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Central Valley Regional Water Quality Control Board

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NOTICE OF APPLICABILITY TO OPERATE UNDER ORDER NO. R5-2008-0149-049, FORMER JM EQUIPMENT, 1245 WEST CHARTER WAY, STOCKTON, SAN JOAQUIN COUNTY

On 14 January 2014, Ground Zero Analysis, Inc. (GZAI) submitted a Notice of Intent (NOI) and supporting technical information (work plans and reports) to operate under Waste Discharge Requirements of General Order R5-2008-0149 (General Order) on your behalf for your site at 1245 West Charter Way in Stockton. On 28 January 2014 and 27 February 2014, GZAI submitted additional information to support the NOI. Central Valley Water Board staff determined that the NOI and supporting technical information were complete on 7 March 2014.

In the NOI, GZAI describes the proposed injection of hydrogen peroxide into groundwater from an injection system consisting of seven injection wells screened from 15 feet below ground surface ('bgs) to 25' bgs. The injection system has been designed to oxidize petroleum hydrocarbon pollution, including methyl tertiary butyl ether (MTBE), in groundwater found between 11-17 feet below ground surface. The Former JM Equipment conducted a pilot study in 2011 and 2012 using hydrogen peroxide injections showing this cleanup technology was successful at reducing concentrations of petroleum hydrocarbons in groundwater at this Site.

The General Order includes a Monitoring and Reporting Program (MRP) that prescribes minimum monitoring requirements. The MRP requires sampling and analytical testing for petroleum hydrocarbon constituents and potential deleterious by-products in ten monitoring wells. Additions to the MRP are included in the Additional Requirements section of the Notice of Applicability (NOA).

Based on our review of the information provided, we have determined this project meets the required conditions to operate under the General Order. All requirements contained in the General Order and/or modified by this NOA are applicable to your project. You are hereby assigned General Order R5-2008-0149-049 to regulate the injection of hydrogen peroxide into groundwater at the former JM Equipment, at 1245 West Charter Way, Stockton site.

PROJECT LOCATION

The former JM Equipment site is located at 1245 West Charter Way in Stockton, California. The legal description for the site is: Assessor's Parcel Number 163-230-34, Mt. Diablo Township/Range/Section 1N, 6E, S___. The closest surface water body is the Stockton Ship Channel located approximately 1 mile north of the site.

KARL E. LONGLEY ScD, P.E., CHAIR | PAMELA C. CREEDON P.E., BCCE, EXECUTIVE OFFICER

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PROJECT DESCRIPTION

A pilot study using injection of hydrogen peroxide was conducted at the former JM Equipment in 2011 and 2012. Results from the pilot study indicate hexavalent chromium was mobilized during the study but returned to levels below background within one to two calendar quarters, and total petroleum hydrocarbons as gasoline declined from 32,000 micrograms per Liter (ug/L) to 22,000 ug/L. Benzene concentrations also declined from 3,400 ug/L to 1,800 ug/L. GZAI proposes to inject a 7.5% to 12.5% hydrogen peroxide solution into injection wells IW-1 through IW-11 for full scale remediation. Analytical testing will be performed on five monitoring wells per the attached Monitoring and Reporting Program (MRP), to determine if hydrogen peroxide injection is effective in reducing petroleum hydrocarbons and to monitor for increases in dissolved levels of specified metals, which may be caused by oxidation of naturally occurring metals in local soil. There is no surface water monitoring associated with this project.

ADDITIONAL REQUIREMENTS

Excerpts from the revised NOI are italicized in the following paragraphs and our comments to the revisions follow.

1. *"In order to establish background and contingency plan compliance concentrations for metals, GZAI recommends that additional groundwater samples be collected from the following wells:*
 - *Background well MW-7*
 - *Transition wells MW-6 and MW-8*
 - *Compliance wells MW-2 and MW-3*

"...GZA recommends that the three (3) additional groundwater monitoring events be performed on the wells listed above in order to determine the groundwater quality prior to establishing the compliance concentrations. Due to the wide fluctuations, GZA recommends that the highest concentration value be accepted as the base concentration for the given well. ...GZA believes that the compliance concentrations for wells MW-6 and MW-8 should reflect not only the background concentrations established for MW-7 but also the concentrations in these wells prior to it being impacted by remedial activities. GZA believes that wells MW-6 and MW-8 are too far down gradient to have experienced chemical alteration from the Phase 1 (pilot study) activities... Upon completion of the three (3) groundwater monitoring events, a short report will be submitted including the analytical results and a discussion regarding the establishment of background and contingency plan compliance concentrations. This report will be completed and submitted prior to the 2nd Quarter 2014 groundwater monitoring event which will be completed in June 2014. This will allow for the June 2014 groundwater monitoring data to be compared to the contingency plan compliance levels and the WQOs... Begin hydrogen peroxide injections 3/20/2014..."

Background levels must to be established from wells that are not impacted by pollutants, therefore it is not appropriate to use data from wells MW-2, MW-3, MW-6 or MW-8 to establish background metals concentrations. The pilot study background levels and Action Levels will remain in effect until new background levels are established.

Action Levels for triggering the implementation of the Contingency Plan are shown in Table 1 below. If background levels already exceed Water Quality Objectives (WQOs), then no increases, may be allowed. In other words, if the average of the three rounds of sampling in compliance wells MW-2

and MW-3 exceed WQOs or background levels established in MW-7 by 20% (whichever is lower), then the Contingency Plan to stop hydrogen peroxide injections and evaluate need for high fructose corn syrup injections must be implemented.

2. The General Order includes a Monitoring and Reporting Program (MRP) that prescribes minimum monitoring requirements. The MRP requires sampling and analytical testing for petroleum hydrocarbon constituents and potential deleterious by-products in monitoring wells. Additions to the MRP are included in the Additional Requirements section of the Notice of Applicability (NOA). The additional requirements include the following:
 - a. The NOI lists the Maximum Practical Quantitation Limit (MPQLs) for metals analysis for: barium (Ba), Bromate, hexavalent chromium (Cr⁶⁺), cadmium (Cd), calcium (Ca), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), molybdenum (Mo), and nickel (Ni). Background levels utilized in the pilot study are shown in the Table below. New background levels may be proposed after three sampling rounds at MW-7 and will be used for comparison of compliance in wells MW-2 and MW-3.

Table 1: Metals Concentrations in micrograms per Liter (ug/L).

Metals	Ba	Bromate	Cr ⁶⁺	Cd	Cu	Pb	Mn	Hg	Mo	Ni
Action Level	156	0.0001	0.17	1.2	1.6	1.2	210	0.2	0.38	2.8
Background A	130	<0.001	0.17	<1.0	1.4	<1.0	210	<0.2	0.32	2.3
MPQL	700	0.0001	0.2	0.04	300	0.2	50	1.2	35	12
WQO ^B	1000	10	0.02	5	1000	15	50	2	35	100
Method	B	B	B	B	B	B	B	B	B	B

A =may be modified by additional sampling from MW-7 B = any method which meets or exceeds (less than) the MPQL

- b. Modifications to sampling frequency, after completion of one year of monitoring, may be directed by Central Valley Water Board staff as appropriate.
- c. In addition to hydrogen peroxide, mildly acidic amendments such as vinegar or citric acid may be used in the injection wells to control biofouling. All acidic amendments must be removed by pumping of the well until pH is restored to previous levels.
- d. The required annual fee (as specified in the annual billing invoice to be issued by the State Water Resources Control Board) shall be submitted until this NOA is officially rescinded. The 2013/14 fee was submitted on 14 January 2014.
- e. In the revised NOI GZA lists injection of high fructose corn syrup (HFCS) after monitoring for six months as the Contingency Plan if transition and compliance wells exceed the established Action Levels and do not decline after the hydrogen peroxide injections cease in compliance zone wells MW-2 and MW-3. Increases of by-products are allowed in the treatment zone and the transition zone wells. The purpose of the transition zone wells is to document the declining concentrations of by-products before they reach the compliance zone wells. Increases in by-products may not exceed 20% above background or the water quality objective whichever is lower in the

compliance wells (Action Levels). The Contingency Plan must be implemented if the Action Levels are exceeded in the compliance well(s) for more than 6 months. Monitoring will continue on a quarterly schedule until the data show evidence that the concentrations of by-products have resumed to a level below the Action Level.

- f. Any changes to the remedial action plan, such as the proposed air sparging, will require the approval of the San Joaquin County Environmental Health Department, the lead agency for the groundwater cleanup on this case.

If you have any questions or concerns please contact James Barton at (916) 464-4615, or by e-mail at jbarton@waterboards.ca.gov.

PAMELA CREEDON
Executive Officer

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