STEAM ELECTRIC DATA REQUEST FOLLOW-UP QUESTIONS

Project Name: Steam Electric Detailed Study	**Project No.:** 0172.04.022.042
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This document contains CBI: ___ Yes _x_ No	**Type of Contact: ___ Email _x_ Telephone**
General Subject: Data Request Follow-Up - Responses for Roxboro Plant	

Request Number	CBI = Yes (Y) No (N)	Question Number/ Copy Number	Page	Question/Answer
1	N	18	B-12	**Q:** Please elaborate on why more bottom sluice water is used for SE Unit 4 (5,000 gpm) compared to SE Unit 2 (1,700 gpm) while both units produce about the same amount of ash. **A:** Plant personnel stated the flow for SE Unit 2 was incorrect and should be listed as 2,360 gpm. Personnel also stated that SE Unit 4 is a double boiler and therefore uses about twice as much sluice water as a single boiler.
2	N	20	B-14	**Q:** In Table 7, the plant stated that solids are sold without further treatment; however, no solids removal process was reported. Please elaborate on the method by which these bottom ash solids are separated from the sluice water to be sold. If they are dredged from the fly ash pond, please indicate how the plant estimated the amount of bottom ash removed (versus fly ash, which is also sent to the same pond). In addition, please indicate how much of the 215 tpd of solids are sold versus sent to the ash pond. **A:** In 2006, the bottom ash sluice water was sent to a segregated portion of the ash pond, and a vendor scoops out the solids to be sold. The plant is able to operate their sluice water systems as combined or segregated, depending on market conditions.
3	N	31	B-21	**Q:** In Table 10, no air heater washwater volume was reported; however, in the diagram a volume of 640,000 gpd was provided. Please confirm if this volume represents the volume of water used for each washing event, or if it is the total volume for all four units. Please also provide the breakdown of volume generated by each unit. **A:** The volume reported represents each washing event. Therefore, the average amount of washwater generated per unit is 640,000 gpd.
4	N	35	B-24	**Q:** Please clarify if the once through system reported for SE Units 1, 2, and 3 is one system, or three. If there is more than one distinct once-through cooling water systems, please provide the information in Table 12 for each system. [Note: in the Form 2C permit application, on page 1 of Attachment 4, the following flows are provided for Units 1, 2, and 3: 249 MGD, 342 MGD, and 505 MGD.] **A:** The plant confirmed that the flows are representative of 2006 and that there are three once-through cooling water systems. The systems for

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				Units 1 and 2 operated 24 hpd and 365 dpy. The system for Unit 3 operated 24 hpd, 197 dpy. The systems were brought online on 5/1966 (Unit 1), 5/1968 (Unit 2), and 7/1973 (Unit 3).
5	N	35	B-24	**Q:** In the Form 2C, Unit 3 is listed as also having a mechanical draft cooling tower used during summer months. Please complete Table 12 for this cooling system. **A:** The mechanical draft cooling tower was added to the table with a flow of 505 MGD (350,694 gpm) for 24 hpd and 168 dpy. Plant personnel clarified that water is <u>not</u> recirculated in the tower.
6	N	47, 49-52	B-28, B-32-34	**Q:** For WWT1, the diagram shows an oil waste basin, but Table 17 lists two settling tanks. Please clarify which is correct, whether the settling tanks are in series or parallel, and the flow of the low volume waste treated in the system. Please also clarify if waste oil/sludge is removed, and provide the flow and destination of this stream. **A:** WWT1 consists of two oil waste tanks in parallel. One tank services Units 1 and 2, while the other services Units 3 and 4. The plant is unable to estimate the amount of waste oil/sludge removed, but did confirm it is burned on site in the boilers.
7	N	47, 49-52	B-28, B-32-34	**Q:** For WWT2, please confirm if the system consists solely of an equalization basin or whether it is a settling pond. If it is a pond, please provide the design information in Table 17. **A:** The system consists of a concrete-lined equalization basin.
8	N	47, 49-52	B-28, B-32-34	**Q:** For WWT2, please confirm the flow for the APW stream (640,000 gpd in diagram versus 160,000 gpd in Table 19). Please also provide the flow rates for the two LVW streams entering WWT2 directly, and the effluent from WWT1. **A:** The correct flow for the APW stream is 640,000 gpd for 7 days in 2006. The combined flow of the two LVW streams is 3 MGD, as shown in the table. The WWT1 effluent flow is unable to be estimated (URE).
9	N	47, 49-52	B-28, B-32-34	**Q:** For WWT3, please confirm the flow for the CPR stream entering and exiting the system (33,055 gpd in diagram versus 200,890 gpd in Table 19). Please also clarify if there is any flow from WWT3 to WWT2, and under what circumstances does such flow occur. **A:** The correct flow is 200,890 gpd as shown in the table. There was no overflow from WWT3 to WWT2 in 2006; however, the plant has the ability to transfer water from WWT3 to WWT2 if needed due to short-term capacity problems.
10	N	47, 49-52	B-28, B-32-34	**Q:** For WWT4, Table 17 indicates that the pond is dredged, but no sludge stream is shown exiting the system. Please provide the flow and destination of this stream. **A:** The plant contacts confirmed that the ash sluice water contributes 260 tpd solids to the ash pond. From the answer to Q. 20, we confirmed that 215 tpd of solids are removed from the pond and sold. ERG will add a solids/sludge stream exiting the pond, with a solids rate of 215 tpd and a destination code of "SOLD."
11	N	47, 49-52	B-28,	**Q:** For WWT4, please clarify whether the 7 MGD stream labeled

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			B-32-34	RECYC-BAS and the 19.25 MGD stream labeled BAS are two different streams entering the treatment system (for a total flow of 26.25 MGD), or if the flow labeled RECYC-BAS is included in the BAS stream. Please also rectify these flows against the flow reported in Table 6 (17.136 MGD). In addition, please confirm whether the 7 MGD stream labeled as RECYC-BAS represents the CTB from SE Unit 4. **A:** The RECYC-BAS stream is a subset of the BAS stream and will therefore be removed from the diagram and table (the cooling tower blowdown reused as BAS has been added to Question 48, Table 16). The flow for the BAS stream was corrected to be 18,086,400 gpd. The LVW sump stream was relabeled as WWT3-EFF and the silo wash water was relabeled as LVW-4. A solids stream was added leaving the pond and showing 215 tpd solids sold.
12	N	47, 49-52	B-28, B-32-34	**Q:** For WWT4, the effluent to WWT5 is shown as 12 MGD; however, the total influent to the system is approximately 22 MGD. Please indicate which flow is correct. Also, please verify if the effluent flows to WWT5 365 days per year. **A:** WWT4 does discharge effluent 365 days per year to the discharge canal (WWT5). **Please provide the answer to the question on flow differences. Flow from WWT4 to WWT5 (12 MGD) is the calculated flow from weir measurements for 2006. Except for the Outfall 005 flow volume (7 MGD) that is part of the ash sluice water, influent sources to WWT4 are approximated/estimated and reflects values off the Form 2c (likely maximums or "worse case" volumes). Further, loses from the ash pond (SPD2) such as evaporation—ROUGHLY calculated to be only about 1 MGD though—are not taken into account. Could back off ash sluice (BAS) volume a bit if we need to get these values closer.**
13	N	47, 49-52	B-28, B-32-34	**Q:** For WWT5, please clarify if the discharge canal acts as an equalization step, a cooling "pond", settling "pond", or if any treatment occurs in this area. **A:** The discharge canal acts as a commingling step for the cooling water and the ash pond effluent. Additional cooling of the water occurs here. After discussion of this operation with the plant, we determined we would not include this as a treatment system, and would remove information on WWT5 from the data request.
14	N	47, 49-52	B-28, B-32-34	**Q:** For WWT5, of the water that is recycled as cooling water, how much comes from once through cooling water versus the effluent from WWT4? Please also confirm that the cooling tower and helper cooling tower flows should be added to this diagram and associated tables. **A:** The plant could only confirm the total amount of flow taken from the discharge canal and recycled back for use as cooling water in the Unit 4 cooling tower, but could not confirm the specific source.
15	N	47, 49-52	B-28, B-32-34	**Q:** For WWT5, please clarify that the effluent labeled RECYC-CW is used in CT1, then used as bottom ash sluice water. **A:** This is correct.
16	N	47, 49-52	B-28, B-32-	**Q:** Please indicate where on the diagrams the pyretic mill rejects should be shown entering the ash pond, and provide the flow and frequency of

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			34	this stream (from Q. 13, it is 19,730,000 gpy). **A:** The pyretic mill rejects stream should be shown entering WWT4 (54,055 gpd). ERG will enter this stream on the diagram.
17	N	53	B-35	**Q:** For WWT2, WWT3, and WWT4, please elaborate on what type of energy costs are associated with each system, and if there is any way to estimate an order-of-magnitude cost? **A:** These systems are gravity fed, and as such have only small pumps in operation, none of which are metered. The energy costs are very small, approaching zero. ERG will add a comment to the data request for this question.
18	N	54	B-36	**Q:** Please indicate when the FGD treatment system (SP/BIO) was constructed and whether capital costs are available? **A:** The FGD treatment was constructed after 2006 and the plant is expecting it to begin operating by the end of the month. The plant personnel felt the system was not necessarily complete and therefore complete cost information was not available. They will be evaluating whether additional pretreatment is needed for the system. The system is currently designed as a settling pond followed by the GE ABMet system. They are targeting removal of both Hg and Se.
19	N	56	B-37	**Q:** Effluent data for total selenium is given in pounds per day. Is it possible to supply the measured concentration data? **A:** The plant is required to report selenium as pounds per day. However, it is possible to calculate the concentration by dividing the mass by the flow reported and multiplying by 8.34 (conversion factor).