request.

Best regards,

Tim Hillman | Project Manager
Power Generation - Environmental Services
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: **(913) 458-7928**
Email: **hillmantm@bv.com**

	A	B
1	/Oct/2010□#2 = 15/Oct/2010□#3	
2	Priority	Section/ Discipline
3	1	Boiler/Fans
4	1	Boiler/Fans
5	1	Boiler/Fans
6	1	Boiler/Fans
7	1	Boiler/Fans
8	1	Boiler/Fans
9	1	Boiler/Fans
10	1	Boiler/Fans
11	1	Boiler/Fans
12	1	Civil/Struct
13	1	Civil/Struct
14	1	Civil/Struct
15	1	EE/ Cntrl
16	1	KO Meeting
17	1	KO Meeting
18	2	3. Plant Data
19	2	Boiler/Fans
20	2	Boiler/Fans
21	2	Boiler/Fans
22	2	Boiler/Fans
23	2	Civil/Struct
24	2	Civil/Struct
25	2	Civil/Struct
26	2	EE/ Cntrl
27	2	EE/ Cntrl
28	2	EE/ Cntrl
29	2	EE/ Cntrl
30	3	1. Drawings
31	3	3. Plant Data
32	3	3. Plant Data
33	3	Boiler/Fans
34	3	Boiler/Fans
35	3	Boiler/Fans
36	3	Boiler/Fans
37	3	Boiler/Fans
38	3	Boiler/Fans
39	3	Boiler/Fans
40	3	Civil/Struct
41	3	EE/ Cntrl
42	3	EE/ Cntrl
43	4	1. Drawings
44	4	3. Plant Data
45	4	Boiler/Fans
46	4	Boiler/Fans

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1	**Priority List for B&V Information Request - Mill Creek 092910 for E.ON Phase II AQC Study**
2	Request
3	1. Fan Data a. FD fan performance curve – Unit 3
4	1. Fan Data i. Booster fan performance curve – Unit 1 & 2
5	3. Air Htr b. Air heater leakage percentage and/or air heater gas outlet oxygen percentage (wet and/or dry bases) – Unit 1, 2, 3, 4
6	3. Air Htr d. Original / Operating performance data (data sheets) – Unit 1, 2, 3, 4
7	6. Boiler a. Boiler steam cycle heat balance – Unit 3 & 4
8	6. Boiler b. Boiler loss on ignition (LOI) percentage – Unit 1, 2, 3, 4
9	6. Boiler d. Excess air percentage at economizer outlet and/or Economizer outlet oxygen percentage (wet and/or dry bases)– Unit 1, 2, 3, 4
10	7. ESPs b. Precipitator leakage percentage and/or Precipitator gas outlet oxygen percentage (wet and/or dry bases)– Unit 1, 2, 3, 4
11	8. Stack a. Stack gas outlet oxygen percentage, wet basis or stack gas outlet oxygen percentage, dry basis – Unit 1, 2, 3, 4.
12	1. Steel superstructure drawings for Units 1 and 2, particularly in economizer and ESP support area, including elevation view of Column Line J and floor plans at or below ESP level
13	5. Building envelope drawings (foundation floor plan and building elevations) for Unit 4 AQCS Switchgear Building south of Unit 4
14	6. Building envelope drawings (foundation floor plan and building elevations) for new RO (Water Treatment) Building north of Unit 1
15	5. Pictures or drawings of transformer name plates including: RATs, Scrubber Transformers, Substation Auto Transformers, all unit MATs and all unit Main Transformers.
16	1. Provide structural and ductwork integrity studies for Unit 3.(Previously requested)
17	4. Provide B&V short circuit and load flow analysis (from the 1990's). (Note: B&V searched our stored files and could not locate this study)
18	o. Need current limestone quality analysis, specifically purity/reactive CaCO3 and inerts.
19	1. Fan Data c. FD fan motor data sheet, nameplate – Unit 1, 2, 3, 4
20	1. Fan Data f. ID fan motor data sheet, nameplate – Unit 2, 3, 4
21	1. Fan Data l. Booster fan motor data sheet, nameplate – Unit 1 & 2
22	3. Air Htr c. General arrangement drawings – Unit 1, 2, 3, 4
23	2. Foundation plan drawings in Unit 1 and 2 area for east end of Boiler Building, ID fans, RATs, SCR, and ductwork
24	3. Foundation plan drawings for Unit 3 and 4 for SCRs and reaction tanks, ID fans, and ductwork
25	4. Foundation plan (outline) drawings for each chimney, Units 1 – 4
26	4. For all units, current auxiliary power bus loads for major switchgear.
27	7. Specific Electrical Drawings
28	a. 345 kV Electrical drawings, includes the following: (317261-E402, 317292-E401, 317292-E402)
29	b. Electrical drawing List and MV 3 lines, includes the following: (317255-E500; 317261-E308, E405, E408; 317264-E500, E504, E594, E552; 317273-E500, E509, E510; 317295-E500, E509, E51
30	h. Drawings of the existing chimney – Unit 1/2, 3, 4
31	e. Recent responses to EPA Information Collection Requests (ICR) and, if applicable, supporting air emissions test reports. (Also, include current mercury stack testing results, if available.)
32	l. Current underground utility information/drawings. (Include underground piping and composite drawings, specifically underground pipe routing and plan views of the area under construction.)
33	1. Fan Data n. List of any major modifications or major repairs made to any existing FD, ID or Booster fans – All units, if any.
34	3. Air Htr e. List of any major modifications or major repairs made to the existing air heater – All units, if any. – Unit 1, 2, 3, 4
35	3. Air Htr a. Air heater transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
36	5. SCR Sys a. SCR transient design pressures in units of inches of water gauge – Unit 3 & 4
37	6. Boiler c. Boiler transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
38	7. ESPs a. Precipitator transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
39	9. FGDs a. Scrubber transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
40	7. Foundation plan drawings for main Coal Conveyor F between Units 2 and 3
41	3. General arrangement and layout drawings of the entire existing substation/HV switchyard.
42	6. General arrangement and layout drawings of the Unit 3 and unit 4 transformers on the river side of the plant.
43	b. Plant arrangements– Unit 1 only – The set of unit 1 plant arrangement drawings we have is unreadable.
44	g. Water analyses and supply information for Ohio River, City Water and Well Water
45	1. Fan Data b. FD fan motor drawing – Unit 1, 2, 3, 4
46	1. Fan Data d. ID fan arrangement drawing – Unit 1, 2, 3, 4

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47	4	Boiler/Fans
48	4	Boiler/Fans
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50	4	Boiler/Fans
51	4	Boiler/Fans
52	4	Boiler/Fans
53	4	Boiler/Fans
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55	4	Boiler/Fans
56	4	Boiler/Fans
57	4	Boiler/Fans
58	4	Boiler/Fans
59	4	Boiler/Fans
60	4	EE/ Cntrl
61	4	EE/ Cntrl
62	4	KO Meeting

	C
47	1. Fan Data e. ID fan motor drawing – Unit 1, 2, 3, 4
48	1. Fan Data g. ID fan fluid coupling drawing – Unit 1, 2, 3, 4
49	1. Fan Data h. ID fan fluid coupling data sheet and/or the following – Unit 1, 2, 3, 4 (Manufacturer, Model name/#, Heat Exchanger drawing & data sheet, Arrgmt showing fan & motor
50	1. Fan Data j. Booster fan arrangement drawing – Unit 1 & 2
51	1. Fan Data k. Booster fan motor drawing – Unit 1 & 2
52	1. Fan Data m. Booster fan fluid coupling data sheet and/or the following – Unit 1 & 2 (Manufacturer, Model name/#, Heat Exchanger drawing & data sheet, Arrgmt showing fan & mot
53	2. Duct Dwgs a. Precipitator to ID fan ductwork transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
54	2. Duct Dwgs b. ID fan to booster fan ductwork transient design pressures in units of inches of water gauge – Unit 1, 2, 3, 4
55	2. Duct Dwgs c. Ductwork drawing: ESP to ID fans – Unit 3 & 4
56	2. Duct Dwgs d. Ductwork drawing: ID fans to FGD Scrubbers – Unit 4
57	2. Duct Dwgs e. Ductwork drawing: FGD Scrubbers to Stack – Unit 4
58	4. SC Air Htr a. Steam Coil Air Heaters - Original data sheets – Unit 1, 2, 3, 4
59	4. SC Air Htr b. Steam Coil Air Heaters - General arrangement drawings – Unit 1, 2, 3, 4
60	1. Provide DCS network or architecture drawings for each unit.
61	2. Confirm all four units are planned to be Experion DCS systems.
62	2. Provide plant access standards (minimum height and width) for roadways. (Previously requested)

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From: Ritchey, Stacy
To: Saunders, Eileen
Sent: 10/7/2010 12:47:54 PM
Subject: FW: Environmental Summary alternate scenario Rev4 - Pras.xlsx
Attachments: Environmental Summay alternate scenario Rev4 - Pras.xlsx

Eileen,

Robert is wanting me to provide them with by month numbers, are you ok with that? It will probably take me at least until the end of tomorrow to get his data. Thanks. Stacy

---

From: Conroy, Robert
Sent: Thursday, October 07, 2010 12:44 PM
To: Ritchey, Stacy
Cc: Schroeder, Andrea
Subject: FW: Environmental Summay alternate scenario Rev4 - Pras.xlsx

Stacy,

This is the table I referenced in my voice-mail. Can you provided us monthly numbers for these projects?

Robert M. Conroy
Director, Rates
E.ON U.S. Services Inc.
(502) 627-3324 (phone)
(502) 627-3213 (fax)
(502) 741-4322 (mobile)
robert.conroy@eon-us.com

From: Garrett, Chris
Sent: Friday, September 24, 2010 10:17 AM
To: Conroy, Robert; Foxworthy, Carol
Subject: Environmental Summay alternate scenario Rev4 - Pras.xlsx

Here is a summary of the costs by technology by plant site. The CCR costs are not included in this schedule, but we anticipate getting ECR recovery in the Plan for the capital expenditures, but not the cost of removal ($200M in capex related; $500m in removal costs). The CCR costs breakdown is in the PowerPoint slide in the prior email.

Chris

	A	C	D	E	F	G	H	I	J	K	L	M	N
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	$ in thousands												
3		**Capital Cost**		2011	2012	2013	2014	2015	2016	2017	2018	Total	
4	**Alternate Plan**												
5	**Brown**												
6	Brown 1 - SCR	$59,000		$2,950	$17,700	$23,600	$14,750					$59,000	$0
7	Brown 1 - Baghouse	$34,000		$1,700	$11,900	$13,600	$6,800					$34,000	$0
8	Brown 1 - PAC Injection	$1,599				$800	$800					$1,599	$0
10	Brown 1 - SAM Mitigation	$4,000		$200	$1,200	$1,600	$1,000					$4,000	$0
12	Brown 1 - Escalation	$15,476		$371	$3,679	$6,504	$4,922					$15,476	$0
13	Total Brown 1	**$114,075**		**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**	**$0**	**$114,075**	**$0**
14													
15	Brown 2 - SCR	$92,000		$9,200.0	$34,500	$43,700	$4,600					$92,000	$0
16	Brown 2 - Baghouse	$34,000			$1,360	$10,200	$10,880	$10,540	$1,020			$34,000	$0
17	Brown 2 - PAC Injection	$2,476					$1,238	$1,238				$2,476	$0
20	Brown 2 - SAM Mitigation	$4,000		$200	$1,600	$2,200						$4,000	$0
22	Brown 2 - Escalation	$21,300		$718	$4,475	$9,214	$3,524	$3,053	$316			$21,300	$0
23	Total Brown 2	**$153,776**		**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**	**$0**	**$153,776**	**$0**
24													
27	Brown 3 - Baghouse	$61,000				$1,830	$21,350	$28,670	$9,150			$61,000	$0
28	Brown 3 - PAC Injection	$5,426					$1,000	$3,426	$1,000			$5,426	$0
31	Brown 3 - Escalation	$16,475		$0	$0	$301	$4,711	$8,320	$3,142			$16,475	$0
32	Total Brown 3	**$82,901**		**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**	**$0**	**$82,901**	**$0**
33													
34	**Total Brown**	**$350,751**		**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**	**$0**	**$350,751**	**$0**
35													
36	**Ghent**												
37	Ghent 1 - Baghouse	$131,000				$3,930	$45,850	$61,570	$19,650			$131,000	$0
38	Ghent 1 - PAC Injection	$6,380					$1,000	$4,380	$1,000			$6,380	$0
42	Ghent 1 - Escalation	$34,012		$0	$0	$645	$9,876	$17,097	$6,393			$34,012	$0
43	Total Ghent 1	**$171,392**		**$0**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**	**$0**	**$171,392**	**$0**
44													
45	Ghent 2 - SCR	$227,000		$11,350	$68,100	$90,800	$56,750					$227,000	$0
46	Ghent 2 - Baghouse	$120,000				$4,800	$42,000	$56,400	$16,800			$120,000	$0
47	Ghent 2 - PAC Injection	$6,109					$1,000	$4,109	$1,000			$6,109	$0
52	Ghent 2 - Escalation	$66,928		$867	$8,135	$15,701	$21,028	$15,686	$5,511			$66,928	$0
53	Total Ghent 2	**$420,037**		**$12,217**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**	**$0**	**$420,037**	**$0**
54													
55	Ghent 3 - Baghouse	$138,000				$16,560	$48,300	$66,240	$6,900			$138,000	$0
56	Ghent 3 - PAC Injection	$6,173					$3,087	$3,087				$6,173	$0
60	Ghent 3 - Escalation	$33,660		$0	$0	$2,720	$10,832	$17,972	$2,136			$33,660	$0
61	Total Ghent 3	**$177,833**		**$0**	**$0**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**	**$0**	**$177,833**	**$0**
62													
63	Ghent 4 - Baghouse	$117,000				$11,700	$40,950	$58,500	$5,850			$117,000	$0
64	Ghent 4 - PAC Injection	$6,210					$3,105	$3,105				$6,210	$0
68	Ghent 4 - Escalation	$28,990		$0	$0	$1,922	$9,287	$15,970	$1,811	$0	$0	$28,990	$0
69	Total Ghent 4	**$152,200**		**$0**	**$0**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**	**$0**	**$152,200**	**$0**
70													
71	**Total Ghent**	**$921,461**		**$12,217**	**$76,235**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**	**$0**	**$921,461**	**$0**
72													
73	**Mill Creek**												

	A	C	D	E	F	G	H	I	J	K	L	M	N
74	Mill Creek 1 - FGD Upgrade	$41,250				$10,313	$28,875	$2,063				$41,250	$0
75	Mill Creek 1 - SCR	$97,020				$2,911	$27,166	$29,106	$35,897	$1,940		$97,020	$0
76	Mill Creek 1 - Baghouse	$80,850			$8,085	$28,298	$40,425	$4,043				$80,850	$0
77	Mill Creek 1 - Electrostatic Precipitator	$0			$0	$0	$0	$0				$0	$0
78	Mill Creek 1 - PAC Injection	$4,290			$429	$1,502	$2,360					$4,290	$0
81	Mill Creek 1 - SAM Mitigation	$7,920				$396	$792	$2,376	$3,960	$396		$7,920	$0
83	Mill Creek 1 - Escalation	$52,077		$0	$1,017	$7,131	$21,000	$9,744	$12,340	$846		$52,077	$0
84	Total Mill Creek 1	**$283,407**		**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**	**$0**	**$283,407**	**$0**
85													
86	Mill Creek 2 - FGD Upgrade	$41,250			$10,313	$28,875	$2,063					$41,250	$0
87	Mill Creek 2 - SCR	$97,020			$2,911	$27,166	$29,106	$35,897	$1,940			$97,020	$0
88	Mill Creek 2 - Baghouse	$80,850		$8,085	$28,298	$40,425	$4,043					$80,850	$0
89	Mill Creek 2 - Electrostatic Precipitator	$33,000		$3,300	$11,550	$16,500	$1,650					$33,000	$0
90	Mill Creek 2 - PAC Injection	$4,290		$429	$1,502	$2,360						$4,290	$0
91	Mill Creek 2 - SAM Mitigation	$7,920			$396	$792	$2,376	$3,960	$396			$7,920	$0
92	Mill Creek 2 - Escalation	$45,866		$903	$6,566	$19,070	$8,271	$10,332	$723	$0		$45,866	$0
93	Total Mill Creek 2	**$310,196**		**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**	**$0**	**$310,196**	**$0**
94													
97	Mill Creek 3 - FGD (U4 update and tie in)	$63,750					$47,813	$15,938				$63,750	$0
98	Mill Creek 3 - FGD (Unit 3 Removal)	$25,500					$6,375	$19,125				$25,500	$0
99	Mill Creek 3 - Baghouse	$104,125			$2,083	$31,238	$39,568	$31,238				$104,125	$0
100	Mill Creek 3 - PAC Injection	$5,525			$111	$1,658	$2,100	$1,658				$5,525	$0
101	Mill Creek 3 - Escalation	$43,488		$0	$262	$5,402	$20,206	$17,617	$0			$43,488	$0
102	Total Mill Creek 3	**$242,388**		**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**	**$0**	**$242,388**	**$0**
103													
104	Mill Creek 4 - FGD	$236,250		$18,900	$80,325	$89,775	$47,250					$236,250	$0
105	Mill Creek 4 - SCR Upgrade	$5,250		$4,200	$1,050							$5,250	$0
106	Mill Creek 4 - Baghouse	$131,250		$5,250	$45,938	$52,500	$27,563					$131,250	$0
107	Mill Creek 4 - PAC Injection	$6,825		$273	$2,389	$2,730	$1,433					$6,825	$0
108	Mill Creek 4 - Ammonia	$10,500		$5,250	$5,250							$10,500	$0
109	Mill Creek 4 - Escalation	$58,596		$2,588	$16,121	$23,815	$16,073	$0				$58,596	$0
110	Total Mill Creek 4	**$448,671**		**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**	**$0**	**$448,671**	**$0**
111													
112	**Total Mill Creek**	**$1,284,663**		**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**	**$0**	**$1,284,663**	**$0**
113													
114	**Trimble**												
115	Trimble 1 - Baghouse	$128,000				$12,800	$44,800	$64,000	$6,400			$128,000	$0
116	Trimble 1 - PAC Injection	$6,451					$3,226	$3,226				$6,451	$0
117	Trimble 1 - Escalation	$31,635		$0	$0	$2,102	$10,124	$17,427	$1,981			$31,635	$0
118	Total Trimble 1	**$166,086**		**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
119													
120	**Total Trimble**	**$166,086**		**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
121													
122	**Total Environmental Compliance Air - Alternate Plan**	**$2,722,961**		**$76,733**	**$377,241**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**	**$0**	**$2,722,961**	**$0**
123													
124													
125	Scope	$2,274,459											
126	Escalation	$448,502											
127		**$2,722,961**											
128													

	A	C	D	E	F	G	H	I	J	K	L	M	N
129													
130													
131													
132													
133													
134				3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%		
135				1	2	3	4	5	6	7	8		

From: Ritchey, Stacy
To: Saunders, Eileen
Sent: 10/4/2010 9:17:05 AM
Subject: Environmental Air File for Financial Planning
Attachments: Environmental Summary Breakdown 10-4-10.xlsx

Eileen,

I made a couple of small changes. Attached is the updated file. I will send it out after we review. Give me a call at Brown (859-748-4455) when you have a few minutes. Thanks.

Stacy Ritchey
Sr Budget Analyst
E.ON US - Project Engineering
820 West Broadway
Louisville, KY 40232
BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

	L
1	
2	
3	
4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$25,500		$25,500	$0	$0		$0	$25,500
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$0**	**$43,488**		**$0**	**$242,388**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$0**	**$200,028**		**$0**	**$1,226,223**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,268,459**	**$40,000**	**$449,142**		**$2,500**	**$2,606,600**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
93	
94	
95	
96	
97	

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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1	
2	
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4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$0		$0	$0	$0		$0	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$216,888**		**$173,400**	**$0**	**$43,488**		**$0**	**$216,888**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,259,163**		**$1,059,135**	**$0**	**$200,028**		**$0**	**$1,200,723**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,732,101**		**$2,242,959**	**$40,000**	**$449,142**		**$2,500**	**$2,581,100**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
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	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	$ in thousands												
3	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
4	**Cash Flow By Year**												
5	**Brown**												
6	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
7	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
8	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
9	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
10	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
11													
12	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
13	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
14	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
15	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
16	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
17													
18	**Brown 1 & 2 - SAM Mitigation**												
19													
20	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
21	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
22	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
23													
24	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
25													
26	**Ghent**												
27	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
28	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
29	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
30	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
31													
32	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
33	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
34	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
35	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
36	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
37													
38	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
39	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
40	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
41	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
42													
43	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
44	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
45	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
46	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
47													
48	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
49													
50	**Mill Creek**												

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	A	C	D	E	F	G	H	I	J	K	L	M	P
51	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
52	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
53	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
54	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
55	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
56	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
57													
58	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
59	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
60	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
61	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
62	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
63	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
64	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
65													
66	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
67	Mill Creek 3 - FGD (Unit 3 Removal)		$25,500		$0	$0	$0	$6,375	$19,125	$0	$0		
68	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
69	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
70	Total Mill Creek 3		**$242,388**	**$0**	**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**		
71													
72	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
73	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
74	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
75	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
76	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
77	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
78													
79	**Total Mill Creek**		**$1,284,663**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**		
80													
81	**Trimble**												
82	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
83	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
84	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
85													
86	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
87													
88	**Environmental Air Studies**												
89	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
90	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
91													
92													
93	**Total Environmental Compliance Air - Alternate Plan**		**$2,757,601**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**		

	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	$ in thousands												
3	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
4	**Cash Flow By Year**												
5	**Brown**												
6	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
7	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
8	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
9	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
10	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
11													
12	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
13	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
14	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
15	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
16	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
17													
18	**Brown 1 & 2 - SAM Mitigation**												
19													
20	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
21	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
22	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
23													
24	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
25													
26	**Ghent**												
27	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
28	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
29	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
30	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
31													
32	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
33	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
34	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
35	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
36	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
37													
38	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
39	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
40	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
41	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
42													
43	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
44	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
45	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
46	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
47													
48	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
49													
50	**Mill Creek**												

Draft

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
52	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
53	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
54	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
55	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
56	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
57													
58	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
59	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
60	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
61	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
62	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
63	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
64	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
65													
66	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
67	Mill Creek 3 - FGD (Unit 3 Removal)		$0		$0	$0	$0	$0	$0	$0	$0		
68	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
69	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
70	Total Mill Creek 3		**$216,888**	**$0**	**$0**	**$2,455**	**$38,297**	**$109,686**	**$66,450**	**$0**	**$0**		
71													
72	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
73	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
74	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
75	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
76	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
77	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
78													
79	**Total Mill Creek**		**$1,259,163**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$370,130**	**$163,970**	**$55,257**	**$3,182**		
80													
81	**Trimble**												
82	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
83	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
84	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
85													
86	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
87													
88	**Environmental Air Studies**												
89	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
90	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
91													
92													
93	**Total Environmental Compliance Air - Alternate Plan**		**$2,732,101**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$796,919**	**$627,986**	**$145,319**	**$3,182**		

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,602,762		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**											
3	**Does Not Include Removal**											
4	$ in thousands											
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$465,924		$26,571	$439,353		$47,185	$3,676	$415,063			
9	**Green River CCR Ruling**	$51,102		$16,931	$34,171		$6,606	$39,839	$4,657			
10	**Pineville CCR Ruling**	$1,126		$869	$256		$1,126	$0	$0			
11	**Tyrone CCR Ruling**	$21,878		$13,742	$8,136		$4,673	$17,205	$0			
12	**Cane Run CCR Ruling**	$90,463		$28,448	$62,015		$2,556	$39,351	$48,556			
13	**Mill Creek CCR Ruling**	$135,533		$21,978	$113,555		$30,209	$4,589	$100,735			
14	**Trimble Co CCR Ruling**	$195,422		$150	$195,272		$6,789	$22	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,121,369		$155,354	$966,014		$101,253	$105,021	$915,095			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From:	Garrett, Chris
To:	Conroy, Robert
CC:	Bellar, Lonnie
Sent:	10/7/2010 3:12:22 PM
Subject:	Environmental Summary Breakdown 10-4-10 R1 (3).xlsx
Attachments:	Environmental Summary Breakdown 10-4-10 R1 (3).xlsx

Robert,

Here are the environmental costs by regulation by year.

Chris

<<...>>

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

	L
1	
2	
3	
4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$25,500		$25,500	$0	$0		$0	$25,500
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$0**	**$43,488**		**$0**	**$242,388**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$0**	**$200,028**		**$0**	**$1,226,223**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,268,459**	**$40,000**	**$449,142**		**$2,500**	**$2,606,600**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
93	
94	
95	
96	
97	

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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1	
2	
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4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$0		$0	$0	$0		$0	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$216,888**		**$173,400**	**$0**	**$43,488**		**$0**	**$216,888**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,259,163**		**$1,059,135**	**$0**	**$200,028**		**$0**	**$1,200,723**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,732,101**		**$2,242,959**	**$40,000**	**$449,142**		**$2,500**	**$2,581,100**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
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92	**$148,501**
93	
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95	
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	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

Draft

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$25,500		$0	$0	$0	$6,375	$19,125	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$242,388**	**$0**	**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,284,663**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,757,601**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**		

	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$0		$0	$0	$0	$0	$0	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$216,888**	**$0**	**$0**	**$2,455**	**$38,297**	**$109,686**	**$66,450**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,259,163**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$370,130**	**$163,970**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,732,101**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$796,919**	**$627,986**	**$145,319**	**$3,182**		

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,602,762		$636,747	$966,014		$304,972	$382,695	$915,095			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From: Conroy, Robert
To: Schroeder, Andrea
Sent: 10/7/2010 4:03:21 PM
Subject: FW: Environmental Summary Breakdown 10-4-10 R1 (3).xlsx
Attachments: Environmental Summary Breakdown 10-4-10 R1 (3).xlsx

Here is a new table with the escalation included in the projects and not as a line item. Chris also put the regulation.

Robert M. Conroy
Director, Rates
E.ON U.S. Services Inc.
(502) 627-3324 (phone)
(502) 627-3213 (fax)
(502) 741-4322 (mobile)
robert.conroy@eon-us.com

From: Garrett, Chris
Sent: Thursday, October 07, 2010 3:12 PM
To: Conroy, Robert
Cc: Bellar, Lonnie
Subject: Environmental Summary Breakdown 10-4-10 R1 (3).xlsx

Robert,

Here are the environmental costs by regulation by year.

Chris

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$25,500		$25,500	$0	$0		$0	$25,500
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$0**	**$43,488**		**$0**	**$242,388**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$0**	**$200,028**		**$0**	**$1,226,223**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,268,459**	**$40,000**	**$449,142**		**$2,500**	**$2,606,600**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
93	
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95	
96	
97	

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**In-Servic d**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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1	
2	
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5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$0		$0	$0	$0		$0	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$216,888**		**$173,400**	**$0**	**$43,488**		**$0**	**$216,888**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,259,163**		**$1,059,135**	**$0**	**$200,028**		**$0**	**$1,200,723**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,732,101**		**$2,242,959**	**$40,000**	**$449,142**		**$2,500**	**$2,581,100**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
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	A	C	D	E	F	G	H	I	J	K	L	M	N
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

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	A	C	D	E	F	G	H	I	J	K	L	M	N
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$25,500		$0	$0	$0	$6,375	$19,125	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$242,388**	**$0**	**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,284,663**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,757,601**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**		

	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$0		$0	$0	$0	$0	$0	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$216,888**	**$0**	**$0**	**$2,455**	**$38,297**	**$109,686**	**$66,450**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,259,163**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$370,130**	**$163,970**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,732,101**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$796,919**	**$627,986**	**$145,319**	**$3,182**		

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,602,762		$636,747	$966,014		$304,972	$382,695	$915,095			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From: Saunders, Eileen
To: Ritchey, Stacy
Sent: 10/4/2010 10:32:46 AM
Subject: FW: ECR compliance plan filings.
Attachments: Environmental Summay alternate scenario Rev4 - Pras (2).xlsx

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From: Conroy, Robert
Sent: Thursday, September 30, 2010 2:25 PM
To: Straight, Scott
Cc: Saunders, Eileen; Schroeder, Andrea
Subject: ECR compliance plan filings.

Scott,

Here is the table that I gave you before you left. As we discussed, the column labeled "ECR Filing" was a place holder based on when spending would occur and in no way is it accurate. What I need is an understanding of what documentation we have to support a CCN and ECR filing for each of the projects. In addition, since most of the projects will require a CCN, I need to know when "construction" as defined by the CCN will begin so that I can plan accordingly on when to file the application with the KPSC.

You had mentioned "Black and Veatch" study supporting the projects. Would it be possible for me to get access to review that document so I can understand what we have? Thanks for your help and let me know what time you are available to discuss tomorrow.

Robert M. Conroy
Director, Rates
E.ON U.S. Services Inc.
(502) 627-3324 (phone)
(502) 627-3213 (fax)
(502) 741-4322 (mobile)
robert.conroy@eon-us.com

	A	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**									
2	$ in thousands									
3		**Capital Cost**	**ECR Filing**	**pportable Docume**	**Start of Constructior**	2011	2012	2013	2014	2015
4	**Alternate Plan**									
5	**Brown**									
6	Brown 1 - SCR	$59,000	Dec-10			$2,950	$17,700	$23,600	$14,750	
7	Brown 1 - Baghouse	$34,000	Dec-10			$1,700	$11,900	$13,600	$6,800	
8	Brown 1 - PAC Injection	$1,599	Apr-12					$800	$800	
10	Brown 1 - SAM Mitigation	$4,000	Dec-10			$200	$1,200	$1,600	$1,000	
12	Brown 1 - Escalation	$15,476				$371	$3,679	$6,504	$4,922	
13	Total Brown 1	**$114,075**				**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**
14										
15	Brown 2 - SCR	$92,000	Dec-10			$9,200.0	$34,500	$43,700	$4,600	
16	Brown 2 - Baghouse	$34,000	Jul-11				$1,360	$10,200	$10,880	$10,540
17	Brown 2 - PAC Injection	$2,476	Apr-13						$1,238	$1,238
20	Brown 2 - SAM Mitigation	$4,000	Dec-10			$200	$1,600	$2,200		
22	Brown 2 - Escalation	$21,300				$718	$4,475	$9,214	$3,524	$3,053
23	Total Brown 2	**$153,776**				**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**
24										
27	Brown 3 - Baghouse	$61,000	Apr-12					$1,830	$21,350	$28,670
28	Brown 3 - PAC Injection	$5,426	Apr-13						$1,000	$3,426
31	Brown 3 - Escalation	$16,475				$0	$0	$301	$4,711	$8,320
32	Total Brown 3	**$82,901**				**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**
33										
34	**Total Brown**	**$350,751**				**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**
35										
36	**Ghent**									
37	Ghent 1 - Baghouse	$131,000	Apr-12					$3,930	$45,850	$61,570
38	Ghent 1 - PAC Injection	$6,380	Apr-13						$1,000	$4,380
42	Ghent 1 - Escalation	$34,012				$0	$0	$645	$9,876	$17,097
43	Total Ghent 1	**$171,392**				**$0**	**$0**	**$4,575**	**$56,726**	**$83,047**
44										
45	Ghent 2 - SCR	$227,000	Dec-10			$11,350	$68,100	$90,800	$56,750	
46	Ghent 2 - Baghouse	$120,000	Apr-12					$4,800	$42,000	$56,400
47	Ghent 2 - PAC Injection	$6,109	Apr-13						$1,000	$4,109
52	Ghent 2 - Escalation	$66,928				$867	$8,135	$15,701	$21,028	$15,686
53	Total Ghent 2	**$420,037**				**$12,217**	**$76,235**	**$111,301**	**$120,778**	**$76,195**
54										
55	Ghent 3 - Baghouse	$138,000	Apr-12					$16,560	$48,300	$66,240
56	Ghent 3 - PAC Injection	$6,173	Apr-13						$3,087	$3,087
60	Ghent 3 - Escalation	$33,660				$0	$0	$2,720	$10,832	$17,972
61	Total Ghent 3	**$177,833**				**$0**	**$0**	**$19,280**	**$62,219**	**$87,298**
62										
63	Ghent 4 - Baghouse	$117,000	Apr-12					$11,700	$40,950	$58,500
64	Ghent 4 - PAC Injection	$6,210	Apr-13						$3,105	$3,105
68	Ghent 4 - Escalation	$28,990				$0	$0	$1,922	$9,287	$15,970
69	Total Ghent 4	**$152,200**				**$0**	**$0**	**$13,622**	**$53,342**	**$77,575**
71	**Total Ghent**	**$921,461**				**$12,217**	**$76,235**	**$148,777**	**$293,065**	**$324,115**
72										

	L	M	N	O	P
1					
2					
3	2016	2017	2018	Total	
4					
5					
6				$59,000	$0
7				$34,000	$0
8				$1,599	$0
10				$4,000	$0
12				$15,476	$0
13	**$0**	**$0**	**$0**	**$114,075**	**$0**
14					
15				$92,000	$0
16	$1,020			$34,000	$0
17				$2,476	$0
20				$4,000	$0
22	$316			$21,300	$0
23	**$1,336**	**$0**	**$0**	**$153,776**	**$0**
24					
27	$9,150			$61,000	$0
28	$1,000			$5,426	$0
31	$3,142			$16,475	$0
32	**$13,292**	**$0**	**$0**	**$82,901**	**$0**
33					
34	**$14,628**	**$0**	**$0**	**$350,751**	**$0**
35					
36					
37	$19,650			$131,000	$0
38	$1,000			$6,380	$0
42	$6,393			$34,012	$0
43	**$27,043**	**$0**	**$0**	**$171,392**	**$0**
44					
45				$227,000	$0
46	$16,800			$120,000	$0
47	$1,000			$6,109	$0
52	$5,511			$66,928	$0
53	**$23,311**	**$0**	**$0**	**$420,037**	**$0**
54					
55	$6,900			$138,000	$0
56				$6,173	$0
60	$2,136			$33,660	$0
61	**$9,036**	**$0**	**$0**	**$177,833**	**$0**
62					
63	$5,850			$117,000	$0
64				$6,210	$0
68	$1,811	$0	$0	$28,990	$0
69	**$7,661**	**$0**	**$0**	**$152,200**	**$0**
70					
71	**$67,052**	**$0**	**$0**	**$921,461**	**$0**
72					

	A	C	D	E	F	G	H	I	J	K
73	**Mill Creek**									
74	Mill Creek 1 - FGD Upgrade	$41,250	Apr-12					$10,313	$28,875	$2,063
75	Mill Creek 1 - SCR	$97,020	Apr-12					$2,911	$27,166	$29,106
76	Mill Creek 1 - Baghouse	$80,850	Jul-11				$8,085	$28,298	$40,425	$4,043
77	Mill Creek 1 - Electrostatic Precipitator	$0					$0	$0	$0	$0
78	Mill Creek 1 - PAC Injection	$4,290	Jul-11				$429	$1,502	$2,360	
81	Mill Creek 1 - SAM Mitigation	$7,920	Apr-12					$396	$792	$2,376
83	Mill Creek 1 - Escalation	$52,077				$0	$1,017	$7,131	$21,000	$9,744
84	Total Mill Creek 1	**$283,407**				**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**
85										
86	Mill Creek 2 - FGD Upgrade	$41,250	Jul-11				$10,313	$28,875	$2,063	
87	Mill Creek 2 - SCR	$97,020	Jul-11				$2,911	$27,166	$29,106	$35,897
88	Mill Creek 2 - Baghouse	$80,850	Dec-10			$8,085	$28,298	$40,425	$4,043	
89	Mill Creek 2 - Electrostatic Precipitator	$33,000	Dec-10			$3,300	$11,550	$16,500	$1,650	
90	Mill Creek 2 - PAC Injection	$4,290	Dec-10			$429	$1,502	$2,360		
91	Mill Creek 2 - SAM Mitigation	$7,920	Jul-11				$396	$792	$2,376	$3,960
92	Mill Creek 2 - Escalation	$45,866				$903	$6,566	$19,070	$8,271	$10,332
93	Total Mill Creek 2	**$310,196**				**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**
94										
97	Mill Creek 3 - FGD (U4 update and tie in)	$63,750	Apr-13						$47,813	$15,938
98	Mill Creek 3 - FGD (Unit 3 Removal)	$25,500	Apr-13						$6,375	$19,125
99	Mill Creek 3 - Baghouse	$104,125	Jul-11				$2,083	$31,238	$39,568	$31,238
100	Mill Creek 3 - PAC Injection	$5,525	Jul-11				$111	$1,658	$2,100	$1,658
101	Mill Creek 3 - Escalation	$43,488				$0	$262	$5,402	$20,206	$17,617
102	Total Mill Creek 3	**$242,388**				**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**
103										
104	Mill Creek 4 - FGD	$236,250	Dec-10			$18,900	$80,325	$89,775	$47,250	
105	Mill Creek 4 - SCR Upgrade	$5,250	Dec-10			$4,200	$1,050			
106	Mill Creek 4 - Baghouse	$131,250	Dec-10			$5,250	$45,938	$52,500	$27,563	
107	Mill Creek 4 - PAC Injection	$6,825	Dec-10			$273	$2,389	$2,730	$1,433	
108	Mill Creek 4 - Ammonia	$10,500	Dec-10			$5,250	$5,250			
109	Mill Creek 4 - Escalation	$58,596				$2,588	$16,121	$23,815	$16,073	$0
110	Total Mill Creek 4	**$448,671**				**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**
111										
112	**Total Mill Creek**	**$1,284,663**				**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**
113										
114	**Trimble**									
115	Trimble 1 - Baghouse	$128,000	Apr-12					$12,800	$44,800	$64,000
116	Trimble 1 - PAC Injection	$6,451	Apr-13						$3,226	$3,226
117	Trimble 1 - Escalation	$31,635				$0	$0	$2,102	$10,124	$17,427
118	Total Trimble 1	**$166,086**				**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**
119										
120	**Total Trimble**	**$166,086**				**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**
121										
122	**Total Environmental Compliance Air - Alternate Plan**	**$2,722,961**				**$76,733**	**$377,241**	**$670,080**	**$803,294**	**$647,111**
123										
124										
125	Scope	$2,274,459								
126	Escalation	$448,502								
127		**$2,722,961**								

	L	M	N	O	P
73					
74				$41,250	$0
75	$35,897	$1,940		$97,020	$0
76				$80,850	$0
77				$0	$0
78				$4,290	$0
81	$3,960	$396		$7,920	$0
83	$12,340	$846		$52,077	$0
84	**$52,197**	**$3,182**	**$0**	**$283,407**	**$0**
85					
86				$41,250	$0
87	$1,940			$97,020	$0
88				$80,850	$0
89				$33,000	$0
90				$4,290	$0
91	$396			$7,920	$0
92	$723	$0		$45,866	$0
93	**$3,060**	**$0**	**$0**	**$310,196**	**$0**
94					
97				$63,750	$0
98				$25,500	$0
99				$104,125	$0
100				$5,525	$0
101	$0			$43,488	$0
102	**$0**	**$0**	**$0**	**$242,388**	**$0**
103					
104				$236,250	$0
105				$5,250	$0
106				$131,250	$0
107				$6,825	$0
108				$10,500	$0
109				$58,596	$0
110	**$0**	**$0**	**$0**	**$448,671**	**$0**
111					
112	**$55,257**	**$3,182**	**$0**	**$1,284,663**	**$0**
113					
114					
115	$6,400			$128,000	$0
116				$6,451	$0
117	$1,981			$31,635	$0
118	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
119					
120	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
121					
122	**$145,319**	**$3,182**	**$0**	**$2,722,961**	**$0**
123					
124					
125					
126					
127					

	A	C	D	E	F	G	H	I	J	K
128										
129										
130										
131										
132										
133										
134						3.5%	3.5%	3.5%	3.5%	3.5%
135						1	2	3	4	5

	L	M	N	O	P
128					
129					
130					
131					
132					
133					
134	3.5%	3.5%	3.5%		
135	6	7	8		

	A	B	D	E	F	G	H	I	J	K	L	M	N
1		**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**											
2		$ in thousands											
3			**Capital Cost**		2011	2012	2013	2014	2015	2016	2017	2018	Total
4		**Alternate Plan**											
5	1	Brown 1 - SCR	$59,000		$2,950	$17,700	$23,600	$14,750					$59,000
6	1	Brown 1 - Baghouse	$34,000		$1,700	$11,900	$13,600	$6,800					$34,000
7	1	Brown 1 - SAM Mitigation	$4,000		$200	$1,200	$1,600	$1,000					$4,000
10	1	Brown 2 - SCR	$92,000		$9,200	$34,500	$43,700	$4,600					$92,000
11	1	Brown 2 - SAM Mitigation	$4,000		$200	$1,600	$2,200						$4,000
12	1	Ghent 2 - SCR	$227,000		$11,350	$68,100	$90,800	$56,750					$227,000
16	1	Mill Creek 2 - Baghouse	$80,850		$8,085	$28,298	$40,425	$4,043					$80,850
19	1	Mill Creek 2 - Electrostatic Precipitator	$33,000		$3,300	$11,550	$16,500	$1,650					$33,000
20	1	Mill Creek 2 - PAC Injection	$4,290		$429	$1,502	$2,360						$4,290
23	1	Mill Creek 4 - FGD	$236,250		$18,900	$80,325	$89,775	$47,250					$236,250
24	1	Mill Creek 4 - SCR Upgrade	$5,250		$4,200	$1,050							$5,250
28	1	Mill Creek 4 - Baghouse	$131,250		$5,250	$45,938	$52,500	$27,563					$131,250
29	1	Mill Creek 4 - PAC Injection	$6,825		$273	$2,389	$2,730	$1,433					$6,825
30	1	Mill Creek 4 - Ammonia	$10,500		$5,250	$5,250							$10,500
35	2	Brown 2 - Baghouse	$34,000			$1,360	$10,200	$10,880	$10,540	$1,020			$34,000
36	2	Mill Creek 1 - Baghouse	$80,850			$8,085	$28,298	$40,425	$4,043				$80,850
37	2	Mill Creek 1 - PAC Injection	$4,290			$429	$1,502	$2,360					$4,290
41	2	Mill Creek 2 - FGD Upgrade	$41,250			$10,313	$28,875	$2,063					$41,250
42	2	Mill Creek 2 - SCR	$97,020			$2,911	$27,166	$29,106	$35,897	$1,940			$97,020
46	2	Mill Creek 2 - SAM Mitigation	$7,920			$396	$792	$2,376	$3,960	$396			$7,920
47	2	Mill Creek 3 - Baghouse	$104,125			$2,083	$31,238	$39,568	$31,238				$104,125
48	2	Mill Creek 3 - PAC Injection	$5,525			$111	$1,658	$2,100	$1,658				$5,525
49	3	Brown 1 - PAC Injection	$1,599				$800	$800					$1,599
50	3	Brown 3 - Baghouse	$61,000				$1,830	$21,350	$28,670	$9,150			$61,000
53	3	Ghent 1 - Baghouse	$131,000				$3,930	$45,850	$61,570	$19,650			$131,000
55	3	Ghent 2 - Baghouse	$120,000				$4,800	$42,000	$56,400	$16,800			$120,000
56	3	Ghent 3 - Baghouse	$138,000				$16,560	$48,300	$66,240	$6,900			$138,000
57	3	Ghent 4 - Baghouse	$117,000				$11,700	$40,950	$58,500	$5,850			$117,000
58	3	Mill Creek 1 - FGD Upgrade	$41,250				$10,313	$28,875	$2,063				$41,250
59	3	Mill Creek 1 - SCR	$97,020				$2,911	$27,166	$29,106	$35,897	$1,940		$97,020
60	3	Mill Creek 1 - SAM Mitigation	$7,920				$396	$792	$2,376	$3,960	$396		$7,920
63	3	Trimble 1 - Baghouse	$128,000				$12,800	$44,800	$64,000	$6,400			$128,000
64	4	Brown 2 - PAC Injection	$2,476					$1,238	$1,238				$2,476
65	4	Brown 3 - PAC Injection	$5,426					$1,000	$3,426	$1,000			$5,426
66	4	Ghent 1 - PAC Injection	$6,380					$1,000	$4,380	$1,000			$6,380
67	4	Ghent 2 - PAC Injection	$6,109					$1,000	$4,109	$1,000			$6,109
68	4	Ghent 3 - PAC Injection	$6,173					$3,087	$3,087				$6,173
69	4	Ghent 4 - PAC Injection	$6,210					$3,105	$3,105				$6,210
70	4	Mill Creek 3 - FGD (U4 update and tie in)	$63,750					$47,813	$15,938				$63,750
71	4	Mill Creek 3 - FGD (Unit 3 Removal)	$25,500					$6,375	$19,125				$25,500
72	4	Trimble 1 - PAC Injection	$6,451					$3,226	$3,226				$6,451
73													
74													
75													

	O
1	
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5	$0
6	$0
7	$0
10	$0
11	$0
12	$0
16	$0
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20	$0
23	$0
24	$0
28	$0
29	$0
30	$0
35	$0
36	$0
37	$0
41	$0
42	$0
46	$0
47	$0
48	$0
49	$0
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56	$0
57	$0
58	$0
59	$0
60	$0
63	$0
64	$0
65	$0
66	$0
67	$0
68	$0
69	$0
70	$0
71	$0
72	$0
73	
74	
75	

	A	B	D	E	F	G	H	I	J	K	L	M	N
76													
77													
78													
79					3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
80					1	2	3	4	5	6	7	8	

From: Conroy, Robert
To: Straight, Scott; Saunders, Eileen
CC: Schroeder, Andrea; Bellar, Lonnie
Sent: 10/7/2010 5:23:22 PM
Subject: FW: ECR compliance plan filings.
Attachments: Environmental Summay alternate scenario Rev4 - Pras (2).xlsx

Scott/Eileen,

Have you been able to complete the information below?

Robert M. Conroy
Director, Rates
E.ON U.S. Services Inc.
(502) 627-3324 (phone)
(502) 627-3213 (fax)
(502) 741-4322 (mobile)
robert.conroy@eon-us.com

From: Conroy, Robert
Sent: Thursday, September 30, 2010 2:25 PM
To: Straight, Scott
Cc: Saunders, Eileen; Schroeder, Andrea
Subject: ECR compliance plan filings.

Scott,

Here is the table that I gave you before you left. As we discussed, the column labeled "ECR Filing" was a place holder based on when spending would occur and in no way is it accurate. What I need is an understanding of what documentation we have to support a CCN and ECR filing for each of the projects. In addition, since most of the projects will require a CCN, I need to know when "construction" as defined by the CCN will begin so that I can plan accordingly on when to file the application with the KPSC.

You had mentioned "Black and Veatch" study supporting the projects. Would it be possible for me to get access to review that document so I can understand what we have? Thanks for your help and let me know what time you are available to discuss tomorrow.

Robert M. Conroy
Director, Rates
E.ON U.S. Services Inc.
(502) 627-3324 (phone)
(502) 627-3213 (fax)
(502) 741-4322 (mobile)
robert.conroy@eon-us.com

	A	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**									
2	$ in thousands									
3		**Capital Cost**	**ECR Filing**	**pportable Docume**	**Start of Constructior**	2011	2012	2013	2014	2015
4	**Alternate Plan**									
5	**Brown**									
6	Brown 1 - SCR	$59,000	Dec-10			$2,950	$17,700	$23,600	$14,750	
7	Brown 1 - Baghouse	$34,000	Dec-10			$1,700	$11,900	$13,600	$6,800	
8	Brown 1 - PAC Injection	$1,599	Apr-12					$800	$800	
10	Brown 1 - SAM Mitigation	$4,000	Dec-10			$200	$1,200	$1,600	$1,000	
12	Brown 1 - Escalation	$15,476				$371	$3,679	$6,504	$4,922	
13	Total Brown 1	**$114,075**				**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**
14										
15	Brown 2 - SCR	$92,000	Dec-10			$9,200.0	$34,500	$43,700	$4,600	
16	Brown 2 - Baghouse	$34,000	Jul-11				$1,360	$10,200	$10,880	$10,540
17	Brown 2 - PAC Injection	$2,476	Apr-13						$1,238	$1,238
20	Brown 2 - SAM Mitigation	$4,000	Dec-10			$200	$1,600	$2,200		
22	Brown 2 - Escalation	$21,300				$718	$4,475	$9,214	$3,524	$3,053
23	Total Brown 2	**$153,776**				**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**
24										
27	Brown 3 - Baghouse	$61,000	Apr-12					$1,830	$21,350	$28,670
28	Brown 3 - PAC Injection	$5,426	Apr-13						$1,000	$3,426
31	Brown 3 - Escalation	$16,475				$0	$0	$301	$4,711	$8,320
32	Total Brown 3	**$82,901**				**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**
33										
34	**Total Brown**	**$350,751**				**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**
35										
36	**Ghent**									
37	Ghent 1 - Baghouse	$131,000	Apr-12					$3,930	$45,850	$61,570
38	Ghent 1 - PAC Injection	$6,380	Apr-13						$1,000	$4,380
42	Ghent 1 - Escalation	$34,012				$0	$0	$645	$9,876	$17,097
43	Total Ghent 1	**$171,392**				**$0**	**$0**	**$4,575**	**$56,726**	**$83,047**
44										
45	Ghent 2 - SCR	$227,000	Dec-10			$11,350	$68,100	$90,800	$56,750	
46	Ghent 2 - Baghouse	$120,000	Apr-12					$4,800	$42,000	$56,400
47	Ghent 2 - PAC Injection	$6,109	Apr-13						$1,000	$4,109
52	Ghent 2 - Escalation	$66,928				$867	$8,135	$15,701	$21,028	$15,686
53	Total Ghent 2	**$420,037**				**$12,217**	**$76,235**	**$111,301**	**$120,778**	**$76,195**
54										
55	Ghent 3 - Baghouse	$138,000	Apr-12					$16,560	$48,300	$66,240
56	Ghent 3 - PAC Injection	$6,173	Apr-13						$3,087	$3,087
60	Ghent 3 - Escalation	$33,660				$0	$0	$2,720	$10,832	$17,972
61	Total Ghent 3	**$177,833**				**$0**	**$0**	**$19,280**	**$62,219**	**$87,298**
62										
63	Ghent 4 - Baghouse	$117,000	Apr-12					$11,700	$40,950	$58,500
64	Ghent 4 - PAC Injection	$6,210	Apr-13						$3,105	$3,105
68	Ghent 4 - Escalation	$28,990				$0	$0	$1,922	$9,287	$15,970
69	Total Ghent 4	**$152,200**				**$0**	**$0**	**$13,622**	**$53,342**	**$77,575**
70										
71	**Total Ghent**	**$921,461**				**$12,217**	**$76,235**	**$148,777**	**$293,065**	**$324,115**
72										

	L	M	N	O	P
1					
2					
3	2016	2017	2018	Total	
4					
5					
6				$59,000	$0
7				$34,000	$0
8				$1,599	$0
10				$4,000	$0
12				$15,476	$0
13	**$0**	**$0**	**$0**	**$114,075**	**$0**
14					
15				$92,000	$0
16	$1,020			$34,000	$0
17				$2,476	$0
20				$4,000	$0
22	$316			$21,300	$0
23	**$1,336**	**$0**	**$0**	**$153,776**	**$0**
24					
27	$9,150			$61,000	$0
28	$1,000			$5,426	$0
31	$3,142			$16,475	$0
32	**$13,292**	**$0**	**$0**	**$82,901**	**$0**
33					
34	**$14,628**	**$0**	**$0**	**$350,751**	**$0**
35					
36					
37	$19,650			$131,000	$0
38	$1,000			$6,380	$0
42	$6,393			$34,012	$0
43	**$27,043**	**$0**	**$0**	**$171,392**	**$0**
44					
45				$227,000	$0
46	$16,800			$120,000	$0
47	$1,000			$6,109	$0
52	$5,511			$66,928	$0
53	**$23,311**	**$0**	**$0**	**$420,037**	**$0**
54					
55	$6,900			$138,000	$0
56				$6,173	$0
60	$2,136			$33,660	$0
61	**$9,036**	**$0**	**$0**	**$177,833**	**$0**
62					
63	$5,850			$117,000	$0
64				$6,210	$0
68	$1,811	$0	$0	$28,990	$0
69	**$7,661**	**$0**	**$0**	**$152,200**	**$0**
70					
71	**$67,052**	**$0**	**$0**	**$921,461**	**$0**
72					

	A	C	D	E	F	G	H	I	J	K
73	**Mill Creek**									
74	Mill Creek 1 - FGD Upgrade	$41,250	Apr-12					$10,313	$28,875	$2,063
75	Mill Creek 1 - SCR	$97,020	Apr-12					$2,911	$27,166	$29,106
76	Mill Creek 1 - Baghouse	$80,850	Jul-11				$8,085	$28,298	$40,425	$4,043
77	Mill Creek 1 - Electrostatic Precipitator	$0					$0	$0	$0	$0
78	Mill Creek 1 - PAC Injection	$4,290	Jul-11				$429	$1,502	$2,360	
81	Mill Creek 1 - SAM Mitigation	$7,920	Apr-12					$396	$792	$2,376
83	Mill Creek 1 - Escalation	$52,077				$0	$1,017	$7,131	$21,000	$9,744
84	Total Mill Creek 1	**$283,407**				**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**
85										
86	Mill Creek 2 - FGD Upgrade	$41,250	Jul-11				$10,313	$28,875	$2,063	
87	Mill Creek 2 - SCR	$97,020	Jul-11				$2,911	$27,166	$29,106	$35,897
88	Mill Creek 2 - Baghouse	$80,850	Dec-10			$8,085	$28,298	$40,425	$4,043	
89	Mill Creek 2 - Electrostatic Precipitator	$33,000	Dec-10			$3,300	$11,550	$16,500	$1,650	
90	Mill Creek 2 - PAC Injection	$4,290	Dec-10			$429	$1,502	$2,360		
91	Mill Creek 2 - SAM Mitigation	$7,920	Jul-11				$396	$792	$2,376	$3,960
92	Mill Creek 2 - Escalation	$45,866				$903	$6,566	$19,070	$8,271	$10,332
93	Total Mill Creek 2	**$310,196**				**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**
94										
97	Mill Creek 3 - FGD (U4 update and tie in)	$63,750	Apr-13						$47,813	$15,938
98	Mill Creek 3 - FGD (Unit 3 Removal)	$25,500	Apr-13						$6,375	$19,125
99	Mill Creek 3 - Baghouse	$104,125	Jul-11				$2,083	$31,238	$39,568	$31,238
100	Mill Creek 3 - PAC Injection	$5,525	Jul-11				$111	$1,658	$2,100	$1,658
101	Mill Creek 3 - Escalation	$43,488				$0	$262	$5,402	$20,206	$17,617
102	Total Mill Creek 3	**$242,388**				**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**
103										
104	Mill Creek 4 - FGD	$236,250	Dec-10			$18,900	$80,325	$89,775	$47,250	
105	Mill Creek 4 - SCR Upgrade	$5,250	Dec-10			$4,200	$1,050			
106	Mill Creek 4 - Baghouse	$131,250	Dec-10			$5,250	$45,938	$52,500	$27,563	
107	Mill Creek 4 - PAC Injection	$6,825	Dec-10			$273	$2,389	$2,730	$1,433	
108	Mill Creek 4 - Ammonia	$10,500	Dec-10			$5,250	$5,250			
109	Mill Creek 4 - Escalation	$58,596				$2,588	$16,121	$23,815	$16,073	$0
110	Total Mill Creek 4	**$448,671**				**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**
111										
112	**Total Mill Creek**	**$1,284,663**				**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**
113										
114	**Trimble**									
115	Trimble 1 - Baghouse	$128,000	Apr-12					$12,800	$44,800	$64,000
116	Trimble 1 - PAC Injection	$6,451	Apr-13						$3,226	$3,226
117	Trimble 1 - Escalation	$31,635				$0	$0	$2,102	$10,124	$17,427
118	Total Trimble 1	**$166,086**				**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**
119										
120	**Total Trimble**	**$166,086**				**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**
121										
122	**Total Environmental Compliance Air - Alternate Plan**	**$2,722,961**				**$76,733**	**$377,241**	**$670,080**	**$803,294**	**$647,111**
123										
124										
125	Scope	$2,274,459								
126	Escalation	$448,502								
127		**$2,722,961**								

	L	M	N	O	P
73					
74				$41,250	$0
75	$35,897	$1,940		$97,020	$0
76				$80,850	$0
77				$0	$0
78				$4,290	$0
81	$3,960	$396		$7,920	$0
83	$12,340	$846		$52,077	$0
84	**$52,197**	**$3,182**	**$0**	**$283,407**	**$0**
85					
86				$41,250	$0
87	$1,940			$97,020	$0
88				$80,850	$0
89				$33,000	$0
90				$4,290	$0
91	$396			$7,920	$0
92	$723	$0		$45,866	$0
93	**$3,060**	**$0**	**$0**	**$310,196**	**$0**
94					
97				$63,750	$0
98				$25,500	$0
99				$104,125	$0
100				$5,525	$0
101	$0			$43,488	$0
102	**$0**	**$0**	**$0**	**$242,388**	**$0**
103					
104				$236,250	$0
105				$5,250	$0
106				$131,250	$0
107				$6,825	$0
108				$10,500	$0
109				$58,596	$0
110	**$0**	**$0**	**$0**	**$448,671**	**$0**
111					
112	**$55,257**	**$3,182**	**$0**	**$1,284,663**	**$0**
113					
114					
115	$6,400			$128,000	$0
116				$6,451	$0
117	$1,981			$31,635	$0
118	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
119					
120	**$8,381**	**$0**	**$0**	**$166,086**	**$0**
121					
122	**$145,319**	**$3,182**	**$0**	**$2,722,961**	**$0**
123					
124					
125					
126					
127					

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128										
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132										
133										
134						3.5%	3.5%	3.5%	3.5%	3.5%
135						1	2	3	4	5

	L	M	N	O	P
128					
129					
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131					
132					
133					
134	3.5%	3.5%	3.5%		
135	6	7	8		

	A	B	D	E	F	G	H	I	J	K	L	M	N
1		**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**											
2		$ in thousands											
3			**Capital Cost**		2011	2012	2013	2014	2015	2016	2017	2018	Total
4		**Alternate Plan**											
5	1	Brown 1 - SCR	$59,000		$2,950	$17,700	$23,600	$14,750					$59,000
6	1	Brown 1 - Baghouse	$34,000		$1,700	$11,900	$13,600	$6,800					$34,000
7	1	Brown 1 - SAM Mitigation	$4,000		$200	$1,200	$1,600	$1,000					$4,000
10	1	Brown 2 - SCR	$92,000		$9,200	$34,500	$43,700	$4,600					$92,000
11	1	Brown 2 - SAM Mitigation	$4,000		$200	$1,600	$2,200						$4,000
12	1	Ghent 2 - SCR	$227,000		$11,350	$68,100	$90,800	$56,750					$227,000
16	1	Mill Creek 2 - Baghouse	$80,850		$8,085	$28,298	$40,425	$4,043					$80,850
19	1	Mill Creek 2 - Electrostatic Precipitator	$33,000		$3,300	$11,550	$16,500	$1,650					$33,000
20	1	Mill Creek 2 - PAC Injection	$4,290		$429	$1,502	$2,360						$4,290
23	1	Mill Creek 4 - FGD	$236,250		$18,900	$80,325	$89,775	$47,250					$236,250
24	1	Mill Creek 4 - SCR Upgrade	$5,250		$4,200	$1,050							$5,250
28	1	Mill Creek 4 - Baghouse	$131,250		$5,250	$45,938	$52,500	$27,563					$131,250
29	1	Mill Creek 4 - PAC Injection	$6,825		$273	$2,389	$2,730	$1,433					$6,825
30	1	Mill Creek 4 - Ammonia	$10,500		$5,250	$5,250							$10,500
35	2	Brown 2 - Baghouse	$34,000			$1,360	$10,200	$10,880	$10,540	$1,020			$34,000
36	2	Mill Creek 1 - Baghouse	$80,850			$8,085	$28,298	$40,425	$4,043				$80,850
37	2	Mill Creek 1 - PAC Injection	$4,290			$429	$1,502	$2,360					$4,290
41	2	Mill Creek 2 - FGD Upgrade	$41,250			$10,313	$28,875	$2,063					$41,250
42	2	Mill Creek 2 - SCR	$97,020			$2,911	$27,166	$29,106	$35,897	$1,940			$97,020
46	2	Mill Creek 2 - SAM Mitigation	$7,920			$396	$792	$2,376	$3,960	$396			$7,920
47	2	Mill Creek 3 - Baghouse	$104,125			$2,083	$31,238	$39,568	$31,238				$104,125
48	2	Mill Creek 3 - PAC Injection	$5,525			$111	$1,658	$2,100	$1,658				$5,525
49	3	Brown 1 - PAC Injection	$1,599				$800	$800					$1,599
50	3	Brown 3 - Baghouse	$61,000				$1,830	$21,350	$28,670	$9,150			$61,000
53	3	Ghent 1 - Baghouse	$131,000				$3,930	$45,850	$61,570	$19,650			$131,000
55	3	Ghent 2 - Baghouse	$120,000				$4,800	$42,000	$56,400	$16,800			$120,000
56	3	Ghent 3 - Baghouse	$138,000				$16,560	$48,300	$66,240	$6,900			$138,000
57	3	Ghent 4 - Baghouse	$117,000				$11,700	$40,950	$58,500	$5,850			$117,000
58	3	Mill Creek 1 - FGD Upgrade	$41,250				$10,313	$28,875	$2,063				$41,250
59	3	Mill Creek 1 - SCR	$97,020				$2,911	$27,166	$29,106	$35,897	$1,940		$97,020
60	3	Mill Creek 1 - SAM Mitigation	$7,920				$396	$792	$2,376	$3,960	$396		$7,920
63	3	Trimble 1 - Baghouse	$128,000				$12,800	$44,800	$64,000	$6,400			$128,000
64	4	Brown 2 - PAC Injection	$2,476					$1,238	$1,238				$2,476
65	4	Brown 3 - PAC Injection	$5,426					$1,000	$3,426	$1,000			$5,426
66	4	Ghent 1 - PAC Injection	$6,380					$1,000	$4,380	$1,000			$6,380
67	4	Ghent 2 - PAC Injection	$6,109					$1,000	$4,109	$1,000			$6,109
68	4	Ghent 3 - PAC Injection	$6,173					$3,087	$3,087				$6,173
69	4	Ghent 4 - PAC Injection	$6,210					$3,105	$3,105				$6,210
70	4	Mill Creek 3 - FGD (U4 update and tie in)	$63,750					$47,813	$15,938				$63,750
71	4	Mill Creek 3 - FGD (Unit 3 Removal)	$25,500					$6,375	$19,125				$25,500
72	4	Trimble 1 - PAC Injection	$6,451					$3,226	$3,226				$6,451
73													
74													
75													

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71	$0
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76													
77													
78													
79					3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
80					1	2	3	4	5	6	7	8	

From: Ritchey, Stacy
To: Garrett, Chris
CC: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Sent: 10/4/2010 1:10:42 PM
Subject: RE: Environmental Air & CCR Ruling Summary
Attachments: Environmental Summary Breakdown 10-4-10 R1.xlsx

Chris,

Attached is the Environmental Summary file with the requested changes incorporated. Please let me know if you have any questions. Thanks.

Stacy Ritchey
Sr Budget Analyst
E.ON US - Project Engineering
820 West Broadway
Louisville, KY 40232
BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

From: Ritchey, Stacy
Sent: Thursday, September 30, 2010 3:49 PM
To: Garrett, Chris
Cc: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Subject: RE: Environmental Air & CCR Ruling Summary

Chris,

Per our conversation I will make the following changes:

-Add In Service dates to the Air Projects.
-Add a column and separate E.ON US Escalation/Overheads from E.ON US Estimates.
-On a separate schedule provide a yearly cash flow that does not include removal.

Thanks,

Stacy

From: Ritchey, Stacy
Sent: Thursday, September 30, 2010 2:36 PM
To: Garrett, Chris

Cc: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Subject: Environmental Air & CCR Ruling Summary

Chris,

The attached file contains a draft copy of the Environmental Air and CCR Ruling Summary. Scott is traveling and has not had a chance to perform a detailed review. If you have any questions please contact myself or Eileen. Thanks.

<< File: Environmental Summary Breakdown 9-30-10.xlsx >>

Stacy Ritchey
Sr Budget Analyst
E.ON US - Project Engineering
820 West Broadway
Louisville, KY 40232
BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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6	**Post 2015**
7	$0
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9	$0
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11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
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49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$25,500		$25,500	$0	$0		$0	$25,500
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$0**	**$43,488**		**$0**	**$242,388**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$0**	**$200,028**		**$0**	**$1,226,223**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,268,459**	**$40,000**	**$449,142**		**$2,500**	**$2,606,600**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
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92	**$148,501**
93	
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95	
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	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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1	
2	
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5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$0		$0	$0	$0		$0	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$216,888**		**$173,400**	**$0**	**$43,488**		**$0**	**$216,888**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,259,163**		**$1,059,135**	**$0**	**$200,028**		**$0**	**$1,200,723**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,732,101**		**$2,242,959**	**$40,000**	**$449,142**		**$2,500**	**$2,581,100**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
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	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

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	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$25,500		$0	$0	$0	$6,375	$19,125	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$242,388**	**$0**	**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,284,663**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,757,601**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**		

	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$0		$0	$0	$0	$0	$0	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$216,888**	**$0**	**$0**	**$2,455**	**$38,297**	**$109,686**	**$66,450**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,259,163**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$370,130**	**$163,970**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,732,101**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$796,919**	**$627,986**	**$145,319**	**$3,182**		

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,602,762		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From:	Saunders, Eileen
To:	Joyce, Jeff; Drake, Michael; Wright, Paul; Mooney, Mike (BOC 3); Revlett, Gary; Jones, Greg; Scott, Randy
CC:	Stockdale, Dianne
Sent:	10/4/2010 2:56:13 PM
Subject:	Agenda for B&V meeting
Attachments:	EON Ghent Kickoff Meeting Agenda.doc

All,

Please see the enclosed copy of the agenda for our meetings with B&V this week and please pass it along to others in your group who may be attending.

In general, the large group will meet Wednesday morning and discuss options for the Ghent Station and then a smaller group will conduct the site walk-downs. On Thursday, B&V will be available for a debriefing for anyone who can attend.

I will have a project coordinator available to escort B&V while they are on-site but if you can spare someone from operations or engineering to tour with the group Wednesday and Thursday, that would be great. The Mill Creek folks who toured with us over the 3 day period proved to be invaluable.

Lastly, please be thinking of someone you can assign to work with me to help coordinate data collection efforts in support of this project.

Thank you,

Eileen

AGENDA

Phase II Air Quality Control Study – Kickoff Meeting and Site Visit
E.ON - Ghent
October 6 - 7, 2010
Location: Ghent Generating Station

Day 1, October 6th, B&V Arrives 8 am

I. Introductions (Starts at 9 am)
II. Project/Scope Description (E.ON – Eileen S)
III. Environmental Drivers Presentation (E.ON – Gary R)
IV. Phase I Study Results/PJFF Overview Presentation (B&V – Rick L and Anand M)
V. Lunch (on site)
VI. Begin Escorted Site Walk Down and Data Collection

Day 2, October 7th, B&V Arrives 8 am

I. Continue Escorted Site Walk Down and Data Collection
II. Lunch (on site)
III. Site Debriefing Meeting
IV. Additional Walk Down Time if Required
V. Depart (no later than 4 pm)

From:	Saunders, Eileen
To:	Jackson, Audrey
Sent:	10/8/2010 3:54:21 PM
Subject:	FW: 168908.21.0100 100924 - Project Instruction Memorandum (PIM)
Attachments:	168908 EON Phase II AQC Study PIM 092410.pdf

From: Hillman, Timothy M. [mailto:HillmanTM@bv.com]
Sent: Friday, September 24, 2010 12:37 PM
To: Saunders, Eileen
Cc: 168908 E.ON-AQC; Jackson, Audrey; Mooney, Mike (BOC 3); Wehrly, M. R.; Lucas, Kyle J.; Hillman, Timothy M.
Subject: 168908.21.0100 100924 - Project Instruction Memorandum (PIM)

Eileen,

As we discussed in our kickoff meeting, please find attached a copy of the Project Instruction Memorandum (PIM). The purpose of the PIM is to summarize the procedures and information that will be used by Black & Veatch in support of developing the Phase II Air Quality Control (AQC) Study for E.ON. It is our understanding that E.ON may duplicate this procedure and file system for your own record and document storage.
Please let us know if you have any questions.

Best regards,

Tim Hillman | Project Manager
Power Generation - Environmental Services
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: (913) 458-7928
Email: hillmantm@bv.com

BLACK & VEATCH CORPORATION
Power Generation

PROJECT INSTRUCTIONS MEMORANDUM

E.ON
Air Quality Control Study

B&V Project 168908
B&V File 21.0100
September 24, 2010

To: Distribution

From: Tim Hillman

The purpose of this Project Instructions Memorandum (PIM) is to summarize the procedures and information that will be used by Black & Veatch in support of developing the Air Quality Control (AQC) Study for E.ON.

1.0 PROJECT ADMINISTRATION

1.1 Scope of Services: Black & Veatch will provide engineering services in accordance with E.ON U.S. Services Inc. Company CONTRACT No. 496789, Phase II: Air Quality Control Study for: E.W. Brown Units 1, 2, and 3, Ghent Units 1, 2, 3, and 4, and Mill Creek Units 1, 2, 3, and 4, dated September 08, 2010.

The purpose of this scope of work is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II). The Phase II scope of work is proposed for the Mill Creek, Ghent, and E.W. Brown facilities, and will be composed of the tasks listed below and deliverables listed in the contract to ensure that the study is properly defined, documented, and completed on time. It should be noted that there are some scope differences between the three facilities because of variations in the complexity of the future AQC equipment scenarios for each. These differences in study scope are noted in the contract in the appropriate tasks and reflected in the cost estimate. For the purpose of this project, E.ON's Mill Creek facility will be the first facility to begin the Phase II services, with the Ghent and E.W. Brown facilities to have a staggered kick-off delay of approximately 1 month each.

The following coal-fired units will be included in this study:

- Mill Creek –Units 1, 2, 3, and 4.
- Ghent –Units 1, 2, 3, and 4
- E.W. Brown –Units 1, 2 and 3.

The project includes the following major tasks:

Task 1 – Project Initiation, Kick-off, and Site Visit
Task 2 – Environmental Regulatory Considerations
Task 3 – Develop Project Instruction Memorandum
Task 4 – Project Management
Task 5 – Develop Project Design Memorandum
Task 6 – AQC Technology Validation/Selection
Task 7 – Develop Preliminary Conceptual Design
Task 8 – Project Cost Estimate

Task 9 – Implementation Schedule
Task 10 – Constructability Plan
Task 11 – Evaluation Report

1.2 Project Numbers: Black & Veatch project number 168908 has been assigned along with the following phases for these engineering activities:

Phase	Description
0100	Project Initiation
X010	Project Management
X020	Kick-off Meeting
X030	Regulatory
X040	Fabric Filter Specification
X050	AQC Validation
X060	Conceptual Design
X070	Cost Estimate
X080	Implementation Schedule
X200	Constructability Plan
X090	Report

Phase numbers will be specific for each facility. "X" will be 1 for Mill Creek, 2 for Ghent, and 3 for E.W. Brown facilities.

1.3 Black & Veatch Personnel

Following are the key Black & Veatch personnel assigned to the Implementation Plan for Emissions Control Upgrades.

Name	Position	Telephone	E-Mail
Tim Hillman	Project Manager	913-458-7928	hillmantm@bv.com
Mike King	Regional General Manager	313-618-8657	Kingml@bv.com
Kyle Lucas	Environmental & Assistant PM	913-458-9062	lucaskj@bv.com
Anand Mahabaleshwarkar	Lead AQCS Engineer	913-458-7736	mahabaleshwarkara@bv.com
Stacy Lawson	Project Support Assistant	913-458-2801	lawsonsj@bv.com
M.R. Wehrly	Engineering Manager/Lead Mechanical Engineer	913-458-7131	wehrlymr@bv.com
Rick Lausman	AQCS Engineer	913-458-7528	lausmanrl@bv.com
Monty Hintz	Lead Civil/Structural Engineer	913-458-2464	hintzme@bv.com

Name	Position	Telephone	E-Mail
Jim Bayless	Lead Control/Electrical Engineer	913-458-8107	baylessjw@bv.com
Mike Preston	Lead Chemical Engineer	913-458-2626	prestonmc@bv.com
Mark Dittus	Lead Steam Generation Engineer	913-458-7133	dittusm@bv.com
Jonathan Crabtree	Mechanical Engineer	913-458-2403	crabtreejd@bv.com
Mike Ballard	Construction Support Manager – Mill Creek	913-458-4341	ballardmw@bv.com
Roger Goodlet	Construction Support Manager – Ghent and E.W. Brown	913-458-4134	goodletrf@bv.com
Tim VanGilder	Project Controls Manager	913-458-8811	vangilderth@bv.com
Ron Fields	Lead Estimator	913-458-8531	fieldsrl@bv.com
Mirka Kramarikova	Accountant	913-458-8355	kramarikovam@bv.com

Correspondence to B&V should be directed to Tim Hillman with a copy to Kyle Lucas.

When it is necessary to correspond by US Postal Service or courier, the following addresses shall be used:

Black & Veatch Corporation
11401 Lamar Avenue
Overland Park, KS 66211

Attn: Mr. Timothy M. Hillman
Project: E.ON - AQC Study

Owner Personnel

Listed below are the key E.ON project personnel for the AQC Study:

Name	Position	Telephone	E-Mail
Corporate			
Eileen Saunders	Project Manager	502-627-2431 At Ghent: 502-347-4023.	eileen.saunders@eon-us.com
Mike Mooney	Budget Analyst	502-627-3571	Mike.mooney@eon-us.com
Audrey Jackson	Administrative Assistant		Audrey.Jackson@eon-us.com
Scott Straight	Director – Project Engineering	502-933-6559	Scott.straight@eon-us.com
Mill Creek			
Alex Betz	Mechanical Engineer – Mill Creek	502-933-6602	Alex.betz@eon-us.com
Ghent			
(Later)			
Brown			
(Later)			

All correspondence and documents that deal with either the general nature or specific details of the project should be directed to Eileen Saunders. Audrey Jackson shall be copied on all E-mail correspondence. Mike Mooney shall be copied on Monthly Reports and invoices.

Eileen Saunders should be copied on all correspondence directly to/from the specific facility.

When it is necessary to correspond to Eileen Saunders by US Postal Service or courier, the following address should be used:

E.ON U.S. Services, Inc.
Project Engineering
820 W. Broadway
Louisville, KY 40202

Invoices should be directed to:

Original: E.ON U.S. Services Inc.
820 West Broadway
Louisville, KY 40202
Attn: Judy Disney

Copy: E.ON U.S. Services Inc.
820 West Broadway
Louisville, KY 40202
Attn: Eileen Saunders

Copy: Mike Mooney – mike.mooney@eon-us.com

Invoice Information	CPA Number	
	Project #	TBA
	Task #	TBA
	E.ON U.S. Contact	Eileen Saunders
	Contractor Contact	Tim Hillman

CONTRACTUAL NOTICES

See the Article titled "Notices" in the Standard Terms for provisions governing contractual notices. In addition, a copy of all notices to E.ON U.S. Services Inc. shall be sent to:

E.ON U.S.'s address: E.ON U.S. Services Inc.
820 West Broadway
Louisville, KY 40202
Attn: Joe Clements
(502) 627-2760
E-mail: Joe.clements@eon-us.com

Contractor's Address: Mike King, P.E.
Regional General Manager
Black & Veatch
3550 Green Court
Ann Arbor, MI. 48105
Phone: (734) 622-8516
Fax: (734) 622-8700
E-mail: kingml@bv.com

Copy to: Tim Hillman
Project Manager
Black & Veatch
11401 Lamar Avenue
Overland park, KS 66211
Fax: (913) 458-7928
E-mail: hillmantm@bv.com

1.5 Document Control

All correspondence, memoranda, and other documents shall indicate the B&V project and file number(s). B&V project files will be maintained in the bvdocs docbase in Documentum by the Project Support Assistant. The project mailbox (168908 E.ON-AQC@bv.com) shall be included on distribution of all electronic files for that purpose. All e-mail correspondence shall also include the B&V project number, file number, date (yymmdd format), Facility and Unit Number, and a general description of the topic (e.g. 168908.21.0000 100912 Mill Creek Unit 1 Program Instructions) in the subject line.

Any documents received that are not practical to scan and place in Documentum will be placed into a traditional "hardcopy" file.

All correspondence sent to E.ON shall also be sent to E.ON's internal Administrative Assistant at Audrey.Jackson@eon-us.com.

1.6 Electronic File Transfer

E-mail will normally be used for the transfer of most electronic files between E.ON and B&V as well as to third parties. Larger files and data will be made available to the appropriate parties by using IBackup which is a web based data storage service. Once iBackup database has been established for this project, access instructions and passwords will be issued. An IBackup account has been established for each E.ON site. B&V will distribute the usernames and passwords to E.ON site contacts.

1.7 File System

The file numbers (attached) have been extracted from the standard Black & Veatch file system and will be used. When it is necessary to expand this list, B&V's standard file system shall be utilized for obtaining new file numbers. The Project Support Assistant is responsible for maintaining this list and keeping it up to date.

E.ON is setting up a similar file structure for their internal use. All correspondence to E.ON shall be copied to their Administrative Assistant at Audrey.Jackson@eon-us.com

2.0 Project Schedule:

Major Milestone Schedule			
Activity	**Mill Creek**	**Ghent**	**Brown**
Notice to Proceed	Aug 26, 2010	Aug 26, 2010	Aug 26, 2010
Project Kickoff and Site Visit Meeting (Task 1)	Sep 14, 2010	Oct 4, 2010	Nov 8, 2010
Begin AQC Validation (Task 6)	Sep 7, 2010	Oct 11, 2010	Nov 15, 2010
Select AQC Technologies - Meeting (Task 6)	Nov 8, 2010	Dec 6, 2010	Jan 10, 2011
Begin Conceptual Design (Task 7)	Nov 15, 2010	Dec 13, 2010	Jan 17, 2011
Begin Cost Estimate (Task 8)	Dec 13, 2010	Jan 10, 2011	Feb 7, 2011
Issue Draft Report (Task 11)	Feb 7, 2011	Mar 14, 2011	Apr 11, 2011
Final Report – Presentation Meeting (Task 11)	Mar 7, 2011	Apr 11, 2011	May 7, 2011

2.1 Progress Reporting

Face-to-face meetings and/or conference calls will be carried out as appropriate. Weekly meetings will typically take place by telephone. B&V will prepare meeting agendas and an action item list for weekly meetings. In addition, monthly progress reports will be prepared by B&V and issued to E.ON.

2.2 Action Item List

B&V will prepare and maintain an Action Item List to track status of pending actions and to identify responsible parties. This document will be reviewed and updated as part of each weekly meeting or conference call. The Action Item List shall contain specific sections for General, Mill Creek, Ghent, and E.W. Brown.

3.0 Conceptual Design

Any documents to be prepared by B&V including sketches, drawings, and calculations, will be prepared in standard B&V format. Drawings and sketches will be numbered in accordance with B&V standard practice.

4.0 Procurements

B&V's scope includes development of technical specifications for the purchase and erection of Fabric Filters for the various units requiring Fabric Filters as part of the AQC Study. Specifications will include technical specifications developed by B&V along with Front End Documents and General Conditions as developed by E.ON.

5.0 PIM Distribution:

E.ON

Eileen Saunders (All by e-mail)
Mike Mooney
Audrey Jackson

Black & Veatch

Tim Hillman (All by e-mail)
Kyle Lucas
Anand Mahabaleshwarkar
Stacy Lawson
M.R. Wehrly
Monty Hintz
Jim Bayless
Mike Preston
Mark Dittus
Jonathan Crabtree
Mike Ballard
Roger Goodlet
Tim VanGilder
Ron Fields
Mirka Kramarikova
Mike King
Rick Lausman

FILE NUMBER LIST

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
10.0000	Project Administration
10.1000	Proposal Management
10.1100	Proposal Correspondence
10.2000	Proposal
10.2200	Project Cost & Schedule
10.2224	Engineering Rates
10.2240	Schedule
11.0000	Contracts (Agreements)
11.1000	Contract with Owner (B&V/Owner, JV/Owner, Consortium/Owner)
11.1200	Contract Documents
11.1210	Master Services Agreements
11.1300	Invoicing Correspondence & Payments
11.1400	Change Orders
11.1410	Change Order Requests
11.1500	Contract Correspondence
11.4200	Project and Phase Opening/Closing/Updates
11.4300	Project Reports
12.0000	Consultant Subcontracts (Subconsultant Agreements)
13.0000	Client/Owner Third Party Agreements
14.0000	Internal Communication
14.1000	Meetings & Conferences (Agenda/Minutes)
14.1100	Conference - B&V/Owner
14.1200	Conference - B&V/Others/Owner
14.1300	Conference - Owner and/or Owner/Others
14.1400	Conference - B&V
14.3000	General
14.4000	B&V/Client General Communications (Note - Limit use of this folder)
14.4100	B&V/Client Correspondence
15.0000	Public Information/Relations
17.0000	Environmental, Safety, Health and Security
18.0000	Quality Assurance
20.0000	Project Management
21.0100	Project Instructions Manual/Memorandum
21.0120	File System
21.1100	Project Contact and Distribution List
21.2000	Staffing Plan
21.2100	Engineering Budget/Resource Allocation
22.0000	Design Management
22.1000	Project Design Memorandum and Project Design Basis Document
22.5000	Drawing Numbering System
24.0000	Schedule Management
24.2000	Project Schedules (also see 41.0807)
25.0000	Financial Management
25.2000	Owner Cost Estimate
25.5200	O&M Costs
25.5500	Project Cost and Invoice Spreadsheet
25.5600	Manhour Tracking
26.0000	Information Management

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
26.1000	IT Plan
26.1100	Drop Zone
26.1200	VOIP
26.1300	Documentum
26.1400	B&V Letter Log
26.1500	Project Mailbox
26.6000	Engineer's Drawings (Lists)
26.6100	B&V Drawing Log
26.7000	Manufacturers' Drawings (Lists)
28.0000	Progress Reports
28.3000	Action Item Summary
28.5000	Project Progress Reports
30.0000	Permits, Licensing & Regulatory Requirements
32.0000	Regulatory Requirements/Issues
33.3000	Environmental Reports
34.0000	Permits
40.0000	Engineering Studies & Analysis
41.0000	General Studies, Fixed Criteria, Natural Phenomena
41.0100	Information, Drawings, and Photos
41.0130	Permit Data
41.0140	Engineering Data
41.0141	Owner Civil-Str Data
41.0142	Owner Mech Data (Including Fuel)
41.0143	Owner Elect Data and Assumptions Memo
41.0144	Owner Control Data
41.0145	Owner Chem-Water Data
41.0147	Economic Criteria
41.0149	Owner Performance, Staffing, and Other Data
41.0150	Existing Drawings
41.0151	Owner Civil-Str Dwgs
41.0152	Owner Mech Dwgs
41.0153	Owner Elect Dwgs
41.0154	Owner Control Dwgs
41.0155	Owner Chem-Water Dwgs
41.0160	Photographs
41.0161	Aerial Photos
41.0162	B&V Photos of Site
41.0163	Photos from EON Personnel
41.0402	Site Arrangement
41.0800	Generation Plant Planning
41.0801	Auxiliary Loads
41.0809	Emissions Study
41.0803.1	Project Design Memorandum (PDM)
41.0803.2	Technology Description
41.0803.3	BACT-Level Cost Estimate
41.0803.4	Analyses
41.0803.5	Study of Alternatives
41.0804	Modifications, Interfaces and Tie-Ins to Existing Equipment and Systems

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
41.0805	Cost Estimate and Assumptions
41.0805.1	O&M Costs
41.0805.2	Owner's Costs
41.0805.3	Contingency
41.0805.4	Escalation
41.0806	Integrated Resource Plan (IRP) Support
41.0807	Level 1 Schedule
41.0807.1	Decision Point Schedule
41.0808	Report
41.0808.1	Executive Summary
41.0809	Auxiliary Electric System Analysis
41.0810	Chimney Analysis
41.0811	SCAT (M10) Runs
41.0812	Scrubber Water Mass Balances
41.0813	Constructability Review
41.0814	Higher Air Heater Outlet Temperatures
50.0000	Engineering Design (Calculations, Drawings, etc.)
60.0000	Plant Equipment Procurement
70.0000	Construction & Constructability Review
80.0000	Construction Management
90.0000	Project Completion

From:	Lucas, Kyle J.
To:	Saunders, Eileen
CC:	168908 E.ON-AQC; Jackson, Audrey; Wehrly, M. R.; Hillman, Timothy M.; Crabtree, Jonathan D.; Lawson, Stacy J.
Sent:	10/5/2010 1:48:44 PM
Subject:	168908.22.1000 101005 - Mill Creek Project Design Memorandum (PDM)
Attachments:	EON Mill Creek Project Design Memo.doc

Eileen,

As defined in our scope of work under Task 5, attached please find a copy of the Project Design Memorandum (PDM) for the Mill Creek Plant. The purpose of the PDM is to summarize and define the technical and functional requirements on which the Mill Creek Phase II AQC study will be based. The PDM is a dynamic document subject to change as new project information is made available, but B&V will control this document and will be responsible for updates and revisions.

This PDM document includes Mill Creek project specific information and was built upon the initial design basis prepared for the Phase I project; however, Phase II requires additional information. Thus, there are several tables that require specific input from E.ON. Please review the document and use the "track changes" feature of the Word software to include your comments and the additional project data. We would request comments from E.ON no later than Tuesday 10/12/10.

Please let us know if you have any questions.

Regards,
Kyle

Kyle Lucas | Environmental Permitting Manager
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: **(913) 458-9062** | Fax: **(913) 458-9062**
Email: **lucaskj@bv.com**

E.ON – Mill Creek Station

Phase II Air Quality Control Study

Project Design Memorandum

October 5, 2010
Revision B – Issued For Client Review

B&V File Number 22.1000

BLACK & VEATCH
Building a **world** of difference®

Black & Veatch Corporation ▪ 11401 Lamar ▪ Overland Park, KS 66211
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www.bv.com

Table of Contents

Appendices

Tables

Figures

1.0 Project Description

1.1 Introduction

1.1.1 Purpose

This site-specific Project Design Memorandum document defines the technical and functional requirements on which the Mill Creek Phase II Air Quality Control Study will be based. The stated functional and technical requirements include E.ON US (E.ON) requirements and are applicable to the Mill Creek portion of the overall project. Separate PDMs will be developed for other stations included in the overall project.

1.1.2 Organization of the Document

This Project Design Memorandum document is organized into various sections covering scope of work, environmental, and engineering criteria and requirements. Additional sections may be added during other phases of the project.

1.1.3 Revisions

The Project Design Memorandum document is dynamic in nature. Black & Veatch (B&V) controls this document and is thus responsible for updates and revisions. It is anticipated that this document will be periodically updated and potentially expanded during the life of the project as additional data and specific design criteria become available.

1.2 Overview

E.ON currently owns and Louisville Gas & Electric (LG&E) operates the Mill Creek Station. The purpose of this Phase II air quality control study is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II) for three different facilities, including Mill Creek. Similar studies will be performed for the Ghent and E.W. Brown facilities. Each facility will have a specific project design memorandum.

The Mill Creek Station is located in southwestern Jefferson County, approximately 10.5 miles southwest of the city of Louisville, Kentucky, on a 509 acre site. Mill Creek Station includes four coal fired electric generating units with a gross total generating

capacity of 1,608 MW. Mill Creek Station Unit 1 was placed in service in 1972, Mill Creek Station Unit 2 was placed in service in 1974, and Mill Creek Station Unit 3 was placed into service in 1978 and Mill Creek Station Unit 4 was placed into service in 1982.

All four steam generators (boilers) fire high sulfur bituminous coal. Each Mill Creek Station unit is composed of one GE reheat tandem compound, double-flow turbine with a condenser and hydrogen-cooled generator. Units 1 and 2 each consist of one Combustion Engineering subcritical, balanced draft boiler and have a gross capacity of 330 MW each. Units 1 and 2 are equipped with Low NO_x Burners (LNBs) and Overfire Air (OFA) for nitrogen oxide (NO_x) control, a cold-side dry Electrostatic Precipitator (ESP) for particulate matter (PM) control, and a Wet Flue Gas Desulfurization (WFGD) for sulfur dioxide (SO_2) and hydrogen chloride (HCl) control. Units 3 and 4 each consist of one Babcock & Wilcox (B&W) balanced draft, Carolina type radiant boiler and have a gross capacity of 423 MW and 525 MW, respectively. Units 3 and 4 are equipped with LNBs and Selective Catalytic Reduction (SCR) for NO_x control, a cold-side dry ESP for PM control and a WFGD for SO_2 and HCl control.

Gypsum, a scrubber by-product, produced at Mill Creek is either stored in the on-site landfill or sold for use in manufacture of wall board for the home construction industry. Fly ash is either stored in the on-site landfill or sold for beneficial reuse to the concrete industry. Bottom ash is sluiced to on-site storage ponds. Initially, all four units were cooled using water from the nearby Ohio River; however, Units 2, 3, and 4 were retrofitted with mechanical draft cooling towers.

The following is a summary of basic project information.

- Project Name: Phase II Air Quality Control Study – Mill Creek Station
- Client/Owner: E.ON US (E.ON)
- Operator: Louisville Gas & Electric (LG&E)
- Engineer & Regulatory Consultant: Black & Veatch Corporation (B&V)
- Project Site Location: Louisville, Kentucky (refer to Figure 1-1 and Figure 1-2)
- Project Type/Size: Retrofit of Environmental/Air Quality Control equipment for existing units.
- On-Site Work: Start Construction – [LATER]
- In Service Date: 2013 to 2017 [E.ON CONFIRM]
- Fuel: High Sulfur Western Kentucky Bituminous Coal from Illinois Basin, Natural Gas for startup
- Water Source: Well Water, City Water, Ohio River Water

North

South

Figure 1-1
Mill Creek Power Plant Site

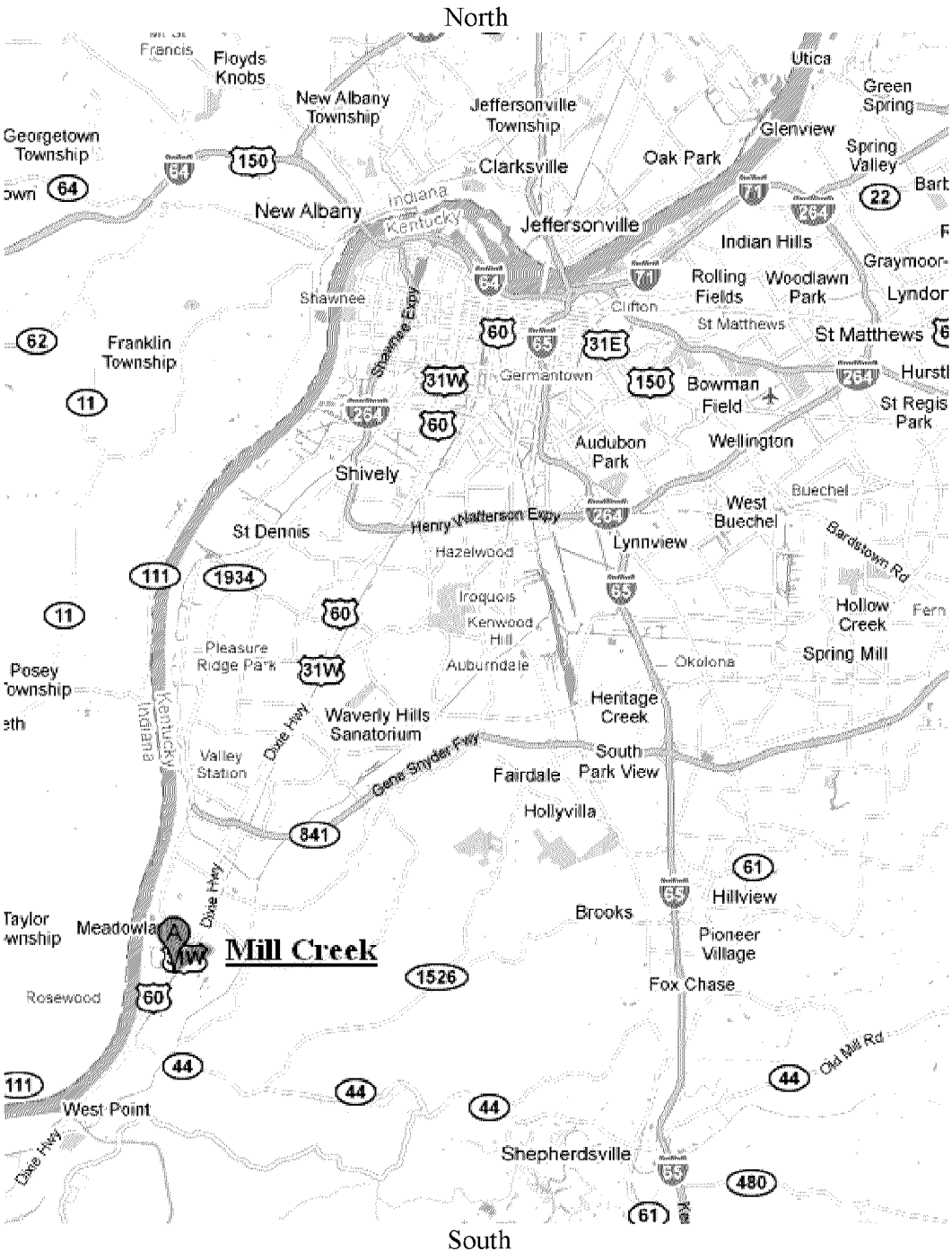


Figure 1-2
Mill Creek and Surrounding Area Map

Existing Facilities:

• Existing On Site Generation Units:	• Unit 1 - 330 gross MW (in-service date 1972) • Unit 2 - 330 gross MW (in-service date 1974) • Unit 3 - 423 gross MW (in-service date 1978) • Unit 4 - 525 gross MW (in-service date 1982)
• Existing Air Quality Control Equipment:	• Unit 1 - Low NO_x Burners (LNBs), Overfire Air System (OFA), Cold-side Dry Electrostatic Precipitator (ESP), Wet Flue Gas Desulfurization (WFGD) • Unit 2 - LNBs, OFA, Cold-side Dry ESP, WFGD • Unit 3 - LNBs, Selective Catalytic Reduction (SCR), Cold-side Dry ESP, WFGD • Unit 4 - LNBs, SCR, Cold-side Dry ESP, WFGD
• Site Access:	Site is located in Jefferson County, Louisville, Kentucky, on the east side of the Ohio River, approximately 10.5 miles southwest of the city of Louisville, near Meadowlawn with access on Lee Driveway off of Dixie Highway (US 60).

1.3 Scope of Work

A summary of the current scope of work is provided below. Refer to Appendix A for the complete scope of work. Project scope items provided by others, but requiring technical interface, are also listed below.

- Project Kick-off Meeting & Site Visit
- Environmental Regulatory Considerations
- Develop Project Instruction Memorandum
- Project Management
- Develop Project Design Memorandum
- AQC Technology Validation and Selection
- Develop Preliminary Conceptual Design

- Project Cost Estimate
- Implementation Schedule
- Constructability Plan
- Evaluation Report
- Fabric Filter Letter Specification and Vendor Workshop

Project Elements being provided by others:

- Permitting – E.ON Environmental Affairs Department
- Existing Scrubber Condition and Upgrade Evaluation - Vendors

1.4 Governing Building Code

The governing local building code is the Kentucky Building Code, Ninth Edition (2006 International Building Code (IBC), as specifically amended).

1.5 Design and Performance

This section summarizes major plant and scope of work interfaces. When fuel or utilities are considered, the following defined properties shall be used as the design basis.

1.5.1 Unit Performance

Plant design is based on the criteria listed in Table 1-1.

Table 1-1
Performance Design Basis

Parameter	Basis Value
Ambient Temperature	77 °F Dry Bulb
Ambient Pressure	29.49 in Hg
Ambient Humidity	60.0 % Relative Humidity
Fuel Analysis	Refer to Subsection 1.5.2

1.5.2 Fuel Specifications

All four Mill Creek units burn high sulfur, western Kentucky, bituminous coal from the Illinois Basin. Refer to Appendix B, Design Basis, for main fuel specifications.

Startup fuel is natural gas.

1.5.3 Water

1.5.3.1 Quality Requirements. Water quality characteristics for water to be used as the source for the AQC systems are listed in Table 1-2.

1.5.3.2 Water Balance. The design basis water balance for the new Mill Creek Unit 4 WFGD systems will be provided separately. The water balance for the other units is assumed to remain the same as current operation.

Table 1-2
Design Basis Water Analysis
[E.ON TO PROVIDE]

Constituent	Well Water	City Water	Ohio River Water
	mg/L as such	mg/L as such	mg/L as such
Calcium			
Magnesium			
Sodium			
Potassium			
Total Cations, mg/L as $CaCO_3$			
M-alkalinity, mg/L as $CaCO_3$			
Sulfate			
Chloride			
Nitrate			
Silica			
Total Anions, mg/L as $CaCO_3$			
pH (range)			
Specific Conductance, µS/cm			
Temperature (range), °F			
Total Suspended Solids			
Total Dissolved Solids			
Turbidity, NTU			
Color, PCU			
Total Phosphate, mg/l as PO_4			

Table 1-2 (continued)
Design Basis Water Analysis

Constituent	Well Water	City Water	Ohio River Water
	mg/L as such	mg/L as such	mg/L as such
Aluminum			
Barium			
Boron			
Cadmium			
Chromium			
Copper			
Iron			
Manganese			
Nickel			
Strontium			
Zinc			

References:
•

1.5.4 Emissions

Plant design is based on the primary target emissions criteria defined in Table 1-3.

Table 1-3
Primary Design Emission Targets

Pollutant	Unit 1	Unit 2	Unit 3	Unit 4
NO_x	0.139 lb/MBtu	0.139 lb/MBtu	0.139 lb/MBtu	0.139 lb/MBtu
SO_2	0.25 lb/MBtu	0.25 lb/MBtu	0.25 lb/MBtu	0.25 lb/MBtu
Sulfuric Acid Mist (SAM)	N/A	N/A	64.3 lb/hr	76.5 lb/hr
Mercury (Hg)	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh
HCl	0.002 lb/MBtu	0.002 lb/MBtu	0.002 lb/MBtu	0.002 lb/MBtu
Particulate Matter[1, 2]	0.03 lb/MBtu	0.03 lb/MBtu	0.03 lb/MBtu	0.03 lb/MBtu
Arsenic (As)[3]	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu
CO	0.10 lb/MBtu	0.10 lb/MBtu	0.10 lb/MBtu	0.10 lb/MBtu
Dioxin/Furan	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu

[1] Particulate matter control limits for $PM_{2.5}$ or $PM_{condensable}$ have not been determined for this project.
[2] Particulate matter assumed to be the surrogate for emissions of certain non-mercury metallic HAP (i.e., antimony (Sb), beryllium (Be), cadmium (Cd), cobalt (Co), lead (Pb), manganese (Mn), and nickel (Ni)).
[3] Arsenic assumed to be the surrogate for non-mercury metallic HAP (i.e., arsenic (As), chromium (Cr), and selenium (Se)).

Data from E.ON Mill Creek kickoff meeting of September 15, 2010 (Gary Revlett handouts and meeting notes).

1.5.5 Bulk Material

The following bulk materials may be associated with this project:

- Limestone will be used as a reagent in the WFGD systems.
- Pebble or powdered lime may be used if a dry scrubber is included on any of the units for SO_3 control and support of SO_2 control.
- Powder Activated Carbon (PAC) will be used for Hg control
- Fly ash will be collected dry from the precipitator and fabric filter.

1.5.5.1 Limestone Handling and Storage. Refer to Table 1-4 for the limestone properties.

Table 1-4
Limestone Properties
[E.ON TO CONFIRM]

Dry Basis, Percent (%) by Weight	Nominal	% Guaranteed
Calcium Carbonate, $CaCO_3$	94%	90% minimum
Magnesium Carbonate, $MgCO_3$	3%	6% maximum ~~(1.5% max insoluble)~~
Silica Dioxide, SiO_2	-	3.5% maximum
Ferric Oxide, Fe_2O_3	-	1.5% maximum
Aluminum Oxide, Al_2O_3	-	4.3% maximum
Total Inerts (non $CaCO_3$)	6%	7% maximum
~~Moisture~~	~~5%~~	~~12% maximum~~
Bond Work Index (kWh/t)	12	12 maximum ~~4 minimum~~
Surface Moisture	12%	7% maximum
Fluorides	500	ppm
Chlorides	550	ppm
Bulk Density Design Basis		
Volumentric Sizing	55	pcf
Structural Loading	115	pcf
Angle of Repose	30	degree
Surcharge Angle	25	degree
Maximum lump size	¾	inch

Data from Environmental Compliance Project Quality Data spreadsheet.

1.5.5.2 Pebble Lime Handling and Storage. Refer to Table 1-5 for the pebble lime properties.

Table 1-5
Pebble Lime Properties

Proximate Analysis, Dry Basis, Percent (%) by Weight	Nominal	Range
Available Calcium Oxide (CaO) Content	90.00	90% minimum
Magnesium Oxide (MgO) Content	0.00	0 – 5%
Inert	10.00	5 – 10%
Total	100.00	--
Bulk Density Design Basis		
Volumentric Sizing	55	pcf
Structural Loading	110	pcf
Angle of Repose	30	degree
Surcharge Angle	25	degree
Maximum lump size	3/4	inch

1.5.5.3 Powdered Lime Handling and Storage. Refer to Table 1-6 for the powdered lime properties.

Table 1-6
Powdered Lime Properties

Bulk Density Design Basis		
Volumentric Sizing	60	pcf
Structural Loading	85	pcf

1.5.5.4 Powdered Activated Carbon (PAC) Handling and Storage. Refer to Table 1-7 for the powdered activated carbon properties.

Table 1-7
Powdered Activated Charcoal Properties

Bulk Density Design Basis		
Volumentric Sizing	15	pcf
Structural Loading	35	pcf

1.5.5.5 Fly Ash from Precipitator/Fabric Filter Handling and Storage. Refer to Table 1-8 for the pebble lime properties.

Table 1-8
Fly Ash Properties

Bulk Density Design Basis		
Volumentric Sizing	65	pcf
Structural Loading	90	pcf

1.5.6 Classification of Hazardous Areas

Electrical equipment, materials, raceway and wiring will be selected, designed, and installed in accordance with NFPA-70 [NEC].

1.5.7 Future Expansion Considerations

The arrangement of the facility will be based on the configuration of the existing units. No additional units or future expansion is planned. Equipment layouts of the air quality control options must leave room for the modification or addition of biomass utilization and ash handling equipment as identified in the recently completed Black & Veatch Mill Creek Biomass Co-Firing Study dated August 23, 2010.

1.6 Permits and Licenses

1.6.1 Permits

The Environmental Affairs Department of E.ON US is responsible for identifying and obtaining the necessary Federal, State and Local permits required to construct and operate the facility and associated equipment. B&V is contracted to coordinate with the environmental counterpart at E.ON US, and provide guidance relevant to regulatory scenario planning to ensure project conceptual design is compliant with applicable federal, state, and local statutes and regulations.

1.7 Site Investigations

1.7.1 Surveys and Topography

The general area of the Mill Creek site under consideration for siting the AQC equipment has been developed as part of the existing plant installation and additional improvements. General site arrangement drawings covering the existing site were developed previously and are available for use in this study. However, several subsequent improvements have been completed in the area and the data on some of the older drawings may not be up to date. The existing drawings are sufficient for purposes of this study with regard to available space and topography, but a full survey of the as-built conditions is recommended before start of detailed design to ensure the latest information is used.

1.7.1.1 Underground Utilities. Relatively extensive existing underground utilities are located in the general area under consideration for the AQC improvements. The expected locations of underground utilities are documented on existing drawings, but

again the degree of completeness and accuracy may be suspect. The existing drawings are adequate for purposes of the AQC study, but a survey of existing underground utilities should be completed prior to detailed design.

1.7.2 Geology and Seismology

Several site-specific geotechnical investigations have previously been completed to support onsite modifications since original construction. Included in these investigations are the following.

- Geotechnical Engineering Investigation, Proposed SCR Unit, Mill Creek Generating Station, ATC Associates, Inc., 2001
- Soil Test Borings, Mill Creek Generating Station, Compilation of Various Soil Boring Logs Completed by Testing Services Corp., Raymond International, Greenbaum Associates, Pittsburg Testing Labs, and ATEC Associates dating back to 1967
- Test Boring Logs, Mill Creek Generating Station, Drawings CA-10621and CA-10622, IU Conversion Systems, Inc., 1980

This information was reviewed for general characteristics applicable to the areas under consideration for the AQC improvements. In general, the existing documentation noted indicated the following subsurface conditions.

- During original construction the area received significant amount of fill material varying from small areas of very soft clay to general areas of medium stiff clay and silty clay with some coarse construction rubble. Fill depth varied from 20 to 40 feet in depth.
- Below the fill, a natural soft clay exists to an approximate depth of 40 feet.
- Below 40 feet, the natural soil consisted of stiff to very stiff sandy clay extending to a depth of 70 to 90 feet.
- A stratum of very dense fine silty to coarse sand exists below the sandy clay to a maximum depth of 100 feet.
- A hard gray shale exists below this depth.
- Groundwater elevation varies with the pool elevation of the nearby river, but was expected at approximately 75 feet below grade. However, perched water above that elevation is likely in pockets of granular soil.

Based on the information above as well as foundations previously installed at the site, for purposes of the AQC study, new foundations for substantial structures will be assumed as driven piles or drilled piers with a safe working capacity of 150 ton in compression. Nominal length of driven piles is assumed at 90 feet for estimating purposes. Light

structures not subject to significant overturning can be assumed to be supported on shallow footing or raft foundations extending below the frost line. Shallow foundations will be designed based on an allowable bearing pressure of 3.0 ksf.

Prior to start of detailed design, additional geotechnical investigation should be completed to more exactly determine the geotechnical design parameters in the immediate area of the proposed improvements.

1.7.3 Hydrology

The site in the area of the AQC improvements is fully developed. Hydrology and storm event design have previously been established and will not be modified unless required. The addition of runoff volume due to any increase in impermeable surfaces resulting form the AQC modifications will be evaluated and the impact to existing stormwater systems estimated as a part of the study. Modifications to existing stormwater systems, if any, deemed necessary by the improvements proposed by the study will be recommended.

1.7.4 Noise

The project's conceptual engineering for noise control will be based on compliance with OSHA requirements and local noise restrictions, as applicable.

1.8 Environmental Design Criteria

1.8.1 Meteorology

Table 1-9 summarizes the meteorological data applicable to plant design. Wind data for the indicated location have been analyzed to develop the wind roses which are included in Appendix C.

Table 1-9
Meteorological (Ambient and Extreme) Data

Design Parameter	Design Value	Units
Rainfall – 24 Hour, 10 Year Event (Design rainfall parameter may vary depending on local codes or agencies.)	4.55(A)	inches
Rainfall – 24 Hour, 25 Year Event (Design rainfall parameter may vary depending on local codes or agencies.)	5.43(A)	inches
Rainfall – Average Annual Total	44.54(B)	inches
Design Rain Rate (100 year recurrence)	3.2(C)	inches per hour
Evaporation Rate – Annual Average NWS Class A Evap Pan	51.13(D)	inches
Design Wind Speed	90*(C, I)	mph
Structural Category for Wind (Table 1-1)	III(E)	
Wind Importance Factor, I_w (Table 6-1)	1.15(E)	
Wind Design Exposure (Chapter 6)	Category C(E)	N/A
Average Wind Speed	8.3(F)	mph
Prevailing Wind Direction (from)	South-southwest (G)	
Frost Depth (50 Year Recurrence)	32(C)	inches
Snow Load – Ground, p_g	15(I)	lb/ft^2
Snow Importance Factor, I_s	1.1(E)	
Open Structure Icing Design Conditions	0.75 inches ice thickness with 30 mph concurrent wind speed(I)	
Freeze Protection Design Conditions	-23.1°F (H) DB with 8.3 (F) mph coincident wind	
Annual Barometric Pressure, adjusted to site elevation	29.49(C)	in. Hg
Design Ambient Temp (Extreme High)	105.4 DB(H)	°F
Design Ambient Temp (Extreme Low)	-23.1 DB(H)	°F
Design Annual Average Ambient Temp	56.9(B)	°F
Winter Design (Dec-Feb) Ave Temp	36.1(B)	°F
Summer Design (Jun-Aug) Ave Temp	76.5(B)	°F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 1.0%)	91.2 DB(H) 75.3 MCWB(H)	°F °F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 2.0%)	89.0 DB(H) 74.3 MCWB(H)	°F °F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 99.0%)	14.5 DB(H) 13.0 MCWB(C)	°F °F

Notes:
Design conditions based on ASHRAE 2009 data for: Louisville, KY
Approximate Location (Google Earth): Latitude: 38.05N Longitude: 85.91W Elevation: 465 ft MSL
*3-second gust at 33 ft. above ground
References:
(A)National Weather Service- Hydrometeorological Design Studies Center.
(B)National Climatic Data Center (NCDC) Climate 20-Climate Normals; Louisville, KY.
(C)Engineering Weather CD, "Summary for Louisville, KY 1973-1996," Engineering Weather Data, 2000 Interactive Edition, 2001, Version 1.0, [CD].
(D)Technical Memorandum No. 34 from NWS, 1982.
(E)ASCE 7-05.
(F)NCDC United States Average Wind Speeds for US cities; Louisville, KY. Based upon 55 years of data, through 2002.
(G)Wind roses from Integrated Surface Hourly Data (ISH) 1995-2008 data for Louisville, KY.
(H)National Climatic Data Center (NCDC), "2009 ASHRAE Handbook Annual Summary with Comparative Data for Louisville, KY."
(I)Kentucky Building Code, Ninth Edition

1.8.2 Site Seismicity

Table 1-10 summarizes Seismicity parameters applicable to plant design. Table references are to ASCE 7 as referenced by the Kentucky Building Code.

Table 1-10
Seismicity Data

Design Parameter	Value
Building Code	Kentucky Building Code (IBC 2006 as specifically amended)
Building Use/Occupancy Category (main plant structures)	III
Seismic Importance Factors	1.25
Site Class (based on assumed soil profile)	D
Spectral Response Accelerations: 0.2 second response (S_s) 1.0 second response (S_1)	 Ss = 0.272 S1 = 0.110
Adjusted maximum considered earthquake response acceleration parameters: F_a (site coefficient from Table 11.4-1) F_v (site coefficient from Table 11.4-2)	 Fa = 1.58 Fv = 2.36
Maximum considered spectral response accelerations: S_{MS} (short periods; Fa * Ss) S_{M1} (1-second period; Fv * S_1)	 SMS = 0.430 SM1 = 0.260
Design spectral response acceleration parameters: S_{DS} = 2/3 (SMS) S_{D1} = 2/3 (SM1)	 SDS = 0.287 SD1 = 0.173
Seismic Design Category (SDC) (from Table 11.6-2)	C

1.8.3 Site Elevation

Site Elevation:	Existing at-grade floor of plant is 460 feet above Mean Sea Level (MSL).

1.8.4 Soil Resistivity

Minimal existing electrical soil resisitivity information was available from the various geotechnical investigations previously noted. Resistivity data in the general area under consideration was documented at approximately 36,000 ohm-cm with probes at 10 foot spacing and 38,000 ohm-cm for a 20 foot spacing. For purposes of this study, these values will be assumed as representative and will be utilized to estimate material requirements The electrical soil resistivity profile used for future grounding design will need to be determined from additional geotechnical investigations to be completed prior to detailed design.

1.9 Electrical Data

The electrical power system conceptual configuration shall be based on the project's one-line diagram which will be provided separately. Table 1-11 includes electrical parameters to be considered in the plant configuration.

Table 1-12 lists prevailing voltages and frequencies to be considered in the plant configuration.

Table 1-11
Electrical Design Data
[TO BE PROVIDED (TBP) BY E.ON]

Design Parameter	Value	Units
Available system fault current at electrical system interface point.		
• 345 KV System–Maximum:	TBP	amps
• 345 KV System–Minimum:	TBP	amps
• 22 KV System–Maximum:	TBP	amps
• 22 KV System–Minimum:	TBP	amps
• 13.8 KV System–Maximum:	TBP	amps
• 13.8 KV System– Minimum:	TBP	amps
• 4.16 KV System–Maximum:	TBP	amps
• 4.16 KV System–Minimum:	TBP	amps
• 480 V System–Maximum:	TBP	amps
• 480 V System–Minimum:	TBP	amps

Table 1-12
Electrical Equipment and System Voltages
[TO BE PROVIDED (TBP) BY E.ON]

	Continuous Voltage (Volts)	Momentary Voltage Dip	Frequency (Hz)		System Neutral Grounding	Transfer to Alternate Source	Max Sym Short-Circuit at Max Voltage (Amps)
Power Supply Code	Nom	% of Nominal	Nominal	Configuration	Type	Method	3-Phase Phase –Ground
GEN-1 Generator (Existing)	22,000	TBP	60	3-phase, 3-wire, Wye	High Resistance	N/A	(Later)
MV-1 Medium Voltage (Existing)	4,160	TBP	60	3-phase, 3-wire, Wye	Low Resistance	TBP	(Later)
MV-2 Medium Voltage (Existing)	13,800	TBP	60	3-phase, 3-wire, Wye	TBP	TBP	(Later)
LV-1 Low Voltage (Power)	480	80	60	3-phase, 3-wire, Delta - Delta	High Resistance	TBP	(Later)
LV-2 Low Voltage (Lighting)	480Y/277	80	60	3-phase, 4-wire, Wye	Solidly Grounded	N/A	(Later)
LV-3 Low Voltage (Power)	208Y/120	80	60	3-phase, 4-wire, Wye	Solidly Grounded	N/A	(Later)
UPS-1 UPS Power	120	80	60	Single phase, 2-wire	Solidly Grounded	Static ½ Cycle	(Later)
DC-1 DC Power	125	70	0	Two-Pole	Ungrounded	N/A	(Later)
CP-1 Control Power (AC)	120	80	60	Single-Phase, 2-Wire	Solidly Grounded	N/A	(Later)

1.10 Temporary Facilities

Construction support services will be required by all onsite contractors, subcontractors, and their personnel. These support services and facilities, depending on contract requirements, may be provided by E.ON, LG&E, the Contractor(s), and/or their subcontractors. The following list summarizes construction facilities that will be estimated in this phase of the project:

- Field Office(s): B&V will estimate size and location of field offices and construction trailers.
- Material Lay-Down Area(s): B&V will estimate size of area needed for material lay-down during construction.
- Project Parking Requirements: B&V will estimate size and location of temporary parking facilities needed during construction.

1.11 Fire Protection Design Data

Fire protection systems design will be based on NFPA requirements. Details of planned fire protection design will be provided later.

1.12 Economic Evaluation Criteria

1.12.1 Economic Evaluation Factors

Table 1-11 lists economic criteria to be considered in the project cost estimate.

Table 1-11
Economic Criteria

Economic Parameters	2010 Costs by Unit			
	1	2	3	4
Remaining Plant Life (years)	30			
Limestone Cost ($/ton)	7.54			
Lime Cost ($/ton)	118.13			
Ash Disposal Cost ($/ton)	15			
SCR Catalyst Replacement Cost ($/$m^3$)	6500			
Ammonia Cost for SCR ($/ton)	530.03			
Trona Cost ($/ton)	195			
Brominated Activated Carbon Cost ($/lb)	1.1			
Auxiliary Power Cost ($/MWh)	21.56	21.69	23.31	22.35
Water Cost ($/1,000 gal)	2			
Fully-Loaded Labor Rate ($/hr)	132,901			
Capital Escalation Rate (%)	2.5			
O&M Escalation Rate (%)	2			
Levelized Fixed Charge Rate or Capital Recovery Factor (%)	12.17			
Interest During Construction (%)	4.5			

Data from Economic Criteria tab of the Phase 1 Design Basis spreadsheet.

1.12.2 Load Model

The average annual unit load model used for economic evaluations is based on unit operation as follows:

Table 1-11
Load Model
[E.ON TO PROVIDE]

Unit #	Unit Load, Percent (%) MCR	Unit Gross Output/MW	Unit Net Output/MW	Operating Hours-Hours/year	Net MW Hours/year
Unit 1	100 90 80 75 Offline Total				
Unit 2	100 90 80 75 Offline Total				
Unit 3	100 90 80 75 Offline Total				
Unit 4	100 90 80 75 Offline Total				

2.0 Design Codes and Standards

2.1 Project Specifications

B&V's scope includes development of technical specifications for the purchase and erection of Fabric Filters for the various units requiring Fabric Filters as part of the AQC Study. Specifications will include technical specifications developed by B&V along with Front End Documents and General Conditions as developed by E.ON. Technical specifications are expected to be letter form in B&V standard format.

2.2 Codes and Standards

The design and specification of work shall be in accordance with applicable state and federal laws and regulations and local codes and ordinances. The codes and industry standards which will be the basis for design, fabrication, and construction are listed below and will be the editions in effect, including all addenda, as stated in equipment and construction purchase or contract documents. Other recognized standards may also be used as design, fabrication, and construction guidelines when not in conflict with the listed standards. Applicable codes will be as established based on consideration of applicable laws and regulations:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI).
- American Institute of Steel Construction (AISC).
- American Iron and Steel Institute (AISI).
- American National Standards Institute (ANSI).
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME).
- American Society for Testing and Materials (ASTM).
- American Water Works Association (AWWA).
- American Welding Society (AWS).
- Compressed Gas Association (CGA).
- Concrete Reinforcing Steel Institute (CRSI).

- Conveyor Equipment Manufacturers Association (CEMA)
- U.S. Department of Transportation (DOT).
- Factory Mutual (FM).
- Illuminating Engineering Society (IES).
- Institute of Electrical and Electronics Engineers (IEEE).
- Instrument Society of America (ISA).
- Insulated Cable Engineers Association (ICEA).
- International Building Code (IBC).
- Kentucky Building Code
- National Electrical Manufacturer's Association (NEMA).
- National Electrical Safety Code (NESC) and National Electric Code (NEC) as applicable.
- National Fire Protection Association (NFPA).
- Occupational Safety and Health Administration (OSHA).
- Underwriters Laboratory (UL) Standards.

2.3 Engineering Drawings and Data Content

B&V standards will be used to establish tagging schemes, drawing content, drawing borders, drawing software and formats, symbols, data report content and formats, virtual modeling format and protocols, and interfaces to contractor and subcontractor drawings and data. Interfaces with and references to non-B&V drawings will be provided in sufficient detail to describe the complete design, but generally will not be a duplication of non-B&V data on B&V drawings. Major equipment interfaces will be represented as needed to support construction.

In instances where the new design impacts existing E.ON/LG&E drawings, such drawings will be modified by B&V as required to reference new drawings or reflect the new design, depending on which results in the most practical, functional, and cost-effective set of deliverables.

Appendix A

EON AQC Budgetary Cost Estimate Proposal

(Rev 1 - Pages 1-8)

PROPOSAL FOR
AIR QUALITY CONTROL BUDGETARY COST ESTIMATE

The purpose of this scope of work is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II). The Phase II scope of work is proposed for the Mill Creek, Ghent, and Brown facilities, and will be composed of the following tasks and deliverables to ensure that the study is properly defined, documented, and completed on time. It should be noted that there are some scope differences between the three facilities because of variations in the complexity of the future AQC equipment scenarios for each. These differences in study scope are noted below in the appropriate tasks and reflected in the cost estimate. For the purpose of this proposal, E.ON's Mill Creek facility is assumed to be the first facility to begin the Phase II services, with the Ghent and Brown facilities to have a staggered kick-off delay of approximately 1 month each.

SCOPE OF WORK

Task 1 – Project Kick-off Meeting & Site Visit

The Black & Veatch project team members will attend project kickoff meetings at Mill Creek, Ghent, and Brown as depicted in the schedule. It is anticipated that Mill Creek's kick-off meeting will consist of an initial meeting with Project Engineering in Louisville, followed by a technical meeting and site walk down at the facility. The kick-off meetings for Ghent and Brown will be held on site. An agenda will be prepared prior to each kick-off meeting.

The following are the main objectives for the kick-off meeting and initial site visit:

- Discuss project objectives, expectations, and constraints.
- Discuss project communication procedures and identify project team contacts for both E.ON and Black & Veatch for utilization in the *Project Instructions Memorandum*.
- Obtain or identify key site specific drawings, plant performance data, and existing equipment information not previously collected.
- Continue discussions of potential equipment locations with plant engineers.
- Develop understanding of draft system capabilities for supporting new emissions control equipment.
- Develop understanding of the general condition of the balance-of-plant and major equipment to estimate existing equipment upgrade costs for various plans.
- Assess potential arrangement interferences for support of cost estimate.
- Obtain copies of existing reports and studies that will be used during the preparation of the study.
- Establish and agree upon the study schedule and deliverables.

To expedite onsite communications and information collection, Black & Veatch understands that utilization of a single point of contact (SPOC) throughout the project is desirable to ensure proper communications and tracking of data exchanges.

Task 2 – Environmental Regulatory Considerations

During the technology evaluation part of the analysis (Task 6), Black & Veatch's experienced staff of regulatory specialists, air quality scientists, biologists, and other environmental professionals will participate in an advisory capacity to the Black & Veatch engineering staff assigned to the project. We will assign an Environmental Permitting Manager who will be responsible for coordinating with the environmental counterpart at E.ON, providing guidance to E.ON and Black & Veatch engineers relevant to regulatory scenario planning to ensure project conceptual design compliance with applicable federal, state, and local statutes and regulations.

Task 3 – Develop Project Instruction Memorandum

To ensure proper communications, interchange of data and information, and development of a sound project definition and cost estimate, the project itself must have a set of processes and procedures. Black & Veatch will develop a Project Instructions Memorandum (PIM) for the project that will include all Owner specific procedures and additional procedures established by Black & Veatch for use during the execution of the project. The memorandum will establish guidelines, methods, procedures, and lines of communication to administer, control, and coordinate the work between Black & Veatch, other project participants, and E.ON as determined during the kick-off meeting. A full PIM will be completed for Mill Creek and amended for the Ghent and Brown facilities.

Task 4 – Project Management

The following Project Management tasks will be provided to ensure the success of the study.

Schedule & Planning

A project milestone schedule will be developed and issued to E.ON for review within 30 days of Kick-off meeting. After discussion and receipt of comments, a base line schedule will be prepared and issued.

Communications & Coordination

To facilitate communications for the project, we would hold weekly teleconferences between the E.ON team and the Black & Veatch project team. These meetings would include review of project status, schedule review, and review of the Action Item list. In addition to the weekly teleconferences, we would plan to attend periodic Progress Meetings at the plant site or E.ON offices to discuss present project status and address any questions or concerns. A monthly Project Progress Report will be prepared and issued to E.ON. In addition to normal email and telephone communication, Black & Veatch will establish a web based system for rapidly transmitting and exchanging information between E.ON, Black & Veatch and Third parties. Information and instructions for utilizing this system will be included in the PIM.

Management Documentation

In addition to the project schedule and the Monthly Progress Reports, Black & Veatch will prepare minutes of the weekly teleconference and prepare an Action Item List which will address pending actions and note responsible parties and commitments dates. The Action Item list will be updated weekly and discussed during the weekly teleconference and the Progress Meetings.

Project Documentation

As defined in the PIM, Black & Veatch will prepare meeting minutes of all meeting attended with E.ON and third parties for the project. The meeting minutes will be prepared and submitted for review and approval and subsequently issued as final. Project E-mail traffic will be captured and filed within the project filing system and key telephone conversations will be documented using confirming email to all parties. Black & Veatch will transmit, file, and track all reports, studies, drawings and other documentation in accordance with the PIM to ensure that the information is stored and retrievable.

Task 5 – Develop Project Design Memorandum.

Black & Veatch will build upon the initial design basis prepared for the fleet-wide, high-level cost assessment and develop a Project Design Memorandum (PDM) for each facility, which will incorporate the controlling requirements for the conceptual engineering design of the project. The purpose of this document will be to describe the design requirements of the project and to provide the basis for conceptual design and cost estimating. The PDM will include information already submitted by E.ON, as well as addition information that may be necessary.

Information contained in the PDM includes the following

- Project description and purpose.

- Scope of Work.
- Governing Building Codes and Standards.
- The site information in the form of data summaries resulting from initial investigations or monitoring of ambient environment, hydrology, meteorology, geology, topography, background noise, and the load bearing capability and resistive characteristics of soils.
- Air emission rate targets as identified by E.ON and reviewed by Black & Veatch.
- Unit capacity factors
- Capacities
- Flue gas temperature
- ID fan / FD fan capacities
- Other operating parameters
- Fuel data
- Water data
- Reagent/sorbent data
- Economic evaluation criteria
- Engineering design criteria, standards and codes for the engineering disciplines: mechanical, civil, structural, electrical, control, and chemical engineering, including site specific criteria.
- Flue gas flow rates and conditions.
- Ash production rates.

The project team will develop the PDM early in the project, but it will be a living document that will undergo updates during the course of the project to include new data and, results of decisions. The document will incorporate any modifications required by E.ON so that the project going forward will be utilizing the most up to date data and information. The chief purpose of the PDM is to encapsulate the preferences of E.ON under which the various control alternatives and conceptual design will be developed.

Task 6 – AQC Technology Validation and Selection

As E.ON is aware, during the course of the high-level, fleet wide analysis conducted in the previous study, preliminary air quality control (AQC) technologies were initially recommended and approved for the purpose of generating order-of-magnitude cost estimates. However, the very nature of the previous work may have resulted in overly conservative AQC technology assumptions and selections in order to meet the project schedule and bracket the cost estimate. Accordingly, Black & Veatch understands that E.ON may have plant-specific AQC preferences, configurations, and alternative control technology scenarios that may also be feasible and capable of meeting the stated environmental goals, particularly in light of fleet-wide averaging opportunities or other constraints.

To address the potential AQC technology scenarios, Black & Veatch will conduct a more refined available technology selection analysis to evaluate and validate the preliminary retrofit technologies, as well as improvement to existing site control equipment, that can achieve the required future emissions target levels. The evaluation includes estimating emissions reduction, addressing technical feasibility and capability, applying known site constraints, providing technical descriptions of each technology, addressing commercial availability and guarantees, and describing the pros and cons of each technology. The technology analysis will validate which retrofit technologies, or improvement to existing control technologies, are technically feasible and capable of meeting the established emission target levels. The analysis will also document and explain, based on physical, chemical, or engineering principles, why technical difficulties may preclude the successful use of a certain control or technology option. The analysis will consider various unit arrangements, including single unit as well as various combinations of multiple units. This task will ensure that the initial technology selection scenarios are feasible and suitable to the facility based on established selection criteria.

Based on the initial results of the Phase I work, as well as an AQC screening workshop conducted for Mill Creek, the following preliminary AQC technologies scenarios (and embedded options) have been identified for each facility.

- Mill Creek:
  - NIDs/DFGD or FF on Units 1-4
  - SCRs on Units 1 and/or 2
  - Refurbishing or replacing WFGDs on Units 1, 2 and 4, including using Unit 4's refurbished WFGD for Unit 3
  - New WFGD on Unit 4
  - PAC and/or trona/lime injection/SBS injection
  - Feasibility of neural network (NN) on Units 1-4
  - Feasibility of ESPs for pre-filtering
- Ghent
  - FFs on Units 1-4
  - PAC and trona/lime injection/SBS injection
  - SCR on Unit 2
  - Feasibility of neural network (NN) on Units 1-4
- Brown
  - FFs on Units 1-3
  - Separate or combined FF on Units 1 and 2
  - LNB/OFA or SCR on Unit 1
  - SCR on Unit 2
  - PAC and trona/lime injection/SBS injection
  - Feasibility of neural network (NN) on Units 1-3

In order to verify, properly vet, and ultimately select an AQC technology suite for each facility for final evaluation, Black & Veatch proposes to perform the following high level studies and comparative analyses.

- Overview analysis of existing water/wastewater systems (Mill Creek only)
- Water mass balance (Mill Creek only)
- Flue gas conditions
- Fan analysis
- Furnace design pressure analysis
- Simplified AQC mass balance
- Auxiliary electric system analysis/comparison
- Chimney analysis (Mill Creek only)
- High level differential cost analysis comparison for scenarios with multiple options (capital and O&M)
- Reagent cost analysis/comparison (Mill Creek only)
- WFGD mass balance and byproduct disposal analysis/comparison (Mill Creek only)
- Existing WFGD upgrade analysis with support from vendors for modeling (Mill Creek only)
- Truck and rail traffic analysis (Mill Creek only)
- Fly ash analysis/comparison
- High level site arrangement drawings for each AQC suite

Upon completion of the aforementioned studies and analyses, Black & Veatch will prepare a draft technology validation and selection report for E.ON's review and comment. Following incorporation of comments, Black & Veatch will meet with E.ON to discuss the results. During the meeting, the team will review the options suggested by the selection study to ensure they are consistent with the requirements and specific goals of the facility. Following the presentation of results, the E.ON/Black & Veatch team will formally select the AQC technology suite for final evaluation.

Task 7 – Develop Preliminary Conceptual Design

The following list defines the predominant conceptual design engineering services to be performed by Black & Veatch to define the basis for the cost estimate, as well as specific deliverables for E.ON. The conceptual design evaluation will address each item for the selected AQC technology scenario, as appropriate.

- Preliminary description of scope of work.
- Equipment performance and emissions review. Current emissions review of plant historical data provided by E.ON.
- Assessment of potential modifications to existing equipment, including upgrading existing WFGDs at Mill Creek.
- Determine the associated balance-of-plant requirements and plant modifications necessary.
- Develop key process flow diagrams (conceptual)
- An overall site plan drawing (conceptual) of the project major equipment, including air quality control equipment, chimney, fuel handling systems, reagent (limestone or lime) handling system, ash handling system, chemical storage, sorbent or PAC injection systems, etc, as applicable. The location of other existing key buildings such as boiler, administration/services building(s) and other buildings and structures, electrical transmission lines/corridors, and access roads will also be identified.
- Building and Plant Arrangements
- Equipment Logistics/Transportation Requirements (see Task 10)
- Permitting/Environmental Impacts (see Task 2)
- Specification and System List
- Lighting Requirements
- Grounding Requirements
- Fire Protection Requirements
- Communication Requirements
- Layout of Critical System and Underground Piping
- Terminal Point List
- Water Mass Balance Diagram (Mill Creek only)
- Equipment Lists
- One-Line Drawing
- Construction Equipment Requirements
- System Descriptions
- Demolition/Relocation Requirements
- Civil/Structural Discipline Drawings
- Mechanical Discipline Drawings
- Electrical Discipline Drawings
- Instrumentation/Control System Discipline Drawings

In addition to the conceptual design services listed above, this task will address the following topics and issues in the manner described for each.

- **Construction Materials**. Black & Veatch will select the materials of construction based on engineering judgment, past experience, and general site technology specifics.
- **Sparing and Capacity**. Since the final selection of AQC technologies may allow a single system to influence the direct operations of more than one unit, impacts to outage scheduling, unit operations and unit reliability are important considerations. Black & Veatch will use E.ON's planned usage pattern for the affected units to identify draft sparing and capacity guidelines and their implications for the units. Provision of these draft guidelines will allow E.ON to evaluate potential tradeoffs and conflicts with the various goals of the project to allow adjustment of the guidelines to achieve the overall project goals in the best approach possible.
- **Draft System**. Depending on the existing ID fan capacity and the incremental draft load to be imposed by the new emissions control equipment, draft system modifications may be required. Additionally, draft

system modifications may require ductwork and/or boiler stiffening to withstand the new operating conditions or for compliance with NFPA-85. Black & Veatch will evaluate the existing draft system capacity and design, operating ranges, and anticipated additional draft losses and recommend modifications, including fan capacity (flow and head) and margins, motor speed(s), draft control alternatives, and structural reinforcing. This will be a high level evaluation based upon the conceptual design developed and is intended to provide sufficient information to allow E.ON to evaluate the various options in the study. Additional future detailed study work would be required for any selected scenario implementation.

- **Chimney Alternatives.** As part of the overall study, Black & Veatch will evaluate the necessity for modifications or replacement of existing chimneys. This evaluation will only consider the physical characteristics of the stack(s) and its availability to operate under any new conditions imposed by the technology scenarios. This analysis is limited to the Mill Creek facility only.
- **Auxiliary Electric System**. Auxiliary electric power supply alternatives for multi-unit emissions control equipment retrofits typically involve a combination of unit-specific power supply and at a minimum, common load and/or startup power supply from the plant switchyards. Considerations in selecting the optimum site-specific configuration include unit startup, redundancy, bus capacity, load flow, generation metering, and capital cost issues. Black & Veatch will evaluate the emissions control equipment affects on the existing auxiliary electric system and a recommend solution for a reliable redundant power supply to the new AQC equipment. This will be a conceptual evaluation in order to provide sufficient information to evaluate the various AQC options of the study.
- **FGD and Landfill Waste Disposal**. As part of the study, Black & Veatch will define the physical and chemical characteristics of the by-products and determine the production rates. E.ON may utilize this information in addressing the transport and final disposition of the byproducts. This analysis is limited to the Mill Creek facility only.
- **FGD System Water Supply.** The water supply to the FGD systems and auxiliaries will be determined by evaluating the potential water and wastewater streams that could be required or produced for the different scenarios. Preliminary water mass balances will be developed for the new or added systems. An overall plant water mass balance has not been included but can be added to the work at E.ON's direction. This analysis is limited to the Mill Creek facility only.
- **Fly Ash Handling.** Black & Veatch will address modifications or replacement of the fly ash handling system only as necessary to accommodate the technology scenarios.

Task 8 – Project Cost Estimate

Black & Veatch will prepare a budgetary cost estimate for the AQC scenario selected by E.ON for continuation. The cost estimate will include monthly cash flows based on the determined contracting strategy (see Contracting Strategy Analysis task). Black & Veatch will solicit major equipment letter quotations to support the cost estimate. As a provider for AQC solutions, Black & Veatch has developed estimating tools that will be utilized for this project, as well as leveraging the information available from the many large AQC projects and coal projects recently completed and ongoing. The capital costs estimates will be generated from proprietary in-house data for similar sized coal fueled units. The cost estimate will go through our internal review processes and procedures that we use when developing our own project pricing structure. When available, this data can also be supplemented with actual pricing and labor rates. Construction contracts will be adjusted for craft wage rates and productivity at the project site. Owner's costs (project development, permitting, financing, etc.) will be estimated as a percentage of the total capital cost unless identified as an amount from E.ON.

In addition to the capital costs, annual O&M costs, both fixed and variable components, will be estimated. Black & Veatch will formulate the overall cost and cash flow estimate (month and year) for the agreed upon scenario. Black & Veatch will prepare capital and operating and maintenance (O&M) cost estimates using current (2010) dollars and include the estimated engineering cost for this project. The cost estimate will include analysis of the contingency use, analysis of any escalation used and a risk analysis for those elements of the cost estimate most at risk from market and pricing concerns.

Task 9 – Implementation Schedule

Black & Veatch will prepare a detailed Level 1 project implementation schedule from inception to commissioning using Primavera. The implementation schedule will begin with the conceptual design and specification development followed by the development period that will include licensing and permitting activities, bid negotiations, and finalization of procurement and construction contracts. Elements in the schedule will include engineering, procurement, construction, startup, and testing.

The implementation schedule will consider time required for each of the activities and their co-relationships, including contingency plans to offset permitting delays and the potential impact of licensing of patented technologies. The facility plant outage planning schedule will be included in the project scheduling process. The procurement and construction duration will also consider regional procurement strategies particularly related to major long lead items, and availability and productivity of local and regional labor.

In addition, as part of this task, Black & Veatch will develop project cash flows based on the implementation schedule and budget estimate.

Task 10 – Constructability Plan

Construction is a key consideration in the success of any major capital plan. The success or failure of a project is realized often only when construction begins. Black & Veatch strongly believes construction professionals must be involved early in the process to ensure the lessons learned from the past are not repeated and that adequate consideration is given to how the plant will be constructed. Simple changes early in the process can save millions only if fully considered at the appropriate time.

A constructability analysis will be developed and included as part of the project implementation schedule. Constructability will be a prime consideration as part of the selection process of virtually all the systems along with the considerations of overall costs, operability, and maintainability. As major systems are defined, the arrangement of the systems on the site will be reviewed with constructability and maintainability in mind. The ability to sequence construction, maintains crane and equipment access, levelize the construction labor force and provide for material deliveries, and lay-down space will be considered. The optimum approach for any one construction phase has to be balanced against available outages, interfacing work, cash flow considerations, fabrication and equipment delivery capabilities, engineering support, etc. In addition to the schedule input from the constuctability plan, a construction facilities drawing will be developed as part of this task.

Task 11 – Evaluation Report

The end result of this study will be a document inclusive of the analyses conducted in the above tasks outlining the consideration undergone by E.ON and Black & Veatch to arrive at the selected AQC conclusions. Black & Veatch will prepare and submit five (5) hardcopies and electronic copies of the draft project report of the work performed under this contract to E.ON for review. Black & Veatch will forward some sections as drafts during earlier tasks and then amended to fit within the purpose of the final report. The draft report will include all conceptual engineering, drawings, costs and schedules developed for this project.

Following submittal of the draft report, Black & Veatch will meet with E.ON to discuss the report and obtain any comments or modifications required. Within four (4) weeks of receiving E.ON comments, Black & Veatch will incorporate these comments and issue five (5) hardcopies and electronic copies of the final report. If requested by E.ON, Black & Veatch will prepare and deliver a formal presentation of the report to E.ON noting conclusions, recommendations and decisions required by the project team and management.

Fabric Filter Letter Specification and Vendor Workshop

Black & Veatch will prepare letter specifications for new FFs at Mill Creek, Ghent, and Brown facilities. The letter specification will be approximately 2 to 3 pages in length, describing the design basis, scope of work, and technical requirements for budgetary purposes only. Following E.ON's review and incorporation of final

comments, Black & Veatch will assist E.ON in contacting and scheduling vendor presentations to coincide with a FF workshop to be held at E.ON's engineering offices. A two-day workshop is proposed, with the first half-day consisting of a FF primer and presentation by Black & Veatch personnel, in preparation for 2-3 back-to-back half-day vendor presentations to follow. The actual schedule date of the workshop will be determined once the vendors are contacted. Black & Veatch will prepare meeting minutes summarizing discussions from the workshop.

SCHEDULE

As previously discussed with E.ON, this Phase II scope of work is proposed for the Mill Creek, Ghent, and Brown facilities. The Mill Creek facility is assumed to be the first facility to begin the Phase II services, with the Ghent and Brown facilities to have a staggered kick-off delay of approximately 1 month each. The following table identifies the major milestone schedule proposed herein.

Major Milestone Schedule			
Activity	**Mill Creek**	**Ghent**	**Brown**
Notice to Proceed	Aug 26, 2010	Aug 26, 2010	Aug 26, 2010
Project Kickoff and Site Visit Meeting (Task 1)	Sep 14, 2010	Oct 4, 2010	Nov 8, 2010
Begin AQC Validation (Task 6)	Sep 7, 2010	Oct 11, 2010	Nov 15, 2010
Select AQC Technologies - Meeting (Task 6)	Nov 8, 2010	Dec 6, 2010	Jan 10, 2011
Begin Conceptual Design (Task 7)	Nov 15, 2010	Dec 13, 2010	Jan 17, 2011
Begin Cost Estimate (Task 8)	Dec 13, 2010	Jan 10, 2011	Feb 7, 2011
Issue Draft Report (Task 11)	Feb 7, 2011	Mar 14, 2011	Apr 11, 2011
Final Report – Presentation Meeting (Task 11)	Mar 7, 2011	Apr 11, 2011	May 7, 2011

Appendix B

Design Basis

(Excerpt From Phase I Report Appendix C - Mill Creek Only)

EON
Design Basis
6/1/2010

Unit Designation	Mill Creek				Reference
	1	2	3	4	
Ultimate Coal analysis, wet basis					
Carbon, %	61.20	61.20	61.20	61.20	Data from E-ON
Hydrogen, %	4.28	4.28	4.28	4.28	Data from E-ON
Sulfur, %	3.36	3.36	3.36	3.36	Data from E-ON
Nitrogen, %	1.27	1.27	1.27	1.27	Data from E-ON
Chlorine, %	0.00	0.00	0.00	0.00	Data from E-ON
Oxygen, %	6.89	6.89	6.89	6.89	Data from E-ON
Ash, %	12.00	12.00	12.00	12.00	Data from E-ON
Moisture, %	11.00	11.00	11.00	11.00	Data from E-ON
Higher Heating Value, Btu/lb	11,200	11,200	11,200	11,200	Data from E-ON
Trace Metal Analysis, ppm					
Antimony (Sb)	1.05	1.05	1.05	1.05	Data from E-ON
Arsenic (As)	13.00	13.00	13.00	13.00	Data from E-ON
Barium (Ba)	74.00	74.00	74.00	74.00	Data from E-ON
Cadmium (Cd)	0.65	0.65	0.65	0.65	Data from E-ON
Chlorine (Cl)	1600.00	1600.00	1600.00	1600.00	Data from E-ON
Chromium (Cr)	23.00	23.00	23.00	23.00	Data from E-ON
Fluorine (F)	98.00	98.00	98.00	98.00	Data from E-ON
Lead (Pb)	11.00	11.00	11.00	11.00	Data from E-ON
Magnesium (Mg)	684.00	684.00	684.00	684.00	Data from E-ON
Mercury (Hg)	0.12	0.12	0.12	0.12	Data from E-ON
Nickel (Ni)	20.00	20.00	20.00	20.00	Data from E-ON
Selenium (Se)	2.94	2.94	2.94	2.94	Data from E-ON
Strontium (Sr)	56.00	56.00	56.00	56.00	Data from E-ON
Vanadium (V)	40.00	40.00	40.00	40.00	Data from E-ON
Zinc (Zn)	48.00	48.00	48.00	48.00	Data from E-ON
Ash Analysis, % by mass					
Alumina (Al2O3)	21.69	21.69	21.69	21.69	Data from E-ON
Barium Oxide (BaO)	0.07	0.07	0.07	0.07	Data from E-ON
Lime (CaO)	2.74	2.74	2.74	2.74	Data from E-ON
Iron Oxide (Fe2O3)	21.80	21.80	21.80	21.80	Data from E-ON
Magnesia (MgO)	0.91	0.91	0.91	0.91	Data from E-ON
Manganese Oxide (MnO)	0.04	0.04	0.04	0.04	Data from E-ON
Phosphorous Pentoxide (P2O5)	0.26	0.26	0.26	0.26	Data from E-ON
Potassium Oxide (K2O)	2.33	2.33	2.33	2.33	Data from E-ON
Silica (SiO2)	45.88	45.88	45.88	45.88	Data from E-ON
Sodium Oxide (Na2O)	0.48	0.48	0.48	0.48	Data from E-ON
Strontium Oxide (SrO)	0.05	0.05	0.05	0.05	Data from E-ON
Sulfur Trioxide (SO3)	2.58	2.58	2.58	2.58	Data from E-ON
Titania (TiO2)	1.04	1.04	1.04	1.04	Data from E-ON
Undetermined	0.12	0.12	0.12	0.12	Data from E-ON
Unit Characteristics					
Gross Turbine Generator Load, MW	330	330	423	525	Data from E-ON
Boiler Efficiency, % (HHV)	85.40	85.40	86.51	86.51	Data from E-ON
Boiler Heat Input, MBtu/hr (HHV)	3,224	3,311	4,209	5,122	Data from E-ON
Coal Flow Rate, lb/hr	287,857	295,625	375,804	457,321	Data from E-ON
Capacity Factor, %	69.00	70.00	75.00	75.00	Data from E-ON
Fly Ash Portion of Total Ash, %	80.0	80.0	80.0	80.0	Data from E-ON
Air Heater Leakage, %	10.0	10.0	10.0	10.0	Data from E-ON
Excess Air, %	20.00	20.00	20.00	20.00	Data from E-ON
Economizer Outlet Conditions					
Flue Gas Temperature, F	760	760	690	640	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-5.0	-5.0	-5.0	-5.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,169,029	3,254,545	4,137,234	5,034,667	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,608,445	1,651,849	1,979,343	2,303,938	B&V Combustion Calculations
Uncontrolled Sulfur Dioxide Concentration, lb/MBtu	6.00	6.00	6.00	6.00	= % Sulfur in Coal x 20,000 / HHV
Uncontrolled Sulfur Dioxide Mass Flow Rate, lb/hr	19,324	19,846	25,228	30,701	B&V Combustion Calculations
Uncontrolled PM Concentration, lb/MBtu	8.746	8.746	8.746	8.746	B&V Combustion Calculations
Uncontrolled PM Mass Flow Rate, lb/hr	28,197	28,958	36,812	44,797	= Uncontrolled PM (lb/MBtu) x Heat Input (MBtu/hr)
Uncontrolled Mercury Concentration, lb/TBtu	10.71	10.71	10.71	10.71	= Hg in Coal (ppm) x Coal Flow Rate (lb/hr) / Heat Input (MBtu/hr)
Uncontrolled HCl Mass Flow Rate, lb/hr	474	486	618	752	= HCl in Coal (ppm) / 1,000,000 x Coal Flow Rate (lb/hr) x MW of HCl / MW of Cl
Uncontrolled HCl Concentration, lb/MBtu	0.15	0.15	0.15	0.15	= HCl Flowrate (lb/hr) / Heat Input (MBtu/hr)
Hot-Side ESP Outlet Conditions					
Flue Gas Temperature, F	**No Hot-side ESP. Unit has a Cold-side ESP**	**No Hot-side ESP. Unit has a Cold-side ESP**	**No Hot-side ESP. Unit has a Cold-side ESP**	**No Hot-side ESP. Unit has a Cold-side ESP**	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu					B&V Combustion Calculations
Controlled PM Mass Flow Rate, lb/hr					= Controlled PM (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %					= { 1- Controlled PM (lb/MBtu) / Uncontrolled PM (lb/MBtu) } x 100
SCR Outlet Conditions					
Flue Gas Temperature, F			690	640	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.			-13.0	-13.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	**No SCR**	**No SCR**	4,219,979	5,135,360	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm			2,061,162	2,399,175	B&V Combustion Calculations
Controlled NOx Concentration, lb/MBtu			0.0584	0.0589	Data from E-ON
Controlled NOx Mass Flow Rate, lb/hr			246	302	= Controlled NOx (lb/MBtu) x Heat Input (MBtu/hr)
Air Heater Outlet Conditions					
Flue Gas Temperature, F	375	375	330	330	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-10.0	-10.0	-18.0	-18.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,485,932	3,580,000	4,641,978	5,648,896	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,229,416	1,262,592	1,581,582	1,924,653	B&V Combustion Calculations
Cold-Side ESP Outlet Conditions					
Flue Gas Temperature, F	340	340	330	330	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-14.0	-14.0	-23.0	-21.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,660,228	3,759,000	4,874,075	5,931,341	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,250,977	1,284,735	1,684,442	2,039,199	B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu	0.0385	0.0443	0.0517	0.0354	Data from E-ON
Controlled PM Mass Flow Rate, lb/hr	124	147	218	181	= Controlled PM (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %	99.56	99.49	99.41	99.60	= { 1- Controlled PM (lb/MBtu) / Uncontrolled PM (lb/MBtu) } x 100
Fabric Filter Outlet Conditions					
Flue Gas Temperature, F	**No Fabric Filter**	**No Fabric Filter**	**No Fabric Filter**	**No Fabric Filter**	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu					Data from E-ON
Controlled PM Mass Flow Rate, lb/hr					= Controlled PM from fabric Filter (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %					= { 1- FF Controlled PM (lb/MBtu) / ESP Controlled PM (lb/MBtu) } x 100
ID Fan Outlet Conditions					
Flue Gas Temperature, F	354.85	355.15	348.83	348.83	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	10.00	10.00	10.00	10.00	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,660,228	3,759,000	4,874,075	5,931,341	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,200,841	1,233,697	1,588,068	1,932,543	B&V Combustion Calculations

EON
Design Basis
6/1/2010

Unit Designation	Mill Creek				Reference
	1	2	3	4	
Scrubber Outlet Conditions					
Flue Gas Temperature, F	130.30	130.32	129.60	129.60	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	1.00	1.00	1.00	1.00	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,879,298	3,984,228	5,157,618	6,277,442	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	972,502	998,878	1,291,025	1,571,359	B&V Combustion Calculations
Controlled Sulfur Dioxide Mass Flow Rate, lb/hr	1,515	1,556	2,441	2,407	B&V Combustion Calculations
Controlled Sulfur Dioxide Concentration, lb/MBtu	0.47	0.47	0.58	0.47	= Controlled SO_2 (lb/hr) / Heat Input (MBtu/hr)
Sulfur Dioxide Removal Efficiency, %	92.17	92.17	90.33	92.17	= { 1- Controlled SO_2 (lb/MBtu) / Uncontrolled SO_2 (lb/MBtu) } x 100
Wet ESP Outlet Conditions					
Flue Gas Temperature, F	**No WESP**	**No WESP**	**No WESP**	**No WESP**	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Stack Outlet Emissions[1]					
Sulfur Dioxide Emission Concentration, lb/MBtu	0.47	0.47	0.58	0.47	Data from E-ON
Sulfur Dioxide Emission Rate, lb/hr	1,515	1,556	2,441	2,407	= SO_2 Emission (lb/MBtu) x Heat Input (MBtu/hr)
PM Emission Concentration, lb/MBtu	0.0385	0.0443	0.0517	0.0354	Data from E-ON
PM Emission Rate, lb/hr	124	147	218	181	= PM Emission (lb/MBtu) x Heat Input (MBtu/hr)
NOx Emission Concentration, lb/MBtu	0.3169	0.3139	0.0584	0.0589	Data from E-ON
NOx Emission Rate, lb/hr	1,022	1,039	246	302	= NOx Emission (lb/MBtu) x Heat Input (MBtu/hr)
Hg Emission Concentration, lb/TBtu	3.0	3.0	2.5	2.5	Data from E-ON
Hg Emission Rate, lb/hr	9.67E-03	9.93E-03	1.05E-02	1.28E-02	= Hg Emission (lb/TBtu) x Heat Input (MBtu/hr) / 1,000,000
HCl Emission Concentration, lb/MBtu	0.0015	0.0015	0.0015	0.0015	Data from E-ON
HCl Emission Rate, lb/hr	5	5	6	8	= HCl Emission (lb/MBtu) x Heat Input (MBtu/hr)
CO Emission Concentration, lb/MBtu	--	--	--	--	CO Emissions are not known
CO Emission Rate, lb/hr	--	--	--	--	CO Emissions are not known
Dioxin/Furan Emission Concentration, lb/MBtu	--	--	--	--	Dioxin/Furan Emissions are not known
Dioxin/Furan Emission Rate, lb/hr	--	--	--	--	Dioxin/Furan Emissions are not known

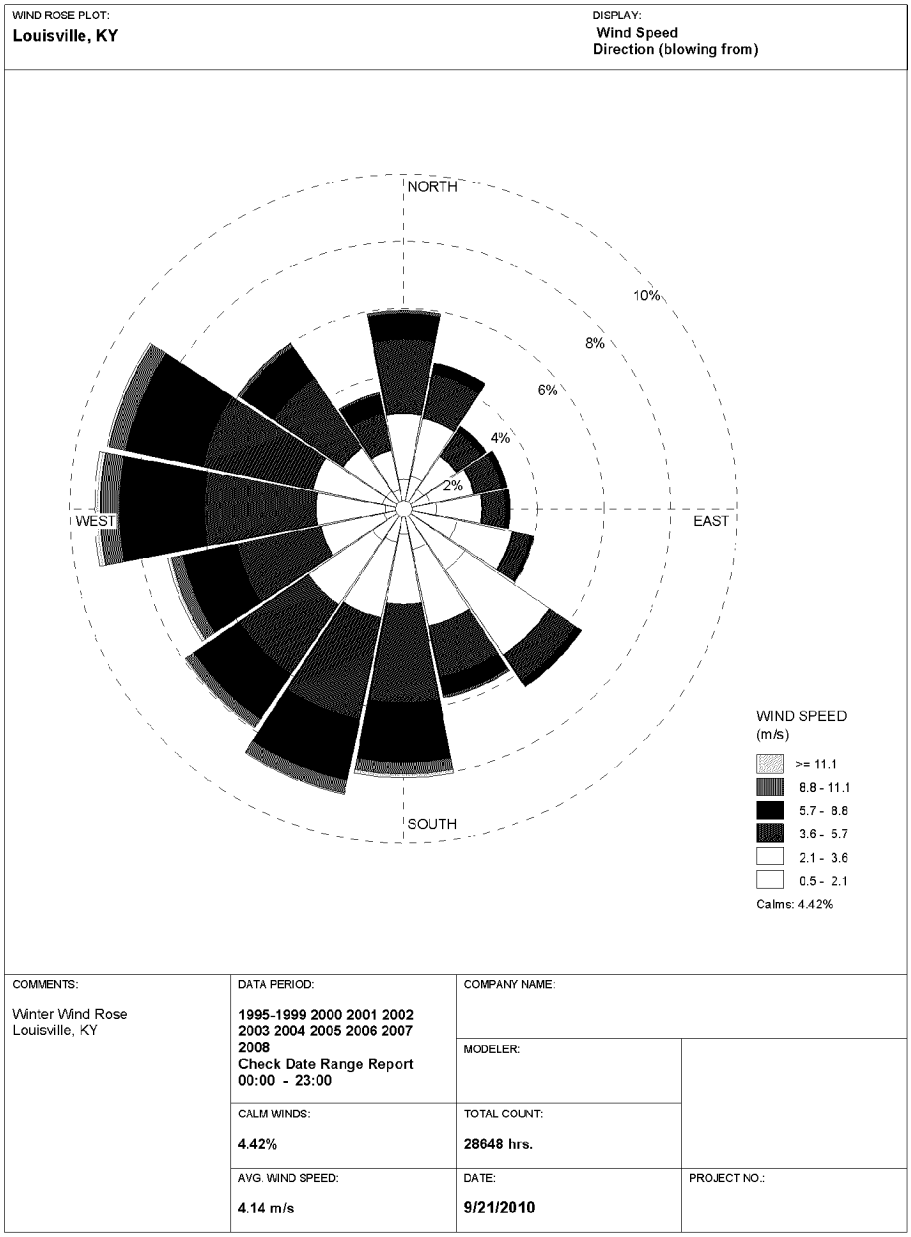
Notes:

1. Current Outlet Emissions as noted in E-ON Matrix

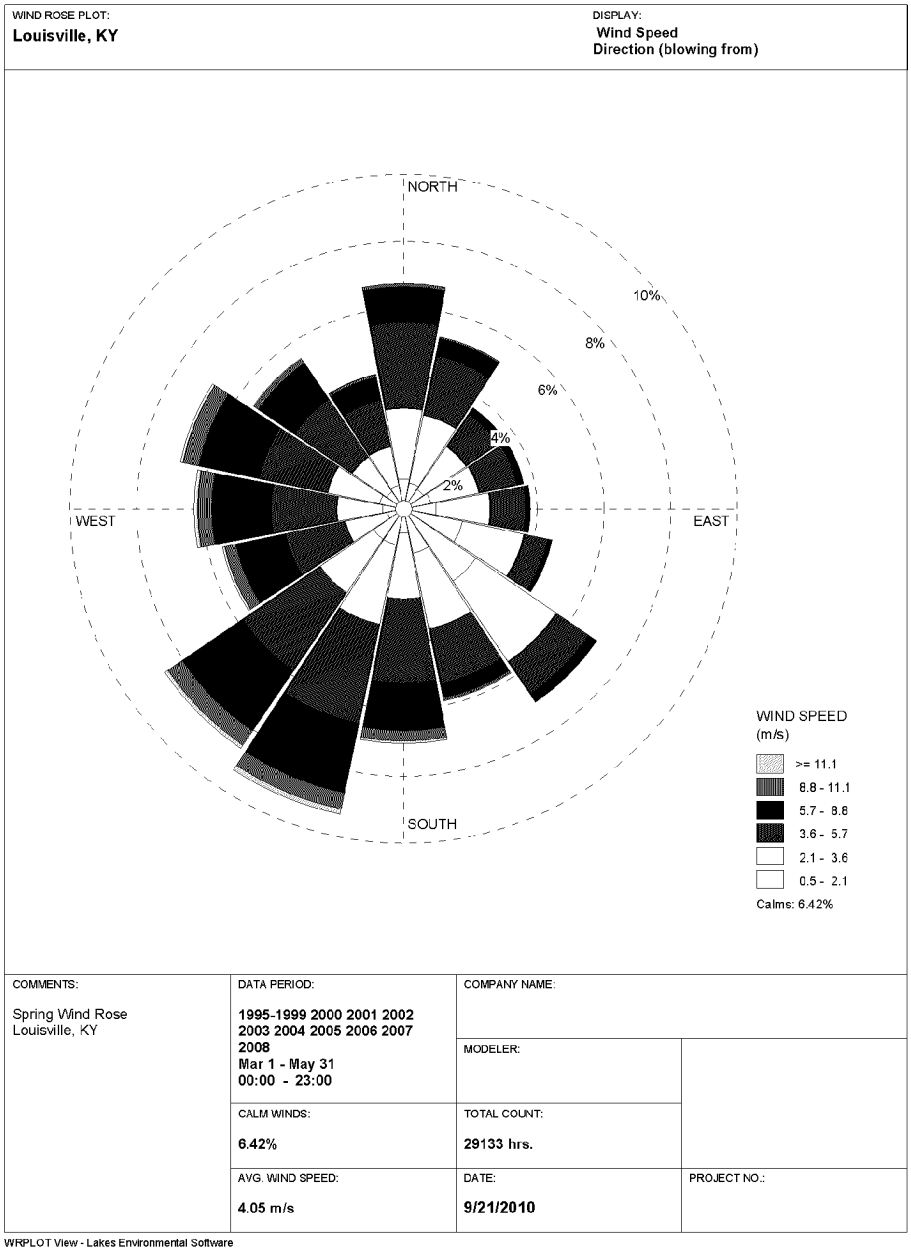
Revision History:

Appendix C

Wind Roses



Winter Wind Rose 1995-2008
Louisville, KY



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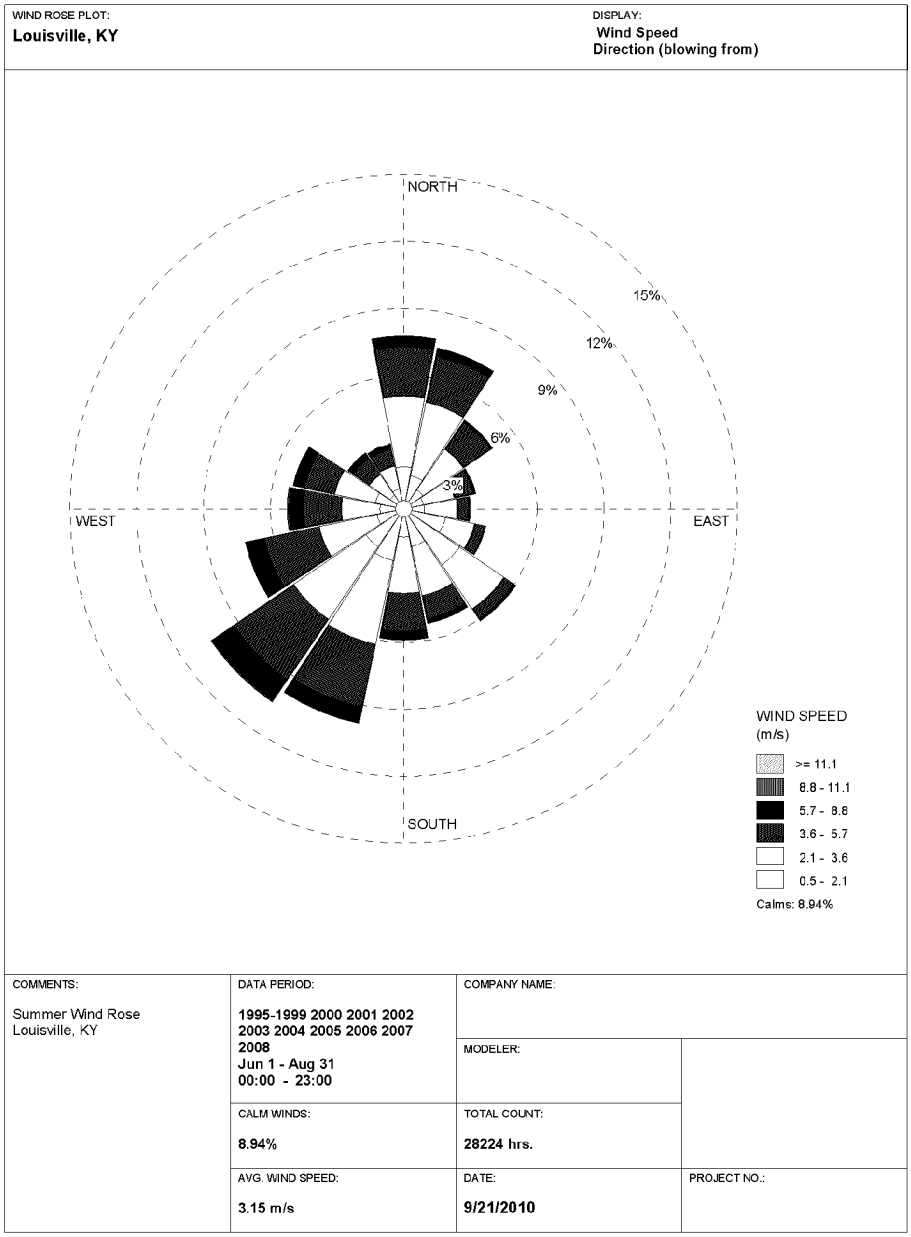
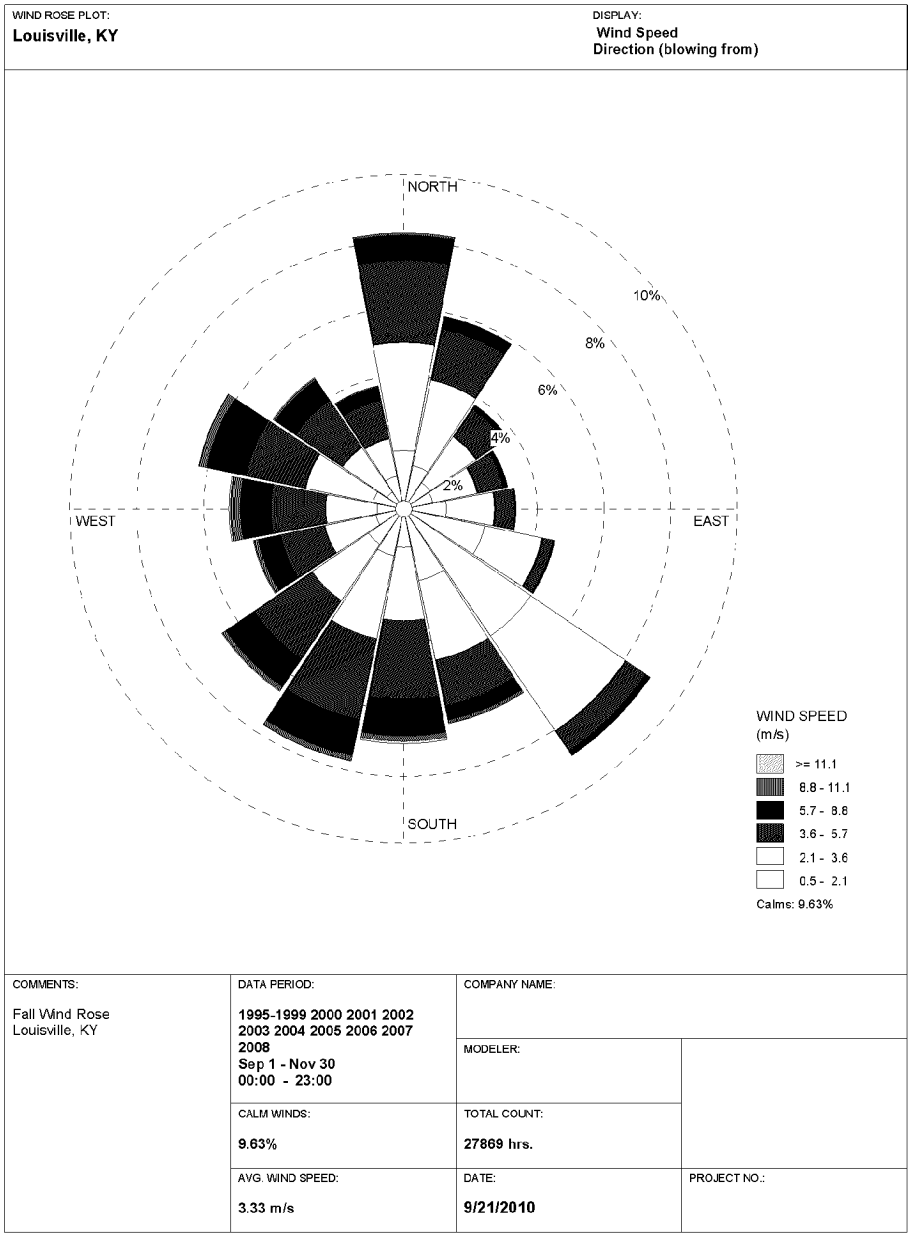
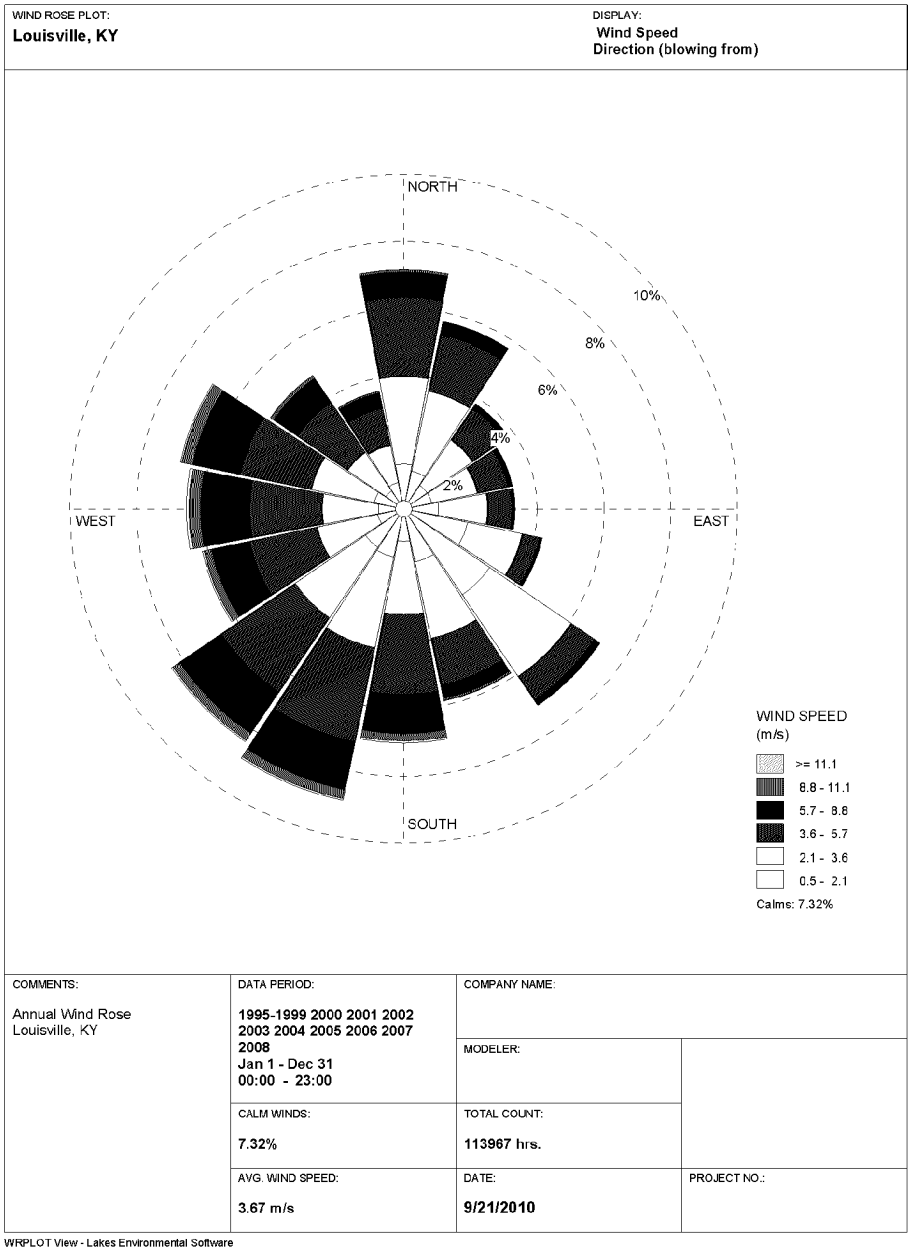
Louisville, KY



Summer Wind Rose 1995-2008
Louisville, KY



Fall Wind Rose 1995-2008
Louisville, KY



Annual Wind Rose 1995-2008
Louisville, KY

From: Revlett, Gary
To: 'Lucas, Kyle J.'
CC: Hillman, Timothy M.; Wehrly, M. R.; Lawson, Stacy J.; 168908 E.ON-AQC; Jackson, Audrey; Saunders, Eileen
Sent: 10/6/2010 7:08:44 AM
Subject: RE: 168908.14.4000 101004 - E.ON MC & Ghent Regulatory Briefing
Attachments: Revlett - Upcoming Environmenta Air Regulations (Ghent).pptx

Hi Kyle,

Attached to this email is a copy of the Ghent PowerPoint presentation that I will use at Ghent's Phase II Air Quality Control Study Kickoff Meeting. The first part of the Ghent presentation is the same as used at Mill Creek meeting to described the regulatory drivers. I have also included the Mill Creek specific environmental requirements and information on CATR.

Gary

From: Lucas, Kyle J. [mailto:LucasKJ@bv.com]
Sent: Monday, October 04, 2010 5:43 PM
To: Revlett, Gary
Cc: Hillman, Timothy M.; Wehrly, M. R.; Lawson, Stacy J.; 168908 E.ON-AQC; Jackson, Audrey; Saunders, Eileen
Subject: 168908.14.4000 101004 - E.ON MC & Ghent Regulatory Briefing

Gary,
For our project records we would like to obtain a copy of your PowerPoint presentation summarizing the regulatory drivers for the Mill Creek plant (from 9/15/10). Likewise, we would like to get an electronic copy of this week's presentation at Ghent.

Thanks for your assistance,

Regards,
Kyle

Kyle Lucas | Environmental Permitting Manager
Black & Veatch - Building a World of Difference™
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Overland Park, KS 66211
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Email: **lucaskj@bv.com**


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New EPA Air Regulations
Gary Revlett
Air Manager, Environmental Affairs

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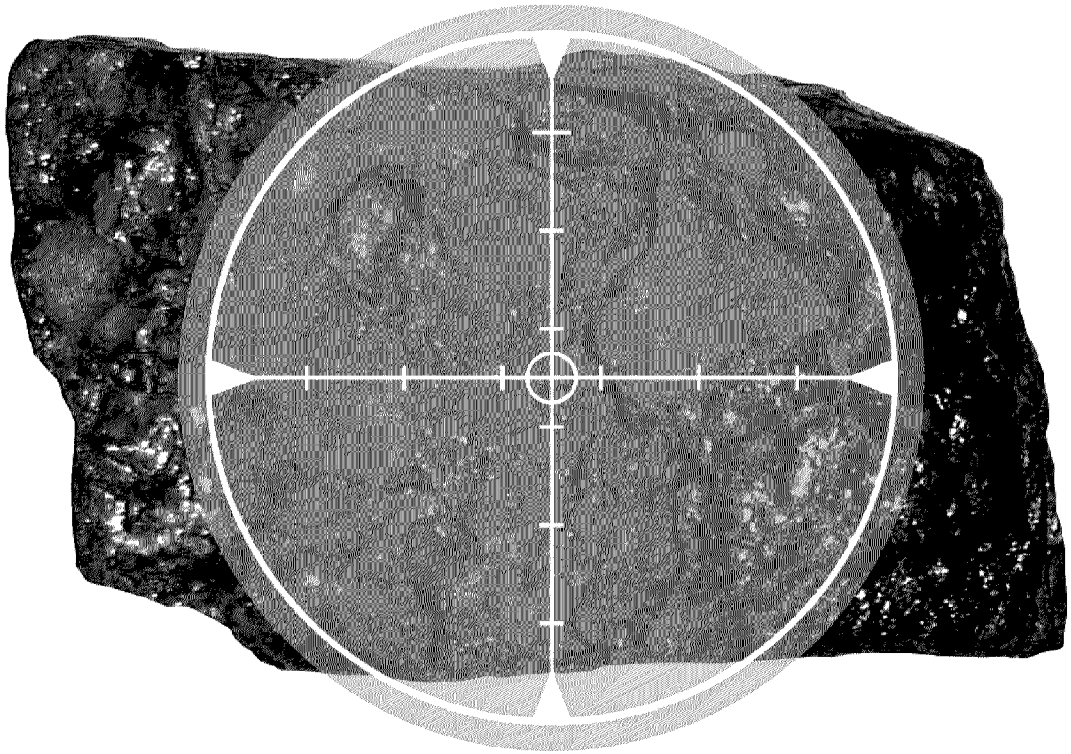
Coal (Still) in the Crosshairs



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Upcoming Air Related EPA Regulations

1. **Nitrogen Dioxide National Ambient Air Quality Standard: NO_x - NAAQS**
2. **Sulfur Dioxide National Ambient Air Quality Standard: SO_2 - NAAQS**
3. **Clean Air Interstate Rule (CAIR) Replacement: Clean Air Transport Rule (CATR)**
4. **Clean Air Mercury Rule (CAMR) Replacement: Electric Generating Unit Maximum Achievable Control Technology (EGU MACT)**

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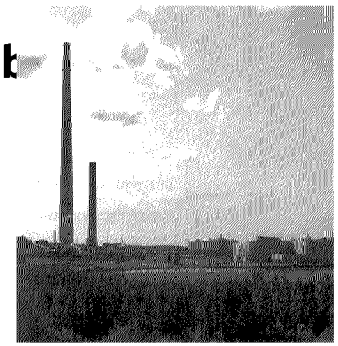
New Nitrogen Dioxide National Ambient Air Quality Standard

- New 1-hour NO_2 ambient air standard added to the current annual standard.
- The new ambient air standard is added to protect public health from short-term exposures.
- Sources with the greatest impact are power plants and major highways.
- Maximum impact due to short-duration adverse meteorological conditions.
- This new regulation is final and compliance is required b



Potential Company Impact(s):

- All coal-fired boilers will need tall stacks (> 400 ft.).
  OR
- Any coal-fired unit without a tall stack will need a SCR

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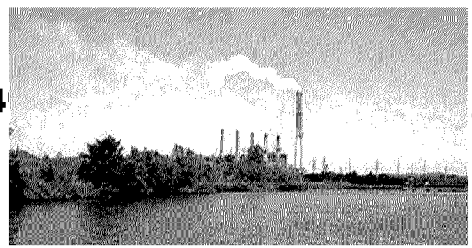
New Sulfur Dioxide National Ambient Air Quality Standard

- New 1-hour SO_2 ambient air standard added to the current 24-hour standard.
- The new ambient air standard is added to protect public health from short-term exposures.
- Sources with the greatest impact are coal-fired power plants.
- Maximum impact due to short-duration adverse meteorological conditions.
- This new regulation is final and compliance is required by end of 2016.

Potential Company Impact(s):

- All coal-fired boilers need tall stacks (> 4



greater than 96% removal efficiency.

OR

- Switch to low sulfur fuels

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CAIR Replacement – Proposed Clean Air Transport Rule (CATR) for SO_2 and NO_x

- Replaces the CAIR cap-and-trade regulations which were vacated in 2008.
- The Acid Rain SO_2 cap-and-trade program will remain in place.
- 100% intrastate trading of SO_2 and NO_x allowances but limited interstate trading
- The new regulations were proposed in July, 2010 and will not be final until June, 2011.
- The proposed implementation dates of Phase 1 in 2012 and Phase 2 in 2014 are unrealistic.

Potential Company Impact(s):

- With less than 10% interstate trading allowed, utilities in Kentucky need to self comply.
- Will require a fleet-wide 20% reduction in NO_x emissions and more than 50% reduction in SO_2 emissions by 2014.

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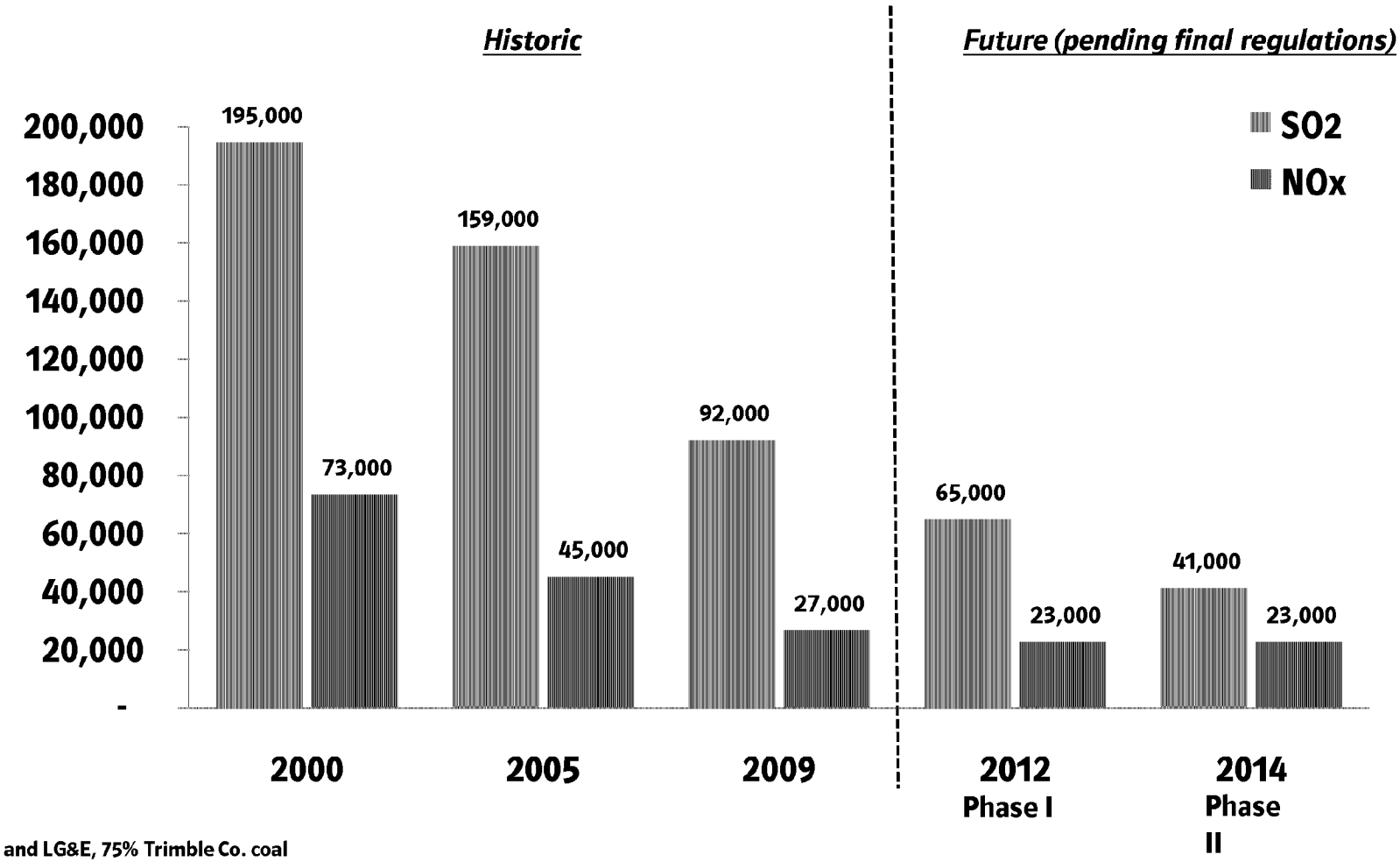
SO_2 and NO_x: Historic Emissions and CATR Allocations



KU and LG&E, 75% Trimble Co. coal

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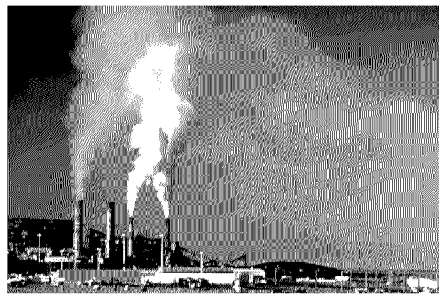
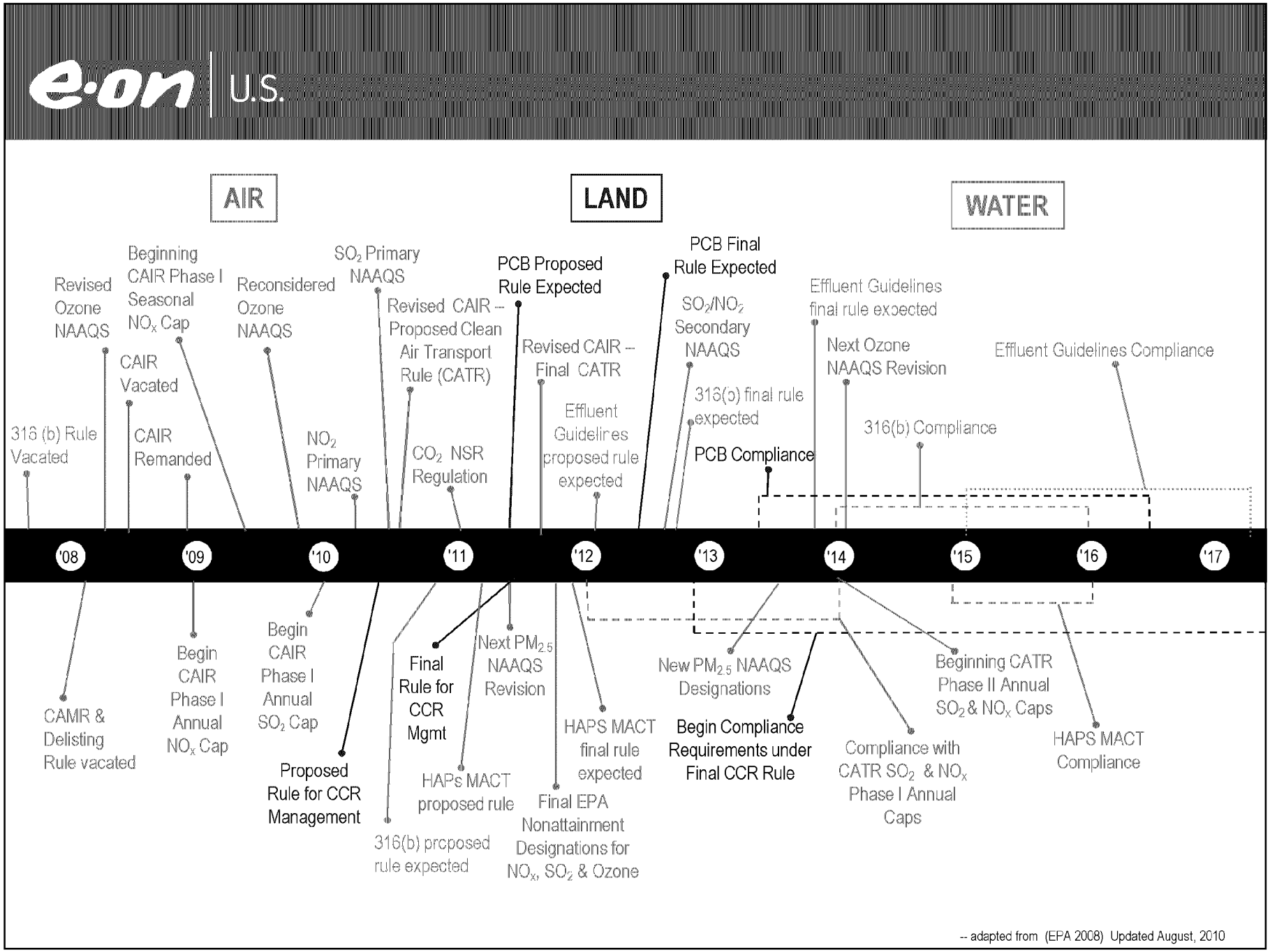
CAMR Replacement – Electric Utility Maximum Achievable Control Technology (MACT)

- Currently the CAMR replacement has not yet been proposed by EPA.
- EPA plans to propose in the new rules in March 2011 and finalize in November 2011.
- New emissions limits for Hazardous Air Pollutants such as mercury, hydrogen chloride and hydrogen fluoride and other toxic metals.
- No trading of emissions or allowances, each plant must meet the pollutant specific emission limit.
- Expected compliance date will be 2015 with a possible 1-year extension.

Potential Company Impact(s):

- Most coal-fired units will need to add a baghouse with carbon and lime injection.

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AIR
LAND
WATER
316 (b) Rule Vacated
Revised Ozone NAAQS
CAIR Vacated
CAIR Remanded
Beginning CAIR Phase I Seasonal NO_x Cap
Reconsidered Ozone NAAQS
NO_2 Primary NAAQS
SO_2 Primary NAAQS
Revised CAIR – Proposed Clean Air Transport Rule (CATR)
CO_2 NSR Regulation
PCB Proposed Rule Expected
Revised CAIR – Final CATR
Effluent Guidelines proposed rule expected
PCB Final Rule Expected
SO_2/NO_2 Secondary NAAQS
316(b) final rule expected
PCB Compliance
Effluent Guidelines final rule expected
Next Ozone NAAQS Revision
316(b) Compliance
Effluent Guidelines Compliance
'08
'09
'10
'11
'12
'13
'14
'15
'16
'17
CAMR & Delisting Rule vacated
Begin CAIR Phase I Annual NO_x Cap
Begin CAIR Phase I Annual SO_2 Cap
Proposed Rule for CCR Management
316(b) proposed rule expected
Final Rule for CCR Mgmt
HAPs MACT proposed rule
Next $PM_{2.5}$ NAAQS Revision
Final EPA Nonattainment Designations for NO_x, SO_2 & Ozone
HAPS MACT final rule expected
New $PM_{2.5}$ NAAQS Designations
Begin Compliance Requirements under Final CCR Rule
Compliance with CATR SO_2 & NO_x Phase I Annual Caps
Beginning CATR Phase II Annual SO_2 & NO_x Caps
HAPS MACT Compliance
-- adapted from (EPA 2008) Updated August, 2010

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Summary

- Coal is still, and will continue to be, in the cross-hairs of the EPA.
- We will analyze every EPA proposal to determine the full magnitude of its impact, including the financial and operational implications.
- As with any proposed environmental regulation, we will continue to follow the developments and act accordingly to achieve full compliance once it takes effect.
- It will be necessary for continued coordination between departments and across the lines of business. There will be an increased effort to educate the public and key stakeholders.

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Estimated Limits & Compliance Dates For Future New Air Requirements

Ghent Station

Program Name	Regulated Pollutants			Unit/Plant Averaging	Current Reg. Required Date	Forcasted Date for Compliance
	Pollutant	Limit	Units			
SAM NSR NOV	H_2SO_4	2 - 10	ppm	Unit	To Be Determined	2012 - 2014
New 1-hour NAAQS for SO_2	SO_2	0.31 for plant avg.	lbs/mmBtu	Based on air quality modeling	June, 2017	June, 2016 to June, 2017
New 1-hour NAAQS for NO_x	NO_x	0.47 for plant avg.	lbs/mmBtu	Based on air quality modeling	January, 2017	No sooner than January, 2017
CATR	SO_2	0.186	lbs/mmBtu	Plant, but statewide trading	Beginning Phase I in 2012; Limits in Phase II during 2014	Beginning Phase I in 2013; Limits in Phase II during 2015
	NO_x	0.041	lbs/mmBtu			
New EGU MACT	Mercury	90% or 0.012	Removal lbs/GWH	Plant	January, 2015, with 1-yr extension - January, 2016	January, 2016, with 1-yr extension - January, 2017 Potential delay for commitment to shutdown older coal-fired units
	Acids (HCl)	0.002	lbs/mmBtu	Unit or Plant		
	Metals (PM) or Metals (As)	0.03 0.5×10^{-5}	lbs/mmBtu lbs/mmBtu			
	Organics (CO)	0.10	lbs/mmBtu			
	Dioxin/Furan	15×10^{-18}	lbs/mmBtu			
$PM_{2.5}$ NAAQS	$PM_{2.5}$ or Condensable PM	To be determined based on modeling	lbs/hours	Plant	After 2017	After 2017

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Evaluation of CATR for Ghent Station

		2009 Actual Emissions				
Plant	Unit	SO_2 (tons)	NO_x (tons)	mmBtu (year)	SO_2 Rate (lbs/mmBtu)	NO_x Rate (lbs/mmBtu)
Ghent	1	1,418.1	973.2	31,802,243	0.09	0.06
Ghent	2	5,044.3	2,664.9	24,783,886	0.41	0.22
Ghent	3	3,188.6	1,972.3	34,425,557	0.19	0.11
Ghent	4	1,220.5	802.8	28,668,181	0.09	0.06
Ghent	**Total**	**10,872**	**6,413**	**119,679,867**	**0.182**	**0.107**

		CATR Allocation Tons			CATR Alterative lb/mmBtu				
Plant	Unit	SO_2 for 2012	SO_2 for 2014	NO_x in ≥ 2012	SO_2 for 2012	SO_2 for 2014	NO_x in ≥ 2012	SO_2 2012 Heat Input	NO_x 2012 Heat Input
Ghent	1	2,221	3,653	794	0.139	0.214	0.050	31,854,467	31,477,413
Ghent	2	2,101	1,813	976	0.180	0.108	0.058	23,378,147	33,536,165
Ghent	3	3,578	3,363	483	0.199	0.203	0.030	35,919,897	32,698,639
Ghent	4	1,214	3,359	468	0.079	0.203	0.029	30,683,824	32,663,045
Ghent	**Total**	**9,114**	**12,188**	**2,721**	**0.155**	**0.186**	**0.041**	**121,836,336**	**130,375,262**

	A	B	C
1		SO2	NOx
2	2000	194,611	73,359
3	2005	158,988	45,130
4	2009	91,988	26,703
5	2012	64,860	22,682
6	2014	41,210	22,682
7			
8			
9	75% TC		

From: Saunders, Eileen
To: Stockdale, Dianne
Sent: 10/6/2010 9:28:16 AM
Subject: Fw: Environmental Air & CCR Ruling Summary
Attachments: Environmental Summary Breakdown 10-4-10 R1.xlsx

Dianne,

Would you please print this document and bring it in to me?

Thanks,

Eileen

From: Ritchey, Stacy
To: Garrett, Chris
Cc: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Sent: Mon Oct 04 13:10:42 2010
Subject: RE: Environmental Air & CCR Ruling Summary

Chris,

Attached is the Environmental Summary file with the requested changes incorporated. Please let me know if you have any questions. Thanks.

<<Environmental Summary Breakdown 10-4-10 R1.xlsx>>

Stacy Ritchey
Sr Budget Analyst

E.ON US - Project Engineering

820 West Broadway

Louisville, KY 40232

BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

From: Ritchey, Stacy
Sent: Thursday, September 30, 2010 3:49 PM
To: Garrett, Chris
Cc: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Subject: RE: Environmental Air & CCR Ruling Summary

Chris,

Per our conversation I will make the following changes:

-Add In Service dates to the Air Projects.

-Add a column and separate E.ON US Escalation/Overheads from E.ON US Estimates.

-On a separate schedule provide a yearly cash flow that does not include removal.

Thanks,

Stacy

From: Ritchey, Stacy
Sent: Thursday, September 30, 2010 2:36 PM
To: Garrett, Chris
Cc: Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Subject: Environmental Air & CCR Ruling Summary

Chris,

The attached file contains a draft copy of the Environmental Air and CCR Ruling Summary. Scott is traveling and has not had a chance to perform a detailed review. If you have any questions please contact myself or Eileen. Thanks.

<< File: Environmental Summary Breakdown 9-30-10.xlsx >>

Stacy Ritchey
Sr Budget Analyst

E.ON US - Project Engineering

820 West Broadway

Louisville, KY 40232

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EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

	L
1	
2	
3	
4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$25,500		$25,500	$0	$0		$0	$25,500
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$0**	**$43,488**		**$0**	**$242,388**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$0**	**$200,028**		**$0**	**$1,226,223**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,268,459**	**$40,000**	**$449,142**		**$2,500**	**$2,606,600**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
91	
92	**$148,501**
93	
94	
95	
96	
97	

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**										
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**	**d In-Servic**	**Total**		**B&V Study (2)**	**ON US Estima**	**Overhead/ Escalatio**		**2010**	**2011-2015**
7	Brown 1 - SCR	NAAQS, CATR	5/31/2014	$68,325		$59,000	$0	$9,325		$0	$68,325
8	Brown 1 - Baghouse	EGU MACT	5/31/2014	$39,218		$34,000	$0	$5,218		$0	$39,218
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$1,899		$1,599	$0	$300		$0	$1,899
10	Brown 1 - SAM Mitigation	NSR	5/31/2014	$4,632		$0	$4,000	$632		$0	$4,632
11	Total Brown 1			**$114,075**		**$94,599**	**$4,000**	**$15,476**		**$0**	**$114,075**
12											
13	Brown 2 - SCR	NAAQS, CATR	11/30/2013	$104,971		$92,000	$0	$12,971		$0	$104,971
14	Brown 2 - Baghouse	EGU MACT	11/30/2015	$41,179		$34,000	$0	$7,179		$0	$39,844
15	Brown 2 - PAC Injection	EGU MACT	11/30/2015	$3,058		$2,476	$0	$582		$0	$3,058
16	Brown 2 - SAM Mitigation	NSR	11/30/2013	$4,568		$0	$4,000	$568		$0	$4,568
17	Total Brown 2			**$153,776**		**$128,476**	**$4,000**	**$21,300**		**$0**	**$152,440**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$76,066		$61,000	$0	$15,066		$0	$64,083
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$6,835		$5,426	$0	$1,409		$0	$5,525
21	Total Brown 3			**$82,901**		**$66,426**	**$0**	**$16,475**		**$0**	**$69,608**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$8,000**	**$53,250**		**$0**	**$336,123**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5	5/31/2016	$163,356		$131,000	$0	$32,356		$0	$137,622
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5	5/31/2016	$8,036		$6,380	$0	$1,656		$0	$6,726
28	Ghent 1 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
29	Total Ghent 1			**$179,142**		**$137,380**	**$7,750**	**$34,012**		**$375**	**$151,723**
30											
31	Ghent 2 - SCR	NAAQS, CATR	4/30/2014	$262,878		$227,000	$0	$35,878		$0	$262,878
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5	4/30/2016	$149,464		$120,000	$0	$29,464		$0	$127,463
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5	4/30/2016	$7,695		$6,109	$0	$1,586		$0	$6,385
34	Ghent 2 - SAM Mitigation	NSR	12/31/2011	$7,750		$0	$7,750	$0		$375	$7,375
35	Total Ghent 2			**$427,787**		**$353,109**	**$7,750**	**$66,928**		**$375**	**$404,101**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$170,210		$138,000	$0	$32,210		$0	$161,173
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,624		$6,173	$0	$1,451		$0	$7,624
39	Ghent 3 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
40	Total Ghent 3			**$186,403**		**$144,173**	**$8,250**	**$33,980**		**$250**	**$177,117**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5	12/31/2015	$144,530		$117,000	$0	$27,530		$0	$136,869
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5	12/31/2015	$7,669		$6,210	$0	$1,459		$0	$7,669
44	Ghent 4 - SAM Mitigation	NSR	12/31/2012	$8,570		$0	$8,250	$320		$250	$8,320
45	Total Ghent 4			**$160,770**		**$123,210**	**$8,250**	**$29,310**		**$250**	**$152,859**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$32,000**	**$164,229**		**$1,250**	**$885,800**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR	11/30/2014	$49,565		$41,250	$0	$8,315		$0	$49,565
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT	11/30/2016	$122,586		$97,020	$0	$25,566		$0	$72,932
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5	11/30/2014	$96,033		$80,850	$0	$15,183		$0	$96,033

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1	
2	
3	
4	
5	
6	**Post 2015**
7	$0
8	$0
9	$0
10	$0
11	**$0**
12	
13	$0
14	$1,336
15	$0
16	$0
17	**$1,336**
18	
19	$11,983
20	$1,310
21	**$13,292**
22	
23	**$14,628**
24	
25	
26	$25,734
27	$1,310
28	$0
29	**$27,043**
30	
31	$0
32	$22,001
33	$1,310
34	$0
35	**$23,311**
36	
37	$9,036
38	$0
39	$0
40	**$9,036**
41	
42	$7,661
43	$0
44	$0
45	**$7,661**
46	
47	**$67,052**
48	
49	
50	$0
51	$49,654
52	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5	11/30/2014	$5,085		$4,290	$0	$795		$0	$5,085
54	Mill Creek 1 - SAM Mitigation	BART	11/30/2016	$10,137		$7,920	$0	$2,217		$0	$4,412
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$0**	**$52,077**		**$0**	**$228,028**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR	11/30/2013	$47,659		$41,250	$0	$6,409		$0	$47,659
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2015	$117,872		$97,020	$0	$20,852		$0	$115,330
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5	11/30/2013	$92,339		$80,850	$0	$11,489		$0	$92,339
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	11/30/2013	$37,690		$33,000	$0	$4,690		$0	$37,690
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5	11/30/2013	$4,890		$4,290	$0	$600		$0	$4,890
62	Mill Creek 2 - SAM Mitigation	BART	11/30/2015	$9,747		$7,920	$0	$1,827		$0	$9,229
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$0**	**$45,866**		**$0**	**$307,137**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR	4/30/2015	$84,262		$63,750	$0	$20,512		$0	$84,262
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$0		$0	$0	$0		$0	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5	4/30/2015	$125,943		$104,125	$0	$21,818		$0	$125,943
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5	4/30/2015	$6,683		$5,525	$0	$1,158		$0	$6,683
69	Total Mill Creek 3			**$216,888**		**$173,400**	**$0**	**$43,488**		**$0**	**$216,888**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR	5/31/2014	$271,994		$236,250	$0	$35,744		$0	$271,994
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$5,696		$5,250	$0	$446		$0	$5,696
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5	5/31/2014	$151,571		$131,250	$0	$20,321		$0	$151,571
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5	5/31/2014	$7,882		$6,825	$0	$1,057		$0	$7,882
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT	5/31/2012	$11,528		$10,500	$0	$1,028		$0	$11,528
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$0**	**$58,596**		**$0**	**$448,671**
77											
78	**Total Mill Creek**			**$1,259,163**		**$1,059,135**	**$0**	**$200,028**		**$0**	**$1,200,723**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5	10/31/2015	$158,119		$128,000	$0	$30,119		$0	$149,737
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5	10/31/2015	$7,967		$6,451	$0	$1,516		$0	$7,967
83	Total Trimble 1			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$0**	**$31,635**		**$0**	**$157,704**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$2,000	$0	$0		$1,250	$750
89	Total Environmental Air Studies			**$2,000**		**$2,000**	**$0**	**$0**		**$1,250**	**$750**
90											
91											
92	**Total Environmental Compliance - Air**			**$2,732,101**		**$2,242,959**	**$40,000**	**$449,142**		**$2,500**	**$2,581,100**
93											
94	Notes										
95	(1) - In-Service Dates are estimated based on current outage schedule.										
96	(2) - Black & Veatch study does not meet level 1 engineering criteria.										
97	(3) - 3.5% overhead and 4% escalation applies to all projects except Ghent 1 & 2 SAM Mitigation, MC3 FGD Removal and Environmental Air Studies.										

	L
53	$0
54	$5,725
55	**$55,380**
56	
57	$0
58	$2,541
59	$0
60	$0
61	$0
62	$519
63	**$3,060**
64	
65	$0
66	$0
67	$0
68	$0
69	**$0**
70	
71	$0
72	$0
73	$0
74	$0
75	$0
76	**$0**
77	
78	**$58,439**
79	
80	
81	$8,381
82	$0
83	**$8,381**
84	
85	**$8,381**
86	
87	
88	$0
89	**$0**
90	
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92	**$148,501**
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	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$25,500		$0	$0	$0	$6,375	$19,125	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$242,388**	**$0**	**$0**	**$2,455**	**$38,297**	**$116,061**	**$85,575**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,284,663**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$376,505**	**$183,095**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,757,601**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$803,294**	**$647,111**	**$145,319**	**$3,182**		

	A	C	D	E	F	G	H	I	J	K	L	M	P
1	**2.) Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**												
2	**Capital Cost - Investment Accrual Basis (Without Removal/ARO)**												
3	$ in thousands												
4	**Estimated**	**In-Servi**	Total	2010	2011	2012	2013	2014	2015	2016	2017		
5	**Cash Flow By Year**												
6	**Brown**												
7	Brown 1 - SCR	5/31/2014	$68,325		$3,175	$19,814	$27,476	$17,859					
8	Brown 1 - Baghouse	5/31/2014	$39,218		$1,830	$13,322	$15,834	$8,233					
9	Brown 1 - PAC Injection	5/31/2014	$1,899		$0	$0	$931	$968					
10	Brown 1 - SAM Mitigation	5/31/2014	$4,632		$215	$1,343	$1,863	$1,211					
11	Total Brown 1		**$114,075**	**$0**	**$5,221**	**$34,479**	**$46,103**	**$28,272**	**$0**	**$0**	**$0**		
12													
13	Brown 2 - SCR	11/30/2013	$104,971		$9,903	$38,621	$50,877	$5,570	$0	$0	$0		
14	Brown 2 - Baghouse	11/30/2015	$41,179		$0	$1,522	$11,875	$13,174	$13,272	$1,336	$0		
15	Brown 2 - PAC Injection	11/30/2015	$3,058		$0	$0	$0	$1,499	$1,559	$0	$0		
16	Brown 2 - SAM Mitigation	11/30/2013	$4,568		$215	$1,791	$2,561	$0	$0	$0			
17	Total Brown 2		**$153,776**	**$0**	**$10,118**	**$41,935**	**$65,314**	**$20,242**	**$14,831**	**$1,336**	**$0**		
18													
19	**Brown 1 & 2 - SAM Mitigation**												
20													
21	Brown 3 - Baghouse	5/31/2016	$76,066		$0	$0	$2,131	$25,851	$36,102	$11,983	$0		
22	Brown 3 - PAC Injection	5/31/2016	$6,835		$0	$0	$0	$1,211	$4,314	$1,310	$0		
23	Total Brown 3		**$82,901**	**$0**	**$0**	**$0**	**$2,131**	**$27,061**	**$40,416**	**$13,292**	**$0**		
24													
25	**Total Brown**		**$350,751**	**$0**	**$15,339**	**$76,414**	**$113,547**	**$75,575**	**$55,248**	**$14,628**	**$0**		
26													
27	**Ghent**												
28	Ghent 1 - Baghouse	5/31/2016	$163,356				$4,575	$55,515	$77,531	$25,734			
29	Ghent 1 - PAC Injection	5/31/2016	$8,036		$0	$0	$0	$1,211	$5,515	$1,310	$0		
30	Ghent 1 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
31	Total Ghent 1		**$179,142**	**$375**	**$7,375**	**$0**	**$4,575**	**$56,726**	**$83,047**	**$27,043**	**$0**		
32													
33	Ghent 2 - SCR	4/30/2014	$262,878		$12,217	$76,235	$105,712	$68,713	$0	$0	$0		
34	Ghent 2 - Baghouse	4/30/2016	$149,464		$0	$0	$5,588	$50,854	$71,021	$22,001			
35	Ghent 2 - PAC Injection	4/30/2016	$7,695		$0	$0	$0	$1,211	$5,174	$1,310			
36	Ghent 2 - SAM Mitigation	12/31/2011	$7,750	$375	$7,375								
37	Total Ghent 2		**$427,787**	**$375**	**$19,592**	**$76,235**	**$111,301**	**$120,778**	**$76,195**	**$23,311**	**$0**		
38													
39	Ghent 3 - Baghouse	10/31/2015	$170,210		$0	$0	$19,280	$58,482	$83,412	$9,036	$0		
40	Ghent 3 - PAC Injection	10/31/2015	$7,624		$0	$0	$0	$3,737	$3,887	$0	$0		
41	Ghent 3 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
42	Total Ghent 3		**$186,403**	**$250**	**$650**	**$7,670**	**$19,280**	**$62,219**	**$87,298**	**$9,036**	**$0**		
43													
44	Ghent 4 - Baghouse	12/31/2015	$144,530		$0	$0	$13,622	$49,582	$73,665	$7,661	$0		
45	Ghent 4 - PAC Injection	12/31/2015	$7,669		$0	$0	$0	$3,760	$3,910	$0	$0		
46	Ghent 4 - SAM Mitigation	12/31/2012	$8,570	$250	$650	$7,670							
47	Total Ghent 4		**$160,770**	**$250**	**$650**	**$7,670**	**$13,622**	**$53,342**	**$77,575**	**$7,661**	**$0**		
48													
49	**Total Ghent**		**$954,101**	**$1,250**	**$28,267**	**$91,575**	**$148,777**	**$293,065**	**$324,115**	**$67,052**	**$0**		
50													

Draft

	A	C	D	E	F	G	H	I	J	K	L	M	P
51	**Mill Creek**												
52	Mill Creek 1 - FGD Upgrade	11/30/2014	$49,565		$0	$0	$12,006	$34,962	$2,597	$0	$0		
53	Mill Creek 1 - SCR	11/30/2016	$122,586		$0	$0	$3,389	$32,892	$36,651	$47,011	$2,643		
54	Mill Creek 1 - Baghouse	11/30/2014	$96,033		$0	$9,051	$32,945	$48,947	$5,090	$0	$0		
55	Mill Creek 1 - PAC Injection	11/30/2014	$5,085		$0	$480	$1,748	$2,857	$0	$0	$0		
56	Mill Creek 1 - SAM Mitigation	11/30/2016	$10,137		$0	$0	$461	$959	$2,992	$5,186	$539		
57	Total Mill Creek 1		**$283,407**	**$0**	**$0**	**$9,531**	**$50,549**	**$120,617**	**$47,331**	**$52,197**	**$3,182**		
58													
59	Mill Creek 2 - FGD Upgrade	11/30/2013	$47,659		$0	$11,544	$33,617	$2,497	$0	$0	$0		
60	Mill Creek 2 - SCR	11/30/2015	$117,872		$0	$3,258	$31,627	$35,242	$45,203	$2,541	$0		
61	Mill Creek 2 - Baghouse	11/30/2013	$92,339		$8,703	$31,678	$47,064	$4,895	$0	$0	$0		
62	Mill Creek 2 - Electrostatic Precipitator	11/30/2013	$37,690		$3,552	$12,930	$19,210	$1,998	$0	$0	$0		
63	Mill Creek 2 - PAC Injection	11/30/2013	$4,890		$462	$1,681	$2,747	$0	$0	$0	$0		
64	Mill Creek 2 - SAM Mitigation	11/30/2015	$9,747		$0	$443	$922	$2,877	$4,987	$519	$0		
65	Total Mill Creek 2		**$310,196**	**$0**	**$12,717**	**$61,534**	**$135,188**	**$47,508**	**$50,190**	**$3,060**	**$0**		
66													
67	Mill Creek 3 - FGD (U4 update and tie in)	4/30/2015	$84,262		$0	$0	$0	$59,235	$25,027	$0	$0		
68	Mill Creek 3 - FGD (Unit 3 Removal)		$0		$0	$0	$0	$0	$0	$0	$0		
69	Mill Creek 3 - Baghouse	4/30/2015	$125,943		$0	$2,331	$36,368	$47,908	$39,335	$0	$0		
70	Mill Creek 3 - PAC Injection	4/30/2015	$6,683		$0	$124	$1,930	$2,542	$2,087	$0	$0		
71	Total Mill Creek 3		**$216,888**	**$0**	**$0**	**$2,455**	**$38,297**	**$109,686**	**$66,450**	**$0**	**$0**		
72													
73	Mill Creek 4 - FGD	5/31/2014	$271,994		$20,344	$89,920	$104,519	$57,210	$0	$0	$0		
74	Mill Creek 4 - SCR Upgrade	5/31/2012	$5,696		$4,521	$1,175	$0	$0	$0	$0	$0		
75	Mill Creek 4 - Baghouse	5/31/2014	$151,571		$5,651	$51,425	$61,122	$33,373	$0	$0			
76	Mill Creek 4 - PAC Injection	5/31/2014	$7,882		$294	$2,674	$3,178	$1,735	$0	$0			
77	Mill Creek 4 - Ammonia	5/31/2012	$11,528		$5,651	$5,877	$0	$0	$0	$0			
78	Total Mill Creek 4		**$448,671**	**$0**	**$36,461**	**$151,072**	**$168,820**	**$92,319**	**$0**	**$0**	**$0**		
79													
80	**Total Mill Creek**		**$1,259,163**	**$0**	**$49,177**	**$224,592**	**$392,854**	**$370,130**	**$163,970**	**$55,257**	**$3,182**		
81													
82	**Trimble**												
83	Trimble 1 - Baghouse	10/31/2015	$158,119	$0	$0	$0	$14,902	$54,244	$80,591	$8,381	$0		
84	Trimble 1 - PAC Injection	10/31/2015	$7,967	$0	$0	$0	$0	$3,905	$4,062	$0	$0		
85	Total Trimble 1		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
86													
87	**Total Trimble**		**$166,086**	**$0**	**$0**	**$0**	**$14,902**	**$58,149**	**$84,653**	**$8,381**	**$0**		
88													
89	**Environmental Air Studies**												
90	Environmental Air Studies		$2,000	$1,250	$750	$0	$0	$0	$0	$0	$0		
91	Total Environmental Air Studies		**$2,000**	**$1,250**	**$750**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**		
92													
93													
94	**Total Environmental Compliance - Air**		**$2,732,101**	**$2,500**	**$93,533**	**$392,581**	**$670,080**	**$796,919**	**$627,986**	**$145,319**	**$3,182**		

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$1,602,762		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From: Saunders, Eileen
To: Betz, Alex
Sent: 10/11/2010 4:27:48 PM
Subject: EON Mill Creek Project Design Memo (E.ON comments).doc
Attachments: EON Mill Creek Project Design Memo (E.ON comments).doc

Alex,

B&V sent me this document to review on Tuesday. Considering I was out with them doing the kickoff meeting for Ghent with them the balance of the week, I did not see it until today and I did not notice you were not copied. This document is mainly a PE function to manage but because it has Mill Creek data included, I thought I would send it to you as well. I have already made my comments and corrections so you will see them highlighted with "track changes".

This PDM (Project Design Memo) is a living and breathing document that will change over time. B&V will control the document and manage all changes.

If you have time, take a look at pages 1-28 for content and the Appendix and let me know if you have any comments. Please don't spend too much time on it as we will have many chances to make changes over time.

I need to send them something back tomorrow so if I don't hear from you, I will just send them my comments. Again, I apologize for the late notice.

Thanks,

Eileen

E.ON – Mill Creek Station

Phase II Air Quality Control Study

Project Design Memorandum

October 5, 2010
Revision B – Issued For Client Review

B&V File Number 22.1000

BLACK & VEATCH
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Table of Contents

Appendices

Tables

Figures

1.0 Project Description

1.1 Introduction

1.1.1 Purpose

This site-specific Project Design Memorandum document defines the technical and functional requirements on which the Mill Creek Phase II Air Quality Control Study will be based. The stated functional and technical requirements include E.ON US (E.ON) requirements and are applicable to the Mill Creek portion of the overall project. Separate PDMs will be developed for other stations included in the overall project.

1.1.2 Organization of the Document

This Project Design Memorandum document is organized into various sections covering scope of work, environmental, and engineering criteria and requirements. Additional sections may be added during other phases of the project.

1.1.3 Revisions

The Project Design Memorandum document is dynamic in nature. Black & Veatch (B&V) controls this document and is thus responsible for updates and revisions. It is anticipated that this document will be periodically updated and potentially expanded during the life of the project as additional data and specific design criteria become available.

1.2 Overview

The purpose of this Phase II air quality control study is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II) for three different facilities, including Mill Creek. Similar studies will be performed for the Ghent and E.W. Brown facilities. Each facility will have a specific project design memorandum.

The Mill Creek Station is located in southwestern Jefferson County, approximately 10.5 miles southwest of the city of Louisville, Kentucky, on a 509 acre site. Mill Creek Station includes four coal fired electric generating units with a gross total generating capacity of 1,608 MW. Mill Creek Station Unit 1 was placed in service in 1972, Mill

Creek Station Unit 2 was placed in service in 1974, and Mill Creek Station Unit 3 was placed into service in 1978 and Mill Creek Station Unit 4 was placed into service in 1982.

All four steam generators (boilers) fire high sulfur bituminous coal. Each Mill Creek Station unit is composed of one GE reheat tandem compound, double-flow turbine with a condenser and hydrogen-cooled generator. Units 1 and 2 each consist of one Combustion Engineering subcritical, balanced draft boiler and have a gross capacity of 330 MW each. Units 1 and 2 are equipped with Low NO_x Burners (LNBs) and Overfire Air (OFA) for nitrogen oxide ($NO_{x)}$ control, a cold-side dry Electrostatic Precipitator (ESP) for particulate matter (PM) control, and a Wet Flue Gas Desulfurization (WFGD) for sulfur dioxide ($SO_{2)}$ and hydrogen chloride (HCl) control. Units 3 and 4 each consist of one Babcock & Wilcox (B&W) balanced draft, Carolina type radiant boiler and have a gross capacity of 423 MW and 525 MW, respectively. Units 3 and 4 are equipped with LNBs and Selective Catalytic Reduction (SCR) for NO_x control, a cold-side dry ESP for PM control and a WFGD for SO_2 and HCl control.

Gypsum, a scrubber by-product, produced at Mill Creek is either stored in the on-site landfill or sold for use in manufacture of wall board for the home construction industry. Fly ash is either stored in the on-site landfill or sold for beneficial reuse to the concrete industry. Bottom ash is sluiced to on-site storage ponds. Initially, all four units were cooled using water from the nearby Ohio River; however, Units 2, 3, and 4 were retrofitted with mechanical draft cooling towers.

The following is a summary of basic project information.

- Project Name: Phase II Air Quality Control Study – Mill Creek Station
- Client/Owner: E.ON US (E.ON)
- Operator: Louisville Gas & Electric (LG&E)
- Engineer & Regulatory Consultant: Black & Veatch Corporation (B&V)
- Project Site Location: Louisville, Kentucky (refer to Figure 1-1 and Figure 1-2)
- Project Type/Size: Retrofit of Environmental/Air Quality Control equipment for existing units.
- On-Site Work: Start Construction – [LATER]
- In Service Date: 2013 to 2017 [E.ON CONFIRM]
- Fuel: High Sulfur Western Kentucky Bituminous Coal from Illinois Basin, Natural Gas for startup
- Water Source: Well Water, City Water, Ohio River Water

North

South

Figure 1-1
Mill Creek Power Plant Site

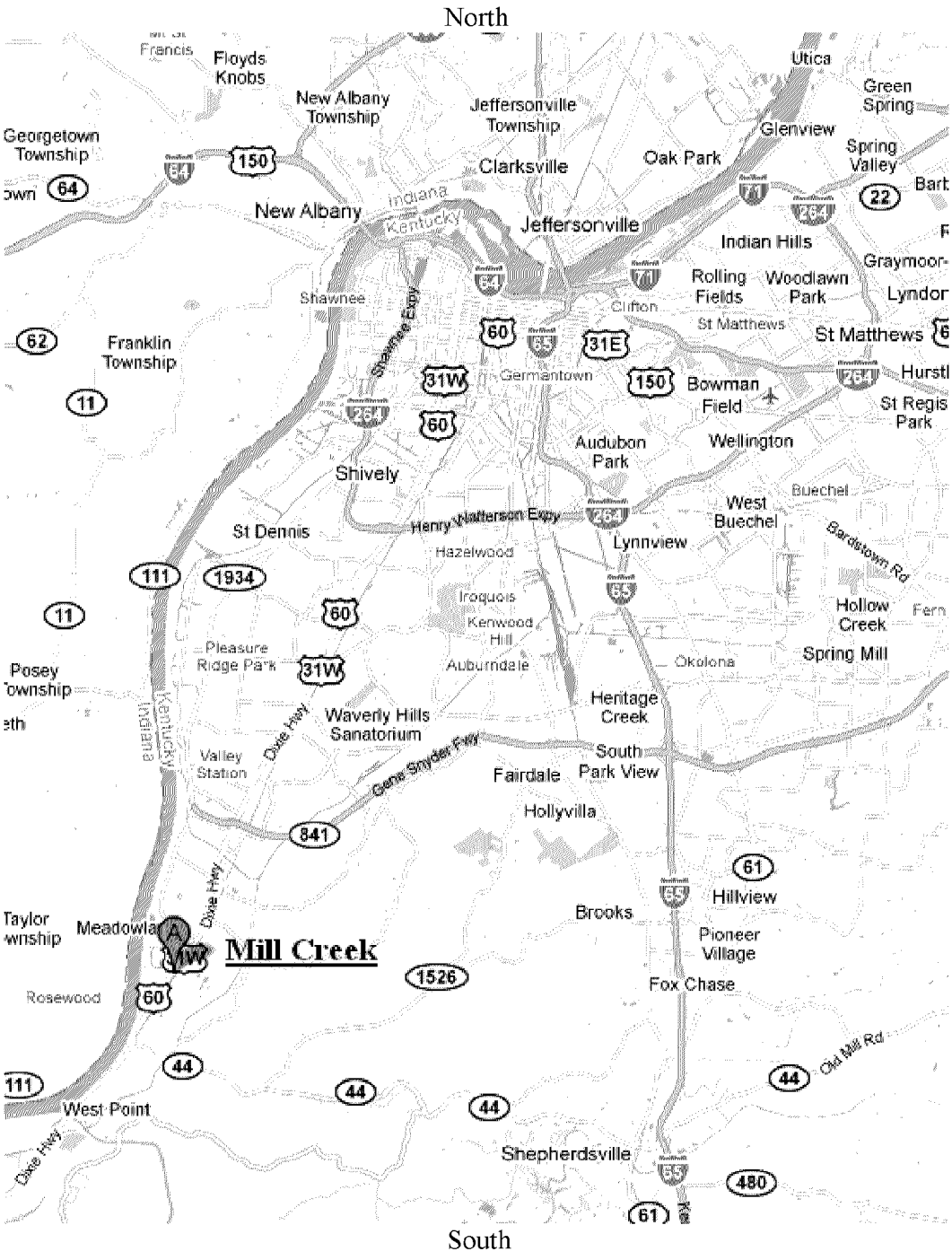


Figure 1-2
Mill Creek and Surrounding Area Map

Existing Facilities:

• Existing On Site Generation Units:	• Unit 1 - 330 gross MW (in-service date 1972) • Unit 2 - 330 gross MW (in-service date 1974) • Unit 3 - 423 gross MW (in-service date 1978) • Unit 4 - 525 gross MW (in-service date 1982)
• Existing Air Quality Control Equipment:	• Unit 1 - Low NO_x Burners (LNBs), Overfire Air System (OFA), Cold-side Dry Electrostatic Precipitator (ESP), Wet Flue Gas Desulfurization (WFGD) • Unit 2 - LNBs, OFA, Cold-side Dry ESP, WFGD • Unit 3 - LNBs, Selective Catalytic Reduction (SCR), Cold-side Dry ESP, WFGD • Unit 4 - LNBs, SCR, Cold-side Dry ESP, WFGD
• Site Access:	Site is located in Jefferson County, Louisville, Kentucky, on the east side of the Ohio River, approximately 10.5 miles southwest of the city of Louisville, near Meadowlawn with access on Lee Driveway off of Dixie Highway (US 60).

1.3 Scope of Work

A summary of the current scope of work is provided below. Refer to Appendix A for the complete scope of work. Project scope items provided by others, but requiring technical interface, are also listed below.

- Project Kick-off Meeting & Site Visit
- Environmental Regulatory Considerations
- Develop Project Instruction Memorandum
- Project Management
- Develop Project Design Memorandum
- AQC Technology Validation and Selection
- Develop Preliminary Conceptual Design

- Project Cost Estimate
- Implementation Schedule
- Constructability Plan
- Evaluation Report
- Fabric Filter Letter Specification and Vendor Workshop

Project Elements being provided by others:

- Permitting – E.ON Environmental Affairs Department
- Existing Scrubber Condition and Upgrade Evaluation - Vendors

1.4 Governing Building Code

The governing local building code is the Kentucky Building Code, Ninth Edition (2006 International Building Code (IBC), as specifically amended).

1.5 Design and Performance

This section summarizes major plant and scope of work interfaces. When fuel or utilities are considered, the following defined properties shall be used as the design basis.

1.5.1 Unit Performance

Plant design is based on the criteria listed in Table 1-1.

Table 1-1
Performance Design Basis

Parameter	Basis Value
Ambient Temperature	77 °F Dry Bulb
Ambient Pressure	29.49 in Hg
Ambient Humidity	60.0 % Relative Humidity
Fuel Analysis	Refer to Subsection 1.5.2

1.5.2 Fuel Specifications

All four Mill Creek units burn high sulfur, western Kentucky, bituminous coal from the Illinois Basin. Refer to Appendix B, Design Basis, for main fuel specifications.

Startup fuel is natural gas.

1.5.3 Water

1.5.3.1 Quality Requirements. Water quality characteristics for water to be used as the source for the AQC systems are listed in Table 1-2.

1.5.3.2 Water Balance. The design basis water balance for the new Mill Creek Unit 4 WFGD systems will be provided separately. The water balance for the other units is assumed to remain the same as current operation.

Table 1-2
Design Basis Water Analysis
[E.ON TO PROVIDE]

Constituent	Well Water	City Water	Ohio River Water
	mg/L as such	mg/L as such	mg/L as such
Calcium			
Magnesium			
Sodium			
Potassium			
Total Cations, mg/L as $CaCO_3$			
M-alkalinity, mg/L as $CaCO_3$			
Sulfate			
Chloride			
Nitrate			
Silica			
Total Anions, mg/L as $CaCO_3$			
pH (range)			
Specific Conductance, µS/cm			
Temperature (range), °F			
Total Suspended Solids			
Total Dissolved Solids			
Turbidity, NTU			
Color, PCU			
Total Phosphate, mg/l as PO_4			

Table 1-2 (continued)
Design Basis Water Analysis

Constituent	Well Water	City Water	Ohio River Water
	mg/L as such	mg/L as such	mg/L as such
Aluminum			
Barium			
Boron			
Cadmium			
Chromium			
Copper			
Iron			
Manganese			
Nickel			
Strontium			
Zinc			

References:
•

1.5.4 Emissions

Plant design is based on the primary target emissions criteria defined in Table 1-3.

Table 1-3
Primary Design Emission Targets

Pollutant	Unit 1	Unit 2	Unit 3	Unit 4
NO_x	0.139 lb/MBtu	0.139 lb/MBtu	0.139 lb/MBtu	0.139 lb/MBtu
SO_2	0.25 lb/MBtu	0.25 lb/MBtu	0.25 lb/MBtu	0.25 lb/MBtu
Sulfuric Acid Mist (SAM)	N/A	N/A	64.3 lb/hr	76.5 lb/hr
Mercury (Hg)	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh	90% control or 0.012 lb/GWh
HCl	0.002 lb/MBtu	0.002 lb/MBtu	0.002 lb/MBtu	0.002 lb/MBtu
Particulate Matter[1, 2]	0.03 lb/MBtu	0.03 lb/MBtu	0.03 lb/MBtu	0.03 lb/MBtu
Arsenic (As)[3]	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu	0.5×10^{-5} lb/MBtu
CO	0.10 lb/MBtu	0.10 lb/MBtu	0.10 lb/MBtu	0.10 lb/MBtu
Dioxin/Furan	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu	15×10^{-18} lb/MBtu

[1] Particulate matter control limits for $PM_{2.5}$ or $PM_{condensable}$ have not been determined for this project.
[2] Particulate matter assumed to be the surrogate for emissions of certain non-mercury metallic HAP (i.e., antimony (Sb), beryllium (Be), cadmium (Cd), cobalt (Co), lead (Pb), manganese (Mn), and nickel (Ni)).
[3] Arsenic assumed to be the surrogate for non-mercury metallic HAP (i.e., arsenic (As), chromium (Cr), and selenium (Se)).

Data from E.ON Mill Creek kickoff meeting of September 15, 2010 (Gary Revlett handouts and meeting notes).

1.5.5 Bulk Material

The following bulk materials may be associated with this project:

- Limestone will be used as a reagent in the WFGD systems.
- Pebble or powdered lime may be used if a dry scrubber is included on any of the units for SO_3 control and support of SO_2 control.
- Powder Activated Carbon (PAC) will be used for Hg control
- Fly ash will be collected dry from the precipitator and fabric filter.

1.5.5.1 Limestone Handling and Storage. Refer to Table 1-4 for the limestone properties.

Table 1-4
Limestone Properties
[E.ON TO CONFIRM]

Dry Basis, Percent (%) by Weight	Nominal	% Guaranteed
Calcium Carbonate, $CaCO_3$	94%	90% minimum
Magnesium Carbonate, $MgCO_3$	3%	6% maximum ~~(1.5% max insoluble)~~
Silica Dioxide, SiO_2	-	3.5% maximum
Ferric Oxide, Fe_2O_3	-	1.5% maximum
Aluminum Oxide, Al_2O_3	-	4.3% maximum
Total Inerts (non $CaCO_3$)	6%	7% maximum
~~Moisture~~	~~5%~~	~~12% maximum~~
Bond Work Index (kWh/t)	12	12 maximum ~~4 minimum~~
Surface Moisture	12%	7% maximum
Fluorides	500	ppm
Chlorides	550	ppm
Bulk Density Design Basis		
Volumentric Sizing	55	pcf
Structural Loading	115	pcf
Angle of Repose	30	degree
Surcharge Angle	25	degree
Maximum lump size	¾	inch

Data from Environmental Compliance Project Quality Data spreadsheet.

1.5.5.2 Pebble Lime Handling and Storage. Refer to Table 1-5 for the pebble lime properties.

Table 1-5
Pebble Lime Properties

Proximate Analysis, Dry Basis, Percent (%) by Weight	Nominal	Range
Available Calcium Oxide (CaO) Content	90.00	90% minimum
Magnesium Oxide (MgO) Content	0.00	0 – 5%
Inert	10.00	5 – 10%
Total	100.00	--
Bulk Density Design Basis		
Volumentric Sizing	55	pcf
Structural Loading	110	pcf
Angle of Repose	30	degree
Surcharge Angle	25	degree
Maximum lump size	3/4	inch

1.5.5.3 Powdered Lime Handling and Storage. Refer to Table 1-6 for the powdered lime properties.

Table 1-6
Powdered Lime Properties

Bulk Density Design Basis		
Volumentric Sizing	60	pcf
Structural Loading	85	pcf

1.5.5.4 Powdered Activated Carbon (PAC) Handling and Storage. Refer to Table 1-7 for the powdered activated carbon properties.

Table 1-7
Powdered Activated Charcoal Properties

Bulk Density Design Basis		
Volumentric Sizing	15	pcf
Structural Loading	35	pcf

1.5.5.5 Fly Ash from Precipitator/Fabric Filter Handling and Storage. Refer to Table 1-8 for the pebble lime properties.

Table 1-8
Fly Ash Properties

Bulk Density Design Basis		
Volumentric Sizing	65	pcf
Structural Loading	90	pcf

1.5.6 Classification of Hazardous Areas

Electrical equipment, materials, raceway and wiring will be selected, designed, and installed in accordance with NFPA-70 [NEC].

1.5.7 Future Expansion Considerations

The arrangement of the facility will be based on the configuration of the existing units. No additional units or future expansion is planned. Equipment layouts of the air quality control options must leave room for the modification or addition of biomass utilization and ash handling equipment as identified in the recently completed Black & Veatch Mill Creek Biomass Co-Firing Study dated August 23, 2010.

1.6 Permits and Licenses

1.6.1 Permits

The Environmental Affairs Department of E.ON US is responsible for identifying and obtaining the necessary Federal, State and Local permits required to construct and operate the facility and associated equipment. B&V is contracted to coordinate with the environmental counterpart at E.ON US, and provide guidance relevant to regulatory scenario planning to ensure project conceptual design is compliant with applicable federal, state, and local statutes and regulations.

1.7 Site Investigations

1.7.1 Surveys and Topography

The general area of the Mill Creek site under consideration for siting the AQC equipment has been developed as part of the existing plant installation and additional improvements. General site arrangement drawings covering the existing site were developed previously and are available for use in this study. However, several subsequent improvements have been completed in the area and the data on some of the older drawings may not be up to date. The existing drawings are sufficient for purposes of this study with regard to available space and topography, but a full survey of the as-built conditions is recommended before start of detailed design to ensure the latest information is used.

1.7.1.1 Underground Utilities. Relatively extensive existing underground utilities are located in the general area under consideration for the AQC improvements. The expected locations of underground utilities are documented on existing drawings, but

again the degree of completeness and accuracy may be suspect. The existing drawings are adequate for purposes of the AQC study, but a survey of existing underground utilities should be completed prior to detailed design.

1.7.2 Geology and Seismology

Several site-specific geotechnical investigations have previously been completed to support onsite modifications since original construction. Included in these investigations are the following.

- Geotechnical Engineering Investigation, Proposed SCR Unit, Mill Creek Generating Station, ATC Associates, Inc., 2001
- Soil Test Borings, Mill Creek Generating Station, Compilation of Various Soil Boring Logs Completed by Testing Services Corp., Raymond International, Greenbaum Associates, Pittsburg Testing Labs, and ATEC Associates dating back to 1967
- Test Boring Logs, Mill Creek Generating Station, Drawings CA-10621and CA-10622, IU Conversion Systems, Inc., 1980

This information was reviewed for general characteristics applicable to the areas under consideration for the AQC improvements. In general, the existing documentation noted indicated the following subsurface conditions.

- During original construction the area received significant amount of fill material varying from small areas of very soft clay to general areas of medium stiff clay and silty clay with some coarse construction rubble. Fill depth varied from 20 to 40 feet in depth.
- Below the fill, a natural soft clay exists to an approximate depth of 40 feet.
- Below 40 feet, the natural soil consisted of stiff to very stiff sandy clay extending to a depth of 70 to 90 feet.
- A stratum of very dense fine silty to coarse sand exists below the sandy clay to a maximum depth of 100 feet.
- A hard gray shale exists below this depth.
- Groundwater elevation varies with the pool elevation of the nearby river, but was expected at approximately 75 feet below grade. However, perched water above that elevation is likely in pockets of granular soil.

Based on the information above as well as foundations previously installed at the site, for purposes of the AQC study, new foundations for substantial structures will be assumed as driven piles or drilled piers with a safe working capacity of 150 ton in compression. Nominal length of driven piles is assumed at 90 feet for estimating purposes. Light

structures not subject to significant overturning can be assumed to be supported on shallow footing or raft foundations extending below the frost line. Shallow foundations will be designed based on an allowable bearing pressure of 3.0 ksf.

Prior to start of detailed design, additional geotechnical investigation should be completed to more exactly determine the geotechnical design parameters in the immediate area of the proposed improvements.

1.7.3 Hydrology

The site in the area of the AQC improvements is fully developed. Hydrology and storm event design have previously been established and will not be modified unless required. The addition of runoff volume due to any increase in impermeable surfaces resulting form the AQC modifications will be evaluated and the impact to existing stormwater systems estimated as a part of the study. Modifications to existing stormwater systems, if any, deemed necessary by the improvements proposed by the study will be recommended.

1.7.4 Noise

The project's conceptual engineering for noise control will be based on compliance with OSHA requirements and local noise restrictions, as applicable.

1.8 Environmental Design Criteria

1.8.1 Meteorology

Table 1-9 summarizes the meteorological data applicable to plant design. Wind data for the indicated location have been analyzed to develop the wind roses which are included in Appendix C.

Table 1-9
Meteorological (Ambient and Extreme) Data

Design Parameter	Design Value	Units
Rainfall – 24 Hour, 10 Year Event (Design rainfall parameter may vary depending on local codes or agencies.)	4.55(A)	inches
Rainfall – 24 Hour, 25 Year Event (Design rainfall parameter may vary depending on local codes or agencies.)	5.43(A)	inches
Rainfall – Average Annual Total	44.54(B)	inches
Design Rain Rate (100 year recurrence)	3.2(C)	inches per hour
Evaporation Rate – Annual Average NWS Class A Evap Pan	51.13(D)	inches
Design Wind Speed	90*(C, I)	mph
Structural Category for Wind (Table 1-1)	III(E)	
Wind Importance Factor, I_w (Table 6-1)	1.15(E)	
Wind Design Exposure (Chapter 6)	Category C(E)	N/A
Average Wind Speed	8.3(F)	mph
Prevailing Wind Direction (from)	South-southwest (G)	
Frost Depth (50 Year Recurrence)	32(C)	inches
Snow Load – Ground, p_g	15(I)	lb/ft^2
Snow Importance Factor, I_s	1.1(E)	
Open Structure Icing Design Conditions	0.75 inches ice thickness with 30 mph concurrent wind speed(I)	
Freeze Protection Design Conditions	-23.1°F (H) DB with 8.3 (F) mph coincident wind	
Annual Barometric Pressure, adjusted to site elevation	29.49(C)	in. Hg
Design Ambient Temp (Extreme High)	105.4 DB(H)	°F
Design Ambient Temp (Extreme Low)	-23.1 DB(H)	°F
Design Annual Average Ambient Temp	56.9(B)	°F
Winter Design (Dec-Feb) Ave Temp	36.1(B)	°F
Summer Design (Jun-Aug) Ave Temp	76.5(B)	°F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 1.0%)	91.2 DB(H) 75.3 MCWB(H)	°F °F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 2.0%)	89.0 DB(H) 74.3 MCWB(H)	°F °F
Space Conditioning Ambient Design Temps (ASHRAE Fundamentals, 99.0%)	14.5 DB(H) 13.0 MCWB(C)	°F °F

Notes:
Design conditions based on ASHRAE 2009 data for: Louisville, KY
Approximate Location (Google Earth): Latitude: 38.05N Longitude: 85.91W Elevation: 465 ft MSL
*3-second gust at 33 ft. above ground
References:
(A)National Weather Service- Hydrometeorological Design Studies Center.
(B)National Climatic Data Center (NCDC) Climate 20-Climate Normals; Louisville, KY.
(C)Engineering Weather CD, "Summary for Louisville, KY 1973-1996," Engineering Weather Data, 2000 Interactive Edition, 2001, Version 1.0, [CD].
(D)Technical Memorandum No. 34 from NWS, 1982.
(E)ASCE 7-05.
(F)NCDC United States Average Wind Speeds for US cities; Louisville, KY. Based upon 55 years of data, through 2002.
(G)Wind roses from Integrated Surface Hourly Data (ISH) 1995-2008 data for Louisville, KY.
(H)National Climatic Data Center (NCDC), "2009 ASHRAE Handbook Annual Summary with Comparative Data for Louisville, KY."
(I)Kentucky Building Code, Ninth Edition

1.8.2 Site Seismicity

Table 1-10 summarizes Seismicity parameters applicable to plant design. Table references are to ASCE 7 as referenced by the Kentucky Building Code.

Table 1-10
Seismicity Data

Design Parameter	Value
Building Code	Kentucky Building Code (IBC 2006 as specifically amended)
Building Use/Occupancy Category (main plant structures)	III
Seismic Importance Factors	1.25
Site Class (based on assumed soil profile)	D
Spectral Response Accelerations: 0.2 second response (S_s) 1.0 second response (S_1)	 Ss = 0.272 S1 = 0.110
Adjusted maximum considered earthquake response acceleration parameters: F_a (site coefficient from Table 11.4-1) F_v (site coefficient from Table 11.4-2)	 Fa = 1.58 Fv = 2.36
Maximum considered spectral response accelerations: S_{MS} (short periods; Fa * Ss) S_{M1} (1-second period; Fv * S_1)	 SMS = 0.430 SM1 = 0.260
Design spectral response acceleration parameters: S_{DS} = 2/3 (SMS) S_{D1} = 2/3 (SM1)	 SDS = 0.287 SD1 = 0.173
Seismic Design Category (SDC) (from Table 11.6-2)	C

1.8.3 Site Elevation

Site Elevation:	Existing at-grade floor of plant is 460 feet above Mean Sea Level (MSL).

1.8.4 Soil Resistivity

Minimal existing electrical soil resisitivity information was available from the various geotechnical investigations previously noted. Resistivity data in the general area under consideration was documented at approximately 36,000 ohm-cm with probes at 10 foot spacing and 38,000 ohm-cm for a 20 foot spacing. For purposes of this study, these values will be assumed as representative and will be utilized to estimate material requirements The electrical soil resistivity profile used for future grounding design will need to be determined from additional geotechnical investigations to be completed prior to detailed design.

1.9 Electrical Data

The electrical power system conceptual configuration shall be based on the project's one-line diagram which will be provided separately. Table 1-11 includes electrical parameters to be considered in the plant configuration.

Table 1-12 lists prevailing voltages and frequencies to be considered in the plant configuration.

Table 1-11
Electrical Design Data
[TO BE PROVIDED (TBP) BY E.ON]

Design Parameter	Value	Units
Available system fault current at electrical system interface point.		
• 345 KV System–Maximum:	TBP	amps
• 345 KV System–Minimum:	TBP	amps
• 22 KV System–Maximum:	TBP	amps
• 22 KV System–Minimum:	TBP	amps
• 13.8 KV System–Maximum:	TBP	amps
• 13.8 KV System– Minimum:	TBP	amps
• 4.16 KV System–Maximum:	TBP	amps
• 4.16 KV System–Minimum:	TBP	amps
• 480 V System–Maximum:	TBP	amps
• 480 V System–Minimum:	TBP	amps

Table 1-12
Electrical Equipment and System Voltages
[TO BE PROVIDED (TBP) BY E.ON]

	Continuous Voltage (Volts)	Momentary Voltage Dip	Frequency (Hz)		System Neutral Grounding	Transfer to Alternate Source	Max Sym Short-Circuit at Max Voltage (Amps)
Power Supply Code	Nom	% of Nominal	Nominal	Configuration	Type	Method	3-Phase Phase –Ground
GEN-1 Generator (Existing)	22,000	TBP	60	3-phase, 3-wire, Wye	High Resistance	N/A	(Later)
MV-1 Medium Voltage (Existing)	4,160	TBP	60	3-phase, 3-wire, Wye	Low Resistance	TBP	(Later)
MV-2 Medium Voltage (Existing)	13,800	TBP	60	3-phase, 3-wire, Wye	TBP	TBP	(Later)
LV-1 Low Voltage (Power)	480	80	60	3-phase, 3-wire, Delta - Delta	High Resistance	TBP	(Later)
LV-2 Low Voltage (Lighting)	480Y/277	80	60	3-phase, 4-wire, Wye	Solidly Grounded	N/A	(Later)
LV-3 Low Voltage (Power)	208Y/120	80	60	3-phase, 4-wire, Wye	Solidly Grounded	N/A	(Later)
UPS-1 UPS Power	120	80	60	Single phase, 2-wire	Solidly Grounded	Static ½ Cycle	(Later)
DC-1 DC Power	125	70	0	Two-Pole	Ungrounded	N/A	(Later)
CP-1 Control Power (AC)	120	80	60	Single-Phase, 2-Wire	Solidly Grounded	N/A	(Later)

1.10 Temporary Facilities

Construction support services will be required by all onsite contractors, subcontractors, and their personnel. These support services and facilities, depending on contract requirements, may be provided by E.ON, LG&E, the Contractor(s), and/or their subcontractors. The following list summarizes construction facilities that will be estimated in this phase of the project:

- Field Office(s): B&V will estimate size and location of field offices and construction trailers.
- Material Lay-Down Area(s): B&V will estimate size of area needed for material lay-down during construction.
- Project Parking Requirements: B&V will estimate size and location of temporary parking facilities needed during construction.

1.11 Fire Protection Design Data

Fire protection systems design will be based on NFPA requirements. Details of planned fire protection design will be provided later.

1.12 Economic Evaluation Criteria

1.12.1 Economic Evaluation Factors

Table 1-11 lists economic criteria to be considered in the project cost estimate.

Table 1-11
Economic Criteria

Economic Parameters	2010 Costs by Unit			
	1	2	3	4
Remaining Plant Life (years)	30			
Limestone Cost ($/ton)	7.54			
Lime Cost ($/ton)	118.13			
Ash Disposal Cost ($/ton)	15			
SCR Catalyst Replacement Cost ($/$m^3$)	6500			
Ammonia Cost for SCR ($/ton)	530.03			
Trona Cost ($/ton)	195			
Brominated Activated Carbon Cost ($/lb)	1.1			
Auxiliary Power Cost ($/MWh)	21.56	21.69	23.31	22.35
Water Cost ($/1,000 gal)	2			
Fully-Loaded Labor Rate ($/hr)	132,901			
Capital Escalation Rate (%)	2.5			
O&M Escalation Rate (%)	2			
Levelized Fixed Charge Rate or Capital Recovery Factor (%)	12.17			
Interest During Construction (%)	4.5			

Data from Economic Criteria tab of the Phase 1 Design Basis spreadsheet.

1.12.2 Load Model

The average annual unit load model used for economic evaluations is based on unit operation as follows:

Table 1-11
Load Model
[E.ON TO PROVIDE]

Unit #	Unit Load, Percent (%) MCR	Unit Gross Output/MW	Unit Net Output/MW	Operating Hours-Hours/year	Net MW Hours/year
Unit 1	100 90 80 75 Offline Total				
Unit 2	100 90 80 75 Offline Total				
Unit 3	100 90 80 75 Offline Total				
Unit 4	100 90 80 75 Offline Total				

2.0 Design Codes and Standards

2.1 Project Specifications

B&V's scope includes development of technical specifications for the purchase and erection of Fabric Filters for the various units requiring Fabric Filters as part of the AQC Study. Specifications will include technical specifications developed by B&V along with Front End Documents and General Conditions as developed by E.ON. Technical specifications are expected to be letter form in B&V standard format.

2.2 Codes and Standards

The design and specification of work shall be in accordance with applicable state and federal laws and regulations and local codes and ordinances. The codes and industry standards which will be the basis for design, fabrication, and construction are listed below and will be the editions in effect, including all addenda, as stated in equipment and construction purchase or contract documents. Other recognized standards may also be used as design, fabrication, and construction guidelines when not in conflict with the listed standards. Applicable codes will be as established based on consideration of applicable laws and regulations:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI).
- American Institute of Steel Construction (AISC).
- American Iron and Steel Institute (AISI).
- American National Standards Institute (ANSI).
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME).
- American Society for Testing and Materials (ASTM).
- American Water Works Association (AWWA).
- American Welding Society (AWS).
- Compressed Gas Association (CGA).
- Concrete Reinforcing Steel Institute (CRSI).

- Conveyor Equipment Manufacturers Association (CEMA)
- U.S. Department of Transportation (DOT).
- Factory Mutual (FM).
- Illuminating Engineering Society (IES).
- Institute of Electrical and Electronics Engineers (IEEE).
- Instrument Society of America (ISA).
- Insulated Cable Engineers Association (ICEA).
- International Building Code (IBC).
- Kentucky Building Code
- National Electrical Manufacturer's Association (NEMA).
- National Electrical Safety Code (NESC) and National Electric Code (NEC) as applicable.
- National Fire Protection Association (NFPA).
- Occupational Safety and Health Administration (OSHA).
- Underwriters Laboratory (UL) Standards.

2.3 Engineering Drawings and Data Content

B&V standards will be used to establish tagging schemes, drawing content, drawing borders, drawing software and formats, symbols, data report content and formats, virtual modeling format and protocols, and interfaces to contractor and subcontractor drawings and data. Interfaces with and references to non-B&V drawings will be provided in sufficient detail to describe the complete design, but generally will not be a duplication of non-B&V data on B&V drawings. Major equipment interfaces will be represented as needed to support construction.

In instances where the new design impacts existing E.ON/LG&E drawings, such drawings will be modified by B&V as required to reference new drawings or reflect the new design, depending on which results in the most practical, functional, and cost-effective set of deliverables.

Appendix A

EON AQC Budgetary Cost Estimate Proposal

(Rev 1 - Pages 1-8)

PROPOSAL FOR
AIR QUALITY CONTROL BUDGETARY COST ESTIMATE

The purpose of this scope of work is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II). The Phase II scope of work is proposed for the Mill Creek, Ghent, and Brown facilities, and will be composed of the following tasks and deliverables to ensure that the study is properly defined, documented, and completed on time. It should be noted that there are some scope differences between the three facilities because of variations in the complexity of the future AQC equipment scenarios for each. These differences in study scope are noted below in the appropriate tasks and reflected in the cost estimate. For the purpose of this proposal, E.ON's Mill Creek facility is assumed to be the first facility to begin the Phase II services, with the Ghent and Brown facilities to have a staggered kick-off delay of approximately 1 month each.

SCOPE OF WORK

Task 1 – Project Kick-off Meeting & Site Visit

The Black & Veatch project team members will attend project kickoff meetings at Mill Creek, Ghent, and Brown as depicted in the schedule. It is anticipated that Mill Creek's kick-off meeting will consist of an initial meeting with Project Engineering in Louisville, followed by a technical meeting and site walk down at the facility. The kick-off meetings for Ghent and Brown will be held on site. An agenda will be prepared prior to each kick-off meeting.

The following are the main objectives for the kick-off meeting and initial site visit:

- Discuss project objectives, expectations, and constraints.
- Discuss project communication procedures and identify project team contacts for both E.ON and Black & Veatch for utilization in the *Project Instructions Memorandum*.
- Obtain or identify key site specific drawings, plant performance data, and existing equipment information not previously collected.
- Continue discussions of potential equipment locations with plant engineers.
- Develop understanding of draft system capabilities for supporting new emissions control equipment.
- Develop understanding of the general condition of the balance-of-plant and major equipment to estimate existing equipment upgrade costs for various plans.
- Assess potential arrangement interferences for support of cost estimate.
- Obtain copies of existing reports and studies that will be used during the preparation of the study.
- Establish and agree upon the study schedule and deliverables.

To expedite onsite communications and information collection, Black & Veatch understands that utilization of a single point of contact (SPOC) throughout the project is desirable to ensure proper communications and tracking of data exchanges.

Task 2 – Environmental Regulatory Considerations

During the technology evaluation part of the analysis (Task 6), Black & Veatch's experienced staff of regulatory specialists, air quality scientists, biologists, and other environmental professionals will participate in an advisory capacity to the Black & Veatch engineering staff assigned to the project. We will assign an Environmental Permitting Manager who will be responsible for coordinating with the environmental counterpart at E.ON, providing guidance to E.ON and Black & Veatch engineers relevant to regulatory scenario planning to ensure project conceptual design compliance with applicable federal, state, and local statutes and regulations.

Task 3 – Develop Project Instruction Memorandum

To ensure proper communications, interchange of data and information, and development of a sound project definition and cost estimate, the project itself must have a set of processes and procedures. Black & Veatch will develop a Project Instructions Memorandum (PIM) for the project that will include all Owner specific procedures and additional procedures established by Black & Veatch for use during the execution of the project. The memorandum will establish guidelines, methods, procedures, and lines of communication to administer, control, and coordinate the work between Black & Veatch, other project participants, and E.ON as determined during the kick-off meeting. A full PIM will be completed for Mill Creek and amended for the Ghent and Brown facilities.

Task 4 – Project Management

The following Project Management tasks will be provided to ensure the success of the study.

Schedule & Planning

A project milestone schedule will be developed and issued to E.ON for review within 30 days of Kick-off meeting. After discussion and receipt of comments, a base line schedule will be prepared and issued.

Communications & Coordination

To facilitate communications for the project, we would hold weekly teleconferences between the E.ON team and the Black & Veatch project team. These meetings would include review of project status, schedule review, and review of the Action Item list. In addition to the weekly teleconferences, we would plan to attend periodic Progress Meetings at the plant site or E.ON offices to discuss present project status and address any questions or concerns. A monthly Project Progress Report will be prepared and issued to E.ON. In addition to normal email and telephone communication, Black & Veatch will establish a web based system for rapidly transmitting and exchanging information between E.ON, Black & Veatch and Third parties. Information and instructions for utilizing this system will be included in the PIM.

Management Documentation

In addition to the project schedule and the Monthly Progress Reports, Black & Veatch will prepare minutes of the weekly teleconference and prepare an Action Item List which will address pending actions and note responsible parties and commitments dates. The Action Item list will be updated weekly and discussed during the weekly teleconference and the Progress Meetings.

Project Documentation

As defined in the PIM, Black & Veatch will prepare meeting minutes of all meeting attended with E.ON and third parties for the project. The meeting minutes will be prepared and submitted for review and approval and subsequently issued as final. Project E-mail traffic will be captured and filed within the project filing system and key telephone conversations will be documented using confirming email to all parties. Black & Veatch will transmit, file, and track all reports, studies, drawings and other documentation in accordance with the PIM to ensure that the information is stored and retrievable.

Task 5 – Develop Project Design Memorandum.

Black & Veatch will build upon the initial design basis prepared for the fleet-wide, high-level cost assessment and develop a Project Design Memorandum (PDM) for each facility, which will incorporate the controlling requirements for the conceptual engineering design of the project. The purpose of this document will be to describe the design requirements of the project and to provide the basis for conceptual design and cost estimating. The PDM will include information already submitted by E.ON, as well as addition information that may be necessary.

Information contained in the PDM includes the following

- Project description and purpose.

- Scope of Work.
- Governing Building Codes and Standards.
- The site information in the form of data summaries resulting from initial investigations or monitoring of ambient environment, hydrology, meteorology, geology, topography, background noise, and the load bearing capability and resistive characteristics of soils.
- Air emission rate targets as identified by E.ON and reviewed by Black & Veatch.
- Unit capacity factors
- Capacities
- Flue gas temperature
- ID fan / FD fan capacities
- Other operating parameters
- Fuel data
- Water data
- Reagent/sorbent data
- Economic evaluation criteria
- Engineering design criteria, standards and codes for the engineering disciplines: mechanical, civil, structural, electrical, control, and chemical engineering, including site specific criteria.
- Flue gas flow rates and conditions.
- Ash production rates.

The project team will develop the PDM early in the project, but it will be a living document that will undergo updates during the course of the project to include new data and, results of decisions. The document will incorporate any modifications required by E.ON so that the project going forward will be utilizing the most up to date data and information. The chief purpose of the PDM is to encapsulate the preferences of E.ON under which the various control alternatives and conceptual design will be developed.

Task 6 – AQC Technology Validation and Selection

As E.ON is aware, during the course of the high-level, fleet wide analysis conducted in the previous study, preliminary air quality control (AQC) technologies were initially recommended and approved for the purpose of generating order-of-magnitude cost estimates. However, the very nature of the previous work may have resulted in overly conservative AQC technology assumptions and selections in order to meet the project schedule and bracket the cost estimate. Accordingly, Black & Veatch understands that E.ON may have plant-specific AQC preferences, configurations, and alternative control technology scenarios that may also be feasible and capable of meeting the stated environmental goals, particularly in light of fleet-wide averaging opportunities or other constraints.

To address the potential AQC technology scenarios, Black & Veatch will conduct a more refined available technology selection analysis to evaluate and validate the preliminary retrofit technologies, as well as improvement to existing site control equipment, that can achieve the required future emissions target levels. The evaluation includes estimating emissions reduction, addressing technical feasibility and capability, applying known site constraints, providing technical descriptions of each technology, addressing commercial availability and guarantees, and describing the pros and cons of each technology. The technology analysis will validate which retrofit technologies, or improvement to existing control technologies, are technically feasible and capable of meeting the established emission target levels. The analysis will also document and explain, based on physical, chemical, or engineering principles, why technical difficulties may preclude the successful use of a certain control or technology option. The analysis will consider various unit arrangements, including single unit as well as various combinations of multiple units. This task will ensure that the initial technology selection scenarios are feasible and suitable to the facility based on established selection criteria.

Based on the initial results of the Phase I work, as well as an AQC screening workshop conducted for Mill Creek, the following preliminary AQC technologies scenarios (and embedded options) have been identified for each facility.

- Mill Creek:
  - NIDs/DFGD or FF on Units 1-4
  - SCRs on Units 1 and/or 2
  - Refurbishing or replacing WFGDs on Units 1, 2 and 4, including using Unit 4's refurbished WFGD for Unit 3
  - New WFGD on Unit 4
  - PAC and/or trona/lime injection/SBS injection
  - Feasibility of neural network (NN) on Units 1-4
  - Feasibility of ESPs for pre-filtering
- Ghent
  - FFs on Units 1-4
  - PAC and trona/lime injection/SBS injection
  - SCR on Unit 2
  - Feasibility of neural network (NN) on Units 1-4
- Brown
  - FFs on Units 1-3
  - Separate or combined FF on Units 1 and 2
  - LNB/OFA or SCR on Unit 1
  - SCR on Unit 2
  - PAC and trona/lime injection/SBS injection
  - Feasibility of neural network (NN) on Units 1-3

In order to verify, properly vet, and ultimately select an AQC technology suite for each facility for final evaluation, Black & Veatch proposes to perform the following high level studies and comparative analyses.

- Overview analysis of existing water/wastewater systems (Mill Creek only)
- Water mass balance (Mill Creek only)
- Flue gas conditions
- Fan analysis
- Furnace design pressure analysis
- Simplified AQC mass balance
- Auxiliary electric system analysis/comparison
- Chimney analysis (Mill Creek only)
- High level differential cost analysis comparison for scenarios with multiple options (capital and O&M)
- Reagent cost analysis/comparison (Mill Creek only)
- WFGD mass balance and byproduct disposal analysis/comparison (Mill Creek only)
- Existing WFGD upgrade analysis with support from vendors for modeling (Mill Creek only)
- Truck and rail traffic analysis (Mill Creek only)
- Fly ash analysis/comparison
- High level site arrangement drawings for each AQC suite

Upon completion of the aforementioned studies and analyses, Black & Veatch will prepare a draft technology validation and selection report for E.ON's review and comment. Following incorporation of comments, Black & Veatch will meet with E.ON to discuss the results. During the meeting, the team will review the options suggested by the selection study to ensure they are consistent with the requirements and specific goals of the facility. Following the presentation of results, the E.ON/Black & Veatch team will formally select the AQC technology suite for final evaluation.

Task 7 – Develop Preliminary Conceptual Design

The following list defines the predominant conceptual design engineering services to be performed by Black & Veatch to define the basis for the cost estimate, as well as specific deliverables for E.ON. The conceptual design evaluation will address each item for the selected AQC technology scenario, as appropriate.

- Preliminary description of scope of work.
- Equipment performance and emissions review. Current emissions review of plant historical data provided by E.ON.
- Assessment of potential modifications to existing equipment, including upgrading existing WFGDs at Mill Creek.
- Determine the associated balance-of-plant requirements and plant modifications necessary.
- Develop key process flow diagrams (conceptual)
- An overall site plan drawing (conceptual) of the project major equipment, including air quality control equipment, chimney, fuel handling systems, reagent (limestone or lime) handling system, ash handling system, chemical storage, sorbent or PAC injection systems, etc, as applicable. The location of other existing key buildings such as boiler, administration/services building(s) and other buildings and structures, electrical transmission lines/corridors, and access roads will also be identified.
- Building and Plant Arrangements
- Equipment Logistics/Transportation Requirements (see Task 10)
- Permitting/Environmental Impacts (see Task 2)
- Specification and System List
- Lighting Requirements
- Grounding Requirements
- Fire Protection Requirements
- Communication Requirements
- Layout of Critical System and Underground Piping
- Terminal Point List
- Water Mass Balance Diagram (Mill Creek only)
- Equipment Lists
- One-Line Drawing
- Construction Equipment Requirements
- System Descriptions
- Demolition/Relocation Requirements
- Civil/Structural Discipline Drawings
- Mechanical Discipline Drawings
- Electrical Discipline Drawings
- Instrumentation/Control System Discipline Drawings

In addition to the conceptual design services listed above, this task will address the following topics and issues in the manner described for each.

- **Construction Materials**. Black & Veatch will select the materials of construction based on engineering judgment, past experience, and general site technology specifics.
- **Sparing and Capacity**. Since the final selection of AQC technologies may allow a single system to influence the direct operations of more than one unit, impacts to outage scheduling, unit operations and unit reliability are important considerations. Black & Veatch will use E.ON's planned usage pattern for the affected units to identify draft sparing and capacity guidelines and their implications for the units. Provision of these draft guidelines will allow E.ON to evaluate potential tradeoffs and conflicts with the various goals of the project to allow adjustment of the guidelines to achieve the overall project goals in the best approach possible.
- **Draft System**. Depending on the existing ID fan capacity and the incremental draft load to be imposed by the new emissions control equipment, draft system modifications may be required. Additionally, draft

system modifications may require ductwork and/or boiler stiffening to withstand the new operating conditions or for compliance with NFPA-85. Black & Veatch will evaluate the existing draft system capacity and design, operating ranges, and anticipated additional draft losses and recommend modifications, including fan capacity (flow and head) and margins, motor speed(s), draft control alternatives, and structural reinforcing. This will be a high level evaluation based upon the conceptual design developed and is intended to provide sufficient information to allow E.ON to evaluate the various options in the study. Additional future detailed study work would be required for any selected scenario implementation.

- **Chimney Alternatives.** As part of the overall study, Black & Veatch will evaluate the necessity for modifications or replacement of existing chimneys. This evaluation will only consider the physical characteristics of the stack(s) and its availability to operate under any new conditions imposed by the technology scenarios. This analysis is limited to the Mill Creek facility only.
- **Auxiliary Electric System**. Auxiliary electric power supply alternatives for multi-unit emissions control equipment retrofits typically involve a combination of unit-specific power supply and at a minimum, common load and/or startup power supply from the plant switchyards. Considerations in selecting the optimum site-specific configuration include unit startup, redundancy, bus capacity, load flow, generation metering, and capital cost issues. Black & Veatch will evaluate the emissions control equipment affects on the existing auxiliary electric system and a recommend solution for a reliable redundant power supply to the new AQC equipment. This will be a conceptual evaluation in order to provide sufficient information to evaluate the various AQC options of the study.
- **FGD and Landfill Waste Disposal**. As part of the study, Black & Veatch will define the physical and chemical characteristics of the by-products and determine the production rates. E.ON may utilize this information in addressing the transport and final disposition of the byproducts. This analysis is limited to the Mill Creek facility only.
- **FGD System Water Supply.** The water supply to the FGD systems and auxiliaries will be determined by evaluating the potential water and wastewater streams that could be required or produced for the different scenarios. Preliminary water mass balances will be developed for the new or added systems. An overall plant water mass balance has not been included but can be added to the work at E.ON's direction. This analysis is limited to the Mill Creek facility only.
- **Fly Ash Handling.** Black & Veatch will address modifications or replacement of the fly ash handling system only as necessary to accommodate the technology scenarios.

Task 8 – Project Cost Estimate

Black & Veatch will prepare a budgetary cost estimate for the AQC scenario selected by E.ON for continuation. The cost estimate will include monthly cash flows based on the determined contracting strategy (see Contracting Strategy Analysis task). Black & Veatch will solicit major equipment letter quotations to support the cost estimate. As a provider for AQC solutions, Black & Veatch has developed estimating tools that will be utilized for this project, as well as leveraging the information available from the many large AQC projects and coal projects recently completed and ongoing. The capital costs estimates will be generated from proprietary in-house data for similar sized coal fueled units. The cost estimate will go through our internal review processes and procedures that we use when developing our own project pricing structure. When available, this data can also be supplemented with actual pricing and labor rates. Construction contracts will be adjusted for craft wage rates and productivity at the project site. Owner's costs (project development, permitting, financing, etc.) will be estimated as a percentage of the total capital cost unless identified as an amount from E.ON.

In addition to the capital costs, annual O&M costs, both fixed and variable components, will be estimated. Black & Veatch will formulate the overall cost and cash flow estimate (month and year) for the agreed upon scenario. Black & Veatch will prepare capital and operating and maintenance (O&M) cost estimates using current (2010) dollars and include the estimated engineering cost for this project. The cost estimate will include analysis of the contingency use, analysis of any escalation used and a risk analysis for those elements of the cost estimate most at risk from market and pricing concerns.

Task 9 – Implementation Schedule

Black & Veatch will prepare a detailed Level 1 project implementation schedule from inception to commissioning using Primavera. The implementation schedule will begin with the conceptual design and specification development followed by the development period that will include licensing and permitting activities, bid negotiations, and finalization of procurement and construction contracts. Elements in the schedule will include engineering, procurement, construction, startup, and testing.

The implementation schedule will consider time required for each of the activities and their co-relationships, including contingency plans to offset permitting delays and the potential impact of licensing of patented technologies. The facility plant outage planning schedule will be included in the project scheduling process. The procurement and construction duration will also consider regional procurement strategies particularly related to major long lead items, and availability and productivity of local and regional labor.

In addition, as part of this task, Black & Veatch will develop project cash flows based on the implementation schedule and budget estimate.

Task 10 – Constructability Plan

Construction is a key consideration in the success of any major capital plan. The success or failure of a project is realized often only when construction begins. Black & Veatch strongly believes construction professionals must be involved early in the process to ensure the lessons learned from the past are not repeated and that adequate consideration is given to how the plant will be constructed. Simple changes early in the process can save millions only if fully considered at the appropriate time.

A constructability analysis will be developed and included as part of the project implementation schedule. Constructability will be a prime consideration as part of the selection process of virtually all the systems along with the considerations of overall costs, operability, and maintainability. As major systems are defined, the arrangement of the systems on the site will be reviewed with constructability and maintainability in mind. The ability to sequence construction, maintains crane and equipment access, levelize the construction labor force and provide for material deliveries, and lay-down space will be considered. The optimum approach for any one construction phase has to be balanced against available outages, interfacing work, cash flow considerations, fabrication and equipment delivery capabilities, engineering support, etc. In addition to the schedule input from the constuctability plan, a construction facilities drawing will be developed as part of this task.

Task 11 – Evaluation Report

The end result of this study will be a document inclusive of the analyses conducted in the above tasks outlining the consideration undergone by E.ON and Black & Veatch to arrive at the selected AQC conclusions. Black & Veatch will prepare and submit five (5) hardcopies and electronic copies of the draft project report of the work performed under this contract to E.ON for review. Black & Veatch will forward some sections as drafts during earlier tasks and then amended to fit within the purpose of the final report. The draft report will include all conceptual engineering, drawings, costs and schedules developed for this project.

Following submittal of the draft report, Black & Veatch will meet with E.ON to discuss the report and obtain any comments or modifications required. Within four (4) weeks of receiving E.ON comments, Black & Veatch will incorporate these comments and issue five (5) hardcopies and electronic copies of the final report. If requested by E.ON, Black & Veatch will prepare and deliver a formal presentation of the report to E.ON noting conclusions, recommendations and decisions required by the project team and management.

Fabric Filter Letter Specification and Vendor Workshop

Black & Veatch will prepare letter specifications for new FFs at Mill Creek, Ghent, and Brown facilities. The letter specification will be approximately 2 to 3 pages in length, describing the design basis, scope of work, and technical requirements for budgetary purposes only. Following E.ON's review and incorporation of final

comments, Black & Veatch will assist E.ON in contacting and scheduling vendor presentations to coincide with a FF workshop to be held at E.ON's engineering offices. A two-day workshop is proposed, with the first half-day consisting of a FF primer and presentation by Black & Veatch personnel, in preparation for 2-3 back-to-back half-day vendor presentations to follow. The actual schedule date of the workshop will be determined once the vendors are contacted. Black & Veatch will prepare meeting minutes summarizing discussions from the workshop.

SCHEDULE

As previously discussed with E.ON, this Phase II scope of work is proposed for the Mill Creek, Ghent, and Brown facilities. The Mill Creek facility is assumed to be the first facility to begin the Phase II services, with the Ghent and Brown facilities to have a staggered kick-off delay of approximately 1 month each. The following table identifies the major milestone schedule proposed herein.

Major Milestone Schedule			
Activity	**Mill Creek**	**Ghent**	**Brown**
Notice to Proceed	Aug 26, 2010	Aug 26, 2010	Aug 26, 2010
Project Kickoff and Site Visit Meeting (Task 1)	Sep 14, 2010	Oct 4, 2010	Nov 8, 2010
Begin AQC Validation (Task 6)	Sep 7, 2010	Oct 11, 2010	Nov 15, 2010
Select AQC Technologies - Meeting (Task 6)	Nov 8, 2010	Dec 6, 2010	Jan 10, 2011
Begin Conceptual Design (Task 7)	Nov 15, 2010	Dec 13, 2010	Jan 17, 2011
Begin Cost Estimate (Task 8)	Dec 13, 2010	Jan 10, 2011	Feb 7, 2011
Issue Draft Report (Task 11)	Feb 7, 2011	Mar 14, 2011	Apr 11, 2011
Final Report – Presentation Meeting (Task 11)	Mar 7, 2011	Apr 11, 2011	May 7, 2011

Appendix B

Design Basis

(Excerpt From Phase I Report Appendix C - Mill Creek Only)

EON
Design Basis
6/1/2010

Unit Designation	Mill Creek				Reference
	1	2	3	4	
Ultimate Coal analysis, wet basis					
Carbon, %	61.20	61.20	61.20	61.20	Data from E-ON
Hydrogen, %	4.28	4.28	4.28	4.28	Data from E-ON
Sulfur, %	3.36	3.36	3.36	3.36	Data from E-ON
Nitrogen, %	1.27	1.27	1.27	1.27	Data from E-ON
Chlorine, %	0.00	0.00	0.00	0.00	Data from E-ON
Oxygen, %	6.89	6.89	6.89	6.89	Data from E-ON
Ash, %	12.00	12.00	12.00	12.00	Data from E-ON
Moisture, %	11.00	11.00	11.00	11.00	Data from E-ON
Higher Heating Value, Btu/lb	11,200	11,200	11,200	11,200	Data from E-ON
Trace Metal Analysis, ppm					
Antimony (Sb)	1.05	1.05	1.05	1.05	Data from E-ON
Arsenic (As)	13.00	13.00	13.00	13.00	Data from E-ON
Barium (Ba)	74.00	74.00	74.00	74.00	Data from E-ON
Cadmium (Cd)	0.65	0.65	0.65	0.65	Data from E-ON
Chlorine (Cl)	1600.00	1600.00	1600.00	1600.00	Data from E-ON
Chromium (Cr)	23.00	23.00	23.00	23.00	Data from E-ON
Fluorine (F)	98.00	98.00	98.00	98.00	Data from E-ON
Lead (Pb)	11.00	11.00	11.00	11.00	Data from E-ON
Magnesium (Mg)	684.00	684.00	684.00	684.00	Data from E-ON
Mercury (Hg)	0.12	0.12	0.12	0.12	Data from E-ON
Nickel (Ni)	20.00	20.00	20.00	20.00	Data from E-ON
Selenium (Se)	2.94	2.94	2.94	2.94	Data from E-ON
Strontium (Sr)	56.00	56.00	56.00	56.00	Data from E-ON
Vanadium (V)	40.00	40.00	40.00	40.00	Data from E-ON
Zinc (Zn)	48.00	48.00	48.00	48.00	Data from E-ON
Ash Analysis, % by mass					
Alumina (Al2O3)	21.69	21.69	21.69	21.69	Data from E-ON
Barium Oxide (BaO)	0.07	0.07	0.07	0.07	Data from E-ON
Lime (CaO)	2.74	2.74	2.74	2.74	Data from E-ON
Iron Oxide (Fe2O3)	21.80	21.80	21.80	21.80	Data from E-ON
Magnesia (MgO)	0.91	0.91	0.91	0.91	Data from E-ON
Manganese Oxide (MnO)	0.04	0.04	0.04	0.04	Data from E-ON
Phosphorous Pentoxide (P2O5)	0.26	0.26	0.26	0.26	Data from E-ON
Potassium Oxide (K2O)	2.33	2.33	2.33	2.33	Data from E-ON
Silica (SiO2)	45.88	45.88	45.88	45.88	Data from E-ON
Sodium Oxide (Na2O)	0.48	0.48	0.48	0.48	Data from E-ON
Strontium Oxide (SrO)	0.05	0.05	0.05	0.05	Data from E-ON
Sulfur Trioxide (SO3)	2.58	2.58	2.58	2.58	Data from E-ON
Titania (TiO2)	1.04	1.04	1.04	1.04	Data from E-ON
Undetermined	0.12	0.12	0.12	0.12	Data from E-ON
Unit Characteristics					
Gross Turbine Generator Load, MW	330	330	423	525	Data from E-ON
Boiler Efficiency, % (HHV)	85.40	85.40	86.51	86.51	Data from E-ON
Boiler Heat Input, MBtu/hr (HHV)	3,224	3,311	4,209	5,122	Data from E-ON
Coal Flow Rate, lb/hr	287,857	295,625	375,804	457,321	Data from E-ON
Capacity Factor, %	69.00	70.00	75.00	75.00	Data from E-ON
Fly Ash Portion of Total Ash, %	80.0	80.0	80.0	80.0	Data from E-ON
Air Heater Leakage, %	10.0	10.0	10.0	10.0	Data from E-ON
Excess Air, %	20.00	20.00	20.00	20.00	Data from E-ON
Economizer Outlet Conditions					
Flue Gas Temperature, F	760	760	690	640	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-5.0	-5.0	-5.0	-5.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,169,029	3,254,545	4,137,234	5,034,667	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,608,445	1,651,849	1,979,343	2,303,938	B&V Combustion Calculations
Uncontrolled Sulfur Dioxide Concentration, lb/MBtu	6.00	6.00	6.00	6.00	= % Sulfur in Coal x 20,000 / HHV
Uncontrolled Sulfur Dioxide Mass Flow Rate, lb/hr	19,324	19,846	25,228	30,701	B&V Combustion Calculations
Uncontrolled PM Concentration, lb/MBtu	8.746	8.746	8.746	8.746	B&V Combustion Calculations
Uncontrolled PM Mass Flow Rate, lb/hr	28,197	28,958	36,812	44,797	= Uncontrolled PM (lb/MBtu) x Heat Input (MBtu/hr)
Uncontrolled Mercury Concentration, lb/TBtu	10.71	10.71	10.71	10.71	= Hg in Coal (ppm) x Coal Flow Rate (lb/hr) / Heat Input (MBtu/hr)
Uncontrolled HCl Mass Flow Rate, lb/hr	474	486	618	752	= HCl in Coal (ppm) / 1,000,000 x Coal Flow Rate (lb/hr) x MW of HCl / MW of Cl
Uncontrolled HCl Concentration, lb/MBtu	0.15	0.15	0.15	0.15	= HCl Flowrate (lb/hr) / Heat Input (MBtu/hr)
Hot-Side ESP Outlet Conditions					
Flue Gas Temperature, F	No Hot-side ESP. Unit has a Cold-side ESP	No Hot-side ESP. Unit has a Cold-side ESP	No Hot-side ESP. Unit has a Cold-side ESP	No Hot-side ESP. Unit has a Cold-side ESP	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu					B&V Combustion Calculations
Controlled PM Mass Flow Rate, lb/hr					= Controlled PM (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %					= { 1- Controlled PM (lb/MBtu) / Uncontrolled PM (lb/MBtu) } x 100
SCR Outlet Conditions					
Flue Gas Temperature, F	No SCR	No SCR	690	640	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.			-13.0	-13.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr			4,219,979	5,135,360	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm			2,061,162	2,399,175	B&V Combustion Calculations
Controlled NOx Concentration, lb/MBtu			0.0584	0.0589	Data from E-ON
Controlled NOx Mass Flow Rate, lb/hr			246	302	= Controlled NOx (lb/MBtu) x Heat Input (MBtu/hr)
Air Heater Outlet Conditions					
Flue Gas Temperature, F	375	375	330	330	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-10.0	-10.0	-18.0	-18.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,485,932	3,580,000	4,641,978	5,648,896	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,229,416	1,262,592	1,581,582	1,924,653	B&V Combustion Calculations
Cold-Side ESP Outlet Conditions					
Flue Gas Temperature, F	340	340	330	330	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	-14.0	-14.0	-23.0	-21.0	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,660,228	3,759,000	4,874,075	5,931,341	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,250,977	1,284,735	1,684,442	2,039,199	B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu	0.0385	0.0443	0.0517	0.0354	Data from E-ON
Controlled PM Mass Flow Rate, lb/hr	124	147	218	181	= Controlled PM (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %	99.56	99.49	99.41	99.60	= { 1- Controlled PM (lb/MBtu) / Uncontrolled PM (lb/MBtu) } x 100
Fabric Filter Outlet Conditions					
Flue Gas Temperature, F	No Fabric Filter	No Fabric Filter	No Fabric Filter	No Fabric Filter	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Controlled PM Concentration, lb/MBtu					Data from E-ON
Controlled PM Mass Flow Rate, lb/hr					= Controlled PM from fabric Filter (lb/MBtu) x Heat Input (MBtu/hr)
Particulate Removal Efficiency, %					= { 1- FF Controlled PM (lb/MBtu) / ESP Controlled PM (lb/MBtu) } x 100
ID Fan Outlet Conditions					
Flue Gas Temperature, F	354.85	355.15	348.83	348.83	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	10.00	10.00	10.00	10.00	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,660,228	3,759,000	4,874,075	5,931,341	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	1,200,841	1,233,697	1,588,068	1,932,543	B&V Combustion Calculations

EON
Design Basis
6/1/2010

Unit Designation	Mill Creek				Reference
	1	2	3	4	
Scrubber Outlet Conditions					
Flue Gas Temperature, F	130.30	130.32	129.60	129.60	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.	1.00	1.00	1.00	1.00	B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr	3,879,298	3,984,228	5,157,618	6,277,442	B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm	972,502	998,878	1,291,025	1,571,359	B&V Combustion Calculations
Controlled Sulfur Dioxide Mass Flow Rate, lb/hr	1,515	1,556	2,441	2,407	B&V Combustion Calculations
Controlled Sulfur Dioxide Concentration, lb/MBtu	0.47	0.47	0.58	0.47	= Controlled SO_2 (lb/hr) / Heat Input (MBtu/hr)
Sulfur Dioxide Removal Efficiency, %	92.17	92.17	90.33	92.17	= { 1- Controlled SO_2 (lb/MBtu) / Uncontrolled SO_2 (lb/MBtu) } x 100
Wet ESP Outlet Conditions					
Flue Gas Temperature, F	**No WESP**	**No WESP**	**No WESP**	**No WESP**	B&V Combustion Calculations
Flue Gas Pressure, in. w.g.					B&V Combustion Calculations
Flue Gas Mass Flow Rate, lb/hr					B&V Combustion Calculations
Volumetric Flue Gas Flow Rate, acfm					B&V Combustion Calculations
Stack Outlet Emissions[1]					
Sulfur Dioxide Emission Concentration, lb/MBtu	0.47	0.47	0.58	0.47	Data from E-ON
Sulfur Dioxide Emission Rate, lb/hr	1,515	1,556	2,441	2,407	= SO_2 Emission (lb/MBtu) x Heat Input (MBtu/hr)
PM Emission Concentration, lb/MBtu	0.0385	0.0443	0.0517	0.0354	Data from E-ON
PM Emission Rate, lb/hr	124	147	218	181	= PM Emission (lb/MBtu) x Heat Input (MBtu/hr)
NOx Emission Concentration, lb/MBtu	0.3169	0.3139	0.0584	0.0589	Data from E-ON
NOx Emission Rate, lb/hr	1,022	1,039	246	302	= NOx Emission (lb/MBtu) x Heat Input (MBtu/hr)
Hg Emission Concentration, lb/TBtu	3.0	3.0	2.5	2.5	Data from E-ON
Hg Emission Rate, lb/hr	9.67E-03	9.93E-03	1.05E-02	1.28E-02	= Hg Emission (lb/TBtu) x Heat Input (MBtu/hr) / 1,000,000
HCl Emission Concentration, lb/MBtu	0.0015	0.0015	0.0015	0.0015	Data from E-ON
HCl Emission Rate, lb/hr	5	5	6	8	= HCl Emission (lb/MBtu) x Heat Input (MBtu/hr)
CO Emission Concentration, lb/MBtu	--	--	--	--	CO Emissions are not known
CO Emission Rate, lb/hr	--	--	--	--	CO Emissions are not known
Dioxin/Furan Emission Concentration, lb/MBtu	--	--	--	--	Dioxin/Furan Emissions are not known
Dioxin/Furan Emission Rate, lb/hr	--	--	--	--	Dioxin/Furan Emissions are not known

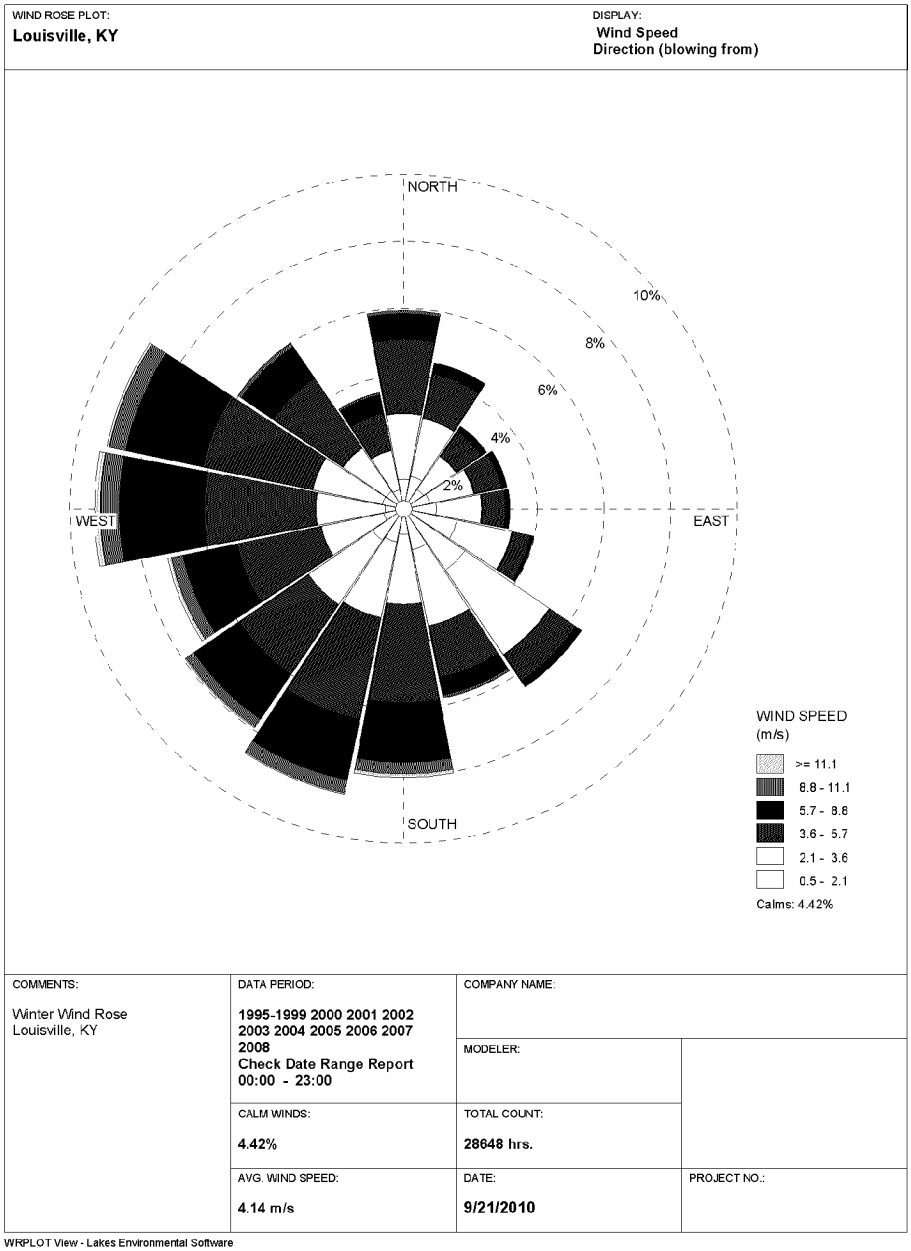
Notes:

1. Current Outlet Emissions as noted in E-ON Matrix

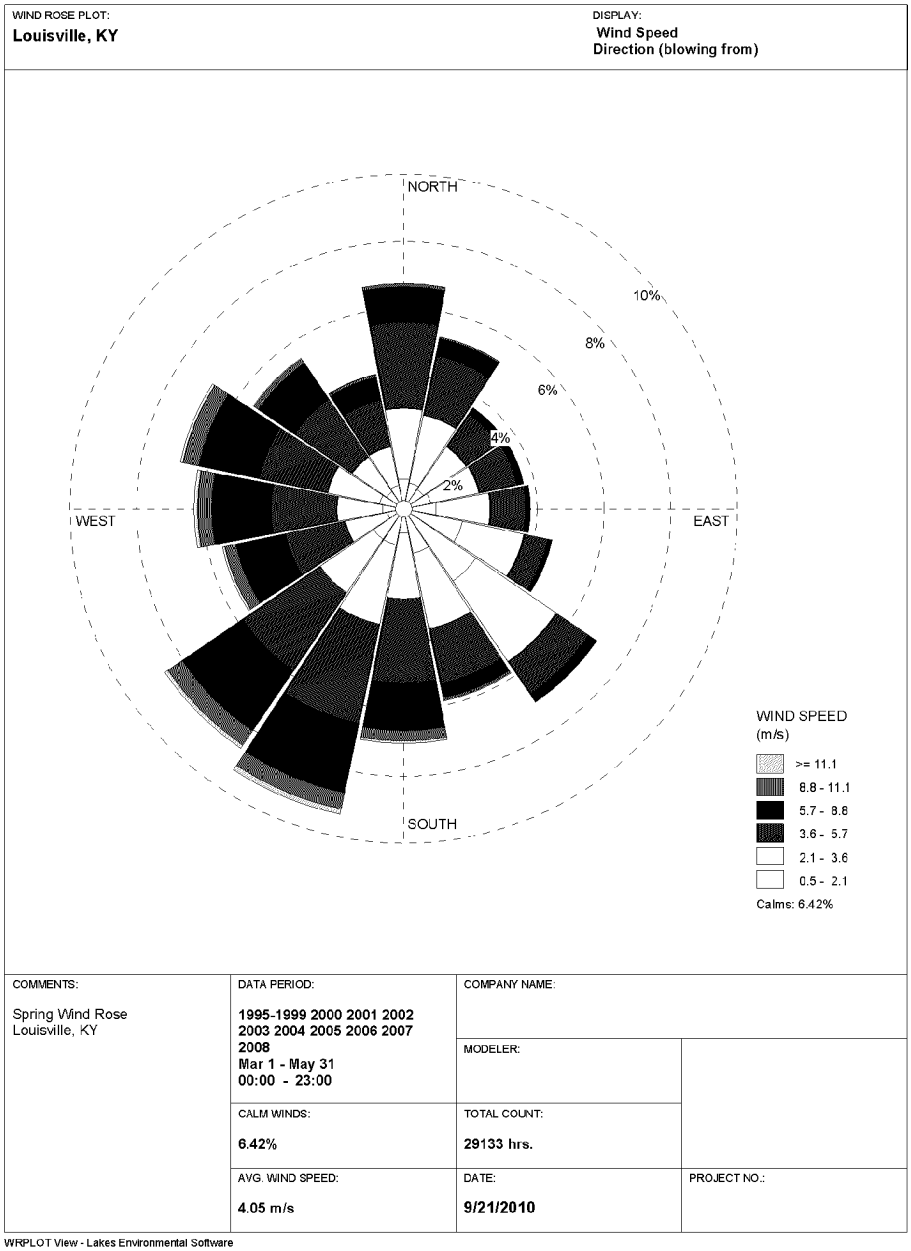
Revision History:

Appendix C

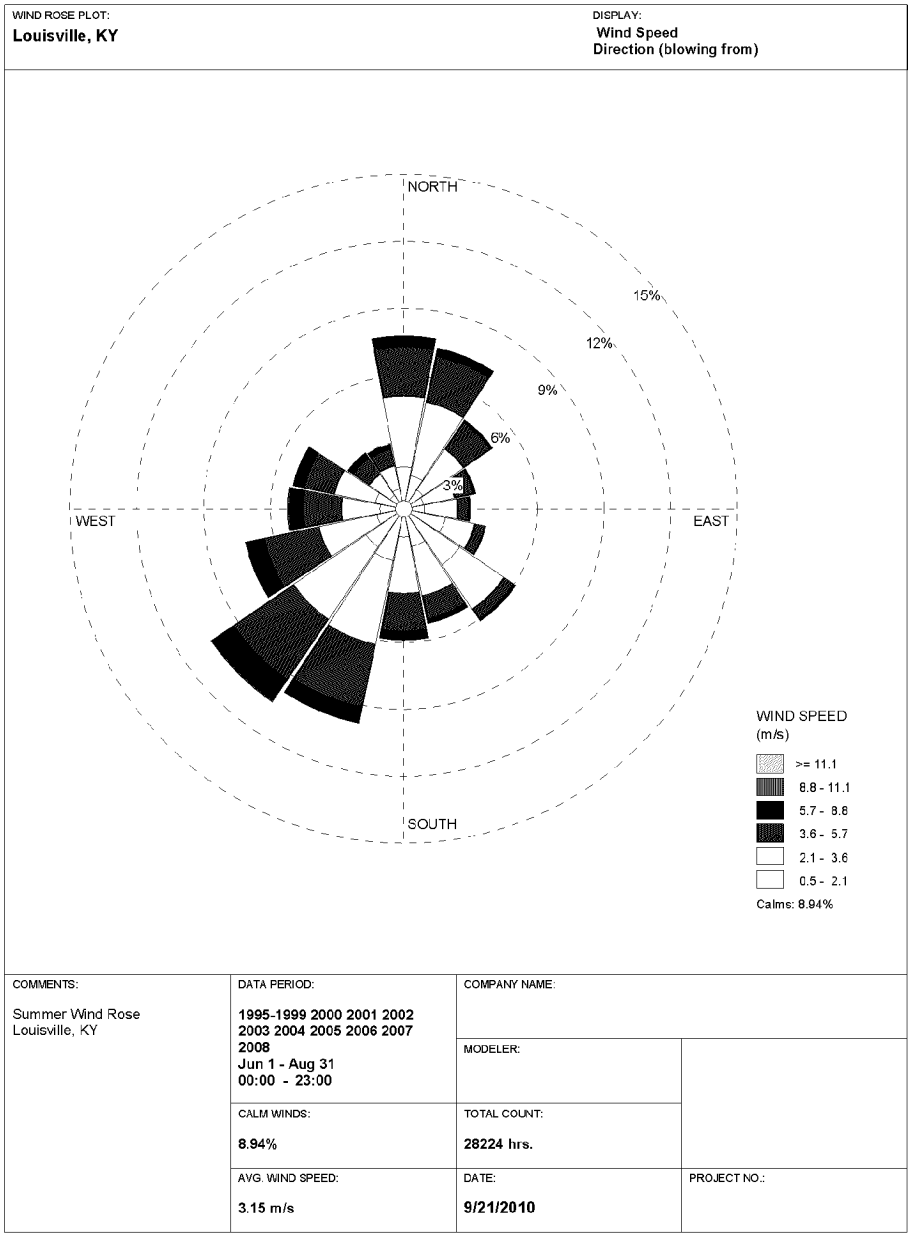
Wind Roses



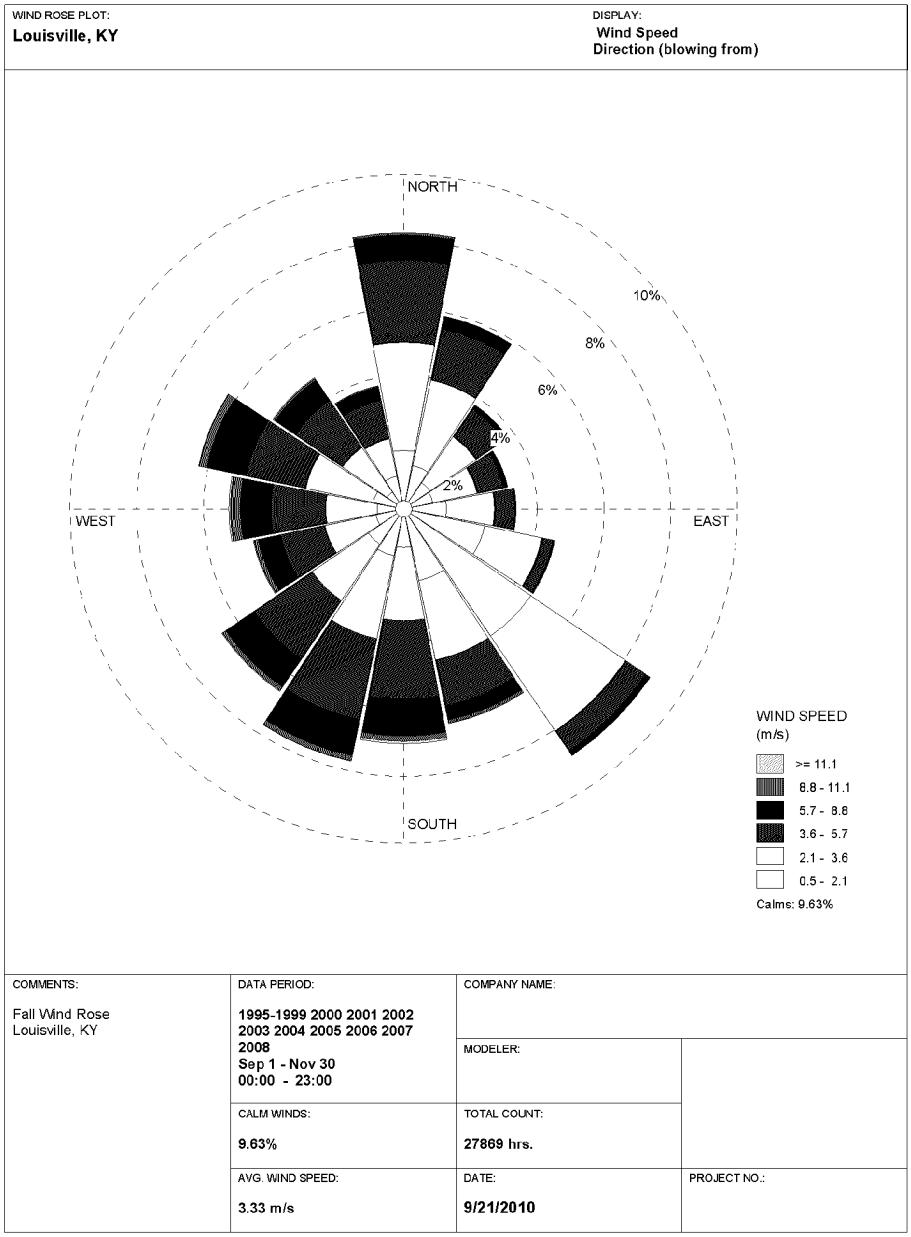
Winter Wind Rose 1995-2008
Louisville, KY



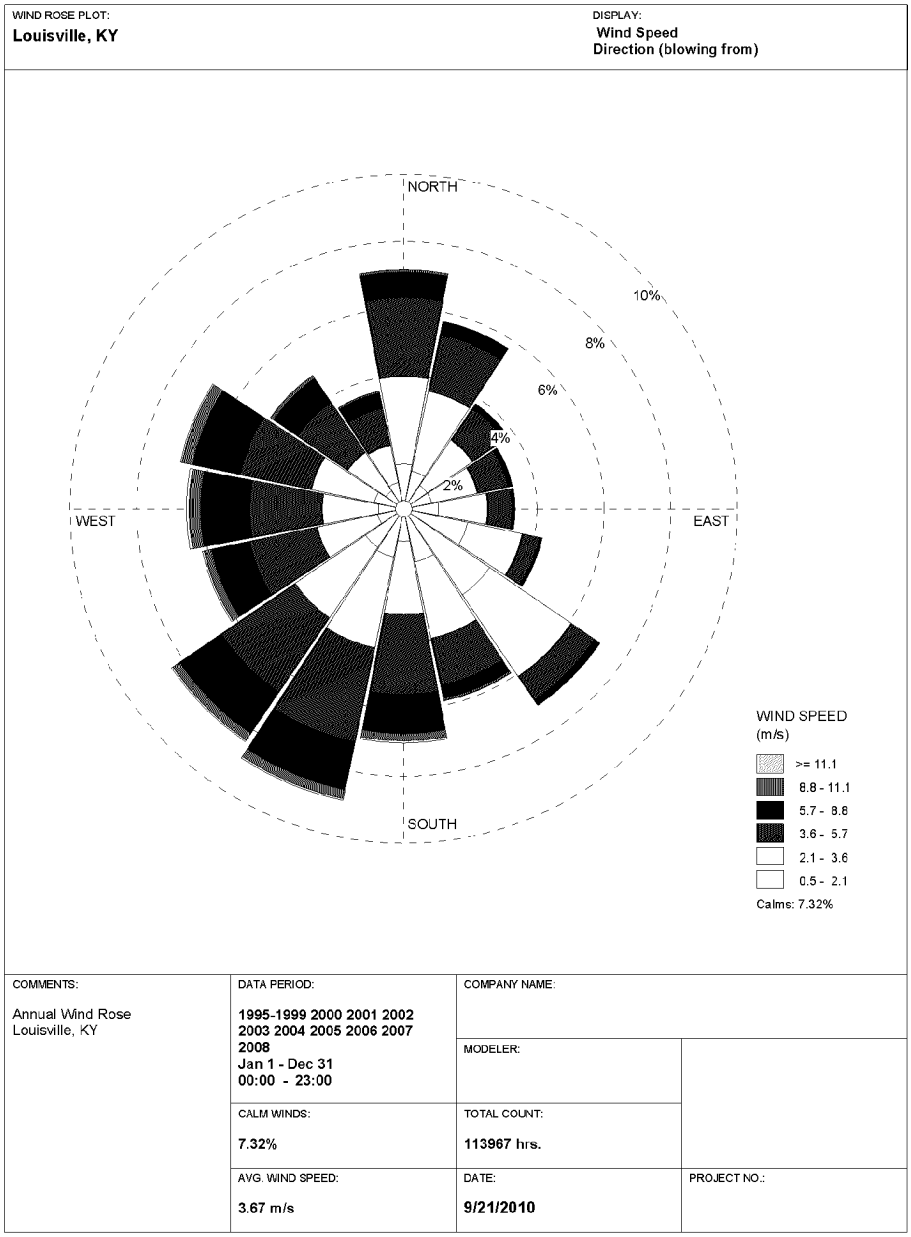
Spring Wind Rose 1995-2008
Louisville, KY



Summer Wind Rose 1995-2008
Louisville, KY



Fall Wind Rose 1995-2008
Louisville, KY



Annual Wind Rose 1995-2008
Louisville, KY

From:	Hillman, Timothy M.
To:	Saunders, Eileen
CC:	Jackson, Audrey; 168908 E.ON-AQC; Wehrly, M. R.; Hintz, Monty E.; Mahabaleshwarkar, Anand; Goodlet, Roger F.; Lausman, Rick L.; Lucas, Kyle J.; Crabtree, Jonathan D.; King, Michael L. (Mike)
Sent:	9/28/2010 8:49:29 AM
Subject:	168908.14.1000 100928 Ghent - Draft Kickoff Meeting Agenda
Attachments:	EON Ghent Kickoff Meeting Agenda.doc

Eileen,

Please find attached a draft meeting agenda for the Ghent kickoff meeting next week. Once again, I have assumed there will be lunch onsite. You will also note that agenda items III and IV on the first day include the presentations we discussed yesterday during our conference call.
B&V attendees will include:

Anand Mahabaleshwarkar (Oct 6th only)
Rick Lausman
M.R. Wehrly
Monty Hintz
Roger Goodlet
Tim Hillman

Once I have your comments, I will finalize for distribution.

Best regards,

Tim Hillman | Project Manager
Power Generation - Environmental Services
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: **(913) 458-7928**
Email: **hillmantm@bv.com**

DRAFT

AGENDA

Phase II Air Quality Control Study – Kickoff Meeting and Site Visit
E.ON - Ghent
October 6 - 7, 2010
Location: Ghent Generating Station

Day 1, October 6th, B&V Arrives 8 am

I. Introductions (Starts at 9 am)
II. Project/Scope Description (E.ON – Eileen)
III. Phase I Study Results Discussion/Presentation (B&V – Rick L and Anand M)
IV. PJFF Overview Discussion/Presentation (B&V – Rick L and Anand M)
V. Lunch (on site)
VI. Begin Escorted Site Walk Down and Data Collection

Day 2, October 7th, B&V Arrives 8 am

I. Continue Escorted Site Walk Down and Data Collection
II. Lunch (on site)
III. Site Debriefing Meeting
IV. Additional Walk Down Time if Required
V. Depart (no later than 4 pm)

From: Williams, John
To: Straight, Scott
Sent: 9/28/2010 3:34:02 PM
Subject: BR Landfill IC Paper - Draft
Attachments: BR Landfill IC Paper (28-Sept-10).doc

Scott,

Attached is the draft IC paper for the BR Landfill based upon our conversation.

Of note is that the following is mentioned in this draft, but in no detail, and the reader would need to reference the attachments for clarification:

- Project Background: general information of design concept to date
- Detail of the current project status and detail of the work complete to date
- EPA proposed CCR ruling definitions
- Schedule impacts & project timeline

Just let me know of any changes needed.

John S. Williams
E.ON U.S.
Project Engineering
Civil Engineer
(859) 367-1275 (E.W. Brown Office)
(502) 627-3793 (Louisville Office)
(502) 645-4330 (Cellular)
John.Williams@eon-us.com

PROJECT ENGINEERING

e·on U.S.

E.W. Brown CCR Storage – Conversion to Landfill

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental side presentation.

Significant work has been completed on the BR CCR Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

Project Engineering and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV & PVRR, is the least cost, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post EPA CCR Ruling while the landfill is being constructed.

BR CCR Storage Viability

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR for both viable Cases A and B will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill for both Cases will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements.
The viable storage options available are summarized below:

- **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective.

The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.

Financials

Considering the factors referenced above, PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B which were based on a horizontal expansion of the landfill. Additional engineering is required to determine if a horizontal or vertical expansion approach is the best alternative. Timing of cash flows would be affected if a vertical expansion approach is chosen. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison

Option	Life	Capacity	2010	2011	2012	2013	2014	2015	NPV	PVRR	Total Project
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
Base Case	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.

Insert CEM Data Once Received

Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Straight, Scott
To: Ritchey, Stacy
CC: Hudson, Rusty; Williams, John
Sent: 9/28/2010 3:43:22 PM
Subject: FW: BR Landfill IC Paper - Draft
Attachments: BR Landfill IC Paper (28-Sept-10).doc

Stacy, do you have the CEM to insert into this draft?

Rusty, I will read this later tonight or tomorrow and get it to you tomorrow by COB.

Scott

From: Williams, John
Sent: Tuesday, September 28, 2010 3:34 PM
To: Straight, Scott
Subject: BR Landfill IC Paper - Draft

Scott,

Attached is the draft IC paper for the BR Landfill based upon our conversation.

Of note is that the following is mentioned in this draft, but in no detail, and the reader would need to reference the attachments for clarification:

- Project Background: general information of design concept to date
- Detail of the current project status and detail of the work complete to date
- EPA proposed CCR ruling definitions
- Schedule impacts & project timeline

Just let me know of any changes needed.

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PROJECT ENGINEERING

e·on U.S.

E.W. Brown CCR Storage – Conversion to Landfill

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental side presentation.

Significant work has been completed on the BR CCR Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

Project Engineering and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV & PVRR, is the least cost, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post EPA CCR Ruling while the landfill is being constructed.

BR CCR Storage Viability

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR for both viable Cases A and B will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill for both Cases will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements.
The viable storage options available are summarized below:

- **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective.

The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.

Financials

Considering the factors referenced above, PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B which were based on a horizontal expansion of the landfill. Additional engineering is required to determine if a horizontal or vertical expansion approach is the best alternative. Timing of cash flows would be affected if a vertical expansion approach is chosen. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison

Option	Life	Capacity	2010	2011	2012	2013	2014	2015	NPV	PVRR	Total Project
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
Base Case	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.

Insert CEM Data Once Received

Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Straight, Scott
To: Williams, John
CC: Heun, Jeff; Hudson, Rusty
Sent: 9/28/2010 3:56:34 PM
Subject: FW: BR Landfill IC Paper - Draft
Attachments: BR Landfill IC Paper (28-Sept-10).doc

John,

Please see my comments to consider. Also, it needs to be in IC format. Work with Jeff to get the header and other format issues worked out. Also, work with Stacy to get the CEM results inserted.

Please finalize a draft and send to me and Rusty by 2:00 tomorrow. Nice work.

Rusty, any other comments or needs in the paper?

Scott

From: Williams, John
Sent: Tuesday, September 28, 2010 3:34 PM
To: Straight, Scott
Subject: BR Landfill IC Paper - Draft

Scott,

Attached is the draft IC paper for the BR Landfill based upon our conversation.

Of note is that the following is mentioned in this draft, but in no detail, and the reader would need to reference the attachments for clarification:

- Project Background: general information of design concept to date
- Detail of the current project status and detail of the work complete to date
- EPA proposed CCR ruling definitions
- Schedule impacts & project timeline

Just let me know of any changes needed.

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PROJECT ENGINEERING

E.W. Brown CCR Storage – Conversion to Landfill

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental presentation.

Significant work has been completed on the BR CCR Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

Project Engineering and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to landfill later.

BR CCR Storage Viability

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR for both viable Cases A and B will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill for both Cases will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements.
The viable storage options available are summarized below:

- **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet

CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.

Financials

Considering the factors referenced above, PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B which were based on a horizontal expansion of the landfill. Additional engineering is required to determine if a horizontal or vertical expansion approach is the best alternative. Timing of cash flows would be affected if a vertical expansion approach is chosen. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison

Option	Life	Capacity	2010	2011	2012	2013	2014	2015	NPV	PVRR	Total Project
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
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Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.

Insert CEM Data Once Received

Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Lively, Noel
To: Straight, Scott
Sent: 10/13/2010 7:10:14 AM
Subject: PE's Bi-Weekly Update of 10-15-10.docx
Attachments: PE's Bi-Weekly Update of 10-01-10.docx

Energy Services - Bi-Weekly Update
PROJECT ENGINEERING
October 15, 2010

- **KU SOx**
  - Safety – Nothing to report (NTR)
  - Auditing – NTR
  - Schedule/Execution:
    - Ghent
      - Unit 4 ID Fans – On plan for fall outage.
    - Brown
      - On plan for Unit 1 outage tie-in this Fall.
      - E.W. Brown Coal Pile Modification
        - Engineering design complete.
        - Pre-bid scheduled for 9/28.
        - KU to perform the overhead line relocation within the next 3-4 weeks. These lines supply power to coal pile lighting and retention pond pumps.
      - United Group Services continues design work for the elevators, with a targeted completion of February 2011.
  - Budget – The current month Fluor forecast for Brown was reduced by $1,647k.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – NTR

- **TC2**
  - Safety – Contractor recordable incident rate reduced to 1.55 after Petrochem's manhours were correctly allocated to the project.
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – The new windings have been installed on the excitation transformer and the remainder of rebuild activities are nering completion. Electrical testing of the transformer and the repaired IPB are scheduled for Oct 13-14. Some FOD to the 2B FD fan was observed during routine inspections. The blades are expected to be repaired in time to support the unit restart date. Modifications to the A-burner row are ongoing and the boiler refire date is Oct 15 with turbine roll now planned for 0ct 18 and synchronization in the Oct 20-22 window. This supports the revised Nov 25 COD. This impact to commissioning is being communicated to KYPSC.
  - Budget – NTR
  - Contract Disputes/Resolution:
    - Bechtel FM Claims – Change Order for the settlement on all FM and most EE claims has been signed.
    - Doosan CFD Model review planned for 9/30.
  - Issues/Risk:
    - Design of the DBEL burners for our coal specification, excitation transformer recovery, remaining commissioning beyond the 50% load achieved to date.
- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – Permit to construct SCR waiting on KYDAQ.

- Engineering – proceeding as planned to support the spring 2012 in-service.
- Schedule/Execution – NTR
- Budget - NTR
- Contracting – NTR
- Issues/Risk – Permit timeframe against starting construction.

- **Ohio Falls Rehabilitation**
  - Schedule/Execution - NTR
  - Permitting - NTR
  - Engineering – Voith now proceeding with engineering to support fabrication/manufacturing now that contract has been signed.
  - Schedule/Execution - NTR
  - Budget – E.ON AG and PPL approved OF contract and revised sanction.
  - Contracting - Contact signed with Voith on 9/15.
  - Issues/Risk - NTR

- **Mill Creek Limestone Project**
  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering - NTR
  - Schedule/Execution
    - East and Westbrook on site the week of 9/27 to begin maintenance building extension.
    - Metso has agreed to a contract and GSA for the mill equipment.
    - Two Project Coordinators have been relocated to Mill Creek permanently to oversee the construction portion of the project.
  - Budget – NTR
  - Contracting - scope of EPC contract is drafted and under internal reviews.
  - Issue/Risk - NTR

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. To date permitting process has gone well.
    - Received 401 Permit on August 4, 2010.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Working on finalizing design to support the proposed 2016 CCGT.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - Working with UCC to update their equipment and material pricing and to issue a purchase order for major equipment.

- **TC CCP Project – BAP/GSP**

- Schedule/Execution:
  - GSP's Flexible Membrane Liner (FML) and Geo-synthetic Clay Liner (GCL) installation to begin next week.
  - Work nearing completion on fill placement and mechanically stabilized earth wall for north and west dikes.
  - GSP to Corn Creek Spillway progressing to plan.
  - Work continues on erection of the new Pipe Rack, electrical duct banks to GSP Electrical Building and to Ash Pond Raft.
- Budget – NTR
- Engineering - NTR
- Permitting – NTR
- Contract Disputes/Resolution – NTR
  - Working on resolution of Weather Delays and requested change to Liquidated Damages by contractor.
  - Working on resolution of Engineering Delays
- Issues/Risk
  - Weather remains the biggest risk; however, the weather over the last 4 months has been exceptional for this project.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering - The Detailed Engineering RFPs are being reviewed.
  - Permitting:
    - Both the June and July Anabat studies have been completed for the Indiana Bat. ***A third party has reviewed both the June and July data and has concluded no findings***. A cost comparison is being generated to determine alternative mitigation plans with and without the Corn Creek plan.
    - Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – NTR
  - Engineering:
    - Detailed Engineering of gypsum fines continues with B&V.
    - Detailed Engineering of the CCR Transport System proposed for B&McD planned for October.
    - Procurement activities for the gypsum fines project are in progress.
    - Drawings and Specifications for the Detailed Engineering for the Landfill have been submitted for review within EON-US.
  - Permitting:
    - All permit applications have been made.
    - PE is working with the various agencies on minimal questions being asked during the review of the permit application.
    - Relocation of the impacted cemetery continues with removal planned for October.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk:

- Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter was sent to the third remaining land owner. The meeting with McDole and Owens was held on 9/20 with progress being made. Final letter send to Deaton. Meeting planned 10/11 to discuss path forward with Real Estate and Legal.

- **E.W. Brown Ash Pond Project**

Starter Dike

- Safety – NTR
- Schedule/Execution:
  - Contract work remains under suspension. Summit re-mobilized the water truck to address the bottom ash stockpile and the haul road(s) present on the pond.
  - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
  - Summit upper management formally notified on 9/27 of contract termination.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

Aux Pond 900'

- Safety – NTR
- Schedule/Execution:
  - Charah continued hauling Type I shot rock to place as the drainage blanket on the East side of the embankment toe.
  - Performed maintenance on equipment.
  - Subcontractor – SES assisted with the storm water collection system maintenance on the Main Pond.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Group from the stations and PE visited dry reagent mills and a permanent BCSI system the week of 9/20.
  - Budget – NTR
  - Testing –
    - Ghent 3 & 4 testing report expected week of Sept. 27.
    - Milling material on Ghent 4 showed strong promise – initial test results were < 4 ppm at the stack.
    - Further testing on Ghent 1 may commence with the use of MgO in the furnace. This testing is by Breen and E.ON Engineering – Breen is paying for this testing.

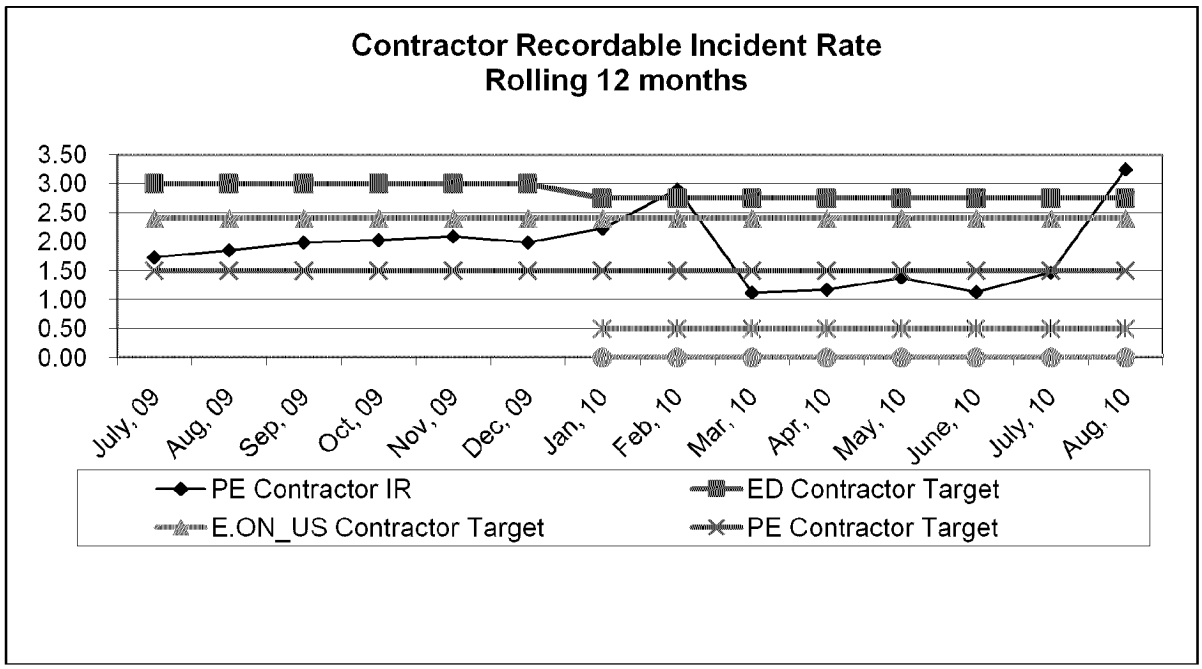
- **SO3 Mitigation (Ghent)**
  - MgO injection trials at GH1 with Breen showed results per the instrumentation is <20% SAM reduction in the furnace. The trial is considered unsuccessful.
  - B&V Calculations:
    - Finalized Base calculation for BACT analysis with all layers of catalyst in place.
    - Calculation based on exact operation today submitted.
    - Calculation based on pre-FGD operation with 1.2 lb SO2/mmBtu coal submitted.

        - Calculation on pre-SCR operation with_1.2 lb SO2/mmBtu fuel submitted.
    - B&V re-draft of BACT analysis and Life Cycle analysis comments returned.
    - B&V requested to prepare two more documents:
        - BACT based on 2005 RBLC database for emissions limits
        - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
    - LFG - LFG Technologies provided pipeline costs for the Valley View project.
    - NBU Cane Run:
        - Commercial Operation date moved to January 1, 2016.
        - Discussions in progress to target October for pipeline study award.
        - Discussions in progress to target November for Owner's Engineer award.
    - Biomass - NTR
    - CCS 100 MW Project – Bids received by Battelle, Fluor, Bechtel, and KBR. All bids are higher than anticipated – proposals need to be re-evaluated and cut to meet our budget expectations.
    - FutureGen – NTR.

- **General**
    - Environmental Scenario Planning – The kickoff for the Ghent program is scheduled for October 6-7, 2010. PE is working with B&V to identify dates to propose to the Brown management team for their kickoff in November. Mill Creek's review in progress.
    - Continue working with Gen Planning on the Revised Air Compliance analyses.
    - Continue working with Rates on all environmental projects needing ECR and/or CCN.
    - PE continues to work with Legal and US EPA in regards to defense of the KPDES Permit for Trimble. Sierra Club withdrew their objections.
    - PE is working with Legal in regards to asbestos litigation regarding the construction of Trimble County Unit 1.

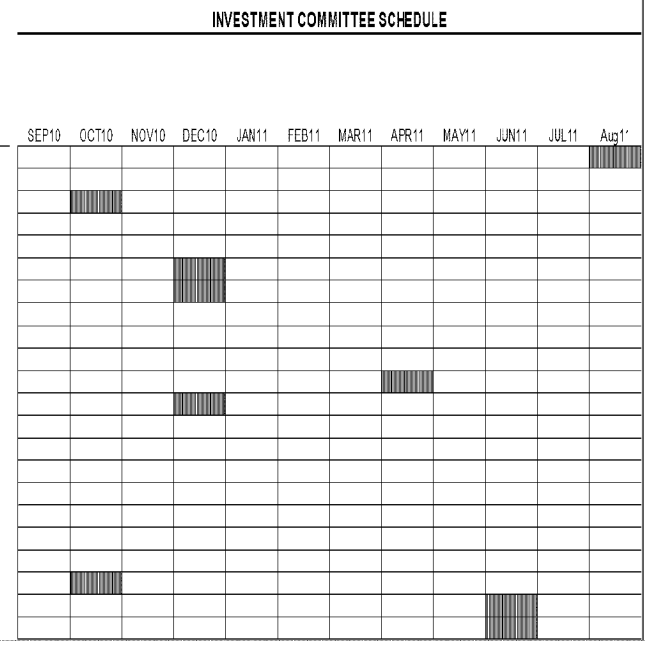
Metrics



Upcoming PWT Needs:

Project Engineering
Investment Committee Schedule

Project Manager	Description	Contract, Project, SSA	Amount $000s	Month of I/C Meeting
Heun	CR CCP - Landfill Phase I - Construction	C	15,000	Aug
Heun	GH CCP - Landfill Phase I - Construction	C		
Heun	GH CCP - Gypsum Fines and Transport - Engineering	C	4,000	Oct
Heun	GH CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Heun	GH CCP - Biannual Update	C		
Imber	BR 3 SAM Mitigation	C	8,000	Dec
Imber	GH 1 -4 SAM Mitigation	P	32,000	Dec
Imber	MC 3 and MC4 SAM Mitigation - **On Hold**	P		
Imber	Biomass Coal Firing			
Imber	Land Fill Gas Engineering			
Lively	CCGT 2016 - Cane Run	P	589,200	Apr
Saunders	MC Limestone Mill EPC Contract	C	12,000	Dec
Saunders	BR 2 SCR Technolcgy	P		
Saunders	BR 2 SCR EPC	P		
Saunders	GH 2 SCR Technology	P		
Saunders	GH 2 SCR EPC	P		
Waterman	TC CCP - Landfill Phase I - Construction	C		
Waterman	TC CCP - Gypsum Fines and Transport - Engineering	C		
Waterman	TC CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Williams	BR CCP - Landfill	P	66,000	Oct
Williams	BR CCP - Landfill Phase I - Construction	C		Jun
Williams	BR CCP - Ash Handling Dry Conversion	C		Jun



Staffing

- Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP, illnesses, and attrition from retirements and transfers. Headcount planning to begin once MTP becomes approved from E.ON US and PPL.
- Lana Linkenhoker to remain off through mid-October. She has been recommended to go on LTD

From: Conroy, Robert
To: Schroeder, Andrea; Foxworthy, Carol
Sent: 9/9/2010 7:33:04 AM
Subject: FW: BR Landfill - Final Justification Paper and PowerPoint
Attachments: BR Landfill Justification (08-Sep-10).docx; BR Landfill Justification (08-Sep-10).pptx

Please review.

Robert M. Conroy

Director, Rates

E.ON U.S. Services Inc.

(502) 627-3324 (phone)

(502) 627-3213 (fax)

(502) 741-4322 (mobile)

robert.conroy@eon-us.com

From: Heun, Jeff
Sent: Wednesday, September 08, 2010 1:54 PM
To: Straight, Scott; Voyles, John; Bowling, Ralph; Fraley, Jeffrey; Hudson, Rusty; Bellar, Lonnie; Conroy, Robert
Cc: Heun, Jeff; Williams, John; Gregory, Ronald
Subject: BR Landfill - Final Justification Paper and PowerPoint

All,

Attached is the updated BR Landfill Justification Paper and PowerPoint based on feedback received from various departments. If you have any questions or concerns contact me at your convenience.

<<...>> <<...>>

Thanks,

Jeffrey B. Heun, P.E.
E.ON U.S.
Project Engineering
Sr Civil Engineer

(502) 627-4525 (Louisville Office)
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PROJECT ENGINEERING

e·on U.S.

E.W. Brown CCR Storage Evaluation
Continue Main Pond Project vs. Conversion to Landfill
September 08, 2010

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate what effects the EPA's proposed CCR rules potentially imposed on long-term wet storage of CCR at BR.

Significant work has been completed on the BR CCR Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'. In addition to the completed tasks, construction of the Main Pond Starter Dike (elevation 902') is in progress but has been suspended by PE pending direction on the path forward for long-term CCR storage at BR.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed per the original plan or on an accelerated scheduled to support CCR storage requirements based on the path forward.

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

Project Background

In 2005, PE was tasked with evaluating storage options to meet the future CCR storage requirements at BR to 2030. The evaluation process consisted of an Initial Siting study, Conceptual Design phase, and Detailed Design of the Main Pond and Aux Pond. The Initial Siting study evaluated potential storage options for BR Station and recommended an on-site storage facility as the least cost option.

The Conceptual Design was built upon the Initial Siting Study and focused on potential storage options available on-site. Options evaluated included ponds, landfills, and a combination of

ponds and landfills; with the final evaluation considering three ponds and two landfill options. Pond Option #1 was a vertical upstream expansion of the existing Main Ash Pond, Pond Option #2 was a vertical upstream expansion of the existing Main Ash Pond and a new Gypsum Stack, and Pond Option #3 was a vertical upstream expansion of the existing Ash Pond and a new Bottom Ash Pond. The two landfill options were based on a common footprint; however Landfill Option #1 was based on conventional dry CCR handling and mechanical placement while Landfill Option #2 was based on wet CCR handling and dense slurry placement. Based on Net Present Value (NPV) evaluations of the (5) five options in 2005, the least-cost alternative was Pond Option #3 consisting of a new Aux Pond for bottom ash storage and the vertical upstream expansion of the existing Ash Pond for flyash and non-marketed gypsum storage. Option #3 capital costs (Phase I and II of five Phases) of $98M were approved for Environment Cost Recovery by the Kentucky Public Service Commission (KYPSC) in 2005 and again in 2009.

Upon completion of the Conceptual Design, Detailed Design of the new Aux Pond and vertical upstream expansion of the Main Pond was initiated. Detailed Design included engineering for the ponds, transmission line relocations, station mechanical upgrades, development & submittal of the Dam Safety and 404/401 permits, and several environmental studies to support the permitting process. Detailed Design for the Aux Pond was completed in 2006 followed by the Main Pond in 2007. The original design basis in 2006 was to provide 20-years (until year 2030) of CCR storage based on the following production rates:

CCR	Annual Production (yd^3)	20-Year Production (yd^3)
Gypsum	500,000	10,000,000
Fly Ash	221,000	4,420,000
Bottom Ash	55,000	1,100,000
Totals	**776,000**	**15,520,000**

Current Project Status

Phase I of Pond Option #3 CCR expansion began in 2006 with Detailed Design. The design consists of an expanded Main Ash Pond embankment, construction of an Aux Ash Pond, transmission line relocations, and ash handling upgrades. The Aux Pond is currently in operation at its initial height of elevation 880'. It provides an alternate location to treat bottom ash and fly ash in the area south of the existing Main Pond while the Main Pond Starter Dike (Starter Dike) is under construction. If the Pond Option #3 design progresses to final completion, the Main Pond will have been constructed to elevation 962' and the Aux Pond to elevation 900'.

Aux Pond

The construction sequence of the Aux Pond was designed with a two phase approach, separated by the construction duration of the Main Pond Starter Dike. Construction of the first phase, designated at Aux Pond elevation 880', commenced in October of 2006 and was

placed into operation in June 2008. The second phase of construction, designated Aux Pond elevation 900', will expand the pond to the final design elevation. The second phase commenced in June 2010 and is currently planned to reach completion in mid-2013.

During the construction of Aux Pond elevation 880', the FGD facility was under construction and gypsum was not in production; therefore, the first phase of the Aux Pond was constructed of clay and rock sourced from on-site borrow. The 47-acre site was stripped and grubbed, karst features were investigated and treated, and a riser outfall structure was constructed to provide outlet control, and the facility's liner system was installed incorporating 60-mil reinforced polypropylene flexible membrane liner (FML). The FGD facility was placed into operation in June 2010, thereby adding gypsum to the by-product stream. The Aux Pond elevation 900' phase incorporates gypsum as the primary constructible fill material.

Main Pond

In June 2008, the Aux Pond was placed into operation at elevation 880'. Shortly thereafter, the Main Ash Pond was taken out of service. To date, excavation and pumping operations of the Main Pond have been performed to drain the low-lying areas allowing the existing ash surface to be stabilized and re-graded. A bi-axial geo-grid reinforced working platform and a starter dike were constructed utilizing shot rock that comprises the foundation for future phased elevation expansions. Also completed is the new riser structure, a storm water runoff system, clay borrow and bottom ash stockpiling, and liner system procurement.

In light of impending EPA regulations that were published in June of 2010, PE suspended most of the work on the Starter Dike contract in an effort to minimize construction of embankments that may not be required should the recommendation to convert the pond project to a landfill is approved. Only shared construction activities between the Starter Dike design and the projected design of a future landfill within the same footprint continue. In suspending the Starter Dike project, the liner system and embankment material can be utilized in the design of the landfill and also utilized to accelerate the construction of the Aux Pond elevation 900' Phase II, thus minimizing approximately $6.5 million of spend on construction that would be stranded.

Transmission Relocation

Early site construction included the relocation of approximately 13,000 linear feet of overhead electric transmission lines and associated poles and towers to accommodate the expansion of the Main Ash Pond and the construction of the Auxiliary Ash Pond. This phase of the construction effort was initiated in mid-2006 and was completed in 2007.

Ash Handling Upgrades

Multiple plant upgrades to the wet ash handling system resulted from the Main Pond expansion and Aux Pond construction. New higher capacity fly ash and bottom ash sluice

pumps, servicing all three units, were required to overcome the added height of the Main Ash Pond embankment and the distance to the Aux Pond.

Phase I Financials

The following table depicts the Phase I expenditures to date verses the Phase I sanction amount.

Cost Through June '10 ($000)	
Engineering	$4,728
Transmission Line Relocation	$18,017
Ash Handling Upgrades	$5,947
Aux Pond 900'	$8,442
Main Pond Starter Dike	$13,202
E.ON U.S./Other	$2,947
Sub-Total	**$53,283**
ECR/Sanction Approved	$73,100
Remaining Budget	**$19,817**

EPA's Proposed CCR Ruling

As a result of the December 2008 ash pond failure at TVA's Kingston's Generating Station, the EPA issued a proposed CCR ruling on June 21, 2010 that would establish federal guidelines for CCR storage. The proposal had three options to govern the storage of CCR, Subtitle "C" – Hazardous, Subtitle "D" – Non-Hazardous, and Subtitle "D" Prime – Non-Hazardous.

Subtitle "C" – Hazardous

The Aux Pond and Main Pond at BR would not comply with the proposed ruling due to strict siting requirements and not having a composite liner. As a result the ponds would have to be closed per one of the two options below:

1. Prior to the ruling becoming effective, BR could cease operation of the ponds and close them under current KY Division of Waste Management regulations. Existing ponds would not be grandfathered in.
2. Once the ruling becomes effective, the ponds would have to stop receiving CCR within 5-years and close within 2-years thereafter. New Subtitle "C" permits would be required in addition to run-on & run-off controls, groundwater monitoring, corrective action plans, closure/post-closure care plan, and financial assurance per the ruling.

Subtitle "D" – Non-Hazardous

The Aux Pond could potentially comply with Subtitle "D" requirements but is highly unlikely as the liner consists of 18" of clay overtopped by an FML while the regulations calls for 24" of clay overtopped by an FML. Without changing our current design plans, the Main Pond at BR would not comply with the proposed ruling due to not having a composite liner and meeting strict siting requirements. As a result, the ponds would have to be closed per one of the two options below:

1. Prior to the ruling becoming effective, BR could cease operation of the ponds and close them under current KY Division of Waste Management regulations. Existing ponds would not be grandfathered in.
2. Once the ruling becomes effective, the ponds would have to stop receiving CCR within 5-years and close within 2-years thereafter. New Subtitle "D" permits would be required in addition to run-on & run-off controls, groundwater monitoring, corrective action plans, and closure/post-closure care plan per the ruling.

Subtitle "D" Prime – Non-Hazardous

Under Subtitle "D" Prime the current elevation of the Aux Pond and Main Pond at the effective date of the ruling would be grandfathered in and allowed to operate for their remaining useful life. However, any future vertical or horizontal expansion would fall under the new regulations and require a new permit, strict siting requirements, composite liner, run-on & run-off controls, groundwater monitoring, corrective action plan, and closure/post-closure care plan per the ruling. These requirements would preclude moving forward because the Main Pond (1) will not provide the required storage volume for CCR due to not being constructed to its final design elevation prior to the rules becoming effective because of both lack of gypsum or rock to construct the berm and insufficient time; and (2) the Main Pond, once placed into operation and filled with water, cannot be retrofitted with the required composite liner to comply with the strict siting requirements.

Under Subtitle "C" the EPA would effectively force the closure of all existing impoundments and eliminate impoundments for future CCR storage as a result of siting restriction, tighter water treatment standards, and cost to implement all technical requirements as set forth. Under Subtitle "D" existing impoundments that do not meet the proposed requirements would be forced to close. However, under Subtitle "D" new impoundments that are designed and constructed with a composite liner, groundwater monitoring, and in compliance with all performance standards would be allowed.

The EPA's proposed ruling will be considered in determining the path forward for the BR CCR project and its effects on the project will be discussed in later sections.

Design Basis Moving Forward

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. The 3 options available are summarized below:

- **Base Case** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.
- **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.
- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Each case was evaluated based on the most recent forecast of CCR production rates as provided by Generation Planning. In the third quarter of 2009, Generation Planning issued updated CCR production rates based on the projected 2010 MTP generation plan. The CCR production rates for BR modeled in 2009 were significantly lower than the original production rates utilized in 2005. This is attributed to a significant reduction in the station's capacity factor from 77 percent to 54 percent due to shifting generation to other stations. Comparison of the average annual CCR production rates are provided below:

CCP	Average Annual Production Rates (yd^3)			
	2005 Design Basis	2010 MTP	Δ	% Reduction
Bottom Ash	55,000	35,879	(19,121)	35%
Fly Ash	221,000	143,516	(77,484)	35%
Gypsum	500,000	290,000	(210,000)	42%
Totals	**776,000**	**469,395**	**(306,605)**	**47%**

The required CCR storage capacity till 2030 using the 2010 MTP production rates is now 7M yd^3 based on an in-service date of January 2014. If utilizing the original 2005 design volume of

15.5M yd^3 the storage, the facility would have a design life of approximately 38-years (2048), well beyond BR's needs.

Moving forward, the CCR storage facility at BR for both viable Cases A and B will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. As described below, the Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill for both Cases will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements.

Base Case

The Base Case is the plan currently being implemented and is in-line with the approved ECR & 2006-2010 MTP/LTP plans. Phase I included the design & permitting of the Aux Pond and Main Pond, relocation of the transmission lines, wet ash handling upgrades, Aux Pond 880' construction, and Main Pond Starter Dike construction. All items except the Main Pond Starter Dike construction (in suspension) have been completed. Phase II includes Aux Pond 900' (its final elevation) and Main Pond 912' construction utilizing gypsum. Under the EPA's proposed CCR Ruling, neither pond will meet either of the proposed requirements and will be required to close per the timeframe outlined in the ruling. As a result, moving forward with the Base Case based on the current plan and liner design will not provide BR the required storage through 2030, even at the lower 2009 model production rates.

Base Case Design Issues

The EPA has proposed three options to manage CCR. If the EPA moves forward with Subtitle "C", this option will effectively eliminate all wet CCR storage and would require all existing ponds to retroactively meet the design criteria or cease operation and close per the requirements set forth under Subtitle "C". The Main Pond at BR would not comply with the proposed ruling due to siting requirements, land disposal restrictions (waste treatment), and not having a composite liner & leachate collection system along with other minor issues. A composite liner and leachate collection system could be installed; however the siting requirements and land disposal restriction would remain an issue.

Under Subtitle "D", the EPA is more open to wet storage of CCR. However, several issues remain such as siting requirements (karst, seismic, proximity to wetland & adjacent property owners, etc), composite liner & leachate collection system, and requiring ponds to retroactively meet the design criteria or cease operation and close per the requirements set forth under Subtitle "D". Prior to the effective date of the EPA's ruling, the Main Pond could be constructed to its ultimate elevation of 928' using rock (if a source of sufficient rock quantity can be found) in-lieu of gypsum and include a composite liner with leachate collection. However, the Main Pond would still be subject to the siting requirements under Subtitle "D". By using rock in-lieu of gypsum, the design life of the pond will be reduced by 8 years as the gypsum eventually produced that would have been used to construct the dike would instead be stored in the pond. To complete construction prior to the effective date, embankment must be placed at 12,000 yd^3 per day when normal average construction is

3,000-5,000 yd^3 per day. In addition, close proximity land would have to be purchased to supply the quantity of clay required to construct the composite liner and to supply the rock necessary to construct the embankments. Compliant rock and clay currently sourced from the Houp Property is becoming limited. Based on production rates from the existing quarry, an additional 200 acres would be required to supply the 2.2M yd^3 of rock needed to complete the Aux Pond to an elevation of 900' and the Main Pond to an elevation of 928'. The purchase of 200 acres for additional borrow sources would add $2.0M (2010 dollars) to the project based on cost data gathered on the Ghent Landfill Project. Assuming the new quarry is located less than 5 miles from the plant and utilizing 40-ton articulated trucks, the additional hauling cost would be approximately $10.25M (2010 dollars) based on 2010 RS Means estimating manuals. These additional costs have not been included in the NPV or PVRR analysis.

Construction of the Main Pond could continue by modifying its design to comply with the proposed technical requirements at a significant cost increase and risk to the company. The technical requirements as proposed could change prior to the final ruling and the pond would no longer be in compliance. The EPA is trying to eliminate ponds and move towards dry landfills; therefore, constructing a new pond for long term CCR storage carries significant risk.

Under Subtitle "D" Prime the current elevation of the Main Pond, at the effective date of the ruling, would be grandfathered in and allowed to operate for the remainder of its useful life. However, any future vertical or horizontal expansion would fall under the new regulations and require a new permit, compliance with strict siting requirements, composite liner, run-on & run-off controls, groundwater monitoring, corrective action plan, and closure/post-closure care plan per the ruling. Prior to the effective date of the EPA's ruling the Main Pond could be constructed to its ultimate elevation of 928' as described above. However, there is significant risk as Subtitle "D" Prime is the least likely alternative to be approved as the EPA is trying to eliminate ponds and move towards dry landfills.

Based on the revised 2010 MTP CCR production rates requiring the reduced storage of 7M yd^3, the Main Pond's maximum elevation has been lowered from 962' to 928'. Moving forward, cost data provided for the Base Case will be based on a final elevation of 928'. The following table reflects the NPV, PVRR, and capital cost cash flows for the Base Case option as currently included in the 2011 MTP/LTP draft of July, 2010.

Base Case Capital Cost ($000) for 7M yd^3											
2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**NPV**	**PVRR**	**Total Project**
$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$2,637	$2,699	$3,813	$103,720	$127,799	$121,687

Case A

Case A consists of immediately terminating construction of the Main Pond Starter Dike (excluding site close out activities such as dust control and reclamation), accelerating the construction of the Aux Pond utilizing rock already blasted that has been recently placed in the Main Pond Starter Dike (thus reducing stranded investments), continued ash grading, Main Pond

cap/closure, Landfill engineering and permitting, converting all station ash handling systems from wet to dry, and constructing the initial phase of a Landfill. Based on recent projects, the anticipated duration to perform these activities is 3.5 years with an in-service date of January 2014.

Design and construction of the Landfill would begin prior to final approval of the EPA's proposed CCR Ruling; however the Landfill liner requirements for both Subtitle "D" Non-Hazardous and "C" Hazardous options are the same and will become the basis of design. By terminating construction of the Main Pond Starter Dike, material already purchased and/or stockpiled, such as FML, Filter Fabric, Clay, Rock, and Bottom Ash, will be utilized in the construction of the Landfill thereby minimizing the cost impacts from the approximately $6.5 million stranded cost for the materials purchased or quarried. Additionally, by utilizing rock already blasted and placed in the Main Pond Starter Dike, the footprint of the landfill will be optimized to approximately 100 acres thereby reducing the final height of the landfill and maximizing the future vertical expansion opportunities up to approximately 18M yd^3.

All Plant effluents and CCR will continue to be directed to the Aux Pond during the design, permitting, and construction of the landfill for approximately 3.5 years in order to keep BR in operation. Based on a recent bathymetric survey conducted by MACTEC, and utilizing the 2010 CCR Production Rates, the Aux Pond has enough remaining capacity to store all the CCR generated through January 2015. This is a conservative estimate and provides one year of project float. The following table reflects the NPV, PVRR, and capital cost cash flows for Case A as reflected in the notes to the 2011 MTP/LTP as Landfill Option #1.

Case A Capital Cost ($000)											
2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**NPV**	**PVRR**	**Total Project**
$9,051	$14,262	$26,722	$24,064	$0	$0	$0	$0	$9,321	$126,322	$181,791	$154,939

Case B

Case B consists of completing the Main Pond Starter Dike and Aux Pond 900' projects as designed and permitted prior to final approval of the EPA's proposed CCR Ruling. Upon approval of the EPA's proposed CCR Ruling, the Main Pond would be taken out of service; the Main Pond would then be dewatered, followed by ash grading, Main Pond cap/closure, Landfill engineering, permitting, wet to dry ash handling conversion, and the initial phase of construction of the Landfill. Based on recent projects, the anticipated duration to perform these activities is 5.5 years with an in-service date of January 2016.

If the construction of the Main Pond Starter Dike were to continue to completion and the EPA's proposed ruling was approved, material already purchased and/or stockpiled such as FML, Filter Fabric, Clay, Rock, and Bottom Ash *cannot* be salvaged or otherwise made available for the construction of the Landfill resulting in the need to purchase additional land for approximately $2M to develop new borrow sources and liner material at future market values. Design and construction of a landfill would begin after final approval of the EPA's proposed CCR Ruling which would be the basis of design. By continuing with the construction of the Main Pond Starter Dike, the footprint of the landfill would be approximately 80 acres, some 20 acres less

than Case A, thus reducing the potential for future vertical expansion, approximate maximum capacity 13.25M yd^3. Case B also would involve having to develop an operation plan for the Brown Station that would enable it to remain in operation while the recently constructed Main Pond was taken back out of service and dewatered to allow construction of the Landfill. **These operational costs are not included in the total project cost shown in the table below as they are difficult to estimate at the time of preparing this paper; however, they are expected to be significant**.

During the design and permitting of the landfill, both the Aux Pond and Main Pond will be used to store CCR material. During construction, a duration of approximately 2 years, all CCR generated will be stored in the existing Aux Pond. Based on a recent bathymetric survey conducted by MACTEC, and utilizing the 2010 CCR Production Rates, the Aux Pond has enough remaining capacity to store all the CCR generated for 2 years starting January 2014. The following table reflects the NPV, PVRR, and capital cost cash flows for Case A as reflected in the notes to the 2011 MTP/LTP as Landfill Option #2.

Case B Capital Cost ($000)											
2010	2011	2012	2013	2014	2015	2016	2017	2018	NPV	PVRR	Total Project
$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$0	$0	$0	$143,980	$204,633	$193,567

NOTE: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.

Case C

Case C consisted of completing the Aux Pond 900' project as designed and modifies the Main Pond Starter Dike to include a composite liner system. With the addition of 24" of clay the Main Pond could comply with Subtitle "D"; however, the Main Pond would not comply with Subtitle "C" and does not comply with the EPA intent to eliminate ponds for storage. Case C was eliminated because (1) it is not possible to source clay and rock from the existing station property in the quantities required; (2) it is not economically feasible to source clay from the surrounding area and the time required to locate and acquire a farm with sufficient quantities within the timeframe required is deemed marginal at best; and (3) to design and construct the composite liner will only allow compliance with subtitle "D" and not "C". Based on this no further consideration was given to Case C.

Schedule Impacts

If the decision is made to convert the Main Pond into a Landfill there are several items that will impact the schedule. They include engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

Permitting will take approximately 18-months and should only include the KY Division of Waste Management permit as the remaining permits were obtained during the original Main

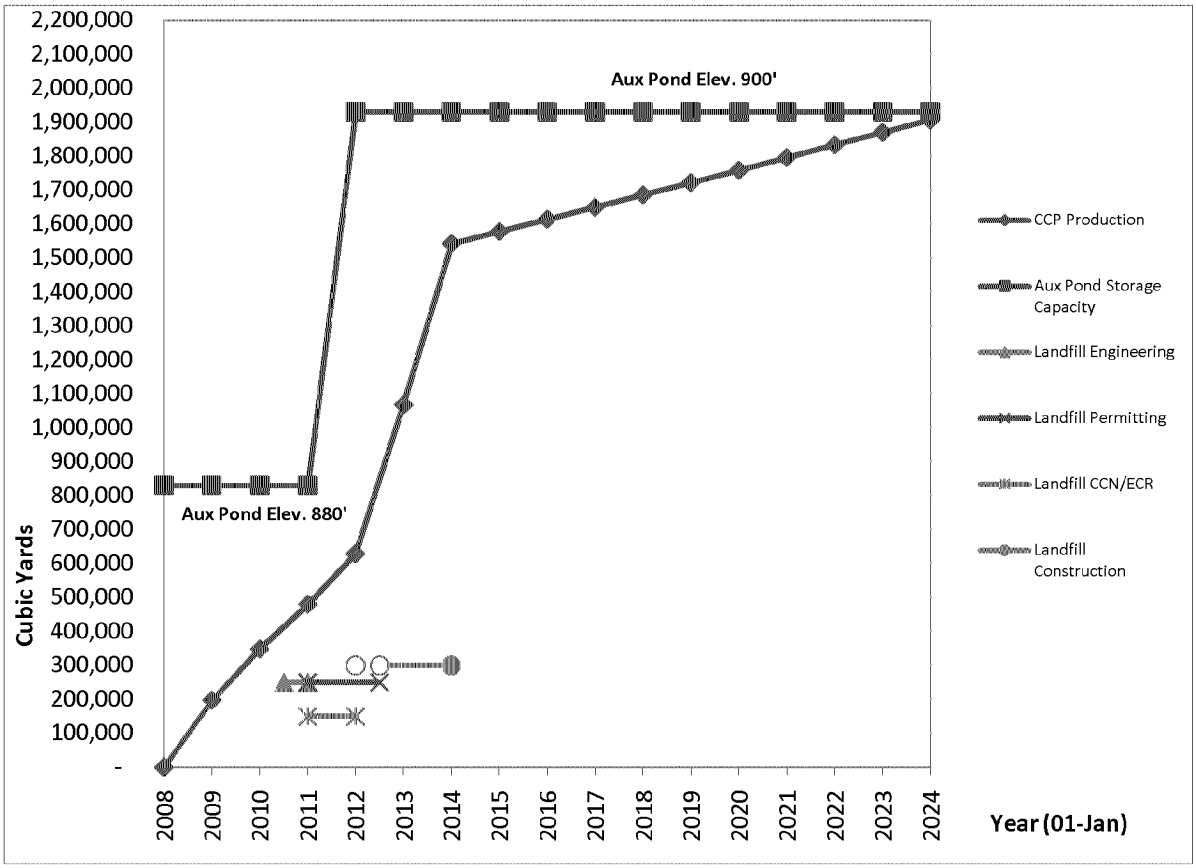
Pond project permitting. The updated or new ECR/CPCN filing will take approximately 6-months and would be submitted in parallel with the engineering/design and permitting process.

The initial landfill construction timeline will be dependent on the chosen option, but will take between 18-24 months to complete. Based on the above, PE performed an analysis to ensure the Aux Pond had enough storage capacity remaining to support the conversion of the Main Pond into a Landfill. Results of the storage analysis are provided below and indicate that the Aux Pond has enough capacity to support either Case A or Case B.

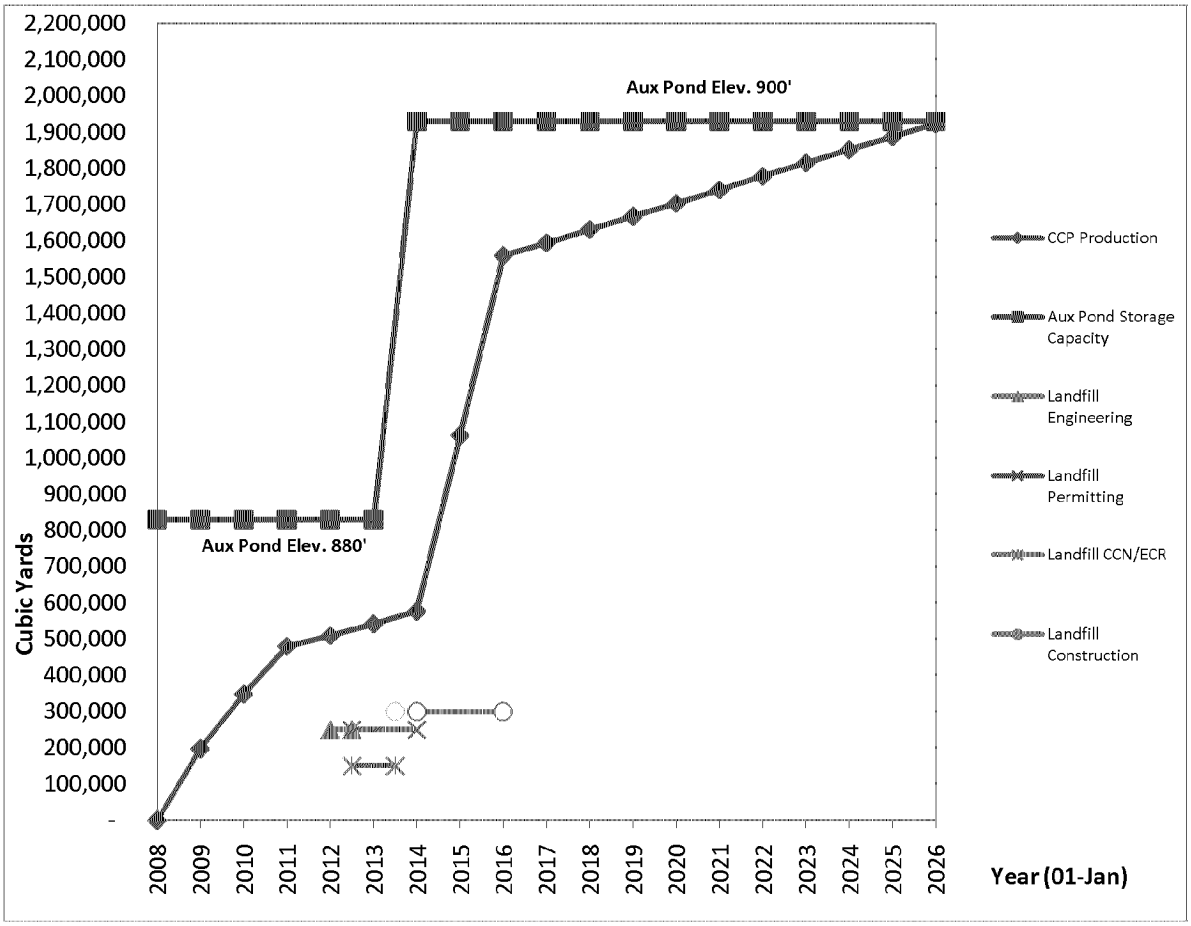
A summary of the schedule is shown below.

Project Timeline		
Task	**Date**	**Duration**
Informal Meeting w/the PSC	October 2010	1 Day
Engineering	September 2010	3-4 Months
File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

Aux Pond Stage Storage Graph (Case A) – Stop Main Pond Starter Dike & Accelerate Aux Pond 900' Construction



Aux Pond Stage Storage Graph (Case B) – Complete Main Pond Starter Dike & Aux Pond 900' per Original Schedule



Financials

Considering the factors referenced above, PE with the assistance of MACTEC, developed capital cost estimates for Case A and B which were based on a horizontal expansion of the landfill. Additional engineering is required to determine if a horizontal or vertical expansion approach is the best alternative. Timing of cash flows would be affected if a vertical expansion approach is chosen. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Case A or B are the only long term storage solutions.*

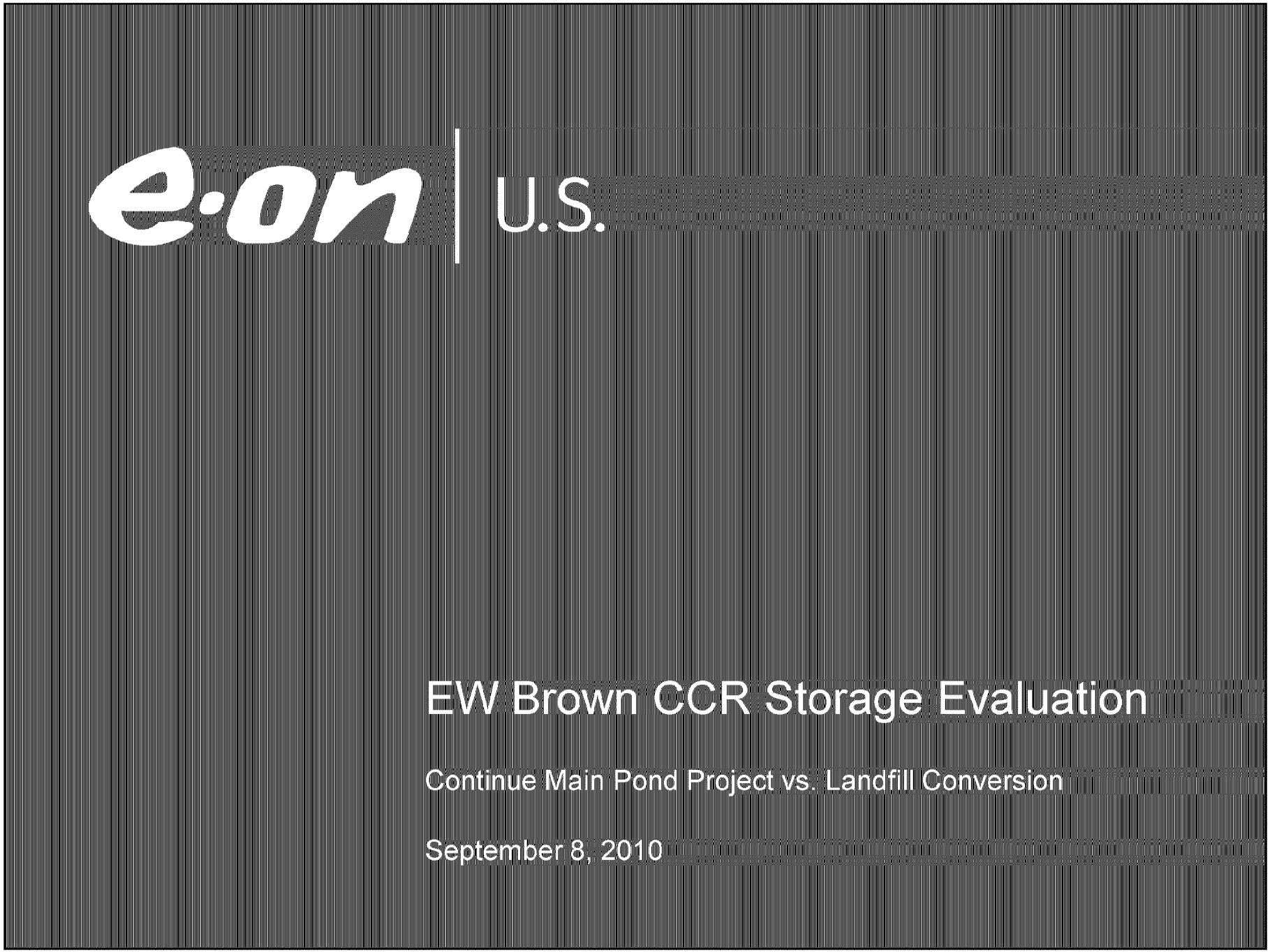
PROJECT ENGINEERING

Cost Estimate Comparison											
Option	**Life**	**Capacity**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**NPV**	**PVRR**	**Total Project**
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
Base Case	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.

Recommendation

Project Engineering and the Brown Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling. This option has the lowest NPV & PVRR, is the least cost, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post EPA CCR Ruling while the landfill is being constructed.


U.S.
EW Brown CCR Storage Evaluation
Continue Main Pond Project vs. Landfill Conversion
September 8, 2010

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Current Plan (Base Case – Modified ECR Approved Scope)

Scope

- Detailed engineering and permitting for all phases, completed 2006
- Relocation of transmission lines, completed 2007
- Ash handling upgrades, completed
- Construction of Aux Pond to elevation 880' (Phase I), completed June 2008

Schedule

- Aux Pond elevation 900' construction (Phase II of II), in progress
  - Will continue via original plan (completion mid-2013) or accelerated schedule to support CCR storage requirements to support landfill development.
- Construction of Main Pond Starter Dike, elevation 902', 75-80% complete
  - Currently suspended pending direction of path forward (Landfill or Pond)
- Accelerate construction of the Aux and Main Ponds based on working one shift, 7 days a week, at 4,000 yd^3 per day using rock and gypsum. Very aggressive schedule
  - Aux Pond constructed to final elevation of 900'
  - Main Pond constructed to an elevation of approximately 912'

Financials

- Phase I: $53.3M of approved $73.1M spent through June 2010
- Phase II: $24.9M approved

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Proposed CCR Rulings: Impact to Current Plan

Subtitle "C" (Hazardous)

- Aux Pond and Main Pond – as currently designed, they are not compliant due to lack of composite liner and may not meet siting requirements relative to Karst terrain.

- Result: Will required the closing of both ponds or retrofit with new liner design as grandfathering is not an option.

Subtitle "D" (Non-Hazardous)

- Aux Pond – compliance unlikely due to current 18" clay liner vs. required 24".
- Main Pond – as currently designed, not compliant due to lack of composite liner and may not meet siting requirements relative to Karst terrain.

- Result: Will require the closing of both ponds or retrofit with new liner system.

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Proposed CCR Rulings: Impact to Current Plan

Subtitle "D" Prime (Non-Hazardous)

- The Aux and Main Pond elevations at effective date of ruling will be grandfathered in; thus allowing the ponds to be operated for their remaining life.
- Any future vertical/horizontal expansion subject to new regulations which will require re-permitting, siting assessment, composite liner, run-on/off controls, groundwater monitoring, corrective action plans, and closure/post-closure care plans.

- Result: Effective date likely to result in lack of fully constructed Main Pond, thus new regulations will require closing Main Pond down and constructing new designed pond or landfill.

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Base Case – 20 Year Storage Capacity

- Based on the current ECR approved plan adjusted to provide storage until 2030

- Phase I – ECR approved 2005
  - Design & permitting of the Aux and Main Ponds - Completed
  - Transmission Line Relocation - Completed
  - Ash handling upgrades - Completed
  - Aux Pond 880' construction - Completed
  - Main Pond starter dike (902') construction – Construction has been suspended

- Phase II – ECR approved 2009
  - Aux Pond 900' construction – Under Construction
  - Main Pond 912' construction

- Phase III – future ECR filing
  - Original ECR scope reduced to match current CCR production rates
  - Main Pond 928' construction versus original 962'

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Landfill – Case A (Convert Now Prior to Placing Main Pond In-service)

Main Pond Starter Dike

- Stop construction immediately.
- EPA's proposed ruling used as the basis of design.
- Convert Main Pond to a Landfill prior to effective date of CCR Ruling and prior to placing wet CCR in Main Pond.
  - Landfill liner requirements same among Subtitle "D" and "C"
  - Utilize material already purchased and/or stockpiled for the intended Main Pond Starter Dike
  - Minimize costs from stranded materials purchased or quarried (~$6.5M)
  - Landfill footprint approximately 100 acres within Main Pond footprint, this reduces final height of landfill while maximizing future vertical expansion opportunities up to 18M yd^3.

Aux Pond 900'

- Accelerated completion of project utilizing rock and gypsum.
- After Landfill is placed into operation, close per regulations and modify with new design for management of process water.

Anticipated duration of activities

- 3.5 years, in service date of January 2014

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Landfill – Case B (Convert Pond to Landfill Post Regulations)

Main Pond Starter Dike

- Continue construction per original design.
  - Material used for pond liner will not be available for landfill construction.
  - Will require new off-site quarry at an estimated cost of $2.0M (due to consuming existing quarry for Main and Aux Pond construction), as well significant purchase of new liner material.
  - Landfill footprint approximately 80 acres, 20 acres smaller than Case A due to Main Pond utilization consuming space; thus reducing future storage to 13.25M yd^3 due to reduced vertical expansion.
- Once anticipated ruling becomes effective:
  - Main Pond required to be taken out of service
  - New Landfill will be required
  - Operation plan needed to maintain Brown Station's operation while Main Pond is taken out of service, dewatered , and landfill constructed. This is anticipated to be a significant impact on the station, a detailed plan of how to accomplish this has not been developed, nor included in the financial comparison.

Aux Pond 900'

- Continue construction per original design
- After Landfill is placed into operation, close per regulations and modify with new design for management of process water.

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Schedule

Project Timeline

Task	Start Date	Duration
Informal Meeting with PSC	October 2010	1 Day
Engineering	September 2010	3-4 Months
File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

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Financial Comparison

Cost Estimate Comparison

Option	Life	Capacity	NPV	PVRR	Total Project
ECR Approved	2054*	15.5M yd^3	$135,467k	N/A	$272,831
Base Case	2030	7.0M yd^3	$100,966k	$127,799	$118,718
Case A	2030	7.0M yd^3	$126,322k	$181,791	$154,939
Case B	2030	7.0M yd^3	$143,980k	$204,633	$193,567k

NOTES:

1. If regulations become final for Hazardous or Non-Hazardous, Base Case will not be viable as the new regulations will require the closing of the newly constructed Ponds.
2. For ECR Approved Case, the original life was 2030 based on 2005 production models. The 2009 production models have shifted generation away from Brown, thus life extended to 2054 if Main Pond developed to original design height.
3. The interim operational and capital cost associated with Case B are not included in the number above. Given Case B is not least-cost in comparison to Case A, the estimate was not performed.
4. $2.0M to purchase additional land to establish clay borrow for Case B only is not included in the above financial analysis.

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Recommendation

Immediate implementation of Case A (convert to Landfill prior to Main Pond In-service)

- Lower NPV & PVRR than Case B
- Lower escalated capital cost than Case B
- Maximizes landfill footprint and future storage capacities than Case B
- Maximizes future vertical expansion opportunities than Case B
- Eliminates difficult and costly issues associated with maintaining station operations while dewatering and closing the Main Pond post-EPA CCR Ruling while landfill is being constructed.

- This recommendation will require modifying the approved ECR project.
- This recommendation will require Landfill permitting.
- This recommendation will require PSC notification.

From:	Hudson, Rusty
To:	Williams, John
CC:	Ritchey, Stacy; Straight, Scott
Sent:	10/13/2010 10:35:15 AM
Subject:	Final Brown CCR Landfill Paper
Attachments:	BR CCR Landfill Project IC Paper (11-Oct-10) R1.docx

John, this is the final paper that I will submit to Financial Planning. I made a few minor word edits, and changed the third paragraph of the executive summary to show the actual spend through August instead of June, and that number now ties back to the table on page 3. Rusty

Investment Proposal for Investment Committee Meeting on: October 25, 2010

Project Name: **E.W. Brown CCR Landfill Project**

Total Expenditures: **Total Project - $154,939k & Landfill Phase I - $57,121k**

Project Numbers: **119961, 125101, 127078**

Business Unit/Line of Business: **Project Engineering/Energy Services**

Prepared/Presented By: **John S. Williams/Scott Straight/Jeff Fraley**

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental presentation.

Significant work has been completed on the BR CCR Ash Pond Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

Through August, 2010, the BR CCR Ash Pond Project Phase I spend is $55.3M of the approved $73.1M sanction. Construction of the final phase of the Aux Pond to elevation 900' is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

PE and the BR Station recommend the immediate implementation of Case A (2011 MTP/LTP) to convert the Main Pond into a Landfill, now before the Main Pond is placed into service, to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost compared to converting later, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to a landfill later.

Background

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective in January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling becomes effective. Moving forward, the CCR storage facility at BR will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The 2010 MTP/LTP of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements. The recommended option is summarized below and descriptions of all options are incorporated into the attached evaluation document:

> **Case A** (2011 MPT/LTP) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

Project Description

- **Project Scope and Timeline**
  The overall scope of the Brown Landfill project is to provide 20-years of on-site storage for dry CCR's. Phase I of the Brown Landfill project includes the following activities: Main Pond ash grading, cap and closure, landfill engineering, permitting, regulatory filings, converting all station ash handling systems from wet to dry, installation of a second gypsum dewatering facility similar to what was constructed during Brown's FGD project, and constructing the initial phase of a landfill. Based on recent projects, the anticipated duration to perform these activities is 3.5 years with an in-service date of January 2014 as shown below:

Project Timeline		
Task	**Date**	**Duration**
Informal Meeting w/the PSC	October 2010	1 Day
Engineering	September 2010	3-4 Months
File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

- **Project Cost**
  Total cost to complete all phases of the Brown Landfill Project is $154,939k with a Landfill Phase I cost of $57,121k. Cost estimates are based on Level I engineering.

Economic Analysis and Risks

- **Assumptions**
  The construction cost estimate is based on actual competitive bid unit rates, 6% escalation, 10% contingency, and 3.5% for E.ON U.S. overheads. The landfill has a 20-year design life and is based upon horizontal expansion.

- **Financial Summary**
  PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B. The ECR approved cost estimate is provided for reference only and Case A is the basis for the 2011MTP/LTP. The 2010 MTP/LTP is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A (2011 MTP/LTP) or B is the only long term storage solution.*

Cost Estimate Comparison

Option	Life	Capacity	2010	2011	2012	2013	2014	2015	NPV	PVRR	Total Project
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
2010 MTP/LTP	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A (2011MTP/LTP)	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE 1: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.
NOTE 2: The NPV, PVRR, and Total Project values include investment to date and forecast through the project Life.

The breakdown of the $154,939k is as follows (in $000's):

Historic ash pond costs	$ 55,306
Remaining ash (aux) pond costs	$ 9,941
Landfill Phase 1	$ 57,121
Landfill Phase 2	$ 10,220
Landfill Phase 3	$ 19,637
Closure Costs	$ 2,714
Total	$154,939

Financial Detail by Year ($000s)	Pre 2010	2010	2011	2012	Post 2012	Total Project
1. Capital Investment Proposed	$47,971	$9,051	$14,262	$26,722	$56,636	$154,642
2. Capital Removal Proposed	$297	$0	$0	$0	$0	$297
3. Total Capital Costs Proposed (US GAAP) (sum of 1 & 2)	$48,268	$9,051	$14,262	$26,722	$56,636	$154,939
4. Capital Investment Cash Basis Proposed	$46,508	$10,350	$13,329	$26,561	$57,894	$154,642
5. Cap Interest Proposed (if applicable)						$0
6. Total Capital Costs Proposed (IFRS) (sum of 4 & 5)	$46,508	$10,350	$13,329	$26,561	$57,894	$154,642
7. Capital Investment Cash Basis 2010 MTP	$47,461	$29,587	$10,184	$8,873	$107,676	$203,781
8. Cap Interest 2010 MTP (if applicable)	$0	$0	$0	$0	$0	$0
9. Total Capital Costs 2010 MTP (IFRS) (sum of 7 & 8)	$47,461	$29,587	$10,184	$8,873	$107,676	$203,781
10. Variance Capital Investment Cash Basis IFRS (9 less 6)	$953	$19,237	($3,145)	($17,688)	$49,782	$49,139
11. Project O&M Costs Proposed (US GAAP)	$0	$0	$0	$0	$0	$0
12. Capital Removal Proposed (Line 2 above)	$297	$0	$0	$0	$0	$297
13. Total Project Opex Costs Proposed (IFRS) (sum of 11 & 12)	$297	$0	$0	$0	$0	$297
14. Project O&M Costs 2010 MTP (US GAAP)	$0	$0	$0	$0	$0	$0
15. Capital Removal 2010 MTP	$297	$0	$0	$0	$0	$297
16. Total Project Opex Costs 2010 MTP (IFRS) (sum of 13 & 14)	$297	$0	$0	$0	$0	$297
17. Total Project Opex Variance to 2010 MTP (IFRS) (16 less 13)	$0	$0	$0	$0	$0	$0
18. EBIT	$12,669	$6,136	$7,491	$9,872	$159,483	$195,651
19. ROCE		11.62%	11.62%	11.62%		10.90%

Project Results	
Capital Expenditure ($000):	$154,939
NPV ($000):	$5,120
IRR:	7.1%
ROCE (20 yr.):	10.9%

The returns above are based on a continuation of the approved KU 2009 ECR Plan, Project Number KU-29. Should a new ECR filing be required, the timing of the cash flows will be different.

- **Sensitivities**

Sensitivities	Change in EBIT			Change in NPV Total
	2010	2011	2012	
Project Costs (Capital +/-10%)	+/- 614	+/- 749	+/-987	+/- 1183

- **Environmental**
  Filing for landfill permits is scheduled for December 2010, following the engineering design.

New Source Review Evaluation, questions 1-6 (as applicable) must be completed on all investment proposals.		
1	Does the project include any new equipment or component with emissions, result in emissions not previously emitted or cause the unit to exceed any emission limit? If yes, Environmental Affairs is required to review this project. If no, go to Question #2.	NO
2	Question 2: Is the change a like-kind or functionally equivalent replacement under $500K? If yes, the project is not subject to NSR and no further evaluation is required. If no, go to Question #3.	NO
3	Question 3: Does the equipment change increase the emissions unit's maximum hourly heat input? If yes, Environmental Affairs is required to review this project. If no, go to Question #4.	NO
4	Question 4: Does the equipment change increase the emissions unit's electrical output? If yes, Environmental Affairs is required to review this project. If no, go to Question #5.	NO
5	Question 5: Has the equipment being repaired/replaced been repaired or replaced in the past at this unit or other units in the fleet? If no, Environmental Affairs is required to review this project. If yes, list any known projects and go to Question #6.	NO
6	Question 6: Have there been forced outages or unit de-rates in the past 5 years due to this component? If no, the project is not subject to NSR and no further evaluation is required; if the answer is yes, Environmental Affairs needs to review this project.	NO

The Environmental Affairs Department was included in the development of the BR CCR Storage project and agrees with the chosen path forward.

- **Risks**
- *Schedule* – Several items will impact the schedule including engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

- *Weather* – Earthen material placement is highly weather dependent.

- *Oil Prices* – The cost of oil is another risk as oil has a direct affect on material placement unit rates as well as petroleum based products such as flexible membrane liners and filter fabrics.

- **Other Alternatives Considered**
  The analyses were based on an assumption that the proposed EPA ruling becomes approved in 2010 and effective in January 2012. The options are summarized below and a more detailed analysis can be found in the attached evaluation document:

  - **2010 MTP/LTP** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.

- **Case A (2011 MTP/LTP)** (Recommended) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.
- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A (2011 MTP/LTP) on top of the newly constructed Main Pond Starter Dike. As with Case A (2011 MTP/LTP), once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Conclusions and Recommendation

Project Engineering and the BR Station recommend that the Investment Committee approve the implementation of Case A (2011 MTP/LTP) to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling in the amount of $154,939k, and sanction the Landfill Phase I cost of $57,121k. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, continuing the Main Pond Project as it is currently designed will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

	A	B	C	D	E	F	G
1	**Financial Detail by Year ($000s)**	**Pre**	**2010**	**2011**	**2012**	**Post**	**Total**
2		**2010**				**2012**	**Project**
3	1. Capital Investment Proposed	$47,971	$9,051	$14,262	$26,722	$56,636	$154,642
4	2. Capital Removal Proposed	$297	$0	$0	$0	$0	$297
5	3. Total Capital Costs Proposed (US GAAP) (sum (	$48,268	$9,051	$14,262	$26,722	$56,636	$154,939
6	4. Capital Investment Cash Basis Proposed	$46,508	$10,350	$13,329	$26,561	$57,894	$154,642
7	5. Cap Interest Proposed (if applicable)						$0
8	6. Total Capital Costs Proposed (IFRS) (sum of 4 &	$46,508	$10,350	$13,329	$26,561	$57,894	$154,642
9	7. Capital Investment Cash Basis 2010 MTP	$47,461	$29,587	$10,184	$8,873	$107,676	$203,781
10	8. Cap Interest 2010 MTP (if applicable)	$0	$0	$0	$0	$0	$0
11	9. Total Capital Costs 2010 MTP (IFRS) (sum of 7	$47,461	$29,587	$10,184	$8,873	$107,676	$203,781
12	10. Variance Capital Investment Cash Basis IFRS (	$953	$19,237	($3,145)	($17,688)	$49,782	$49,139
13	11. Project O&M Costs Proposed (US GAAP)	$0	$0	$0	$0	$0	$0
14	12. Capital Removal Proposed (Line 2 above)	$297	$0	$0	$0	$0	$297
15	13. Total Project Opex Costs Proposed (IFRS) (sun	$297	$0	$0	$0	$0	$297
16	14. Project O&M Costs 2010 MTP (US GAAP)	$0	$0	$0	$0	$0	$0
17	15. Capital Removal 2010 MTP	$297	$0	$0	$0	$0	$297
18	16. Total Project Opex Costs 2010 MTP (IFRS) (su	$297	$0	$0	$0	$0	$297
19	17. Total Project Opex Variance to 2010 MTP (IFI	$0	$0	$0	$0	$0	$0
20							
21	18. EBIT	$12,669	$6,136	$7,491	$9,872	$159,483	$195,651
22	19. ROCE		11.62%	11.62%	11.62%		10.90%

From: Heun, Jeff
To: Straight, Scott
CC: Waterman, Bob
Sent: 10/13/2010 2:56:23 PM
Subject: Bi-Weekly Update
Attachments: PE's Bi-Weekly Update of 10-15-10 RCWa & JBH Comments_11Oct10.docx

Bi-Weekly update for Bob and I.

Thanks,
Jeffrey B. Heun, P.E.
E.ON U.S.
Project Engineering
Sr Civil Engineer
(502) 627-4525 (Louisville Office)
(859) 367-1254 (Brown Office)
(502) 592-2421 (Mobile)
(502) 217-2678 (FAX)
jeff.heun@eon-us.com

Energy Services - Bi-Weekly Update
PROJECT ENGINEERING
October 15, 2010

- **KU SOx**
  - Safety – Nothing to report (NTR)
  - Auditing – NTR
  - Schedule/Execution:
    - Ghent
      - Unit 4 ID Fans – On plan for fall outage.
    - Brown
      - On plan for Unit 1 outage tie-in this Fall.
      - E.W. Brown Coal Pile Modification
        - Engineering design complete.
        - Pre-bid scheduled for 9/28.
        - KU to perform the overhead line relocation within the next 3-4 weeks. These lines supply power to coal pile lighting and retention pond pumps.
      - United Group Services continues design work for the elevators, with a targeted completion of February 2011.
  - Budget – The current month Fluor forecast for Brown was reduced by $1,647k.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – The initial fault in the exciter transformer has been identified as a failure of the low voltage windings in the C-phase. New low voltage windings are in production and are scheduled to be shipped in early October. The transformer core was tested 9/29 and passed, therefore the project will proceed with repairing the transformer. PE looking into cost and schedule of a spare transformer given the uniqueness of it. Given the repair of the transformer is the path forward, the COD is 11/25. The collateral damage was limited and repairs are expected to be completed to support 11/25 COD. This impact to commissioning is being communicated to KYPSC.
  - Budget – NTR
  - Contract Disputes/Resolution:
    - Bechtel FM Claims – Change Order for the settlement on all FM and most EE claims has been signed.
    - Doosan CFD Model review planned for 9/30.
  - Issues/Risk:
    - Design of the DBEL burners for our coal specification, excitation transformer recovery, remaining commissioning beyond the 50% load achieved to date.
- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – Permit to construct SCR waiting on KYDAQ.

- Engineering – proceeding as planned to support the spring 2012 in-service.
- Schedule/Execution – NTR
- Budget - NTR
- Contracting – NTR
- Issues/Risk – Permit timeframe against starting construction.

- **Ohio Falls Rehabilitation**
  - Schedule/Execution - NTR
  - Permitting - NTR
  - Engineering – Voith now proceeding with engineering to support fabrication/manufacturing now that contract has been signed.
  - Schedule/Execution - NTR
  - Budget – E.ON AG and PPL approved OF contract and revised sanction.
  - Contracting - Contact signed with Voith on 9/15.
  - Issues/Risk - NTR

- **Mill Creek Limestone Project**
  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering - NTR
  - Schedule/Execution
    - East and Westbrook on site the week of 9/27 to begin maintenance building extension.
    - Metso has agreed to a contract and GSA for the mill equipment.
    - Two Project Coordinators have been relocated to Mill Creek permanently to oversee the construction portion of the project.
  - Budget – NTR
  - Contracting - scope of EPC contract is drafted and under internal reviews.
  - Issue/Risk - NTR

- **Cane Run CCP Project**
  - Permitting
    - 404 and Landfill Permit applications remain under review by the agencies. To date permitting process has gone well.
    - Second public meeting on the KYDWM Landfill permit was held on October14th and was attended by PE and EA.
    - Received 401 Permit on August 4, 2010.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Working on finalizing design to support the proposed 2016 CCGT.
    - Meeting was held on October 15th between the Plant, Landfill team, and the CCGT team to discuss the layout and size of the 5-year landfill.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**

- Finalized order with UCC to purchase pneumatic Fly Ash handling system.
- Updated the 404 Permit drawings per USACE request. Permit has been published on the USACE's website.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - GSP's Flexible Membrane Liner (FML) and Geo-synthetic Clay Liner (GCL) installation began on 04Oct10.
    - Work nearing completion on fill placement and mechanically stabilized earth wall for north and west dikes.
    - GSP to Corn Creek Spillway progressing to plan.
    - Work continues on erection of the new Pipe Rack, electrical duct banks to GSP Electrical Building and to Ash Pond Raft.
  - Budget – NTR
  - Engineering - NTR
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
    - Working on resolution of Weather Delays and requested change to Liquidated Damages by contractor.
    - Working on resolution of Engineering Delays
  - Issues/Risk
    - Weather remains the biggest risk; however, the weather over the last 4 months has been exceptional for this project.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering - The Detailed Engineering RFPs are being reviewed.
  - Permitting:
    - Both the June and July Anabat studies have been completed for the Indiana Bat. ***A third party has reviewed both the June and July data and has concluded no findings***. A cost comparison is being generated to determine alternative mitigation plans with and without the Corn Creek plan.
    - Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – NTR
  - Engineering:
    - Detailed Engineering of gypsum fines continues with B&V.
    - Installation of Unit #4 new gypsum underflow nozzle underway.
    - Detailed Engineering of the CCR Transport System was pulled from the October IC meeting to look at potential change to an EPC approach.
    - Procurement activities for the gypsum fines project are in progress.
    - Drawings and Specifications for the Detailed Engineering for the Landfill have been submitted for review within EON-US.
  - Permitting:

- All permit applications have been made.
- Review meeting with KYDWM was held on October 7th to discuss NOD #1, no major issues were identified.
- Relocation of the impacted cemetery continues with removal planned for October.

- Contract Disputes/Resolution – NTR
- Issues/Risk:
  - Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter was sent to the third remaining land owner. The meeting with McDole and Owens was held on 9/20 with progress being made. Final letter send to Deaton. Meeting was held on on 10/11 to discuss path forward with Real Estate and Legal. A follow-up meeting will be scheduled with Deaton's to discuss our last offer.

- **E.W. Brown Ash Pond Project**

Starter Dike

- Safety – NTR
- Schedule/Execution:
  - Contract work remains under suspension. Summit re-mobilized the water truck to address the bottom ash stockpile and the haul road(s) present on the pond.
  - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
  - Summit upper management formally notified on 9/27 of contract termination.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

Aux Pond 900'

- Safety – NTR
- Schedule/Execution:
  - Charah continued hauling Type I shot rock to place as the drainage blanket on the East side of the embankment toe.
  - Performed maintenance on equipment.
  - Subcontractor – SES assisted with the storm water collection system maintenance on the Main Pond.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

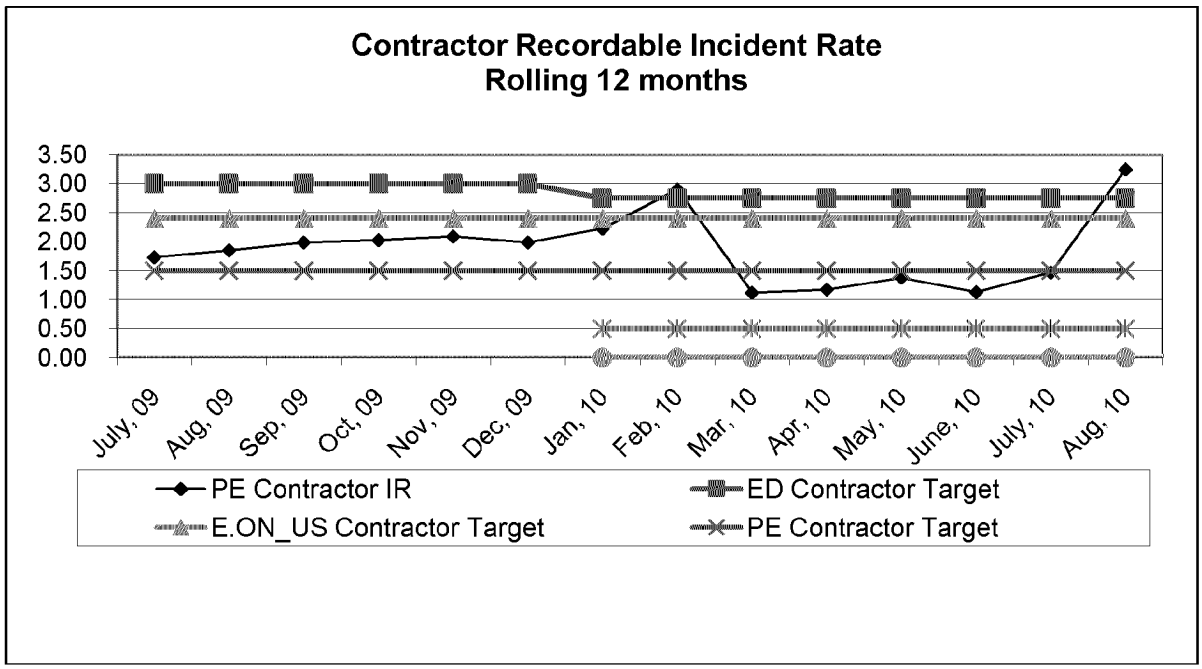
- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Group from the stations and PE visited dry reagent mills and a permanent BCSI system the week of 9/20.
  - Budget – NTR
  - Testing –
    - Ghent 3 & 4 testing report expected week of Sept. 27.
    - Milling material on Ghent 4 showed strong promise – initial test results were < 4 ppm at the stack.
    - Further testing on Ghent 1 may commence with the use of MgO in the furnace. This testing is by Breen and E.ON Engineering – Breen is paying for this testing.

- **SO3 Mitigation (Ghent)**
  - MgO injection trials at GH1 with Breen showed results per the instrumentation is <20% SAM reduction in the furnace. The trial is considered unsuccessful.
  - B&V Calculations:
    - Finalized Base calculation for BACT analysis with all layers of catalyst in place.
    - Calculation based on exact operation today submitted.
    - Calculation based on pre-FGD operation with 1.2 lb SO2/mmBtu coal submitted.
    - Calculation on pre-SCR operation with_1.2 lb SO2/mmBtu fuel submitted.
  - B&V re-draft of BACT analysis and Life Cycle analysis comments returned.
  - B&V requested to prepare two more documents:
    - BACT based on 2005 RBLC database for emissions limits
    - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
  - LFG - LFG Technologies provided pipeline costs for the Valley View project.
  - NBU Cane Run:
    - Commercial Operation date moved to January 1, 2016.
    - Discussions in progress to target October for pipeline study award.
    - Discussions in progress to target November for Owner's Engineer award.
  - Biomass - NTR
  - CCS 100 MW Project – Bids received by Battelle, Fluor, Bechtel, and KBR. All bids are higher than anticipated – proposals need to be re-evaluated and cut to meet our budget expectations.
  - FutureGen – NTR.

- **General**
  - Environmental Scenario Planning – The kickoff for the Ghent program is scheduled for October 6-7, 2010. PE is working with B&V to identify dates to propose to the Brown management team for their kickoff in November. Mill Creek's review in progress.
  - Continue working with Gen Planning on the Revised Air Compliance analyses.
  - Continue working with Rates on all environmental projects needing ECR and/or CCN.
  - PE continues to work with Legal and US EPA in regards to defense of the KPDES Permit for Trimble. Sierra Club withdrew their objections.
  - PE is working with Legal in regards to asbestos litigation regarding the construction of Trimble County Unit 1.

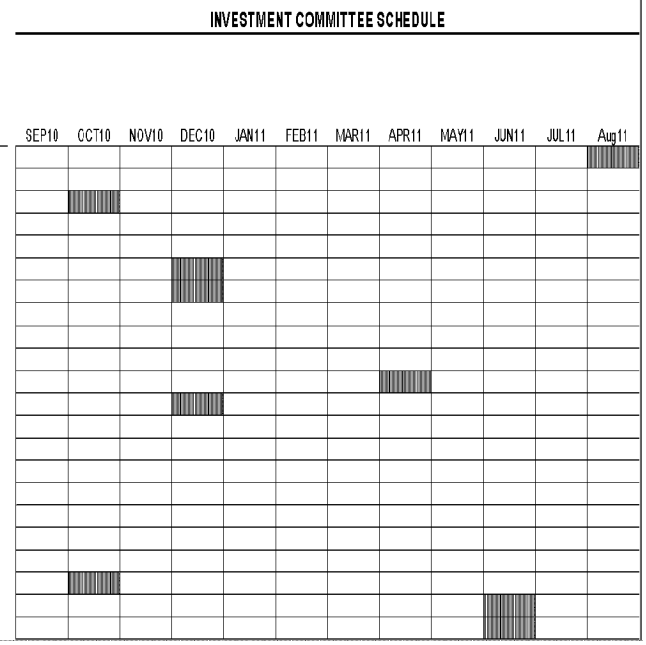
Metrics



Upcoming PWT Needs:

Project Engineering
Investment Committee Schedule

Project Manager	Description	Contract, Project, SSA	Amount $000s	Month of IC Meeting
Heun	CR CCP - Landfill Phase I - Construction	C	15,000	Aug
Heun	GH CCP - Landfill Phase I - Construction	C		
Heun	GH CCP - Gypsum Fines and Transport - Engineering	C	4,000	Oct
Heun	GH CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Heun	GH CCP - Biannual Update	C		
Imber	BR 3 SAM Mitigation	C	8,000	Dec
Imber	GH 1 -4 SAM Mitigation	P	32,000	Dec
Imber	MC 3 and MC4 SAM Mitigation - On Hold	P		
Imber	Biomass Coal Firing			
Imber	Land Fill Gas Engineering			
Lively	CCGT 2016 - Cane Run	P	589,200	Apr
Saunders	MC Limestone Mill EPC Contract	C	12,000	Dec
Saunders	BR 2 SCR Technology	P		
Saunders	BR 2 SCR EPC	P		
Saunders	GH 2 SCR Technology	P		
Saunders	GH 2 SCR EPC	P		
Waterman	TC CCP - Landfill Phase I - Construction	C		
Waterman	TC CCP - Gypsum Fines and Transport - Engineering	C		
Waterman	TC CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Williams	BR CCP - Landfill	P	66,000	Oct
Williams	BR CCP - Landfill Phase I - Construction	C		Jun
Williams	BR CCP - Ash Handling Dry Conversion	C		Jun



Staffing

- Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP, illnesses, and attrition from retirements and transfers. Headcount planning to begin once MTP becomes approved from E.ON US and PPL.
- Lana Linkenhoker to remain off through mid-October. She has been recommended to go on LTD

From: Ritchey, Stacy
To: Saunders, Eileen
Sent: 9/29/2010 10:26:58 AM
Subject: Environmental Air Summary for Financial Planning
Attachments: Environmental Summary Breakdown.xlsx

Eileen,

Here is what I have put together. Thanks.

Stacy Ritchey
Sr Budget Analyst
E.ON US - Project Engineering
820 West Broadway
Louisville, KY 40232
BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**					Draft					
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**		**Total**		**B&V Study**	**E.ON US**		**2010**	**2011-2015**	**Post 2015**
7	Brown 1 - SCR			$68,325		$59,000	$9,325		$0	$68,325	$0
8	Brown 1 - Baghouse			$39,218		$34,000	$5,218		$0	$39,218	$0
9	Brown 1 - PAC Injection			$1,899		$1,599	$300		$0	$1,899	$0
10	Brown 1 - SAM Mitigation			$4,632		$0	$4,632		$0	$4,632	$0
11	Total Brown 1			**$114,075**		**$94,599**	**$19,476**		**$0**	**$114,075**	**$0**
12											
13	Brown 2 - SCR			$104,971		$92,000	$12,971		$0	$104,971	$0
14	Brown 2 - Baghouse			$41,179		$34,000	$7,179		$0	$39,844	$1,336
15	Brown 2 - PAC Injection			$3,058		$2,476	$582		$0	$3,058	$0
16	Brown 2 - SAM Mitigation			$4,568		$0	$4,568		$0	$4,568	$0
17	Total Brown 2			**$153,776**		**$128,476**	**$25,300**		**$0**	**$152,440**	**$1,336**
18											
19	Brown 3 - Baghouse			$76,066		$61,000	$15,066		$0	$64,083	$11,983
20	Brown 3 - PAC Injection			$6,835		$5,426	$1,409		$0	$5,525	$1,310
21	Total Brown 3			**$82,901**		**$66,426**	**$16,475**		**$0**	**$69,608**	**$13,292**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$61,250**		**$0**	**$336,123**	**$14,628**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse			$163,356		$131,000	$32,356		$0	$137,622	$25,734
27	Ghent 1 - PAC Injection			$8,036		$6,380	$1,656		$0	$6,726	$1,310
28	Ghent 1 - SAM Mitigation			$7,750		$0	$7,750		$375	$7,375	$0
29	Total Ghent 1			**$179,142**		**$137,380**	**$41,762**		**$375**	**$151,723**	**$27,043**
30											
31	Ghent 2 - SCR			$262,878		$227,000	$35,878		$0	$262,878	$0
32	Ghent 2 - Baghouse			$149,464		$120,000	$29,464		$0	$127,463	$22,001
33	Ghent 2 - PAC Injection			$7,695		$6,109	$1,586		$0	$6,385	$1,310
34	Ghent 2 - SAM Mitigation			$7,750		$0	$7,750		$375	$7,375	$0
35	Total Ghent 2			**$427,787**		**$353,109**	**$74,678**		**$375**	**$404,101**	**$23,311**
36											
37	Ghent 3 - Baghouse			$170,210		$138,000	$32,210		$0	$161,173	$9,036
38	Ghent 3 - PAC Injection			$7,624		$6,173	$1,451		$0	$7,624	$0
39	Ghent 3 - SAM Mitigation			$8,570		$0	$8,570		$250	$8,320	$0
40	Total Ghent 3			**$186,403**		**$144,173**	**$42,230**		**$250**	**$177,117**	**$9,036**
41											
42	Ghent 4 - Baghouse			$144,530		$117,000	$27,530		$0	$136,869	$7,661
43	Ghent 4 - PAC Injection			$7,669		$6,210	$1,459		$0	$7,669	$0
44	Ghent 4 - SAM Mitigation			$8,570		$0	$8,570		$250	$8,320	$0
45	Total Ghent 4			**$160,770**		**$123,210**	**$37,560**		**$250**	**$152,859**	**$7,661**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$196,229**		**$1,250**	**$885,800**	**$67,052**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade			$49,565		$41,250	$8,315		$0	$49,565	$0
51	Mill Creek 1 - SCR			$122,586		$97,020	$25,566		$0	$72,932	$49,654

	A	B	C	D	E	F	G	H	I	J	K
52	Mill Creek 1 - Baghouse			$96,033		$80,850	$15,183		$0	$96,033	$0
53	Mill Creek 1 - PAC Injection			$5,085		$4,290	$795		$0	$5,085	$0
54	Mill Creek 1 - SAM Mitigation			$10,137		$7,920	$2,217		$0	$4,412	$5,725
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$52,077**		**$0**	**$228,028**	**$55,380**
56											
57	Mill Creek 2 - FGD Upgrade			$47,659		$41,250	$6,409		$0	$47,659	$0
58	Mill Creek 2 - SCR			$117,872		$97,020	$20,852		$0	$115,330	$2,541
59	Mill Creek 2 - Baghouse			$92,339		$80,850	$11,489		$0	$92,339	$0
60	Mill Creek 2 - Electrostatic Precipitator			$37,690		$33,000	$4,690		$0	$37,690	$0
61	Mill Creek 2 - PAC Injection			$4,890		$4,290	$600		$0	$4,890	$0
62	Mill Creek 2 - SAM Mitigation			$9,747		$7,920	$1,827		$0	$9,229	$519
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$45,866**		**$0**	**$307,137**	**$3,060**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)			$77,961		$63,750	$14,211		$0	$77,961	$0
66	Mill Creek 3 - FGD (Unit 3 Removal)			$31,802		$25,500	$6,302		$0	$31,802	$0
67	Mill Creek 3 - Baghouse			$125,943		$104,125	$21,818		$0	$125,943	$0
68	Mill Creek 3 - PAC Injection			$6,683		$5,525	$1,158		$0	$6,683	$0
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$43,488**		**$0**	**$242,388**	**$0**
70											
71	Mill Creek 4 - FGD			$271,994		$236,250	$35,744		$0	$271,994	$0
72	Mill Creek 4 - SCR Upgrade			$5,696		$5,250	$446		$0	$5,696	$0
73	Mill Creek 4 - Baghouse			$151,571		$131,250	$20,321		$0	$151,571	$0
74	Mill Creek 4 - PAC Injection			$7,882		$6,825	$1,057		$0	$7,882	$0
75	Mill Creek 4 - Ammonia			$11,528		$10,500	$1,028		$0	$11,528	$0
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$58,596**		**$0**	**$448,671**	**$0**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$200,028**		**$0**	**$1,226,223**	**$58,439**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse			$158,119		$128,000	$30,119		$0	$149,737	$8,381
82	Trimble 1 - PAC Injection			$7,967		$6,451	$1,516		$0	$7,967	$0
83	Total Trimble 1			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$750	$1,250		$1,250	$750	$0
89	Total Environmental Air Studies			**$2,000**		**$750**	**$1,250**		**$1,250**	**$750**	**$0**
90											
91											
92											
93	**Total Environmental Compliance Air**			**$2,757,601**		**$2,267,209**	**$490,392**		**$2,500**	**$2,606,600**	**$148,501**
94											
95	Note 1 - E.ON US includes 3.5% overheads and 4% escalation.										
96	Note 2 - Black & Veatch study does not meet level 1 engineering criteria.										

From: Saunders, Eileen
To: Ritchey, Stacy
Sent: 9/29/2010 11:52:34 AM
Subject: Environmental Summary Breakdown (3) 9-29-10.xlsx
Attachments: Environmental Summary Breakdown (3) 9-29-10.xlsx

Stacy,

Here are my changes.

Thanks,

Eileen

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**					Draft					
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**		**Total**		**B&V Study**	**E.ON US**		**2010**	**2011-2015**	**Post 2015**
7	Brown 1 - SCR	NAAQS, CATR		$68,325		$59,000	$9,325		$0	$68,325	$0
8	Brown 1 - Baghouse	EGU MACT		$39,218		$34,000	$5,218		$0	$39,218	$0
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5		$1,899		$1,599	$300		$0	$1,899	$0
10	Brown 1 - SAM Mitigation	BART		$4,632		$0	$4,632		$0	$4,632	$0
11	Total Brown 1			**$114,075**		**$94,599**	**$19,476**		**$0**	**$114,075**	**$0**
12											
13	Brown 2 - SCR	NAAQS, CATR		$104,971		$92,000	$12,971		$0	$104,971	$0
14	Brown 2 - Baghouse	EGU MACT		$41,179		$34,000	$7,179		$0	$39,844	$1,336
15	Brown 2 - PAC Injection	EGU MACT		$3,058		$2,476	$582		$0	$3,058	$0
16	Brown 2 - SAM Mitigation	BART		$4,568		$0	$4,568		$0	$4,568	$0
17	Total Brown 2			**$153,776**		**$128,476**	**$25,300**		**$0**	**$152,440**	**$1,336**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5		$76,066		$61,000	$15,066		$0	$64,083	$11,983
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5		$6,835		$5,426	$1,409		$0	$5,525	$1,310
21	Total Brown 3			**$82,901**		**$66,426**	**$16,475**		**$0**	**$69,608**	**$13,292**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$61,250**		**$0**	**$336,123**	**$14,628**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5		$163,356		$131,000	$32,356		$0	$137,622	$25,734
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5		$8,036		$6,380	$1,656		$0	$6,726	$1,310
28	Ghent 1 - SAM Mitigation	BART		$7,750		$0	$7,750		$375	$7,375	$0
29	Total Ghent 1			**$179,142**		**$137,380**	**$41,762**		**$375**	**$151,723**	**$27,043**
30											
31	Ghent 2 - SCR	NAAQS, CATR		$262,878		$227,000	$35,878		$0	$262,878	$0
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5		$149,464		$120,000	$29,464		$0	$127,463	$22,001
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5		$7,695		$6,109	$1,586		$0	$6,385	$1,310
34	Ghent 2 - SAM Mitigation	BART		$7,750		$0	$7,750		$375	$7,375	$0
35	Total Ghent 2			**$427,787**		**$353,109**	**$74,678**		**$375**	**$404,101**	**$23,311**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5		$170,210		$138,000	$32,210		$0	$161,173	$9,036
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5		$7,624		$6,173	$1,451		$0	$7,624	$0
39	Ghent 3 - SAM Mitigation	BART		$8,570		$0	$8,570		$250	$8,320	$0
40	Total Ghent 3			**$186,403**		**$144,173**	**$42,230**		**$250**	**$177,117**	**$9,036**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5		$144,530		$117,000	$27,530		$0	$136,869	$7,661
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5		$7,669		$6,210	$1,459		$0	$7,669	$0
44	Ghent 4 - SAM Mitigation	BART		$8,570		$0	$8,570		$250	$8,320	$0
45	Total Ghent 4			**$160,770**		**$123,210**	**$37,560**		**$250**	**$152,859**	**$7,661**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$196,229**		**$1,250**	**$885,800**	**$67,052**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR		$49,565		$41,250	$8,315		$0	$49,565	$0
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT		$122,586		$97,020	$25,566		$0	$72,932	$49,654

	A	B	C	D	E	F	G	H	I	J	K
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5		$96,033		$80,850	$15,183		$0	$96,033	$0
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5		$5,085		$4,290	$795		$0	$5,085	$0
54	Mill Creek 1 - SAM Mitigation	BART		$10,137		$7,920	$2,217		$0	$4,412	$5,725
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$52,077**		**$0**	**$228,028**	**$55,380**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR		$47,659		$41,250	$6,409		$0	$47,659	$0
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINME		$117,872		$97,020	$20,852		$0	$115,330	$2,541
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5		$92,339		$80,850	$11,489		$0	$92,339	$0
60	Mill Creek 2 - Electrostatic Precipitator			$37,690		$33,000	$4,690		$0	$37,690	$0
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5		$4,890		$4,290	$600		$0	$4,890	$0
62	Mill Creek 2 - SAM Mitigation	BART		$9,747		$7,920	$1,827		$0	$9,229	$519
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$45,866**		**$0**	**$307,137**	**$3,060**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR		$77,961		$63,750	$14,211		$0	$77,961	$0
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$31,802		$25,500	$6,302		$0	$31,802	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5		$125,943		$104,125	$21,818		$0	$125,943	$0
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5		$6,683		$5,525	$1,158		$0	$6,683	$0
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$43,488**		**$0**	**$242,388**	**$0**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR		$271,994		$236,250	$35,744		$0	$271,994	$0
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINME		$5,696		$5,250	$446		$0	$5,696	$0
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5		$151,571		$131,250	$20,321		$0	$151,571	$0
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5		$7,882		$6,825	$1,057		$0	$7,882	$0
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINME		$11,528		$10,500	$1,028		$0	$11,528	$0
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$58,596**		**$0**	**$448,671**	**$0**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$200,028**		**$0**	**$1,226,223**	**$58,439**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5		$158,119		$128,000	$30,119		$0	$149,737	$8,381
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5		$7,967		$6,451	$1,516		$0	$7,967	$0
83	Total Trimble 1			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$750	$1,250		$1,250	$750	$0
89	Total Environmental Air Studies			**$2,000**		**$750**	**$1,250**		**$1,250**	**$750**	**$0**
90											
91											
92											
93	**Total Environmental Compliance Air**			**$2,757,601**		**$2,267,209**	**$490,392**		**$2,500**	**$2,606,600**	**$148,501**
94											
95	Note 1 - E.ON US includes 3.5% overheads and 4% escalation.										
96	Note 2 - Black & Veatch study does not meet Level 1 engineering criteria.										

From: Ritchey, Stacy
To: Straight, Scott
CC: Saunders, Eileen
Sent: 9/29/2010 12:04:49 PM
Subject: Environmental Summary for Financial Planning
Attachments: Environmental Summary Breakdown 9-29-10.xlsx

Scott,

Eileen and I have updated the attached file to reflect the information requested by Financial Planning. There are two tabs, one for the Air projects and one for the CCP Ruling projects. I would like to discuss the regulations highlighted in yellow on the Air tab. Thanks.

<<...>>

Stacy Ritchey
Sr Budget Analyst

E.ON US - Project Engineering

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Louisville, KY 40232

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EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**					Draft					
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**		**Total**		**B&V Study**	**E.ON US**		**2010**	**2011-2015**	**Post 2015**
7	Brown 1 - SCR	NAAQS, CATR		$68,325		$59,000	$9,325		$0	$68,325	$0
8	Brown 1 - Baghouse	EGU MACT		$39,218		$34,000	$5,218		$0	$39,218	$0
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5		$1,899		$1,599	$300		$0	$1,899	$0
10	Brown 1 - SAM Mitigation	BART		$4,632		$0	$4,632		$0	$4,632	$0
11	Total Brown 1			**$114,075**		**$94,599**	**$19,476**		**$0**	**$114,075**	**$0**
12											
13	Brown 2 - SCR	NAAQS, CATR		$104,971		$92,000	$12,971		$0	$104,971	$0
14	Brown 2 - Baghouse	EGU MACT		$41,179		$34,000	$7,179		$0	$39,844	$1,336
15	Brown 2 - PAC Injection	EGU MACT		$3,058		$2,476	$582		$0	$3,058	$0
16	Brown 2 - SAM Mitigation	BART		$4,568		$0	$4,568		$0	$4,568	$0
17	Total Brown 2			**$153,776**		**$128,476**	**$25,300**		**$0**	**$152,440**	**$1,336**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5		$76,066		$61,000	$15,066		$0	$64,083	$11,983
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5		$6,835		$5,426	$1,409		$0	$5,525	$1,310
21	Total Brown 3			**$82,901**		**$66,426**	**$16,475**		**$0**	**$69,608**	**$13,292**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$61,250**		**$0**	**$336,123**	**$14,628**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5		$163,356		$131,000	$32,356		$0	$137,622	$25,734
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5		$8,036		$6,380	$1,656		$0	$6,726	$1,310
28	Ghent 1 - SAM Mitigation	BART		$7,750		$0	$7,750		$375	$7,375	$0
29	Total Ghent 1			**$179,142**		**$137,380**	**$41,762**		**$375**	**$151,723**	**$27,043**
30											
31	Ghent 2 - SCR	NAAQS, CATR		$262,878		$227,000	$35,878		$0	$262,878	$0
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5		$149,464		$120,000	$29,464		$0	$127,463	$22,001
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5		$7,695		$6,109	$1,586		$0	$6,385	$1,310
34	Ghent 2 - SAM Mitigation	BART		$7,750		$0	$7,750		$375	$7,375	$0
35	Total Ghent 2			**$427,787**		**$353,109**	**$74,678**		**$375**	**$404,101**	**$23,311**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5		$170,210		$138,000	$32,210		$0	$161,173	$9,036
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5		$7,624		$6,173	$1,451		$0	$7,624	$0
39	Ghent 3 - SAM Mitigation	BART		$8,570		$0	$8,570		$250	$8,320	$0
40	Total Ghent 3			**$186,403**		**$144,173**	**$42,230**		**$250**	**$177,117**	**$9,036**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5		$144,530		$117,000	$27,530		$0	$136,869	$7,661
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5		$7,669		$6,210	$1,459		$0	$7,669	$0
44	Ghent 4 - SAM Mitigation	BART		$8,570		$0	$8,570		$250	$8,320	$0
45	Total Ghent 4			**$160,770**		**$123,210**	**$37,560**		**$250**	**$152,859**	**$7,661**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$196,229**		**$1,250**	**$885,800**	**$67,052**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR		$49,565		$41,250	$8,315		$0	$49,565	$0
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT		$122,586		$97,020	$25,566		$0	$72,932	$49,654
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5		$96,033		$80,850	$15,183		$0	$96,033	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5		$5,085		$4,290	$795		$0	$5,085	$0
54	Mill Creek 1 - SAM Mitigation	BART		$10,137		$7,920	$2,217		$0	$4,412	$5,725
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$52,077**		**$0**	**$228,028**	**$55,380**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR		$47,659		$41,250	$6,409		$0	$47,659	$0
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$117,872		$97,020	$20,852		$0	$115,330	$2,541
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5		$92,339		$80,850	$11,489		$0	$92,339	$0
60	Mill Creek 2 - Electrostatic Precipitator			$37,690		$33,000	$4,690		$0	$37,690	$0
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5		$4,890		$4,290	$600		$0	$4,890	$0
62	Mill Creek 2 - SAM Mitigation	BART		$9,747		$7,920	$1,827		$0	$9,229	$519
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$45,866**		**$0**	**$307,137**	**$3,060**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR		$77,961		$63,750	$14,211		$0	$77,961	$0
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$31,802		$25,500	$6,302		$0	$31,802	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5		$125,943		$104,125	$21,818		$0	$125,943	$0
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5		$6,683		$5,525	$1,158		$0	$6,683	$0
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$43,488**		**$0**	**$242,388**	**$0**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR		$271,994		$236,250	$35,744		$0	$271,994	$0
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$5,696		$5,250	$446		$0	$5,696	$0
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5		$151,571		$131,250	$20,321		$0	$151,571	$0
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5		$7,882		$6,825	$1,057		$0	$7,882	$0
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$11,528		$10,500	$1,028		$0	$11,528	$0
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$58,596**		**$0**	**$448,671**	**$0**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$200,028**		**$0**	**$1,226,223**	**$58,439**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5		$158,119		$128,000	$30,119		$0	$149,737	$8,381
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5		$7,967		$6,451	$1,516		$0	$7,967	$0
83	Total Trimble 1			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$750	$1,250		$1,250	$750	$0
89	Total Environmental Air Studies			**$2,000**		**$750**	**$1,250**		**$1,250**	**$750**	**$0**
90											
91											
92											
93	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,267,209**	**$490,392**		**$2,500**	**$2,606,600**	**$148,501**
94											
95	Note 1 - E.ON US includes 3.5% overheads and 4% escalation.										
96	Note 2 - Black & Veatch study does not meet level 1 engineering criteria.										

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCP Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCP Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCP Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCP Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCP Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCP Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCP Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCP Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCP Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCP Ruling**	$594,874		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From: Hudson, Rusty
To: Saunders, Eileen
CC: Disney, Judy
Sent: 9/9/2010 11:20:34 AM
Subject: FW: ssa - black and veatch
Attachments: [Untitled].pdf

Eileen, here is the signed award rec. for B&V environmental air engineering. Rusty

-----Original Message-----
From: MARISA.MOSS@EON-US.COM [mailto:marisa.moss@eon-us.com]
Sent: Thursday, September 09, 2010 11:10 AM
To: Hudson, Rusty
Subject: ssa - black and veatch

Russel A. Hudson
Director, Generation Acctg and Budgeting

220 West Main Street
Louisville, Kentucky 40202
T (502) 627-3661
F (502) 627-2665
Rusty.hudson@eon-us.com

September 3, 2010

To: John Voyles
Ralph Bowling
Paul Thompson
Brad Rives
Vic Staffieri

Re: Sole Source Authorization – Black & Veatch

The Black & Veatch sole source authorization for $2.0m to continue advancing engineering on the 2011 MTP environmental air compliance was approved electronically by the Investment Committee on September 2, 2010. A copy of the approval notification is attached.

Please let me know of any questions that you have, and kindly return this to me after signing.

Rusty Hudson
Rusty Hudson

Attachment

Investment Proposal for IC:	August 31, 2010
Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $4 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

sole source award on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight 9/3/10
Director Project Engineering

John Voyles 9/7/10
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson 9/7/10
SVP Energy Services

Brad Rives 9/9/10
Chief Financial Officer

Victor A. Staffieri
Chief Executive Officer

Hudson, Rusty

From: Kuhl, Megan
Sent: Thursday, September 02, 2010 9:28 AM
To: Hudson, Rusty
Subject: FW: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects
Attachments: 2011 MTP Level I Engineering - Air Compliance Projects.docx

The MTP Engineering proposal has been approved by the Investment Committee.

From: Kuhl, Megan
Sent: Friday, August 27, 2010 11:34 AM
To: Rives, Brad; Thompson, Paul; McCall, John; Hermann, Chris
Cc: Garrett, Chris; Neal, Susan; Blake, Kent; Kaiser, Pat
Subject: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, state and federal air compliance regulations through 2016.

Authority is also requested for a sole source award to Black & Veatch (B&V) engineering firm for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Please send your approval/rejection by COB Wednesday, September 1.

Thank you,

Megan Kuhl
Financial Analyst I, Financial Planning
E.ON U.S.
(502) 627-3716
megan.kuhl@eon-us.com

From: Saunders, Eileen
To: Mooney, Mike (BOC 3)
CC: Whitworth, Wayne; Straight, Scott; Reed, Kathleen
Sent: 9/9/2010 11:22:19 AM
Subject: FW: ssa - black and veatch
Attachments: [Untitled].pdf

Mike,

Here is the signed SSA for B&V. Hopefully the AIP is still getting routed for approvals. Please let me know the status.

Thanks,

Eileen

-----Original Message-----
From: Hudson, Rusty
Sent: Thursday, September 09, 2010 11:21 AM
To: Saunders, Eileen
Cc: Disney, Judy
Subject: FW: ssa - black and veatch

Eileen, here is the signed award rec. for B&V environmental air engineering. Rusty

-----Original Message-----
From: MARISA.MOSS@EON-US.COM [mailto:marisa.moss@eon-us.com]
Sent: Thursday, September 09, 2010 11:10 AM
To: Hudson, Rusty
Subject: ssa - black and veatch

Russel A. Hudson
Director, Generation Acctg and Budgeting

220 West Main Street
Louisville, Kentucky 40202
T (502) 627-3661
F (502) 627-2665
Rusty.hudson@eon-us.com

September 3, 2010

To: John Voyles
Ralph Bowling
Paul Thompson
Brad Rives
Vic Staffieri

Re: Sole Source Authorization – Black & Veatch

The Black & Veatch sole source authorization for $2.0m to continue advancing engineering on the 2011 MTP environmental air compliance was approved electronically by the Investment Committee on September 2, 2010. A copy of the approval notification is attached.

Please let me know of any questions that you have, and kindly return this to me after signing.

Rusty Hudson

Attachment

Investment Proposal for IC:	August 31, 2010
Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $4 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

sole source award on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight 9/3/10
Director Project Engineering

John Voyles 9/7/10
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson 9/7/10
SVP Energy Services

Brad Rives 9/9/10
Chief Financial Officer

Victor A. Staffieri
Chief Executive Officer

Hudson, Rusty

From: Kuhl, Megan
Sent: Thursday, September 02, 2010 9:28 AM
To: Hudson, Rusty
Subject: FW: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects
Attachments: 2011 MTP Level I Engineering - Air Compliance Projects.docx

The MTP Engineering proposal has been approved by the Investment Committee.

From: Kuhl, Megan
Sent: Friday, August 27, 2010 11:34 AM
To: Rives, Brad; Thompson, Paul; McCall, John; Hermann, Chris
Cc: Garrett, Chris; Neal, Susan; Blake, Kent; Kaiser, Pat
Subject: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, state and federal air compliance regulations through 2016.

Authority is also requested for a sole source award to Black & Veatch (B&V) engineering firm for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Please send your approval/rejection by COB Wednesday, September 1.

Thank you,

Megan Kuhl
Financial Analyst I, Financial Planning
E.ON U.S.
(502) 627-3716
megan.kuhl@eon-us.com

From: Williams, John
To: Straight, Scott
Sent: 9/29/2010 2:06:30 PM
Subject: BR Landfill IC Paper (29-Sept-10)
Attachments: BR CCR Landfill Project IC Paper (29-Sept-10).doc

Scott,

Attached is the revised IC paper for the BR landfill project.

John S. Williams
E.ON U.S.
Project Engineering
Civil Engineer
(859) 367-1275 (E.W. Brown Office)
(502) 627-3793 (Louisville Office)
(502) 645-4330 (Cellular)
John.Williams@eon-us.com

Investment Proposal for Investment Committee Meeting on: **XXX**

Project Name: **E.W. Brown CCR Landfill Project**

Total Expenditures: **Total Project - $89,694k & Phase I - $57,121k**

Project Number: **XXX**

Business Unit/Line of Business: **Generation Services/Project Engineering**

Prepared/Presented By: **John S. Williams/Scott Straight/Jeff Fraley**

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental presentation.

Significant work has been completed on the BR CCR Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

Project Engineering and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to landfill later.

Background

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements. The recommended option is summarized below and descriptions of all options are incorporated into the attached evaluation document:

> **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

Project Description

- **Project Scope and Timeline**
  The overall scope of the Brown Landfill project is to provide 20-years of on-site storage for dry CCR's. Phase I of the Brown Landfill project includes the following activities: Main Pond ash grading, cap and closure, landfill engineering, permitting, filings, converting all station ash handling systems from wet to dry, installation of a second gypsum dewatering facility similar to what was constructed during Brown's FGD project, and constructing the initial phase of a landfill. Based on recent projects, the anticipated duration to perform these activities is 3.5 years with an in-service date of January 2014 as shown below:

Project Timeline		
Task	**Date**	**Duration**
Informal Meeting w/the PSC	October 2010	1 Day
Engineering	September 2010	3-4 Months
File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

- **Project Cost**
  Total cost to complete all phases of the Brown Landfill Project is $89,649k with a Phase I cost of $57,121k. Cost estimates are based on Level I engineering.

Economic Analysis and Risks

- **Assumptions**
  The construction cost estimate is based on actual competitive bid unit rates, 6% escalation, 10% contingency, and 3.5% for E.ON U.S. overheads. The landfill has a 20-year design life and is based upon horizontal expansion.

- **Financial Summary**

  PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison											
Option	**Life**	**Capacity**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**NPV**	**PVRR**	**Total Project**
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
Base Case	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE 1: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.
NOTE 2: Costs include work completed on Phase I & II of approved ATB project.

Case A Capital Expenditure	$154,939
NPV	($11,834)
IRR	4.0%
ROCE(20yr)	10.9%

	Change in EBIT			Change in NPV
	2011	2012	2013	Total
Project Costs (Capital +/-10%)	11	15	18	1183

- **Environmental**
  Filing for landfill permits is scheduled for December 2010, following the engineering design.

New Source Review Evaluation, questions 1-6 (as applicable) must be completed on all investment proposals.		
1	Does the project include any new equipment or component with emissions, result in emissions not previously emitted or cause the unit to exceed any emission limit? If yes, Environmental Affairs is required to review this project. If no, go to Question #2.	NO
2	Question 2: Is the change a like-kind or functionally equivalent replacement under $500K? If yes, the project is not subject to NSR and no further	NO

	evaluation is required. If no, go to Question #3.	
3	Question 3: Does the equipment change increase the emissions unit's maximum hourly heat input? If yes, Environmental Affairs is required to review this project. If no, go to Question #4.	NO
4	Question 4: Does the equipment change increase the emissions unit's electrical output? If yes, Environmental Affairs is required to review this project. If no, go to Question #5.	NO
5	Question 5: Has the equipment being repaired/replaced been repaired or replaced in the past at this unit or other units in the fleet? If no, Environmental Affairs is required to review this project. If yes, list any known projects and go to Question #6.	NO
6	Question 6: Have there been forced outages or unit de-rates in the past 5 years due to this component? If no, the project is not subject to NSR and no further evaluation is required; if the answer is yes, Environmental Affairs needs to review this project.	NO

The Environmental Affairs Department was included in the development of the BR CCR Storage project and agrees with the chosen path forwards.

- **Risks**
- *Schedule* – Several items will impact the schedule including engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

- *Weather* – Is a major risk as earthen material placement is weather dependent.

- *Oil Prices* – The cost of oil is another risk as oil has a direct affect on material placement unit rates as well as petroleum based products such as flexible membrane liners and filter fabrics.

- **Other Alternatives Considered**

  The analyses were based on an assumption that the proposed EPA ruling becomes approved in 2010 and effective in January 2012. The options are summarized below and a more detailed analysis can be found in the attached evaluation document:

  - **Base Case** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.
  - **Case A** (Recommended) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Conclusions and Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling in the amount of $89,694k inclusive of a sanction Phase I cost of $57,121k. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Straight, Scott
To: Williams, John
Sent: 9/29/2010 3:39:21 PM
Subject: RE: BR Landfill IC Paper (29-Sept-10)
Attachments: BR CCR Landfill Project IC Paper (29-Sept-10) RSS.docx

Please see my comments. Send the final version to me and Rusty ASAP.

Nice Work.

Scott

From: Williams, John
Sent: Wednesday, September 29, 2010 2:07 PM
To: Straight, Scott
Subject: BR Landfill IC Paper (29-Sept-10)

Scott,

Attached is the revised IC paper for the BR landfill project.

<< File: BR CCR Landfill Project IC Paper (29-Sept-10).doc >>

John S. Williams
E.ON U.S.
Project Engineering
Civil Engineer
(859) 367-1275 (E.W. Brown Office)
(502) 627-3793 (Louisville Office)
(502) 645-4330 (Cellular)
John.Williams@eon-us.com

Investment Proposal for Investment Committee Meeting on: **XXX**

Project Name: **E.W. Brown CCR Landfill Project**

Total Expenditures: **Total Project - $89,694k & Phase I - $57,121k**

Project Number: **XXX**

Business Unit/Line of Business: **Project Engineering/Energy Services**

Prepared/Presented By: **John S. Williams/Scott Straight/Jeff Fraley**

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental presentation.

Significant work has been completed on the BR CCR Ash Pond Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

PE and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill, now before the Main Pond is placed into service, to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost compared to converting later, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to landfill later.

Background

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements. The recommended option is summarized below and descriptions of all options are incorporated into the attached evaluation document:

> **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

Project Description

- **Project Scope and Timeline**
  The overall scope of the Brown Landfill project is to provide 20-years of on-site storage for dry CCR's. Phase I of the Brown Landfill project includes the following activities: Main Pond ash grading, cap and closure, landfill engineering, permitting, regulatory filings, converting all station ash handling systems from wet to dry, installation of a second gypsum dewatering facility similar to what was constructed during Brown's FGD project, and constructing the initial phase of a landfill. Based on recent projects, the anticipated duration to perform these activities is 3.5 years with an in-service date of January 2014 as shown below:

Project Timeline		
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Engineering	September 2010	3-4 Months
File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

- **Project Cost**
  Total cost to complete all phases of the Brown Landfill Project is $89,649k with a Phase I cost of $57,121k. Cost estimates are based on Level I engineering.

Economic Analysis and Risks

- **Assumptions**
  The construction cost estimate is based on actual competitive bid unit rates, 6% escalation, 10% contingency, and 3.5% for E.ON U.S. overheads. The landfill has a 20-year design life and is based upon horizontal expansion.

- **Financial Summary**

  PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison											
Option	**Life**	**Capacity**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**NPV**	**PVRR**	**Total Project**
ECR Approved	2054	15.5M yd^3	$25,233	$10,220	$8,777	$4,865	$5,463	$6,945	$143,394	$158,684	$200,132
Base Case	2030	7M yd^3	$19,300	$6,700	$4,153	$6,365	$3,424	$8,951	$103,720	$127,799	$121,687
Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE 1: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.
NOTE 2: Costs include work completed on Phase I & II of approved ATB project.

Case A Capital Expenditure	$154,939
NPV	($11,834)
IRR	4.0%
ROCE(20yr)	10.9%

	Change in EBIT			Change in NPV
	2011	2012	2013	Total
Project Costs (Capital +/-10%)	11	15	18	1183

- **Environmental**
  Filing for landfill permits is scheduled for December 2010, following the engineering design.

New Source Review Evaluation, questions 1-6 (as applicable) must be completed on all investment proposals.		
1	Does the project include any new equipment or component with emissions, result in emissions not previously emitted or cause the unit to exceed any emission limit? If yes, Environmental Affairs is required to review this project. If no, go to Question #2.	NO
2	Question 2: Is the change a like-kind or functionally equivalent replacement	

	under $500K? If yes, the project is not subject to NSR and no further evaluation is required. If no, go to Question #3.	NO
3	Question 3: Does the equipment change increase the emissions unit's maximum hourly heat input? If yes, Environmental Affairs is required to review this project. If no, go to Question #4.	NO
4	Question 4: Does the equipment change increase the emissions unit's electrical output? If yes, Environmental Affairs is required to review this project. If no, go to Question #5.	NO
5	Question 5: Has the equipment being repaired/replaced been repaired or replaced in the past at this unit or other units in the fleet? If no, Environmental Affairs is required to review this project. If yes, list any known projects and go to Question #6.	NO
6	Question 6: Have there been forced outages or unit de-rates in the past 5 years due to this component? If no, the project is not subject to NSR and no further evaluation is required; if the answer is yes, Environmental Affairs needs to review this project.	NO

The Environmental Affairs Department was included in the development of the BR CCR Storage project and agrees with the chosen path forwards.

- **Risks**
- *Schedule* – Several items will impact the schedule including engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

- *Weather* – Is a major risk as earthen material placement is weather dependent.

- *Oil Prices* – The cost of oil is another risk as oil has a direct affect on material placement unit rates as well as petroleum based products such as flexible membrane liners and filter fabrics.

- **Other Alternatives Considered**

  The analyses were based on an assumption that the proposed EPA ruling becomes approved in 2010 and effective in January 2012. The options are summarized below and a more detailed analysis can be found in the attached evaluation document:

  - **Base Case** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.
  - **Case A** (Recommended) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Conclusions and Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling in the amount of $89,694k inclusive of a sanction Phase I cost of $57,121k. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Williams, John
To: Hudson, Rusty; Straight, Scott
Sent: 9/29/2010 3:51:40 PM
Subject: BR CCR Landfill Project IC Paper
Attachments: BR CCR Landfill Project IC Paper (29-Sept-10).docx

Rusty and Scott,

Attached is the IC paper for the BR Landfill Project.

Regards,

John S. Williams
E.ON U.S.
Project Engineering
Civil Engineer
(859) 367-1275 (E.W. Brown Office)
(502) 627-3793 (Louisville Office)
(502) 645-4330 (Cellular)
John.Williams@eon-us.com

Investment Proposal for Investment Committee Meeting on: **XXX**

Project Name: **E.W. Brown CCR Landfill Project**

Total Expenditures: **Total Project - $89,694k & Phase I - $57,121k**

Project Number: **XXX**

Business Unit/Line of Business: **Project Engineering/Energy Services**

Prepared/Presented By: **John S. Williams/Scott Straight/Jeff Fraley**

Executive Summary

On June 21, 2010 the EPA issued a proposed Coal Combustion Residual (CCR) ruling that establishes federal guidelines for CCR storage. In light of the EPA's proposed CCR ruling, Project Engineering (PE) reviewed the CCR storage project (i.e., Main Ash Pond Project) at E.W. Brown (BR) that is under construction to evaluate effects the EPA's proposed CCR rules potentially impose on long-term wet storage of CCR at BR. The analysis is described in detail in the attached evaluation document and supplemental presentation.

Significant work has been completed on the BR CCR Ash Pond Project, including detailed engineering and permitting for all phases of the project, as well as the physical work of relocating the transmission lines that cross the ash pond, ash handling upgrades and construction of the Auxiliary (Aux) Pond to elevation 880'.

As of June 2010, Phase I spend is $53.3M of the approved $73.1M sanction. Construction of Aux Pond elevation 900' (Phase II of II) is currently in progress and will proceed on an accelerated schedule to support CCR storage requirements and the Main Pond Starter Dike construction contract will undergo termination to avoid additional stranded costs. Both actions are precluded by the decision to convert the Main Ash Pond Project to a landfill as recommended by PE and the BR Station.

PE and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill, now before the Main Pond is placed into service, to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost compared to converting later, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to landfill later.

Background

As a result of the EPA's proposed CCR Ruling, PE has reevaluated long-term CCR storage at BR as the current Main Pond design will no longer meet the 2030 storage requirement. The analyses are based on an assumption that the proposed ruling becomes effective on January 2012. The January 2012 effective date was based on the proposed ruling being approved in 2010, and accounted for one year of litigation before the ruling became effective. Moving forward, the CCR storage facility at BR will provide a minimum storage capacity of 7M yd^3 and will allow for future expansion if necessary. The Base Case of continuing to construct the Main Pond and utilize it until 2030 will not be allowed under either scenario in the proposed regulations. In other words, the CCR landfill will be designed and permitted with the maximum footprint available and the height of the facility will be adjusted to meet potential changing capacity requirements. The recommended option is summarized below and descriptions of all options are incorporated into the attached evaluation document:

> **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

Project Description

- **Project Scope and Timeline**
  The overall scope of the Brown Landfill project is to provide 20-years of on-site storage for dry CCR's. Phase I of the Brown Landfill project includes the following activities: Main Pond ash grading, cap and closure, landfill engineering, permitting, regulatory filings, converting all station ash handling systems from wet to dry, installation of a second gypsum dewatering facility similar to what was constructed during Brown's FGD project, and constructing the initial phase of a landfill. Based on recent projects, the anticipated duration to perform these activities is 3.5 years with an in-service date of January 2014 as shown below:

Project Timeline		
Task	**Date**	**Duration**
Informal Meeting w/the PSC	October 2010	1 Day
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File Permits	December 2010	18 Months
CPCN/ECR Filing	December 2010	6 Months
Construction	May 2012	18 Months

- **Project Cost**
  Total cost to complete all phases of the Brown Landfill Project is $89,649k with a Phase I cost of $57,121k. Cost estimates are based on Level I engineering.

Economic Analysis and Risks

- **Assumptions**
  The construction cost estimate is based on actual competitive bid unit rates, 6% escalation, 10% contingency, and 3.5% for E.ON U.S. overheads. The landfill has a 20-year design life and is based upon horizontal expansion.

- **Financial Summary**

  PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B. The ECR approved cost estimate is the basis for the 2011 MTP/LTP and is provided for reference only. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison											
Option	**Life**	**Capacity**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**NPV**	**PVRR**	**Total Project**
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Case A	2030	7M yd^3	$9,051	$14,262	$26,722	$24,064	$0	$0	$126,322	$181,791	$154,939
Case B	2030	7M yd^3	$19,350	$2,907	$3,605	$10,786	$31,135	$31,387	$143,980	$204,633	$193,567

NOTE 1: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.
NOTE 2: Costs include work completed on Phase I & II of approved ATB project.

Case A Capital Expenditure	$154,939
NPV	($11,834)
IRR	4.0%
ROCE(20yr)	10.9%

	Change in EBIT			Change in NPV
	2011	2012	2013	Total
Project Costs (Capital +/-10%)	11	15	18	1183

- **Environmental**
  Filing for landfill permits is scheduled for December 2010, following the engineering design.

New Source Review Evaluation, questions 1-6 (as applicable) must be completed on all investment proposals.		
1	Does the project include any new equipment or component with emissions, result in emissions not previously emitted or cause the unit to exceed any emission limit? If yes, Environmental Affairs is required to review this project. If no, go to Question #2.	NO
2	Question 2: Is the change a like-kind or functionally equivalent replacement	

	under $500K? If yes, the project is not subject to NSR and no further evaluation is required. If no, go to Question #3.	NO
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The Environmental Affairs Department was included in the development of the BR CCR Storage project and agrees with the chosen path forwards.

- **Risks**
- *Schedule* – Several items will impact the schedule including engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

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- **Other Alternatives Considered**

  The analyses were based on an assumption that the proposed EPA ruling becomes approved in 2010 and effective in January 2012. The options are summarized below and a more detailed analysis can be found in the attached evaluation document:

  - **Base Case** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.
  - **Case A** (Recommended) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Conclusions and Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling in the amount of $89,694k inclusive of a sanction Phase I cost of $57,121k. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Williams, John
To: Hudson, Rusty
CC: Straight, Scott
Sent: 9/30/2010 8:11:42 AM
Subject: RE: BR CCR Landfill Project IC Paper
Attachments: BR CCR Landfill Project IC Paper (30-Sept-10).docx

Rusty,

I replaced the sentence, "The ECR approved cost estimate is the basis or the 2011 MTP/LTP and is provided for reference only," with the following sentence: "The ECR approved cost estimate is provided for reference only and Case A is the basis for the 2011 MTP/LTP."

Regards,

John

From: Hudson, Rusty
Sent: Wednesday, September 29, 2010 4:20 PM
To: Williams, John
Subject: RE: BR CCR Landfill Project IC Paper

John, though I am sure we will have more changes come tomorrow, I would consider re-wording in the final version the sentence on page 3 that states "the ECR approved case estimate is the basis for the 2011 MTP/LTP". That may have originally been true, but what we have in the current version of the 2011 MTP reflects case A I believe. Rusty

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From: Williams, John
Sent: Wednesday, September 29, 2010 3:52 PM
To: Hudson, Rusty; Straight, Scott
Subject: BR CCR Landfill Project IC Paper

Rusty and Scott,

Attached is the IC paper for the BR Landfill Project.

<< File: BR CCR Landfill Project IC Paper (29-Sept-10).docx >>
Regards,

John S. Williams
E.ON U.S.
Project Engineering
Civil Engineer
(859) 367-1275 (E.W. Brown Office)
(502) 627-3793 (Louisville Office)
(502) 645-4330 (Cellular)
John.Williams@eon-us.com

Investment Proposal for Investment Committee Meeting on: **XXX**

Project Name: **E.W. Brown CCR Landfill Project**

Total Expenditures: **Total Project - $89,694k & Phase I - $57,121k**

Project Number: **XXX**

Business Unit/Line of Business: **Project Engineering/Energy Services**

Prepared/Presented By: **John S. Williams/Scott Straight/Jeff Fraley**

Executive Summary

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PE and the BR Station recommend the immediate implementation of Case A to convert the Main Pond into a Landfill, now before the Main Pond is placed into service, to meet the EPA's proposed CCR Ruling. This option has the lowest NPV & PVRR, is the least cost compared to converting later, maximizes the landfill footprint, maximizes future vertical expansion opportunities to accommodate changes in production, and eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed. It should be noted that the proposed regulations will require long-term dry storage (landfill), this analysis reviewed the benefits of converting the Main Pond Project to a Landfill Project now rather than placing the pond in-service only to have to convert to landfill later.

Background

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> **Case A** – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

Project Description

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  Total cost to complete all phases of the Brown Landfill Project is $89,649k with a Phase I cost of $57,121k. Cost estimates are based on Level I engineering.

Economic Analysis and Risks

- **Assumptions**
  The construction cost estimate is based on actual competitive bid unit rates, 6% escalation, 10% contingency, and 3.5% for E.ON U.S. overheads. The landfill has a 20-year design life and is based upon horizontal expansion.

- **Financial Summary**

  PE with the assistance of MACTEC Engineering and Consulting, developed capital cost estimates for Case A and B. The ECR approved cost estimate is provided for reference only and Case A is the basis for the 2011MTP/LTP. The Base Case is a modification of the ECR approved option which provides 7M yd^3 of storage and is no longer a viable long term solution for CCR storage as the current design of the Main Pond will not comply with the EPA's proposed CCR Ruling. *Implementing Case A or B is the only long term storage solution.*

Cost Estimate Comparison											
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NOTE 1: Case B values do not include the estimated $2.0M for land purchase for additional clay borrow source.
NOTE 2: Costs include work completed on Phase I & II of approved ATB project.

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NPV	($11,834)
IRR	4.0%
ROCE(20yr)	10.9%

	Change in EBIT			Change in NPV
	2011	2012	2013	Total
Project Costs (Capital +/-10%)	11	15	18	1183

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  Filing for landfill permits is scheduled for December 2010, following the engineering design.

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The Environmental Affairs Department was included in the development of the BR CCR Storage project and agrees with the chosen path forwards.

- **Risks**
- *Schedule* – Several items will impact the schedule including engineering/design, permitting, a new or updated ECR/CPCN filing, and initial landfill construction. Based on experience from previous projects the engineering/design will take approximately 3-4-months and will include development of the landfill drawings, specifications, stability analysis, groundwater monitoring plan, and permit application.

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- **Other Alternatives Considered**

  The analyses were based on an assumption that the proposed EPA ruling becomes approved in 2010 and effective in January 2012. The options are summarized below and a more detailed analysis can be found in the attached evaluation document:

  - **Base Case** – Continue with construction of the Aux Pond to elevation 900' and the Main Pond to 962' per the original design.
  - **Case A** (Recommended) – Stop construction of the Main Pond Starter Dike immediately and convert the Main Pond into a landfill prior to the effective date of the CCR Ruling and prior to placing wet CCR in the Main Pond. Complete construction of the Aux Pond 900' project utilizing rock in lieu of gypsum to accelerate construction completion prior to the rules becoming effective. The Aux Pond will eventually be closed per the new regulations once the landfill is placed into service.

- **Case B** – Continue construction of the Main Pond Starter Dike and Aux Pond 900' per the original design. Once the CCR Ruling becomes effective, take the Main Pond out of service, close and cap it per the new regulations, and then construct a landfill similar to Case A on top of the newly constructed Main Pond Starter Dike. As with Case A, once the landfill is placed into service the Aux Pond will be closed per the regulations.
- **Case C** – Modify the design of the Main Pond and install a composite liner per Subtitle "D" requirements. Complete the Aux Pond 900' project as originally designed.

Conclusions and Recommendation

Project Engineering and the BR Station recommend the implementation of Case A to convert the Main Pond into a Landfill to meet the EPA's proposed CCP Ruling in the amount of $89,694k inclusive of a sanction Phase I cost of $57,121k. This option has the lowest NPV and NPVRR of the Cases reviewed while maximizing the landfill footprint. Maximizing the landfill footprint also maximizes future vertical expansion opportunities and eliminates future cost and issues associated with Station operations while dewatering and closing the pond post-EPA CCR Ruling. It is important to note that both options proposed by the EPA for CCR storage are for long-term dry storage (i.e., landfill). Therefore, not converting the Main Pond Project to a dry landfill project now will not eliminate the requirement to convert all CCR storage to a dry landfill should either of the EPA proposed regulations become final.

From: Straight, Scott
To: Thompson, Paul; Voyles, John; Bowling, Ralph; Hudson, Rusty; Hincker, Loren; Sinclair, David; Schetzel, Doug; Yussman, Eric; Jackson, Fred
CC: Waterman, Bob; Imber, Philip; Lively, Noel; Saunders, Eileen; Gregory, Ronald; Heun, Jeff; Hance, Chuck; Clements, Joe; Cooper, David (Legal); Jones, Greg; Keeling, Chip; Hendricks, Claudia; Ray, Barry; O'brien, Dorothy (Dot); Bellar, Lonnie; Blake, Kent; Sturgeon, Allyson; Conroy, Robert
Sent: 9/30/2010 8:28:35 AM
Subject: Project Engineering's ES Bi-Weekly Report - October 1, 2010
Attachments: PE's Bi-Weekly Update of 10-01-10.docx

Energy Services - Bi-Weekly Update
PROJECT ENGINEERING
October 01, 2010

- **KU SOx**
  - Safety – Nothing to report (NTR)
  - Auditing – NTR
  - Schedule/Execution:
    - Ghent
      - Unit 4 ID Fans – On plan for fall outage.
    - Brown
      - On plan for Unit 1 outage tie-in this Fall.
      - E.W. Brown Coal Pile Modification
        - Engineering design complete.
        - Pre-bid scheduled for 9/28.
        - KU to perform the overhead line relocation within the next 3-4 weeks. These lines supply power to coal pile lighting and retention pond pumps.
      - United Group Services continues design work for the elevators, with a targeted completion of February 2011.
  - Budget – The current month Fluor forecast for Brown was reduced by $1,647k.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – The initial fault in the exciter transformer has been identified as a failure of the low voltage windings in the C-phase. New low voltage windings are in production and are scheduled to be shipped in early October. The transformer core was tested 9/29 and passed, therefore the project will proceed with repairing the transformer. PE looking into cost and schedule of a spare transformer given the uniqueness of it. Given the repair of the transformer is the path forward, the COD is 11/25. The collateral damage was limited and repairs are expected to be completed to support 11/25 COD. This impact to commissioning is being communicated to KYPSC.
  - Budget – NTR
  - Contract Disputes/Resolution:
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    - Doosan CFD Model review planned for 9/30.
  - Issues/Risk:
    - Design of the DBEL burners for our coal specification, excitation transformer recovery, remaining commissioning beyond the 50% load achieved to date.
- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – Permit to construct SCR waiting on KYDAQ.

- Engineering – proceeding as planned to support the spring 2012 in-service.
- Schedule/Execution – NTR
- Budget - NTR
- Contracting – NTR
- Issues/Risk – Permit timeframe against starting construction.

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  - Schedule/Execution - NTR
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  - Engineering – Voith now proceeding with engineering to support fabrication/manufacturing now that contract has been signed.
  - Schedule/Execution - NTR
  - Budget – E.ON AG and PPL approved OF contract and revised sanction.
  - Contracting - Contact signed with Voith on 9/15.
  - Issues/Risk - NTR

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  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering - NTR
  - Schedule/Execution
    - East and Westbrook on site the week of 9/27 to begin maintenance building extension.
    - Metso has agreed to a contract and GSA for the mill equipment.
    - Two Project Coordinators have been relocated to Mill Creek permanently to oversee the construction portion of the project.
  - Budget – NTR
  - Contracting - scope of EPC contract is drafted and under internal reviews.
  - Issue/Risk - NTR

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. To date permitting process has gone well.
    - Received 401 Permit on August 4, 2010.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Working on finalizing design to support the proposed 2016 CCGT.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
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- **Trimble Co. Barge Loading/Holcim**
  - Working with UCC to update their equipment and material pricing and to issue a purchase order for major equipment.

- **TC CCP Project – BAP/GSP**

- Schedule/Execution:
  - GSP's Flexible Membrane Liner (FML) and Geo-synthetic Clay Liner (GCL) installation to begin next week.
  - Work nearing completion on fill placement and mechanically stabilized earth wall for north and west dikes.
  - GSP to Corn Creek Spillway progressing to plan.
  - Work continues on erection of the new Pipe Rack, electrical duct banks to GSP Electrical Building and to Ash Pond Raft.
- Budget – NTR
- Engineering - NTR
- Permitting – NTR
- Contract Disputes/Resolution – NTR
  - Working on resolution of Weather Delays and requested change to Liquidated Damages by contractor.
  - Working on resolution of Engineering Delays
- Issues/Risk
  - Weather remains the biggest risk; however, the weather over the last 4 months has been exceptional for this project.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering - The Detailed Engineering RFPs are being reviewed.
  - Permitting:
    - Both the June and July Anabat studies have been completed for the Indiana Bat. ***A third party has reviewed both the June and July data and has concluded no findings***. A cost comparison is being generated to determine alternative mitigation plans with and without the Corn Creek plan.
    - Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
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- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – NTR
  - Engineering:
    - Detailed Engineering of gypsum fines continues with B&V.
    - Detailed Engineering of the CCR Transport System proposed for B&McD planned for October.
    - Procurement activities for the gypsum fines project are in progress.
    - Drawings and Specifications for the Detailed Engineering for the Landfill have been submitted for review within EON-US.
  - Permitting:
    - All permit applications have been made.
    - PE is working with the various agencies on minimal questions being asked during the review of the permit application.
    - Relocation of the impacted cemetery continues with removal planned for October.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk:

- Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter was sent to the third remaining land owner. The meeting with McDole and Owens was held on 9/20 with progress being made. Final letter send to Deaton. Meeting planned 10/11 to discuss path forward with Real Estate and Legal.

- **E.W. Brown Ash Pond Project**

Starter Dike

- Safety – NTR
- Schedule/Execution:
  - Contract work remains under suspension. Summit re-mobilized the water truck to address the bottom ash stockpile and the haul road(s) present on the pond.
  - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
  - Summit upper management formally notified on 9/27 of contract termination.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

Aux Pond 900'

- Safety – NTR
- Schedule/Execution:
  - Charah continued hauling Type I shot rock to place as the drainage blanket on the East side of the embankment toe.
  - Performed maintenance on equipment.
  - Subcontractor – SES assisted with the storm water collection system maintenance on the Main Pond.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Group from the stations and PE visited dry reagent mills and a permanent BCSI system the week of 9/20.
  - Budget – NTR
  - Testing –
    - Ghent 3 & 4 testing report expected week of Sept. 27.
    - Milling material on Ghent 4 showed strong promise – initial test results were < 4 ppm at the stack.
    - Further testing on Ghent 1 may commence with the use of MgO in the furnace. This testing is by Breen and E.ON Engineering – Breen is paying for this testing.

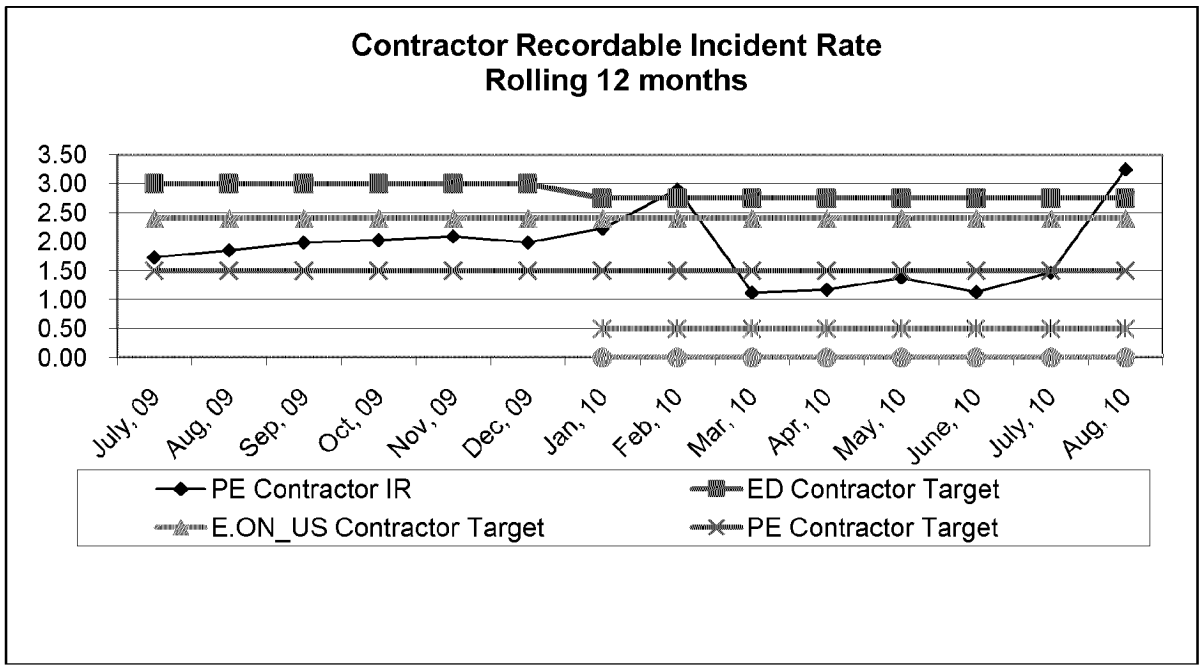
- **SO3 Mitigation (Ghent)**
  - MgO injection trials at GH1 with Breen showed results per the instrumentation is <20% SAM reduction in the furnace. The trial is considered unsuccessful.
  - B&V Calculations:
    - Finalized Base calculation for BACT analysis with all layers of catalyst in place.
    - Calculation based on exact operation today submitted.
    - Calculation based on pre-FGD operation with 1.2 lb SO2/mmBtu coal submitted.

        - Calculation on pre-SCR operation with_1.2 lb SO2/mmBtu fuel submitted.
    - B&V re-draft of BACT analysis and Life Cycle analysis comments returned.
    - B&V requested to prepare two more documents:
        - BACT based on 2005 RBLC database for emissions limits
        - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
    - LFG - LFG Technologies provided pipeline costs for the Valley View project.
    - NBU Cane Run:
        - Commercial Operation date moved to January 1, 2016.
        - Discussions in progress to target October for pipeline study award.
        - Discussions in progress to target November for Owner's Engineer award.
    - Biomass - NTR
    - CCS 100 MW Project – Bids received by Battelle, Fluor, Bechtel, and KBR. All bids are higher than anticipated – proposals need to be re-evaluated and cut to meet our budget expectations.
    - FutureGen – NTR.

- **General**
    - Environmental Scenario Planning – The kickoff for the Ghent program is scheduled for October 6-7, 2010. PE is working with B&V to identify dates to propose to the Brown management team for their kickoff in November. Mill Creek's review in progress.
    - Continue working with Gen Planning on the Revised Air Compliance analyses.
    - Continue working with Rates on all environmental projects needing ECR and/or CCN.
    - PE continues to work with Legal and US EPA in regards to defense of the KPDES Permit for Trimble. Sierra Club withdrew their objections.
    - PE is working with Legal in regards to asbestos litigation regarding the construction of Trimble County Unit 1.

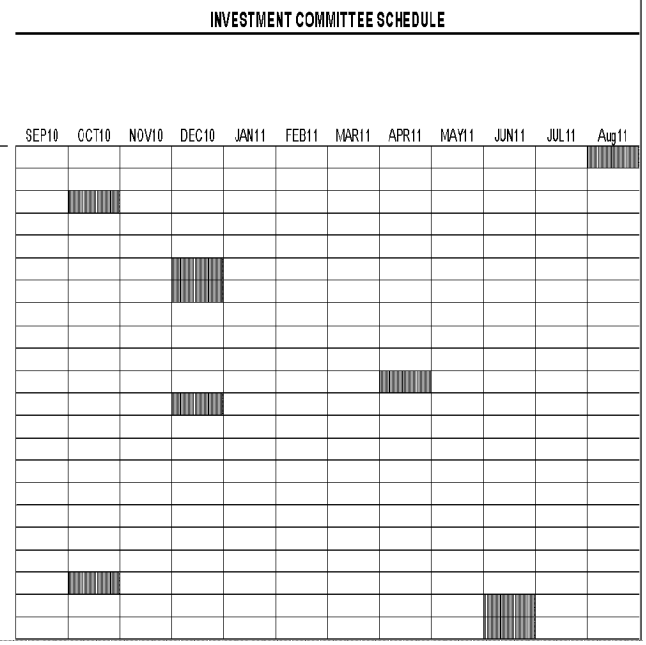
Metrics



Upcoming PWT Needs:

Project Engineering
Investment Committee Schedule

Project Manager	Description	Contract, Project, SSA	Amount $000s	Month of IC Meeting
Heun	CR CCP - Landfill Phase I - Construction	C	15,000	Aug
Heun	GH CCP - Landfill Phase I - Construction	C		
Heun	GH CCP - Gypsum Fines and Transport - Engineering	C	4,000	Oct
Heun	GH CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Heun	GH CCP - Biannual Update	C		
Imber	BR 3 SAM Mitigation	C	8,000	Dec
Imber	GH 1 -4 SAM Mitigation	P	32,000	Dec
Imber	MC 3 and MC4 SAM Mitigation - On Hold	P		
Imber	Biomass Coal Firing			
Imber	Land Fill Gas Engineering			
Lively	CCGT 2016 - Cane Run	P	589,200	Apr
Saunders	MC Limestone Mill EPC Contract	C	12,000	Dec
Saunders	BR 2 SCR Technology	P		
Saunders	BR 2 SCR EPC	P		
Saunders	GH 2 SCR Technology	P		
Saunders	GH 2 SCR EPC	P		
Waterman	TC CCP - Landfill Phase I - Construction	C		
Waterman	TC CCP - Gypsum Fines and Transport - Engineering	C		
Waterman	TC CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Williams	BR CCP - Landfill	P	66,000	Oct
Williams	BR CCP - Landfill Phase I - Construction	C		Jun
Williams	BR CCP - Ash Handling Dry Conversion	C		Jun



Staffing

- Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP, illnesses, and attrition from retirements and transfers. Headcount planning to begin once MTP becomes approved from E.ON US and PPL.
- Lana Linkenhoker to remain off through mid-October. She has been recommended to go on LTD

From: Hurst, Brian
To: Wilson, Stuart
Sent: 9/9/2010 4:40:20 PM
Subject: RE: Brown Ash Pond/Landfill Analysis
Attachments: 20100908_BrownLandfillNotes_BCH.docx

Stuart,
Attached is the bullet point summary you requested for the Brown Landfill/Ash Pond analysis and (hopefully) all the relevant information needed between the 2005 study and the recent document from Project Engineering. I can construct this into a formal document if need be...just let me know.

Basically the story is the Landfill options in the 2005 study were the highest cost with long projected permitting lead times (3+ years). The high by-product production rates (40% higher than the recent Project Engineering document) forecasted the ponds to be full by January 2010 which was too late to wait for landfill permitting. That's why the landfills weren't considered. The Project Engineering report still expects the landfills to be more expensive, but in order to be compliant, the ash ponds need to discontinue by-product disposal.

Let me know if you have any questions or issues.

Brian Hurst
Planning Engineer, Generation Planning
(502) 627-3416 phone
(502) 217-4898 fax

From: Wilson, Stuart
Sent: Wednesday, September 08, 2010 3:26 PM
To: Hurst, Brian
Subject: Re: Brown Ash Pond/Landfill Analysis

Sounds good. We can reference this report to bridge the gap between the options considered in 2009 and the options we're considering now. As we discussed, we need a series of bullet points summarizing our story. I'd envision this to be part of a bullet point. Make sense?

Stuart

From: Hurst, Brian
To: Wilson, Stuart
Sent: Wed Sep 08 14:57:21 2010
Subject: RE: Brown Ash Pond/Landfill Analysis

Stuart,

Just talked to Jeff Heun in Project Engineering who was the lead on the Brown Ash Pond project up until early this year. He said that the document they based their onsite ash-pond/onsite landfill decision on was an FMSM (engineering consulting firm) report from September 2006, that we referenced several times in our testimony and appendices for the 2009 ECR Filing. In this document FMSM evaluated 3 different ash pond options and 2 different on-site landfill options. The limiting factor was that Brown needed byproduct capacity very soon and landfill permitting was estimated to take at least 3 years because of the coarse features underneath the property at Brown (cave-like features). For the landfill options, once the ponds filled up, off-site trucking would be needed until permitting and initial construction could be completed which significantly increased the revenue requirements.

He said that the PSC has several of these documents in their possession and can reference them.

However, I will still look at this report (he said Generation Engineering has a copy) and diagnose the

major points we can use if the PSC comes back with questions on this issue.

Let me know if you have any questions or issues.

Brian Hurst

Planning Engineer, Generation Planning

(502) 627-3416 phone

(502) 217-4898 fax

From: Wilson, Stuart
Sent: Tuesday, September 07, 2010 5:56 PM
To: Hurst, Brian
Subject: Brown Ash Pond/Landfill Analysis

Brian,

Based on your experience from the 2009 ECR filing (as it relates to Brown), I'd like your thoughts on how best to communicate the 'stop the pond and go with a landfill' decision to the commission. What did we say before? What should we say now? So far, PE's paper contains total revenue requirements. Is this all the commission needs to see? I understand that our 2009 filing contained two options (ash pond and off-site landfill). How do we bridge the gap from that 'story' to our story now?

Thanks.

Stuart

Brown Landfill/Ash Pond Summary (9-9-10)

- FMSM report dated September 6, 2005 evaluated 3 ash pond options & 2 landfill options:
  - Analysis of existing ash pond indicated by-product storage will be depleted by January 2010 (FGD Gypsum by-product in mid-2009)
    - By-product production rates used a 77% capacity factor, provided by Generation Planning
  - Ash Pond Option #3 was selected due to:
    - Least NPV of all 5 options: $118M

$M	Construction and Operation Costs, NPV		
	Capital	O&M	Total
Ash Pond Option #1	$ 103	$ 19	$ 122
Ash Pond Option #2	$ 92	$ 32	$ 124
Ash Pond Option #3	$ 99	$ 19	$ 118
Landfill Option #1	$ 78	$ 124	$ 202
Landfill Option #2	$ 83	$ 138	$ 221

    - Involves little change to current ash handling systems
    - Uses an auxiliary pond during construction allowing the existing main pond to come out of service during its expansion
    - Requires no new operating skills
    - Poses the least risk of delay due to permitting and public involvement
  - Ash Pond options could retain permits from the Division of Waste Management and the Division of Water within 6 months of design completion and application submittal
  - Landfill options require permits from the Division of Waste Management and the Division of Water also. However, the time between application submittal and final approval with several reviews, revisions, and public comment could take 3 or more years to complete.
    - Landfills spanning karst features, as the proposed options do, would be accepted by the DWM if it presented a safer solution than raising the existing dam
    - Landfill disposal requires a special waste permit and the associated public notice obligations, as well as, public hearing opportunities
  - All options are based on a design life of 20 years (ending January 2030) with no plans for future expansion of disposal facilities

- Project Engineering Report (Continue Main Pond Project vs. Conversion to Landfill dated August 5, 2010):
  - 3 options were evaluated in comparison to the "Continue as-is" Base Case.
  - Landfill Case A was selected due to:
    - Lowest NPV of Cases

$M	PVRR
Base Case	$ 80
Landfill Case A	$ 115
Landfill Case B	$ 133
Landfill Case C	eliminated

- Maximizes Landfill footprint
- Maximizes future vertical expansion opportunities
- Eliminates the difficult and costly issues associated with maintaining station operations while dewatering and closing the pond post-EPA CCR Ruling while the landfill is being constructed (in Landfill Case B)
- Complies with proposed future regulations

- As a result of December 2008 ash pond failure at the TVS Kingston Generating station, the EPA issued a proposed CCR ruling June 21, 2010
  - Work on Starter Dike was suspended in June 2010 in an effort to minimize construction of embankments that may not be required should the recommendation to convert the pond to a landfill is approved.
- Main Pond and Aux Pond are not compliant with guidelines
- Annual by-product Production Rates:

	Avg. Annual By-Product Production Rates (CY)			
	2005 Design Basis	**2010 MTP**	**Δ**	**% Reduction**
Bottom Ash	55,000	36,000	(19,000)	35%
Fly Ash	221,000	143,000	(78,000)	35%
Gypsum	500,000	290,000	(210,000)	42%
TOTAL	**776,000**	**469,000**	**(307,000)**	**40%**

- Base Case involves the continuation of the ECR-approved elevations of the Main Pond and Aux Pond (won't be compliant with proposed EPA regulations)
- Case A involves immediate termination of all Main Pond Starter Dike activities, accelerating construction of the Aux Pond, and all initial engineering, permitting and construction for conversion to a landfill
  - Duration is 3.5 years, with in-service date of January 2014
  - 2010 MTP CCR production rates conclude the Aux Pond has enough capacity through January 2015, giving a 1-year project float
- Case B involves completing the Main Pond Starter Dike and Aux Pond 900' construction. Upon approval of the EPA proposed CCR ruling, Main Pond will be taken out of service, and all initial engineering, permitting and construction for conversion to a landfill
  - Duration is 5.5 years, with in-service date of January 2016
  - Footprint for landfill would be smaller than Case A
  - Plant would have to develop an operating plan while Main Pond is taken out of service to allow construction to a landfill (costs not included in results)
- Case C was given no further consideration due to a 24-inch liner not being compliant with Subtitle "C" (EPA regulation)

From: Sinclair, David
To: Schram, Chuck; Pfeiffer, Caryl; Brunner, Bob; Wilson, Stuart
Sent: 9/30/2010 11:14:59 AM
Subject: FW: Project Engineering's ES Bi-Weekly Report - October 1, 2010
Attachments: PE's Bi-Weekly Update of 10-01-10.docx

From: Straight, Scott
Sent: Thursday, September 30, 2010 8:29 AM
To: Thompson, Paul; Voyles, John; Bowling, Ralph; Hudson, Rusty; Hincker, Loren; Sinclair, David; Schetzel, Doug; Yussman, Eric; Jackson, Fred
Cc: Waterman, Bob; Imber, Philip; Lively, Noel; Saunders, Eileen; Gregory, Ronald; Heun, Jeff; Hance, Chuck; Clements, Joe; Cooper, David (Legal); Jones, Greg; Keeling, Chip; Hendricks, Claudia; Ray, Barry; O'brien, Dorothy (Dot); Bellar, Lonnie; Blake, Kent; Sturgeon, Allyson; Conroy, Robert
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  - Contract Disputes/Resolution – NTR
  - Issues/Risk:

- Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter was sent to the third remaining land owner. The meeting with McDole and Owens was held on 9/20 with progress being made. Final letter send to Deaton. Meeting planned 10/11 to discuss path forward with Real Estate and Legal.

- **E.W. Brown Ash Pond Project**

Starter Dike

- Safety – NTR
- Schedule/Execution:
  - Contract work remains under suspension. Summit re-mobilized the water truck to address the bottom ash stockpile and the haul road(s) present on the pond.
  - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
  - Summit upper management formally notified on 9/27 of contract termination.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

Aux Pond 900'

- Safety – NTR
- Schedule/Execution:
  - Charah continued hauling Type I shot rock to place as the drainage blanket on the East side of the embankment toe.
  - Performed maintenance on equipment.
  - Subcontractor – SES assisted with the storm water collection system maintenance on the Main Pond.
- Budget – NTR
- Contract Disputes/Resolution: NTR
- Issues/Risk – NTR.

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Group from the stations and PE visited dry reagent mills and a permanent BCSI system the week of 9/20.
  - Budget – NTR
  - Testing –
    - Ghent 3 & 4 testing report expected week of Sept. 27.
    - Milling material on Ghent 4 showed strong promise – initial test results were < 4 ppm at the stack.
    - Further testing on Ghent 1 may commence with the use of MgO in the furnace. This testing is by Breen and E.ON Engineering – Breen is paying for this testing.

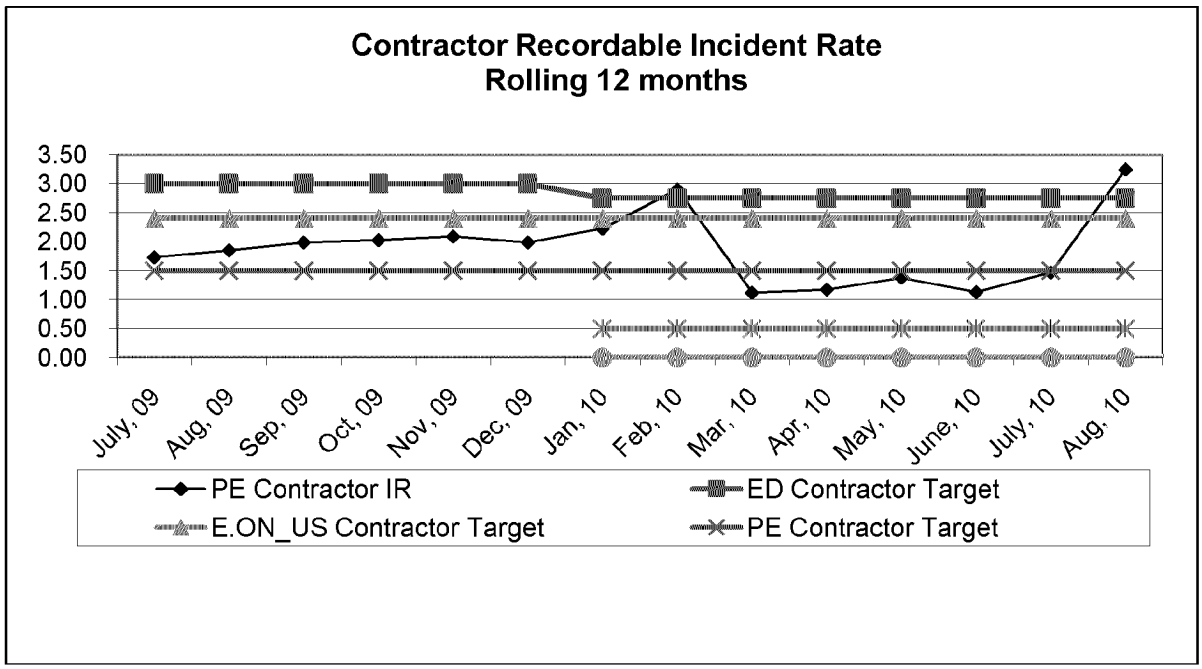
- **SO3 Mitigation (Ghent)**
  - MgO injection trials at GH1 with Breen showed results per the instrumentation is <20% SAM reduction in the furnace. The trial is considered unsuccessful.
  - B&V Calculations:
    - Finalized Base calculation for BACT analysis with all layers of catalyst in place.
    - Calculation based on exact operation today submitted.
    - Calculation based on pre-FGD operation with 1.2 lb SO2/mmBtu coal submitted.

        - Calculation on pre-SCR operation with_1.2 lb SO2/mmBtu fuel submitted.
    - B&V re-draft of BACT analysis and Life Cycle analysis comments returned.
    - B&V requested to prepare two more documents:
        - BACT based on 2005 RBLC database for emissions limits
        - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
    - LFG - LFG Technologies provided pipeline costs for the Valley View project.
    - NBU Cane Run:
        - Commercial Operation date moved to January 1, 2016.
        - Discussions in progress to target October for pipeline study award.
        - Discussions in progress to target November for Owner's Engineer award.
    - Biomass - NTR
    - CCS 100 MW Project – Bids received by Battelle, Fluor, Bechtel, and KBR. All bids are higher than anticipated – proposals need to be re-evaluated and cut to meet our budget expectations.
    - FutureGen – NTR.

- **General**
    - Environmental Scenario Planning – The kickoff for the Ghent program is scheduled for October 6-7, 2010. PE is working with B&V to identify dates to propose to the Brown management team for their kickoff in November. Mill Creek's review in progress.
    - Continue working with Gen Planning on the Revised Air Compliance analyses.
    - Continue working with Rates on all environmental projects needing ECR and/or CCN.
    - PE continues to work with Legal and US EPA in regards to defense of the KPDES Permit for Trimble. Sierra Club withdrew their objections.
    - PE is working with Legal in regards to asbestos litigation regarding the construction of Trimble County Unit 1.

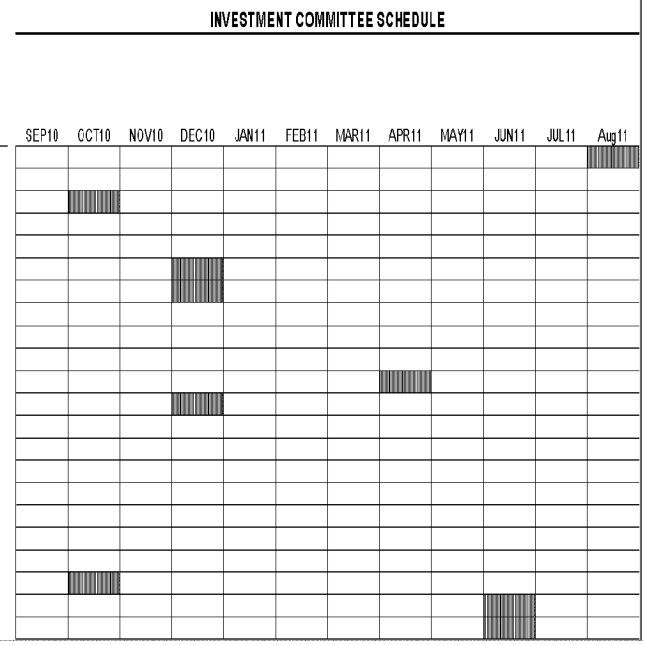
Metrics



Upcoming PWT Needs:

Project Engineering
Investment Committee Schedule

Project Manager	Description	Contract, Project, SSA	Amount $000s	Month of IC Meeting
Heun	CR CCP - Landfill Phase I - Construction	C	15,000	Aug
Heun	GH CCP - Landfill Phase I - Construction	C		
Heun	GH CCP - Gypsum Fines and Transport - Engineering	C	4,000	Oct
Heun	GH CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Heun	GH CCP - Biannual Update	C		
Imber	BR 3 SAM Mitigation	C	8,000	Dec
Imber	GH 1 -4 SAM Mitigation	P	32,000	Dec
Imber	MC 3 and MC4 SAM Mitigation - On Hold	P		
Imber	Biomass Coal Firing			
Imber	Land Fill Gas Engineering			
Lively	CCGT 2016 - Cane Run	P	589,200	Apr
Saunders	MC Limestone Mill EPC Contract	C	12,000	Dec
Saunders	BR 2 SCR Technology	P		
Saunders	BR 2 SCR EPC	P		
Saunders	GH 2 SCR Technology	P		
Saunders	GH 2 SCR EPC	P		
Waterman	TC CCP - Landfill Phase I - Construction	C		
Waterman	TC CCP - Gypsum Fines and Transport - Engineering	C		
Waterman	TC CCP - Gypsum Fines and Transport - Equipment/Construction	C		
Williams	BR CCP - Landfill	P	66,000	Oct
Williams	BR CCP - Landfill Phase I - Construction	C		Jun
Williams	BR CCP - Ash Handling Dry Conversion	C		Jun



Staffing

- Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP, illnesses, and attrition from retirements and transfers. Headcount planning to begin once MTP becomes approved from E.ON US and PPL.
- Lana Linkenhoker to remain off through mid-October. She has been recommended to go on LTD

From: DEBORAH.DOWD@EON-US.COM
To: Saunders, Eileen
Sent: 9/10/2010 9:02:39 AM
Subject: AIP Project Approval - 131693 - ORIGINAL
Attachments: 131693-6.pdf

LG&E project number 131693 (Envir Compliance Study-Air-LGE) has been submitted for your approval. Please login to PowerPlant and respond to the items awaiting your approval.

login to powerplant

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

Environmental Compliance Studies - Air for Mill Creek
AIP is requesting $2M for Environmental Air Studies for Mill Creek on LGE (36%), Ghent and Brown (64%) on KU. To be going to IC on 8-26-10.
Approved by IC on 9-3-10

Costs	Capital Investment	Cost of Removal/ Retirement	Capital Cost Subtotal	Inital O&M Cost	Lifetime Maintenance Cost	O&M Cost Subtotal	TOTAL INVESTMENT
	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contract Labor	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - IFRS	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Straight, Ronald		Y
Vice President	$750,000.00	Voyles, John		Y
Investment Committee Coordinator	$0.00	Wright, Sharon		Y
Financial Planning Director	$0.00	Garrett, Christopher		Y
Senior Officer	$1,000,000.00	Thompson, Paul		Y
CFO	$1,000,001.00	Rives, Stephen		Y
CEO	$1,000,002.00	Staffieri, Victor		Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
Provide related project numbers or indicate 'N/A'.
131694

Is this an IT related project?
IT project is any project that requires IT involvement or the purchase of hardware and software.
no

Purchase/Sale of Real Estate?
Is this a transaction related to the sale/purchase of land or buildings?
no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

Environmental Project
Is this an Environmental Project?
yes

Environmental Cost Recovery
If an environmental project, is this an approved environmental cost recovery (ECR) project?
yes

ECR Project Type
If this is an ECR project, indicate the project type.
Air

ECR Compliance Number
If this is an ECR project, provide the ECR compliance plan number (see the approved project list on the Rates and Regulatory intranet site).
Not Assigned Yet

Environmental Affairs
Does Environmental Affairs need to review this project for environmental permitting issues (based on responses to the six questions in the Investment Proposal)?
no

Research and Experimental Credit
Is this an experimental project with the purpose of improving, enhancing, or adding to a current manufacturing process?
no

Sales Tax-Pollution Control
Is this project done for environmental regulations or statutes? (If yes, may qualify for the Pollution Control Exemption.)
no

Sales Tax-Manufacturing Integration
Is this project integrated in the Manufacturing Process? (Yes to this question and the following two questions may qualify for the New and Expanded Exemption.)
no

Sales Tax-State Equipment Use
Is this equipment used in the state for the first time?
no

Sales Tax-Upgrade or Improvement?
Is this project considered an upgrade or improvement? If yes, enter description on next line.
no

Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From: Saunders, Eileen
To: Ritchey, Stacy
Sent: 9/30/2010 2:13:04 PM
Subject: Environmental Summary Breakdown 9-30-10.xlsx
Attachments: Environmental Summary Breakdown 9-30-10.xlsx

Stacy,

Please open and call me at Ghent on 347-4023.

Thanks,

Eileen

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**					Draft					
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**		**Total**		**B&V Study**	**E.ON US**		**2010**	**2011-2015**	**Post 2015**
7	Brown 1 - SCR	NAAQS, CATR		$68,325		$59,000	$9,325		$0	$68,325	$0
8	Brown 1 - Baghouse	EGU MACT		$39,218		$34,000	$5,218		$0	$39,218	$0
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5		$1,899		$1,599	$300		$0	$1,899	$0
10	Brown 1 - SAM Mitigation	NSR		$4,632		$0	$4,632		$0	$4,632	$0
11	Total Brown 1			**$114,075**		**$94,599**	**$19,476**		**$0**	**$114,075**	**$0**
12											
13	Brown 2 - SCR	NAAQS, CATR		$104,971		$92,000	$12,971		$0	$104,971	$0
14	Brown 2 - Baghouse	EGU MACT		$41,179		$34,000	$7,179		$0	$39,844	$1,336
15	Brown 2 - PAC Injection	EGU MACT		$3,058		$2,476	$582		$0	$3,058	$0
16	Brown 2 - SAM Mitigation	NSR		$4,568		$0	$4,568		$0	$4,568	$0
17	Total Brown 2			**$153,776**		**$128,476**	**$25,300**		**$0**	**$152,440**	**$1,336**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5		$76,066		$61,000	$15,066		$0	$64,083	$11,983
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5		$6,835		$5,426	$1,409		$0	$5,525	$1,310
21	Total Brown 3			**$82,901**		**$66,426**	**$16,475**		**$0**	**$69,608**	**$13,292**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$61,250**		**$0**	**$336,123**	**$14,628**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5		$163,356		$131,000	$32,356		$0	$137,622	$25,734
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5		$8,036		$6,380	$1,656		$0	$6,726	$1,310
28	Ghent 1 - SAM Mitigation	NSR		$7,750		$0	$7,750		$375	$7,375	$0
29	Total Ghent 1			**$179,142**		**$137,380**	**$41,762**		**$375**	**$151,723**	**$27,043**
30											
31	Ghent 2 - SCR	NAAQS, CATR		$262,878		$227,000	$35,878		$0	$262,878	$0
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5		$149,464		$120,000	$29,464		$0	$127,463	$22,001
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5		$7,695		$6,109	$1,586		$0	$6,385	$1,310
34	Ghent 2 - SAM Mitigation	NSR		$7,750		$0	$7,750		$375	$7,375	$0
35	Total Ghent 2			**$427,787**		**$353,109**	**$74,678**		**$375**	**$404,101**	**$23,311**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5		$170,210		$138,000	$32,210		$0	$161,173	$9,036
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5		$7,624		$6,173	$1,451		$0	$7,624	$0
39	Ghent 3 - SAM Mitigation	NSR		$8,570		$0	$8,570		$250	$8,320	$0
40	Total Ghent 3			**$186,403**		**$144,173**	**$42,230**		**$250**	**$177,117**	**$9,036**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5		$144,530		$117,000	$27,530		$0	$136,869	$7,661
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5		$7,669		$6,210	$1,459		$0	$7,669	$0
44	Ghent 4 - SAM Mitigation	NSR		$8,570		$0	$8,570		$250	$8,320	$0
45	Total Ghent 4			**$160,770**		**$123,210**	**$37,560**		**$250**	**$152,859**	**$7,661**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$196,229**		**$1,250**	**$885,800**	**$67,052**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR		$49,565		$41,250	$8,315		$0	$49,565	$0
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT		$122,586		$97,020	$25,566		$0	$72,932	$49,654
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5		$96,033		$80,850	$15,183		$0	$96,033	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5		$5,085		$4,290	$795		$0	$5,085	$0
54	Mill Creek 1 - SAM Mitigation	BART		$10,137		$7,920	$2,217		$0	$4,412	$5,725
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$52,077**		**$0**	**$228,028**	**$55,380**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR		$47,659		$41,250	$6,409		$0	$47,659	$0
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$117,872		$97,020	$20,852		$0	$115,330	$2,541
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5		$92,339		$80,850	$11,489		$0	$92,339	$0
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$37,690		$33,000	$4,690		$0	$37,690	$0
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5		$4,890		$4,290	$600		$0	$4,890	$0
62	Mill Creek 2 - SAM Mitigation	BART		$9,747		$7,920	$1,827		$0	$9,229	$519
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$45,866**		**$0**	**$307,137**	**$3,060**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR		$77,961		$63,750	$14,211		$0	$77,961	$0
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$31,802		$25,500	$6,302		$0	$31,802	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5		$125,943		$104,125	$21,818		$0	$125,943	$0
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5		$6,683		$5,525	$1,158		$0	$6,683	$0
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$43,488**		**$0**	**$242,388**	**$0**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR		$271,994		$236,250	$35,744		$0	$271,994	$0
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$5,696		$5,250	$446		$0	$5,696	$0
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5		$151,571		$131,250	$20,321		$0	$151,571	$0
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5		$7,882		$6,825	$1,057		$0	$7,882	$0
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$11,528		$10,500	$1,028		$0	$11,528	$0
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$58,596**		**$0**	**$448,671**	**$0**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$200,028**		**$0**	**$1,226,223**	**$58,439**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5		$158,119		$128,000	$30,119		$0	$149,737	$8,381
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5		$7,967		$6,451	$1,516		$0	$7,967	$0
83	Total Trimble 1			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$750	$1,250		$1,250	$750	$0
89	Total Environmental Air Studies			**$2,000**		**$750**	**$1,250**		**$1,250**	**$750**	**$0**
90											
91											
92											
93	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,267,209**	**$490,392**		**$2,500**	**$2,606,600**	**$148,501**
94											
95	Note 1 - E.ON US includes 3.5% overheads and 4% escalation.										
96	Note 2 - Black & Veatch study does not meet level 1 engineering criteria.										

	A	B	C	D	E	F	G	H	I	K	L	M
1	**Environmental Compliance - CCP Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCP Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCP Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCP Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCP Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCP Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCP Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCP Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCP Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCP Ruling**	$594,874		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From:	Ritchey, Stacy
To:	Garrett, Chris
CC:	Straight, Scott; Hudson, Rusty; Saunders, Eileen; Cermack, Stacy
Sent:	9/30/2010 2:36:12 PM
Subject:	Environmental Air & CCR Ruling Summary
Attachments:	Environmental Summary Breakdown 9-30-10.xlsx

Chris,

The attached file contains a draft copy of the Environmental Air and CCR Ruling Summary. Scott is traveling and has not had a chance to perform a detailed review. If you have any questions please contact myself or Eileen. Thanks.

Stacy Ritchey
Sr Budget Analyst
E.ON US - Project Engineering
820 West Broadway
Louisville, KY 40232
BOC Phone: (502) 627-4388
EW Brown Phone (859) 748-4455
Fax: (502) 217-4980
Stacy.Ritchey@eon-us.com

	A	B	C	D	E	F	G	H	I	J	K
1	**Environmental Air - CATR by January 2015, NAAQS by January 2016, HAPs by January 2017**										
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**					Draft					
3	$ in thousands										
4											
5											
6	**Brown**	**Regulation**		**Total**		**B&V Study**	**E.ON US**		**2010**	**2011-2015**	**Post 2015**
7	Brown 1 - SCR	NAAQS, CATR		$68,325		$59,000	$9,325		$0	$68,325	$0
8	Brown 1 - Baghouse	EGU MACT		$39,218		$34,000	$5,218		$0	$39,218	$0
9	Brown 1 - PAC Injection	EGU MACT, PM 2.5		$1,899		$1,599	$300		$0	$1,899	$0
10	Brown 1 - SAM Mitigation	NSR		$4,632		$0	$4,632		$0	$4,632	$0
11	Total Brown 1			**$114,075**		**$94,599**	**$19,476**		**$0**	**$114,075**	**$0**
12											
13	Brown 2 - SCR	NAAQS, CATR		$104,971		$92,000	$12,971		$0	$104,971	$0
14	Brown 2 - Baghouse	EGU MACT		$41,179		$34,000	$7,179		$0	$39,844	$1,336
15	Brown 2 - PAC Injection	EGU MACT		$3,058		$2,476	$582		$0	$3,058	$0
16	Brown 2 - SAM Mitigation	NSR		$4,568		$0	$4,568		$0	$4,568	$0
17	Total Brown 2			**$153,776**		**$128,476**	**$25,300**		**$0**	**$152,440**	**$1,336**
18											
19	Brown 3 - Baghouse	EGU MACT, PM 2.5		$76,066		$61,000	$15,066		$0	$64,083	$11,983
20	Brown 3 - PAC Injection	EGU MACT, PM 2.5		$6,835		$5,426	$1,409		$0	$5,525	$1,310
21	Total Brown 3			**$82,901**		**$66,426**	**$16,475**		**$0**	**$69,608**	**$13,292**
22											
23	**Total Brown**			**$350,751**		**$289,501**	**$61,250**		**$0**	**$336,123**	**$14,628**
24											
25	**Ghent**										
26	Ghent 1 - Baghouse	EGU MACT, PM 2.5		$163,356		$131,000	$32,356		$0	$137,622	$25,734
27	Ghent 1 - PAC Injection	EGU MACT, PM 2.5		$8,036		$6,380	$1,656		$0	$6,726	$1,310
28	Ghent 1 - SAM Mitigation	NSR		$7,750		$0	$7,750		$375	$7,375	$0
29	Total Ghent 1			**$179,142**		**$137,380**	**$41,762**		**$375**	**$151,723**	**$27,043**
30											
31	Ghent 2 - SCR	NAAQS, CATR		$262,878		$227,000	$35,878		$0	$262,878	$0
32	Ghent 2 - Baghouse	EGU MACT, PM 2.5		$149,464		$120,000	$29,464		$0	$127,463	$22,001
33	Ghent 2 - PAC Injection	EGU MACT, PM 2.5		$7,695		$6,109	$1,586		$0	$6,385	$1,310
34	Ghent 2 - SAM Mitigation	NSR		$7,750		$0	$7,750		$375	$7,375	$0
35	Total Ghent 2			**$427,787**		**$353,109**	**$74,678**		**$375**	**$404,101**	**$23,311**
36											
37	Ghent 3 - Baghouse	EGU MACT, PM 2.5		$170,210		$138,000	$32,210		$0	$161,173	$9,036
38	Ghent 3 - PAC Injection	EGU MACT, PM 2.5		$7,624		$6,173	$1,451		$0	$7,624	$0
39	Ghent 3 - SAM Mitigation	NSR		$8,570		$0	$8,570		$250	$8,320	$0
40	Total Ghent 3			**$186,403**		**$144,173**	**$42,230**		**$250**	**$177,117**	**$9,036**
41											
42	Ghent 4 - Baghouse	EGU MACT, PM 2.5		$144,530		$117,000	$27,530		$0	$136,869	$7,661
43	Ghent 4 - PAC Injection	EGU MACT, PM 2.5		$7,669		$6,210	$1,459		$0	$7,669	$0
44	Ghent 4 - SAM Mitigation	NSR		$8,570		$0	$8,570		$250	$8,320	$0
45	Total Ghent 4			**$160,770**		**$123,210**	**$37,560**		**$250**	**$152,859**	**$7,661**
46											
47	**Total Ghent**			**$954,101**		**$757,872**	**$196,229**		**$1,250**	**$885,800**	**$67,052**
48											
49	**Mill Creek**										
50	Mill Creek 1 - FGD Upgrade	NAAQS, CATR		$49,565		$41,250	$8,315		$0	$49,565	$0
51	Mill Creek 1 - SCR	NAAQS, CATR, JEFF. CO., NON ATTAINMENT		$122,586		$97,020	$25,566		$0	$72,932	$49,654
52	Mill Creek 1 - Baghouse	EGU MACT, PM 2.5		$96,033		$80,850	$15,183		$0	$96,033	$0

	A	B	C	D	E	F	G	H	I	J	K
53	Mill Creek 1 - PAC Injection	EGU MACT, PM 2.5		$5,085		$4,290	$795		$0	$5,085	$0
54	Mill Creek 1 - SAM Mitigation	BART		$10,137		$7,920	$2,217		$0	$4,412	$5,725
55	Total Mill Creek 1			**$283,407**		**$231,330**	**$52,077**		**$0**	**$228,028**	**$55,380**
56											
57	Mill Creek 2 - FGD Upgrade	NAAQS, CATR		$47,659		$41,250	$6,409		$0	$47,659	$0
58	Mill Creek 2 - SCR	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$117,872		$97,020	$20,852		$0	$115,330	$2,541
59	Mill Creek 2 - Baghouse	EGU MACT, PM 2.5		$92,339		$80,850	$11,489		$0	$92,339	$0
60	Mill Creek 2 - Electrostatic Precipitator	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$37,690		$33,000	$4,690		$0	$37,690	$0
61	Mill Creek 2 - PAC Injection	EGU MACT, PM 2.5		$4,890		$4,290	$600		$0	$4,890	$0
62	Mill Creek 2 - SAM Mitigation	BART		$9,747		$7,920	$1,827		$0	$9,229	$519
63	Total Mill Creek 2			**$310,196**		**$264,330**	**$45,866**		**$0**	**$307,137**	**$3,060**
64											
65	Mill Creek 3 - FGD (U4 update and tie in)	NAAQS, CATR		$77,961		$63,750	$14,211		$0	$77,961	$0
66	Mill Creek 3 - FGD (Unit 3 Removal)	NAAQS, CATR		$31,802		$25,500	$6,302		$0	$31,802	$0
67	Mill Creek 3 - Baghouse	EGU MACT, PM 2.5		$125,943		$104,125	$21,818		$0	$125,943	$0
68	Mill Creek 3 - PAC Injection	EGU MACT, PM 2.5		$6,683		$5,525	$1,158		$0	$6,683	$0
69	Total Mill Creek 3			**$242,388**		**$198,900**	**$43,488**		**$0**	**$242,388**	**$0**
70											
71	Mill Creek 4 - FGD	NAAQS, CATR		$271,994		$236,250	$35,744		$0	$271,994	$0
72	Mill Creek 4 - SCR Upgrade	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$5,696		$5,250	$446		$0	$5,696	$0
73	Mill Creek 4 - Baghouse	EGU MACT, PM 2.5		$151,571		$131,250	$20,321		$0	$151,571	$0
74	Mill Creek 4 - PAC Injection	EGU MACT, PM 2.5		$7,882		$6,825	$1,057		$0	$7,882	$0
75	Mill Creek 4 - Ammonia	NAAQS, CATR, JEFF. COUNTY, NON ATTAINMENT		$11,528		$10,500	$1,028		$0	$11,528	$0
76	Total Mill Creek 4			**$448,671**		**$390,075**	**$58,596**		**$0**	**$448,671**	**$0**
77											
78	**Total Mill Creek**			**$1,284,663**		**$1,084,635**	**$200,028**		**$0**	**$1,226,223**	**$58,439**
79											
80	**Trimble**										
81	Trimble 1 - Baghouse	EGU MACT, PM 2.5		$158,119		$128,000	$30,119		$0	$149,737	$8,381
82	Trimble 1 - PAC Injection	EGU MACT, PM 2.5		$7,967		$6,451	$1,516		$0	$7,967	$0
83	Total Trimble 1			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
84											
85	**Total Trimble**			**$166,086**		**$134,451**	**$31,635**		**$0**	**$157,704**	**$8,381**
86											
87	**Environmental Air Studies**										
88	Environmental Air Studies			$2,000		$750	$1,250		$1,250	$750	$0
89	Total Environmental Air Studies			**$2,000**		**$750**	**$1,250**		**$1,250**	**$750**	**$0**
90											
91											
92											
93	**Total Environmental Compliance - Air**			**$2,757,601**		**$2,267,209**	**$490,392**		**$2,500**	**$2,606,600**	**$148,501**
94											
95	Note 1 - E.ON US includes 3.5% overheads and 4% escalation.										
96	Note 2 - Black & Veatch study does not meet level 1 engineering criteria.										

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Environmental Compliance - CCR Ruling**											
2	**Capital Cost - Investment Accrual Basis (Includes Removal/ARO)**											
3	$ in thousands											
4												
5												
6		**Total**		**GAI Study**	**E.ON US**		**2011-2015**	**2016-2020**	**Post 2020**			
7	**Brown CCR Ruling**	$159,921		$46,665	$113,256		$2,109	$339	$157,473			
8	**Ghent CCR Ruling**	$724,084		$284,731	$439,353		$172,505	$136,516	$415,063			
9	**Green River CCR Ruling**	$96,425		$62,254	$34,171		$15,474	$76,294	$4,657			
10	**Pineville CCR Ruling**	$2,896		$2,639	$256		$2,896	$0	$0			
11	**Tyrone CCR Ruling**	$24,562		$16,426	$8,136		$4,673	$19,889	$0			
12	**Cane Run CCR Ruling**	$124,817		$62,802	$62,015		$2,792	$73,469	$48,556			
13	**Mill Creek CCR Ruling**	$201,692		$88,137	$113,555		$62,325	$38,632	$100,735			
14	**Trimble Co CCR Ruling**	$268,365		$73,093	$195,272		$42,198	$37,556	$188,611			
15												
16	**Total Environmental Compliance - CCR Ruling**	$594,874		$224,032	$370,842		$107,315	$149,657	$337,902			
17												
18	Note 1 - E.ON US includes 3.5% overheads and 6% escalation.											
19	Note 2 - GAI study does not meet level 1 engineering criteria.											
20												
21												
22												
23												

From:	JOHN.VOYLES@EON-US.COM
To:	Garrett, Chris
Sent:	9/10/2010 3:49:32 PM
Subject:	AIP Project Approval - 131693 - ORIGINAL
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects.docx; 131693-6.pdf

LG&E project number 131693 (Envir Compliance Study-Air-LGE) has been submitted for your approval. Please login to PowerPlant and respond to the items awaiting your approval.

login to powerplant

Investment/Contract Proposal for IC: e-mail vote on 8/27/10

Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Sole Source Amount:	$1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $3 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

Environmental Compliance Studies - Air for Mill Creek
AIP is requesting $2M for Environmental Air Studies for Mill Creek on LGE (36%), Ghent and Brown (64%) on KU. To be going to IC on 8-26-10.
Approved by IC on 9-3-10

Costs	Capital Investment	Cost of Removal/ Retirement	Capital Cost Subtotal	Inital O&M Cost	Lifetime Maintenance Cost	O&M Cost Subtotal	TOTAL INVESTMENT
	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contract Labor	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - IFRS	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Saunders, Eileen for Straight, Ronald	9/10/2010	Y
Vice President	$750,000.00	Voyles, John	9/10/2010	Y
Investment Committee Coordinator	$0.00	Wright, Sharon		Y
Financial Planning Director	$0.00	Garrett, Christopher		Y
Senior Officer	$1,000,000.00	Thompson, Paul		Y
CFO	$1,000,001.00	Rives, Stephen		Y
CEO	$1,000,002.00	Staffieri, Victor		Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
Provide related project numbers or indicate 'N/A'.
131694

Is this an IT related project?
IT project is any project that requires IT involvement or the purchase of hardware and software.
no

Purchase/Sale of Real Estate?
Is this a transaction related to the sale/purchase of land or buildings?
no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

Environmental Project
Is this an Environmental Project?
yes

Environmental Cost Recovery
If an environmental project, is this an approved environmental cost recovery (ECR) project?
yes

ECR Project Type
If this is an ECR project, indicate the project type.
Air

ECR Compliance Number
If this is an ECR project, provide the ECR compliance plan number (see the approved project list on the Rates and Regulatory intranet site).
Not Assigned Yet

Environmental Affairs
Does Environmental Affairs need to review this project for environmental permitting issues (based on responses to the six questions in the Investment Proposal)?
no

Research and Experimental Credit
Is this an experimental project with the purpose of improving, enhancing, or adding to a current manufacturing process?
no

Sales Tax-Pollution Control
Is this project done for environmental regulations or statutes? (If yes, may qualify for the Pollution Control Exemption.)
no

Sales Tax-Manufacturing Integration
Is this project integrated in the Manufacturing Process? (Yes to this question and the following two questions may qualify for the New and Expanded Exemption.)
no

Sales Tax-State Equipment Use
Is this equipment used in the state for the first time?
no

Sales Tax-Upgrade or Improvement?
Is this project considered an upgrade or improvement? If yes, enter description on next line.
no

Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From:	BRAD.RIVES@EON-US.COM
To:	Staffieri, Vic
Sent:	9/15/2010 12:36:02 PM
Subject:	AIP Project Approval - 131693 - ORIGINAL
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects.docx; 131693-6.pdf

LG&E project number 131693 (Envir Compliance Study-Air-LGE) has been submitted for your approval. Please login to PowerPlant and respond to the items awaiting your approval.

login to powerplant

Investment/Contract Proposal for IC: e-mail vote on 8/27/10

Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Sole Source Amount:	$1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $3 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

Environmental Compliance Studies - Air for Mill Creek
AIP is requesting $2M for Environmental Air Studies for Mill Creek on LGE (36%), Ghent and Brown (64%) on KU. To be going to IC on 8-26-10.
Approved by IC on 9-3-10

Costs	Capital Investment	Cost of Removal/ Retirement	Capital Cost Subtotal	Inital O&M Cost	Lifetime Maintenance Cost	O&M Cost Subtotal	TOTAL INVESTMENT
	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contract Labor	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - IFRS	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Saunders, Eileen for Straight, Ronald	9/10/2010	Y
Vice President	$750,000.00	Voyles, John	9/10/2010	Y
Investment Committee Coordinator	$0.00	Wright, Sharon	9/10/2010	Y
Financial Planning Director	$0.00	Garrett, Christopher	9/13/2010	Y
Senior Officer	$1,000,000.00	Hudson, Russel for Thompson, Paul	9/13/2010	Y
CFO	$1,000,001.00	Rives, Stephen	9/15/2010	Y
CEO	$1,000,002.00	Staffieri, Victor		Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
Provide related project numbers or indicate 'N/A'.
131694

Is this an IT related project?
IT project is any project that requires IT involvement or the purchase of hardware and software.
no

Purchase/Sale of Real Estate?
Is this a transaction related to the sale/purchase of land or buildings?
no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

Environmental Project
Is this an Environmental Project?
yes

Environmental Cost Recovery
If an environmental project, is this an approved environmental cost recovery (ECR) project?
yes

ECR Project Type
If this is an ECR project, indicate the project type.
Air

ECR Compliance Number
If this is an ECR project, provide the ECR compliance plan number (see the approved project list on the Rates and Regulatory intranet site).
Not Assigned Yet

Environmental Affairs
Does Environmental Affairs need to review this project for environmental permitting issues (based on responses to the six questions in the Investment Proposal)?
no

Research and Experimental Credit
Is this an experimental project with the purpose of improving, enhancing, or adding to a current manufacturing process?
no

Sales Tax-Pollution Control
Is this project done for environmental regulations or statutes? (If yes, may qualify for the Pollution Control Exemption.)
no

Sales Tax-Manufacturing Integration
Is this project integrated in the Manufacturing Process? (Yes to this question and the following two questions may qualify for the New and Expanded Exemption.)
no

Sales Tax-State Equipment Use
Is this equipment used in the state for the first time?
no

Sales Tax-Upgrade or Improvement?
Is this project considered an upgrade or improvement? If yes, enter description on next line.
no

Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From:	CHRIS.GARRETT@EON-US.COM
To:	Thompson, Paul
Sent:	9/13/2010 10:15:32 AM
Subject:	AIP Project Approval - 131693 - ORIGINAL
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects.docx; 131693-6.pdf

LG&E project number 131693 (Envir Compliance Study-Air-LGE) has been submitted for your approval. Please login to PowerPlant and respond to the items awaiting your approval.

login to powerplant

Investment/Contract Proposal for IC: e-mail vote on 8/27/10

Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Sole Source Amount:	$1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

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In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

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Conclusions and Recommendation

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Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

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Approved by IC on 9-3-10

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Contract Labor	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - IFRS	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Saunders, Eileen for Straight, Ronald	9/10/2010	Y
Vice President	$750,000.00	Voyles, John	9/10/2010	Y
Investment Committee Coordinator	$0.00	Wright, Sharon	9/10/2010	Y
Financial Planning Director	$0.00	Garrett, Christopher	9/13/2010	Y
Senior Officer	$1,000,000.00	Thompson, Paul		Y
CFO	$1,000,001.00	Rives, Stephen		Y
CEO	$1,000,002.00	Staffieri, Victor		Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
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131694

Is this an IT related project?
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no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

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Is this an Environmental Project?
yes

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If an environmental project, is this an approved environmental cost recovery (ECR) project?
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Air

ECR Compliance Number
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Sales Tax-Pollution Control
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Is this equipment used in the state for the first time?
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Is this project considered an upgrade or improvement? If yes, enter description on next line.
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Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From:	VIC.STAFFIERI@EON-US.COM
To:	Rose, Bruce
Sent:	9/15/2010 5:20:36 PM
Subject:	AIP Project Approval - 131693 - ORIGINAL
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects.docx; 131693-6.pdf

LG&E project number 131693 (Envir Compliance Study-Air-LGE) has been submitted for your approval. Please login to PowerPlant and respond to the items awaiting your approval.

login to powerplant

Investment/Contract Proposal for IC: e-mail vote on 8/27/10

Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Sole Source Amount:	$1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

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Project timeline:

Level I Engineering	**Begin**	**Complete**
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Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

Environmental Compliance Studies - Air for Mill Creek
AIP is requesting $2M for Environmental Air Studies for Mill Creek on LGE (36%), Ghent and Brown (64%) on KU. To be going to IC on 8-26-10.
Approved by IC on 9-3-10

Costs	Capital Investment	Cost of Removal/ Retirement	Capital Cost Subtotal	Inital O&M Cost	Lifetime Maintenance Cost	O&M Cost Subtotal	TOTAL INVESTMENT
	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contract Labor	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
Net Expenditures - IFRS	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Saunders, Eileen for Straight, Ronald	9/10/2010	Y
Vice President	$750,000.00	Voyles, John	9/10/2010	Y
Investment Committee Coordinator	$0.00	Wright, Sharon	9/10/2010	Y
Financial Planning Director	$0.00	Garrett, Christopher	9/13/2010	Y
Senior Officer	$1,000,000.00	Hudson, Russel for Thompson, Paul	9/13/2010	Y
CFO	$1,000,001.00	Rives, Stephen	9/15/2010	Y
CEO	$1,000,002.00	Staffieri, Victor	9/15/2010	Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
Provide related project numbers or indicate 'N/A'.
131694

Is this an IT related project?
IT project is any project that requires IT involvement or the purchase of hardware and software.
no

Purchase/Sale of Real Estate?
Is this a transaction related to the sale/purchase of land or buildings?
no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

Environmental Project
Is this an Environmental Project?
yes

Environmental Cost Recovery
If an environmental project, is this an approved environmental cost recovery (ECR) project?
yes

ECR Project Type
If this is an ECR project, indicate the project type.
Air

ECR Compliance Number
If this is an ECR project, provide the ECR compliance plan number (see the approved project list on the Rates and Regulatory intranet site).
Not Assigned Yet

Environmental Affairs
Does Environmental Affairs need to review this project for environmental permitting issues (based on responses to the six questions in the Investment Proposal)?
no

Research and Experimental Credit
Is this an experimental project with the purpose of improving, enhancing, or adding to a current manufacturing process?
no

Sales Tax-Pollution Control
Is this project done for environmental regulations or statutes? (If yes, may qualify for the Pollution Control Exemption.)
no

Sales Tax-Manufacturing Integration
Is this project integrated in the Manufacturing Process? (Yes to this question and the following two questions may qualify for the New and Expanded Exemption.)
no

Sales Tax-State Equipment Use
Is this equipment used in the state for the first time?
no

Sales Tax-Upgrade or Improvement?
Is this project considered an upgrade or improvement? If yes, enter description on next line.
no

Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From:	Rose, Bruce
To:	Schroeder, Andrea
Sent:	9/17/2010 1:10:52 PM
Subject:	FW: AIP Project Approval - 131693 - ORIGINAL
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects.docx; 131693-6.pdf

Andrea,

As the alert has yet to be added to PowerPlant for you and Carol, I wanted to make you aware this AIP came thru for approval. It mentions that it will be eventually added to the ECR plan. Essentially, the $2M for the AIP will be split between LGE/KU. Once the study is completed, and actual construction begins, separate AIP's for each location will be activated, and these study charges will be allocated to the individual projects. Just wanted you to be kept in the loop. Have a good weekend!

Investment/Contract Proposal for IC: e-mail vote on 8/27/10

Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Sole Source Amount:	$1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $3 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

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Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
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Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
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Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

AUTHORIZATION FOR INVESTMENT PROPOSAL - ORIGINAL

☐ EON U.S. Services Co. ☒ Louisville Gas and Electric Co. ☐ Kentucky Utilities Company

Name of Project: Envir Compliance Study-Air-LGE	**Funding Project Type:** LGE Steam NonBlnk Excluding Land	
Date Requested: 8/5/2010	**Project Number:** 131693	**Budgeted:** no
Related Project Numbers: 131694	**If unbudgeted, list alternate budget ref. Number(s):** Going before Investment Committee on 8-26-10	
Expected Start Date: 1/1/2010	**Expected In Service Date:** 12/31/2011	**Expected Completion Date:** 3/31/2012
AIP Prepared by: Mooney, Michael Allen		**Phone:** 502/627-3671
Project Manager: Saunders, Eileen		**Phone:** 502/627-2431
Asset Location: Mill Creek Unit 4		**Environmental Code:** Air
Resp. Center: 002020-GENERATION SUPPORT - LGE		**Product Code:** 111 - WHOLESALE GENERATION

REASONS AND DETAILED DESCRIPTION OF PROJECT

131693-Envir Compliance Study-Air-LGE

Environmental Compliance Studies - Air for Mill Creek
AIP is requesting $2M for Environmental Air Studies for Mill Creek on LGE (36%), Ghent and Brown (64%) on KU. To be going to IC on 8-26-10.
Approved by IC on 9-3-10

Costs	Capital Investment	Cost of Removal/ Retirement	Capital Cost Subtotal	Inital O&M Cost	Lifetime Maintenance Cost	O&M Cost Subtotal	TOTAL INVESTMENT
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Subtotal - GAAP	$2,000,000.00	$0.00	$2,000,000.00	$0.00	$0.00	$0.00	$2,000,000.00
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2010 Total	$1,250,000.00	$0.00	$1,250,000.00	$0.00	$0.00	$0.00	$1,250,000.00
2011 Total	$750,000.00	$0.00	$750,000.00	$0.00	$0.00	$0.00	$750,000.00
2012 Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Approval Type: Non-IT Projects

Authorized by	Amount	Name	Date Approved	Req'd
Supervisor	$25,000.00			N
Manager	$100,000.00	Clements, Joseph	9/8/2010	Y
Budget Coordinator	$0.00	Ritchey, Stacy	9/8/2010	Y
Special Approvers	$0.00	Saunders, Eileen	9/8/2010	Y
Budget Coordinator	$0.00	Dowd, Deborah	9/10/2010	Y
Director	$300,000.00	Saunders, Eileen for Straight, Ronald	9/10/2010	Y
Vice President	$750,000.00	Voyles, John	9/10/2010	Y
Investment Committee Coordinator	$0.00	Wright, Sharon	9/10/2010	Y
Financial Planning Director	$0.00	Garrett, Christopher	9/13/2010	Y
Senior Officer	$1,000,000.00	Hudson, Russel for Thompson, Paul	9/13/2010	Y
CFO	$1,000,001.00	Rives, Stephen	9/15/2010	Y
CEO	$1,000,002.00	Staffieri, Victor	9/15/2010	Y
Property Accounting	$0.00	Rose, Bruce		Y

INVESTMENT MATERIALS

UOP #	Utility Account Id		Quantity	Total Cost	
06677	131100	MISCELLANEOUS STRUCTURES (066	0	$720,000.00	

RETIRED EQUIPEMENT (OR MATERIALS)

UOP #	Utility Account Id		Quantity	Vintage Year	Original Project Number

AIP QUESTIONS

Are there Related Project Numbers?
Provide related project numbers or indicate 'N/A'.
131694

Is this an IT related project?
IT project is any project that requires IT involvement or the purchase of hardware and software.
no

Purchase/Sale of Real Estate?
Is this a transaction related to the sale/purchase of land or buildings?
no

Budgeted?
Is the project budgeted or unbudgeted?
no

AIP QUESTIONS

Alternate Budget Numbers?
If the project is unbudgeted, list alternate budget reference numbers. Enter N/A, if none.
Going before Investment Committee on 8-26-10

Legal Asset Retirement Obligation?
Is there a legal or environmental requirement governing disposal of this asset?
no

Leased Asset?
Does this project involve a leased asset?
no

Obsolete Inventory?
Will this project create obsolete inventory?
no

Environmental Project
Is this an Environmental Project?
yes

Environmental Cost Recovery
If an environmental project, is this an approved environmental cost recovery (ECR) project?
yes

ECR Project Type
If this is an ECR project, indicate the project type.
Air

ECR Compliance Number
If this is an ECR project, provide the ECR compliance plan number (see the approved project list on the Rates and Regulatory intranet site).
Not Assigned Yet

Environmental Affairs
Does Environmental Affairs need to review this project for environmental permitting issues (based on responses to the six questions in the Investment Proposal)?
no

Research and Experimental Credit
Is this an experimental project with the purpose of improving, enhancing, or adding to a current manufacturing process?
no

Sales Tax-Pollution Control
Is this project done for environmental regulations or statutes? (If yes, may qualify for the Pollution Control Exemption.)
no

Sales Tax-Manufacturing Integration
Is this project integrated in the Manufacturing Process? (Yes to this question and the following two questions may qualify for the New and Expanded Exemption.)
no

Sales Tax-State Equipment Use
Is this equipment used in the state for the first time?
no

Sales Tax-Upgrade or Improvement?
Is this project considered an upgrade or improvement? If yes, enter description on next line.
no

Sales Tax-Upgrade Description
Description of upgrade, if applicable (i.e., improved materials, increased capacity, longer life, etc.) from prior question. Enter N/A, if not applicable.
N/A

From: Jackson, Fred
To: Thompson, Paul
CC: Voyles, John
Sent: 9/16/2010 3:03:12 PM
Subject: Draft Energy Services Major Projects Report June-August 2010
Attachments: Energy Services Major Projects Monthly Report June-August 2010 Draft .docx; PE's Bi-Weekly Update of 7-2-10.docx; PE's Bi-Weekly Update of 7-30-10.docx; PE's Bi-Weekly Update of 8-16-10.docx; PE's Bi-Weekly Update of 8-27-10.docx

Paul,

Attached is a draft of the June-August 2010 ES Major Projects Monthly Report. All updates are shown as tracked changes against the May report you sent to Vic. I have ***not*** mentioned the potential Cane Run CCGT impact on Cane Run CCP project. I did include the potential increase in cost for the transport system on Ghent CCP Project and the hold on the BR Main Ash Pond.

I also attached the July 2, July 31, August 16, and August 27 Project Engineering Bi-Weekly Updates as reference. Please let me know if questions.

Thanks,
Fred

Fred D. Jackson PE
Director Generation Services
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Louisville, Kentucky 40232
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F (502) 217-4958
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Energy Services Major Projects Monthly Report
June-August 2010

I. KU SOx Program

A. Safety

No Issues to report.

B. Schedule

Ghent 3: Mechanically complete. Shakedown activities are continuing and moving towards final contract settlement, including LD claims. Operationally, the re-engineered ID fan bearing replacement made in June 2009 is operating satisfactorily but continues under close monitoring.

Ghent 4: Mechanically complete. Second rewound ID fan motor installed and placed into service. Planning to install FlaktWoods axial fans in Fall 2010 outage.

Ghent 1: Mechanically complete.

Ghent Site: Restoration projects nearing completion.

Brown: FGD tie-in to Unit 3 successfully completed May 21. FGD now in service for Unit 3 only. Units 1 and 2 operationally on plan to be placed in service later this year.

C. Budget

Ghent 3: No Material Change.

Ghent 4: No Material Change.

Ghent 1: No Material Change.

Brown: Currently forecasting a positive variance to budget of greater than $50M.

D. Issues/Risks

ID Fan Bearing issues as noted above. FlaktWoods and Flour have signed the Final Settlement Term Sheet. Finalized trade of one Brown ID fan motor for spare blades for two fans at Ghent. Blades received at Ghent. WEG (Subcontractor to FlaktWoods) ID Fan motor inspection complete. Motor received for GH4 scheduled outage in fall 2010.

Significant icing and fogging experienced on Ghent 1 FGD from Ghent 2 Cooling Tower. Contract awarded for siding on Ghent Unit 1 SCR and FGD. Work in progress.

Ghent FGDs experiencing numerous leaking valves. Replacement of valves is planned.

II. Trimble County 2

A. Safety

No Issues to report.

B. Schedule

Achieved 50% load on June 17. Significant combustion issues have resulted in significant damage to approximately half of the 30 burners. New burner parts installed with modifications. Testing of the unit restarted in mid August and COD is revised to October 12, 2010.

C. Budget

Sanction amount is $964.5M. Forecasted costs at 8 to 9% above sanction.

D. Issues/Risks

Schedule as noted above.

Force Majeure claims on weather events still under discussion. Discussion on Bechtel Excusable Event letters in progress.

Bechtel cancelled air blows based on no strategic value. Reviewing a change order to recover associated reduced costs.

Significant combustion issues as noted above.

Delayed COD.

III. Brown Ash Pond

A. Safety

No issues to Report

B. Schedule

Work on Phase I of the Main Pond is on hold pending potential impact of proposed coal combustion products regulations.

C. Budget

No Material Change

D. Issues/Risks

Potential impact of proposed coal combustion products regulations as noted above.

IV. KU NOx Program (Brown 3)

A. Safety

No issues to Report

B. Schedule

Technology agreement executed December 9, 2009.
EPC contract awarded to Zachary May 19 including assignment of technology purchase agreement.

C. Budget

No material change.

D. Issues/Risks

Timeliness of permits to construct.

V. Trimble County Coal Combustion Products

A. Safety

No issues to Report

B. Schedule

See Issues/Risks below

C. Budget

No Material Change

D. Issues/Risks

Meeting long term on site disposal needs is a schedule concern based engineering/construction and permitting. CCN issued December 23, 2009.

Negotiating with U.S. Fish and Wildlife on mitigation plan for Indiana Bat.

Holcim contract negotiations for beneficial reuse have resumed.

Resolved an issue with GAI (Consultant) associated with costs for the mechanical engineering scope of the Bottom Ash Pond/Gypsum Pond work.

VI. Ghent Coal Combustion Products

A. Safety

No Issues to Report

B. Schedule

See Issues/Risks below. All permit applications submitted.

C. Budget

Current projected cost for CCP Transport System considerable higher than original estimate. Verifying scope and cost estimate.

D. Issues/Risks

Meeting on site disposal needs is a schedule concern based on timeline associated land acquisition, permitting, and engineering/construction. CCN issued December 23, 2009. Review of potential modifications to landfill design to eliminate need for these three properties complete. Final offers sent to remaining three landowners.

CCP transport scope and cost estimate as noted above.

VII. Cane Run Coal Combustion Products

A. Safety

No issues to Report

B. Schedule

404/401 and Special Waste Landfill permit applications submitted to KY Division of Water and KY Division of Waste Management, respectively.

C. Budget

No Material Change

D. Issues/Risks

Meeting on site disposal needs is a schedule concern based on timeline associated with permitting and engineering/construction. No land acquisition expected under current construction plan.

Based on updated CCP production rates, the maximum life of the proposed landfill is 16 years.

Energy Services - Bi-Weekly Update
July2, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – Internal Auditing has issued the final draft of the Brown FGD audit with zero significant findings.
  - Schedule/Execution:
    - Ghent
      - Chimney Coatings – Testing of the coating application remain.
      - SCR/FGD Icing Siding – Installation nearing completion.
      - Unit 4 ID Fans – On plan for fall 2010 install. Fluor mobilizing to the site.
      - Chimney Capping – Work to begin July 6th.
      - Elevators- Bids higher than anticipated but within budget. New schedules and higher cost being accounted for in the 2011 MTP.
    - Brown
      - The FGD continues to operate very well.
      - E.W. Brown Gypsum Dewatering Facility
        - Commissioning nearing completion, the system is running.
        - Facility operation contract bid reviews ongoing.
      - E.W. Brown Gypsum Lab
        - Construction almost complete.
  - Budget - NTR.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks - NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – TC2 achieved 50% load Jun 15th. Bechtel has experienced significant combustion issues that have resulted in significant damage to about half of the 30 burners. The Root Cause Analysis (RCA) has not been issued but Doosan claims the Dodge Hill coal has a high Free Swelling Index, meaning the coal becomes plastic as it burns resulting in heavy slagging in the burner. It appears likely that we will have to resume commissioning on an alternate fuel while Doosan redesigns the burners for our fuel box post commissioning or until Bechtel changes to another vendor's burners. **Bechtel's anticipates restarting the unit mid-August with a new substantial completion date of Oct 8.** This impact to commissioning was communicated through a formal letter to KYPSC.
  - Budget – NTR
  - Contract Disputes/Resolution:
    - Bechtel FM Claims – Parked at the present time by both parties.

- Issues/Risk:
  - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.

- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – waiting on permit to construct pending resolution of SAM with KYDAQ.
  - Engineering – proceeding as planned to support the spring 2012 in-service.
  - Budget - NTR
  - Contracting – authorization to award the Hot Water Recirc contract to Alstom planned for the July IC meeting.
  - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
  - Schedule/Execution – Working towards finalizing a schedule with Voith Hydro that supports all units being completed by the end of 2014. PE is investigating being able to de-water two units simultaneously to gain schedule float.
  - Permitting – NTR
  - Engineering/General:
    - Reviewing Voith updated scope for rehabilitation minus automation.
    - Working with power marketing group on interconnection issues regarding unit testing and commercial dates.
    - Reviewing Historic Preservation and Maintenance Plan developed in 2008.
  - Budget:
    - Total roll up of estimate to complete work under a lump sum to Voith Hydro is essentially at 2010 MTP values. PE continues to assemble pricing for work outside hydro vendor scope. Revised project sanction planned for July/August IC meeting along with award of remaining runners to Voith through a separate PO while the lump sum contract is negotiated and drafted for a August/September IC meeting.
  - Contracting:
    - Negotiations with Voith ramping up to wrap all existing contracts and purchase orders into a single Lump Sum contract.
  - Issues/Risk
    - Release of third unit runner to Voith is required in August to maintain schedule.
    - The tentative schedule for completion of all units by late 2014 is highly dependent on year-round dewatering.

- **Mill Creek Limestone Project**
  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering/General
    - Meetings continue with station management and URS to move the activities associated with the project from the Plant to PE.
    - Scope development for the limestone building extension is underway with the RFQ being issued to the market within the next few weeks.

        - Working with URS to procure long lead time equipment such as the verti-mill.
    - Budget
        - AIP development in progress.
        - Revised cash flow reflected in 2011 MTP
    - Contracting - NTR
    - Issue/Risk - NTR

- **Cane Run CCP Project**
    - Permitting
        - 404/401 and Landfill Permit applications remain under review by the agencies. Preparing to respond to comments on the 404 and Landfill Permit applications. To date permitting process has gone well.
    - Engineering
        - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
        - Transmission working towards relocation of the 69kV line.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
    - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.

- **TC CCP Project – BAP/GSP**
    - Schedule/Execution:
        - Dewatering of the Gypsum Storage Pond was recently completed to allow investigation of existing clay liner thickness and permeability.
    - Budgeting – The additional $1.5m net against a project sanction of $25m net to fund modifying the GSP liner system to meet anticipated future regulations will require IC approval and a revised AIP.
    - Engineering:
        - Performing a study on the GSP clay liner originally installed to compare against potential new regulations. Path forward is to utilize the existing clay liner as part of a composite liner system to meet proposed new regulations before the pond is placed into service.
        - A repair strategy for the BAP is being developed in response to the EPA Inspection in June 2009.
    - Permitting – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk
        - Weather remains the biggest risk. The contractor has submitted a request for adjustments to the LDs due to the weather delays from the wet winter and spring.
        - PE is developing plans to expedite the completion of the GSP and/or South Dike to help mitigate the high water elevations in the BAP.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering – The Detailed Engineering RFP has been issued and bidders are preparing proposals with bids due in early July.
  - Permitting – Negotiations continue with USFWS on the resolution of the Indiana Bat issue. Recent testing on the IN bat was completed with a single finding. Work continues on the development of the 401/404 Permits for an August/September submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – Conceptual Engineering on the CCP transport systems has resulted in a refined estimate that is significantly over the original amount included in the project ECR filings. PE will continue working with B&V and station management through the 2011 MTP development to refine the scope and reduce the cost impact.
  - Engineering – Detailed Engineering of gypsum fines and Conceptual Engineering on CCP transport for landfill continues with Black & Veatch. Procurement activities for the gypsum fines project are in progress.
  - Permitting – All permit applications have been made. Project Engineering is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues with planning with the local authorities and the cemetery where the remains will be relocated.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk:
    - Land Acquisition – a final offer that will discuss condemnation potential will be sent to the remaining three land owners in early July. A final recommendation will be presented to management for approval on whether to change designs or condemn the remaining property in late July.

- **General CCP Projects**
  - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These cost have been included in PE's 2011 MTP draft.

- **E.W. Brown Ash Pond Project**
  - Safety – NTR
  - Schedule/Execution:
    - Work on Phase I is being suspended until a decision is made on whether to convert the main pond to a landfill. .
    - Aux Pond Phase II work awarded to Charah.
  - Budget – NTR
  - Contract Disputes/Resolution - NTR

- Issues/Risk – A decision is required in July on whether to continue with the Main Pond or convert to a dry landfill. Economics indicate conversion now to be least cost compared to continuing with pond and then converting once regulations are final.

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - RFP for MC3, MC4, BR3 and GH2 released June 29 to URS, Nol-Tek, UCC, FLsmidth, ClydeBergemann, and BCSI. Pre-bid meetings scheduled at sites July 7 & 8 with bids due July 20 unless extension are granted.
    - RFP addendum being prepared to include bid request for wet systems on all four Ghent units as part of the work on Ghent NOV.
    - MC 4 tests by E.ON Engineering published.
    - MC 3 testing performed for one week with ADA/Breen. Initial results include 8 ppm and 2.3 ppm at the stack; however, significant ESP issues occurred during the test period. ESP issues are being assessed to see if there is a relationship to the testing or if sections tripped due to high hopper levels.
  - Other – Visited IPL Harding Station with Vincent Forcellini and Brad Pabian. They have URS's SBS Injection System on one unit.

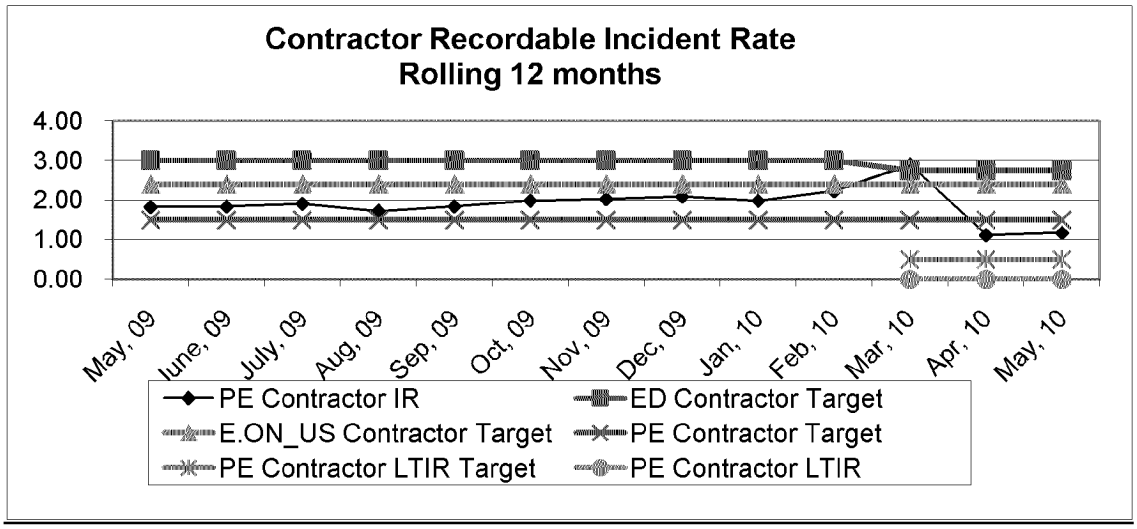
- **SO3 Mitigation (Ghent)**
  - Met with EPA in Atlanta to discuss the NOV issue on June 29 - E.ON technical action items to respond by mid July.
  - GH2 testing postponed until the "permanent" temporary system is installed by the plant.
  - Preparing a test plan and schedule for MgO injection at GH4.
  - Ghent station is currently installing the "permanent" temporary system from Nol-Tek with operation expected around July 9th.
  - B&V draft of SAM testing difficulties white paper received.
  - B&V draft of SAM calculations at Ghent Units received.
  - Emissions Monitoring Inc. (Jim Peeler) has published a white paper on CEMS/Compliance Monitoring Testing.

- **NBU1 and Other Generation Development**
  - LFG
    - Second Landfill Gas Sample Result received.
    - LFG Technologies is planning visits to the landfills in July.
  - NBU CR – HDR updated estimate received. Layout and landfill issues assessed. Gas pipeline issues assessed. Water balance issues assessed. On schedule for late July report draft.
  - Biomass – Black and Veatch submitted draft of Co-Firing Early Estimates and Level I Schedule for MTP purposes. They are progressing with Vista models. On schedule for early August report draft.
  - FutureGen – NTR

- **General**
  - Impoundment Integrity Program – PE is transitioning this to Generation Services.

- Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost.
- Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Award of the BR3 HWRS to Alstom will need approval in July IC meeting.
2. Decision to convert TC's GSP to a composite liner or maintain current plan. Changing design and implementation now versus later is significantly less expensive and less disruptive to station operations than waiting until after the pond is placed into service. A recommendation from PE and the station will be presented to officers within ES the week after July 4th.
3. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. A recommendation from PE and the station will be presented to officers within ES by mid-July.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP.
2. Philip Imber has submitted for two Manager postings outside of ES.

Energy Services - Bi-Weekly Update
July30, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – NTR.
  - Schedule/Execution:
    - Ghent
      - Chimney Coatings – Testing of the coating application remain.
      - SCR/FGD Icing Siding – Installation nearing completion.
      - Unit 4 ID Fans – An outage kickoff meeting is planned for 8/4/10.
      - Chimney Capping – Caps placed by helicopter on both chimneys on 7/25/10.
      - Elevators - Award Recommendation is circulating for signatures.
    - Brown
      - The FGD continues to operate very well.
      - E.W. Brown Gypsum Dewatering Facility
        - Product to be sent to the facility next week for final commissioning activity. This was delayed a week due to high ash content in gypsum stream.
        - Facility operation award recommendation being routed for signatures.
      - E.W. Brown Coal Pile Modification
        - Bid received for engineering from MACTEC and PO under development.
      - Balance of Project Items
        - Paving scope out for bid
        - Elevator scope out for bid
  - Budget – Slight reduction in the total Brown FGD Program ITC to $408.8m.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks - NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Bechtel has installed new secondary burner air barrels. The first deliveries of new primary air and core air assemblies have begun to arrive. We continue to work with Bechtel and Fuels to source an alternate coal until the permanent burner solution is installed. **Bechtel anticipates restarting the unit mid-August with a new substantial completion date of 10/12/10.** This impact to commissioning was communicated through a formal letter to KYPSC.
  - Budget – Minor additions made to MTP to account for staffing through 2011 and for the recently verbal agreement on FM and EE claim settlement.
  - Contract Disputes/Resolution:

        - Bechtel FM Claims – Verbal agreement on all FM and most EE claims reached. Written agreement expected within next two weeks.
    - Issues/Risk:
        - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.

- **Brown 3 SCR**
    - Schedule/Execution – NTR
    - Permitting – Request to KYDAQ for station-wide SAM annual emission limit sent to KYDAQ on 7/30/10. Permit to construct SCR dependent on agreement with KYDAQ on SAM limit.
    - Engineering – proceeding as planned to support the spring 2012 in-service.
    - Budget - NTR
    - Contracting – IC approved award of Hot Water Recirc to Alstom in the July IC meeting.
    - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
    - Schedule/Execution –NTR
    - Permitting – NTR
    - Engineering/General:
        - Reviewing Voith updated scope for rehabilitation minus automation.
        - Reviewing Historic Preservation and Maintenance Plan developed in 2008.
    - Budget:
        - Total roll up of estimate to complete work under a lump sum to Voith Hydro is essentially at 2010 MTP values. PE continues to assemble pricing for work outside hydro vendor scope.
        - Revised project sanction planned for August IC meeting
    - Contracting:
        - Negotiations with Voith are progressing well. Voith has agreed to defer the need to issue a PO for the remaining runners pending approval of EPC from IC in August.
    - Issues/Risk
        - Release of third unit runner to Voith is required in August to maintain schedule.
        - The tentative schedule for completion of all units by late 2014 is highly dependent on year-round dewatering.

- **Mill Creek Limestone Project**
    - Safety - NTR
    - Auditing - NTR
    - Permitting - NTR
    - Engineering/General
        - Pre-bid meeting for the building extension work was held at Mill Creek on July 8, 2010 and bids were received July 23, 2010.
        - Working with URS to develop RFQ for long lead equipment.
    - Budget
        - AIP complete.
        - Revised cash flow reflected in 2011 MTP

- Contracting – NTR
- Issue/Risk – Potential delay in awarding the equipment and engineering for the verti-mills as the impacts of the new air regulations are being assessed.

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. Preparing to respond to comments on the 404 and Landfill Permit applications. To date permitting process has gone well.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Meeting with the Plant and the engineer to discuss a reduced scope landfill that would facilitate the construction of a CCGT.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.
  - Working with UCC to update their equipment and material pricing.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - Gypsum Storage Pond is being prepared for the installation of the Flexible Membrane Liner (FML) and a Geosynthetic Clay Liner (GCL) scheduled to begin within the next 2 to 4 weeks.
    - Work continues on the fill placement and mechanically stabilized earth (MSE) wall for the north, south, and west dikes.
    - Work has begun on both Emergency Spillways.
    - Working continues on the fiberglass piping for the project
  - Budgeting – The additional $1.5m net against a project sanction of $25m net to fund modifying the GSP liner system to meet anticipated future regulations will require IC approval and a revised AIP.
  - Engineering:
    - Performing a study on the GSP clay liner originally installed to compare against potential new regulations. Path forward is to utilize the existing clay liner as part of a composite liner system to meet proposed new regulations before the pond is placed into service.
    - A repair strategy for the BAP is being developed in response to the EPA Inspection in June 2009.
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk

        - Weather remains the biggest risk. The contractor has submitted a request for adjustments to the LDs due to the weather delays from 2009 and the wet winter and spring in 2010.
        - PE is developing plans to expedite the completion of the GSP and/or South Dike to help mitigate the high water elevations in the BAP.

- **TC CCP Project – Landfill**
    - Schedule/Execution - NTR
    - Budgeting - NTR
    - Engineering – The Detailed Engineering RFPs were received on Friday, 09Jul10. Three proposals were received. Proposal review is in progress.
    - Permitting – A meeting was held with USFWS on 27Jul10 concerning the resolution of the Indiana Bat issue. Anabat (acoustical) Testing on the Phase II (July) for the Indiana Bat is being concluded during the week of 26Jul10. Only two "hits" were recorded. Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
    - Schedule/Execution – NTR
    - Budget – Conceptual Engineering on the CCP transport systems has resulted in a refined estimate that is significantly over the original amount included in the project ECR filings. PE will continue working with B&V and station management through the 2011 MTP development to refine the scope and reduce the cost impact.
    - Engineering – Detailed Engineering of gypsum fines continues with Black & Veatch. Bids have been received and currently under review for the CCP transport Detailed Design. Procurement activities for the gypsum fines project are in progress. Detailed Engineering for the Landfill is focusing on completion of construction drawings.
    - Permitting – All permit applications have been made. Project Engineering is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues with planning with the local authorities and the cemetery where the remains will be relocated.
    - Contract Disputes/Resolution – NTR
    - Issues/Risk:
        - Land Acquisition – a final offer that will discuss condemnation potential will be sent to the remaining three land owners in early July. A final recommendation will be presented to management for approval on whether to change designs or condemn the remaining property in late July.

- **General CCP Projects**
    - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These cost have been included in PE's 2011 MTP draft.

- **E.W. Brown Ash Pond Project**
  - Safety – NTR
  - Schedule/Execution:
    - Work on Phase I is being suspended until a decision is made on whether to convert the main pond to a landfill.
    - Working on evaluation and recommendation paper for the main pond conversion from a pond to a landfill .
    - Aux Pond Phase II work awarded to Charah.
  - Budget – NTR
  - Contract Disputes/Resolution - NTR
  - Issues/Risk – A decision is required in July on whether to continue with the Main Pond or convert to a dry landfill. Economics indicate conversion now to be least cost compared to continuing with pond and then converting once regulations are final.

- **E.W. Brown Ash Pond Project**
  - **E.W. Brown Starter Dike**
    - Safety – (0) Recordable
    - Schedule/Execution:
      - Contract work remains under suspension except for rock embankment placement, dust control, and general site maintenance.
      - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
      - Rock placement continued on the West and South Embankments.
    - Budget – NTR
    - Contract Disputes/Resolution: NTR
    - Issues/Risk – Summit was given notice to suspend all work except rock placement and some minor activities beginning July 6th until further notice.

  - **E.W. Brown Aux Pond 900'**
    - Schedule/Execution:
      - Installation of erosion and sediment control measures.
      - Topsoil stockpiles were relocated.
      - Began rock embankment blasting at the Houp Property.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Proposals for MC3, MC4, BR3 and GH2 released June 29 to URS, Nol-Tek, UCC, FLsmidth, ClydeBergemann, and BCSI received July 20.
    - Bid review meetings held with stations and all suppliers July 26 & 28.
    - Initial team evaluation sheets due COB Friday July 30. Summary discussion meeting to be set the week of Aug. 2.

- Bid Summary – dry system pricing ranges from $2.2 to $6.3M per system with numerous clarifications and further engineering to be performed and evaluated. **Meaningful pricing not submitted for the wet system.**
  - URS – only offered core technology equipment, no BOP, no construction. 2 ppmv guarantee at the stack with LD to 10% of equipment cost
  - Nol-Tec – turn-key offer, similar to our existing systems with substantial upgrades. 2 ppmv guarantee with LD to contract price
  - BCSI – turnkey in concept, construction partners not finalized (systems pre-packaged to minimize on site fabrication). Highly redundant process, similar to our existing systems with upgrades. 1.9 ppmv guarantee with LD to contract price
  - UCC – turnkey, system designed to minimize cost at every point, 1 ppmv guarantee offered with LD to contract price. Based on our experience their proposal is not a technically sound offer.
  - FLS – turnkey, we are not familiar with the construction partners, 5 ppmv guarantee with LD to 20% contract price
  - Clyde Bergemann – turnkey system, similar to our existing systems but equipment is sized small, 3-5 ppmv guarantee (not firm in the discussion) and not firm on extent of LD.
- All vendors owe further information/clarification by COB Tuesday August 4.
- Path forward to October investment committee is convoluted due to URS submittal. Planning to pick 1 or 2 dry vendor systems to continue commercial and technical conformance. Likely hire URS to perform an engineering study to price Ghent 2 (with common systems sized for all Ghent units).

- Budget – Spending $3M in 2010 is dependent on the procurement process and discussions surrounding delaying MC work.
- Testing – Contracts need to be placed and test plans need to be prepared on the following:
  - Notify Air Quality Services that they will be doing testing from 8/16-8/27 at Brown.
  - Notify Clean Air Engineering that they will be doing testing from 8/16-8/27 at Ghent.
  - Notify EON Engineering that they will be doing testing from 8/22-9/3 at Ghent.

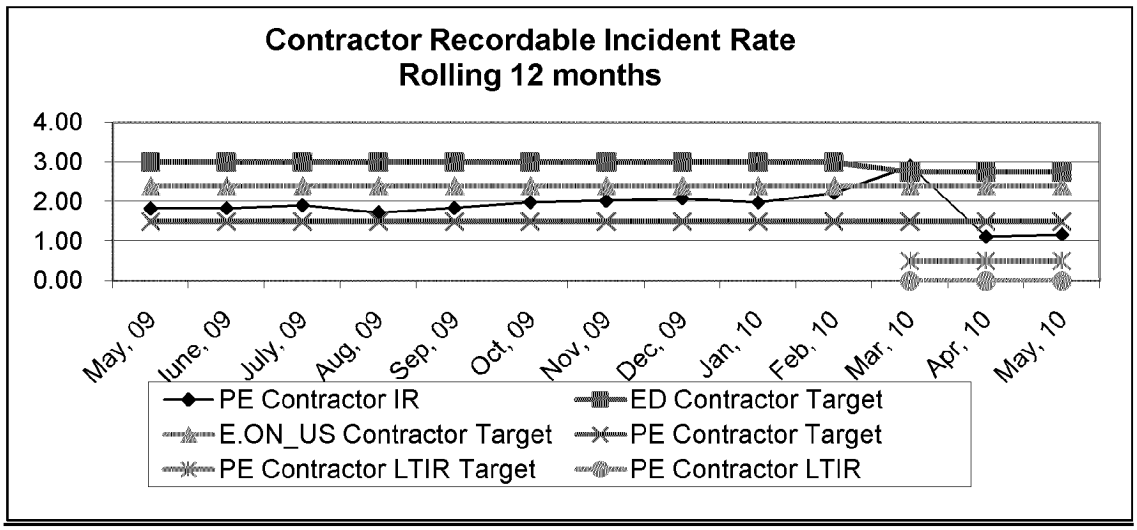
- **SO3 Mitigation (Ghent)**
  - Preparing for MgO injection at GH4.
  - Stoic Calculations for Ghent testing prepared.
  - B&V reworking SAM calculations for the Ghent Units based on Title V Heat Inputs..
  - B&V draft BACT analysis submitted and commented by E.ON.
  - B&V requested to prepare two more documents:
    - BACT based on 2005 RBLC database for emissions limits
    - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
  - LFG
    - Landfill Gas Sample Result completed – final sample report outstanding.
    - LFG Technologies completed landfill visits.
    - Draft report expected week of August 2.

- NBU CR – Complete draft of documents submitted July 20. E.ON comments submitted July 28. Final draft expected week of August 2.
- Biomass –
  - Complete draft report from B&V due the week of August 2.
  - Moore Ventures completed a fuel analysis assessment.
- CCS 100 MW Project – Prepared a SOW and RFP for study work regarding a DOE/State/E.ON project. Submitted comment to presentation to DOE. Project will not get funding for a 2016 100 MW project – as such internal work ceased prior to releasing RFP to Bechtel, Fluor, Battelle, and EPRI.
- FutureGen – NTR

- **General**
  - Impoundment Integrity Program – PE is transitioning this to Generation Services.
  - Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost. Plans are underway to extend the B&V contract to begin discussing various scenarios for compliance with upcoming environmental air regulations.
  - Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. A revised recommendation will be presented to officers within ES the week of 8/6/10.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP.
2. Philip Imber has submitted for two postings outside of ES.
3. Jason Finn has submitted for positions.
4. Charlie Jacobs, Lana Linkenhoker, Charlie White and Bill Moerhke out due to surgery/illness.

Energy Services - Bi-Weekly Update
August 16, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – NTR.
  - Schedule/Execution:
    - Ghent
      - Unit 4 ID Fans – On plan for fall outage.
      - Elevators - Abell Elevator Company has received the contract for their signature.
    - Brown
      - Fluor continues to work on punch-list items and demobilization activities.
      - On plan for Unit 1 outage tie-in.
      - Gypsum slurry sent to de-watering facility on 8/5.
      - Gypsum de-watering operational contract awarded to FPG.
      - MACTEC awarded engineering contract for coal yard extension. Soil borings and engineering have begun.
      - Paving scope bids received.
      - Elevator scope bids received.
  - Budget – NTR.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Bechtel has completed installation of the new burner parts. Meetings were held Aug 11-12 with Bechtel and DBEL to discuss operational issues and needed changes for restart. **The unit is behind schedule for the planned restart on Aug 16 due to air balancing issues and erroneous thermocouple readings.**
  - Budget – Minor additions made to MTP to account for staffing through 2011 and for the recently verbal agreement on FM and EE claim settlement.
  - Contract Disputes/Resolution:
    - Bechtel FM Claims – Verbal agreement on all FM and most EE claims reached. Comments sent to Bechtel on change order draft with expectations of reaching agreement on language of FM and EE claims the week of 8/16.
  - Issues/Risk:
    - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.

- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – Request to KYDAQ for station-wide SAM annual emission limit sent to KYDAQ on 7/30/10. Permit to construct SCR dependent on agreement with KYDAQ on SAM limit.
  - Engineering – proceeding as planned to support the spring 2012 in-service.
  - Budget - NTR
  - Contracting – NTR
  - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
  - Schedule/Execution –NTR
  - Permitting – NTR
  - Engineering/General:
    - Engineering of Voith scope, automation, historic preservation and de-watering in progress.
  - Budget:
    - NTR
    - Revised project sanction planned for August IC meeting
  - Contracting:
    - Negotiations held with Voith on 8/12-8/13 went very well. PE is still pushing negotiations to support IC review/approval in August, albeit very tight. Voith has agreed to defer the need to issue a PO for the remaining runners pending approval of EPC from IC in August.
  - Issues/Risk
    - Release of third unit runner to Voith is required in August to maintain schedule.
    - The tentative schedule for completion of all units by late 2014 is highly dependent on year-round dewatering.

- **Mill Creek Limestone Project**
  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering/General
    - Bids have been received for the maintenance building. PE is reviewing the bids and anticipates an award by 8/31.
    - Working with URS to develop RFQ for long lead equipment. (This process was delayed as options for Mill Creek Air Compliance were explored. Activities associated with ordering the limestone equipment will resume the week of 8/16)
  - Budget
    - AIP complete.
    - Revised cash flow reflected in 2011 MTP
  - Contracting – NTR
  - Issue/Risk – NTR

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. To date permitting process has gone well.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.
  - Working with UCC to update their equipment and material pricing.
  - 2010 budget reduced to $1m for this scope with the remainder moving to 2011.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - GSP's Flexible Membrane Liner (FML) and Geo-synthetic Clay Liner (GCL) scheduled to begin in September.
    - Work continues on fill placement and mechanically stabilized earth wall with the north and west dikes substantially completed.
    - Work has begun on both Emergency Spillways.
    - The fiberglass piping for the project has been substantially completed.
  - Budgeting – The $1.5m net against a project sanction of $25m net to fund modifying the GSP liner system to meet anticipated future regulations may require IC approval. PE is tracking the overall cost of the project against the remaining contingency before seeking increased authorization and revised AIP.
  - Engineering:
    - The study on the GSP clay liner originally installed to compare against potential new regulations has been completed. Path forward is to utilize the existing clay liner as part of a composite liner system.
    - A repair strategy for the BAP is being developed in response to the EPA Inspection in June 2009.
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk
    - Weather remains the biggest risk. The contractor has submitted a request for adjustments to the LDs due to the weather delays from 2009 and the wet winter and spring in 2010. The contractor has also submitted financial claims for delays. The claim is being reviewed by PE.
    - PE is developing plans to expedite the completion of the GSP and/or South Dike to help mitigate the high water elevations in the BAP.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering – The Detailed Engineering RFPs are being reviewed.
  - Permitting – Both the June and July Anabat studies have been completed for the Indiana Bat. A third party has reviewed the June data and confirmed no findings of the Indiana Bat. The July data is being prepared to be sent to the third party.
  - Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – PE is working with Zachry Engineering to perform a sanity high-level scope and estimate check against the B&V scope and estimate on CCR Transport system. This review is planned to wrap up by the end of August.
  - Engineering – Detailed Engineering of gypsum fines continues with Black & Veatch. Bids have been received and currently under review for the CCR transport Detailed Design. Procurement activities for the gypsum fines project are in progress. Drawings and Sepcifications for the Detailed Engineering for the Landfill have been submitted for review by EON-US.
  - Permitting – All permit applications have been made. PE is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues with the final step in the relocation process being approved by the Carroll County Fiscal Court on 8/10. The relocation will occur in September or October.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk:
    - Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter will be sent to the third remaining land owner the week of 8/16.

- **General CCP Projects**
  - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These costs have been included in PE's 2011 MTP draft.
  - PE is working with Legal and US EPA in regards to defense of the KPDES Permit

- **E.W. Brown Ash Pond Project**
  - **E.W. Brown Starter Dike**
    - Safety – NTR
    - Schedule/Execution:
      - Contract work remains under suspension. Summit demobilized 90% of equipment and performed requested grade work and site stabilization activity.

        - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
    - Budget – NTR
    - Contract Disputes/Resolution: NTR
    - Issues/Risk – Summit was given notice to suspend all work except rock placement and some minor activities beginning 7/6 until further notice.

- **E.W. Brown Aux Pond 900'**
    - Schedule/Execution:
        - Continued rock embankment blasting at the Houp Property.
        - Began rock embankment placement on the East side foundation.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
    - Safety – NTR
    - Schedule/Execution:
        - Held teleconferences with Nol-Tek and BCSI – both to provide initial draft of a conformed, redline version of the technical specification and GSA.
        - URS site visit to Ghent held on 8/12. URS to provide commercial response (GSA mark up and guarantee language) the week of 8/16. URS to provide a Ghent 2 technical proposal 9/10. Imber and Straight to visit URS in Austin on 8/23.
        - Sent letters of dismissal to the other three bidders.
            - FLS/CoaLogic – lack of competitive SO3 removal guarantee and the lack of a competitive commercial position regarding the SO3 removal
            - Clyde Bergemann - lack of a competitive the SO3 removal guarantee and no technical advancement
            - UCC – least robust system proposed, lack of confidence in the technical proposal as evaluated by the technical team
        - Path forward to October investment committee is convoluted due to URS submittal and the new options being considered at Mill Creek as a result of the fleet wide environmental studies.
    - Budget – Spending $3M in 2010 is dependent on the procurement process and discussions surrounding delaying MC work.
    - Testing – Contracts prepared but not finalized. Brown and Ghent testing plans published for Aug. 16 – Sep 3:
        - Air Quality Services will be doing testing from 8/16-8/27 at Brown.
        - Clean Air Engineering will be doing testing from 8/16-8/27 at Ghent.
        - EON Engineering will be doing testing from 8/22-9/3 at Ghent.

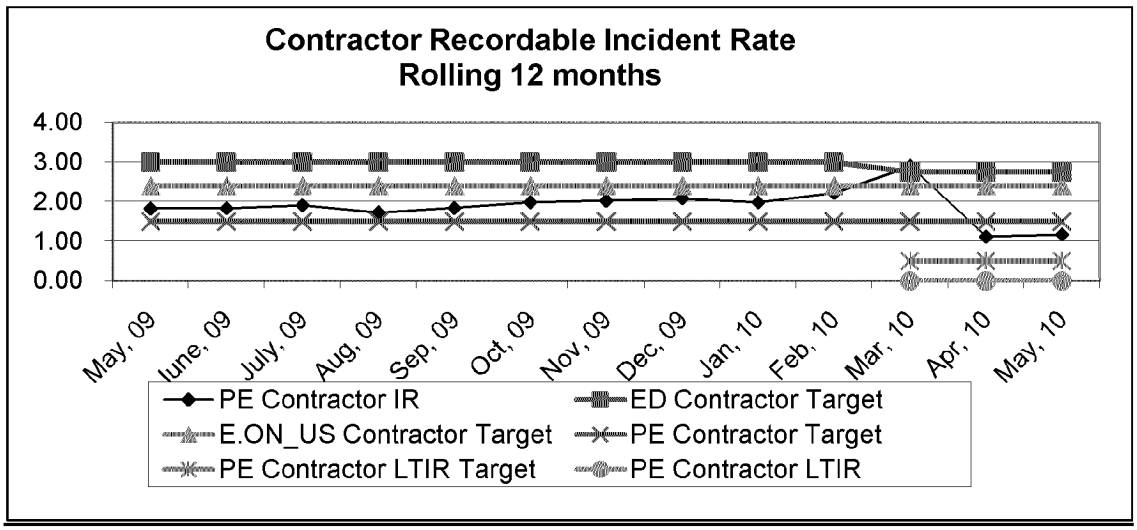
- **SO3 Mitigation (Ghent)**
    - AIPs being processed for each unit for $250k to allow charging of testing/engineering.
    - Preparing for MgO injection at GH4 with Breen. Breen has been at Ghent in preparation of the testing.

- Calculations for Ghent SAM life cycle reviewed with B&V. Four sets of calculations are being prepared:
  - Base calculation for BACT analysis with all layers of catalyst in place
  - Calculation based on exact operation today.
  - Calculation based on pre-FGD operation with 1.2 lb SO2/mmbtu fuel
  - Calculation pre-SCR operation with 1.2 lb SO2/mmbtu fuel
- B&V re-draft of BACT analysis and Life Cycle analysis expected week of 8/16
- B&V requested to prepare two more documents:
  - BACT based on 2005 RBLC database for emissions limits
  - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
  - LFG - LFG Technologies provided a draft report and updates based on E.ON comment.
  - NBU Cane Run
    - New pro-forma submitted.
    - Outstanding items to be completed: property line drawing and schedule updates
  - Biomass
    - Draft report received with E.ON comments being prepared to release to B&V the week of 8/16.
  - CCS 100 MW Project – Director of Business Development still working on contract with the state. PE in discussion with Battelle, Fluor, Bechtel and EPRI for support of this study work.
  - FutureGen – New project announced in Indiana as a Oxyfuel plant. Path forward for technical committee not identified at this time.

- **General**
  - Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost. Plans are underway to extend the B&V contract to begin discussing various scenarios for compliance with upcoming environmental air regulations. Over $1B removed from Mill Creek Air Compliance after meeting with Kirkland, PE and B&V senior level engineers.
  - Revised Air Compliance cash flows communicated within ES on 8/13. The three scenarios are for a 2014, 2015 and 2016 CATR with all three scenarios having a 1-year delay on HAPs to 2017.
  - Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. A revised recommendation will be presented to officers within ES the week of 8/6/10.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP.
2. Jason Finn has submitted for positions.
3. Charlie Jacobs, Lana Linkenhoker, Charlie White and Bill Moerhke out due to surgery/illness.

Energy Services - Bi-Weekly Update
August 27, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – The Ghent FGD Program has achieved 4.5 million safe work hours which will be celebrated on 9/2 at Ghent.
  - Auditing – Nothing to report (NTR).
  - Schedule/Execution:
    - Ghent
      - Unit 4 ID Fans – On plan for fall outage.
      - Elevators - Abell Elevator Company awarded contract.
      - Siding project nearing completion.
    - Brown
      - On plan for Unit 1 outage tie-in.
      - Gypsum De-watering Facility operation contract awarded to FPG.
      - E.W. Brown Coal Pile Modification
        - MACTEC continues engineering design.
        - KU transmission performed site visit for the rerouting of power feeds to the coal yard lighting and retention pond sump pumps.
      - Paving scope has been awarded to Asphalt Paving & Maintenance and is targeting a mid-September completion.
      - Elevator scope has been awarded to United Group Services with a targeted completion of February 2011.
  - Budget – Brown continues to trend slightly down from last month.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Burner test run of 8/20 was unsuccessful since slagging was still evident in the burners on E row. Burner damage was avoided and the E-row burners were fitted with the pumpkin tooth modification. Test run in progress that includes increased secondary air. If this is successful, then all burners may be revised with this modification and possibly with a further modification of "ski ramps" at the burner tip. **We are still working towards a substantial completion date of 10/12/10.** This impact to commissioning was communicated through a formal letter to KYPSC.
  - Budget – Minor additions made to MTP to account for staffing through 2011 and for the recently verbal agreement on FM and EE claim settlement.
  - Contract Disputes/Resolution:
    - Bechtel FM Claims – Change Order for the settlement on all FM and most EE claims expected to be signed the week of 8/30.

  - Issues/Risk:
    - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.
- **Brown 3 SCR**
  - Schedule/Execution – NTR
  - Permitting – Request to KYDAQ for station-wide SAM annual emission limit sent to KYDAQ on 7/30. Permit to construct SCR dependent on agreement with KYDAQ.
  - Engineering – proceeding as planned to support the spring 2012 in-service.
  - Budget - NTR
  - Contracting – NTR
  - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
  - Schedule/Execution –NTR
  - Permitting – NTR
  - Engineering/General - NTR
  - Budget – IC approved revised sanction of $130.5M on 8/26. Requires approval from E.ON first week in September and then PPL Transition on 9/14.
  - Contracting - Negotiations going very well with Voith. Contract in current form sent to review group. Majority of outstanding issues are exhibits, parent guarantee.
  - Issues/Risk
    - Release of third unit runner to Voith is required to maintain schedule.

- **Mill Creek Limestone Project**
  - Safety - NTR
  - Auditing - NTR
  - Permitting - NTR
  - Engineering/General
    - The erection of the maintenance building will be awarded to East and Westbrook.
  - Metso proposal is under review.
  - Budget – This project will remain in the 2011 MTP after reviewing dry-FGD for Mill Creek and determination dry scrubbing is much more expensive than the current wet scrubbing due to existing wet FGD infrastructure.
  - Contracting – NTR
  - Issue/Risk – NTR

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. To date permitting process has gone well.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR

- Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.
  - Working with UCC to update their equipment and material pricing.
  - 2010 budget reduced to $1m for this scope with the remainder moving to 2011.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - GSP's Flexible Membrane Liner (FML) and Geo-synthetic Clay Liner (GCL) scheduled to begin in September.
    - Work continues on fill placement and mechanically stabilized earth wall with the north and west dikes substantially completed.
    - Emergency Spillways progressing to plan.
    - The fiberglass piping for the project has been substantially completed.
  - Budget – NTR
  - Engineering:
    - Repair strategy for the BAP being developed in response to EPA Inspection in June 2009.
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk
    - Weather remains the biggest risk.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering – The Detailed Engineering RFPs are being reviewed.
  - Permitting – Both the June and July Anabat studies have been completed for the Indiana Bat. A third party has reviewed the June data and confirmed no findings of the Indiana Bat. The July data is being prepared to be sent to the third party.
  - Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – Zachry Engineering is performing a sanity high-level scope and estimate check against the B&V scope and estimate on CCR Transport system. This review is planned to wrap up by the end of August.
  - Engineering – Detailed Engineering of gypsum fines continues with B&V. Bids have been received and are under review for the CCR transport Detailed Design. Procurement activities for the gypsum fines project are in progress. Drawings and Specifications for the Detailed Engineering for the Landfill have been submitted for review by EON-US.

- Permitting – All permit applications have been made. PE is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues with the final step in the relocation process being approved by the Carroll County Fiscal Court on 8/10. The relocation will occur in September or October.
- Contract Disputes/Resolution – NTR
- Issues/Risk:
  - Land Acquisition – a final offer that discusses condemnation potential was sent to the McDole and Owens land owners. A second letter will be sent to the third remaining land owner the week of 8/16. McDole and Owens have requested a meeting which will take place the week of 8/30.

- **General CCP Projects**
  - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These costs have been included in PE's 2011 MTP draft.
  - PE is working with Legal and US EPA in regards to defense of the KPDES Permit

- **E.W. Brown Ash Pond Project**
  - **E.W. Brown Starter Dike**
    - Safety – NTR
    - Schedule/Execution:
      - Contract work remains under suspension. Summit re-mobilized the water truck to address the bottom ash stockpile and the haul road(s) present on the pond.
      - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
    - Budget – NTR
    - Contract Disputes/Resolution: NTR
    - Issues/Risk – Summit was given notice to suspend all work except dust control.

  - **E.W. Brown Aux Pond 900'**
    - Schedule/Execution:
      - Continued rock embankment placement on the East side foundation.
      - Began In-Situ foundation treatment on the Southeast and South expansion footprint.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:

        - Meeting held with BCSI on terms and conditions, with similar meeting planned with Nol-Tec 8/31.
        - Visited URS in Austin offices to discuss project. Conceptually agreed on a 3 ppm guarantee. URS remains on 40% LD only applied to the technology offering and they have not commented on the GSA. A full proposal is due 9/10. Considering the mid September submittal from URS, the proposed late September meeting with the EPA, the EPA visit to Ghent in October it is unlikely we will make a technology decision for an October investment committee. Potentially we can finalize negotiations in November and release contracts in December.
    - Budget – Spending $3M in 2010 is unlikely due to permit limit uncertainties and discussions surrounding delaying MC work.
    - Testing – Testing with AQS finalized at EW Brown on 8/27. Testing with Clean Air at Ghent extended to September 1. E.ON Engineering at Ghent continues into the week of August 30. [Getting Table from E. Davis to input into the report if possible today]

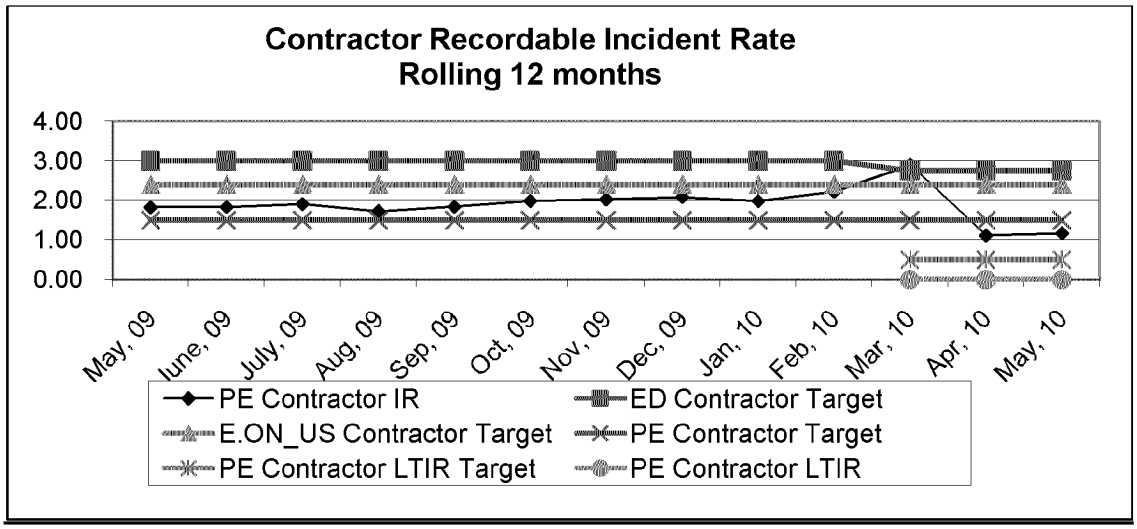
- **SO3 Mitigation (Ghent)**
    - MgO injection at GH1 with Breen was unsuccessful – the system provided was not capable of pumping the viscous material. We were unable to assess the value of MgO injection for slagging and SO3 reduction.
    - B&V Calculations:
        - Finalized Base calculation for BACT analysis with all layers of catalyst in place.
        - Calculation based on exact operation today.
        - Calculation based on pre-FGD operation with 1.2 lb SO2/mmBtu coal
        - Draft submitted on calculation pre-SCR operation with 1.2 lb SO2/mmBtu fuel
    - B&V re-draft of BACT analysis and Life Cycle analysis expected 8/27
    - B&V requested to prepare two more documents:
        - BACT based on 2005 RBLC database for emissions limits
        - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
    - LFG - LFG Technologies provided an update report and O&M costs.
    - NBU Cane Run - Feasibility Report Published
    - Biomass - Feasibility Report Published.
    - CCS 100 MW Project – Expect to release an RFP the week of 8/30 to Battelle, Fluor, Bechtel and EPRI for support of this study work.
    - FutureGen – NTR.

- **General**
    - Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost. Working on the B&V contract to begin Level I engineering on the various scenarios for compliance with upcoming air regulations. Over $1B removed from Mill Creek Air Compliance after meeting with Kirkland, PE and B&V senior level engineers. A kickoff for the Mill Creek program has been scheduled for September 15, 2010.
    - Impoundment Integrity Program – A meeting is planned with Executive Management to share the final recommendation for the new policy on September 1, 2010.

- Working on adding to the Revised Air Compliance cash flows communicated within ES on 8/13 that included a 2014, 2015 and 2016 CATR with all three scenarios having a 1-year delay on HAPs to 2017. Additional cash flows will be for the previous CATR cases with zero delay on HAP to January 2016.
- Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. Meeting scheduled with PWT for 9/1/10.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP, illnesses, and attrition from retirements and transfers.
2. Charlie Jacobs, Lana Linkenhoker, Charlie White and Bill Moerhke out due to surgery/illness.

From:	Hillman, Timothy M.
To:	Saunders, Eileen
CC:	168908 E.ON-AQC; Jackson, Audrey; Mooney, Mike (BOC 3); Wehrly, M. R.; Lucas, Kyle J.; Hillman, Timothy M.
Sent:	9/24/2010 12:36:44 PM
Subject:	168908.21.0100 100924 - Project Instruction Memorandum (PIM)
Attachments:	168908 EON Phase II AQC Study PIM 092410.pdf

Eileen,

As we discussed in our kickoff meeting, please find attached a copy of the Project Instruction Memorandum (PIM). The purpose of the PIM is to summarize the procedures and information that will be used by Black & Veatch in support of developing the Phase II Air Quality Control (AQC) Study for E.ON. It is our understanding that E.ON may duplicate this procedure and file system for your own record and document storage.
Please let us know if you have any questions.

Best regards,

Tim Hillman | Project Manager
Power Generation - Environmental Services
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: **(913) 458-7928**
Email: **hillmantm@bv.com**

BLACK & VEATCH CORPORATION
Power Generation

PROJECT INSTRUCTIONS MEMORANDUM

E.ON
Air Quality Control Study

B&V Project 168908
B&V File 21.0100
September 24, 2010

To: Distribution

From: Tim Hillman

The purpose of this Project Instructions Memorandum (PIM) is to summarize the procedures and information that will be used by Black & Veatch in support of developing the Air Quality Control (AQC) Study for E.ON.

1.0 PROJECT ADMINISTRATION

1.1 Scope of Services: Black & Veatch will provide engineering services in accordance with E.ON U.S. Services Inc. Company CONTRACT No. 496789, Phase II: Air Quality Control Study for: E.W. Brown Units 1, 2, and 3, Ghent Units 1, 2, 3, and 4, and Mill Creek Units 1, 2, 3, and 4, dated September 08, 2010.

The purpose of this scope of work is to build upon the previous fleet-wide, high-level air quality technology review and cost assessment conducted for six E.ON facilities (Phase I) in order to develop a facility-specific project definition consisting of a conceptual design and a budgetary cost estimate for selected air quality control technologies (Phase II). The Phase II scope of work is proposed for the Mill Creek, Ghent, and E.W. Brown facilities, and will be composed of the tasks listed below and deliverables listed in the contract to ensure that the study is properly defined, documented, and completed on time. It should be noted that there are some scope differences between the three facilities because of variations in the complexity of the future AQC equipment scenarios for each. These differences in study scope are noted in the contract in the appropriate tasks and reflected in the cost estimate. For the purpose of this project, E.ON's Mill Creek facility will be the first facility to begin the Phase II services, with the Ghent and E.W. Brown facilities to have a staggered kick-off delay of approximately 1 month each.

The following coal-fired units will be included in this study:

- Mill Creek –Units 1, 2, 3, and 4.
- Ghent –Units 1, 2, 3, and 4
- E.W. Brown –Units 1, 2 and 3.

The project includes the following major tasks:

Task 1 – Project Initiation, Kick-off, and Site Visit
Task 2 – Environmental Regulatory Considerations
Task 3 – Develop Project Instruction Memorandum
Task 4 – Project Management
Task 5 – Develop Project Design Memorandum
Task 6 – AQC Technology Validation/Selection
Task 7 – Develop Preliminary Conceptual Design
Task 8 – Project Cost Estimate

Task 9 – Implementation Schedule
Task 10 – Constructability Plan
Task 11 – Evaluation Report

1.2 Project Numbers: Black & Veatch project number 168908 has been assigned along with the following phases for these engineering activities:

Phase	Description
0100	Project Initiation
X010	Project Management
X020	Kick-off Meeting
X030	Regulatory
X040	Fabric Filter Specification
X050	AQC Validation
X060	Conceptual Design
X070	Cost Estimate
X080	Implementation Schedule
X200	Constructability Plan
X090	Report

Phase numbers will be specific for each facility. "X" will be 1 for Mill Creek, 2 for Ghent, and 3 for E.W. Brown facilities.

1.3 Black & Veatch Personnel

Following are the key Black & Veatch personnel assigned to the Implementation Plan for Emissions Control Upgrades.

Name	Position	Telephone	E-Mail
Tim Hillman	Project Manager	913-458-7928	hillmantm@bv.com
Mike King	Regional General Manager	313-618-8657	Kingml@bv.com
Kyle Lucas	Environmental & Assistant PM	913-458-9062	lucaskj@bv.com
Anand Mahabaleshwarkar	Lead AQCS Engineer	913-458-7736	mahabaleshwarkara@bv.com
Stacy Lawson	Project Support Assistant	913-458-2801	lawsonsj@bv.com
M.R. Wehrly	Engineering Manager/Lead Mechanical Engineer	913-458-7131	wehrlymr@bv.com
Rick Lausman	AQCS Engineer	913-458-7528	lausmanrl@bv.com
Monty Hintz	Lead Civil/Structural Engineer	913-458-2464	hintzme@bv.com

Name	Position	Telephone	E-Mail
Jim Bayless	Lead Control/Electrical Engineer	913-458-8107	baylessjw@bv.com
Mike Preston	Lead Chemical Engineer	913-458-2626	prestonmc@bv.com
Mark Dittus	Lead Steam Generation Engineer	913-458-7133	dittusm@bv.com
Jonathan Crabtree	Mechanical Engineer	913-458-2403	crabtreejd@bv.com
Mike Ballard	Construction Support Manager – Mill Creek	913-458-4341	ballardmw@bv.com
Roger Goodlet	Construction Support Manager – Ghent and E.W. Brown	913-458-4134	goodletrf@bv.com
Tim VanGilder	Project Controls Manager	913-458-8811	vangilderth@bv.com
Ron Fields	Lead Estimator	913-458-8531	fieldsrl@bv.com
Mirka Kramarikova	Accountant	913-458-8355	kramarikovam@bv.com

Correspondence to B&V should be directed to Tim Hillman with a copy to Kyle Lucas.

When it is necessary to correspond by US Postal Service or courier, the following addresses shall be used:

Black & Veatch Corporation
11401 Lamar Avenue
Overland Park, KS 66211

Attn: Mr. Timothy M. Hillman
Project: E.ON - AQC Study

Owner Personnel

Listed below are the key E.ON project personnel for the AQC Study:

Name	Position	Telephone	E-Mail
Corporate			
Eileen Saunders	Project Manager	502-627-2431 At Ghent: 502-347-4023.	eileen.saunders@eon-us.com
Mike Mooney	Budget Analyst	502-627-3571	Mike.mooney@eon-us.com
Audrey Jackson	Administrative Assistant		Audrey.Jackson@eon-us.com
Scott Straight	Director – Project Engineering	502-933-6559	Scott.straight@eon-us.com
Mill Creek			
Alex Betz	Mechanical Engineer – Mill Creek	502-933-6602	Alex.betz@eon-us.com
Ghent			
(Later)			
Brown			
(Later)			

All correspondence and documents that deal with either the general nature or specific details of the project should be directed to Eileen Saunders. Audrey Jackson shall be copied on all E-mail correspondence. Mike Mooney shall be copied on Monthly Reports and invoices.

Eileen Saunders should be copied on all correspondence directly to/from the specific facility.

When it is necessary to correspond to Eileen Saunders by US Postal Service or courier, the following address should be used:

E.ON U.S. Services, Inc.
Project Engineering
820 W. Broadway
Louisville, KY 40202

Invoices should be directed to:

Original: E.ON U.S. Services Inc.
820 West Broadway
Louisville, KY 40202
Attn: Judy Disney

Copy:	E.ON U.S. Services Inc. 820 West Broadway Louisville, KY 40202 Attn: Eileen Saunders	
Copy:	Mike Mooney – mike.mooney@eon-us.com	
Invoice Information	CPA Number	
	Project #	TBA
	Task #	TBA
	E.ON U.S. Contact	Eileen Saunders
	Contractor Contact	Tim Hillman

CONTRACTUAL NOTICES

See the Article titled "Notices" in the Standard Terms for provisions governing contractual notices. In addition, a copy of all notices to E.ON U.S. Services Inc. shall be sent to:

E.ON U.S.'s address:	E.ON U.S. Services Inc. 820 West Broadway Louisville, KY 40202 Attn: Joe Clements (502) 627-2760 E-mail: Joe.clements@eon-us.com
Contractor's Address:	Mike King, P.E. Regional General Manager Black & Veatch 3550 Green Court Ann Arbor, MI. 48105 Phone: (734) 622-8516 Fax: (734) 622-8700 E-mail: kingml@bv.com
Copy to:	Tim Hillman Project Manager Black & Veatch 11401 Lamar Avenue Overland park, KS 66211 Fax: (913) 458-7928 E-mail: hillmantm@bv.com

1.5 Document Control

All correspondence, memoranda, and other documents shall indicate the B&V project and file number(s). B&V project files will be maintained in the bvdocs docbase in Documentum by the Project Support Assistant. The project mailbox (168908 E.ON-AQC@bv.com) shall be included on distribution of all electronic files for that purpose. All e-mail correspondence shall also include the B&V project number, file number, date (yymmdd format), Facility and Unit Number, and a general description of the topic (e.g. 168908.21.0000 100912 Mill Creek Unit 1 Program Instructions) in the subject line.

Any documents received that are not practical to scan and place in Documentum will be placed into a traditional "hardcopy" file.

All correspondence sent to E.ON shall also be sent to E.ON's internal Administrative Assistant at Audrey.Jackson@eon-us.com.

1.6 Electronic File Transfer

E-mail will normally be used for the transfer of most electronic files between E.ON and B&V as well as to third parties. Larger files and data will be made available to the appropriate parties by using IBackup which is a web based data storage service. Once iBackup database has been established for this project, access instructions and passwords will be issued. An IBackup account has been established for each E.ON site. B&V will distribute the usernames and passwords to E.ON site contacts.

1.7 File System

The file numbers (attached) have been extracted from the standard Black & Veatch file system and will be used. When it is necessary to expand this list, B&V's standard file system shall be utilized for obtaining new file numbers. The Project Support Assistant is responsible for maintaining this list and keeping it up to date.

E.ON is setting up a similar file structure for their internal use. All correspondence to E.ON shall be copied to their Administrative Assistant at Audrey.Jackson@eon-us.com

2.0 Project Schedule:

Major Milestone Schedule			
Activity	**Mill Creek**	**Ghent**	**Brown**
Notice to Proceed	Aug 26, 2010	Aug 26, 2010	Aug 26, 2010
Project Kickoff and Site Visit Meeting (Task 1)	Sep 14, 2010	Oct 4, 2010	Nov 8, 2010
Begin AQC Validation (Task 6)	Sep 7, 2010	Oct 11, 2010	Nov 15, 2010
Select AQC Technologies - Meeting (Task 6)	Nov 8, 2010	Dec 6, 2010	Jan 10, 2011
Begin Conceptual Design (Task 7)	Nov 15, 2010	Dec 13, 2010	Jan 17, 2011
Begin Cost Estimate (Task 8)	Dec 13, 2010	Jan 10, 2011	Feb 7, 2011
Issue Draft Report (Task 11)	Feb 7, 2011	Mar 14, 2011	Apr 11, 2011
Final Report – Presentation Meeting (Task 11)	Mar 7, 2011	Apr 11, 2011	May 7, 2011

2.1 Progress Reporting

Face-to-face meetings and/or conference calls will be carried out as appropriate. Weekly meetings will typically take place by telephone. B&V will prepare meeting agendas and an action item list for weekly meetings. In addition, monthly progress reports will be prepared by B&V and issued to E.ON.

2.2 Action Item List

B&V will prepare and maintain an Action Item List to track status of pending actions and to identify responsible parties. This document will be reviewed and updated as part of each weekly meeting or conference call. The Action Item List shall contain specific sections for General, Mill Creek, Ghent, and E.W. Brown.

3.0 Conceptual Design

Any documents to be prepared by B&V including sketches, drawings, and calculations, will be prepared in standard B&V format. Drawings and sketches will be numbered in accordance with B&V standard practice.

4.0 Procurements

B&V's scope includes development of technical specifications for the purchase and erection of Fabric Filters for the various units requiring Fabric Filters as part of the AQC Study. Specifications will include technical specifications developed by B&V along with Front End Documents and General Conditions as developed by E.ON.

5.0 PIM Distribution:

E.ON

Eileen Saunders (All by e-mail)
Mike Mooney
Audrey Jackson

Black & Veatch

Tim Hillman (All by e-mail)
Kyle Lucas
Anand Mahabaleshwarkar
Stacy Lawson
M.R. Wehrly
Monty Hintz
Jim Bayless
Mike Preston
Mark Dittus
Jonathan Crabtree
Mike Ballard
Roger Goodlet
Tim VanGilder
Ron Fields
Mirka Kramarikova
Mike King
Rick Lausman

FILE NUMBER LIST

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
10.0000	Project Administration
10.1000	Proposal Management
10.1100	Proposal Correspondence
10.2000	Proposal
10.2200	Project Cost & Schedule
10.2224	Engineering Rates
10.2240	Schedule
11.0000	Contracts (Agreements)
11.1000	Contract with Owner (B&V/Owner, JV/Owner, Consortium/Owner)
11.1200	Contract Documents
11.1210	Master Services Agreements
11.1300	Invoicing Correspondence & Payments
11.1400	Change Orders
11.1410	Change Order Requests
11.1500	Contract Correspondence
11.4200	Project and Phase Opening/Closing/Updates
11.4300	Project Reports
12.0000	Consultant Subcontracts (Subconsultant Agreements)
13.0000	Client/Owner Third Party Agreements
14.0000	Internal Communication
14.1000	Meetings & Conferences (Agenda/Minutes)
14.1100	Conference - B&V/Owner
14.1200	Conference - B&V/Others/Owner
14.1300	Conference - Owner and/or Owner/Others
14.1400	Conference - B&V
14.3000	General
14.4000	B&V/Client General Communications (Note - Limit use of this folder)
14.4100	B&V/Client Correspondence
15.0000	Public Information/Relations
17.0000	Environmental, Safety, Health and Security
18.0000	Quality Assurance
20.0000	Project Management
21.0100	Project Instructions Manual/Memorandum
21.0120	File System
21.1100	Project Contact and Distribution List
21.2000	Staffing Plan
21.2100	Engineering Budget/Resource Allocation
22.0000	Design Management
22.1000	Project Design Memorandum and Project Design Basis Document
22.5000	Drawing Numbering System
24.0000	Schedule Management
24.2000	Project Schedules (also see 41.0807)
25.0000	Financial Management
25.2000	Owner Cost Estimate
25.5200	O&M Costs
25.5500	Project Cost and Invoice Spreadsheet
25.5600	Manhour Tracking
26.0000	Information Management

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
26.1000	IT Plan
26.1100	Drop Zone
26.1200	VOIP
26.1300	Documentum
26.1400	B&V Letter Log
26.1500	Project Mailbox
26.6000	Engineer's Drawings (Lists)
26.6100	B&V Drawing Log
26.7000	Manufacturers' Drawings (Lists)
28.0000	Progress Reports
28.3000	Action Item Summary
28.5000	Project Progress Reports
30.0000	Permits, Licensing & Regulatory Requirements
32.0000	Regulatory Requirements/Issues
33.3000	Environmental Reports
34.0000	Permits
40.0000	Engineering Studies & Analysis
41.0000	General Studies, Fixed Criteria, Natural Phenomena
41.0100	Information, Drawings, and Photos
41.0130	Permit Data
41.0140	Engineering Data
41.0141	Owner Civil-Str Data
41.0142	Owner Mech Data (Including Fuel)
41.0143	Owner Elect Data and Assumptions Memo
41.0144	Owner Control Data
41.0145	Owner Chem-Water Data
41.0147	Economic Criteria
41.0149	Owner Performance, Staffing, and Other Data
41.0150	Existing Drawings
41.0151	Owner Civil-Str Dwgs
41.0152	Owner Mech Dwgs
41.0153	Owner Elect Dwgs
41.0154	Owner Control Dwgs
41.0155	Owner Chem-Water Dwgs
41.0160	Photographs
41.0161	Aerial Photos
41.0162	B&V Photos of Site
41.0163	Photos from EON Personnel
41.0402	Site Arrangement
41.0800	Generation Plant Planning
41.0801	Auxiliary Loads
41.0809	Emissions Study
41.0803.1	Project Design Memorandum (PDM)
41.0803.2	Technology Description
41.0803.3	BACT-Level Cost Estimate
41.0803.4	Analyses
41.0803.5	Study of Alternatives
41.0804	Modifications, Interfaces and Tie-Ins to Existing Equipment and Systems

E.ON
Phase II: AQC Study
Conceptual Design and Budgetary Cost Estimate

Project File Number System
168908.21.0120

FileNumber	Title
41.0805	Cost Estimate and Assumptions
41.0805.1	O&M Costs
41.0805.2	Owner's Costs
41.0805.3	Contingency
41.0805.4	Escalation
41.0806	Integrated Resource Plan (IRP) Support
41.0807	Level 1 Schedule
41.0807.1	Decision Point Schedule
41.0808	Report
41.0808.1	Executive Summary
41.0809	Auxiliary Electric System Analysis
41.0810	Chimney Analysis
41.0811	SCAT (M10) Runs
41.0812	Scrubber Water Mass Balances
41.0813	Constructability Review
41.0814	Higher Air Heater Outlet Temperatures
50.0000	Engineering Design (Calculations, Drawings, etc.)
60.0000	Plant Equipment Procurement
70.0000	Construction & Constructability Review
80.0000	Construction Management
90.0000	Project Completion

From: Saunders, Eileen
To: Whitworth, Wayne
CC: Clements, Joe
Sent: 9/21/2010 2:04:20 PM
Subject: FW: ssa - black and veatch
Attachments: [Untitled].pdf

Wayne,

I am re-forwarding the copy of the SSA that I forwarded to you back on September 9, 2010 for B&V. Rusty's cover letter states that the SSA was approved electronically.

Thank you,

Eileen

-----Original Message-----
From: Saunders, Eileen
Sent: Thursday, September 09, 2010 11:22 AM
To: Mooney, Mike (BOC 3)
Cc: Whitworth, Wayne; Straight, Scott; Reed, Kathleen
Subject: FW: ssa - black and veatch

Mike,

Here is the signed SSA for B&V. Hopefully the AIP is still getting routed for approvals. Please let me know the status.

Thanks,

Eileen

-----Original Message-----
From: Hudson, Rusty
Sent: Thursday, September 09, 2010 11:21 AM
To: Saunders, Eileen
Cc: Disney, Judy
Subject: FW: ssa - black and veatch

Eileen, here is the signed award rec. for B&V environmental air engineering. Rusty

-----Original Message-----
From: MARISA.MOSS@EON-US.COM [mailto:marisa.moss@eon-us.com]
Sent: Thursday, September 09, 2010 11:10 AM
To: Hudson, Rusty
Subject: ssa - black and veatch

Russel A. Hudson
Director, Generation Acctg and Budgeting

220 West Main Street
Louisville, Kentucky 40202
T (502) 627-3661
F (502) 627-2665
Rusty.hudson@eon-us.com

September 3, 2010

To: John Voyles
Ralph Bowling
Paul Thompson
Brad Rives
Vic Staffieri

Re: Sole Source Authorization – Black & Veatch

The Black & Veatch sole source authorization for $2.0m to continue advancing engineering on the 2011 MTP environmental air compliance was approved electronically by the Investment Committee on September 2, 2010. A copy of the approval notification is attached.

Please let me know of any questions that you have, and kindly return this to me after signing.

Rusty Hudson
Rusty Hudson

Attachment

Investment Proposal for IC:	August 31, 2010
Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $4 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes approximately $3 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

sole source award on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering 9/3/10

John Voyles
VP Transmission & Gen. Services 9/7/10

Ralph Bowling
VP Power Production

Paul Thompson for P. Thompson
Paul Thompson 9/7/10
SVP Energy Services

Brad Rives
Chief Financial Officer 9/9/10

Victor A. Staffieri
Chief Executive Officer

Hudson, Rusty

From: Kuhl, Megan
Sent: Thursday, September 02, 2010 9:28 AM
To: Hudson, Rusty
Subject: FW: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects
Attachments: 2011 MTP Level I Engineering - Air Compliance Projects.docx

The MTP Engineering proposal has been approved by the Investment Committee.

From: Kuhl, Megan
Sent: Friday, August 27, 2010 11:34 AM
To: Rives, Brad; Thompson, Paul; McCall, John; Hermann, Chris
Cc: Garrett, Chris; Neal, Susan; Blake, Kent; Kaiser, Pat
Subject: E-MAIL VOTE SOLICITED: MTP Engineering - Air Compliance Projects

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, state and federal air compliance regulations through 2016.

Authority is also requested for a sole source award to Black & Veatch (B&V) engineering firm for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Please send your approval/rejection by COB Wednesday, September 1.

Thank you,

Megan Kuhl
Financial Analyst I, Financial Planning
E.ON U.S.
(502) 627-3716
megan.kuhl@eon-us.com

From: Waterman, Bob
To: Straight, Scott
Sent: 8/12/2010 10:31:46 AM
Subject: PE's Bi-Weekly Update of 7-30-10 RCWa Comments_11Aug10.docx
Attachments: PE's Bi-Weekly Update of 7-30-10 RCWa Comments_11Aug10.docx

Scott:

I am forwarding my edits of the progress report for Mr. Thompson directly to you as I am not certain when Jeff Heun is returning from vacation. Previously, you had requested that we combine our reports.

RCWa

Energy Services - Bi-Weekly Update
July30, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – NTR.
  - Schedule/Execution:
    - Ghent
      - Chimney Coatings – Testing of the coating application remain.
      - SCR/FGD Icing Siding – Installation nearing completion.
      - Unit 4 ID Fans – An outage kickoff meeting is planned for 8/4/10.
      - Chimney Capping – Caps placed by helicopter on both chimneys on 7/25/10.
      - Elevators - Award Recommendation is circulating for signatures.
    - Brown
      - The FGD continues to operate very well.
      - E.W. Brown Gypsum Dewatering Facility
        - Product to be sent to the facility next week for final commissioning activity. This was delayed a week due to high ash content in gypsum stream.
        - Facility operation award recommendation being routed for signatures.
      - E.W. Brown Coal Pile Modification
        - Bid received for engineering from MACTEC and PO under development.
      - Balance of Project Items
        - Paving scope out for bid
        - Elevator scope out for bid
  - Budget – Slight reduction in the total Brown FGD Program ITC to $408.8m.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks - NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Bechtel has installed new secondary burner air barrels. The first deliveries of new primary air and core air assemblies have begun to arrive. We continue to work with Bechtel and Fuels to source an alternate coal until the permanent burner solution is installed. **Bechtel anticipates restarting the unit mid-August with a new substantial completion date of 10/12/10.** This impact to commissioning was communicated through a formal letter to KYPSC.
  - Budget – Minor additions made to MTP to account for staffing through 2011 and for the recently verbal agreement on FM and EE claim settlement.
  - Contract Disputes/Resolution:

        - Bechtel FM Claims – Verbal agreement on all FM and most EE claims reached. Written agreement expected within next two weeks.
    - Issues/Risk:
        - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.

- **Brown 3 SCR**
    - Schedule/Execution – NTR
    - Permitting – Request to KYDAQ for station-wide SAM annual emission limit sent to KYDAQ on 7/30/10. Permit to construct SCR dependent on agreement with KYDAQ on SAM limit.
    - Engineering – proceeding as planned to support the spring 2012 in-service.
    - Budget - NTR
    - Contracting – IC approved award of Hot Water Recirc to Alstom in the July IC meeting.
    - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
    - Schedule/Execution –NTR
    - Permitting – NTR
    - Engineering/General:
        - Reviewing Voith updated scope for rehabilitation minus automation.
        - Reviewing Historic Preservation and Maintenance Plan developed in 2008.
    - Budget:
        - Total roll up of estimate to complete work under a lump sum to Voith Hydro is essentially at 2010 MTP values. PE continues to assemble pricing for work outside hydro vendor scope.
        - Revised project sanction planned for August IC meeting
    - Contracting:
        - Negotiations with Voith are progressing well. Voith has agreed to defer the need to issue a PO for the remaining runners pending approval of EPC from IC in August.
    - Issues/Risk
        - Release of third unit runner to Voith is required in August to maintain schedule.
        - The tentative schedule for completion of all units by late 2014 is highly dependent on year-round dewatering.

- **Mill Creek Limestone Project**
    - Safety - NTR
    - Auditing - NTR
    - Permitting - NTR
    - Engineering/General
        - Pre-bid meeting for the building extension work was held at Mill Creek on July 8, 2010 and bids were received July 23, 2010.
        - Working with URS to develop RFQ for long lead equipment.
    - Budget
        - AIP complete.
        - Revised cash flow reflected in 2011 MTP

- Contracting – NTR
- Issue/Risk – Potential delay in awarding the equipment and engineering for the verti-mills as the impacts of the new air regulations are being assessed.

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. Preparing to respond to comments on the 404 and Landfill Permit applications. To date permitting process has gone well.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Meeting with the Plant and the engineer to discuss a reduced scope landfill that would facilitate the construction of a CCGT.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.
  - Working with UCC to update their equipment and material pricing.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - Gypsum Storage Pond is being prepared for the installation of the Flexible Membrane Liner (FML) and a Geosynthetic Clay Liner (GCL) scheduled to begin in September.
    - Work continues on the fill placement and mechanically stabilized earth (MSE) wall for the north, south, and west dikes. The north and west dikes have been substantially completed.
    - Work has begun on both Emergency Spillways.
    - The fiberglass piping for the project has been substantially completed.
  - Budgeting – The additional $1.5m net against a project sanction of $25m net to fund modifying the GSP liner system to meet anticipated future regulations will require IC approval and a revised AIP.
  - Engineering:
    - The study on the GSP clay liner originally installed to compare against potential new regulations has been completed. Path forward is to utilize the existing clay liner as part of a composite liner system with a Geosynthetic Clay Liner to meet proposed new regulations before the pond is placed into service.
    - A repair strategy for the BAP is being developed in response to the EPA Inspection in June 2009.
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk

- Weather remains the biggest risk. The contractor has submitted a request for adjustments to the LDs due to the weather delays from 2009 and the wet winter and spring in 2010. The contractor has also submitted financial claims for delays. The claim is being reviewed by Project Engineering.
- PE is developing plans to expedite the completion of the GSP and/or South Dike to help mitigate the high water elevations in the BAP.

- **TC CCP Project – Landfill**
  - Schedule/Execution - NTR
  - Budgeting - NTR
  - Engineering – The Detailed Engineering RFPs are being reviewed.
  - Permitting – Both the June and July Anabat studies have been completed for the Indiana Bat. A third party has reviewed the June data and confirmed no findings of the Indiana Bat. The July data is being prepared to be sent to the third party. A meeting with US F&W was held on Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
  - Schedule/Execution – NTR
  - Budget – Conceptual Engineering on the CCP transport systems has resulted in a refined estimate that is significantly over the original amount included in the project ECR filings. PE will continue working with B&V and station management through the 2011 MTP development to refine the scope and reduce the cost impact.
  - Engineering – Detailed Engineering of gypsum fines continues with Black & Veatch. Bids have been received and currently under review for the CCP transport Detailed Design. Procurement activities for the gypsum fines project are in progress. Drawings and Sepcifications for the Detailed Engineering for the Landfill have been submitted for review by EON-US.
  - Permitting – All permit applications have been made. Project Engineering is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues. The final step in the relocation process was the approval of the Carroll County Fiscal Court, which was received on Tuesday, 10Aug10. The relocation will occur in September or October. Contract Disputes/Resolution – NTR
  - Issues/Risk:
    - Land Acquisition – a final offer that will discuss condemnation potential will be sent to the remaining three land owners in early July. A final recommendation will be presented to management for approval on whether to change designs or condemn the remaining property in late July.

- **General CCP Projects**
  - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential

additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These cost have been included in PE's 2011 MTP draft.

- Project Engineering is working with EON US Legal and US EPA in regards to defense of the KPDES Permit

- **E.W. Brown Ash Pond Project**
  - Safety – NTR
  - Schedule/Execution:
    - Work on Phase I is being suspended until a decision is made on whether to convert the main pond to a landfill.
    - Working on evaluation and recommendation paper for the main pond conversion from a pond to a landfill .
    - Aux Pond Phase II work awarded to Charah.
  - Budget – NTR
  - Contract Disputes/Resolution - NTR
  - Issues/Risk – A decision is required in July on whether to continue with the Main Pond or convert to a dry landfill. Economics indicate conversion now to be least cost compared to continuing with pond and then converting once regulations are final.

- **E.W. Brown Ash Pond Project**
  - **E.W. Brown Starter Dike**
    - Safety – (0) Recordable
    - Schedule/Execution:
      - Contract work remains under suspension except for rock embankment placement, dust control, and general site maintenance.
      - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
      - Rock placement continued on the West and South Embankments.
    - Budget – NTR
    - Contract Disputes/Resolution: NTR
    - Issues/Risk – Summit was given notice to suspend all work except rock placement and some minor activities beginning July 6th until further notice.

  - **E.W. Brown Aux Pond 900'**
    - Schedule/Execution:
      - Installation of erosion and sediment control measures.
      - Topsoil stockpiles were relocated.
      - Began rock embankment blasting at the Houp Property.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:

- Proposals for MC3, MC4, BR3 and GH2 released June 29 to URS, Nol-Tek, UCC, FLsmidth, ClydeBergemann, and BCSI received July 20.
- Bid review meetings held with stations and all suppliers July 26 & 28.
- Initial team evaluation sheets due COB Friday July 30. Summary discussion meeting to be set the week of Aug. 2.
- Bid Summary – dry system pricing ranges from $2.2 to $6.3M per system with numerous clarifications and further engineering to be performed and evaluated. **Meaningful pricing not submitted for the wet system.**
  - URS – only offered core technology equipment, no BOP, no construction. 2 ppmv guarantee at the stack with LD to 10% of equipment cost
  - Nol-Tec – turn-key offer, similar to our existing systems with substantial upgrades. 2 ppmv guarantee with LD to contract price
  - BCSI – turnkey in concept, construction partners not finalized (systems pre-packaged to minimize on site fabrication). Highly redundant process, similar to our existing systems with upgrades. 1.9 ppmv guarantee with LD to contract price
  - UCC – turnkey, system designed to minimize cost at every point, 1 ppmv guarantee offered with LD to contract price. Based on our experience their proposal is not a technically sound offer.
  - FLS – turnkey, we are not familiar with the construction partners, 5 ppmv guarantee with LD to 20% contract price
  - Clyde Bergemann – turnkey system, similar to our existing systems but equipment is sized small, 3-5 ppmv guarantee (not firm in the discussion) and not firm on extent of LD.
- All vendors owe further information/clarification by COB Tuesday August 4.
- Path forward to October investment committee is convoluted due to URS submittal. Planning to pick 1 or 2 dry vendor systems to continue commercial and technical conformance. Likely hire URS to perform an engineering study to price Ghent 2 (with common systems sized for all Ghent units).

- Budget – Spending $3M in 2010 is dependent on the procurement process and discussions surrounding delaying MC work.
- Testing – Contracts need to be placed and test plans need to be prepared on the following:
  - Notify Air Quality Services that they will be doing testing from 8/16-8/27 at Brown.
  - Notify Clean Air Engineering that they will be doing testing from 8/16-8/27 at Ghent.
  - Notify EON Engineering that they will be doing testing from 8/22-9/3 at Ghent.

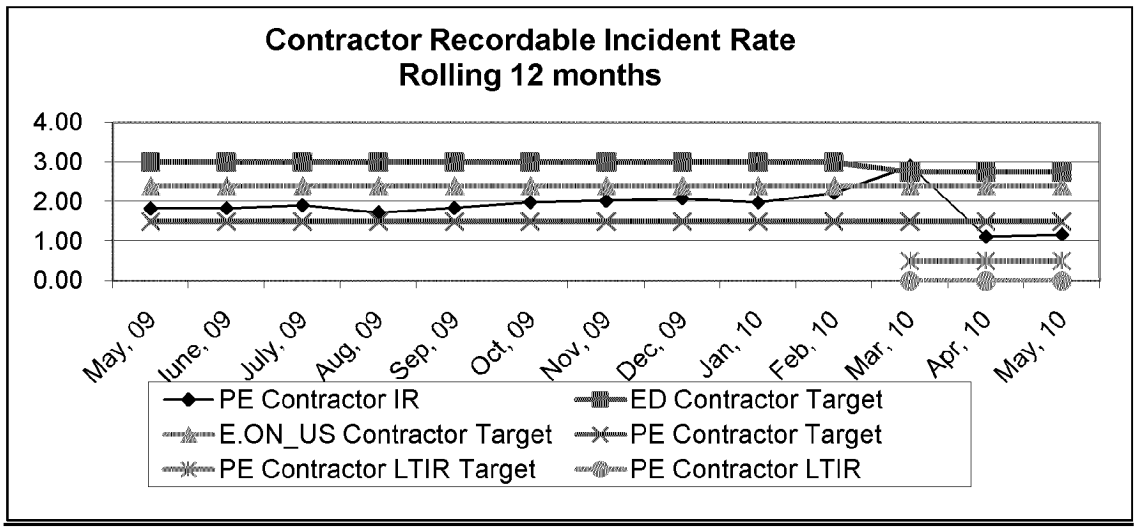
- **SO3 Mitigation (Ghent)**
  - Preparing for MgO injection at GH4.
  - Stoic Calculations for Ghent testing prepared.
  - B&V reworking SAM calculations for the Ghent Units based on Title V Heat Inputs..
  - B&V draft BACT analysis submitted and commented by E.ON.
  - B&V requested to prepare two more documents:
    - BACT based on 2005 RBLC database for emissions limits
    - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**

- LFG
  - Landfill Gas Sample Result completed – final sample report outstanding.
  - LFG Technologies completed landfill visits.
  - Draft report expected week of August 2.
- NBU CR – Complete draft of documents submitted July 20. E.ON comments submitted July 28. Final draft expected week of August 2.
- Biomass –
  - Complete draft report from B&V due the week of August 2.
  - Moore Ventures completed a fuel analysis assessment.
- CCS 100 MW Project – Prepared a SOW and RFP for study work regarding a DOE/State/E.ON project. Submitted comment to presentation to DOE. Project will not get funding for a 2016 100 MW project – as such internal work ceased prior to releasing RFP to Bechtel, Fluor, Battelle, and EPRI.
- FutureGen – NTR

- **General**
  - Impoundment Integrity Program – PE is transitioning this to Generation Services.
  - Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost. Plans are underway to extend the B&V contract to begin discussing various scenarios for compliance with upcoming environmental air regulations.
  - Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. A revised recommendation will be presented to officers within ES the week of 8/6/10.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP.
2. Philip Imber has submitted for two postings outside of ES.
3. Jason Finn has submitted for positions.
4. Charlie Jacobs, Lana Linkenhoker, Charlie White and Bill Moerhke out due to surgery/illness.

From: Straight, Scott
To: Mooney, Mike (BOC 3); Ritchey, Stacy
CC: Saunders, Eileen
Sent: 8/12/2010 2:31:23 PM
Subject: FW: E.ON Conference Call - Review Workshop Meeting Minutes and Next Phase Scope of Work
Attachments: EON AQC Workshop Mill Creek - Meeting Minutes 081010.pdf

Stacy and Mike,

The last page of the meeting notes reflect the capex for each technology on Mill Creek.

Scott

From: Hillman, Timothy M. [mailto:HillmanTM@bv.com]
Sent: Tuesday, August 10, 2010 7:47 PM
To: Saunders, Eileen; Straight, Scott
Cc: Mahabaleshwarkar, Anand; Lausman, Rick L.; Harris, David K. (Dave); King, Michael L. (Mike); Wehrly, M. R.; Ballard, Michael W; Lucas, Kyle J.; Hillman, Timothy M.
Subject: RE: E.ON Conference Call - Review Workshop Meeting Minutes and Next Phase Scope of Work
Importance: High

Scott and Eileen,

Please find attached the draft meeting minutes and spreadsheet with schematic and costs from our AQC Workshop last Thursday and Friday in your office. We look forward to reviewing this with you during our conference call on Wednesday (2 pm your time).
Best regards,

Tim Hillman | Project Manager
Black & Veatch - Building a World of Difference™
11401 Lamar Avenue
Overland Park, KS 66211
Phone: (913) 458-7928
Email: hillmantm@bv.com

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nothy M.
igust 10, 2010 2:18 PM
en; Wehrly, M. R.; Straight, Scott; Mahabaleshwarkar, Anand; Lausman, Rick L.; Harris, David K. (Dave); King, Michael L. (Mike)
Conference Call - Review Workshop Meeting Minutes and Next Phase Scope of Work
/, August 11, 2010 1:00 PM-2:00 PM (GMT-06:00) Central Time (US & Canada).
&V Folks)

Call in number

877-603-8688

Conf ID: 8791684

DRAFT

BLACK & VEATCH CORPORATION
CONFERENCE MEMORANDUM

E.ON US
AQC Evaluation Project
Mill Creek Workshop Meeting

B&V Project 167987
B&V File 15.0200
August 10, 2010

An AQC Technology Screening Meeting for Mill Creek (MC) was held on August 5th and 6th at E.ON's Broadway Office Complex in Louisville, Kentucky.

Recorded by: Rick Lausman/Tim Hillman

Attending:

E.ON US

Scott Straight	Dir. Proj. Engin
Phillip Imber	Sr. Chem. Eng
Ronald Gregory	Mgr Major Project
Gary Revlett (Aug 5 Only, part time)	Mgr Air Section
Mike Kirkland	Mill Creek Plt Mgr

Black & Veatch

Tim Hillman	Proj Mgr
Mike Ballard	Oper Mgr. Constr.
Anand Mahabaleshwarkar	AQCS
Rick Lausman	AQCS

The purpose of the meeting was to provide a workshop for discussing the retrofit AQC costs and strategy for the Mill Creek plant.

DISCUSSION
Day 1, August 5, 2010

1. The meeting began with introductions and distribution of the agenda (attached herein for reference).
2. E.ON reviewed the major issues for discussion during the AQC workshop. Two (2) billion dollars was the cost developed by B&V for the Mill Creek facility during the Phase I study in July 2010. The Mill Creek units alone were approximately half of the fleet-wide AQC costs estimated in the Phase I study.
    - Are they overly conservative?
    - Need to prioritize Mill Creek unit AQC additions in light of future regulations.
3. E.ON wants to look at various combinations to reduce the costs for the AQC retrofit, including wet, dry, and hybrid SO2 removal technologies.

MILL CREEK SITE SPECIFIC

4. E.ON provided a matrix of the potential emission limits and regulations for Mill Creek entitled Estimated Coal-fired Boiler Air Emission Limits Under Future Environmental Regulations (attached herein for reference).
    - Shaded items in the table represent final rules.

- E.ON has final SAM BART determination for MC3 and MC4, with no specific implementation date specified. MC1 and MC2 were not affected. E.ON expects BART implementation to coincide with Title V Operating Permit Renewal in mid 2011.
- It may be possible for E.ON to get an extension of the BART SAM implementation date if they go forward with additional AQC controls.
- CATR compliance date for first round of allowances is 2012. E.ON is targeting 2014 for SO2 CATR controls for all 4 MC units, while trying to negotiate a schedule relief for SAM BART implementation.
- E.ON believes MC controls will primarily be focused on Hg, SAM, and SO2. NOx compliance is thought to be satisfactory for MC, although MC4's SCR requires improvement. SCRs for MC1 and MC2 will only be necessary in the event a fleet-wide NOx compliance margin is necessary.

5. E.ON provided a document entitled KU and LG&E Modeled Emissions Requirements Under CATR and NAAQS for SO2 and NOx for discussion (attached herein for reference).
6. Regulators called a meeting last week with E.ON. An SO2 monitor within a couple of blocks of the plant already has shown exceedances of the new 1–hr limit.

NOx ISSUES

7. In general, E.ON believes that MC's existing NOx controls will meet proposed CATR and NAAQS requirements, although MC4's SCR will need improved performance.
8. NOx controls also likely in 2016 – concern is mostly CATR not NAAQS. Limit is tons/year with an annual limitation.
9. E.ON reported that MC 4 SCR is limited compared to MC 3 and needs some upgrades. MC 3 initially did not meet limits, but they added some more mixers since they had the fan, so now it is one of the best SCRs in the country. That is where Unit 4 needs to go.
10. Brown 3 getting SCR for 2013 and then Ghent 2 would be the next target, so Mill Creek U1 and U2 SCRs may not be needed. Cane Run – repowering with combined cycle by 2016.
11. MC 4 may be only SCR changes at Mill Creek. E.ON is looking at improving SCR and improving staging O2 in furnace, which creates a reducing atmosphere. Plant is currently overlaying the boiler tubes to handle this.
12. No other NOx changes for Mill Creek. This means MC1 and MC2 do not necessarily need SCRs from a facility perspective, but may be considered in the future to allow margin from fleet-wide perspective. MC2 would be the easiest to add an SCR to since it is on the end of the line of the units. **E.ON wants to keep space available for MC1 and MC2 SCRs just in case they are required in the future.**

SO2 ISSUES

13. Mill Creek can not easily switch to and burn PRB because fan/air issues.
14. For SO2, the real driver at MC is the new 1-hour NAAQS. 2016 end of year is when NAAQS standard must be met, but regulators will try to push that out further. Nearby SO2 ambient monitors are already indicating problems with the new 1-hour standard. The state has already contacted E.ON inquiring about what they intend to do about it. Currently, MC is emitting approximately 0.5 lb/MBtu (facility average), but air dispersion

modeling indicates MC needs to be about 0.25 lb/MBtu on average to be in compliance with NAAQS.

15. Plant is currently running about 0.6 lb/MBTU emissions on 6.2 lb/MBtu fuel. This equates to approximately 90 percent removal.
16. It is uncertain how the NAAQS will be implemented – will regulators allow a 24-hr emission limit, or a 1-hr limit.
17. The plant will need to see an overall FGD removal efficiency of 95 -96 percent for compliance with a 6.2 lb/MBtu fuel.
18. CATR does not allow old credits to be used for new program. Dates for compliance are set for 2012. Regulators may provide some relief.
19. The fleet wide SO2 emissions are sufficiently low with respect to the first phase of CATR in 2012, so SO2 may not be a worry until 2014.

HAPS ISSUES

20. With respect to Hg and MACT regulatory compliance, E.ON reports that ICR tests are just finishing up at four stations. Based on the initial ICR test results, EON estimates that MC will require Hg control, and believes that acid gases are probably alright at approximately 95 percent control. Hg will be an issue at Mill Creek; MC3 and MC4 will be close to the limit.
21. Regulators may allow plant-wide averaging for Hg, but this is uncertain.
22. E.ON reports that Trimble 1 and 2 98 percent scrubbers are getting 91-92 percent Hg removal.
23. Acid gas emissions should be compliant at Mill Creek.
24. Metals emissions are also low at Mill Creek with FGD.

BYPRODUCT ISSUES

25. Mill Creek needs to be able to sell ash due to landfill limitations.
26. E.ON worried about water emission issues and future limitations that may be forthcoming that would impact the site.

SITE/UNIT SPECIFIC ISSUES

27. Major outages allowed every 8 years (8 weeks). Most of these longer outages are in the next couple of years. Typical outages are 4 weeks in other years. The spring of 2014 outage is MC 4's major outage.
28. MC1 and 2 had trays added in 2002 which are now wearing thin. All duct work needs replaced. Top of modules need to be placed.
29. MC 3 and 4 FGD had trays added in 2000.
30. MC 4 top of modules and duct work needs to be replaced.
31. MC 4 contact trays were initially installed with thinner trays to save cost, but have thinned further due to erosion and also need replacement.
32. Do not necessarily need to replace the pumps on the units. MC 1 and 2 had some pumps replaced previously.
33. E.ON reports all scrubbers are basically in a constant rebuilding mode, and are generally good for another 20 years structurally speaking.

34. Do not necessarily need to replace the recycle piping on the units. MC 1 and 2 had most replaced.
35. Plant access road and rail tracks are impacted with AQC additions.
36. If access road area is required for AQC equipment location, then access during construction becomes an issue. May have to cut in to coal pile storage area for construction/plant access.
37. New FGDs will require approximately the same or more aux power than the existing equipment. Assume the units will need new fans. CDS or NIDS technology has about 6-7" w.g. pressure drop across reactor, while spray dry absorber may be less.
38. Rail Tracks – Four tracks currently run along the access road. One set has been abandoned, and only the two inner tracks are used. The two outer tracks could be demolished.
39. Water/Wastewater – DFGD would have less impact on water and landfill issues. Currently, the wastewater is routed to the ash ponds.
40. Reagent costs are the down side to any DFGD addition to the units.
41. E.ON reports that chlorine is going up in the Illinois basin coals, so DFGDs would be beneficial because of their acid gas removal capability. High chlorides will also impact the wastewater stream that is currently going to ash ponds.
42. MC1 and MC2 need replacement of the top of the scrubber modules. All duct work has been replaced that wasn't replaced during the wet stack conversion.
43. MC4 top of scrubber module needs replacement. Duct work needs replacement, and trays are thin and need replacement.
44. MC3 scrubber structure is good, although mixing is poor. MC3 also has the underground reaction tanks and recycle pumps, which cause maintenance and reliability issues.
45. All pumps are routinely redesign/replaced.
46. Rick Lausman (B&V) led a discussion and presentation of alternative FGD technologies for new systems and for upgrading existing units.
    - E.ON questioned if Mill Creek had to reduce water emissions for chlorides and metals with wastewater treatment, what would be a rule of thumb cost? B&V noted that they would need to get an answer from their Chemical section.
    - Skipped much of the WFGD to get to Semi-Dry discussion.
    - Of the semi-dry FGD technologies, the Alstom NIDs system would allow most flexibility from a site retrofit aspect because it is modular and has less footprint impact.
47. Various AQCS upgrade and retrofit scenarios were discussed for the station. As the result of discussions during the workshop, the technology scenario deemed to provide the best balance of cost and performance was as follows:
    - Build a new WFGD for MC4.
    - Upgrade MC4's existing WFGD and use it for MC3.
    - Upgrade MC1 and MC2's existing WFGDs.
    - Add fabric filters to all four units.
    - Add PAC for Hg control.

- Add duct injection systems for SO3 control.
- As an alternative to the fabric filter, add NID system.

Day 2, August 6, 2010

48. E.ON reported that after yesterday's meeting, that they had talked to B&W and Babcock Power about the having them look at MC 1 & 2 for estimates about what it would take to modify the units to improve performance.

49. Support systems are reported to be satisfactory for limestone slurry. Dewatering should be satisfactory, but could be reviewed. Much of the piping has been replaced during maintenance over the last several years.

50. There is an 8 week outage in 2011 on Unit 2 that may be utilized for part of the FGD upgrade.

51. Anand Mahabaleshwarkar (B&V) lead a white board discussion focused on developing high-level costs of the scenario discussed in the item 47 above. A spreadsheet that captures the results of the discussion and provides information on the following is attached herein for reference.

    - Schematics of the AQC scenarios
    - Priorities
    - High-level costs
    - Schedule
    - Performance targets

ACTION ITEMS

- Provide rule of thumb costs for wastewater treatment if chlorides and metals in wastewater require reduction.

Attachments:

- Agenda
- Estimated Coal-fired Boiler Air Emission Limits Under Future Environmental Regulations.
- KU and LG&E Modeled Emissions Requirements Under CATR and NAAQS for SO2 and NOx
- Spreadsheet schematic and $/kW costs

cc: All Attendees
File

AGENDA

AQC Technology Screening Workshop
E.ON - Mill Creek Station
August 5th and 6th, 2010
(8:30 am – 4:00 pm)
Location: E.ON Broadway Office Complex

Day 1, Aug 5th

I. Introductions

II. Mill Creek Site-Specific Issues

III Review Phase I Study Results/Background/Conclusions

IV. Technology Overview Presentation

V. Pros and Cons of AQC Technologies Applied to Mill Creek

Day 2, Aug 6th

VI. Constructability Challenges

VII. High Level Cost Estimate (Interactive during the workshop)

VIII. Workshop Conclusions - Next Steps

Adjourn

Revised
Gary
Herdat

Estimated Coal-fired Boiler Air Emission Limits under Future Environmental Regulations

Program Name	Regulated Pollutants		Coal -fired Power Plants						Forcasted Date for Compliance
	Pollutant	Units	Brown	Ghent	Green River	Cane Run	Mill Creek	Trimble	
BART	MC3 - SAM	lbs/hour	-	-	-	-	MC3 - 64.3 MC4 - 76.5	-	Within 6 months of final Title V
New 1-hour NAAQS for NO_x	NO_x	lbs/mmBtu	> 0.5	0.47	0.56	0.07	0.39	> 0.5	2016 2015 - 2017
New 1-hour NAAQS for SO_2	SO_2	lbs/mmBtu	> 0.4	0.31	0.15	0.06	0.25	> 0.5	2016
Clean Air Transport Rule (CATR)*	NO_x	lbs/mmBtu	0.145	0.041	0.314	0.315	0.114	0.047	Beginning in 2012 & Phase II in 2014
	SO_2		0.108	0.186	0.887	0.187	0.311	0.162	
New EGU MACT	Mercury	Removal lbs/GWH	90% or 0.012	90% or 0.012	90% or 0.012	90% or 0.012	90% or 0.012	90% or 0.012	Estimated January, 2015; with 1-yr extension - January, 2016
	Acids (HCl)	lbs/mmBtu	0.002	0.002	0.002	0.002	0.002	0.002	
	Metals (PM)	lbs/mmBtu	0.03	0.03	0.03	0.03	0.03	0.03	
	Metals (As)	lbs/mmBtu	0.5×10^{-5}	0.5×10^{-5}	0.5×10^{-5}	0.5×10^{-5}	0.5×10^{-5}	0.5×10^{-5}	
	Organics (CO)	lbs/mmBtu	0.10	0.10	0.10	0.10	0.10	0.10	
	Dioxin/Furan	lbs/mmBtu	15×10^{-18}	15×10^{-18}	15×10^{-18}	15×10^{-18}	15×10^{-18}	15×10^{-18}	

[ ] - Regulation or requirements are final

* - Intrastate Cap & Trade Program with KU and LG&E estimated total being: 22,832 t/y NO_x in 2012; 65,235 t/y SO_2 in 2012; and 41,774 t/y SO_2 in 2014.

Revised 4/2 from Gary R. during mtg

KU and LG&E Modeled Emission Requirements under CATR and NAAQS for SO_2 and NO_x

Plant	Unit	2009 Actual Emissions					CATR Allocation Tons			CATR Alterative lb/mmBtu			NAAQS Modeling (lbs/mmBtu)	
		SO_2 (tons)	NO_x (tons)	mmBtu (year)	SO_2 Rate (lbs/mmBtu)	NO_x Rate (lbs/mmBtu)	SO_2 for 2012	SO_2 for 2014	NO_x in ≥ 2012	SO_2 for 2012	SO_2 for 2014	NO_x in ≥ 2012	SO_2-2016	NO_x-2015
KU														
Brown	1	3,452.4	606.2	2,591,990	2.66	0.47	2,851	795	1,346	1.530	0.203	0.372		
Brown	2	6,726.2	903.27	5,098,318	2.64	0.35	678	650	1,913	0.211	0.108	0.318		
Brown	3	22,070.9	2,716.10	16,803,275	2.63	0.32	1,525	1,463	915	0.164	0.093	0.058		
				Average=	**2.63**	**0.35**			**Average =**	**0.318**	**0.108**	**0.145**	**> 0.4**	**> 0.5**
Brown CT	5	0.0	2.4	64,040	0.00	0.07	0	0	0	0.001	0.000	0.000		
Brown CT	6	0.1	19.2	510,439	0.00	0.08	0	0	0	0.001	0.000	0.000		
Brown CT	7	0.2	12.7	328,815	0.00	0.08	2	0	0	0.008	0.000	0.000		
Brown CT	8	0.0	8.9	132,139	0.00	0.13	0	0	0	0.001	0.000	0.000		
Brown CT	9	0.0	2.3	41,253	0.00	0.11	0	0	0	0.001	0.000	0.000		
Brown CT	10	0.2	3.5	48,766	0.01	0.14	0	0	0	0.009	0.000	0.000		
Brown CT	11	0.2	5.3	80,331	0.00	0.13	0	0	0	0.007	0.000	0.000		
Brown	**Total**	**32,250.2**	**4,279.9**	**25,699,366**			**5,056**	**2,908**	**4,174**					
						expected emissions =	**1,726**	**1,746**	**3,062**					
						bank =	**3,330**	**1,162**	**1,112**					
Ghent	1	1,418.1	973.2	31,802,243	0.09	0.06	2,221	3,653	794	0.139	0.214	0.050		
Ghent	2	5,044.3	2,664.9	24,783,886	0.41	0.22	2,101	1,813	976	0.180	0.108	0.058		
Ghent	3	3,188.6	1,972.3	34,425,557	0.19	0.11	3,578	3,363	483	0.199	0.203	0.030		
Ghent	4	1,220.5	802.8	28,668,181	0.09	0.06	1,214	3,359	468	0.079	0.203	0.029		
Ghent	**Total**	**10,871.5**	**6,413.2**	**119,679,867.3**	**0.18**	**0.11**	**9,114**	**12,188**	**2,721**	**0.155**	**0.186**	**0.041**	**0.31**	**0.47**
						expected emissions =	**11,480**	**11,381**	**7,833**					
						bank =	**-2,366**	**807**	**-5,112**					
Green River	4	5,447.7	525.7	2,580,883	4.22	0.41	5,215	1,153	890	4.029	0.887	0.310		
Green River	5	9,276.3	894.0	4,595,734	4.04	0.39	9,447	2,854	1,159	3.882	0.887	0.316		
Green River	**Total**	**14,724.0**	**1,419.7**	**7,176,617**	**4.10**	**0.40**	**14,662**	**4,007**	**2,049**	**3.955**	**0.887**	**0.314**	**0.15**	**0.56**
						expected emissions =	**14,467**	**15,654**	**1,916**					
						bank =	**195**	**-11,647**	**133**					
Tyrone	5	203.7	77.1	325,548	1.25	0.47	1,634	1,180	610	1.312	0.593	0.307		
Tyrone	**Total**	**203.7**	**77.1**	**325,548**	**1.25**	**0.47**	**1,634**	**1,180**	**610**	**1.312**	**0.593**	**0.307**		
						expected emissions =	**0**	**0**	**0**					
						bank =	**1,634**	**1,180**	**610**					
KU	**Total**	**58,049**	**12,190**	**152,881,398**	**0.76**	**0.16**	**30,466**	**20,283**	**9,554**	**0.399**	**0.265**	**0.125**		
						Expected Emissions =	**27,673**	**28,782**	**12,811**					
						Bank =	**2,793**	**-8,499**	**-3,257**					

Expected emissions from Generation Planning, 2010728_Emissions_by_Unit_by_Month_30Yrs.xlsx. Value for 2012 is the average of 2012 2013.

KU and LG&E Modeled Emission Requirements under CATR and NAAQS for SO_2 and NO_x

Plant	Unit	2009 Actual Emissions					CATR Allocation Tons			CATR Alterative lb/mmBtu			NAAQS Modeling (lbs/mmBtu)	
		SO_2 (tons)	NO_x (tons)	mmBtu (year)	SO_2 Rate (lbs/mmBtu)	NO_x Rate (lbs/mmBtu)	SO_2 for 2012	SO_2 for 2014	NO_x in 2012	SO_2 for 2012	SO_2 for 2014	NO_x in 2012	SO_2-2016	NO_x-2015
LGE														
Cane Run	4	2,158.2	1,770.0	10,295,729	0.42	0.34	1,930	821	1,724	0.371	0.161	0.339		
Cane Run	5	2,099.9	2,020.0	10,259,979	0.41	0.39	1,918	918	1,763	0.345	0.161	0.310		
Cane Run	6	4,534.0	1,948.4	13,442,706	0.67	0.29	4,801	2,039	2,497	0.685	0.227	0.301		
Cane Run	**Total**	**8,792.1**	**5,738.4**	**33,998,414**	**0.517**	**0.34**	**8,649**	**3,778**	**5,984**	**0.487**	**0.187**	**0.315**	**0.06**	**0.07**
						expected emissions =	**7,655**	**8,565**	**4,399**					
						bank =	**994**	**-4,787**	**1,585**					
Mill Creek	1	3,731.8	3,127.0	19,477,664	0.38	0.32	3,562	2,666	2,722	0.393	0.239	0.241		
Mill Creek	2	4,122.8	2,991.6	18,829,209	0.44	0.32	4,444	3,021	2,648	0.424	0.268	0.235		
Mill Creek	3	8,215.0	777.6	28,372,378	0.58	0.05	8,366	3,725	621	0.601	0.300	0.043		
Mill Creek	4	8,164.4	1,010.7	36,428,449	0.45	0.06	8,249	6,044	704	0.461	0.379	0.040		
Mill Creek	**Total**	**24,234.0**	**7,906.9**	**103,107,700**	**0.470**	**0.15**	**24,621**	**15,456**	**6,695**	**0.480**	**0.311**	**0.114**	**0.25**	**0.39**
						expected emissions =	**24,977**	**24,149**	**8,433**					
						bank =	**-356**	**-8,693**	**-1,738**					
Paddy's Run	13	0.0	0.5	12,730	0	0.079	0.0	0.0	0.0	0.001	0.000	0.000		
Paddy's Run	**Total**	**0.0**	**0.5**	**12,730**	**-**	**0.08**	**0.0**	**0.0**	**0.0**	0.001	0.000	0.000		
Trimble Co.	1	1,216.6	1,110.7	30,713,328	0.079	0.072	1,499	2,257	599	**0.078**	**0.162**	**0.047**	**> 0.5**	**> 0.5**
Trimble Co. CT	5	0.1	7.0	479,506	0.000	0.029	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble Co. CT	6	0.0	5.7	323,359	0.000	0.035	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble Co. CT	7	0.0	5.8	398,057	0.000	0.029	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble Co. CT	8	0.1	5.9	388,797	0.001	0.030	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble Co. CT	9	0.0	5.2	304,087	0.000	0.034	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble Co. CT	10	0.0	4.6	242,941	0.000	0.038	0.0	0.0	0.0	0.001	0.000	0.000		
Trimble	**Total**	**1,216.8**	**1,144.9**	**32,850,075.0**	**0.074**	**0.07**	**1,499**	**2,257**	**599**					
						expected emissions =	**3,561**	**3,615**	**1,763**					
						bank =	**-2,062**	**-1,358**	**-1,164**					
LG&E	**Total**	**34,243**	**14,791**	**169,968,919**	**0.403**	**0.174**	**34,769**	**21,491**	**13,278**	**0.409**	**0.253**	**0.156**		
						Expected Emissions =	**36,193**	**36,329**	**14,595**					
						Bank =	**-1,424**	**-14,838**	**-1,317**					
KU + LG&E	**Total**	**92,292**	**26,981**	**322,850,317**	**0.572**	**0.167**	**65,235**	**41,774**	**22,832**	**0.404**	**0.259**	**0.141**		
						Expected Emissions =	**63,866**	**65,110**	**27,406**					
						Bank =	**1,369**	**-23,336**	**-4,574**					

Expected emissions from Generation Planning, 2010728_Emissions_by_Unit_by_Month_30Yrs.xlsx. Value for 2012 is the average of 2012 2013.

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Mill Creek Conceptual AQCS Compliance Preliminary Scenario Summary
August 5 &6, 2010 Workshop Results

Uncontrolled SO2 6.2 lb/Mmbtu

	MW	Unit	Current Emissions lb/mmBtu	Current Removal %	Future Removal %	Planned future TECH	Priority	Preliminary Schedule FGD	FF	SCR	Fans	Chimney	FF Location
	330	1	0.48	92	93	FGD- up	1	2012 U	2014	2016	2014	Existing	In road
	330	2	0.48	92	93	FGD- up	4	2013 or 4th - 2013	2013	2015	2013	Existing	To open area north
	425	3	0.36	86	94	Unit 4 FGD	3	1st Qtr 2014	APR - 2015		2015	Existing	Road with fans in Unit 3 FGD area
	525	4	0.12	92	98	New FGD	2	4th - 2013	4th - 2013	Relocate NH3	2013	Likely New	South side of plant
Summary	1610		0.36										
		Target	lb/mmBtu	0.25		% Removal	96.0						

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Mill Creek Conceptual AQCS Compliance Scenarios and Costs
August 5 &6, 2010 Workshop Results

Unit 1

330	MW	SCR		AH	ESP	PAC	ID Fan	SO3	FF NID	Bstr. Fan	WFGD- R				
W/O NIDS	$/Kw	294				13		24	245		125			701	$/kw
	$ x 1000	97,020				4,290		7,920	80,850		41,250			231,330	Total, $ x 1000
W NIDS	$/Kw	294				13			450		125			882	$/kw
	$ x 1000													291,060	Total, $ x 1000

Unit 2

330	MW	SCR		AH	ESP - N	PAC	ID Fan	SO3	FF NID	Bstr. Fan	WFGD- R				
W/O NIDS	$/KW	294			100	13		24	245		125			801	$/kw
	$ x 1000	97,020			33,000	4,290		7,920	80,850	0	41,250			264,330	Total, $ x 1000
W NIDS	$/Kw	294			100	13			450		125			982	$/kw
	$ x 1000													324,060	Total, $ x 1000

Unit 3

425	MW	SCR		AH	ESP	PAC	ID Fan	SO3	FF NID	Bstr. Fan	WFGD- RU4	Demolition			
W/O NIDS	$/Kw	0			0	13		24	245		150	60		492	$/kw
	$ x 1000	0				5,525		10,200	104,125		63,750	25,500		209,100	Total, $ x 1000
W NIDS	$/Kw	0			0	13			450		150	60		673	$/kw
	$ x 1000													286,025	Total, $ x 1000

Unit 4

525	MW	SCR		AH	ESP	PAC	ID Fan	SO3	FF NID	Bstr. Fan	WFGD- N	Chimney			
		Upgrades	NH3 and Site										Demolition		
W/O NIDS	$/Kw	10	20		0	13		24	250	0	400	50	0	767	$/kw
	$ x 1000	5,250	10,500			6,825		12,600	131,250		210,000	26,250		402,675	Total, $ x 1000
W NIDS	$/Kw	10	20		0	13			500	0	400	50	0	993	$/kw
	$ x 1000													521,325	Total, $ x 1000

Optional
New

TOTAL COST	Without NIDS	1,107,435	$ x 1000
	With NIDS	1,422,470	$ x 1000

FGD Capital Cost Include
- Inlet and outlet duct
- Ductwork
- Recycle Pumps
- Spray Levels
- Flow Devices/Tray/Rings
- ME
- Shell material
- Structural Steel
- Fans
- Recondition Support Steel
- Aux Power
- Unit 2 topshell upgrade needs to be looked at since plant had taken that out of budget

From:	Hudson, Rusty
To:	Kuhl, Megan
CC:	Straight, Scott; Saunders, Eileen
Sent:	8/18/2010 12:01:28 PM
Subject:	Revised Environmental Air paper
Attachments:	2011 MTP Level I Engineering - Air Compliance Projects (2).docx

Megan, please accept this revised version of the environmental air engineering paper. It includes some minor changes: adding the project numbers, listing the sole source award in the box on page 1, and adding Vic's name in the signature block. Rusty

Investment Proposal for IC:	August 26, 2010
Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures: Sole Source Amount:	$2,000K $1,600K
Project Number:	131693 – LG&E 131694 - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Eileen Saunders/Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In addition to requesting approval of a new engineering project that will continue refining the 2011 MTP air compliance scope, this request also seeks approval of a sole source award to Black &Veatch (B&V) engineering firm. B&V will perform the majority of studies included in the $2 million project sanction request; however, smaller valued contracts will be awarded to various technology firms to perform miscellaneous reviews of the LG&E and KU existing air pollution control technologies for potential upgrades to their performance.

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new environmental air regulations on the KU and LG&E coal-fired units. B&V was hired through a competitive bid process at a contract valued at $149K and given six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $4 billion (escalated) of Air

Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Through the approval of this investment/contract proposal, B&V will be contracted with to continue with Phase II of the engineering and estimating effort. This effort will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 Engineering assessment for Mill Creek, Ghent and EW Brown. The work for each facility will be staggered with the Mill Creek effort commencing first.

Award of the Phase II work to B&V will provide continuity to the initial study work. The contract will be on a time and material basis, not-to-exceed sole source contract, with a value of $1.6M. Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Refined Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms to review existing air pollution control technology performance enhancement options. Two examples of this would be hiring Riley Power (the original SCR technology firm) to review/model NOx emission reduction improvements on the existing Mill Creek 4 SCR that they originally design in 2002 and their review of improvements to the Mill Creek FGDs similar to the improvements they designed for TC1's FGD improvements as part of the TC2 Project.

Project timeline:

Level I Engineering	**Begin**	**Complete**
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions. The primary assumptions are described in the Background section above.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($Millions)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$.75	$1.25	$2.0

Sensitivities

None performed.

Risks

The 2011 draft MTP includes some $4 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans. Approval is also requested to award B&V a sole source award for $1.6 million on a time-and-material basis for Phase II of the Air Compliance portion of the 2011 MTP.

Eileen Saunders
Manager Major Capital Projects

Scott Straight
Director Project Engineering

John Voyles
VP Transmission & Gen. Services

Ralph Bowling
VP Power Production

Paul Thompson
SVP Energy Services

Brad Rives
Chief Financial Officer

Victor Staffieri
Chief Executive Officer

From: Imber, Philip
To: Straight, Scott
Sent: 8/13/2010 9:08:37 AM
Subject: PE's Bi-Weekly Update of 8-13-10 pai.docx
Attachments: PE's Bi-Weekly Update of 8-13-10 pai.docx

See attached.

Energy Services - Bi-Weekly Update
July30, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – NTR.
  - Schedule/Execution:
    - Ghent
      - Chimney Coatings – Testing of the coating application remain.
      - SCR/FGD Icing Siding – Installation nearing completion.
      - Unit 4 ID Fans – An outage kickoff meeting is planned for 8/4/10.
      - Chimney Capping – Caps placed by helicopter on both chimneys on 7/25/10.
      - Elevators - Award Recommendation is circulating for signatures.
    - Brown
      - The FGD continues to operate very well.
      - E.W. Brown Gypsum Dewatering Facility
        - Product to be sent to the facility next week for final commissioning activity. This was delayed a week due to high ash content in gypsum stream.
        - Facility operation award recommendation being routed for signatures.
      - E.W. Brown Coal Pile Modification
        - Bid received for engineering from MACTEC and PO under development.
      - Balance of Project Items
        - Paving scope out for bid
        - Elevator scope out for bid
  - Budget – Slight reduction in the total Brown FGD Program ITC to $408.8m.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks - NTR

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Bechtel has installed new secondary burner air barrels. The first deliveries of new primary air and core air assemblies have begun to arrive. We continue to work with Bechtel and Fuels to source an alternate coal until the permanent burner solution is installed. **Bechtel anticipates restarting the unit mid-August with a new substantial completion date of 10/12/10.** This impact to commissioning was communicated through a formal letter to KYPSC.
  - Budget – Minor additions made to MTP to account for staffing through 2011 and for the recently verbal agreement on FM and EE claim settlement.
  - Contract Disputes/Resolution:

        - Bechtel FM Claims – Verbal agreement on all FM and most EE claims reached. Written agreement expected within next two weeks.
    - Issues/Risk:
        - Delivery of the new burners, design of the DBEL burners for our coal specification, remaining commissioning beyond the 50% load achieved to date.

- **Brown 3 SCR**
    - Schedule/Execution – NTR
    - Permitting – Request to KYDAQ for station-wide SAM annual emission limit sent to KYDAQ on 7/30/10. Permit to construct SCR dependent on agreement with KYDAQ on SAM limit.
    - Engineering – proceeding as planned to support the spring 2012 in-service.
    - Budget - NTR
    - Contracting – IC approved award of Hot Water Recirc to Alstom in the July IC meeting.
    - Issues/Risk – NTR

- **Ohio Falls Rehabilitation**
    - Schedule/Execution –NTR
    - Permitting – NTR
    - Engineering/General:
        - Reviewing Voith updated scope for rehabilitation minus automation.
        - Reviewing Historic Preservation and Maintenance Plan developed in 2008.
    - Budget:
        - Total roll up of estimate to complete work under a lump sum to Voith Hydro is essentially at 2010 MTP values. PE continues to assemble pricing for work outside hydro vendor scope.
        - Revised project sanction planned for August IC meeting
    - Contracting:
        - Negotiations with Voith are progressing well. Voith has agreed to defer the need to issue a PO for the remaining runners pending approval of EPC from IC in August.
    - Issues/Risk
        - Release of third unit runner to Voith is required in August to maintain schedule.
        - The tentative schedule for completion of all units by late 2014 is highly dependent on year-round dewatering.

- **Mill Creek Limestone Project**
    - Safety - NTR
    - Auditing - NTR
    - Permitting - NTR
    - Engineering/General
        - Pre-bid meeting for the building extension work was held at Mill Creek on July 8, 2010 and bids were received July 23, 2010.
        - Working with URS to develop RFQ for long lead equipment.
    - Budget
        - AIP complete.
        - Revised cash flow reflected in 2011 MTP

- Contracting – NTR
- Issue/Risk – Potential delay in awarding the equipment and engineering for the verti-mills as the impacts of the new air regulations are being assessed.

- **Cane Run CCP Project**
  - Permitting
    - 404/401 and Landfill Permit applications remain under review by the agencies. Preparing to respond to comments on the 404 and Landfill Permit applications. To date permitting process has gone well.
  - Engineering
    - Finalization of construction drawings are on hold until the KYDWM has completed their initial review.
    - Meeting with the Plant and the engineer to discuss a reduced scope landfill that would facilitate the construction of a CCGT.
    - Transmission working towards relocation of the 69kV line.
  - Budget – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk – NTR

- **Trimble Co. Barge Loading/Holcim**
  - PE notified to re-start engineering and procurement activities due to negotiations with Holcim being resumed.
  - Working with UCC to update their equipment and material pricing.

- **TC CCP Project – BAP/GSP**
  - Schedule/Execution:
    - Gypsum Storage Pond is being prepared for the installation of the Flexible Membrane Liner (FML) and a Geosynthetic Clay Liner (GCL) scheduled to begin within the next 2 to 4 weeks.
    - Work continues on the fill placement and mechanically stabilized earth (MSE) wall for the north, south, and west dikes.
    - Work has begun on both Emergency Spillways.
    - Working continues on the fiberglass piping for the project
  - Budgeting – The additional $1.5m net against a project sanction of $25m net to fund modifying the GSP liner system to meet anticipated future regulations will require IC approval and a revised AIP.
  - Engineering:
    - Performing a study on the GSP clay liner originally installed to compare against potential new regulations. Path forward is to utilize the existing clay liner as part of a composite liner system to meet proposed new regulations before the pond is placed into service.
    - A repair strategy for the BAP is being developed in response to the EPA Inspection in June 2009.
  - Permitting – NTR
  - Contract Disputes/Resolution – NTR
  - Issues/Risk

        - Weather remains the biggest risk. The contractor has submitted a request for adjustments to the LDs due to the weather delays from 2009 and the wet winter and spring in 2010.
        - PE is developing plans to expedite the completion of the GSP and/or South Dike to help mitigate the high water elevations in the BAP.

- **TC CCP Project – Landfill**
    - Schedule/Execution - NTR
    - Budgeting - NTR
    - Engineering – The Detailed Engineering RFPs were received on Friday, 09Jul10. Three proposals were received. Proposal review is in progress.
    - Permitting – A meeting was held with USFWS on 27Jul10 concerning the resolution of the Indiana Bat issue. Anabat (acoustical) Testing on the Phase II (July) for the Indiana Bat is being concluded during the week of 26Jul10. Only two "hits" were recorded. Work continues on the development of the 401/404 Permits for Fall 2010 submittal.
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **Ghent CCP Projects - Landfill**
    - Schedule/Execution – NTR
    - Budget – Conceptual Engineering on the CCP transport systems has resulted in a refined estimate that is significantly over the original amount included in the project ECR filings. PE will continue working with B&V and station management through the 2011 MTP development to refine the scope and reduce the cost impact.
    - Engineering – Detailed Engineering of gypsum fines continues with Black & Veatch. Bids have been received and currently under review for the CCP transport Detailed Design. Procurement activities for the gypsum fines project are in progress. Detailed Engineering for the Landfill is focusing on completion of construction drawings.
    - Permitting – All permit applications have been made. Project Engineering is working with the various agencies on minimal questions being asked during the review of the permit application. Relocation of the impacted cemetery continues with planning with the local authorities and the cemetery where the remains will be relocated.
    - Contract Disputes/Resolution – NTR
    - Issues/Risk:
        - Land Acquisition – a final offer that will discuss condemnation potential will be sent to the remaining three land owners in early July. A final recommendation will be presented to management for approval on whether to change designs or condemn the remaining property in late July.

- **General CCP Projects**
    - Study by PE and GAI has been completed in final draft form that identifies very conceptual cost to comply with EPA options of CCP storage. Range of cost is $700 - $1,100 million and is dependent on Subpart C or Subpart D final ruling. These costs do not include potential additional landfill cost at Mill Creek, Green River, or conversion of Brown ATB to Landfill. These cost have been included in PE's 2011 MTP draft.

- **E.W. Brown Ash Pond Project**
  - Safety – NTR
  - Schedule/Execution:
    - Work on Phase I is being suspended until a decision is made on whether to convert the main pond to a landfill.
    - Working on evaluation and recommendation paper for the main pond conversion from a pond to a landfill .
    - Aux Pond Phase II work awarded to Charah.
  - Budget – NTR
  - Contract Disputes/Resolution - NTR
  - Issues/Risk – A decision is required in July on whether to continue with the Main Pond or convert to a dry landfill. Economics indicate conversion now to be least cost compared to continuing with pond and then converting once regulations are final.

- **E.W. Brown Ash Pond Project**
  - **E.W. Brown Starter Dike**
    - Safety – (0) Recordable
    - Schedule/Execution:
      - Contract work remains under suspension except for rock embankment placement, dust control, and general site maintenance.
      - 95% of exposed ash has been covered with either straw mats or filter fabric as dust control.
      - Rock placement continued on the West and South Embankments.
    - Budget – NTR
    - Contract Disputes/Resolution: NTR
    - Issues/Risk – Summit was given notice to suspend all work except rock placement and some minor activities beginning July 6th until further notice.

  - **E.W. Brown Aux Pond 900'**
    - Schedule/Execution:
      - Installation of erosion and sediment control measures.
      - Topsoil stockpiles were relocated.
      - Began rock embankment blasting at the Houp Property.
    - Budget – NTR
    - Contract Disputes/Resolution – NTR
    - Issues/Risk – NTR

- **SO3 Mitigation (Mill Creek 3, Mill Creek 4, Brown 3, Ghent)**
  - Safety – NTR
  - Schedule/Execution:
    - Held teleconferences with Nol-Tek and BCSI – both to provide initial draft of a conformed, redline version of the technical specification and GSA August 17.
    - URS site visit to Ghent on August 12. URS to provide commercial response (GSA mark up and guarantee language) the week of August 16. URS to provide a Ghent 2 technical proposal September 10.
    - Sent letters of dismissal to the other three bidders.

- FLS/CoaLogic – lack of competitive SO3 removal guarantee and the lack of a competitive commercial position regarding the SO3 removal
- Clyde Bergemann - lack of a competitive the SO3 removal guarantee and no technical advancement
- UCC – least robust system proposed, lack of confidence in the technical proposal as evaluated by the technical team

▪
▪ Path forward to October investment committee is convoluted due to URS submittal and the new options being considered at Mill Creek as a result of the fleet wide environmental studies.

- Budget – Spending $3M in 2010 is dependent on the procurement process and discussions surrounding delaying MC work.
- Testing – Contracts prepared but not finalized. Brown and Ghent testing plans published for Aug. 16 – Sep 3:
  - Air Quality Services will be doing testing from 8/16-8/27 at Brown.
  - Clean Air Engineering will be doing testing from 8/16-8/27 at Ghent.
  - EON Engineering will be doing testing from 8/22-9/3 at Ghent.

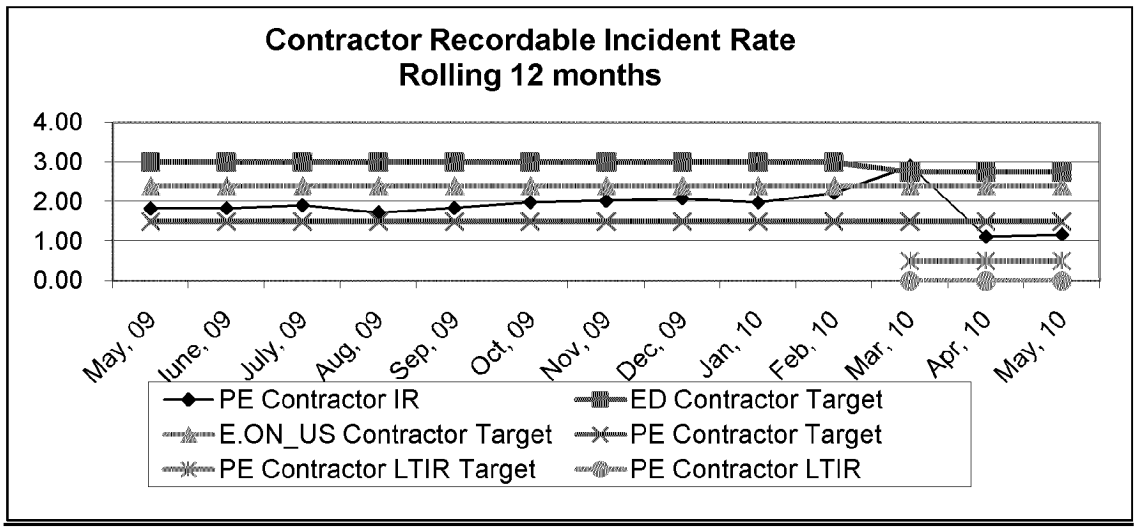
- **SO3 Mitigation (Ghent)**
  -
  - AIPs need to be finalized for Ghent 1-4.
  - Preparing for MgO injection at GH4 with Breen. Breen has been at Ghent in preparation of the testing.
  - Calculations for Ghent SAM life cycle reviewed with B&V. Four sets of calculations are being prepared:
    - Base calculation for BACT analysis with all layers of catalyst in place
    - Calculation based on exact operation today.
    - Calculation based on pre-FGD operation with 1.2 lb SO2/mmbtu fuel
    - Calculation pre-SCR operation with 1.2 lb SO2/mmbtu fuel
  - B&V re-draft of BACT analysis and Life Cycle analysis expected week of August 16
  - B&V requested to prepare two more documents:
    - BACT based on 2005 RBLC database for emissions limits
    - Technology choice based on a 5 ppmv requirement

- **NBU1 and Other Generation Development**
  - LFG
    - LFG Technologies provided a draft report and updates based on E.ON comment.
  - NBU CR –
    - New pro-forma submitted.
    - Outstanding items to be completed: property line drawing and schedule updates
    - Final draft expected week of August 16.
  - Biomass –
    - Draft report received.
    - E.ON comments being prepared to release to BV Aug 16.
  - CCS 100 MW Project – Director of Business Development still working on contract with the state. PE in discussion with Battelle, Fluor, Bechtel and EPRI for support of this study work.

- FutureGen – New project announced in Indiana as a Oxyfuel plant. Path forward for technical committee not identified at this time.

- **General**
  - Impoundment Integrity Program – PE is transitioning this to Generation Services.
  - Environmental Scenario Planning – The review and refinement of the draft B&V report continues relative to scopes and cost. Plans are underway to extend the B&V contract to begin discussing various scenarios for compliance with upcoming environmental air regulations.
  - Alstom Master Agreement- Negotiations continue and progressing towards a final agreement in July.

Metrics



Upcoming PWT Needs:

1. Decision to convert Brown's Main Pond to a landfill. Changing direction now before the Main Pond is placed into service is showing to be least cost and least disruptive to station operations. A revised recommendation will be presented to officers within ES the week of 8/6/10.

Staffing

1. Significant staffing increases in PE will be required to manage the current slate of projects in PE's draft 2011 MTP.
2. Philip Imber has submitted for two postings outside of ES.
3. Jason Finn has submitted for positions.
4. Charlie Jacobs, Lana Linkenhoker, Charlie White and Bill Moerhke out due to surgery/illness.

From: Saunders, Eileen
To: Straight, Scott
Sent: 8/13/2010 9:26:39 AM
Subject: 2011 MTP Level I Engineering - Air Compliance Projects (Rev 2).docx
Attachments: 2011 MTP Level I Engineering - Air Compliance Projects (Rev 2).docx

Scott,

Please take a look at these revisions.

Thank you,

Eileen

Investment Proposal for IC:	August XX, 2010
Project Name:	MTP Engineering – Air Compliance Projects
Total Expenditures:	$2,000K
Project Number:	XXXXXX – LG&E YYYYYY - KU
Business Unit/Line of Business:	LG&E and KU Coal-Fired Generation
Prepared/Presented By:	Scott Straight

Executive Summary

This request seeks authorization of $2,000K to continue refining the scopes, implementation schedules and cost estimates of projects identified in the development of the 2011 MTP as necessary for compliance with proposed or final local, State and Federal air compliance regulations through 2016.

In May of 2010, Project Engineering was asked to investigate the technological and financial impacts of new Environmental Air regulations on the EON U.S. fleet of coal fired units. Black and Veatch was hired through a competitive bid process at a contract valued at $149K and given four to six weeks to provide a high level estimate based on site visits, data collection from the plants and industry experience. As a result of this Phase I effort, approximately $4 billion (escalated) of Air Emissions Mitigation System additions and retrofits were identified as possible scenarios for bringing the fleet into compliance with the projected standards.

Approval of this investment/contract proposal will allow funding of a Phase II engineering and estimating effort that will provide a facility-specific project definition consisting of conceptual designs and budgetary cost estimates for selected air quality control technologies. This effort will result in a Level 1 assessment for the Mill Creek, Ghent and EW Brown facilities. The work for each facility will be staggered with the Mill Creek effort commencing first.

For work product continuity purposes, Project Engineering proposes to award the Phase II work to Black & Veatch on a time and material not to exceed sole source contract, with a value of $1.6M (plus 20 % contingency). Black and Veatch will keep their original team in place to gain efficiencies for the Phase II work. The scope of their work will include activities/deliverables such as the following:

- Kick-Off Meetings at each facility
- Conceptual Design
- Building and Plant Arrangements
- Technology Screening
- Constructability Plans
- Project Cost Estimates including Cash Flows
- Implementation Schedules

The remainder of the investment funding will cover costs of internal labor and expenses and the use of other external engineering /construction firms that may be hired to apply their expert opinions of the constructability of the options put forth by Black and Veatch or to conduct independent assessments as directed by Project Engineering (i.e. BPEI assessing Mill Creek FGD upgrades).

Background

Starting this year and continuing for the next two years, the United States Environmental Protection Agency (USEPA) will be developing and implementing several new environmental regulations. These new regulations will significantly impact our coal-fired electric generating units and will affect all environmental areas of air, water and land. The pollutants targeted in three of the new air regulations are SO_2 and NO_x. There is a recent new 1-hour National Ambient Air Quality Standard (NAAQS) for SO_2 and NO_x that will require lower emission rates at several of the stations and the CAIR rule is proposed to be replace by a new Clean Air Transport Rule (CATR). Each will require additional reductions in SO_2 and NO_x. In 2011, the USEPA is expected to propose and finalize an Electric Utility Maximum Achievable Control Technology Rule (MACT). The MACT rule will require significant reductions in hazardous air pollutants such as mercury and acid gases (i.e., SO_3/H_2SO_4 emissions) which are also emitted from the LG&E and KU coal-fired electric generation fleet.

Project timeline:

Level I Engineering	Begin	Complete
Mill Creek	August 2010	March 2011
Ghent	October 2010	April 2011
Brown	January 2011	May 2011

Economic Analysis and Risks

No economic or risk analyses have been performed as this request seeks only sanction to continue refining and developing the scopes, schedules and cost estimates for projects throughout the coal-fired fleet within LG&E and KU to comply with pending air regulations. Each project identified in this continuance of studies will seek sanction independent of this sanction and thus will have economic and risk analyses performed specifically for each project or coal-fired unit.

Assumptions

Assumptions that will be used as a basis for the continuance of analyses performed within this sanction are the Energy Services 2011 MTP Assumptions.

Financial Summary ($000s)

None performed. This sanction will be capitalized and spread pro-rata across the air compliance projects that are sanctioned in the future.

Cash Flow Comparison ($000s)

Project Expenditures ($000s)	2010	2011	Total
2010 MTP/LTP	$0.0	$0.0	$0.0
Current Proposal	$1.0	$21.9	$130.5

Sensitivities

None performed.

Risks

The 2011 draft MTP includes some $4 billion in air compliance projects identified with scope identification, schedules and cost estimates based on minimum (much less than Level I Engineering) engineering analyses. Disapproving this sanction will result in the continuance of generation planning for compliance with pending or proposed air regulations with scopes, schedules and estimates that have a significant margin of error.

Other Alternatives Considered

None

Conclusions and Recommendation

It is the recommendation of Project Engineering and Power Production to approve the continuance of studying and analyzing the scopes and options necessary to comply with pending or proposed air compliance regulations for the KU and LG&E coal-fired generating units. The continuance of these studies will lead to better definition of scopes, implementation schedules and cost estimates of major capital projects to comply with the air regulations that will be incorporated into the 2011 and 2012 MTP plans.

From: Saunders, Eileen
To: Straight, Scott
CC: Gregory, Ronald
Sent: 8/13/2010 4:31:09 PM
Subject: PE's Bi-Weekly Update of 8-13-10 rdg-els.docx
Attachments: PE's Bi-Weekly Update of 8-13-10 rdg-els.docx

Scott,

Here is the report for Brown, Ghent and Mill Creek. My apologies for the lateness of the document. Ron sent his part in on time but I did not get to it until today.

Thanks,

Eileen

Energy Services - Bi-Weekly Update
August 13, 2010
PROJECT ENGINEERING

- **KU SOx**
  - Safety – Nothing new to report (NTR).
  - Auditing – NTR.
  - Schedule/Execution:
    - Ghent
      - Chimney Coatings – Testing of the coating application remain.
      - SCR/FGD Icing Siding – Installation nearing completion.
      - Unit 4 ID Fans – An outage kickoff meeting took place on 8/4/10.
      - Elevators - Abell Elevator Company has received the contract for their signature.
    - Brown
      - FGD, Limestone and BOP
        - Fluor continues to work on punchlist items and perform demobilization activities.
        - Major activities will resume just prior to the scheduled fall outage for Brown Unit 1.
      - E.W. Brown Gypsum Dewatering Facility
        - Gypsum slurry sent to facility on 8/5, with minor checkout issues on-going.
        - Facility operational contract awarded to FPG. Contractor labor began training on equipment.
      - E.W. Brown Coal Pile Modification
        - MACTEC awarded engineering contract.
        - Soil borings and bathymetric survey conducted.
        - Engineering design on-going.
      - Balance of Project Items
        - Paving scope bids received and an award recommendation is being prepared.
        - Elevator scope bids received and an award recommendation is being prepared.
  - Budget – NTR.
  - Contract Disputes/Resolution - NTR
  - Issues/Risks – Procurement process for the elevator took longer than anticipated primarily due to review of very different approaches to the project taken by the bidders. More work will flow into 2011 which is reflected in the MTP.

- **TC2**
  - Safety – NTR
  - Permitting – NTR
  - Auditing – NTR
  - Schedule/Execution:
    - Bechtel EPC – Bechtel has installed new secondary burner air barrels. The first deliveries of new primary air and core air assemblies have begun to arrive. We continue to work with Bechtel and Fuels to source an alternate coal