

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2002-0719

FOR

ALPHA DYNO NOBEL dba ALPHA EXPLOSIVES
AND HERCULES INCORPORATED

ALPHA EXPLOSIVES LINCOLN FACILITY
PLACER COUNTY

This Order is issued to Alpha Dyno Nobel dba Alpha Explosives and Hercules Incorporated (hereafter collectively referred to as Discharger) based on provisions of California Water Code Section 13304, which authorizes the Regional Water Quality Control Board, Central Valley Region (Regional Board) to issue a Cleanup and Abatement Order (Order).

The Regional Board finds, with respect to the Discharger's acts, or failure to act, the following:

BACKGROUND

1. Alpha Explosives owns the 23-acre property at 3400 Nader Road, Lincoln (site) as shown in the Attachments 1 and 2 which are made part of this Order. Prior to 1964 and up until 1971, the land was owned by Chamberlain Ranch. Between 1971 and 1999, the land was owned by Wilson Ranch, when it was sold to Alpha Explosives. Between 1964 and 1971, Hercules Incorporated occupied the site under a master lease from Chamberlain Ranch. Hercules Incorporated conducted research and development of pourable slurries containing perchlorate, and manufactured and distributed ANFO, which is a mixture of ammonium nitrate and diesel fuel. During this time, Alpha Explosives leased a small portion of the property from Hercules and distributed prepackaged explosives. Thereafter, Alpha Explosives has manufactured and distributed ANFO.
2. Alpha Explosives is subject to this Order because it is owner of the property and it conducted activities that caused waste to be discharged or deposited where it discharged into waters of the state and has created and threatens to create a condition of pollution or nuisance. Hercules Incorporated is subject to this Order because it conducted activities that caused waste to be discharged or deposited where it discharged into waters of the state and has created and threatens to create a condition of pollution or nuisance.
3. On 14 May 1999, the Regional Board issued Cleanup and Abatement Order No. 99-715 to Alpha Explosives. Since that time, Alpha Explosives has delineated the vertical and lateral extent of soil pollution, performed a biological treatability study for perchlorate-polluted groundwater, conducted a capture zone analysis for the pilot study remediation monitoring

well TW-1, and submitted a work plan to implement an in situ bioremediation pilot test. Remediation technology for perchlorate pollution is currently experimental and includes microbiological degradation. Therefore, the Cleanup and Abatement Order is revised to establish a remediation schedule for implementing this experimental technology on a pilot scale.

4. The in situ bioremediation pilot test consists of treating a portion of soil beneath the former evaporation pond and treating the underlying groundwater. The former evaporation pond is within the suspected source area. Groundwater at this location contains about 30,000 µg/L perchlorate and about 500 mg/L nitrate (as nitrogen). A measured amount of ethanol and phosphate will be introduced into a shallow pit excavated at the base of the former evaporation pond. The base of the shallow pit will be about 10 feet below ground surface and about 15 feet above the groundwater surface. Ethanol will be consumed by nitrate and perchlorate-degrading microbes within the soil column and in the aquifer. Phosphate provides nutrients for microbial growth. Microbial metabolism is expected to oxidize ethanol to carbon dioxide and reduce nitrate and perchlorate to dinitrogen gas and chloride, respectively. Adjacent to and downgradient of the application pit will be proposed monitoring well TW-2, and 30 feet further downgradient is existing monitoring well TW-1. The location of the pilot study, ethanol application area, pilot study monitoring wells and nearby groundwater monitoring wells are shown in Attachments 3 and 4, which are made part of this Order. The pilot study is expected to be concluded within 16 weeks of implementation.
5. The Discharger will install an additional temporary monitoring well, TW-3, downgradient of TW-1, and within the capture zone of TW-1 to monitor the temporal and spatial distribution of biodegradation end products.
6. The progress of the pilot study will be monitored biweekly pursuant to Monitoring and Reporting Program No. R5-2002-0719, which is attached and made part of this Order.
7. The Contingency Plan element of the May 2002 *Pilot Test Work Plan for In Situ Bioremediation of Nitrate and Perchlorate in Impacted Soils and Groundwater* (Pilot Test Work Plan) consists of extracting groundwater from either well TW-1 or TW-2 and using the extracted water in on-site production processes. The Contingency Plan will be implemented if any of the following threshold concentrations are exceeded:
 - a. the concentration of total organic carbon (TOC) exceeds 100 mg/l in conjunction with nitrate or perchlorate less than 10 mg/l in TW-3. This would indicate that the initial carbon quantity exceeded the quantity of nitrate and perchlorate to be degraded;
 - b. the pH falls below 5.0 in TW-3, which would indicate unanticipated acidification;

- c. ammonium concentration exceeds 20 mg/l in TW-3, the predominant background concentration; or
 - d. TOC concentration exceeds 1,000 mg/l in TW-1. This would imply that degradation is not taking place at a rate sufficient enough to expect it to continue.
8. There are 14 groundwater plume delineation monitoring wells at the site, 11 of which have been sampled quarterly for two years and semi-annually for three years. Constituents of concern and the maximum concentrations detected in groundwater at the facility are as follows: perchlorate at 110,000 µg/L in 1999, nitrate (as nitrogen) at 1,100 mg/L in 2001, and ammonium at 28 mg/L in 1998. Petroleum products have not been detected in groundwater since 1997. In soil, the maximum concentration of nitrate was 2,200 mg/kg in 1996, and perchlorate was 1.6 mg/kg in 1999. The extent of soil pollution is adequately defined.
9. Alpha Explosives has been conducting groundwater monitoring and reporting in accordance with Monitoring and Reporting Program No. 5-00-842, which continues to be in effect.

AUTHORITY – LEGAL REQUIREMENTS

10. The Regional Board’s *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, 4th Edition*, (hereafter Basin Plan) designates beneficial uses of the waters of the state, establishes water quality objectives (WQOs) to protect those uses, and establishes implementation policies to implement WQOs. The beneficial uses of the groundwater beneath the site are domestic, municipal, industrial, and agricultural supply.
11. The wastes detected at the site are not naturally-occurring, and some can cause adverse human health effects. Pollution of groundwater with elevated concentrations of constituents of concern impairs the beneficial uses of the groundwater.
12. WQOs listed in the Basin Plan include numeric WQOs, e.g., state drinking water maximum contaminant levels that are incorporated by reference, and narrative WQOs, including the toxicity objective and the taste and odors objective for surface water and groundwater. The numeric standards for the constituents of concern listed in the following table implement the Basin Plan WQOs.

Constituent	Numeric Limit	Water Quality Objectives
Ammonium	0.5 mg/l ¹	Narrative objective for taste and odor
Nitrate (as nitrogen)	10 mg/l	California Department of Health Services Primary Maximum Contaminant Level
Perchlorate	4 µg/l ²	Narrative objective for toxicity

¹ Council of the European Union, *On the Quality of Water Intended for Human Consumption*, Council Directive 98/83/EC (3 November 1998).

² California Department of Health Services Action Level for Toxicity.

13. The groundwater exceeds the WQOs for the constituents listed in Finding No. 12, which are wastes as defined in California Water Code Section 13050. The exceedance of applicable WQOs in the Basin Plan is pollution as defined in California Water Code Section 13050. The Discharger has caused or permitted waste to be discharged or deposited where it has discharged to waters of the state and has created, and continues to threaten to create, a condition of pollution or nuisance.
14. The State Water Resources Control Board (hereafter State Board) has adopted Resolution No. 92-49, the *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*. This Policy sets forth the policies and procedures to be used during an investigation or cleanup of a contaminated site and requires that cleanup standards be consistent with State Board Resolution 68-16 (the antidegradation policy). Resolution 92-49 and the Basin Plan establish the cleanup levels to be achieved. Resolution 92-49 requires the waste to be cleaned up to background, or if that is not reasonable, to an alternative level that is the most stringent level that is economically and technologically feasible in accordance with Section 2550.4, Title 23, California Code of Regulations (CCR). Any alternative cleanup level to background must (1) be consistent with the maximum benefit to the people of the state; (2) not unreasonably affect present and anticipated beneficial use of such water; and (3) not result in water quality less than that prescribed in the Basin Plan and applicable Water Quality Control Plans and Policies of the State Board.
15. Section 13304(a) of the California Water Code provides that:

“Any person who has discharged or discharges waste into waters of this state in violation of any waste discharge requirements or other order or prohibition issued by a regional board or the state board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the state and creates, or threatens to create, a condition of pollution or nuisance, shall upon order of the regional board clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including but not limited to, overseeing cleanup and abatement efforts. Upon failure of any person to comply with the cleanup or abatement order, the Attorney General, at the request of the board, shall petition the superior court for that county for the issuance of an injunction requiring the person to comply with the order. In the suit, the court shall have jurisdiction to grant a prohibitory or mandatory injunction, either preliminary or permanent, as the facts may warrant.”
16. Section 13267(b) of the California Water Code provides that:

“In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

The technical reports required by this Order are necessary to assure compliance with Section 13304 of the California Water Code. Existing data and information about the site indicates that waste has been discharged or is discharging at the property, which is currently owned and operated by Alpha Dyno Nobel dba Alpha Explosives, and formerly operated by Hercules Incorporated, both of which are named in this Order.

17. Section 13304(c)(1) of the California Water Code provides that:

“. . . the person or persons who discharged the waste, discharges the waste, or threatened to cause or permit the discharge of the waste within the meaning of subdivision (a), are liable to that government agency to the extent of the reasonable costs actually incurred in cleaning up the waste, abating the effects of the waste, supervising cleanup or abatement activities, or taking other remedial action. . .”

18. If the Discharger fails to comply with this Order, the Executive Officer may request the Attorney General to petition the superior court for the issuance of an injunction.

19. If the Discharger intentionally or negligently violates this Cleanup and Abatement Order, then the Discharger may be liable civilly in a monetary amount provided by the California Water Code.

20. The issuance of this Order is an enforcement action taken by a regulatory agency and is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.), pursuant to Section 15321(a)(2), Title 14, CCR. The implementation of this Order is also an action to assure the restoration of the environment and is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.), in accordance with Section 15308 and 15330, Title 14, CCR.

21. Any person affected by this action of the Regional Board may petition the State Board to review the action in accordance with Sections 2050-2068, Title 23, CCR. The State Board must receive the petition within 30 days of the date of this Order. The regulations will be provided upon request and are available at www.swrcb.ca.gov.

REQUIRED ACTIONS

IT IS HEREBY ORDERED that pursuant to Section 13304 and Section 13267 of the California Water Code, Cleanup and Abatement Order No. 99-715 is rescinded and Alpha Dyno Nobel dba Alpha Explosives and Hercules Incorporated shall:

1. Investigate the discharges of waste, clean up the waste, and abate the effects of the waste, forthwith, resulting from activities at 3400 Nader Road, Lincoln, in conformance with the State Board's Resolution 92-49 *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* and with the Regional Board's *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (in particular the Policies and Plans listed within the Control Action Considerations portion of Chapter IV). "Forthwith" means as soon as is reasonably possible. Compliance with this requirement shall include, but not be limited to, completing the tasks listed below.

Site Assessment

2. By **27 September 2002**, submit a work plan and time schedule to delineate the lateral and vertical extent of groundwater pollution. The work plan shall define the lateral extent of pollution beyond wells MW-10 and MW-13. The work plan shall be prepared in general accordance with Attachment 5, which is made part of this Order.
3. Within **30 days** of staff concurrence with the work plan identified in Item 2., implement the work plan and submit a site assessment report in accordance with the approved time schedule, which shall become a part of this Order. The report shall be prepared in general accordance with Attachment 6, which is made part of this Order.

Pilot Test

4. By **27 September 2002**, submit a work plan and time schedule to install temporary pilot test wells TW-2 and TW-3.
5. Within **30 days** of staff concurrence with the temporary test well work plan, install the test wells.
6. Within **30 days** of staff concurrence with the May 2002 *Pilot Test Work Plan*, implement the pilot test in accordance with the approved time schedule, which shall become part of this Order.
7. If any of the following thresholds are exceeded, then within **7 days** of receiving the analytical results, the Discharger shall obtain a confirmation sample.

- (a) TOC concentration is greater than 1,000 mg/L in TW-1, or
- (b) TOC concentration is greater than 100 mg/L, and both nitrate and perchlorate are less than 10 mg/L in TW-3, or
- (c) acidity is below pH 5 in TW-3, or
- (d) ammonium concentration exceeds 20 mg/L in TW-3.

Within **15 days** of confirming that a threshold has been exceeded, the Discharger shall notify Regional Board staff and implement the *Contingency Plan* element of the May 2002 *Pilot Test Work Plan*.

8. Within **90 days** of implementing the *Contingency Plan*, submit a report describing the actions, results, and recommendations.
9. Within **60 days** of implementing the May 2002 *Pilot Test Work Plan*, but no later than **6 December 2002**, submit the first monthly tabulated data report. Monthly data submittals shall follow the schedule in the attached Monitoring and Reporting Program No. R5-2002-0719. -
10. Within **18 weeks** of the start of implementation of the pilot test, submit a *Pilot Test Report* as described in the attached Monitoring and Reporting Program No. R5-2002-0719. The Discharger shall provide interim submittals if modifications to the work plan are proposed, or at the request of Regional Board staff.
11. Within **30 days** of staff concurrence with the *Pilot Test Report*, submit a work plan and schedule to obtain additional information identified in the *Pilot Test Report*, if any. Implement the work plan and submit a *Supplemental Evaluation Report* in accordance with the work plan time schedule, which shall become part of this Order.

Cleanup Plan

12. Within **60 days** of staff concurrence with the *Pilot Test Report*, or, if applicable, within **60 days** of staff concurrence with the *Supplemental Evaluation Report*, submit a *Cleanup Plan* for remediation of soil and groundwater. The *Cleanup Plan* shall identify specific actions to clean up soil and groundwater, and shall provide a schedule to conduct cleanup activities and provide progress reports. The Cleanup Plan must meet the range of cleanup levels as described in the Basin Plan and in Resolution 92-49. The Discharger shall attempt to clean up each constituent to background concentrations, or to the level that is technically and economically feasible and at least achieves the water quality objectives in the Basin Plan.

13. Within **30 days** of Executive Officer approval of the *Cleanup Plan*, commence remediation or installation of the remediation system, or submit a Report of Waste Discharge, if Waste Discharge Requirements are required. The approved time schedule to implement the remediation shall become a part of this Order. The Discharger shall notify staff by telephone prior to beginning field work.
14. Within **30 days** of Regional Board adoption of WDRs, if applicable, commence remediation or installation of the remediation system. The Discharger shall notify staff by telephone prior to beginning field work.
15. Within **120 days** of Executive Officer approval of the *Cleanup Plan*, or within **120 days** of Regional Board adoption of WDRs, if applicable, submit a *Cleanup Implementation Report* describing the installation of the cleanup system and results obtained to date. The *Cleanup Implementation Report* shall clearly show whether the installation of any cleanup system is complete, and if not, give a schedule and proposed work plan for the installation of the remaining cleanup activities, including a proposed monitoring plan.
16. Submit regular progress reports as scheduled in the approved *Cleanup Plan*, which include a summary of cleanup actions and results to date, and make recommendations for modifications or additions to the treatment process and/or schedule, if necessary. The recommendations and schedule may be modified by staff before concurrence. Upon concurrence, the schedule shall be made part of this Order.

Groundwater Monitoring

17. Continue to conduct monitoring of the existing groundwater monitoring wells and any additional groundwater plume delineation monitoring wells in accordance with existing Monitoring and Reporting Program No. 5-00-842, or any revisions thereof.

General Requirements

18. Continue to reimburse the Regional Board for reasonable costs (as estimated by Regional Board staff at the beginning of each fiscal year) associated with oversight of the cleanup of this facility. Failure to do so shall be considered a violation of this Order.
19. Conduct work only after Regional Board staff concur with work plans.
20. Include in all reports a cover letter from the Discharger stating concurrence or nonconcurrence with the conclusions and recommendations in the report.
21. As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, have all reports prepared by, or under the supervision of, a registered professional engineer or geologist and signed by the registered professional. All technical reports

submitted by the Discharger shall include a statement signed by the Discharger's authorized representative certifying under penalty of law that the representative has examined and is familiar with the report and that to his knowledge, the report is true, complete, and accurate.

22. Upon startup of any remediation system(s), operate the remediation system(s) continuously, except for periodic and required maintenance. Any interruptions in the operation of the remediation system(s), other than for maintenance or emergencies, without prior approval from the Executive Officer is a violation of this Order.
23. Periodically optimize cleanup systems and report on the effectiveness of the optimization in the Annual Report.
24. Notify Regional Board staff at least three working days prior to any onsite work, testing, or sampling.
25. Obtain all local and state permits and access agreements necessary to fulfill the requirements of this Order prior to beginning the work.
26. Continue any remediation or monitoring activities until such time as the Executive Officer determines that sufficient cleanup has been accomplished and this Order has been rescinded.
27. If, for any reason, the Discharger is unable to perform any activity or submit any document in compliance with the schedule set forth herein, or in compliance with any work schedule submitted pursuant to this Order and approved by the Executive Officer, the Discharger may request, in writing, an extension of the time specified. The extension request shall include justification for the delay. An extension shall be granted only by revision of this Order.
28. If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement or may issue a complaint for administrative civil liability.

This Order is effective upon the date of signature.

THOMAS R. PINKOS, Acting Executive Officer

(Date)