

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO R5-2012-XXXX  
FOR

CLOSURE AND POST-CLOSURE MAINTENANCE,  
BIO INDUSTRIES, INC.

BIO-REMEDATION FACILITY FOR PETROLEUM-CONTAMINATED SOILS  
TEHAMA COUNTY

The Discharger shall comply with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated January 2012 (hereafter Standard Provisions), as ordered by Waste Discharge Requirements Order No. R5-2012-XXXX.

**A. REQUIRED MONITORING REPORTS**

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D)	<b>Semiannually</b>
2. Annual Monitoring Summary Report (Section E)	<b>Annually</b>
3. Unsaturated Zone Monitoring (Section D)	<b>Semiannually</b>

- |   |                     |
|---|---------------------|
| 4. Surface Water Monitoring (Section D)           | <b>Semiannually</b> |
| 5. Facility Monitoring (Section D)                | <b>As necessary</b> |
| 6. Response to a Release<br>(Standard Provisions) | <b>As necessary</b> |

## **B. REPORTING**

The Discharger shall submit **semiannual and annual** monitoring reports with the data and information required in this Monitoring and Reporting Program and as required in Order No. R5-2012-XXXX and Standard Provisions. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in Section E, "Facility Monitoring," below.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) in accordance with the following schedule for the calendar period in which samples were taken or observations made.

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<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Semiannually	Last Day of Month	<i>Semiannually, see below*</i>
Quarterly	Semiannually	31 March	<i>Semiannually, see below*</i>
	Semiannually	30 June	<i>Semiannually, see below*</i>
	Semiannually	30 September	<i>Semiannually, see below*</i>
	Semiannually	31 December	<i>Semiannually, see below*</i>
Semiannually	Semiannually	30 June	<i>* 1 August</i>
		31 December	<i>* 1 February</i>
Annually	Annually	31 December	<i>1 February</i>

The Discharger shall submit an **Annual Monitoring Summary Report** to the Central Valley Water Board covering the previous monitoring year. The annual report shall contain the information specified in Section E., “Facility Monitoring,” below, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

**C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD**

**1. Water Quality Protection Standard Report**

For the facility, the Water Quality Protection Standard shall consist of all

constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Water Quality Protection Standard, or any modification thereto, shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface water and groundwater** that could be affected in the event of a release from any treatment cell or the inert cell. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the points of compliance in accordance with Title 27 §20405.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

A California-Professional Civil Engineer or Geologist shall certify that Water Quality Protection Standards meet requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality

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changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the facility, the Discharger may request modification of the Water Quality Protection Standard.

**2. Constituents of Concern**

Constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained at the facility. The constituents of concern for the facility are those listed in Table V. The Discharger shall monitor all constituents of concern every five years, *as warranted based on results of analysis of the inert cell*, or more frequently as required in accordance with a Corrective Action Program.

**3. Monitoring Parameters**

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a treatment cell. The monitoring parameters for the facility are those listed in Tables I through IV for the specified monitored medium.

**4. Concentration Limits**

For each naturally occurring constituent of concern, the concentration limit shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to Title 27 §20415 (e)(8); or
- b. By an alternate statistical method meeting the requirements of

Title 27 §20415(e)(8)(E).

**5. Point of Compliance**

Points of compliance for the water standard at this facility are monitoring wells MW-1, MW-3, and MW-4.

**6. Compliance Period**

The compliance period for the facility shall be **twelve calendar quarters** following the adoption of this Order. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the facility. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program. **At the end the of the compliance period**, the Discharger shall submit a report with appropriate recommendations for either continued monitoring, or destruction of monitoring wells under Tehama County Environmental Health Department permit.

**D. MONITORING**

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specifications of Waste Discharge Requirements, Order No. R5-2012-XXXX. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan (Plan). The Plan shall include quality assurance/quality control standards that shall be submitted for review and approval.

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All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through V.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those that cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table V.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

### **CHARACTERIZATION OF SOILS IN THE INERT CELL**

The Discharger shall drill borings in a pattern as proposed in Figure 1 of the 30 November 2011 amended Preliminary Closure and Post-Closure Maintenance Plan (PCPCMP). A qualified California Professional Engineer or Geologist shall be on-site to directly supervise all fieldwork. The Discharger shall describe, field screen, and collect intact samples of soil, nominally every five feet of penetration as deep as safely feasible without penetrating the liner. For soil screening, sampling, and follow-up laboratory analyses, the Discharger shall use the following protocols:

Describe each soil sample at minimum using the Unified Soil Classification System (USCS). Field-screen soils for visible sheen and volatile organic compounds (VOCs). In addition to qualitatively logging, field screening methods for sheen should at minimum include appropriate

fluoroscopy. Field screening methods for VOCs at minimum shall include a photoionization detector (PID), freshly calibrated with isobutylene, installed with a 10.2 or 10.6 electron-volt lamp. For all samples with PID readings greater than 100 parts per million-volume equivalent isobutylene (ppm-v), perform EPA Method 5035 field preservation. From a representative, judgmental selection, minimum 25% of total samples collected, analyze for bulk density and moisture content. Analyses of bulk density and moisture content shall be sufficient to assess distribution of capillary zone pore water within the inert cell.

Analyze all samples for EPA Method 8015 modified gasoline, diesel, and oil and grease (TPH-g, d, and o/g). Based on results of EPA Method 8015, further analyze as follows:

- Further analyze samples with the highest 25% of TPH-g results for Benzene, Toluene, Ethylbenzene, Xylenes, seven fuel oxygenates, Ethylene Dibromide (EDB), and 1,2-Dichloroethene (1,2-DCA) with EPA Method 8260B, and for organic lead with DHS Method 939-M.
- Further analyze samples with PID readings greater than 100 ppm-v for full list EPA Method 8260B.
- Further analyze samples with the highest 25% of TPH-d for poly-aromatic hydrocarbons with EPA Method 8270C.
- Further analyze samples with highest 10% of TPH-og, or identified sheen, for polychlorinated biphenyls with EPA Method 8082.
- Further analyze samples with highest 10% of TPH-og for CAM 17 metals, pH, and oxidation reduction potential (ORP). For samples with at least one metal result greater than its total threshold limit concentration (TTLC), if greater than 10 times the related soluble threshold limit concentration (STLC), with the California Waste Extraction Test (WET) using citric acid. Further assess all metals results greater than

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their individual TLCs in terms of feasible soluble forms, based on related pH and ORP stability.

**By 1 November 2012**, the Discharger shall submit a report of findings with recommendations for appropriate long-term containment of the inert cell, in compliance with Title 27 §21090 et seq.

## GROUNDWATER

The Discharger shall continue to operate and maintain monitoring wells MW-1, MW-2S, MW-2D, MW-3, MW-4, SW-1, SW-2, SW-3, SW-4, SW-5, and SW-6 in compliance with the applicable provisions of Title 27 §20415 and §20420 in accordance with an approved Detection Monitoring Program. The Discharger shall collect, preserve, and transport groundwater samples in accordance with an approved Sample Collection and Analysis Plan for VOCs and SVOCS; see Tables I through V.

The Discharger shall check monitoring parameters of each reporting period for ion balance, and submit major ion results graphically as Stiff diagrams posted at monitoring well locations on water table maps, and other appropriate potentiometric surface maps. To mitigate potential errors in ion balance, the Discharger shall measure pH, electrical conductivity (EC), and temperature in the field, and confirm pH and EC with a follow-up laboratory analyses.

The Discharger shall also measure temperature-compensated specific conductance, convert results to estimated total dissolved solids (TDS), and, by relative percent difference (RPD), compare estimates to independently measured TDS as described in Table I. The Discharger shall analyze for Cadmium, Chromium (total), Nickel, Lead, and Zinc, of both unfiltered and filtered samples. At their discretion, based on major ion balance and RPD, staff may request further analyses. For non-statistical, geochemical analyses of metals anomalies, staff suggests sufficient analyses of Aluminum, Iron, and Manganese to support appropriate covariant plots with other metals results.

Staff considers wells MW-2S and MW-2D as background wells, part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and **frequency specified in Table I.**

During each groundwater sampling event, the Discharger shall estimate groundwater flow rate and direction in the uppermost aquifer. Subject to further demonstration, staff considers the uppermost aquifer as that sampled in wells MW-2S, MW-3, and MW-4. If perched groundwater, as found sporadically in wells SW-1, SW-2, SW-3, SW-4, SW-5, and SW-6, is of sufficient volume to measure static water level and sample, the Discharger shall also estimate groundwater flow rate and direction in perched groundwater. Staff considers flow rate as mean linear velocity ( $V$ ); based on representative hydraulic conductivity ( $K$ ), hydraulic gradient ( $i$ ), and effective porosity ( $n_{eff}$ ),  $V = Ki/n_{eff}$ . The Discharger shall also submit hydrographs based on quarterly soundings of each well with static water levels relative to mean sea level.

### UNSATURATED ZONE MONITORING

The Discharger shall continue to monitor with lysimeters LY-1 through LY-6. Assuming sufficient water volume in a lysimeter, the Discharger shall submit samples for VOCs and SVOCs, major ions, specific conductance, pH, TDS, Cadmium, Chromium (total), Nickel, Lead, and Zinc. For metals, the Discharger shall run both filtered and unfiltered samples. Staff suggests further analyses for Iron, Manganese, and Aluminum. With insufficient water volume in a given lysimeter, sampling and the analyses shall be performed in the order listed above until insufficient water volume remains. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and **frequency specified in Table II.**

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### SURFACE WATER MONITORING

The Discharger shall sample surface water in accordance with the current Industrial Storm Water Permit. Unless otherwise required, this will generally entail continued sampling of effluent points E-1 and E-2, storm water points R-1 and R-2, and the sedimentation basin during the first rainy season storm that causes flow, standing water, or drainage into Brickyard Creek, and monthly after all significant rainfall events, greater than or equal to 1 inch in 24 hours. The Discharger shall collect and analyze for monitoring parameters with methods and **frequency specified in Tables III and IV.**

#### E. FACILITY MONITORING

##### 1. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September** of each year, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control, and monitoring systems, and shall include the Standard Observations described below. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

##### 2. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. 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 REQUIREMENTS

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post-closure period.

Such legible records shall show the following for each sample:

- Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
  - Date, time, and manner of sampling;
  - Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
  - Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
  - Calculation of results; and
  - Results of analyses, and the MDL and MRL for each analysis.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for

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correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.

Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:

- For each monitoring point and background monitoring point addressed by the report, a description of:
  - The time of water level measurement;
  - The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
  - The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
  - The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
  - A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.
  - A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow beneath the facility, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.

- Laboratory statements of results of all analyses evaluating compliance with requirements.
- An evaluation of the effectiveness of the leachate monitoring and controls, and of the run-off/run-on controls.
- A summary and certification of completion of all **Standard Observations** for the treatment cells, for the perimeter of the cell, and for the receiving waters. Standard observations for active treatment cells shall be conducted **weekly** during the wet season (1 October to 30 April of each year) and **monthly** during the dry season (1 May to 30 September of each year). Standard Observations shall include:
  - For Former Treatment Cell 4, the following shall be reported:
    - Observation or other evidence of ponded water at any point in the cell shall be reported, and the location shown on an appropriate map;
    - Detection of odors beyond the boundaries of the cell - presence or absence, characterization, source, and distance of travel from source; and
    - Evidence of erosion of the cell containment structure.
  - Along the Perimeter of the Facility:
    - Observation of other evidence of liquid leaving or entering the facility, estimated size of the affected area, and flow rate (show affected area on an appropriate map);
    - Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
    - Signs of erosion.
  - For Receiving Waters:

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- Discoloration and turbidity - description of color, source, and size of affected area;
  - Detection of odors - presence or absence, characterization, source, and distance of travel from source;
  - Evidence of water uses - presence of water-associated wildlife;
  - Flow rate; and
  - Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
3. The Discharger shall report by telephone any seepage from the facility **immediately** after it is discovered. A written report shall be filed with the Central Valley Water Board **within seven days**, containing at least the following information:
- A map showing the location(s) of seepage;
  - An estimate of the flow rate;
  - A description of the nature of the discharge (e.g., all pertinent observations and analyses);
  - Verification that samples have been submitted for analyses of the Monitoring Parameters and Constituents of Concern listed in Table III of this MRP, and an estimated date that the results will be submitted to the Regional Water Board; and
  - Corrective measures underway or proposed, and corresponding time schedule.
4. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the reporting period of the previous monitoring year. This report shall contain:

- All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot down-gradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
- All historical monitoring data, including data for the previous year, shall be submitted in tabular form as well as in a digital file format. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 §20420(h)], in that this facilitates periodic review by the Regional Water Board.
- A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned that may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
- A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.

The Discharger shall implement the above monitoring program on the effective date of this Program.

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Ordered by: \_\_\_\_\_

PAMELA C. CREEDON, Executive Officer

\_\_\_\_\_

(Date)

EJR:

**TABLE I**  
**DETECTION MONITORING PROGRAM, GROUNDWATER (ROUTINE)**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<b>Field Parameters</b>		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Eh	millivolts	Quarterly
Dissolved Oxygen	mg/L	Quarterly
Turbidity	Nephelometric Turbidity Units,	Quarterly
<b>Monitoring Parameters</b>		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Bicarbonate	mg/L and meq/L	Quarterly
Carbonate	mg/L and meq/L	Quarterly
Chloride	mg/L and meq/L	Quarterly
Sulfate	mg/L and meq/L	Quarterly
Calcium	mg/L and meq/L	Quarterly
Magnesium	mg/L and meq/L	Quarterly
Potassium	mg/L and meq/L	Quarterly
Sodium	mg/L and meq/L	Quarterly
Cadmium	mg/L	Quarterly
Chromium (total)	mg/L	Quarterly
Lead	mg/L	Quarterly
Nickel	mg/L	Quarterly
Zinc	mg/L	Quarterly
Total Petroleum Hydrocarbons as gasoline, diesel, and oil and grease	mg/L	Quarterly
Volatile Organic Compounds (USEPA Method 8260, key petroleum constituents; see Table IV)	µg/L	Quarterly
Semi-Volatile Organic Compounds (USEPA Method 8270C, key petroleum constituents, see Table IV)	µg/L	Quarterly

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**TABLE II**

**DETECTION MONITORING PROGRAM, UNSATURATED ZONE (ROUTINE)**

**SOIL GAS PROBES, AS REQUIRED BASED ON FINDINGS OF INERT CELL CHARACTERIZATION:**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<b>Monitoring Parameters</b>		
Volatile Organic Compounds (USEPA Method TO-15, key petroleum constituents; see Table IV)	$\mu\text{g}/\text{cm}^3$ and ppb-v	Semiannually

**LYSIMETERS:**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
<b>Field Parameters</b>		
Electrical Conductivity	$\mu\text{mhos}/\text{cm}$	Semiannually
pH	pH units	Semiannually

**Monitoring Parameters**

Total Dissolved Solids (TDS)	mg/L	Semiannually
Bicarbonate	mg/L and meq/L	Semiannually
Carbonate	mg/L and meq/L	Semiannually
Chloride	mg/L and meq/L	Semiannually
Sulfate	mg/L and meq/L	Semiannually
Calcium	mg/L and meq/L	Semiannually
Magnesium	mg/L and meq/L	Semiannually
Potassium	mg/L and meq/L	Semiannually
Sodium	mg/L and meq/L	Semiannually
Cadmium	mg/L	Semiannually
Chromium (total)	mg/L	Semiannually
Lead	mg/L	Semiannually
Nickel	mg/L	Semiannually
Zinc	mg/L	Semiannually
Total Petroleum Hydrocarbons (USEPA Method 8015M) as gasoline, diesel, and oil and grease	mg/L	Semiannually
Volatile Organic Compounds (USEPA Method 8260B, key petroleum constituents, Table IV)	$\mu\text{g}/\text{L}$	Semiannually
Semi-Volatile Organic Compounds (USEPA Method 8270C, key petroleum constituents, Table IV)	$\mu\text{g}/\text{L}$	Semiannually

**TABLE III**

**SURFACE WATER DETECTION MONITORING PROGRAM (ROUTINE)**

As required in the current Industrial Storm Water Permit.

**TABLE IV**

**MONITORING PARAMETERS FOR DETECTION MONITORING, KEY PETROLEUM  
(ROUTINE)**

**ALL GROUNDWATER AND SOIL SAMPLES:**

**VOCs, key petroleum constituents,**

**USEPA Method 8260B**

Benzene  
n-Butylbenzene  
sec-Butylbenzene  
Ethylbenzene  
Isopropylbenzene  
Toluene  
1,2,4-Trimethylbenzene  
1,3,5-Trimethylbenzene  
Total Xylenes  
Ethanol (EtOH)  
Methanol (MeOH)  
Di-isopropylether (DIPE)  
Ethyl tertiary butyl ether (EtBE)  
Methyl tertiary butyl ether (MtBE)  
Tertiary amyl methyl ether (TAME)  
Tertiary butyl alcohol (TBA)  
Ethylene Dibromide (EDB)  
Ethylene Dichloride (1,2-Dichloroethane)  
Naphthalene

**SVOCs, key petroleum constituents,**

**USEPA Method 8270C**

Acenaphthene  
Anthracene  
Benz(a)anthracene  
Benzo(a)pyrene  
Benzo(b)fluoranthene  
Benzo(j)fluoranthene  
Benzo(k)fluoranthene  
Chrysene  
Dibenz(a)acridine

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Dibenz(h)acridine  
Dibenz(a,h)acridine  
7H-Dibenzo(c,g)carbazole  
Dibenzo(a,e)pyrene  
Dibenzo(a,h)pyrene  
Dibenzo(a,l)pyrene  
7,12-Dimethylbenz(a)anthracene  
1,6-Dinitropyrene  
1,8-Dinitropyrene  
Fluoranthene  
Fluorene  
Indeno(1,2,3-c,d)pyrene  
3-Methylcholanthrene  
5-Methylchrysene  
2-Methylnaphthalene  
5-Nitroacenaphthene  
6-Nitrocrysene  
2-Nitrofluorene  
1-Nitropyrene  
4-Nitropyrene  
Pyrene

**SOIL GAS SAMPLES, AS REQUIRED BASED ON FINDINGS OF INERT CELL  
CHARACTERIZATION:**

**VOCs, key petroleum constituents**

**USEPA METHOD TO-15**

Benzene  
Toluene  
Ethylbenzene  
total Xylenes  
Ethanol (EtOH)  
Methanol (MeOH)  
Di-isopropylether (DIPE)  
Ethyl tertiary butyl ether (EtBE)  
Methyl tertiary butyl ether (MtBE)  
Tertiary amyl methyl ether (TAME)  
Tertiary butyl alcohol (TBA)  
Naphthalene

**TABLE V**

**CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS  
 (EVERY FIVE YEARS, AS REQUIRED BASED ON FINDINGS OF INERT CELL  
 CHARACTERIZATION)**

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Barium	6010
Beryllium	6010
Chromium	6010
Cobalt	6010
Copper	6010
Iron	6010
Manganese	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Antimony	7041
Arsenic	7062
Lead	7421
Nickel	7521
Selenium	7742
Thallium	7841
Cadmium	7131A
Mercury	7470A
Cyanide	9010B
Sulfide	9030B

**Volatile Organic Compounds**

**USEPA Method 8260, and Method TO-15 AS REQUIRED BASED ON FINDINGS OF  
 INERT CELL CHARACTERIZATION**

- Acetone
- Benzene
- Bromodichloromethane (Dibromochloromethane)
- Bromoform (Tribromomethane)
- Bromomethane
- 2-Butanone (MEK)
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chloroethane (Ethyl chloride)
- Chloroform (Trichloromethane)
- Chloroethane
- Chloromethane
- Dibromochloromethane (Chlorodibromomethane)

**DRAFT**

1,2-Dibromoethane (Ethylene dibromide; EDB)  
o-Dichlorobenzene (1,2-Dichlorobenzene)  
m-Dichlorobenzene (1,3-Dichlorobenzene)  
p-Dichlorobenzene (1,4-Dichlorobenzene)  
1,1 -Dichloroethane (Ethylidene chloride)  
1,2-Dichloroethane (Ethylene dichloride)  
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)  
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)  
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)  
1,2-Dichloropropane (Propylene dichloride)  
1,1 -Dichloropropene  
cis- 1,3-Dichloropropene  
trans- 1,3-Dichloropropene  
Di-isopropylether (DIPE)  
Ethanol  
Ethyltertiary butyl ether (EtBE)  
Ethylbenzene  
2-Hexanone (Methyl butyl ketone)  
Methyl chloride (Chloromethane)  
Methyl ethyl ketone (MEK; 2-Butanone)  
Methyl tertiary butyl ether (MtBE)  
4-Methyl-2-pentanone (Methyl isobutyl ketone)  
Naphthalene  
Styrene  
Tertiary amyl methyl ether (TAME)  
Tertiary butyl alcohol (TBA)  
1,1,1,2-Tetrachloroethane  
1,1,2,2-Tetrachloroethane  
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)  
Toluene  
1,2,4-Trichlorobenzene  
1,1,1 -Trichloroethane, Methylchloroform  
1,1,2-Trichloroethane  
Trichloroethylene (Trichloroethene; TCE)  
Trichlorofluoromethane (CFC- 11)  
Trichlorofluoroethane (CFC- 113)  
Vinyl chloride (Chloroethene)  
Xylenes

**Semi-Volatile Organic Compounds**

**USEPA Method 8270**

Acenaphthene  
Acenaphthylene  
Anthracene  
Benzo[a]anthracene (Benzanthracene)  
Benzo[b]fluoranthene  
Benzo[k]fluoranthene  
Benzo[g,h,i]perylene  
Benzo[a]pyrene

MONITORING AND REPORTING PROGRAM NO. R5-2012-XXXX  
CLOSURE AND POST-CLOSURE MAINTENANCE,  
BIO INDUSTRIES, INC.  
FORMER BIO-REMEDIATION FACILITY FOR PETROLEUM-CONTAMINATED SOILS  
TEHAMA COUNTY

24

Bis(2-ethylhexyl) phthalate  
Butyl benzyl phthalate (Benzyl butyl phthalate)  
p-Chloro-m-cresol (4-Chloro-3-methylphenol)  
2-Chlorophenol  
Chrysene  
Cresols  
Dibenz[a,h]anthracene  
Di-n-butyl phthalate  
2,4-Dichlorophenol  
2,6-Dichlorophenol  
Diethyl phthalate  
7,12-Dimethylbenz[a]anthracene  
2,4-Dimethylphenol (m-Xylenol)  
Dimethyl phthalate  
Di-n-octyl phthalate  
Fluoranthene  
Fluorene  
Indeno(1,2,3-c,d)pyrene  
o-Nitrophenol (2-Nitrophenol)  
p-Nitrophenol (4-Nitrophenol)  
Pentachlorophenol  
Phenanthrene  
Phenol  
Pyrene  
Tetrachlorophenols  
Trichlorophenols