

Mirant Potrero, LLC
Potrero Power Plant
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13 July 2004

Ms. Alexa La Plante
Environmental Scientist
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
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VIA E-MAIL (acl@rb2.swrcb.ca.gov) AND HAND DELIVERY

**Subject: Infeasibility Study
Potrero Power Plant
Mirant Potrero, LLC**



Dear Ms. La Plante:

Pursuant to a request from the San Francisco Bay Regional Water Quality Control Board (Water Board) as part of the renewal of National Pollutant Discharge Elimination System (NPDES) Permit No. CA0005657 (Permit), Mirant Potrero, LLC (Mirant) is providing the following letter report to demonstrate its infeasibility to immediately comply with proposed water-quality-based effluent limits (WQBELs) for copper, mercury, DDE, and dieldrin ("constituents") in wastewater discharged from Outfall E-001 at Potrero Power Plant (Plant). Since Mirant has made diligent efforts to quantify the concentrations of these constituents in Outfall E-001, described source-control measures in place for the applicable constituents, and proposed a schedule for further characterizing constituent concentrations in Outfall E-001, it requests that the Water Board grant and establish interim limits and compliance schedules in the new Permit.

Methods

Mirant conducted its infeasibility study in accordance with the requirements of the State Water Resources Control Board's (2000) *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP) and the Water Board's (1995) *San Francisco Bay Basin Water-Quality Control Plan*. In cases such as Mirant's where wastewater dischargers cannot immediately comply with WQBELs, these two documents stipulate that the following information be supplied to the Water Board to support a finding of infeasibility:

- results from a diligent effort to quantify constituent concentrations and potential sources
- documentation of source-control efforts currently underway or completed
- a proposed schedule for any additional source-control measures
- a demonstration that the proposed schedule is as expedient as possible

Monitoring Efforts

Copper and Mercury. Under the current Permit, total copper and mercury concentrations have been measured semiannually in Intake I-001 and Outfall E-001 since at least 1994. Mirant has also measured dissolved copper and total mercury concentrations monthly in Intake I-001 and Outfall E-001 since 2002 to meet SIP requirements in accordance with its Water Board-approved (2001) *SIP Sampling and Analysis Plan for Potrero Power Plant* (MWH Americas, Inc. 2001). Copper data collected before 28 April 2004 are generally considered invalid because potential interferences from the saline matrix were



not accounted for during analysis. Furthermore, mercury data collected before 25 June 2002 are not considered useable because ultraclean sampling and analysis methods were not employed.

In an effort to generate a dataset of metals' concentrations unbiased by saline-matrix interference, Mirant (2004) collected and analyzed 10 sets of paired Intake I-001 and Outfall E-001 samples for total and dissolved metals, including copper, from 28 April to 25 May 2004. The samples were analyzed using U.S. Environmental Protection Agency (EPA) Method 6020 (inductively coupled plasma with mass spectrometry) on a specialized "reaction-gas, matrix-elimination" instrument specifically designed to handle "high matrix" samples (e.g., seawater) and provide highly accurate results. Mercury was not included in the suite of metals analyzed for these samples because the previous ultraclean data, generated using EPA Method 1631, a hydride-generation technique, were not affected by saline-matrix interference. Table 1 summarizes the valid total copper and mercury concentrations for Intake I-001 and Outfall E-001.

DDE and Dieldrin. Although the current Permit does not require sampling and analysis for DDE and dieldrin, Mirant has collected data for these pesticides in Outfall E-001 semiannually since 2002 to meet SIP requirements. Simultaneous Intake I-001 samples were not collected because the Plant is not a source of these contaminants to San Francisco Bay (Bay). Table 1 summarizes the available data for Outfall E-001.

Source-Control Efforts

Copper. Mirant believes that most, if not all, of the copper present in Outfall E-001 is derived directly from copper already present in the Bay water obtained from Intake I-001. Indeed, a pairwise comparison of Intake I-001 and Outfall E-001 concentrations (Table 1) results in a correlation coefficient (r) of 0.73, showing a considerable association. In addition, the relative magnitude of flow from boiler blowdown and stormwater—two other potential sources of copper to Outfall E-001—is miniscule: on average, boiler blowdown and stormwater respectively represent a mere 0.001 and 0.003% of total Outfall E-001 flow. Since stormwater flows to Outfall E-001 do not intercept potential copper sources on their way to the Bay and boiler blowdown discharges are minimal volumetrically, the potential weathering of copper alloys in the once-through cooling-water system ("system") is the only potential significant source of this element.

In order to evaluate this potential source, Mirant reviewed system metallurgy. Interestingly, the former owners of the Plant, Pacific Gas & Electric Company (PG&E), conducted a general metallurgical analysis of the system in response to concerns from the Water Board in 1988 that "cooling water effluent contains amounts of heavy metals at significantly higher concentrations than the intake cooling water" (PG&E, 1988). PG&E inventoried and assessed the system equipment and concluded that metals "are not used in any part of the process except as alloys in various pieces of equipment" and "could possibly be introduced into the water as a result of corrosion, [but] the increase in concentration of metals is not consistent with corrosion rates."

Mirant reviewed and updated the data from the PG&E (1988) assessment using methods similar to those conducted in the renewal of the NPDES Permit for Pittsburg Power Plant (Mirant Delta, LLC, 2002).¹ Basically, the metallurgy of the system was inventoried, cooling-water residence times were evaluated, and approximate contact-equipment surface areas were calculated. Copper was found to be a common metal used in system equipment—especially the main condenser, traveling screens, and heat exchangers—and may potentially be added to the Bay via weathering of alloys.

¹Mirant Delta, LLC worked with the Water Board to use the Pittsburg Power Plant metallurgical results to tailor the Self-Monitoring Program such that it included regulated metals that could potentially enter the Bay and excluded those that did not. The approach ensured that water quality would be protected while minimizing sampling and analytical effort.



However, Mirant is not aware of any economically feasible source-control measures that could be used to limit the potential for copper to weather into the system and enter the Bay. Replacement of equipment with other alloys would require shutdown of the Plant for months and be extremely expensive. Mirant recommends that additional copper data be collected from both Intake I-001 and Outfall E-001 to allow a more comprehensive evaluation of this potential source. Until that time, no feasible source-control measures can be proposed.

Mercury. Mirant believes that virtually all the mercury discharged from Outfall E-001 originates from mercury already present in the Bay water obtained from Intake I-001. Not only do paired Intake I-001 and Outfall E-001 mercury concentrations show a strong correlation ($r = 0.96$; Table 1), but average intake concentrations are also notably greater than average outfall concentrations. Since stormwater flows to Outfall E-001 do not intercept potential mercury sources on their way to the Bay, boiler blowdown is the only potential direct source of this element since there are no mercury-containing alloys in the system. Potential indirect sources could include mercury released from broken fluorescent lightbulbs, laboratory thermometers, and certain types of laboratory waste, but these items are handled appropriately and are either recycled or disposed of offsite (Mirant, 2003).

Mirant demineralizes potable water obtained from the City of San Francisco for use in its boilers. The deionization process is believed to remove the vast majority of the mercury already present in the raw water as received by Mirant. Whatever mercury remains in the demineralized boiler water may potentially be discharged to the Bay during blowdowns. Mirant will design the provisional mercury study required in the new Permit to assess this potential mercury source to the Bay. Because there are no known sources of mercury at this time, no source-control measures can be proposed.

DDE and Dieldrin. There are no sources of DDE or dieldrin at the Plant and thus no site-specific source-control measures are proposed.

Schedule

Additional data are needed to assess whether the system is contributing copper to the Bay from equipment weathering. Monthly sampling for copper in Intake I-001 and Outfall E-001, as required in the new Permit, appears to be an appropriate schedule for assessing the potential effects of equipment leaching.

Mirant does not believe it is a source of mercury to the Bay, but will confirm this by collecting additional data as part of a provisional study in the new Permit. The plan for this study will be prepared in accordance with the deadlines in the new Permit so that potential sources of this metal can be assessed in a timely fashion.

Until additional data are collected, Mirant cannot make an accurate assessment of potential sources of the constituents to the Bay. Should any sources of the constituents be identified in the future, Mirant will implement appropriate source-control measures.

Closing

I trust that this letter provides you with the information you need regarding Mirant's inability to immediately comply with proposed WQBELs in the new Permit. If you have questions or need more information, please contact me at 925.427.3513 or guy.chammas@mirant.com.



Sincerely,

Guy Chammas, MS, RG, CPSSc, REA
Senior Environmental Specialist

Attachment

Table 1 Total Copper, Mercury, DDE, and Dieldrin Results

References

- Mirant Delta, LLC. 2002. *Analysis of NPDES Data for Proposed Water-Quality-Based Effluent Limits*. Submitted to Ms. Judy Huang of the San Francisco Bay Regional Water Quality Control Board as part of the renewal of NPDES Permit No. CA0004880 for Pittsburg Power Plant. 13 May.
- Mirant Potrero, LLC (Mirant). 2003. *Hazardous Waste Source Reduction (SB14) Reporting for Year 2002*. September.
- . 2004. Letter from Mr. Guy Chammas, Senior Environmental Specialist, to Ms. Alexa La Plante, Environmental Scientist, San Francisco Bay Regional Water Quality Control Board, re: Follow Up on Recent NPDES Permit Renewal Meeting. 5 May.
- MWH Americas, Inc. 2001. *State Implementation Policy Sampling and Analysis Plan for Potrero Power Plant*. Prepared for Mirant Potrero, LLC. 1 October.
- Pacific Gas & Electric Company (PG&E). 1988. Letter from Mr. Norman B. Wheelock, Potrero Power Plant Manager, to Mr. Michael D. Drennan, San Francisco Bay Regional Water Quality Control Board, re: Letter Dated 7/25/88 on Potrero Power Plant and Letter Dated 8/8/88 on Hunters Point Power Plant. 1 September.
- San Francisco Bay Regional Water Quality Control Board (Water Board). 1995. *San Francisco Bay Basin (Region 2) Water-Quality Control Plan*. Published 21 June. Approved by the State Water Resources Control Board on 20 July and the California State Office of Administrative Law on 13 November.
- . 2001. Letter from Ms. Shin-Roei Lee, NPDES Division Chief, to Mr. Steve Bauman, Mirant Potrero, LLC, re: Conditional Approval of the Sampling and Analysis Plan Submitted to Fulfill Requirements for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy. 20 December.
- State Water Resources Control Board. 2000. *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*. Phase I of the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan.

TABLE 1
TOTAL COPPER, MERCURY, DDE, AND DIELDRIN RESULTS
Infeasibility Study
Potrero Power Plant
Mirant Potrero, LLC

DATE	Parameter:	TOTAL COPPER		TOTAL MERCURY		DDE	Dieldrin
	Location:	I-001	E-001	I-001	E-001	E-001	
	Method:	EPA 6020		EPA 1631		EPA 8081	
	Units:	mg/L		ng/L		µg/L	
6/25/2002		-	-	17.2	9.23	-	-
6/27/2002		-	-	-	-	<0.060	<0.060
7/23/2002		-	-	4.98	4.48	-	-
8/14/2002		-	-	8.62	7.78	-	-
9/18/2002		-	-	2.88	3.03	-	-
10/2/2002		-	-	3.37	3.22	-	-
11/21/2002		-	-	4.38	4.64	<0.060	<0.060
12/19/2002		-	-	100.2	50.5	-	-
1/23/2003		-	-	8.95	13.8	-	-
2/7/2003		-	-	5.89	6.17	-	-
3/28/2003		-	-	-	10.7	-	-
10/31/2003		-	-	8.8	6.4	-	-
12/4/2003		-	-	9.1	4.0	<0.060	<0.060
1/31/2004		-	-	11.5	5.06	-	-
2/9/2004		-	-	5.33	5.26	-	-
3/3/2004		-	-	19.6	4.03	-	-
4/2/2004		-	-	6.21	6.79	-	-
4/28/2004		0.00270	0.00225 J	-	-	-	-
4/29/2004		0.00270	0.00470	-	-	-	-
5/4/2004		0.00539	0.00500	-	-	-	-
5/5/2004		0.00467	0.00361	9.44	10.1	<0.045	<0.031
5/11/2004		0.00378	0.00717	-	-	-	-
5/13/2004		0.00317	0.00228 J	-	-	-	-
5/18/2004		0.00180 J	0.00240 J	-	-	-	-
5/19/2004		0.00280	0.00300	-	-	-	-
5/24/2004		0.00283	0.00333	-	-	-	-
5/25/2004		<0.000695	0.00128 J	-	-	-	-
6/2/2004		<0.000695	<0.000695	5.21	8.64	-	-
	Minimum:	<0.000695	0.00128	2.88	3.03	-	-
	Mean:	0.00278	0.00322	13.6	9.1	-	-
	Median:	0.00280	0.00300	8.62	6.29	-	-
	Maximum:	0.00539	0.00717	100.2	50.5	-	-
	Correlation Coefficient:	0.73		0.96		-	-

Notes:

< = analyte not detected above the indicated limit

- = not analyzed or not useable

J = estimated result (less than reporting limit, but greater than detection limit)

mg/L = milligrams per liter

ng/L = nanograms per liter

µg/L = micrograms per liter