CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2008-0825

FOR
HJ BAKER & BRO. INC., MARTIN OPERATING PARTNERSHIP, THE PORT OF STOCKTON, AND METROPOLITAN STEVEDORE
MOLTEN SULFUR PROCESSING PLANTS
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program (MRP) describes requirements for monitoring an industrial location at which sulfur prill is generated and transported. HJ Baker & Bro., Inc. (Baker), Martin Operating Partnership (Martin), the Port of Stockton (the Port), and Metropolitan Stevedore (Metropolitan) are hereafter together referred to as the "Discharger". The MRP requires a sample collection and analysis plan, a workplan for an expanded monitoring well system, and monitoring by individual facilities (i.e., monitoring by either Baker, Martin, the Port, or Metropolitan) and group monitoring (i.e., combined monitoring performed by Baker, Martin, the Port, and Metropolitan). Pursuant to Section 13267 of the California Water Code, the Discharger must comply with this MRP. Failure to comply with this MRP constitutes noncompliance with the Water Code, which can result in the imposition of civil monetary liability. The Discharger must not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

MONITORING

All monitoring must be conducted in accordance with a Sample Collection and Analysis Plan, which must include quality assurance and quality control standards which are acceptable to the Executive Officer. The groundwater monitoring wells and the surface water sampling location are shown on Attachment A. A Sample Collection and Analysis plan meeting the requirements in Section 1 of Attachment B is due by **31 September 2008**.

A workplan for an expanded monitoring well system for the shallow groundwater zone to determine background concentrations and to monitor the horizontal extent of contamination is **due by 31 November 2008.** The monitoring well installation report must be submitted **by 31 March 2009.** Any monitoring well installation workplan and any monitoring well installation report must include the information in Sections 2 and 3 of Attachment B to the MRP.

Monitoring must begin **by the first quarter of 2009.** All samples must be representative of the volume, nature, or matrix of material sampled. The time, date, and location of each sample must be recorded on the sample chain of custody form. If methods other than U.S. EPA-approved methods or *Standard Methods for the Examination of Water and Wastewater*, latest edition, are used, the exact methodology must be submitted for review and approval. All monitoring points must be sampled and analyzed for parameters and constituents of concern as indicated and listed herein. All monitoring results must be reported and all relevant facts must be fully disclosed.

Martin's Specific Monitoring For Volume, Freeboard, and Sulfur Contact-Water in the Concrete AST

Martin must monitor and report the volume, freeboard, and the sulfur contact-water constituent concentrations in the 481,000-gallon concrete AST. The volume and freeboard must be obtained from gauges graduated in feet and tenths-of-feet. Table 1 and Table 2 contain the frequency and parameters for Martin to monitor. Results must be reported in the quarterly and annual Monitoring Reports.

Table 1
Martin's Monitoring of the AST Volume and Freeboard

Parameters	Units	Monitoring Frequency
Tank volume	Gallons	Weekly
Tank freeboard	Feet & tenths of feet	Weekly

Table 2
Martin's Monitoring of the AST Sulfur Contact-Water

Field Parameters	Units	Monitoring Frequency
Temperature	^{o}C	Quarterly
Specific Conductance	umhos/cm	Quarterly
pH	SU	Quarterly
Monitoring Parameters		
Sulfur, total (EPA 200.7)	mg/L	Quarterly
Total Dissolved Solids (EPA 160.1)	mg/L	Quarterly
Sulfate (EPA 300 Series)	mg/L	Quarterly
Major Anions (See Table 8)	mg/L	Annually
Major Cations (See Table 8)	mg/L	Annually

Baker's Specific Monitoring For Volume, Freeboard, and Sulfur Contact-Water in the AST

Baker must monitor the volume, freeboard, and sulfur contact-water of its 500,000-gallon AST. Table 3 contains the monitoring frequencies for volume and freeboard. The volume and freeboard must be obtained from gauges graduated in feet and tenths-of-feet. Table 4 contains the parameters for monitoring the sulfur contact-water. Results must be reported in the quarterly and annual Monitoring Reports.

Table 3
Baker's Monitoring of the AST Volume and Freeboard

Parameters	Units	Monitoring Frequency
Tank volume	Gallons	Monthly
Tank freeboard	Feet & tenths of feet	Weekly

Table 4
Baker's Monitoring of the AST Sulfur Contact-Water

Field Parameters	Units	Monitoring Frequency
Temperature	^{o}C	Quarterly
Specific Conductance	umhos/cm	Quarterly
pH	SU	Quarterly
Monitoring Parameters		
Sulfur, total (EPA 200.7)	mg/L	Quarterly
Total Dissolved Solids (EPA 160.1)	mg/L	Quarterly
Sulfate (EPA 300 Series)	mg/L	Quarterly
Major Anions (See Table 8)	mg/L	Annually
Major Cations (See Table 8)	mg/L	Annually

The Port's Specific Monitoring of the Tunnel

The Port must sample and analyze the tunnel water at the frequency and for the parameters shown in Table 5. Tunnel water samples must be collected at a point along the tunnel where any standing water is deepest along the expanse of the tunnel. Tunnel water analytical results must be reported quarterly and annually for the parameters and frequencies as shown in Table 5, below.

Table 5
Port of Stockton's Tunnel Water Monitoring

Field Parameters	Units	Monitoring Frequency
Temperature	^{o}C	Quarterly
Specific Conductance	umhos/cm	Quarterly
pH	SU	Quarterly
Monitoring Parameters		
Sulfur, total (EPA 200.7)	mg/L	Quarterly
Total Dissolved Solids (EPA 160.1)	mg/L	Quarterly
Sulfate (EPA 300 Series)	mg/L	Quarterly
Major Anions (See Table 8)	mg/L	Annually
Major Cations (See Table 8)	mg/L	Annually

Discharger's Groundwater Monitoring

The Discharger (Baker, Martin, the Port, and Metropolitan) must operate and maintain a groundwater monitoring system in accordance with a Monitoring Program and Sample Collection and Analysis Plan approved by the Executive Officer. Monitoring must be reported quarterly and annually. The Discharger must collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan and the MRP. Under this MRP, the groundwater monitoring wells include MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, and any additional wells installed thereafter. The groundwater gradient and flow direction must be determined quarterly.

In addition, groundwater samples must be collected, analyzed, and reported for the monitoring parameters in accordance with the methods and frequency specified in Table 6.

Table 6
Discharger's Groundwater Monitoring

Field Parameters	Units	Monitoring Frequency
Groundwater Elevation	Ft., & hundredths, MSL	Quarterly
Temperature	^{o}C	Quarterly
Specific Conductance	umhos/cm	Quarterly
pH	SU	Quarterly
Monitoring Parameters		
Sulfur, total (EPA 200.7)	mg/L	Quarterly
Total Dissolved Solids (EPA 160.1)	mg/L	Quarterly
Sulfate (EPA 300 Series)	mg/L	Quarterly
Major Anions (See Table 8)	mg/L	Annually
Major Cations (See Table 8)	mg/L	Annually

Discharger's Surface Water Monitoring

The Discharger (Baker, Martin, the Port, and Metropolitan) must sample and analyze surface water at the storm water retention basin shown on Attachment A to this MRP. Surface water samples must be obtained during the first hour of discharge from (1) the first storm event of the wet season, and (2) at least one other storm event in the wet season. Surface water monitoring results must be reported quarterly and annually. Surface water samples must be collected, analyzed, and reported for the monitoring parameters in accordance with the methods and frequency specified in Table 7.

Table 7
Discharger's Surface Water Monitoring

Field Parameters	Units	Monitoring Frequency
Temperature	^{o}C	Two storm events as described in the industrial general permit
Specific Conductance	µmhos/cm	
pH	pH number	

Table 7
Discharger's Surface Water Monitoring

Monitoring Parameters		
Major Anions (See Table 8)	mg/L	
Major Cations (See Table 8)	mg/L	Two storm events as described in the
Sulfur, total (EPA 200.7)	mg/L	industrial general permit
Total Dissolved Solids (EPA 160.1)	mg/L	
Total Suspended Solids (EPA 160.2)	mg/L	
Sulfate (EPA 300 series)	mg/L	

Analytical Methods

Table 8 contains analytical methods for anions, cations, and total sulfur.

Table 8
Analytical Methods for Major Anions, Major Cations, and Total Sulfur

Parameter	**Units**	**USEPA Method**
Major anions and sulfate (bicarbonate, carbonate, chloride, sulfate)	mg/L	300 Series
Major cations (calcium, magnesium, sodium, potassium)	mg/L	6010
Sulfur, total	mg/L	200.7

Facility Monitoring For Martin, Baker, Metropolitan, and the Discharger

Baker and Martin's Stockpile Height Monitoring

Baker and Martin must separately monitor and report the prill stockpile height for their respective facilities. The prill stockpile height must be inspected, documented, and logged weekly. Log sheets must be submitted quarterly for the quarter in which inspections occurred.

Baker and Martin's Report of Off-Site Disposal

Baker and Martin must separately track and report any sulfur contact water that is disposed to any off-site facility. The volume of sulfur contact-water, name of the hauler, and name of the disposal facility must be reported in the quarterly report for the quarter in which the disposal occurred.

Baker, Martin, and Metropolitan's Inspections/Repairs after Storm Events

Baker, Martin, and Metropolitan must separately inspect their respective precipitation, diversion, and drainage facilities for damage **within 7 days** following major storm events. Necessary repairs must be completed **within 30 days** of the inspection and must be reported in the quarterly reports for which the inspection and the repairs were completed.

Baker, Martin, and Metropolitan must separately report any discharge of sulfur-contact water onto bare earth. Baker, Martin, and Metropolitan must i**mmediately notify Board staff verbally** of the finding and **provide** written notification by certified mail **within seven days** of such determination.

Baker, Martin, and Metropolitan's Facility Inspections

Annually, prior to the anticipated rainy season, but no later than **30 September**, Baker, Martin, and Metropolitan must conduct an inspection of their respective facilities. The inspection must assess damage to the drainage control system. Any necessary construction, maintenance, or repairs must be completed by **31 October**. By **15 November** of each year, Baker, Martin, and Metropolitan must each submit an annual report describing the results of the facility inspection and the repair measures implemented, including photographs of the problem and the repairs.

Discharger's Inspection of Groundwater Monitoring Equipment and Wellhead

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger must conduct an inspection of their groundwater monitoring equipment, tapes, wells, wellheads, caps, locks, and related well equipment. Tapes must be calibrated to obtain an accurate depth to groundwater. Any necessary construction, maintenance, or repairs must be completed by **31 October**. By **15 November** of each year, the Discharger must submit an annual report describing the results of the inspection and the repair measures implemented.

REPORT CONTENTS AND REPORT SUBMITTAL DATES

The Discharger must submit quarterly, annual, facility, and response to release monitoring reports. Monitoring that is specific to Baker, Martin, the Port, and Metropolitan must also be reported. The Discharger must fully disclose and report all monitoring data and all relevant information as required in this MRP.

In reporting monitoring data, the Discharger must arrange the data in tabular form so that the date, sample type (*e.g.*, effluent, soil, *etc*.), and reported analytical result for each sample are readily discernible. The Discharger must summarize the data in such a manner so as to illustrate clearly compliance with the MRP and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required by the MRP must be fully disclosed and reported in the quarterly report for the quarter in which the monitoring occurred.

A letter transmitting the self-monitoring reports must accompany each report. Such a letter must include a discussion of any violation found since the last such report was submitted and actions taken or planned for correcting noted violations, such as operation or facility modifications. If no violations have occurred since the last submittal, this must be stated in the letter of transmittal. The Discharger must include a brief description of any corrective actions and/or a time schedule for implementing the corrective action, reference to the commencement date and duration of

corrective action and any time schedules will be satisfactory. **All reports and transmittal letters must be signed** by persons identified below:

a. For a corporation*:* by a principal executive officer of at least the level of senior vice-president.
b. For a partnership or sole proprietorship*:* by a general partner or the proprietor.
c. A duly authorized representative of a person designated in a or b above if:
    i. the authorization is made in writing by a person described in a or b of this provision;
    ii. the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and
    iii. the written authorization is submitted to the Board.

Baker, Martin, the Port, and Metropolitan must each certify and include a separate penalty of perjury statement:

> *"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."*

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports must be prepared under the direct supervision of a Registered Engineer or Geologist and must be signed and stamped by the registered professional.

Reports that do not comply with the required format will be rejected and the Discharger will be deemed to be in noncompliance with the MRP. Reports must include the information listed below in addition to the results of monitoring required by the MRP.

A. Reporting Due Dates

The following two tables contain due dates for submittal of reports.

Quarterly Monitoring Reports

Report Type	Sampling Frequency	Reporting Period	Date Due
Quarterly	Weekly/monthly/quarterly	1 January – 31 March	**30 April**
		1 April – 30 June	**31 July**
		1 July – 30 September	**31 October**
		1 October – 31 December	**31 January**

Other Reports

Annual Monitoring Summary Report	**31 January** of each year
Facility Monitoring Report	**15 November** of each year
Response to a Release	As necessary
Monitoring Well Installation Report	**31 March 2009**

B. Quarterly Monitoring Reports

Each Quarterly monitoring report must include all water quality data, field data, inspections, and observation collected during the reporting period and submitted per the **Reporting Due Dates** in Section A of this MRP. Quarterly monitoring reports must include the results of all monitoring performed for the quarter in addition to the information listed below:

1. Martin, Baker, and the Port must report their AST, sulfur contact-water, and tunnel monitoring results in the quarterly reports.
2. Surface water monitoring results must be reported in the quarterly reports. If no surface water was present during the quarter, then this information must be included in the report.
3. The Discharger must determine and report the groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored pursuant to this MRP. Results must be reported quarterly, including the times of highest and lowest elevations of the water levels in the wells.
4. In reporting the monitoring data, the Discharger must arrange the data in tables so that the date, the constituents, the concentrations, units, and compliance are readily discernible. The data must be summarized in such a manner so as to illustrate clearly the compliance with the cleanup and abatement order or lack thereof. All historical and current analytical results must be tabulated and submitted.
5. A discussion of the monitoring results, including notations of any water quality violations must precede any tabular summaries.
6. The Discharger must include a site map showing the facility features, existing and historical monitoring wells, direction of groundwater flow, and stormwater and surface water monitoring locations.

7. The Discharger must include hard copies of all analytical reports as signed by the laboratory director.
8. The Discharger must include the monitoring well data sheets, including the date and time, type of pump, purging and sampling method, and water disposal method.
9. The Discharger must provide a description of the sampling procedure (number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and time of sampling, the name and qualifications of the person taking the samples, and any other observations).
10. Martin and Baker must include the logs for the weekly inspection of stockpile height and any sulfur contact-water that has been disposed at an off-site facility.
11. Monitoring performed and repairs completed after storm events must be reported.

C. Annual Monitoring Summary Report

The Discharger must submit an Annual Monitoring Summary Report to the Regional Water Board covering the previous monitoring year. The annual report must contain the monitoring results, information required in the quarterly monitoring report, and the additional information as defined below:

a. Tabular summaries of all data collected during the year.

b. For each groundwater monitoring well, the Discharger must submit time-series graphs showing analytical data for all historical samples (i.e., 1991 through the current year). Each time-series graph must plot the concentration of one or more constituents for the period of record for a given monitoring well at a scale appropriate to show trends or variations in water quality. The graphs must plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release. Graphs for background wells must be plotted at the same scale as any other well.

c. The Discharger must include a comprehensive discussion of the compliance record, any planned corrective actions, and the result of any implemented corrective actions.

d. The Discharger must include a written summary of the monitoring results, indicating any changes made or observed since the previous annual report.

e. Hydrographs of each well must be prepared quarterly and submitted annually. The hydrographs must show 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.

f. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

g. The groundwater monitoring parameters must be evaluated annually with regards to the cation/anion balance, and the results must be graphically presented using a Stiff diagram, a Piper graph, or Schueller plot.

h. A database of electronic Excel tables must be submitted on a CD that must include the historical and current analytical results, the analyte, test method, units, PQL, MDL, qualifiers, dates, and sample identification numbers. Numbers must be presented as

numbers, not text. In the tables, non-detects must be represented by "ND" or the symbol "<" followed by the MDL. Lab qualifiers must be defined. In addition, all historical data for 1991 through the current year must be submitted in the electronic Excel tables. The database format must be acceptable to the Regional Water Board so that statistical analysis may be performed. The acceptable format is shown in the following table.

Format for Electronic Excel Spreadsheet of Historical Analytical Data

Sample Location ID	Date Sampled	Analyte	Results	PQL	MDL	Qualifiers	Units
Example Location ID #MW-6	mm/dd/yyyy	Analyte 1	.004	.005	.0025	J	mg/L
Example Location ID #MW-6	mm/dd/yyyy	Analyte 2	ND	.005	.0025		mg/L
Example Location ID #MW-6	mm/dd/yyyy	Analyte 3	40	25	12		ug/L
Example Location ID #MW-10	mm/dd/yyyy	Analyte 1	.6	.005	.0025		mg/L
Example Location ID #MW-10	mm/dd/yyyy	Analyte 2	10	.005	.0025		mg/L
Example Location ID #MW-10	mm/dd/yyyy	Analyte 3	.6	.005	.0025		mg/L
Example Location ID #MW-10	mm/dd/yyyy	Analyte 4	26	25	12		ug/L

D. Facility Monitoring Report

The Facility Monitoring Reports specifically required for Baker, Martin, and Metropolitan must show the results of the facility inspection, completed repairs, and a schedule for repairs not already finished.

E. Response to a Release

The Discharger must immediately notify the Board verbally and must provide written notification by certified mail within seven days upon the determination that a release has occurred.

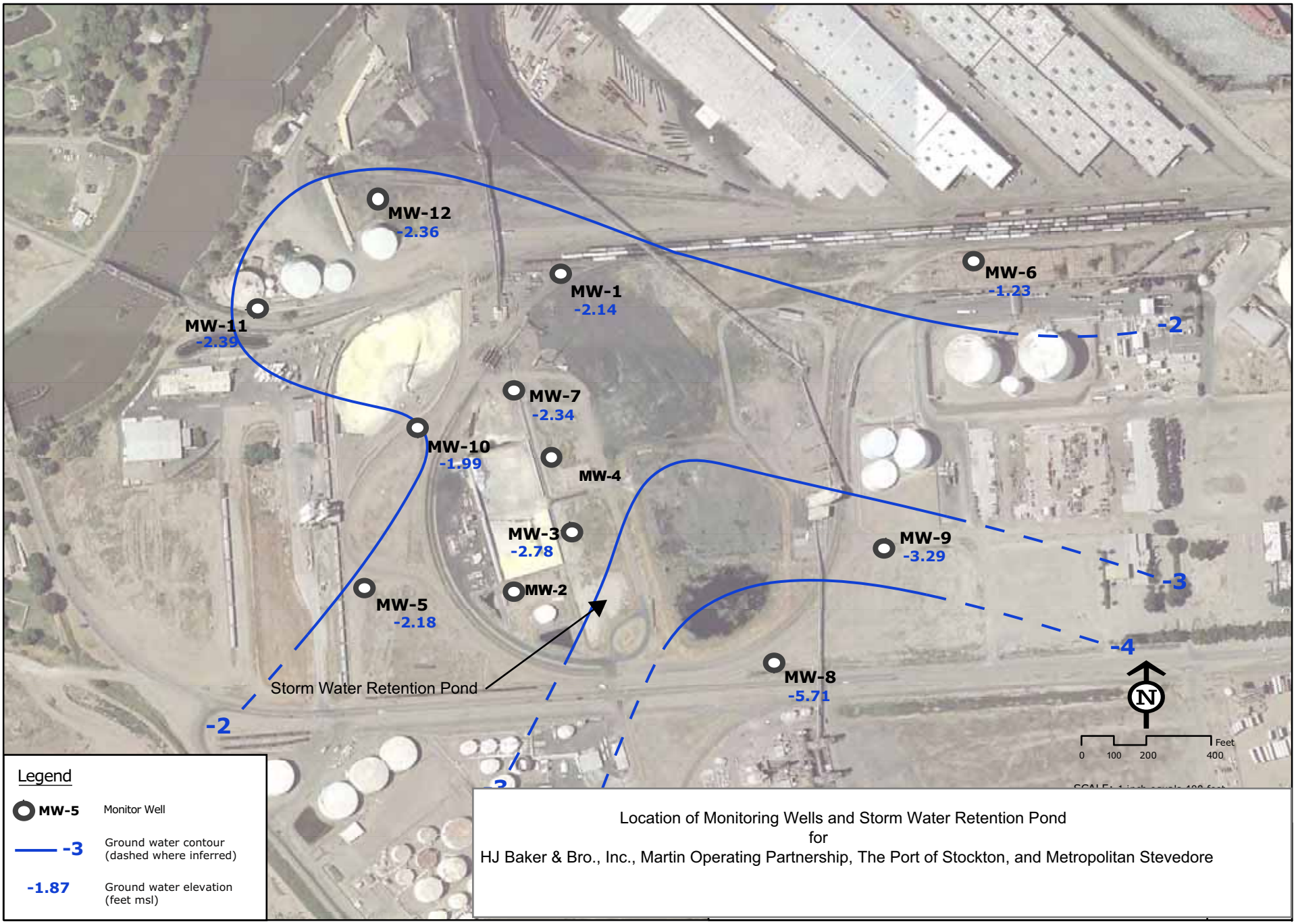
The Discharger must implement the above monitoring program on the effective date of this Order.

PAMELA C. CREEDON, Executive Officer

25 July 2008
(Date)

Attachment A: Location of Monitoring Wells and Storm Water Retention Pond
Attachment B: Requirements for Sample Collection and Analysis Plans, Monitoring Well Installation Work Plans, and Monitoring Well Installation Reports

MB: 3 Jun 2008



Location of Monitoring Wells and Storm Water Retention Pond
for
HJ Baker & Bro., Inc., Martin Operating Partnership, The Port of Stockton, and Metropolitan Stevedore

Source: Environmental Risk Services Corporation

ATTACHMENT B
MONITORING AND REPORTING PROGRAM ORDER NO. R5-2008-0825
FOR
HJ BAKER & BRO., INC., MARTIN OPERATING PARTNERSHIP, THE PORT OF STOCKTON, AND METROPOLITAN STEVEDORE
MOLTEN SULFUR PROCESSING PLANT
SAN JOAQUIN COUNTY

REQUIREMENTS FOR SAMPLE COLLECTION AND ANALYSIS PLANS, MONITORING WELL INSTALLATION WORKPLANS, AND MONITORING WELL INSTALLATION REPORTS

Any Sample Collection and Analysis Plan (SAP) prepared for the Discharger's facility will contain, at a minimum, the information in Section 1.

In addition, prior to any installation of any monitoring wells, the Discharger must submit a monitoring well installation workplan (MWP) that will contain, at a minimum, the information listed in Section 2, below. Any proposed wells may be installed after Regional Water Board staff concurs with the MWP and SAP.

Upon installation of any monitoring wells and receipt of analysis, the Discharger must submit a well installation and analytical report (Report). The Report must include the information contained in Section 3, below. When any new wells are installed, the wells must be incorporated into and sampled according to the Monitoring and Reporting Program No. R5-2008-0825. Any analytical results must be reported in the report in which the samples were obtained.

The SAP, MWP, and Report must be prepared under the direction of, and signed and stamped by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 – Sample Collection and Analysis Plan (SAP)

All Sampling Collection and Analysis Plans must contain, at a minimum, the following information:

A. Table of Contents

B. General Information, Purpose, and Scope of the Plan

C. Include the requirements of when and how to notify the Regional Water Quality Control Board staff regarding results of analysis. Include phone, certified mail, and resample results notification time lines, procedures, and requirements.

D. Technical Information for sampling collection and analysis
   1. Proposed locations for leachate, tunnel, and surface water sampling.
   2. Tables with a list of all individual analytes by EPA Test Method, the practical quantitation limit, and the method detection limit for each individual analyte.
   3. Table with sample identification numbers (including groundwater monitoring wells, leachate, tunnel water, surface water, field duplicates, and MS/MSDS) and the list of test methods to be performed for each sample identification number.

4. Map that shows sample locations by their respective sample identification numbers.
5. Table with analytical methods, volumes, containers, preservatives, special field methods (such as field-filtering), preservation methods, practical quantitation limits, method detection limits, and hold times.
6. Identification of analytical laboratory and California DHS certification number
7. Chain of custody (COC) procedures and a copy of a sample COC.
8. Field procedures in sequential numbered order.

E. Field instrument calibration procedures and QA/QC procedures for field and laboratory analysis.

F. List of the Analytical Laboratory Reporting Requirements, as defined below:

1. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. The analytical method having the lowest method detection limit (MDL) must be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
2. **"Trace" results,** results falling between the MDL and the practical quantitation limit (PQL), must be reported as such, and must be accompanied by both the estimated MDL value and PQL value for that analytical run.
3. **MDLs and PQLs** must be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs must 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 agree closely with published USEPA MDLs and PQLs.
4. 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 must be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL must always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result**. The PQL must 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, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
5. All **QA/QC data** must 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 must be reported unadjusted for blank results or spike recoveries. In cases where

contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results must be appropriately flagged.

6. Unknown chromatographic peaks must be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.
7. The statistical method must account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL that is used in the statistical method must be the lowest concentration (or value) that can be reliably achieved for routine laboratory operating conditions that are available to the facility.
8. Case narratives signed by the laboratory director.
9. All chains-of-custody must be signed as received by the laboratory.
10. All laboratory reports must be signed by an authorized representative of the laboratory.

G. Constituents of Concern

1. Provide a table with the Constituents of Concern and their corresponding water quality objectives

H. Groundwater Well Sampling

9. Minimum time after development before sampling (48 hours)
10. Well purging method and purge water volume, storage, and disposal
11. Equipment decontamination procedures
12. Field equipment decontamination procedures
13. Copy of the field data sheet for recording and documenting data.

E. Proposed analytical laboratory.

F. Proposed Schedule for Sampling and Analytical Reports

1. Provide a time-schedule that at a minimum shows fieldwork, laboratory analysis, and report preparation.

G. Required Analytical Parameters and Test Methods

1. The analytical parameters listed in the Monitoring and Reporting Program No. R5-2008-0825 must be used unless otherwise directed and/or approved by the Regional Water Board staff.

2. SAP must be signed and stamped by a California Licensed engineer or geologist

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SECTION 2 - Monitoring Well Installation Workplan

A. General Information:

1. Purpose of well installation and sampling/analysis project
2. Site location map

3. Copies of County Well Construction Permits (to be submitted after workplan review)
4. New monitoring well locations and rationale
5. Equipment decontamination procedures
6. Health and safety plan
7. Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details:

1. Drill rig and contractor
2. Sampling intervals and logging methods.

C. Monitoring Well Design–Graphic and Descriptive:

1. Casing diameter and centralizer spacing (if needed)
2. Borehole diameter
3. Depth of surface seal
4. Well construction materials
5. Diagram of proposed well construction details
6. Type of well cap, bottom cap either screw on or secured with stainless steel screws
7. Size of perforations and rationale
8. Grain size of sand pack and rationale
9. Thickness and position of bentonite seal and sand pack
10. Depth of well, length and position of perforated interval.

D. Well Development:

1. Method development
2. Method of determining when development is complete
3. Parameters to be monitored during development
4. Development water storage and disposal.

E. Well Survey Coordinates, horizontal and vertical:

1. Name of the Licensed Land Surveyor or Registered Civil Engineer
2. Well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates)
3. Horizontal and vertical accuracy (vertical must be at least 0.01-foot).

F. Water Level Measurement:

2. The elevation reference point at each monitoring well must be within 0.01-foot
3. Ground surface elevation at each monitoring well must be within 0.01-foot
4. Method and time of water level measurement must be specified.

G. Proposed time-schedule with dates for proposed work.

H. Plan signed and stamped by California Licensed engineer or geologist.

SECTION 3 - Monitoring Well Installation and Groundwater Analytical Report

A. Well Construction Details–Graphical, Tabular, and Descriptive:

1. Quantity and depth of wells drilled
2. Date(s) wells drilled and completed
3. Description of drilling and construction
4. Updated comprehensive site map with facility site features including monitoring wells, sample locations and identification numbers, storage ponds, landfills, investigation areas, groundwater gradient and iso-contour lines, buildings, tanks, and etc.
5. A well construction diagram for each well with the following details:
   a. Well number, date started, date completed, geologist's name
   b. Total depth drilled
   c. Drilling Contractor and driller name and address
   d. Depth of open hole (same as total depth drilled if no caving occurs)
   e. Method and materials of grouting excess borehole
   f. Footage of hole collapsed
   g. Length of slotted casing installed
   h. Depth of bottom of casing
   i. Depth to top of sand pack
   j. Thickness of sand pack
   k. Depth to top of bentonite seal
   l. Thickness of bentonite seal
   m. Thickness of concrete grout
   n. Boring diameter
   o. Casing diameter
   p. Casing material
   q. Size of perforations
   r. Well elevation at top of casing
   s. Stabilized depth to groundwater
   t. Date of water level measurement
   u. Monitoring well number
   v. Date drilled
   w. Location

B. Well Development:

1. Date(s) of development of each well
2. Method of development
3. Volume of water purged from well
4. How well development completion was determined
5. Method of effluent disposal
6. Field notes from well development should be included in report.

C. Well Survey:

1. Coordinate system, epochs, bench marks, horizontal controls, accuracy, and precision

2. Survey results of casing elevation with the cap removed (vertical to 1/100th foot)
3. California Registered Civil Engineer or Licensed Surveyor's report, field notes, and stamp/signature in an appendix
4. Description of the measuring points (i.e. ground surface, top of casing, etc.)
5. Tabulated survey data with well numbers and horizontal and vertical coordinates.

D. Groundwater Field Sampling

1. Tabulated groundwater elevations and wells
2. Graphical presentation of groundwater gradient and iso-contour lines.
3. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals

E. Laboratory Analytical Results

All analytical reports prepared for the Discharger's facility must contain, at a minimum, the information within this section.

1. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals
2. Appendix with laboratory reports, COCs, and laboratory signatures on reports.
3. Laboratory reports showing results, reporting units, MDLs, PQLs, "trace" results, flagged results, matrix effects, and QA/QC results.
4. Site map(s) showing iso-concentration lines for Constituents of Concern
5. Piper Diagrams and Stiff Plots comparing upgradient and downgradient water quality parameters.
6. Discussion of results including, but not limited to, discussion of violations, exceedances, if all field and monitoring parameters were sampled and analyzed, description of groundwater flow direction, comparison of analysis and field sampling results to background and water quality goals, list of potential constituents of concern at each sampling location, and other relevant discussions.
7. Certification statement signed by an authorized representative.
8. Report signed and stamped by California Licensed engineer or geologist.