CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-____
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-____.

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:

Constituent/Parameter	Units	Type	Frequency
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 List[1]

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:

Constituent/Parameter	Units	Type of Sample	Frequency
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 Farming Company, LLC 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:

Constituent/Parameter	Units	Type	Frequency
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:

Constituent/Parameter	Units	Type	Frequency
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 calender 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.

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Pamela C. Creedon, Executive Officer

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(Date)