

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2009-0052

WASTE DISCHARGE REQUIREMENTS
FOR
STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
STARWOOD-MIDWAY POWER PLANT
FRESNO COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board) finds that:

1. Starwood Power-Midway, LLC, (Starwood), a Delaware limited liability company, submitted a Report of Waste Discharge (RWD) dated 6 May 2008 to obtain Waste Discharge Requirements (WDRs) for the discharge of industrial process wastewater to an unlined surface impoundment at the Starwood-Midway Power Plant (Facility). Additional information was submitted on 6 June 2008 and the RWD was deemed complete by Central Valley Water Board staff in a letter dated 26 June 2008.
2. Starwood, owner and operator of the Facility, has a signed lease with the property owner, PAO Investments, LLC, a California limited liability company. Both Starwood and PAO Investments, LLC are hereafter jointly referred to as Discharger.
3. The Facility is at 43627 West Panoche Road, an unincorporated area of western Fresno County. The Facility is about 12 miles southwest of the City of Mendota and two miles east of Interstate 5, as shown on Attachment A, which is attached hereto and made a part of this Order by reference.
4. The 5.57-acre Facility is on a 128-acre parcel (Assessor's Parcel Number 027-060-78S) in the southwest quarter of Section 5, Township 15 South, Range 13 East, Mount Diablo Base and Meridian, as shown on Attachment B, which is attached hereto and made a part of this Order by reference.
5. The Facility is a 120 megawatt peaking-power electrical generation plant with four natural gas-fired combustion turbine generators. The Facility is expected to generate between 400 and 4,000 hours of electricity per year.
6. The Facility needs high-purity water for inlet air fogging and turbine combustor water injection for nitrous oxide control.

Source Water Characteristics

7. The source water for the Facility is reclaimed agricultural backwash water from 162 irrigation system sand filters, owned and operated by Baker Farming Company, LLC (Baker Farms). Baker Farms uses approximately 24,000 acre-feet of water annually from the California Aqueduct to irrigate about 7,000 acres. Approximately 160 acre-feet of backwash water is produced annually by Baker Farms. The Facility property owner, PAO Investments, LLC consists of members of the Baker family.

8. Baker Farms and Starwood have a 7-year contract for Baker Farms to provide backwash water to Starwood. The contract is subject to termination by Baker Farms with two years notice and, if not terminated, will continue for a term not to exceed 15 years, the duration of Starwood's Power Purchase Agreement with Pacific Gas and Electric.
9. On 19 February 2008, backwash water samples were collected by Starwood from Baker Farms. The analytical results are shown in Table I below:

Table I

Backwash Water Constituent Concentrations

(Concentrations in milligrams per liter, except where noted)

Constituent	Concentration
Arsenic	0.0023
Barium	0.035
Bicarbonate Alkalinity (as CaCO ₃)	84
Boron	0.27
Calcium	36
Carbonate Alkalinity (as CaCO ₃)	<1
Chloride	69
Electrical Conductivity ¹	500
Fluoride	0.12
Iron	0.064
Magnesium	15
Nitrate (as NO ₃)	15
Potassium	4
Selenium	0.0037
Silica, Total	20
Sodium	54
Sulfate	59
Total Dissolved Solids	310

¹ Specific Conductance measured in micromhos per centimeter at 25° Centigrade

10. The source water is conveyed to the Facility by a 3-inch diameter underground pipeline from a 30 acre-foot collection basin. The basin is about 1.5 miles southeast of the Facility as shown on Attachment C, which is attached hereto and made a part of this Order by reference.
11. The source water is treated at the Facility with sodium hypochlorite, a sand filter, and then a reverse-osmosis (RO) unit and a demineralizer process. The treatment system includes a 75,000-gallon RO water storage tank and two 75,000-gallon demineralized

water storage tanks. The Facility requires about 10.2 acre-feet of treated water annually for 400 hours and 102 acre-feet for 4,000 hours of electric generation.

Wastewater Characteristics

12. Based on the backwash water chemistry, the RO system supplier predicted an annual RO reject water volume total of 4.38 acre-feet for 400 hours and 43.8 acre-feet for 4,000 hours of electric generation.
13. The RO system supplier predicted the concentration of chemical constituents in the reject water from the RO system. The prediction was based on the backwash water quality from Baker Farms, treatment using the proposed RO membrane, and the resulting mass balance. Predicted wastewater constituent concentrations are shown in Table II below.

Table II
Predicted RO Reject Wastewater Constituent Concentrations

(Concentrations in milligrams per liter, except where noted)

Constituent	Concentration
Arsenic	0.0076
Barium	0.120
Bicarbonate Alkalinity (as CaCO ₃)	272
Boron	0.38
Calcium	119
Carbonate Alkalinity (as CaCO ₃)	2.3
Chloride	306
Electrical Conductivity ¹	1,650
Fluoride	0.39
Iron	0.21
Magnesium	50
Nitrate (as NO ₃)	43
Potassium	11
Selenium	0.012
Silica, Total	65
Sodium	176
Sulfate	196
Total Dissolved Solids	1,242

¹ Specific Conductance measured in micromhos per centimeter at 25° Centigrade.

Surface Impoundment Design

14. Reject water from the RO system, backwash/rinse water from the normal maintenance of the RO multimedia filter and demineralizer unit, and drainage/overflow water from the RO/demineralized water storage tanks (wastewater) are conveyed via pipelines to four concrete catch basins. An underground pipeline conveys the wastewater to an unlined surface impoundment for disposal by evaporation and percolation. The water treatment system and surface impoundment are shown on Attachment D, which is attached hereto and made a part of this Order by reference.
15. The preliminary Facility Grading Plan and Cross Sections submitted with the RWD indicate the bottom of the surface impoundment is at an elevation of 397 feet above mean sea level (amsl) and the top is at an elevation of 403 feet amsl. The surface impoundment was designed to accommodate the 100-year, 24-hour storm event on the site.
16. The surface impoundment is designed to hold approximately 1.8 acre-feet of wastewater with two feet of freeboard. The sidewalls have steep slopes of two horizontal to one vertical to discourage waterfowl nesting.

Site-Specific Conditions

17. Land use in the vicinity is primarily large-scale agricultural and some rural residential. The CalPeak Panoche and Wellhead Peaker electrical generation plants are immediately west and south of the Facility, respectively. Adjacent to and west of the CalPeak Panoche plant is the PG&E electrical substation. A short distance to the south and west of the substation is the Panoche Energy Center electrical generation plant.
18. The climate in the area is semi-arid, with long, hot, dry summers and mild winters. The average annual precipitation at Five Points SSW, the nearest weather station about 35 miles south of the Facility, is 6.92 inches, based on 58 years of data. The 100-year, 24-hour precipitation event at the Facility is estimated to be about 2.5 inches.
19. The average annual evaporation at the Los Banos Detention Reservoir, about 30 miles northwest of the Facility, is about 108 inches, based on 38 years of data. Based on eight years of data, the average annual evaporation rate at the Little Panoche Detention Dam, about 15 miles northwest of the site is 111 inches.
20. Federal Emergency Management Agency Flood Insurance Rate Map, Community Panel No. 1975, dated 19 July 2001, shows the Facility is partially within the special flood hazard area (Zone A) subject to the 100-year flood. The U.S. Department of Homeland Security Elevation Certificate states the base flood elevation is 404 feet amsl. The Facility is surrounded by an engineered earthen berm extending at least one foot above the base flood elevation.
21. Storm water from the Facility is retained onsite and collected in a subsurface storm drain system that discharges to an unlined onsite storm water retention basin.

22. No active or potentially active faults are known to cross the Facility. The closest known active fault is the Ortigalita fault zone, located 19 miles west of the site. The next closest known active fault is the San Andreas fault located 28 miles west of the Facility.
23. The nearest natural surface water body is Panoche Creek, an ephemeral stream about 1.8 miles northwest of the Facility. The California Aqueduct is about 2.6 miles northeast of the Facility.
24. The Facility is on the Panoche Creek alluvial fan which slopes to the east-northeast at a gradient of about 30 feet per mile near the Facility. Surface soils consist of the Panoche Series which is comprised of about 98 percent clay loam and two percent sandy loam.

Basin Plan, Beneficial Uses, and Water Quality Objectives

25. The *Water Quality Control Plan for the Tulare Lake Basin, 2nd Edition - 1995* (Basin Plan) designates beneficial uses, establishes numerical and narrative water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates by reference plans and policies of the State Water Board. Pursuant to Section 13263(a) of the California Water Code (CWC), these WDRs implement the Basin Plan.
26. The Facility is in the Westside Basin Hydrologic Unit, Detailed Analysis Unit (DAU) No. 244. The Basin Plan designates groundwater beneficial uses in this DAU as municipal and domestic supply (MUN), agricultural supply (AGR), and industrial service supply (IND).
27. The Facility is in the South Valley Floor Hydrologic Unit, Westlands Hydrologic Area No. 551.10. The Basin Plan designates surface water beneficial uses in this area as agricultural supply (AGR), industrial service supply (IND), industrial process supply (PRO), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), wildlife habitat (WILD), rare, threatened, or endangered species (RARE), and groundwater recharge (GWR).
28. The Basin Plan includes a water quality objective for chemical constituents that at a minimum, requires waters designated as domestic or municipal supply to meet the maximum contaminant levels (MCLs) specified in Title 22, Division 4, Chapter 15. The Basin Plan recognizes that that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
29. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity. The toxicity objective requires groundwater to be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.

Groundwater Considerations

30. The Facility is generally underlain by alluvium of the Panoche Creek fan consisting of interbedded, poorly to moderately sorted, gravel, sand, silt, and clay layers of varying thickness.
31. The Corcoran Clay divides the groundwater system into an upper semi-confined zone, and a lower confined zone with the vertical gradient between the two zones typically downward. The Corcoran Clay was encountered at a depth from 660 to 785 feet below ground surface (bgs) in a monitoring well boring at the Panoche Energy Center.
32. There are seven offsite groundwater wells within ½ mile of the Facility. One United States Geological Survey (USGS) groundwater well monitors the lower confined zone, and a second well monitors the upper semi-confined zone. At the Panoche Energy Center, two groundwater wells monitor the lower confined zone, and a third well monitors the upper semi-confined zone. At the CalPeak Panoche facility, an industrial supply well extracts groundwater from the upper semi-confined zone. An inoperable irrigation well is completed in the lower confined zone. Irrigation wells within 2 miles of the Facility are completed in the lower confined zone.
33. During February 2008, Starwood installed groundwater monitoring well MW-1 on the west side of the Facility, about 330 feet upgradient from the surface impoundment. MW-1 is shown on Attachment D. The well is constructed with 5-inch diameter polyvinyl chloride casing and completed in the upper semi-confined zone with the screened interval from 160 to 220 feet bgs. Groundwater was first encountered at 170 feet bgs.
34. During January 2009, Starwood installed two groundwater monitoring wells, MW-2 and MW-3, at the locations shown on Attachment D. The wells are completed in the upper semi-confined zone and constructed with 4-inch diameter polyvinyl chloride casing and screened from 160 to 220 feet bgs.
35. During March 2008, Starwood collected three baseline groundwater samples from monitoring well MW-1. During February 2009, Starwood collected baseline groundwater samples from monitoring wells MW-2 and MW-3. The range of analytical results for selected constituents in the groundwater, source water, the predicted RO reject wastewater, and numerical water quality objectives are shown in Table III on the following page.

Table III
Source Water, Predicted RO Reject Wastewater, and Baseline Groundwater
Analytical Results with Municipal and Agricultural Water Quality Objectives

(Concentrations in milligrams per liter, except where noted)

Constituent	Source Water	Predicted RO Reject Wastewater	Baseline Groundwater (Range of samples)	Water Quality Objectives	
				Municipal	Agricultural ¹
Arsenic	0.0023	0.0076	0.039 – 0.063	0.010 ²	<0.05 – 12
Barium	0.035	0.120	0.011 – 0.022	1 ²	-
Bicarbonate ³	84	271	73 – 85	-	-
Boron	0.27	0.38	3.0 – 3.2	-	<0.5 – 15
Calcium	36	119	580 – 640	-	-
Carbonate ³	<1	2.3	<1	-	-
Chloride	69	306	880 – 1,100	250 – 600 ⁴	<106 – >355
Electrical Conductivity ⁵	500	1,650	5,800 – 7,000	900 – 2,200 ⁴	<700 – >3,000
Fluoride	0.12	0.39	<0.1 – 0.32	2.0 ²	1
Iron	0.064	0.21	<0.05	0.3 ⁴	5
Magnesium	15	50	390 – 420	-	-
Nitrate (as NO ₃)	15	43	1,000 – 1,100	45 ²	-
Potassium	4	11	11 – 13	-	-
Selenium	0.0037	0.012	0.88 – 1.4	0.05 ²	0.02
Silica	20	65	45 – 48	-	-
Sodium	54	176	690 – 760	-	<69 – >207
Sulfate	59	196	2,200 – 2,500	250 – 600 ⁴	-
TDS ⁶	310	1,242	5,200 – 6,300	500 – 1,500 ⁴	<450 – >2,000

¹ Ayers R.S. and Westcot D.W., 1985, *Water Quality for Agriculture*

² Primary Maximum Contaminant Level (MCL) - Title 22 Drinking Water Standards

³ Alkalinity as CaCO₃

⁴ Secondary MCL – Title 22 Drinking Water Standards

⁵ Specific Conductance measured in micromhos per centimeter at 25° Centigrade

⁶ Total dissolved solids

36. The data in Table III indicate that:

- a. Baseline groundwater concentrations of boron, chloride, electrical conductivity (EC), nitrate, selenium, sodium, sulfate, and total dissolved solids (TDS) exceed their respective numeric water quality objectives for MUN and/or AGR;
- b. Predicted RO reject wastewater concentrations of arsenic, boron, calcium, chloride, EC, magnesium, nitrate, selenium, sodium, sulfate, and TDS are less than their respective baseline groundwater concentrations; and,
- c. Predicted RO reject wastewater concentrations of barium, bicarbonate and carbonate (considered one constituent, bicarbonate, because their occurrence is

pH dependent), fluoride, and silica exceed their respective baseline groundwater concentrations.

Antidegradation Analysis

37. The predicted concentrations of chloride, EC, sodium, and TDS in the RO reject wastewater, while exceeding their respective water quality objectives, do not exceed their respective baseline groundwater concentrations. The applicable salinity objectives are the greater of naturally occurring background or the water quality objectives that would otherwise apply. While there are no historical data available to the Central Valley Water Board to determine historic groundwater quality, the groundwater sampling data establishes that the predicted RO reject wastewater concentrations of these constituents are below baseline groundwater concentrations, and the discharge should not cause groundwater degradation. Three monitoring wells at the Facility monitor groundwater quality.
38. The discharge of wastewater to the surface impoundment could potentially cause degradation of the upper semi-confined groundwater for barium, bicarbonate, fluoride, and silica. The predicted RO reject wastewater concentrations of barium and fluoride do not exceed their respective water quality objectives for MUN and/or AGR. Although there are no numerical water quality objectives, and narrative water quality objectives have not been established for bicarbonate and silica, their predicted RO reject wastewater concentrations are not at levels that could adversely affect the beneficial uses of the upper semi-confined groundwater.
39. State Water Board Resolution No. 68-16 (*"Policy with Respect to Maintaining High Quality Waters of the State"*) (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown:
 - a. The degradation is consistent with the maximum benefit to the people of the State;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
 - d. The discharger employs Best Practicable Treatment or Control (BPTC) to minimize degradation.
40. The anticipated de-minimus groundwater degradation is in the best interest of and consistent with the maximum benefit to the citizens of California. This determination is supported by the following:
 - a. Operation of the Facility will supply a more reliable electrical supply to the State during periods of peak power use.
 - b. Operation of the Facility will provide increased employment in the area.
 - c. The Discharger will utilize reclaimed backwash water from an irrigation sand filtration system. This water would not have been reused by Baker Farms and would have

been lost to evaporation and percolation if the Facility were not constructed. The reclaimed water not used by the Facility will be available for reuse by Baker Farms.

- d. The upper semi-confined groundwater is not known to be used within several miles of the Facility except for one industrial supply well. Irrigation wells are completed in the lower confined groundwater.
- e. Any degradation anticipated by barium, bicarbonate, fluoride, and silica is de-minimus compared to the improvement in groundwater quality of chloride, nitrate, sodium, sulfate, and TDS constituent concentrations in the discharge.
- f. The predicted concentrations of barium and fluoride in the wastewater discharge do not exceed their respective water quality objectives. Water quality objectives have not been established for bicarbonate and silica, and
- g. The discharge will not unreasonably affect present and anticipated future beneficial uses of the upper semi-confined groundwater.

Designated Waste and Title 27

41. CWC Section 13173 defines designated waste as either:
 - a. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Section 25143 of the Health and Safety Code or,
 - b. Non-hazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or could reasonably be expected to affect beneficial uses of the waters of the state contained in the appropriate state water quality control plan.
42. Release of designated waste is subject to full containment pursuant to the requirements of Title 27, CCR, Section 20005 et seq (hereafter Title 27). Title 27 Section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards provided the following conditions are met:
 - a. The applicable regional water board has issued waste discharge requirements, or waived such issuance;
 - b. The discharge is in compliance with the applicable basin plan; and,
 - c. The waste is not hazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.
43. The discharge is exempt from the Title 27 containment standards because the discharge is not considered hazardous waste, the applicable regional water board has issued waste discharge requirements, and, applying the directives of State Water Board Resolution No. 68-18, the antidegradation analysis as described in Findings 37-40, finds the discharge to be in compliance with the applicable Basin Plan.

CEQA and Other Legal References

44. The California Energy Commission (CEC), as the lead agency under the California Environmental Quality Act (CEQA), has a facility certification process to examine public health and safety, environmental impacts, and engineering aspects of proposed electrical generation plants. Under the certified program, the CEC is exempt from having to prepare an environmental impact report (EIR). However, the facility certification process is functionally equivalent to an EIR because it requires an environmental analysis, including an analysis of alternatives and mitigation measures, to minimize any significant adverse effect on the environment.
45. Central Valley Water Board staff reviewed the *Application for Certification* submitted by Starwood to the CEC, the lead agency under a CEQA-equivalent process. Comments to the CEC concerning water quality were provided in correspondence dated 20 December 2006.
46. On 16 January 2008, the CEC adopted Order No. 08-0116-02 which adopts the *Commission Decision*, approves the *Application for Certification* for the Facility, and grants a certificate to construct and operate the Facility. The approval of the *Application for Certification* is subject to the timely performance of the Conditions of Certification and Compliance Verifications enumerated in the *Commission Decision*.
47. The *Commission Decision* includes a finding which states that implementation of the Conditions of Certification described in the Water Resources section of the document will result in potential water resource impacts being mitigated to insignificance.
48. These WDRs implement measures necessary to mitigate any impacts to groundwater to less than significant levels, including Facility Specification B.4, which stipulates waste constituents cannot be released or discharged in a concentration or mass that causes violation of the WDRs groundwater limitations.
49. The State Water Board adopted Order No. 97-03-DWQ (NPDES General Permit No. CAS000001), on 17 April 1997, specifying WDRs for discharge of storm water associated with industrial activities, excluding construction requirements, and requiring submittal of a Notice of Intent (NOI) by industries covered under the permit. All storm water at the Facility will be directed to and contained in a storm water retention pond. Consequently, the Facility will not be required to obtain coverage under General Permit No CAS00001.
50. The State Water Board adopted Order No. 99-08-DWQ (NPDES General Permit No. CAS000002), on 17 April 1997, specifying WDRs for discharge of storm water associated with construction activities and requiring submittal of a Notice of Intent (NOI) to obtain coverage under the permit. Starwood's Storm Water Pollution Prevention Plan (SWPPP) has been reviewed by Central Valley Water Board staff and it appears that the SWPPP meets the requirements of the General Permit. Starwood has submitted a NOI to the State Water Board.

General Findings

51. These WDRs do not authorize violation of any federal, state, or local law or regulation. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the Discharger from liabilities under federal, state, or local law.
52. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of these WDRs does not create a vested right to continue the discharge.
53. The Central Valley Water Board will review these WDRs periodically and will revise requirements when necessary.
54. CWC Section 13267(b) states: *“In conducting an investigation specified in subdivision (a), the Regional Water Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”*
55. The attached Monitoring and Reporting Program No. R5-2009-0052 is necessary to assure compliance with these WDRs. Starwood operates the Facility that discharges the waste subject to these WDRs.
56. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, as described in California Well Standards Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 94-81 (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC Section 13801, apply to all monitoring wells.

Public Notice

57. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the conditions of discharge.
58. The Discharger and interested agencies and persons have been notified of the intent to prescribe WDRs for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
59. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, Starwood Power-Midway, LLC, PAO Investments, LLC, and their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted there under, shall comply with the following:

A. Prohibitions

1. The discharge of wastewater outside of the surface impoundment is prohibited.
2. The discharge of wastewater to surface waters or surface water drainage courses is prohibited.
3. Discharge of waste classified as 'hazardous', as defined in Section 2521(a) of Title 23, California Code of Regulations, Section 2510 et seq., is prohibited. Discharge of waste classified as 'designated,' as defined in CWC Section 13173, in a manner that causes violation of groundwater limitations, is prohibited.
4. Discharge of wastewater in a manner or location other than that described herein is prohibited.

B. Facility Specifications

1. The surface impoundment shall be designed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
2. The surface impoundment shall have sufficient storage capacity to accommodate allowable wastewater flow, design seasonal precipitation during winter months, required freeboard levels, high velocity winds, or seismic shaking.
3. The surface impoundment shall be managed to prevent breeding of mosquitoes. Specifically, (a) erosion control measures shall be implemented to minimize irregularities around the perimeter of the water surface, (b) weeds within and around the perimeter shall be minimized through control of water depth, harvesting, or herbicides and, (c) dead algae, vegetation, and debris shall not accumulate on the water surface.
4. The collection, treatment, storage, discharge, or disposal of wastes at the Facility shall not result in: (a) discharge of waste constituents in a manner which could cause degradation of surface water or groundwater, except as discussed in Finding No. 37, 38, and 40, (b) contamination or pollution of surface water or groundwater, (c) a condition of nuisance, (d) exceedance of water quality objectives, or (e) unreasonably affect beneficial uses (as defined by the California Water Code Section 13050).
5. All wells shall have sanitary seals that meet the requirements of the Fresno County Department of Public Health, Environmental Health Division or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent

to the Central Valley Water Board and to the California Department of Water Resources.

C. Monitoring Specifications

1. The Discharger shall comply with Monitoring and Reporting Program No. R5-2009-0052 (MRP), which is part of these WDRs, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer. Submittal dates shall be no later than those specified in the MRP for Discharger self-monitoring reports.

D. Effluent Limitations

1. The wastewater shall not have a pH less than 6.5 or greater than 9.0.

E. Groundwater Limitations

1. The discharge of wastewater to the surface impoundment shall not cause or contribute to groundwater:
 - a. Containing constituents identified in Title 22, Division 4, Chapter 15 above the maximum contaminant levels quantified therein or baseline concentrations, whichever is greater.
 - b. Containing toxic substances, or any other constituents, in concentrations that cause nuisance or adversely affect beneficial uses.

F. Provisions

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as Standard Provisions. To the extent that the Standard Provisions are inconsistent with any terms, conditions, or requirements in these WDRs, the WDRs shall govern.
2. The Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.
3. The Discharger shall maintain and operate the surface impoundment sufficiently to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain a permanent marker with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.

4. The surface impoundment shall be maintained to prevent seepage or leakage caused by erosion, slope failure, or animal burrowing.
5. Wastewater production shall be controlled to the extent necessary to maintain consistent compliance with the terms of the WDRs.
6. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the WDRs.
7. The Discharger shall immediately notify the Central Valley Water Board of any flooding, unpermitted discharge of waste, equipment failure, slope failure, or other change in site conditions which could impair the integrity of the surface impoundment.
8. Any proposed change of the source water for the Facility as described in Finding No. 7 and characterized in Finding No. 9 shall require the submittal of a Report of Waste Discharge by the Discharger.
9. The Discharger shall keep a copy of the WDRs, including the MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with the contents.
10. The Discharger shall, within a reasonable time, furnish any information the Central Valley Water Board may request, to determine whether cause exists for modifying, revoking and reissuing, or terminating the WDRs. The Discharger shall, upon request, also furnish copies of records required to be kept by the WDRs.
11. The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of the WDRs. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of the WDRs.
12. All technical reports and work plans required herein that involve planning, investigation, evaluation, design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with sections 415 and 3065 of Title 16, California Code of Regulations, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

13. The Discharger must comply with all conditions of the WDRs, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of the WDRs.
14. In the event of any change in control or ownership of land or waste treatment and storage facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of the WDRs by letter, a copy of which shall be immediately forwarded to the appropriate Central Valley Water Board office.
15. To assume operation under the WDRs, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the WDRs. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with the WDRs. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of the WDRs at one of its regularly scheduled meetings.
16. If the Central Valley Water Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of an objective for groundwater, the WDRs may be reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.
17. The WDRs may be reopened to address any changes in state plans, policies, or regulations that would affect water quality requirements for the discharge and as authorized by state law.
18. A Sampling and Analysis Plan shall be submitted to the Executive Officer for review and approval within **45 days** following adoption of the WDRs. The approved Sampling and Analysis Plan shall at a minimum include: sample collection procedures describing purging techniques; sampling equipment and decontamination of sampling equipment; sample preservation information and shipment procedures; sample analytical methods and procedures; sample quality assurance/quality control procedures; and Chain of Custody control.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 24 April 2009.

Original Signed by

PAMELA C. CREEDON, Executive Officer

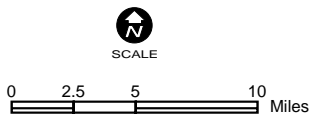
Attachments:

- Monitoring and Reporting Program
- A. Location Map
- B. Facility Map
- C. Vicinity Map
- D. Site Map
- Information Sheet
- Standard Provisions

DLW/SRG: 02/26/2009



Starwood-Midway Power Plant



LOCATION MAP

ORDER NO. R5-2009-0052

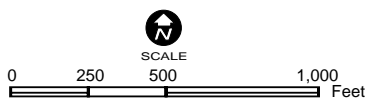
WASTE DISCHARGE REQUIREMENTS
FOR

STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
STARWOOD-MIDWAY POWER PLANT
FRESNO COUNTY

ATTACHMENT A

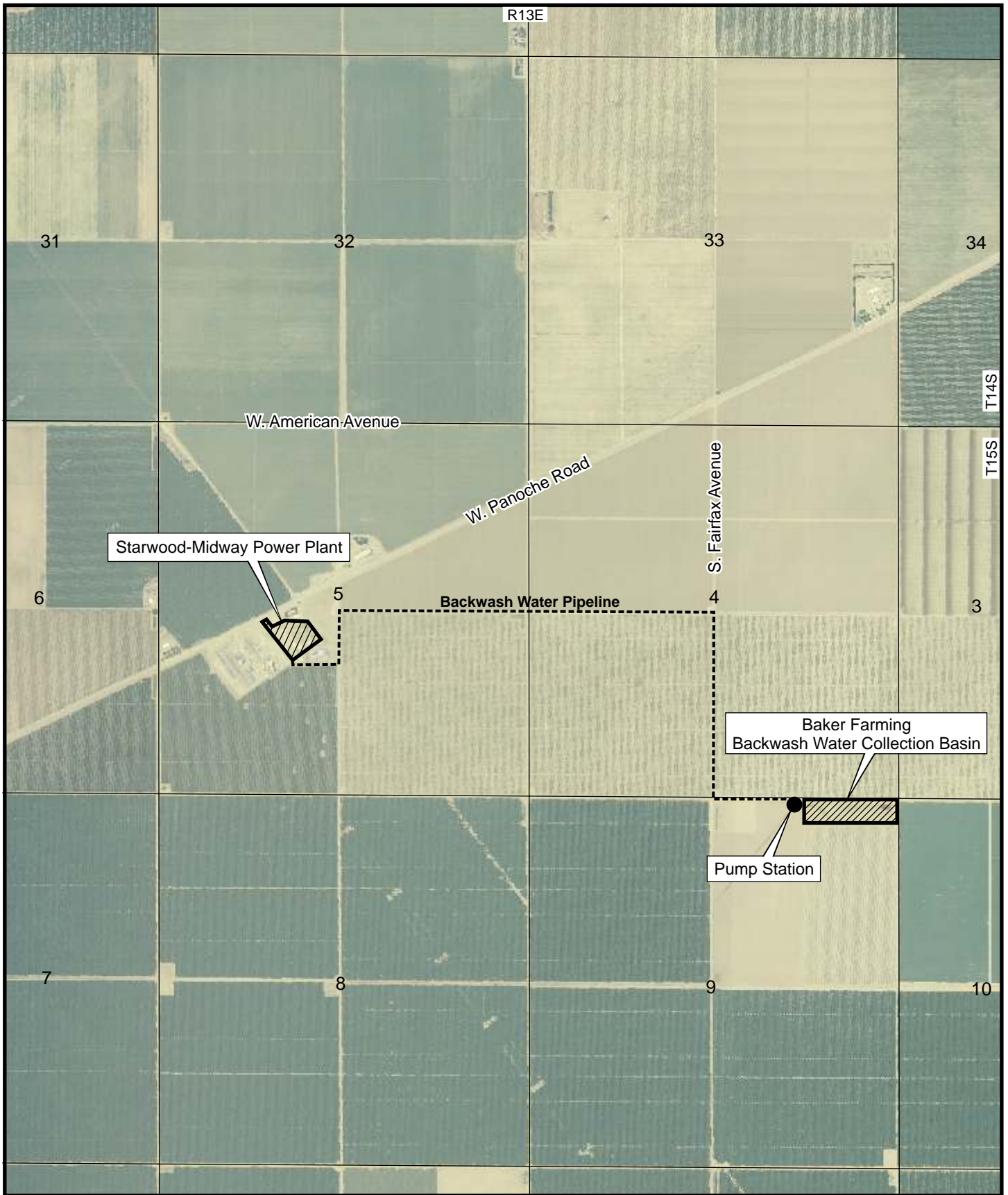


Map Source:
 NAIP Aerial Photograph (2005)
 Section 5, T15S, R13E, MDB&M

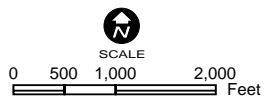


FACILITY MAP
 ORDER NO. R5-2009-0052
 WASTE DISCHARGE REQUIREMENTS
 FOR
 STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
 STARWOOD-MIDWAY POWER PLANT
 FRESNO COUNTY

ATTACHMENT B

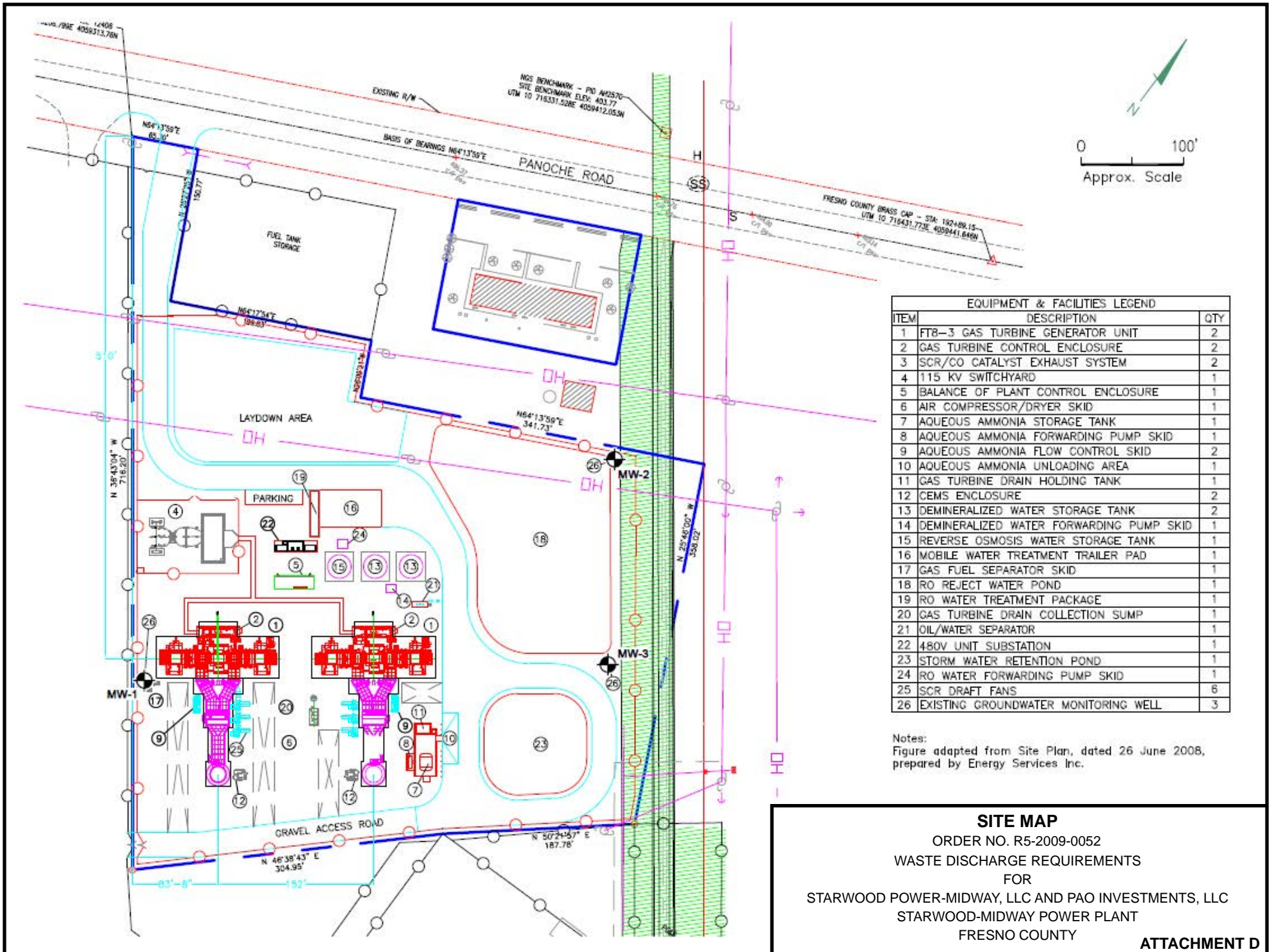


Map Source:
 NAIP Aerial Photograph (2005)
 Sections 4, 5, & 9, T15S, R13E, MDB&M



VICINITY MAP
 ORDER NO. R5-2009-0052
 WASTE DISCHARGE REQUIREMENTS
 FOR
 STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
 STARWOOD-MIDWAY POWER PLANT
 FRESNO COUNTY

ATTACHMENT C



EQUIPMENT & FACILITIES LEGEND		
ITEM	DESCRIPTION	QTY
1	FTB-3 GAS TURBINE GENERATOR UNIT	2
2	GAS TURBINE CONTROL ENCLOSURE	2
3	SCR/CO CATALYST EXHAUST SYSTEM	2
4	115 KV SWITCHYARD	1
5	BALANCE OF PLANT CONTROL ENCLOSURE	1
6	AIR COMPRESSOR/DRYER SKID	1
7	AQUEOUS AMMONIA STORAGE TANK	1
8	AQUEOUS AMMONIA FORWARDING PUMP SKID	1
9	AQUEOUS AMMONIA FLOW CONTROL SKID	2
10	AQUEOUS AMMONIA UNLOADING AREA	1
11	GAS TURBINE DRAIN HOLDING TANK	1
12	CEMS ENCLOSURE	2
13	DEMINEALIZED WATER STORAGE TANK	2
14	DEMINEALIZED WATER FORWARDING PUMP SKID	1
15	REVERSE OSMOSIS WATER STORAGE TANK	1
16	MOBILE WATER TREATMENT TRAILER PAD	1
17	GAS FUEL SEPARATOR SKID	1
18	RO REJECT WATER POND	1
19	RO WATER TREATMENT PACKAGE	1
20	GAS TURBINE DRAIN COLLECTION SUMP	1
21	OIL/WATER SEPARATOR	1
22	480V UNIT SUBSTATION	1
23	STORM WATER RETENTION POND	1
24	RO WATER FORWARDING PUMP SKID	1
25	SCR DRAFT FANS	6
26	EXISTING GROUNDWATER MONITORING WELL	3

Notes:
Figure adapted from Site Plan, dated 26 June 2008, prepared by Energy Services Inc.

SITE MAP
ORDER NO. R5-2009-0052
WASTE DISCHARGE REQUIREMENTS
FOR
STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
STARWOOD-MIDWAY POWER PLANT
FRESNO COUNTY
ATTACHMENT D

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0052
FOR
STARWOOD POWER-MIDWAY, LLC AND PAO INVESTMENTS, LLC
STARWOOD-MIDWAY POWER PLANT
FRESNO COUNTY

The Discharger shall comply with this Monitoring and Reporting Program (MRP) required pursuant to California Water Code section 13267, and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements* (Standard Provisions), dated 1 March 1991, as ordered by Waste Discharge Requirements (WDRs) Order No. R5-2009-0052.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopts or the Executive Officer issues a revised MRP.

Monitoring shall be installed and operational prior to wastewater discharge. All monitoring shall be conducted in accordance with a Sampling and Analysis Plan (SAP), reviewed and approved by the Executive Officer.

The Discharger shall provide Central Valley Water Board staff a minimum of one week notification prior to commencing any field activities related to installation, repair, or abandonment of groundwater monitoring wells, and a minimum 48-hour notification prior to the collection of water samples.

Changes to any sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised station(s) shall be submitted for approval by the Executive Officer.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample Chain of Custody form. All analyses shall be performed in accordance with the Standard Provisions and the approved SAP. The results of analyses performed in accordance with specified test procedures, taken more frequently than required at the locations specified in this MRP, shall be reported to the Central Valley Water Board and used in determining compliance.

Field test instruments (such as pH) may be used provided that:

1. the operator is trained in the proper use of the instrument;
2. the instruments are calibrated prior to each use;
3. instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. field calibration reports are submitted as described in the "Reporting" section of this MRP.

Each laboratory report shall clearly identify the following:

1. analytical method;
2. measured value;

3. units;
4. what constituent a value is reported as;
5. method detection limit (MDL);
6. reporting limit (RL) (i.e., practical quantitation limit or PQL);
7. documentation of cation/anion balance for General Minerals analysis.

For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of United States Environmental Protection Agency (USEPA) Methods, such as the latest editions, as applicable, of: (1) *Methods for the Analysis of Organics in Water and Wastewater* (USEPA 600 Series), (2) *Test Methods for Evaluating Solid Waste* (SW-846, latest edition), and (3) *Methods for Chemical Analysis of Water and Wastes* (USEPA 600/4-79-020), or *Standard Methods for the Examination of Water and Wastewater* (Standard Methods) published by the American Public Health Association, the American Water Works Association, and the Water Environmental Federation, and in accordance with the approved SAP.

If methods other than USEPA approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.

The methods of analysis and the detection limits used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter found in concentrations which produce more than 90 percent non-numerical determinations (i.e., "trace" or non-detect, "ND") in data from background monitoring points for that medium, the analytical method having the lowest MDL shall be selected from among those methods which provide valid results in light of any matrix effects or interferences.

An MDL and PQL shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.

If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99 percent reliability of a nonzero result. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, a PQL should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

All quality assurance/quality control (QA/QC) data shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or laboratory blanks), the accompanying sample results shall be appropriately flagged.

Unknown chromatographic peaks shall be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of recurring unknown chromatographic peaks may be required.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration after at least 12 months of monitoring, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

WASTEWATER MONITORING

When there is no wastewater flow to the surface impoundment, the monitoring report shall state that during the required monitoring period(s), there was no flow to record or no sample collected. When there is wastewater flow, the Discharger shall sample the reverse osmosis (RO) reject wastewater at the point of discharge into the surface impoundment, or as near thereto as reasonably possible. The time the grab sample is collected shall be recorded. Monitoring shall be conducted during calendar quarters and include, in milligrams per liter (mg/L) except where noted, the following:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Type</u>	<u>Frequency</u>
Flow ¹	gallons per month	Continuous flow	Monthly
Specific Conductance	micromhos per centimeter	Grab	Quarterly
pH	pH units	Grab	Quarterly
General Minerals ²	mg/L	Grab	Quarterly
Arsenic	mg/L	Grab	Quarterly
Barium	mg/L	Grab	Quarterly
Fluoride	mg/L	Grab	Quarterly
Iron	mg/L	Grab	Quarterly
Nitrate (as NO ₃)	mg/L	Grab	Quarterly
Silica, Total	mg/L	Grab	Quarterly
Selenium	mg/L	Grab	Quarterly

¹ Flow shall be measured using a calibrated flow meter appropriate for recording wastewater flow.

² General Minerals shall include the constituents in the General Minerals Analyte List below.

General Minerals Analyte List¹

Alkalinity (as CaCO ₃)	Carbonate (as CaCO ₃)	Total Dissolved Solids
Bicarbonate (as CaCO ₃)	Hardness (as CaCO ₃)	Sulfate
Boron	Calcium	Chloride
Magnesium	Potassium	Sodium

¹ General Minerals analytes shall include at least the above analytes and properties. **A cation/anion balance shall accompany results.**

GROUNDWATER MONITORING

Concurrently with groundwater quality sampling, the Discharger shall measure the water level in each monitoring well as groundwater depth (in feet and hundredths) and as groundwater surface elevation (in feet and hundredths above mean sea level, amsl). The horizontal geodetic location of each well shall be provided where the point of beginning shall be described by the California State Plane Coordinate System, 1983 datum. The Discharger shall also measure the total depth of each monitoring well at least once annually.

Prior to collecting samples and after measuring the water level, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the formation, the volume purged is typically from 3 to 5 volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume. Alternate purging procedures would need to be proposed in the SAP for approval by the Executive Officer.

The Discharger shall include in its submittal of groundwater elevation data, a contour map based on said data showing the gradient and direction of groundwater flow. The groundwater contour map shall also include the location of the monitoring wells.

Samples shall be collected during calendar quarters from approved monitoring wells and analyzed for the constituents/parameters listed on the next page:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Depth to groundwater	feet ¹	Measured	Quarterly
Groundwater elevation	feet amsl ¹	Calculated	Quarterly
Specific Conductance	micromhos per centimeter	Grab	Quarterly
pH	standard units	Grab	Quarterly
General Minerals ²	mg/L	Grab	Quarterly
Arsenic	mg/L	Grab	Quarterly
Barium	mg/L	Grab	Quarterly
Fluoride	mg/L	Grab	Quarterly
Iron	mg/L	Grab	Quarterly
Nitrate (as NO ₃)	mg/L	Grab	Quarterly
Silica, Total	mg/L	Grab	Quarterly
Selenium	mg/L	Grab	Quarterly

¹ To the nearest hundredth of a foot above mean sea level.

² General Minerals includes the constituents in the General Minerals Analyte List under wastewater monitoring.

SOURCE WATER MONITORING

The Discharger shall sample the Baker Farms source water supply every calendar quarter at a point prior to any water treatment at the Facility. Source water monitoring shall be for the constituents/parameters listed on the next page:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Type</u>	<u>Frequency</u>
Flow ¹	gallons per month	Continuous flow	Monthly
Specific Conductance	micromhos per centimeter	Grab	Quarterly
pH	pH units	Grab	Quarterly
General Minerals ²	mg/L	Grab	Quarterly
Arsenic	mg/L	Grab	Quarterly
Barium	mg/L	Grab	Quarterly
Fluoride	mg/L	Grab	Quarterly
Iron	mg/L	Grab	Quarterly
Nitrate (as NO ₃)	mg/L	Grab	Quarterly
Silica, Total	mg/L	Grab	Quarterly
Selenium	mg/L	Grab	Quarterly

¹ Flow shall be measured using a calibrated flow meter appropriate for recording wastewater flow.

² General Minerals shall include the constituents in the General Minerals Analyte List under wastewater monitoring.

SURFACE IMPOUNDMENT MONITORING

The Discharger shall sample wastewater whenever sufficiently present in the impoundment to be able to obtain a representative sample. The sample shall be obtained at a location opposite the wastewater discharge point. Monitoring shall be as follows:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Type</u>	<u>Frequency</u>
Freeboard	0.1 feet	Measurement	Weekly
Odors	--	Observation	Weekly
Berm condition	--	Observation	Weekly
Specific Conductance	µmhos/cm	Grab	Quarterly ²
pH	pH units	Grab	Quarterly ²
General Minerals ¹	mg/L	Grab	Quarterly ²
Arsenic	mg/L	Grab	Quarterly ²
Barium	mg/L	Grab	Quarterly ²
Fluoride	mg/L	Grab	Quarterly ²
Iron	mg/L	Grab	Quarterly ²
Nitrate (as NO ₃)	mg/L	Grab	Quarterly ²
Silica, Total	mg/L	Grab	Quarterly ²
Selenium	mg/L	Grab	Quarterly ²

¹ General Minerals shall include the constituents in the General Minerals Analyte List under wastewater monitoring.

² Monitoring shall be conducted during calendar quarters.

FACILITY MONITORING

Annually, prior to the anticipated rainy season, but no later than **15 August**, the Discharger shall conduct an inspection of the Facility. The inspection shall assess any damage to the Facility drainage control system, groundwater monitoring wells, and the surface impoundment.

Any necessary construction, maintenance, or repairs of the drainage control system, groundwater monitoring wells, and the surface impoundment shall be completed by **15 October**.

The Discharger shall inspect all drainage facilities for damage **within 7 days** following *major storm events*. Necessary interim repairs shall be completed **within 10 days** of the inspection and permanent repairs shall be completed when feasible. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

REPORTING

The Discharger shall report monitoring data and information as required in this MRP and the Standard Provisions. In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible.

The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with WDRs. Data shall also be submitted in a digital format acceptable to the Executive Officer.

If the Discharger monitors any constituents at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the monitoring report.

A. Quarterly Reports

Source Water, Wastewater, and Surface Impoundment: Weekly, monthly, and quarterly monitoring data shall be reported in quarterly monitoring reports. Quarterly monitoring reports shall be submitted to the Central Valley Water Board no later than **the end of the first month after the calendar quarter**, except the last report of each year shall be submitted no later than the end of the second month after the end of the year (i.e., the 1st Quarter Report is due by 30 April, 2nd Quarter Report is due by 31 July, the 3rd Quarter Report is due 31 October, and the 4th Quarter Report is due by 28 February of the following year). At a minimum, the quarterly reports shall include:

1. The results of source water, wastewater, and surface impoundment monitoring. Data shall be presented in tabular format and include previous data.
2. Copies of original laboratory analytical reports; and
3. A calibration log verifying calibration of all field and onsite monitoring instruments and devices used to comply with the prescribed monitoring program.

Groundwater: Quarterly groundwater monitoring data shall be reported in quarterly monitoring reports and be submitted to the Central Valley Water Board no later than **the end of the first month after the calendar quarter**, except the last report of each year shall be submitted no later than the end of the second month after the end of the year (i.e., the 1st Quarter Report is due by 30 April, 2nd Quarter Report is due by 31 July, the 3rd Quarter Report is due 31 October, and the 4th Quarter Report is due by 28 February of the following year). At a minimum, the quarterly reports shall include:

1. Quarterly groundwater contour maps;
2. Graphs of the laboratory analytical data for all samples taken from each well within at least the previous five calendar years. Each such graph shall plot over time for a given monitoring well, the concentration of one or more waste constituents selected in concurrence with Central Valley Water Board staff; and
3. All monitoring analytical data obtained during the quarter presented in tabular form and included with previous data obtained for the given well.

B. Annual Reports

Source Water, Wastewater, and Surface Impoundment: An Annual Monitoring Report shall be prepared as a fourth quarter monitoring report. The Annual Monitoring Report will include all monitoring data required in the quarterly schedule. The Annual Monitoring Report shall be submitted to the Central Valley Water Board **by 28 February of the following year**. In addition to the data normally presented, the Annual Monitoring Report shall include the following:

1. The names and general responsibilities of all persons in charge of wastewater treatment and disposal;
2. The names and telephone numbers of persons to contact regarding the Facility for emergency and routine situations;
3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4);
4. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous three calendar years;
5. A summary and discussion of the compliance record for the reporting period. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with this Order.

Groundwater: An Annual Monitoring Report shall be prepared as a fourth quarter monitoring report. The Annual Monitoring Report will include all groundwater monitoring data required in the groundwater monitoring schedule. The Annual Monitoring Report shall be submitted to the Central Valley Water Board **by 28 February of the following year**. In addition to the data normally presented in the quarterly monitoring reports, the Annual Monitoring Report shall include the following:

1. Quarterly groundwater contour maps from the previous four quarters;
2. Graphs of the analytical data for all samples collected from each monitoring well for at least five calendar years. Each such graph shall plot over time for a given monitoring well, the concentration of one or more waste constituents selected in concurrence with Central Valley Water Board staff. Graphs shall be plotted at a scale appropriate to show trends or variations in water quality, and shall plot each datum, rather than plotting mean values;
3. Hydrographs of each monitoring well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be submitted annually.
4. A tabular summary of all monitoring data obtained during the previous monitoring events for at least the last five calendar years.

Facility: An Annual Monitoring Report shall be submitted to the Central Valley Water Board describing the results of the Facility inspection, any erosion control measures implemented, and any construction, maintenance, or repairs of Facility drainage control facilities, groundwater monitoring wells, or the surface impoundment. The Annual Monitoring Report shall include photographs of the problem(s) and the repair(s), and shall be submitted to the Central Valley Water Board **by 28 February of the following year.**

All technical reports required herein must be overseen and certified by a California registered civil engineer or geologist in accordance with California Business and Professions Code, Sections 6735, 7835, and 7835.1.

All reports submitted in response to this Order shall comply with the signatory requirements in Standard Provision B.3.

A transmittal letter shall accompany each monitoring report. The letter shall discuss any violations during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Original signature on file

PAMELA C. CREEDON, Executive Officer

(Date)

INFORMATION SHEET

ORDER NO. R5-2009-0052
STARWOOD-MIDWAY POWER PLANT
FRESNO COUNTY

Starwood Power-Midway, LLC, (Starwood) submitted a Report of Waste Discharge, dated 6 May 2008, to obtain Waste Discharge Requirements (WDRs) for the discharge of industrial process wastewater to land. Starwood proposes the discharge of wastewater to an unlined surface impoundment at a 120 megawatt natural gas-fired peaking-power electrical generation plant, the Starwood-Midway Power Plant (Facility).

The 5.57-acre Facility is in Section 5, T15S, R13E, MDB&M, and is 12 miles southwest of the City of Mendota in western Fresno County. Starwood, owner and operator of the Facility, has a signed lease agreement with the property owner, PAO Investments, LLC. Both Starwood and PAO Investments are jointly referred to as the Discharger.

Source Water

The source water for the Facility is reclaimed agricultural backwash water from Baker Farming Company, LLC (Baker Farms). The backwash water is conveyed to the Facility by an underground pipeline from a 30 acre-foot collection basin about 1.5 miles southeast of the Facility.

Baker Farms irrigates about 7,000 acres using 24,000 acre-feet of water annually from the California Aqueduct. About 160 acre-feet of backwash water is produced annually from the irrigation water. Baker Farms and Starwood have a 7-year contract for Baker Farms to provide backwash water to Starwood.

The Facility will require about 10.2 acre-feet of backwash water annually for 400 hours and 102 acre-feet annually for 4,000 hours of electric generation.

Water Treatment

The Facility water treatment system consists of a sand filter, a reverse osmosis (RO) treatment unit, a demineralizer unit, a RO water storage tank, and two demineralized water storage tanks.

Wastewater

The wastewater is reject water from the RO treatment system, backwash/rinse water from the maintenance of the RO multimedia filter and demineralizer unit, and drainage/overflow water from the RO/demineralized water storage tanks. The RO system supplier estimates an annual RO reject wastewater volume of 4.38 acre-feet for 400 hours and 43.8 acre-feet for 4,000 hours of electric generation. The RO system supplier predicted the concentration of selected chemical constituents in the RO reject wastewater based on the quality of the backwash water and treatment using the proposed RO membrane. The predicted concentrations are in Table I.

Surface Impoundment Design

Wastewater is conveyed via pipes from a Facility water treatment system to the surface impoundment for disposal by evaporation and percolation. The impoundment is designed to hold four feet of wastewater (about 1.8 acre-feet) with two feet of freeboard.

Groundwater

The Corcoran Clay divides the groundwater system into an upper semi-confined zone and a lower confined zone. The Corcoran Clay is at a depth of about 660 to 785 feet beneath ground surface (bgs) in a monitoring well boring at the nearby Panoche Energy Center.

There are seven offsite groundwater wells within ½ mile of the Facility. Five of these wells monitor groundwater with two wells monitoring the upper semi-confined zone and three wells monitoring the lower confined zone. An industrial supply well extracts groundwater from the upper semi-confined zone. An inoperable irrigation well is completed in the lower confined zone. Irrigation wells within 2 miles of the Facility are completed in the lower confined zone.

Starwood has installed three groundwater monitoring wells at the Facility to monitor the upper zone at the water table. The upgradient well, MW-1, is about 330 feet southwest, and the downgradient wells, MW-2 and MW-3, are 10 to 15 feet east of the impoundment. Since March 2008, Starwood has collected five groundwater samples from the wells.

Analytical Results

The range of analytical results for selected constituents in the groundwater, source water, and predicted RO reject wastewater, and numerical water quality objectives, in milligrams per liter, except where noted, are shown in Table I below:

Table I
Source Water, Predicted RO Reject Wastewater, and Baseline Groundwater Analytical Results with Municipal and Agricultural Water Quality Objectives

Constituent	Source Water	Predicted RO Reject Wastewater	Baseline Groundwater (Range of samples)	Water Quality Objectives	
				Municipal	Agricultural ¹
Arsenic	0.0023	0.0076	0.039 – 0.063	0.010 ²	<0.05 – 12
Barium	0.035	0.120	0.011 – 0.022	1 ²	-
Bicarbonate ³	84	271	73 – 85	-	-
Boron	0.27	0.38	3.0 – 3.2	-	<0.5 – 15
Calcium	36	119	580 – 640	-	-
Carbonate ³	<1	2.3	<1	-	-
Chloride	69	306	880 – 1,100	250 – 600 ⁴	<106 – >355
Electrical Conductivity ⁵	500	1,650	5,800 – 7,000	900 – 2,200 ⁴	<700 – >3,000
Fluoride	0.12	0.39	<0.1– 0.32	2.0 ²	1
Iron	0.064	0.21	<0.05	0.3 ⁴	5
Magnesium	15	50	390 – 420	-	-
Nitrate (as NO ₃)	15	43	1,000 – 1,100	45 ²	-
Potassium	4	11	11 – 13	-	-
Selenium	0.0037	0.012	0.88 – 1.4	0.05 ²	0.02
Silica	20	65	45 – 48	-	-
Sodium	54	176	690 – 760	-	<69 – >207
Sulfate	59	196	2,200 – 2,500	250 – 600 ⁴	-
TDS ⁶	310	1,242	5,200 – 6,300	500 – 1,500 ⁴	<450 – >2,000

- ¹ Ayers R.S. and Westcot D.W., 1985, *Water Quality for Agriculture*
- ² Primary MCL – Title 22 Drinking Water Standards
- ³ Alkalinity as CaCO₃
- ⁴ Secondary MCL – Title 22 Drinking Water Standards
- ⁵ Specific Conductance measured in micromhos per centimeter at 25^o Centigrade
- ⁶ Total dissolved solids

The data in Table I indicate the following:

- (1) Baseline groundwater concentrations of boron, chloride, electrical conductivity (EC), nitrate, selenium, sodium, sulfate, and total dissolved solids (TDS) exceed their respective numeric water quality objectives for municipal and domestic supply (MUN) and/or agricultural supply (AGR),
- (2) Predicted RO reject wastewater concentrations of arsenic, boron, calcium, chloride, EC, magnesium, nitrate, selenium, sodium, sulfate, and TDS are less than their respective baseline groundwater concentrations; and,
- (3) Predicted RO reject wastewater concentrations of barium, bicarbonate and carbonate (considered one constituent, bicarbonate, because their occurrence is pH dependent), fluoride, and silica exceed their respective baseline groundwater concentrations.

Antidegradation Analysis

State Water Board Resolution No. 68-16 prohibits degradation of groundwater unless it has been shown that the degradation is consistent with the maximum benefit to the people of the State; the degradation will not unreasonably affect present and anticipated future beneficial uses; the degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and, the discharger employs Best Practicable Treatment or Control (BPTC) to minimize degradation.

The discharge of wastewater to the impoundment could potentially cause degradation of the upper semi-confined groundwater for barium, bicarbonate, fluoride, and silica. The anticipated groundwater degradation caused by barium, bicarbonate, fluoride, and silica is in the best interest of and consistent with the maximum benefit to the people of the State. This determination is supported by the following:

- (a) Operation of the Facility will supply a more reliable electrical supply to the State during periods of peak power use;
- (b) Operation of the Facility provides increased employment in the area;
- (c) The Discharger will utilize reclaimed irrigation backwash water that would have been lost to evaporation and percolation if the Facility were not constructed;
- (d) The upper semi-confined groundwater is not known to be used within several miles of the Facility except for one industrial supply well and irrigation wells are completed in the lower confined groundwater;
- (e) Any groundwater degradation anticipated by barium, bicarbonate, fluoride, and silica is de-minimus compared to the improvement in groundwater quality by the chloride, nitrate, sodium, sulfate, and TDS constituent concentrations in the discharge;

- (f) The predicted concentrations of barium and fluoride in the discharge do not exceed their water quality objectives. Water quality objectives have not been established for bicarbonate and silica. However, their predicted concentrations in the RO reject wastewater are not at levels that adversely affect the beneficial uses of the upper semi-confined groundwater; and,
- (g) The discharge will not unreasonably affect present and anticipated future beneficial uses of the upper semi-confined groundwater.

Monitoring Requirements

The proposed Order includes a Monitoring and Reporting Program required pursuant to Section 13267 of the California Water Code. A single groundwater monitoring well upgradient from and two monitoring wells downgradient from the impoundment will be sampled quarterly. The backwash water, RO reject wastewater, and wastewater in the impoundment will also be sampled quarterly. Monitoring reports will be submitted quarterly.

CEQA

Central Valley Water Board staff reviewed the *Application for Certification* submitted by Starwood to the California Energy Commission (CEC), the lead agency under a CEQA-equivalent process. Comments to the CEC concerning water quality were provided in correspondence dated 20 December 2006.

On 16 January 2008, the CEC adopted Order No. 08-0116-02 which adopts the *Commission Decision*, approves the *Application for Certification* for the Facility, and grants a certificate to construct and operate the Facility. The *Commission Decision* includes a finding which states that implementation of the Conditions of Certification described in the Water Resources section of the document will result in potential water resource impacts being mitigated to insignificance.

Reopener

The proposed Order was developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans. If applicable laws and regulations change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.