STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF MAY 13, 2005
Prepared on April 13, 2005

ITEM NUMBER: 15

SUBJECT: Perchlorate Cleanup Sites

DISCUSSION:

New information is shown in *italics*. Please refer to the Central Coast Regional Water Quality Control Board's (Regional Water Board), July 9, 2004 and February 11, 2005 staff reports for additional historical background information.

General Information: The Department of Health Services (DHS) released the draft Maximum Contaminant Level (MCL) for perchlorate on October 27, 2004. The draft MCL is 6 ppb. The DHS must now formally adopt the MCL through a statutorily defined process. The main steps in DHS' Drinking Water Program's regulations process include review by DHS' Office of Regulations, DHS' Budget Office, the Department of Finance, and the Health & Human Services Agency. It is then released to the Office of Administrative Law (OAL) for publication in the *California Regulatory Notice Register* announcing the availability of the regulation for a 45-day public comment period. If changes are made in response to public comments received during the first comment period, then a second 15-day public comment period will be held. The draft MCL will then be approved by the DHS Director's Office followed by a final review by OAL. Following OAL approval, the regulation is filed with the Secretary of State, and becomes effective 30 days later. Regional Water Board staff anticipates the MCL will be adopted within the next 12 months and will provide updates as the draft MCL makes its way through the review and adoption process.

Olin Corporation Facility, 425 Tennant Avenue, Morgan Hill, Santa Clara County [David Athey 805-542-4644]

Current milestones in the investigation of perchlorate contamination on- and off-site of the former Olin facility include:

On-site Groundwater Treatment and Containment:

On November 18, 2003, Regional Water Board staff approved the installation and operation of the on-site Groundwater containment and perchlorate removal system. The system's purpose is to provide hydraulic containment and removal of perchlorate through on-site groundwater extraction and treatment. The system began operation on February 23, 2004. By April 7, 2004, system startup was completed and has been operated continuously since that time.

Update: Olin continues to operate the on-site groundwater containment and treatment system. During the month of February 2005, the system treated approximately 4.1 million gallons of perchlorate-contaminated groundwater. Since extraction started in February 2004, the system has removed perchlorate from approximately 41 million gallons of groundwater. Olin is required to submit first quarter 2005 treatment system data on April 30, 2005.

For the latest information regarding the treatment system's 4th quarter 2004 performance, please refer to the February 11, 2005 staff report. The February staff report can be found on the web at: http://www.swrcb.ca.gov/rwqcb3/Board/Meetings/documents/FEB05agn_001.pdf

On-site Ex Situ and In Situ Soil Treatment:

Olin has proposed to treat on-site perchlorate impacted soils using both ex situ and in situ methods. The two main components of the treatment option include: ex situ anaerobic bioremediation of perchlorate-contaminated soils greater than 7,800 µg/kg, the United States Environmental Protection Agency (USEPA) residential Preliminary Remedial Goal, and in situ bioremediation of soils above the site-specific soil screening level of 50 µg/kg. The site specific soil remediation goal is derived from the methods described in the USEPA's *Soil Screening Guidance*: *Users Guide* and is the calculated concentration of perchlorate that would not result in groundwater impacts above 4 µg/L.

Regional Water Board staff conditionally approved *Olin's Remedial Action Work Plan & 90% Design Report For Soil Remediation* on June 10, 2004. Olin subsequently responded to comments and Regional Water Board staff provided final approval on August 3, 2004. Olin has begun in situ system construction and has completed the ex situ soil treatment pile. Figures 1 and 2 in the October 22, 2004, Staff Report show the completed ex situ pile without the cover.

Olin continues to construct the in situ system and will initiate operation at the conclusion of ex situ soil treatment.

Olin is continuing ex situ soil treatment via bioremediation. Olin is preparing to sample the ex situ soil pile to determine if remediation goals have been achieved. Olin will be providing the results and its recommendations to the Regional Water Board regarding next steps in the remediation process.

Groundwater Monitoring and Reporting:

On April 30, 2004, Olin submitted the 1st Quarter 2004 groundwater monitoring report. This report includes information related to groundwater monitoring activities, including greater detail on groundwater flow conditions, and provides Olin's justification for its proposed groundwater monitoring system. Regional Water Board staff has reviewed and incorporated, where appropriate, comments from the Cities of Morgan Hill and Gilroy, the Santa Clara Valley Water District (Water District) and PCAG.

Update: Cleanup and Abatement Order No. R3-2005-0014 (CAO No. R3-2005-0014) was signed and sent to the Dischargers on March 10, 2005. CAO No. R3-2005-0014 contains requirements for Olin to submit an updated groundwater-monitoring plan that details their plan to fully delineate the lateral and vertical extent of the off-site plume. The groundwater-monitoring plan was received on April 9, 2005, as required and is being reviewed. Further details regarding the CAO No. R3-2005-0014 are included at the end of this report.

On-site Well Sampling Activities: On February 1, 2005, Olin conducted water-level measurements in 20 on-site and off-site monitoring wells and eight nested (26 screen completions) on-site BarCad© wells. Groundwater samples were collected from the 13 on-site wells. Olin will submit the monitoring results in the First Quarter 2005 monitoring report due April 30, 2005.

Off-site Well Sampling Activities: Olin continues to collect off-site supply well groundwater samples for the First Quarter 2005 monitoring event. Between February 1 and 28, 2005, groundwater samples were collected from 138 off-site supply wells. Olin will submit the results in the First Quarter 2005 monitoring report.

Northeast Groundwater Flow Assessment:

Regional Water Board staff met with Olin and its consultants on May 17, 2004, to discuss their preliminary findings. Olin presented findings related to regional groundwater flow conditions and a simplified model of upgradient municipal well capture zones. However, Olin did not present any information on local groundwater conditions including groundwater elevations.

Olin submitted the Northeast Groundwater Flow Assessment Report on September 10, 2004. Regional Water Board staff met with

Olin, the City of Morgan Hill, and the Water District on September 22, 2004 to discuss the report's findings.

Regional Water Board staff finished review of Olin's Northeast Groundwater Flow Report and provided comments to Olin in a December 8, 2004 letter. Olin's Northeast Groundwater Flow Report was submitted before the July 31, 2005 due date. The Report included additional information in response to the Regional Water Board's request to determine if groundwater has migrated northeast from the site. The additional information was in the form of a groundwater flow model, which Olin used to predict groundwater flow directions. Regional Water Board staff disagreed with Olin's model results and has since issued a letter directing Olin to continue with the Northeast Groundwater Flow investigation. The December 8th letter directs Olin to continue with the Northeast Flow Assessment Work Plan by installing piezometers in the Northeast Groundwater Flow Study Area. In addition, Regional Water Board staff directed Olin to monitor northeast private supply wells for perchlorate and develop and submit a forensic investigation work plan to determine if perchlorate detections upgradient can be attributed to the Olin property.

On December 28, 2004, Regional Water Board staff sent a follow-up letter to Olin regarding three requests Olin made in a December 16, 2004 meeting. Olin had requested that it be allowed to submit a piezometer installation work plan and schedule on January 7, 2005, delay perchlorate sampling in the Northeast Flow Study Area private wells, and that we clarify if the Water District would be performing the forensic investigation. Regional Water Board staff allowed Olin to submit the work plan and schedule for well installation on January 7, 2005, denied Olin's other request for a delay of sampling and clarified Regional Water Board staff's understanding of the Water District's forensic investigation position.

On December 30, 2004, Olin and Standard Fusee (Dischargers) requested an evidentiary hearing and stay of the December 8, 2004 letter. Olin requested the stay and hearing so that the Regional Water Board could reconsider the December 8, 2004 letter. An evidentiary hearing was scheduled for March 25, 2005, but has been stayed. Regional Water Board staff and the Dischargers have agreed to stay the hearing pending execution of additional work. The stay is conditioned on the Dischargers' performing one round of perchlorate sampling of private wells northeast of the facility and the Water District performing a forensic analysis.

Update: Regional Water Board staff has received the northeast perchlorate supply well sampling work plan. Regional Water Board staff has reviewed and approved the work plan; the approval letter is included as ***Attachment 1****. The work plan outlines the Dischargers' plans to sample private wells for perchlorate, specifically wells that have lithologic logs or fill spatial data gaps. In addition, the Dischargers are required to sample the piezometers described below.*

The December 8, 2004 letter also directed Olin to proceed with northeast off-site piezometer installation. Olin submitted the piezometers installation work plan on January 26, 2005. Olin has subsequently reviewed comments from the City of Morgan Hill and the Water District and provided an amended work plan on March 3, 2005. Olin has added two additional multi-level (now a total of four locations) and three additional single level piezometers (paired with MP-1, MP-2, and MP-3) to the monitoring network. Regional Water Board staff has reviewed the amended plan and discussed its comments with Olin on March 18, 2005. Olin proposed several changes based on Regional Water Board staff and interested party comment. Regional Water Board staff subsequently approved Olin's piezometer installation work plan on April 6, 2005. The April 6, 2005 approval letter is included as ***Attachment 2****.*

The Water District has completed a draft forensic work plan and is currently conducting an internal review prior to Regional Water Board submission. Regional Water Board staff anticipates receiving the plan sometime near the end of April. Regional Water Board

staff will provide more specific details in the July 2005 staff report.

City of Morgan Hill Water - Tennant Well:

Tennant well operation has resumed. Please refer to the February 11, 2005, staff report for additional Tennant well information. The February staff report can be found on the web at: http://www.swrcb.ca.gov/rwqcb3/_Board/Meetings/documents/FEB05agn_001.pdf.

Cleanup or Abatement Order No. R3-2004-0101:

The July 9, 2004 Cleanup Order directs Olin and Standard Fusee to supply uninterrupted replacement water to well owners with perchlorate-contaminated wells. The Order requires Olin and Standard Fusee to provide interim uninterrupted water to well owners whose wells meet two important criteria. The first criterion is for wells that test at or higher than 4 ppb. Well owners with wells that test at or higher than 4 ppb shall be supplied interim uninterrupted water service (currently bottled water). The Order also establishes a mechanism for stopping bottled water supply to these wells and includes follow up monitoring. The second criterion is for wells that test less than 4 ppb. For those wells, Olin and Standard Fusee may cease supply of uninterrupted water service if, after four quarters of testing, the results remain less than 4 ppb. However, the Order requires additional testing to monitor perchlorate groundwater concentrations.

On August 5, 2004, Olin petitioned the State Water Resources Control Board (State Water Board) to review the Order. The State Water Board is currently reviewing the petition and will be issuing a determination on completeness shortly. In the meantime, Olin is continuing to comply with the ordered requirements. Wellhead treatment for the West San Martin Water Company and the San Martin County Water District wells will not be affected by Olin's appeal. Olin has made individual agreements with these water purveyors and perchlorate will continue to be removed from those supply sources.

Update: The State Water Board issued a draft Order remanding the issue back to the Regional Water Board for reconsideration. The draft Order finds that Regional Water Board staff abused its discretion in not deferring to the Office of Environmental Health Hazard Assessment's Public Health Goal (PHG) for perchlorate. The PHG is currently 6 parts per billion (ppb). Regional Water Board staff responded to the draft Order and attended a State Water Board workshop on April 6, 2005, to discuss its comments. Regional Water Board staff comments are included as ***Attachment 3****. The State Water Board directed its staff to bring back an Order for the State Board to adopt that would replace our CAO (at least the petitioned sections regarding 4 ppb), rather than remanding our Order. Also, the State Water Board directed staff to narrow the draft Order to apply only to the Olin circumstances in lieu of the previous draft Order, which potentially affected cleanups and alternative water issues in other regions. Regional Water Board staff will be evaluating the revised draft State Water Board Order when it is released for public comment. The State Water Board will consider the revised draft Order at its May 19, 2005 workshop, unless the Dischargers request a continuance to allow more time to meet with Regional Water Board staff regarding monitoring requirements. The first meeting is scheduled for April 20.*

Southern Plume Area and Gilroy Wells:

During the second quarter of 2004, Olin tested 42 southern area wells near the City of Gilroy. Of these 42 wells, six were sampled for the first time. Twenty-six wells did not contain perchlorate above the reporting limit of 4 ppb. Sixteen wells had perchlorate concentrations ranging from 4 to 6.6 ppb. According to Olin, these results define the southern-most detections of perchlorate above the Department of Health Service's 6 ppb action level.

At the March 25, 2005 Regional Water Board meeting, The Regional Water Board asked

staff about the current status of southern plume area lateral and vertical perchlorate characterization. Olin has not conducted additional sampling of southern plume area wells because of its belief that the extent of the southern plume area has been identified. While perchlorate concentrations appear to be declining in this area, Regional Water Board staff is currently not convinced that the edge of the plume, both vertically and laterally has been identified. Cleanup or Abatement Order No. R3-2005-0014 (CAO R3-2005-0014), Ordering Paragraph A, requires the Dischargers to delineate the lateral and vertical extent of perchlorate in the Llagas groundwater subbasin. Ordering Paragraph A requires the Dischargers to submit a comprehensive monitoring plan including recommendations for off-site monitoring wells, by April 9, 2005. Olin submitted the report on time and has not proposed dedicated monitoring wells for the southern plume area. Olin is proposing to use existing supply wells to define the plume's downgradient edge. Regional Water Board staff will be evaluating Olin's proposed monitoring system, including the elements concerning the southern plume area, to ensure that the plume's extent is delineated.

Perchlorate Community Advisory Group (PCAG)

Update: Regional Water Board staff provided an update at the April 1, 2005 PCAG meeting. Regional Water Board staff discussed their response to the draft State Water Board Order, Cleanup and Abatement Order No. R3-2005-0014, and northeast perchlorate issues. Sylvia Hammilton, PCAG chair, attended and spoke at the April 6th State Water Board Workshop. The next Perchlorate Community Advisory Group meetings are scheduled for 2 pm May 6, and June 3, 2005. PCAG will be asking Olin Corporation to attend one of the next meetings to discuss on-site soil treatment results and its off-site monitoring plans.

Cleanup or Abatement Order R3-2005-0014:

The Executive Officer issued CAO R3-2005-0014 on March 10, 2005, to Olin and Standard Fusee. CAO R3-2005-0014 applies to areas south of the Olin site. CAO R3-2005-0014 requirements include a:

- *Llagas subbasin groundwater monitoring plan.*
- *groundwater monitoring well installation work plan.*
- *Llagas subbasin characterization report.*
- *plume migration control feasibility study.*
- *plume migration control work plan.*
- *Llagas subbasin cleanup level report.*
- *Llagas subbasin cleanup feasibility study.*
- *Llagas subbasin cleanup work plan.*

Regional Water Board staff solicited public comments on the Draft CAO R3-2005-0014 to facilitate the community's participation. Comments were received from the Perchlorate Community Advisory Group, Olin Corporation, City of Morgan Hill, Santa Clara Valley Water District, Perchlorate Medical Advisory Group and Dr. Richard Peekema. Regional Water Board staff considered all submitted comments and included its responses in the final CAO R3-2005-0014 transmittal letter. The Order and transmittal letter were provided to Regional Water Board as part of the February 2005 Staff Report. CAO R3-2005-0014 was not petitioned.

Olin reports and significant correspondence can be accessed on our web site by going to: http://www.swrcb.ca.gov/rwqcb3/Facilities/Olin%20Perchlorate/Olinsite.htm

McCormick Selph, 3601 Union Road, Hollister, San Benito County

Update: The Discharger performed the first quarter 2005 sampling event on February 21, 2005. Regional Water Board staff anticipates receiving the monitoring data as part of the first quarter 2005, groundwater monitoring report due April 30, 2005.

The data collected as part of the quarterly monitoring events will be used to assess the success of the enhanced in situ bio-remediation program (EISB). Components of the EISB include: 1) pre-injection groundwater monitoring (completed), 2) pilot scale injection of Hydrogen Releasing

Compound® (completed), 3) post injection groundwater monitoring (ongoing), and 4) preparation and implementation of a full-scale EISB work plan. Prior to preparation of the full-scale EISB work plan, six groundwater monitoring events are scheduled. There are two more groundwater monitoring events scheduled prior to full-scale EISB work plan submittal. The Discharger will be submitting the full-scale EISB work plan by September 30, 2005.

Whittaker Ordnance Facility, 2751 San Juan Road, Hollister, San Benito County

On January 24, 2005, Regional Water Board staff member Kristina Seley assumed project oversight responsibilities.

On August 13, 2004, Regional Water Board staff visited the Whittaker Ordnance facility to discuss site activities and observe site cleanup areas. Perchlorate and volatile organic compound remediation efforts continue at contaminated areas on- and off-site. Whittaker is still collecting data and will be submitting the following reports shortly (some reports have been received):

- **First Semiannual 2004 Groundwater Monitoring Report** – This report covers monitoring activities from January 1, 2004 to June 30, 2004. This Report was received on August 30, 2004.

- **Deep Aquifer Analysis Report (DAAR)** –*The DAAR is a supplement to the Corrective Action Plan. The DAAR evaluates volatile organic compounds (VOCs) and perchlorate plume stability, identifies monitoring data gaps, and summarizes ongoing groundwater corrective actions. The Report includes detailed perchlorate and TCE iso-concentration contour maps and trend analysis. This Report was received on September 17, 2004. Staff has reviewed the report and will provide comments to the discharger.*

- **Former Building 22A Ethanol Infiltration Pilot-Test Status Report Addendum** – This report presents additional testing information collected by Whittaker. This Report was received on September 13, 2004, and is currently being reviewed by Regional Water Board staff.

- **Ex Situ Bioremediation Pilot-Test Status Report** – This report presents the current test status and recommendations for additional work. This report was received on September 15, 2004, and is currently being reviewed by Regional Water Board staff.

- **Monitoring Well Installation Report and Revised Hydrostratigraphic Interpretation Report** – This report was received on September 20, 2004. The report details well installation activities performed to better define groundwater conditions downgradient. It also presents a revised interpretation of the geology and hydrostratigraphy beneath the Whittaker site. *Regional Water Board staff has reviewed the report and will provide comments to the discharger.*

- **Final Waste Storage Pad Demonstration Report** – This report was received on October 20, 2004. This report summarizes pilot study activities for perchlorate soil remediation at the waste storage pad area. A field scale anaerobic in situ reactive zone was implemented to decrease perchlorate concentrations. The field demonstration footprint was 30 feet by 40 feet with a depth below ground surface of 40 feet. Average perchlorate concentrations decreased by 81% to 93% in monitored soil clusters. Both carbon substrates injected, corn syrup and ethanol, exhibited the same degradation trends. The report concluded that the field demonstration indicates in situ bioremediation would likely be successful at other perchlorate source areas.

- **Second Semiannual Groundwater Monitoring Report** – This Report was received on January 31, 2005. The report summarizes soil and groundwater monitoring activities during the second

half of 2004. The report also presents the status of remediation activities.

Remedial activities currently underway at the site include:

- Point-of-use treatment systems for three private supply wells off-site including ion exchange for perchlorate remediation and granular activated carbon for VOC treatment.
- Air stripping at the Riverside well for VOC contamination.
- Groundwater extraction and treatment and soil vapor extraction at the north Building 5 septic tank area.
- Ozone sparging at the north building 5 septic tank area. Since March 2003, the system has not been operational, and although major efforts to repair the system have been conducted, no further operation of the system is proposed.
- In situ reactive zone groundwater remediation programs at the northwest site boundary, Building 23 area, upper burn area and southwest burn area.
- Proposed soil flushing at the Former Burn area. Construction efforts are underway for soil flushing. However, this remediation strategy will be reevaluated for the site-wide remediation strategy before implementation.

Regional Water Board staff have reviewed the Second Semiannual Groundwater Monitoring Report, in conjunction with the DAAR, and Monitoring Well Installation Report and anticipate providing comments prior to the May 13th meeting.

- ***Draft Sampling and Analysis Plan*** *- This report was submitted in response to Regional Water Board staff's request for a comprehensive review of on and off-site groundwater monitoring. The draft report applies to soil and groundwater sample collection, analysis, and data review. It also applies the soil vapor extraction systems, groundwater extraction systems, and domestic and irrigation supply well treatment systems. On and off-site monitoring is conducted to assess the vertical and lateral extent of contamination, and to design, modify, and assess corrective actions and evaluate treatment system performance. The report was submitted on February 25, 2005. Staff is currently reviewing the draft report and will provide comments to the discharger.*

  Regional Water Board staff anticipates updating Whittaker's Monitoring and Reporting Program once the draft report is reviewed and approved.

On January 27, 2005, Regional Water Board staff met with Whittaker's consultants to discuss their development of a comprehensive site strategy. The consultants presented their draft site cleanup strategy, a site model with remedial alternatives for contaminated site areas, and a proposed remedial program. The conceptual site model identified six soil source areas impacting groundwater. Remediation alternatives for each soil area and each impacted groundwater zone were developed. Perchlorate and VOC remedial alternatives were ranked based on effectiveness, time, and cost. Regional Water Board staff provided feedback to the proposed strategy, including a request for a compilation of data presented in a Site Strategy Report. Regional Water Board staff anticipate receiving the site-wide cleanup strategy report on May 28, 2005.

United Defense, 900 John Smith Road, Hollister, San Benito County

On January 24, 2005, Regional Water Board staff member Kristina Seley assumed project oversight responsibilities.

Site Investigation Update:

As reported at the July 9, 2004 Regional Water Board meeting, United Defense is proceeding with additional site investigations. Regional Water Board staff approved the additional investigation work items in a July 30, 2004 letter. The recommendations set forth within the Report include:

- Continued research and analysis of local hydrogeology and geology to determine the fate and transport of site contaminants.
- Ranch well groundwater sampling.
- Surface water sampling in the Santa Ana Creek up and down stream of the pond and up and down stream of Arena 2.
- Further evaluation of the lateral and vertical extent of perchlorate and nitrate including the implementation of additional monitoring wells, cone penetration test borings, and soil borings at Arena 1 and Building 6.
- Attainment of United Defense's non-drinking water well's construction log.

United Defense submitted the Phase III Environmental Investigation Report (Report) on September 30, 2004. The Report provides supplemental information to the Initial Site Assessment and Phase II Reports. The Phase III investigation was conducted to more fully assess the extent of perchlorate, nitrate and nitrite, energetics (explosive compounds, i.e. TNT), and aluminum contamination in site soil, groundwater, and surface water. The following areas were investigated:

- Arena 1: Previous sampling during the Phase II investigation found perchlorate at a maximum of 2,900 milligrams per kilogram (mg/kg) in soil and 2,600 micrograms per liter (µg/L) in groundwater. Soil results from the Phase III investigation ranged from ND to 3.4 mg/kg. As stated in the Report, Phase II and Phase III perchlorate soil samples are generally highest within two feet below ground surface. Perchlorate detections in groundwater for the Phase III analysis ranged from ND to 8.5 µg/L. These results are from groundwater samples taken from recently installed groundwater wells. Previous groundwater perchlorate results were collected from temporary soil borings.
- Arena 2: One soil boring at 0.5 ft had a perchlorate detection of 3.7 mg/kg.
- Three Nearby Groundwater Wells: Perchlorate was detected in the Rancher's well at 15 µg/L and the Windmill well at 34 µg/L. Nitrate + nitrite (as N) was detected in the Windmill well and WW-1 at 45 µg/L and 4.2 µg/L respectively.
- Ranch Pond Dredge Area: Perchlorate was detected at 1.1 mg/kg in one of the two soil boring samples taken. Nitrate + nitrite (as N) was detected at 8.2 mg/kg and 27 mg/kg in the two borings. Aluminum was also detected at 13,000 mg/kg and 17,000 mg/kg, but results were below the background sample results of approximately 25,000 mg/kg.
- Building No 6 Area: Additional energetic sampling was conducted near Building No. 6 to further assess the extent of HMX, RDX, and TNB (energetics) contamination. The Report states that generally concentrations increase with depth. HMX, RDX, and TNB were found at 2,400 µg/kg, 1,200 µg/kg, and 240 µg/k, respectively, 20 feet below ground surface.
- Building No 1 Area: All groundwater and surface water results tested non detect for energetics and perchlorate.
- Santa Ana Creek: All surface water samples of perchlorate, nitrates and nitrites, and energetics were non-detect. Dissolved aluminum was detected in four samples ranging from 0.14 mg/L to 0.25 mg/L. Sediment samples exhibited similar results; perchlorate, nitrates/nitrites and energetics samples were all non-detect. However, aluminum concentrations ranged from 6,300 mg/kg to 13,000 mg/kg.

On November 30, 2004, United Defense submitted its Phase III Environmental Investigation Report Addendum. The Addendum provided additional monitoring results to fill data gaps; findings from the Addendum are included below.

- Arena 1: Additional soil borings were advanced to assess the extent of perchlorate contamination. One of 33 soil samples detected perchlorate at 1.1 mg/kg at a depth of 1.5 to 2 feet below ground surface (bgs).
- Cattle Guard: Soil samples where Arena 1 drainage meets the Santa Ana Creek were non detect for perchlorate.

- Water Well WW-2: Groundwater was collected from WW-2 and analyzed for perchlorate, nitrate + nitrite, and nitroaeromatics/nitroamines (energetics). Perchlorate and energetics were not detected, however, nitrate + nitrite as N was detected at 3.5 mg/L.

  Regional Water Board staff has completed review of both the Phase III Report and Report Addendum. Regional Water Board staff provided comments to United Defense on December 22, 2004. Regional Water Board staff directed United Defense to proceed with the on-site environmental investigation and provide a Phase IV Report by April 1, 2005. The following highlights information United Defense is required to submit as part of the Phase IV Report:

- Resample the Windmill well. If perchlorate is confirmed, propose an investigation to identify the source and extent of perchlorate contamination.
- Continue to monitor for perchlorate and nitrate + nitrite in the Ranch Pond Dredge area.
- Determine vertical and lateral extent of energetic contamination at Building 6.
- Begin quarterly sampling of the Rancher's well and Windmill well and installed monitoring wells for nitroaromatics/ nitroamines (energetics), perchlorate and nitrate + nitrite.
- Develop a site-specific monitoring plan for monitoring of constituents of concern (COCs).
- Propose cleanup standards for perchlorate and energetics by July 1, 2005.

Regional Water Board staff anticipates issuing a monitoring and reporting program for the United Defense, Hollister Test Facility following submittal of site-specific monitoring plan in the Phase IV Report. Once perchlorate and energetic cleanup standards are determined and monitoring data is collected to delineate vertical and lateral extent of COC contamination, Regional Water Board staff will require United Defense to submit a cleanup plan.

On February 4, 2005, Regional Water Board received the following documents.

- **Revised Analytical Results for Table 1 and 2 for the Phase III Environmental Investigation** – The Phase III revised results include a greater detail of perchlorate concentrations. The lab's method detection limits were decreased to 4 ppb for perchlorate groundwater results and 10 to 40 ppb for perchlorate soil results. The laboratory reanalyzed the same samples with the increased sensitivity of 4 ppb. The decrease resulted in two soil detections at Arena 2 and over 16 soil detections between 0.17 mg/kg and 1.8 mg/kg that were previously non-detect.
- **Storm Water Pollution Prevention Plan**
- **Storm Water Monitoring Program**
- **Addendum Work Plan Phase IV Environmental Investigation** – The Addendum Work Plan proposes work to be performed during the Phase IV Environmental Investigation (EI). The Phase IV EI will address Regional Water Board comments issued in our December 6, 2004 letter and comments from the landowner who leases the site to United Defense. The EI will further assess site stratigraphy, water quality, and lateral and vertical extent of COC contamination, particularly at Arena 1. Regional Water Board staff anticipates approving the proposed work.

On February 8, 2005, Regional Water Board staff spoke with United Defense's consultant, URS. URS stated they were moving aggressively with the work plan and have already begun site work. The Reports have been reviewed and the addendum work plan was found to be adequate.

Update: Regional Water Board staff approved a request by United Defense to extend the Phase IV Report due date from April 1 to May 15, 2005. United Defense made the request because 1) URS has been restricted from performing necessary site drilling and sampling to complete the Phase IV work due to rainy weather conditions. 2) The Regional Water Board and the landowner have requested additional work which was not anticipated in the draft scope of work. 3) The

number of monitoring wells has increased based on initial exploratory borings.

On March 28, 2005, Ms. Seley spoke with URS staff member Susie Vedantham, United Defense's consultant. Ms. Seley discussed the request by the Regional Water Board to implement interim corrective action at source areas. Pursuant to the request, URS will continue with the Phase IV work to delineate the perchlorate and energetic contamination to characterize the source areas. URS will also propose a draft cleanup level, which will be the basis for cleanup. Once the two items are complete, Regional Water Board staff will request a proposal for interim remedial options at the source areas and an overall cleanup strategy.

Following submittal of the Phase IV Report, Regional Water Board staff will meet with United Defense and its consultant to review the Report findings and discuss conclusions.

ATTACHMENTS

1. Olin March 28, 2005 Letter Re: Approval of Northeast Groundwater Sampling Plan.
2. Olin April 6, 2005 Letter Re: Groundwater Flow Assessment Phase II, Multi-Level Piezometer Installation/ Destruction Final Work Plan
3. Olin March 30, 2005 Letter Re: Regional Water Board Comments to Draft State Water Board Order, Concerning *Cleanup or Abatement Order No. R3-2004-0101*

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