Cal/EPA

State of California

Department of Toxic Substances Control

RESPONSE TO COMMENTS

Permit Modification – Revised Pond 1 Closure Plan
Proposed Interim Measure Work Plan

Phibro-Tech Inc., Santa Fe Springs Facility

May 25, 2016

RESPONSES to COMMENTS
Permit Modification – Revised Pond 1 Closure Plan
Proposed Interim Measure Work Plan
Phibro-Tech Inc., Santa Fe Springs Facility
May 25, 2016

TABLE OF CONTENTS

TABLE OF CONTENTS i

INTRODUCTION 1

SUBMITTED COMMENTS 1

ORGANIZATION OF THE RESPONSE TO COMMENTS 3

MORE ABOUT THESE RESPONSES 3

GENERAL RESPONSE 4

DTSC RESPONSE TO COMMENTS ..... 5 – 44

APPENDIX A: COMMENT-RESPONSE INDEX

APPENDIX B: SUBMITTED COMMENT DOCUMENTS, WITH COMMENT NUMBERS

RESPONSES to COMMENTS
Permit Modification – Revised Pond 1 Closure Plan
Proposed Interim Measure Work Plan
Phibro-Tech Inc., Santa Fe Springs Facility
May 25, 2016

INTRODUCTION

The Department of Toxic Substances Control (DTSC) public noticed two documents on December 15, 2015 for public review and comment. These documents described proposed plans for cleanup and closure of Pond 1 at the Phibro-Tech, Inc. Santa Fe Springs Hazardous Waste Facility (Phibro-Tech Facility or PTI).

- Proposed Interim Measures described in the Proposed Interim Measure Work Plan (2015 December)

- DTSC-initiated Permit Modification incorporating the Revised Pond 1 Closure Plan (Updated December 3, 2015)

The comment period for these documents began December 15, 2015 and ended February 15, 2016. DTSC held a public hearing on these plans on January 28, 2016 at the Los Nietos Middle School in Whittier.

DTSC received twenty-two documents containing comments from the public during the comment period from December 15, 2015 to February 15, 2016, including the recorded transcript of the Public Hearing held on January 28, 2016. Many of the comment documents contained multiple comments covering different topics. DTSC identified the comments, assigned a comment number to each comment, and provided responses to those comments in this Response to Comments document.

DTSC prepared this Response to Comments document as required by California Code of Regulations (CCR), title 22, section 66271.16 in order to address public comments on the Revised Pond 1 Closure Plan (a DTSC-Initiated Permit Modification) and to respond to comments received on the Interim Measure Work Plan.

SUBMITTED COMMENTS:

DTSC received the following comment documents containing comments for the two plans under consideration:

1. Letter, from Local Neighbor, to Stephen Baxter, not dated, mailed 2016 January 19, received 2016 Jan 21.
2. EMail, from Nick Aquino @DCBA.lacounty.gov, to Stephen Baxter @DTSC.ca.gov, sent 2016 January 21 11:40 AM, Subject: PTI
3. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Gloria Durand
4. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Nick Aquino
5. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Andei Soto

6. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Benjamin Martinez, Jr.
7. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Jaime Sanchez
8. Green Hearing Comment Card (2016 Jan 28 Hrg): Art Escubedo
9. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez
10. Green Hearing Comment Card (2016 Jan 28 Hrg): Nick Aquino
11. Green Hearing Comment Card (2016 Jan 28 Hrg): Issac Hernandez
12. Green Hearing Comment Card (2016 Jan 28 Hrg): Jaime Sanchez
13. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez, Jr. (second submittal)
14. hand delivered document, from Jaime Sanchez, presented to Phil Blum, dated January 28, 2016, Comment Document (13 pages) with attached journal article (8 pages)
15. Transcript of DTSC Hearing on Draft Pond 1 Closure Plan and Interim Measure Work Plan and Permit, transcribed January 28, 20
16. EMail, from Suzan Alvarado @gmail.com, to Stephen Baxter, @DTSC.ca.gov, sent 2016 January 28, 12:11 PM, Subject: PHIBRO-TECH, INC. OF SANTA FE SPRINGS, CA
17. EMail, from Jack Cheng @ aqmd.gov, to Stephen Baxter @dtsc.ca.gov, sent February 02, 2016 4:04 PM, Subject: Proposed Interim Measure Work Paln Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, Attachment: “LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf”
18. Letter, from Jillian Wong/SQACMD, to Stephen Baxter / DTSC, dated February 2, 2016, re: Proposed Interim Measure Work Plan, Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, attached to EMail from JCheng @aqmd.gov sent February 02, 2016 (“LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf”)

19a. Letter, from Benjamin Martinez, Jr, to Mr. Stephen Baxter, dated 02/08/2016, with 3-page attachment titled “PHIBRO-TECH” dated 01/28/2016.

19b. Letter, from Benjamin Martinez, Jr, to Mr. Jesus Cruz, dated 02/08/2016, with 3-page attachment titled “PHIBRO-TECH” dated 01/28/2016.

20. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 10:52 PM, subject: COMMENTS ON PTI IM AND CP PUBLIC NOTICE
21. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 11:15 PM, subject: PTI IM AND CP, attachment: “Comments on PTI IM and CP Pub Notice – 2-15-2016.pdf”
22. Letter, from Philip B Chandler, to Stephen Baxter, dated February 15, 2016, re: RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PROPOSED INTERIM MEASURE WORK PLAN AND REVISED POND 1 CLOSURE PLAN FOR PHIBRO-TECH, INC (PTI), 8851 DICE ROAD, SANTA FE SPRINGS, CALIFORNIA 90670 – [EPA ID NUMBER CAD 008 488 025; PERMIT NO. 91-3-TS-002 [pdf file: “Comments on PTI IM and CP Public Notice – 2-15-2016.pdf”]

ORGANIZATION OF THE RESPONSE TO COMMENTS:

DTSC reviewed all the submitted comment documents and placed a comment number near the location of each comment in the right hand margin of the document. The comment number combines a number for the document with a number for the comment made in that document. For instance, comment numbers for document #50 would start with the number 50. If document #50 contained three comments, they were assigned comment numbers 50.1, 50.2, and 50.3, respectively.

The Submitted Comment Documents are included in Appendix B and includes the comment numbers. The numbers may be out of sequence or some numbers skipped based on the way some comments were grouped together for response.

A Comment-Response Index is provided in Appendix A. The Index shows the comments, the comment number for each comment made by that commenter, and a response number that identifies where in the Response to Comments document the commenter can find DTSC's response to their comment.

DTSC grouped the comment-responses into categories as follows:

- PUBLIC PARTICIPATION
- REVISED POND 1 CLOSURE PLAN (P1CP)
- PROPOSED INTERIM MEASURE WORK PLAN (IMWP)
- HEALTH RISK ASSESSMENT (HRA)
- CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
- CORRECTIVE ACTION (CLEANUP)
- CORRECTIVE ACTION AGREEMENT, ORDER, PERMIT
- PENDING RENEWAL PERMIT FOR PHIBRO-TECH
- VIOLATIONS AT PHIBRO-TECH
- DEPARTMENT OF TOXIC SUBSTANCES CONTROL
- CLASS 2 PERMIT MODIFICATION REQUEST
- COMMUNITY CONCERNS

MORE ABOUT THE RESPONSES:

DTSC attempted to identify comments within the documents received that had substantive content. DTSC provided a response to these comments in this Response to Comments document. Some comments may have more than one response.

Some of the comments DTSC received contained factual technical information. The information was checked for accuracy. DTSC did not respond to these comments.

DTSC received comments that related to other facilities such as Exide, the Aliso Canyon natural gas storage field near Porter Ranch, the Flint Michigan public water system, and ExxonMobil. These comments were either outside the scope of DTSC jurisdiction or not relevant to the current proposed work plans. DTSC provides a general response to these comments below.

GENERAL RESPONSE:

Some comments discussed comparisons between Phibro-Tech Inc. and other facilities. DTSC does not believe these comments are relevant to the two decisions under consideration: Permit Modification of a Revised Pond 1 Closure Plan, and Proposed Interim Measure Work Plan.

However, to address the comparison of PTI to other facilities, DTSC offers the following response.

DTSC is aware of and appreciates the public's concern regarding perceived regulatory failures related to other facilities or industries. DTSC understands that the public reasonably expects that DTSC exercise a high level of care when considering permitting and cleanup decisions within its jurisdiction, and in particular with respect to PTI.

From a practical perspective, there is little comparison between the PTI facility and other hazardous waste and industrial facilities such as Exide, ExxonMobil, or the Porter Ranch gas field mentioned in the comments. Importantly, PTI no longer conducts any of the activities that caused the historic soil and groundwater contamination that is required to be cleaned up at the PTI site, including the underground storage of chromic acid, hexavalent chromium, volatile organic compounds (VOCs), gasoline and diesel. Nor is PTI emitting these chemicals to the air, except in minute quantities as may occur as a result of remediation. They are legacy contaminants that PTI inherited from the prior operators of the facility, but which PTI is still responsible to clean up.

All the health risk assessments prepared under DTSC oversight for PTI have shown very low health risks, both from cleanup activities and current operations. This is in contrast to Exide, which, until it ceased operating, was still receiving, treating, and emitting lead, arsenic and other hazardous wastes which, according to the South Coast Air Quality Management District's health risk assessment, could cause significant health risks over time. The other facilities mentioned, including ExxonMobil, the Aliso Canyon gas field, and the Flint water system are completely different and unrelated facilities regulated by entities other than DTSC.

Nonetheless, DTSC is mindful of the commenters' heightened concern. DTSC is determined to use the full authority in the law and regulations to assure that PTI operates the facility in compliance and in a manner that is protective of public health and the environment.

DTSC RESPONSE TO COMMENTS

PUBLIC PARTICIPATION

RESPONSE 1

Comment Number	Comment
9.1 Martinez Green Card J28	*Benjamin Martinez Jr.* *[address redacted]* *[telephone number redacted]* *Please mail me the Results of this meeting Regarding Phy Bro Tech*

DTSC maintains a project mailing list specific to the Phibro-Tech Facility. DTSC has added the commenter's contact information to DTSC's mailing list for the Phibro-Tech Facility, and will send a copy of this Response to Comments document to the commenter.

In addition, DTSC will mail a public notice of the decision to everyone on the DTSC's mailing list for the Phibro-Tech Facility.

RESPONSE 2

Comment Number	Comment
18.2 Wong SCAQMD Letter F02	The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the abovementioned document and would like to be included in future public participation activities associated with the cleanup effort. ...

DTSC has added the commenter's contact information to DTSC's mailing list for the Phibro-Tech Facility. DTSC will continue to coordinate with South Coast Air Quality Management District in advance of future activities associated with the cleanup effort.

RESPONSE 3

Comment Number	Comment
22.39 Chandler Letter F15	• The Public Notice statements 'The Revised Pond 1 Closure Plan requires PTI to remove the pond structure, hazardous waste tanks, and clean up the underlying soils." and "The removal and clean up would involve excavation of the top 10 feet of soil and treatment of the deeper soil using the same process as proposed for the interim measure." are useful as far as they go. The closure performance standards should also be cited in the Public Notice. ...

The public notice is not required to include the closure performance standards. The purpose of the public notice is to notify the public of a permit action and provide a general summary of the projects being proposed. The details of the projects, such as the closure performance standards, are in the available documents.

For example, the performance standards for closing Pond 1 are included in the Revised Pond 1 Closure Plan. DTSC also included the performance standards in DTSC's Fact Sheet prepared for the Revised Pond 1 Closure Plan and DTSC-initiated permit modification. The Fact Sheet is available on DTSC's website, EnviroStor, and in the project information repositories.

REVISED POND 1 CLOSURE PLAN

RESPONSE 4

Comment Number	Comment
22.38 Chandler Letter F15	• Iris Environmental states that "Because Pond 1 is regulated by an Interim Status Document as a surface impoundment, this Closure Plan addresses applicable requirements of 22 CCR 66265.110 et seq., 22 CCR 66265.220 et seq., Chapter 15 Article 7, and 22 CCR 66265.310." This is incorrect. Since the Pond 1 closure issue was made part of the expired permit by the Class 3 remedy selection in 1995, and since the facility contained to utilize the pond as secondary containment which periodically contained leakage liquid from waste water treatment and holds a filter press and tanks under a long out-of-date variance, 22 CCR 662654 regulations apply.

Pond 1 is a surface impoundment constructed in 1975 by Southern California Chemical Company, the previous owner of the Facility. An Interim Status Document was issued to Southern California Chemical Company in 1981 and included Pond 1. Southern California Chemical Company discontinued using Pond 1 as a surface impoundment in 1985 without fully closing the unit. The United States Environmental Agency (US EPA) and California Department of Health Services (DTSC's predecessor) approved a 1988 Modified [Pond 1] Closure / Post-Closure Plan for Pond 1 under the 1981 Interim Status Document.

In 1991, both US EPA and California Department of Health Services issued hazardous waste facility permits to Southern California Chemical Company, under the facility name Entech Recovery, Inc. The 1991 Permits did not authorize Pond 1 and did not include the 1988 Pond 1 Closure Plan. Pond 1 remained under the 1981 Interim Status Document. The interim status of Pond 1 is not affected by the issuance of the 1991 permit for the others units at the facility (See Cal.Code Reg., tit. 22, § 66270.1 (c)(4)). The unit remained as an interim status unit subject to the requirements of closure. Facility owners and operators with interim status units must comply with interim status standards set forth in chapter 15, including closure.

During the 1995 DTSC-Initiated Permit Modification, there was no application or authorization submitted to transfer the Pond 1 from its Interim Status to a Permit status. The modified permit did not add Pond 1 as an authorized unit and did not alter the regulatory status of Pond 1. According to DTSC's *Amendment to Order Denying Petition for Review* (issued on September 10, 1997), the "…approved Closure Plan remain[ed] to be implemented by PTI and is not covered by this Permit Modification. Permit Condition V.E.7 does not require any closure activities at Pond 1 and is misstated by PTI's Appeal Contention. Instead, Permit Condition V.E.7. provides a brief background of Pond 1 and requires only that a status report be submitted to the Department." (DTSC's Amendment to Order Denying Petition for Review, Docket HWCA 97/98-P001, issued September 10, 1997, Response to Appeal Contention 19). The 1995 DTSC-Initiated Permit Modification added a requirement to submit a status report and schedule for implementing the approved 1988 Modified [Pond 1] Closure / Post-Closure Plan. The closure of Pond 1 continued to be under the Modified Closure / Post Closure Plan approved in September 1988. It was the requirement to provide a status report on the ISD Closure Plan that was inserted into the Permit during the 1995 Permit Modification. Pond 1 remains an interim status unit subject to closure.

RESPONSE 5

Comment Number	Comment
22.40 Chandler Letter F15	• ...Iris Environmental states "It is intended that soils will be excavated until: 1) confirmation sampling indicates that either background levels or a risk-based closure performance standard was achieved, or 2) that closure performance standards can be met using in-situ soil treatment technologies demonstrated to be effective by the pilot test conducted in accordance with the Corrective Action Consent Order. If background levels are selected for screening criteria, a background study work plan will be submitted to DTSC for review and approval prior to implementing the background study." This is too ambiguous to be considered an adequate set of performance standards. What background? What health-based standards? Deferral to corrective action is not acceptable? Table 4-1 answers most of this. The TCE and PCE soil numbers are not acceptable----these seem to be based on the TTLC?

The closure performance standard in the regulations is to clean up all waste residues. The closure plan uses the US EPA RSL screening levels shown in Table 4-1 of the Closure Plan as the Target Cleanup levels to meet the closure performance standards. The TCE and PCE soil cleanup numbers were not based on the TTLC but on the U.S. EPA RSL screening numbers.

RESPONSE 6

Comment Number	Comment
22.41 Chandler Letter F15	• Has the Assurance of Financial Responsibility been revised adequately to address the forgoing ambiguities?

The Revised Pond 1 Closure Plan includes a written closure cost estimate that includes the closure cost estimate for Pond 1, Tanks W1, W2, W3, and W4, and a contingent post-closure care cost estimate. DTSC reviewed and concurred with these cost estimates prior to releasing the Revised Pond 1 Closure Plan for public review.

The closure cost estimates are discussed in the Pond 1 Closure Plan, Section 10 and Appendix D. The total Closure Cost and Post-Closure Cost Estimates in the 2015 December Revised Pond 1 Closure Plan is $1,998,000.

Once DTSC issues a decision for the Revised Pond 1 Closure Plan, Phibro-Tech will be required to provide financial assurance to cover these closure cost estimates.

RESPONSE 7

Comment Number	Comment
22.36 Chandler Letter F15	• The Public Notice statement "The Revised Pond 1 Closure Plan proposes to revise and update a previously approved Closure Plan for a former surface impoundment (known as Pond 1)." Does not seem to mean a permit modification is being noticed. Even if DTSC argues ambiguities in the earlier authorization and the 1988 approval of a modified closure /post-closure plan, the 1995 Class Permit Modification clearly embedded the Pond 1 closure issues into the expired permit. DTSC is not adhering to the statutes and regulations regarding closure process. The "revised" Closure Plan (CP) is really a modification for a CP for a unit within the expired permit and must be re-noticed as a permit modification.

22.37 Chandler Letter F15	• The December 3, 2015, letter from Iris Environmental further emphasizes that fact in that it is titled Pond 1 Closure Plan Package Submittal---not permit modification submittal. It is not even titled Closure Plan Modification as would be appropriate if DTSC were making an argument for the Pond 1 to be subject to ISO regulations rather than permit regulations.

DTSC is required to provide the public, through a newspaper notice, the opportunity to submit written comments on the amended closure plan, which DTSC did. In addition, a permit modification modifying applicable permit language to incorporate the Revised Pond 1 Closure Plan was available for public review and comment.

DTSC processed the Revised Pond 1 Closure Plan as a DTSC-initiated Permit Modification. The Revised Pond 1 Closure Plan includes the closure of Pond 1 (under the 1981 Interim Status Document), the closure of Tanks W1 and W2 (under the 1991 Permit, as modified in 1995), and the closure of Tanks W3 and W4 (under the 1988 Permit Variance). The publicly available Fact Sheet for the Pond 1 Closure Plan discusses the details of the permit modification, including the specific changes to the Permit. The documents available for public review and comment clearly indicate that both the Revised Pond 1 Closure Plan and DTSC-initiated permit modification was under consideration.

DTSC reviewed the wording of the public notice. The public notice included the necessary content information such as: the name and address of the office processing the permit action, the name and address of the permit applicant, a brief description of the activity, the name address and telephone number of the person whom interested persons may obtain further information, a brief description of the comment procedures, the time and place of the hearing, and finally the location of the administrative record.

RESPONSE 8

Comment Number	Comment
3.3 Durand Yellow Card J28	Gloria Duran Closure plan for Tanks W-3 + W-4
3.4 Durand Yellow Card J28	Gloria Duran “sludge”

The Revised Pond 1 Closure Plan includes the closure of four wastewater treatment tanks, designated as Tanks W1, W2, W3, and W4. These tanks receive wastewaters generated from various other processes through PTI.

The closure of the wastewater tanks involves the removal of the remaining wastewater (called “waste inventory”) and any remaining sludge. Sludge is a defined term, which means “any solid, semi-solid or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant” (Cal. Code Regs., tit. 22 § 66260.10). The treated wastewater is tested before being disposed under PTI’s sewer permit. The sludge is sent off site to an authorized facility for further treatment or disposal. When all residue is removed from the tanks, the tanks are either removed and used for another purpose, or the tanks are shredded and removed to be disposed off-site.

The Revised Pond 1 Closure Plan includes details on the closing of the tanks and other structures.

PROPOSED INTERIM MEASURE WORK PLAN

RESPONSE 9

Comment Number	Comment
22.51 Chandler Letter F15	I request that because of the failure to follow the applicable statutes and regulations, established processes, lumping of incompatible CEQA projects and ignoring consistency with historical U.S. EPA agreements concerning corrective action at PTI that this noticed material in this notice be withdrawn. The technical elements of the IM and CMS need some tweaking, but implementation of the IM is, on the whole, an environmentally sound thing to do---take care of the hexchrome before the dry aquifer units re-saturate. However, the corrective action needs to be incorporated into the corrective action section of the expired permit, re-noticed, and the revised corrective action remedy as was given in 1995 by EPA and DTSC.

DTSC has reviewed the information provided in the comment and declines to withdraw its notice. Significant concentrations of contaminants of concern (hexavalent chromium) are present in the vadose zone at the Phibro-Tech Hazardous Waste Facility (Site) and pose a potential threat to groundwater if not remediated. DTSC determined that interim measures are necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated. DTSC's authority to require interim measures is found in Part V, Section E.13.b of the Hazardous Waste Facility Permit and Section 5.3 of the Corrective Action Consent Order, dated February 22, 2012.

The Interim Measure should not be confused with the remedy modification PTI has proposed to DTSC. DTSC is currently reviewing PTI's proposal. Any modification to the remedy that is currently required in the Permit will require a modification to either the existing permit or may be made as part of a subsequent permit decision.

RESPONSE 10

Comment Number	Comment
22.25 Chandler Letter F15	• **October 15, 2015 Approval Letter** - It is singularly inappropriate to approve the IM ahead of the public notice. Mr. Stephen McCredie's October 15, 2015 "approval" letter does just this.
22.27 Chandler Letter F15	• The following states that the IM Work Plan is approved by DTSC----NO PUBLIC NOTICE, JUST FLAT OUT APPROVED!!!!!!!! DTSC reviewed the June 1, 2015 Interim Measure Work Plan submitted by Iris Environmental and provided comments and a cover letter, dated June 15, 2015. This draft Work Plan adequately addresses the June 2015 comments and is approved by DTSC.
22.28 Chandler Letter F15	• The following states that the "draft Work Plan" will be public noticed----after already stating that it is approved. This is ridiculous. DTSC should be proposing to approve the IM Work Plan in the public notice, except that it has already approved it. How is public input going to affect the approval already given? The Please note that DTSC will provide the public with an opportunity to review and comment on interim measures. DTSC will be preparing a public notice and factsheet announcing that the draft Work Plan will be made available for public review and that DTSC will be accepting public comments on the interim measures. After considering and responding to public comments (if any), DTSC will decide to either adopt the proposed the in-situ treatment, adopts it with changes or other alternatives.

DTSC's correspondence dated October 15, 2015 clearly indicates that the Interim Measure Work Plan was approved only for the public review process. Please see the following text of the letter:

> "Please note that DTSC will provide the public with an opportunity to review and comment on interim measures. DTSC will be preparing a public notice and factsheet announcing that the draft Work Plan will be made available for public review and that DTSC will be accepting public comments on the interim measures. After considering and responding to public comments (if any), DTSC will decide to either adopt the proposed the in-situ treatment, adopts it with changes or other alternatives." (DTSC's Letter dated October 15, 2015).

The letter clearly indicates that DTSC did not approve the Interim Measure Work Plan for implementation.

RESPONSE 11

Comment Number	Comment
22.26 Chandler Letter F15	• The following clip pays lip service to the selected remedy but raises the CACO to the same level. Inappropriate to say the least. The proposed interim measure was submitted pursuant to part V, section E.13.b of the Hazardous Waste Facility Permit, as modified by the 1995 Corrective Action Permit Modification, and section 5.3 of the Corrective Action Consent Order dated February 22, 2012.
22.27 Chandler Letter F15	• The following states that the IM Work Plan is approved by DTSC----NO PUBLIC NOTICE, JUST FLAT OUT APPROVED!!!!!!!! DTSC reviewed the June 1, 2015 Interim Measure Work Plan submitted by Iris Environmental and provided comments and a cover letter, dated June 15, 2015. This draft Work Plan adequately addresses the June 2015 comments and is approved by DTSC.
22.29 Chandler Letter F15	• **1.0 INTRODUCTION** - This section states that the IM is "Pursuant to part V, section E.13.b of the Hazardous Waste Facility Permit 1995 Corrective Action Permit Modification and section 5.3 of the Corrective Action Consent Order dated, February 22, 2012 ..." Really now! Such hypocrisy. The expired permit is cited as a basis for the IM but DTSC chooses to ignore the need to modify the permit to incorporate changes to the Selected Remedy.

DTSC determined that interim measures are necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated, and required PTI to submit an Interim Measure Work Plan for review and approval. DTSC's authority to require interim measures is found in both Part V, Section E.13.b of the Hazardous Waste Facility Permit and Section 5.3 of the Corrective Action Consent Order, dated February 22, 2012.

Part V, Section E.13.b of the Hazardous Waste Facility Permit, as modified by the 1995 Corrective Action Permit authorizes DTSC to take other appropriate action to address any immediate or potential threats to human health and the environment, newly identified releases of hazardous waste or hazardous constituents, including but are not limited to, Interim Measures.

The proposed interim measure cleanup is identified for an area of the facility that presents the biggest threat to groundwater, should rising groundwater levels come into contact with hexavalent chromium impacted soil. Additionally, the Interim Measure activities described in the Work Plan consist of in-situ remediation of soils at the Site and do not conflict with required corrective measures for groundwater.

The proposed Interim Measure should not be confused with the remedy modification PTI has proposed to DTSC. Following the successful implementation of the 2012 pilot test to treat hexavalent chromium impacted vadose zone soils and in groundwater using CPS injections, PTI proposed modifying the selected groundwater remedy required in the Permit and submitted a Corrective Measures Study Report (CMS), dated December 13, 2013 to DTSC for approval. The purpose of the CMS was to evaluate groundwater

remediation alternatives and propose a remedy to replace groundwater treatment selected and required to be implemented in the Permit (pump and treat). PTI submitted a Revised Corrective Measures Study Report (Revised CMS), dated October 6, 2015. The Revised CMS addressed DTSC comments submitted to PTI on September 5, 2014.

The Revised CMS evaluated the following four corrective measures alternatives:

- No action;
- Groundwater pump and treat;
- In-situ injection of calcium polysulfide; and,
- Zero-valent iron nanoparticle injection.

The Revised CMS recommends modifying DTSC-selected groundwater remedy and permit conditions to allow In-situ injection of CPS of facility-wide groundwater contamination. Such modification will require a modification to either the existing permit or may be made as part of a subsequent permit decision. DTSC is reviewing the Revised CMS.

RESPONSE 12

Comment Number	Comment
22.30 Chandler Letter F15	• **1.0 INTRODUCTION** - PTI states that it "...implemented a calcium polysulfide (CPS) solution interim Pilot Test in 2012 to treat impacted vadose zone soils and dissolved hexavalent chromium in groundwater"---outside of the context of the conditions in the expired Permit. The kicker is that PTI then states that "Because of the pilot test's success, the Department of Toxic Substances Control (DTSC) indicated it **would consider a permit modification to change the treatment technology from groundwater extraction and treatment**, as reflected in the facility's 1995 Corrective Action Permit Modification." Instead DTSC comes up with a circumvention of the permit process. How nice.
22.31 Chandler Letter F15	• **2.0 INTERIM REMEDIAL MEASURES OVERVIEW** - "The activities discussed herein will be conducted using similar methods to the May 29, 2008 *Revised Groundwater Corrective Action Pilot Test Work* Plan submitted to DTSC and approved June 27. 2008." This demonstrates that DTSC was ignoring the expired permit and the appropriate process as far back as 2008. Nearly ten years should have been enough to do a permit modification to reflect changes in the selected remedy. Well maybe not since DTSC has not renewed the 1985 permit that was modified in 1995----say 30 years for that.

The proposed Interim Measure should not be confused with the remedy modification PTI has proposed to DTSC. Following the successful implementation of the 2012 pilot test to treat hexavalent chromium impacted vadose zone soils and in groundwater using CPS injections, PTI proposed modifying the selected groundwater remedy required in the Permit and submitted a Corrective Measures Study Report (CMS), dated December 13, 2013 to DTSC for approval.

The Revised CMS recommends modifying DTSC-selected groundwater remedy and permit conditions to allow In-situ injection of CPS of facility-wide groundwater contamination. Such modification will require a modification to either the existing permit or may be made as part of a subsequent permit decision. DTSC is reviewing the Revised CMS.

RESPONSE 13

Comment Number	Comment
22.32 Chandler Letter F15	• **5.3 Injection Zones** - "Three injection zones will be targeted at each borehole: unsaturated fill materials and the upper silty sand and sand of the Gage Aquifer, extending from 10 feet bgs to 30 feet bgs; the unnamed aquitard extending from approximately 30 to 50 feet bgs; and the upper 5 feet of the upper Hollydale Aquifer extending from approximately 50 to 55 feet bgs." A graphical representation of the overlap of influence of individual injection points would be useful here to illustrate the coverage projected.
22.33 Chandler Letter F15	• **5.4 Process and Performance Monitoring** - "Process monitoring will be conducted for the Gage Aquifer, unnamed aquitard, and unsaturated upper Hollydale Aquifer by collecting discrete soil samples after the first four adjacent borings are injected." It is suggested that the zone of saturation in the lower Hollydale be monitored as well.

A graphical representation of the overlap of influence of individual injection points was not included because the variability of the overlap of the zone of influence at each injection point. The zone of influence averaged about 7½-foot during the pilot test. However, this was an average as the extent of the zone of influence varied at each injection point and may be even more variable during the interim measure CPS injection. Confirmation samples will be collected between some of the injection points to verify the CPS solution contacted hexavalent chromium impacted soil. A graphic illustrating the field measured zone of influence will be included in the final interim measure implementation report.

The lower Hollydale Aquifer will be monitored during the interim measure.

RESPONSE 14

Comment Number	Comment
22.34 Chandler Letter F15	• **6.1 Data Quality Objectives** - Nice to have a section entitled Data Quality Objectives (DQOs), but it would be even nicer to have the DQOs actually present as per U.S.EPA guidance. Just saying that they are "...qualitative and quantitative statements that specify the quality of the data required to support decisions made during testing activities." and that "DQOs are based on the end uses of the data to be collected" is insufficient. The Data Quality Objective (DQO) process consists of seven steps that result in the development of a sampling plan. The output of Step 1 defines the factors that need to be considered in Step 2; the output of Step 2 defines the factors to be considered in Step 3. This process continues through each step and, ultimately, a sampling strategy is formulated in Step 7 based on the outputs from Steps 1 through 6. By establishing the DQOs for this project, the data collection is supported by a technical rationale and will meet the requirements of the project objectives. The IM should be pulled back and revised to include real DQO's using applicable EPA guidance and re-noticed. **THIS IS A MAJOR FLAW**.

The EPA DQOs are guidance documents and not required Federal or State mandates. The DQO process has been applied and evolved over the last two decades during discovery, investigation, evaluation of contamination data and proposed cleanup. The process has been iterative, as past project managers, technical staff, and senior staff have stepped back to reconsider prior data to develop new approaches to understanding the type and source of contamination and evolving cleanup technologies. The Interim Measure Workplan (Workplan) identifies the cleanup method performance, treatment boundaries, and cleanup verification including, analytical testing, physical observations, monitoring, and the decision process to determine if the outcome meets the cleanup goals.

RESPONSE 15

Comment Number	Comment
18.3 Wong SCAQMD Letter F02	... If remediation or any on-site activity involves equipment or operations which either emits or controls air pollution, SCAQMD staff should be consulted in advance of the project start to determine whether or not any permits or plans are required to be filed and approved by SCAQMD prior to start of the operation.
18.4 Wong SCAQMD Letter F02	The following comments are intended to provide guidance to the lead agency and should be incorporated into the Proposed Interim Measure Work Plan. As stated in the Proposed Interim Measure Workplan, the lead agency will remove and properly dispose of soils contaminated with hexavalent chromium at the project site in order to reduce the potential threat to human health and the environment. Approximately 800 cubic yards of potentially impacted soil and demolition debris will be excavated, segregated, and sampled. Based on analytical results, soil that exceeds the Site cleanup criteria will be transported offsite to a permitted disposal facility. Additionally, the PTI should also discuss how the project will comply with SCAQMD Rule 402 – Nuisance and SCAQMD Rule 403 – Fugitive Dust and Rule.
18.5 Wong SCAQMD Letter F02	Furthermore, should the lead agency encounter asbestos, storage tank/pipe degassing, or VOC contaminated soil during demolition and excavation, the lead agency should ensure compliance with SCAQMD Rule 1403 (Asbestos Emissions From Demolition/Renovation Activities), SCAQMD Rule 1149 (Storage Tank and Pipeline Cleaning and Degassing), and SCAQMD Rule 1166 (Volatile Organic Compound Emissions From Decontamination of Soil). ...
18.6 Wong SCAQMD Letter F02	... It may be appropriate to perform air monitoring for dust, lead, hexavalent chrome or other contaminants.

DTSC and PTI are aware of these requirements and compliance with SCAQMD Rules. DTSC will require PTI to include an amendment to the Health and Safety Plan requiring monitoring of cleanup and contingencies if excavation conditions change or debris is encountered that requires implementation of the SCAQMD Rules.

RESPONSE 16

Comment Number	Comment
5.3 Soto Yellow Card J28	ANDREI SOTO 3. IS THIS A FIX OR A STOP GAP?
14.4 Sanchez Documents J28	With respect to the Department of Toxic Substances Control "*Proposed Interim Measure Work Plan and Revised Pond 1 Closure Plan*" for Phibro Tech, Inc., *Neighbors Against Phibro Tech* questions the validity and effectiveness of the plan, and more importantly, the long term consequences to the community.

The cleanup of the historic chemical releases from the facility, including petroleum hydrocarbons, volatile organic compounds, and metals, are not stop-gaps or temporary fixes. DTSC determined that interim measures are necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated. The proposed interim measure cleanup is identified for an area of the facility that presents the biggest threat to groundwater, should rising groundwater levels come into contact with hexavalent chromium impacted soil.

The Interim Measure Work Plan and Revised Pond 1 Closure Plan propose cleanup of hexavalent chromium by injection of a nontoxic calcium polysulfide (CPS) solution. This type of in-situ, or in-place, treatment technology is now a common practice in environmental cleanups and has been used successfully at many DTSC cleanup sites. The validity and effectiveness of this cleanup method was successfully field tested at the facility in 2012. CPS reduces the hexavalent chromium to the nontoxic, trivalent chromium when the CPS is in contact with the hexavalent chrome in the soil. The by-product of the reaction is two common elements found in the earth's crust, calcium and sulfur, and a nontoxic hydroxide compound and water.

Long term validation of the treatment effectiveness will be determined during the required groundwater monitoring. Groundwater quality data will be reviewed during the long term monitoring for rebound concentrations of hexavalent chromium and other chemicals of concern at the facility.

RESPONSE 17

Comment Number	Comment
2.5 Aquino EMail J21	The process you outline to correct the existing problem involves injecting another chemical substance in the ground in hopes that it will act as a counter measure to the contaminated soil and pollutant to our ground water. Why isn't PTI being required to remove the contaminated soil which is the only sure way to address the problem?
5.4 Soto Yellow Card J28	ANDREI SOTO 4. THE PLAN IS TO REDUCE OR ELIMINATE HEXAVALENT CHROMIUM?

The soil and groundwater treatment technologies have changed dramatically over the last couple of decades. Most of the new technologies use direct, in-place soil treatment, or in-situ treatment, to reduce toxic chemical contamination in the soil instead of excavation. Many of the new technologies deliver a nontoxic chemical into the soil or groundwater to reduce or eliminate contamination on contact. The science behind the in-situ technology has been tested and proven to work and is now common practice in environmental cleanups. These methods are accepted by the federal Environmental Protection Agency and the California Environmental Protection Agency.

Injection of nontoxic calcium polysulfide (CPS) is a widely accepted in-situ treatment for hexavalent chromium cleanup. CPS reduces the hexavalent chromium to the nontoxic, trivalent chromium when the CPS is in contact with the hexavalent chrome in the soil. The by-product of the reaction is two common elements found in the earth's crust, calcium and sulfur, and a nontoxic hydroxide compound and water.

The viability of in-situ injection of CPS to reduce hexavalent chromium at Phibro-Tech was tested in 2012. Chemical testing of samples of soil collected before and after the CPS injection showed in all locations tested, the hexavalent chromium was reduced to concentrations below the EPA's Regional Screening Levels and there were no toxic by-products, or contamination, that resulted from the cleanup of the hexavalent chromium.

The hexavalent chromium is present below the Facility from ground surface to about 55 feet. An excavation to 55 feet deep is not geotechnically feasible under current conditions at the Facility and cost prohibitive. An excavation to 55 feet would generate a large volume of soil that would have to be hauled off the facility by trucks to a landfill and soil would have to be imported to the facility by trucks to backfill the excavation. In addition, the excavation and backfill operation would generate a large amount of greenhouse gases from the excavation equipment, haul trucks, and grading equipment required to backfill and compact the soil.

RESPONSE 18

Comment Number	Comment
14.12 Sanchez Documents J28	**Calcium polysulfide treatment of Cr(VD-contaminated soil** (Source: Journal of Hazardous Materials 179 (2010) 650-657) ... Even though the applications indicate that **CPS** could be an effective reductant, **no** peer-reviewed literature was found that methodically investigated the application of CPS in soil as a function of pH, Cr speciation and other geochemical parameters in bench scale studies. ...

Abstracts and articles listed below describe site cleanups of hexavalent chromium using CPS solution injection. DTSC has worked on numerous sites throughout the State that successfully used CPS injection to cleanup hexavalent chromium contamination. Report documentation of these DTSC authorized cleanups and the references listed below, can be obtained through DTSC's website Envirostor or upon request to DTSC's Regional Office, in Chatsworth.

- Remediation Plan for Reduction of Hexavalent Chromium at the African Queen, Building 5, and Building 6, North Former C-1 Facility, Long Beach, California, January 9, 2002, by MWH.
- Abstracts: In-Situ Delivery Methods for Remediation of Hexavalent Chromium in Soil and Groundwater, Presented to the 2001 AEG-AIPG National Meeting, St. Louis, Missouri, James A. Jacob, FAST-TEK Engineering Support Services.
- Early Results Bode Well for New Groundwater Treatability Test, July 25, 2005, Flour Your Information, Volume 3, Number 30, for Fluor Hanford's Groundwater Remediation Project.
- In-Situ Abiotic Detoxification and Immobilization of Hexavalent Chromium, Winter 2003, Groundwater Monitoring & Remediation 23, Number 1, Faruque A.Khan and Robert W. Puls.

Additionally, the California Regional Water Quality Control Board, Revised Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Chromium Impacted Sites (Order Number R4-2007-0019) lists calcium polysulfide as a material that can be used for in-situ remediation of hexavalent chromium.

RESPONSE 19

Comment Number	Comment
14.14 Sanchez Documents J28	It has been **concluded** in previous studies that, while **CPS** has a long residence time in the environment and is a promising reductant, in situ reduction is **not** an **efficient treatment method** for soils with highly insoluble **Cr(VI)** compounds, especially in surficial layers. ...
14.15 Sanchez Documents J28	Hence, assuming that CPS is inefficient form of treatment, our community would be left with a false impression of success. In the final analysis, the threat posed by hexavalent chromium contamination may remain the same, and more time and resources may be wasted. Such a scenario would be unacceptable now and upon discovery in the future. As such, we are **not** convinced that **CPS** treatment is a viable solution. We demand that the DTSC address **all** alternative forms of treatment and share that information with the community before making a final determination. ...

19.11 Martinez Letter F08 Attachment J28	Pumping more chemicals into the ground at the PHIBRO-TECH facility to reduce contamination to acceptable levels is not the answer. It is nothing more, than additional contamination on top of contamination.

The hexavalent chromium species cited in the article (Source: Journal of Hazardous Materials 179 (2010) 650-657) is a lead chromate with "…extremely low solubility….". Its low solubility is the reason it did not migrate below a depth of five feet at the site and was not responsive to treatment by CPS solution injection during lab studies. The hexavalent chromium in the soil below the Phibro-Tech facility is highly soluble when in contact with groundwater. The 2012 pilot test confirmed how effective the CPS solution injection treatment was at reducing the toxic hexavalent chromium to the nontoxic trivalent chromium at the facility. Long term groundwater monitoring is required and DTSC will be watching for changes in concentrations of hexavalent chromium. CPS solution is a nontoxic chemical, not a contaminant, when in contact with hexavalent chromium yields by-products that are nontoxic, including two elements that are commonly found in the earth's crust, sulfur and calcium, a nontoxic hydroxide compound and water. This process eliminates the hexavalent chromium threat to the environment and leaves in its place nonthreatening, nontoxic by-products.

RESPONSE 20

Comment Number	Comment
14.6 Sanchez Documents J28	In 1997, established the Maximum Contaminant Level (MCL) for hexavalent chromium was 2 parts per billion. That year, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" at **concentrations nearly 3 million times the state public health goal**. In 2014, the level was revised. The California Department of Public Health (CDPH) now established the Maximum Contaminant Level (MCL) for hexavalent chromium at 10 micrograms per liter (µg/L).

The 1995 modified Permit identified the cleanup standard for *total* chromium in groundwater as 50 parts per billion. In 1997 a Maximum Contaminant Level (MCL) for hexavalent chromium was not established. The two parts per billion mentioned in the comment, was established as a public health goal in 2011, not an MCL in 1997. An MCL for hexavalent chromium was not established until 2014 at 10 parts per billion or micrograms per liter.

Recent groundwater monitoring results of monitoring wells that historically have had the biggest impacts from hexavalent chromium contamination demonstrate that hexavalent chromium concentrations at the Facility are at or below the Omega Plume background concentrations. The depth to groundwater has continued to drop since the start of the drought in the Los Nietos/Santa Fe Springs area. Hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility.

RESPONSE 21

Comment Number	Comment
14.13 Sanchez Documents J28	**Calcium polysulfide treatment of Cr(VD-contaminated soil** (Source: Journal of Hazardous Materials 179 (2010) 650-657) ... Regarding Cr contamination of the soil and groundwater, the DTSC proposes a pump-and-treat system to be installed to contain the groundwater contamination and prevent migration of Cr. **However**, similar studies indicate that 99% of the chromium is tightly bound to the soil, resulting in slow leaching rates that render the aquifer **treatment inefficient** over a practical timescale [14]. Thus, direct treatment of the soil phase emerged as a cost-effective alternative. The objective is to evaluate the use of CPS for Cr(VI) treatment in soil by investigating the pH and Cr(VI) speciation effects on the kinetics of the CPS-soil reaction.
15.26 Hearing Transcript J28	MR. [JAIME] SANCHEZ: ... Regarding chromium, the contamination in the soil and the groundwater, the DTSC proposes to pump and treat the information with the CPS. However, similar studies indicate that 99% of the chromium study found in the soil resulting in slow leaching rates that rendered the aquifer treatment inefficient. In conclusion, CPS has a long residence time in the environment. In situ reduction is not an efficient treatment method for soils with high insoluble chromium 6 compounds. We are not convinced that CPS treatment is a viable solution. ...

The hexavalent chromium species cited in the article (Source: Journal of Hazardous Materials 179 (2010) 650-657) is a lead chromate found to have "…extremely low solubility….". The low solubility is why it remained tightly bound to the soil and did not migrate below a depth of five feet. The hexavalent chromium in the soil below the facility is highly soluble and mobilizes quickly when in contact with groundwater. That is why cleanup of the source of the hexavalent chromium in the soil by injection of the CPS solution is an appropriate method for eliminating the threat to groundwater. The 2012 pilot test confirmed how effective it is at reducing the toxic hexavalent chromium to the nontoxic trivalent chromium.

The monitoring wells at the Facility that historically have had the biggest impacts from hexavalent chromium contamination currently have hexavalent chromium concentrations that are at or below the Omega Plume background concentrations. The pump and treat method of groundwater cleanup cannot effectively eliminate the long term threat to the groundwater from the hexavalent chromium impacted soil at the facility. The 2012 pilot test demonstrated that CPS solution injection effectively treated the hexavalent chromium contamination in the soil. That is why the CPS solution injection is the method proposed for eliminating the threat posed by hexavalent chromium to groundwater.

RESPONSE 22

Comment Number	Comment
14.15 Sanchez Documents J28	Hence, assuming that CPS is inefficient form of treatment, our community would be left with a false impression of success. In the final analysis, the threat posed by hexavalent chromium contamination may remain the same, and more time and resources may be wasted. Such a scenario would be unacceptable now and upon discovery in the future. As such, we are **not** convinced that **CPS** treatment is a viable solution. We demand that the DTSC address **all** alternative forms of treatment and share that information with the community before making a final determination. ...

14.16 Sanchez Documents J28	...As such, we are **not** convinced that **CPS** treatment is a viable solution. We demand that the DTSC address **all** alternative forms of treatment and share that information with the community before making a final determination. ...
14.17 Sanchez Documents J28	Therefore, and in the interim, the residents of Los Nietos and Santa Fe Springs propose that the DTSC utilize the **most efficient and effective** form of treatment for hexavalent chromium contamination, and that it be applied to Pond 1 at the earliest possible time.
15.27 Hearing Transcript J28	MR. [JAIME] SANCHEZ: ... We are not convinced that CPS treatment is a viable solution. We demand that the DTSC provide us with all viable alternatives and the DTSC use the most efficient and effective method.
23.3 Amira EMail F21	... I understand the need to clean up the contaminated soil. Unfortunately, we are presented with only ONE process to accomplish that clean up. I believe it would have been appropriate to offer various forms of cleanup, thus, establishing a level of confidence to the community members, that you are working on their behalf.

Other alternatives have been considered including pump and treat and zero-valent iron nanoparticle injection. However, those treatment methods would be focused on groundwater and would not address the source of the hexavalent chromium in the soil that will continue to impact groundwater when in contact with groundwater if it is not treated.

CPS solution injection to treat hexavalent chromium impacted soil at the facility has been successfully tested at the facility in an area close to the former chromic acid tank. Soil samples collected and tested for hexavalent chromium after CPS solution injection showed that where CPS came into contact with hexavalent chromium in the soils, the hexavalent chromium was reduced to the nontoxic trivalent chromium and residual concentrations hexavalent chromium that remained in the soil were reduced to levels below the cleanup standards.

Additionally, the California Regional Water Quality Control Board, Revised Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel, Volatile Organic Compound and/or Hexavalent Chromium Impacted Sites (Order Number R4-2007-0019) lists calcium polysulfide as a material that is approved for in-situ remediation of hexavalent chromium.

RESPONSE 23

Comment Number	Comment
3.2 Durand Yellow Card J28	Gloria Duran Testing of Soil

There have been many investigations at the facility since the 1990s to sample and test the soil for chemicals released during historic operations in the 1960s, 70s and 80s. The soil testing has shown three types of chemicals were released:

- Petroleum hydrocarbons such as gasoline and diesel;
- Volatile Organic Compounds (VOCs) such as trichloroethylene; and
- Metals such as hexavalent chromium.

Cleanup of the VOCs and petroleum hydrocarbons was accomplished with a soil vapor extraction system (SVES). The SVES removed over 13,000 pounds of chemicals after operating for five years. The SVES is currently being checked to determine if the soil vapor cleanup is complete.

The proposed clean-up method for hexavalent chromium is the injection of a nontoxic chemical, calcium polysulfide (CPS), into the soil. Cleanup of the hexavalent chromium is proposed in a location at the facility that DTSC believes is the biggest threat to groundwater. The proposed Interim Measure is in response to the potential threat posed to the environment from rising groundwater contacting hexavalent chromium impacted soil. The proposed cleanup of hexavalent chromium was presented to the community during a meeting on January 28, 2016.

HEALTH RISK ASSESSMENT

RESPONSE 24

Comment Number	Comment
3.1 Durand Yellow Card J28	Gloria Duran Health Risk Assessment – 2015
14.24 Sanchez Documents J28	The residents of Los Nietos and Santa Fe Springs requested that the DTSC conduct an "Environmental Impact Report" ..., and a "Health Risk Assessment" to determine the degree of risk to human health. ...

A number of health risk assessments have been conducted over the course of the last several years under DTSC's oversight. The human health risk from historical releases and current day-to-day operations as well as accidental spills have been extensively investigated in the Human Health Risk Assessment (for historical releases, referred to as the HHRA) approved by DTSC on February 6, 2015, as well as the Current Operations Health Risk Assessment (COHRA) approved by DTSC on January 29, 2015.

Both of these health risk assessments demonstrated that there was no significant risk above a level that would be considered health protective to residents of the Los Nietos and West Whittier neighborhoods, including the residences of maximal exposure which are located in the vicinity of Burke Street and Skabo Avenue.

RESPONSE 25

Comment Number	Comment
3.5 Durand Yellow Card J28	Gloria Duran no more info on homes less than ¼ mile north end of SFS
15.3 Hearing Transcript J28	MS. DE LOZA: Our first speaker is Art Escobedo. MR. [ART] ESCOBEDO: The reason why I am here is one -- for one specific reason, and that is I am the president of the Los Nietos Board of Education. Our schools lie within a 20 minute proximity to Phibro-Tech. That means they are very close, within a half mile. I also represent a community of not only frightened people but very angry people.
15.12 Hearing Transcript J28	MR. [BENJAMIN] MARTINEZ: ... The population has gone from 38 million to 39.1 million, and it is going to go bigger. The population in our area here has grown since 2010. More people are coming this way. If this keeps up and other companies like Phibro-Tech keep operating, we are going to take people out in body bags because they are going to die of one contaminate or another. That' s the reality.

19.2 Martinez Letter F08	I checked into the demographics of the CITY of SANTA FE SPRINGS, CA. The city is 8.7 to 8.9 square miles with a population at about 16,200 residents. The population of SANTA FE SPRINGS is not affected by the contamination around their city. On the other hand, we in WEST WHITTIER/LOS NIETOS area are exposed and affected by their business model.
19.12 Martinez Letter F08 Attachment J28	People exposed to industrial contamination, suffer greatly and endure a slow death. As of the 2010 U.S. Census, the combined Los Nietos-West Whittier area has a population of 25,540 people within 2.519 square miles. This puts the population density at 10,138.5 people per square mile. This being 2016, a New Year, I suspect that population is larger now.

Extensive human health risk assessments demonstrate that there is no significant health risk to neighborhood residents of Los Nietos or West Whittier from PTI historical releases or current operations. The health risk assessments demonstrated that there was no significant risk above a level that would be considered health protective to residents of the Los Nietos and West Whittier neighborhoods, including the residences of maximal exposure which are located in the vicinity of Burke Street and Skabo Avenue. DTSC believes that the health risk assessments which were conducted also demonstrate that no health risk from PTI would affect any of the schools in the Los Nietos or West Whittier neighborhoods.

Comment noted concerning population growth.

RESPONSE 26

Comment Number	Comment
14.41 Sanchez Documents J28	The Department of Toxic Substances Control has **failed** to determine the risk posed to the community. The residents of Los Nietos and Santa Fe Springs believe that they are at great risk, both human and environmental, and that they suffer from the occurrence of a greater-than-expected number of serious illnesses and diseases, including a "***CANCER CLUSTER***".

Human health risk assessments conducted for historical releases (HHRA 2015) and current operations (COHRA 2015) have concluded that no significant health risk to neighborhood residents of Los Nietos or West Whittier. In response to questions from the Los Nietos community concerning the incidence of cancer and serious illness, the DTSC enlisted the aid of the Los Angeles County Department of Public Health - Toxics Epidemiology Program and requested that they assist us in investigating this issue. Carrie Tayour Ph.D., MPH conducted an analysis of cancer incidence and cancer clusters within the Los Nietos area and concluded that there were no identifiable cancer clusters and no cancer incidence greater than that seen for the greater Los Angeles metropolitan area, or for California and the United States as a whole. Dr. Tayour presented a poster and spoke with many residents at the DTSC sponsored Workshop on January 23, 2013, which was held at the Gus Velasco Neighborhood Community Center in Santa Fe Springs.

RESPONSE 27

Comment Number	Comment
15.13 Hearing Transcript J28	MR. [BENJAMIN] MARTINEZ: ... I've learned through the years that people who are exposed to contamination, industrial contamination, suffer greatly and endure a slow death. And it is permanent. There is no do-overs. No makeovers. No second chance. That is final. And unless Phibro-Tech leaves the area, the body count is going to go up. It will be slow, but it will get there because we are getting more people in there and there is going to be more sick people. Thank you.

Comment noted concerning industrial contamination. Extensive human health risk assessments demonstrate that there is no significant health risk to neighborhood residents of Los Nietos or West Whittier from PTI historical releases or current operations.

RESPONSE 28

Comment Number	Comment
19.7 Martinez Letter F08 Attachment J28	PHIBRO-TECH processes hazardous liquids and/or solids for recycling. These elements are known to cause cancer and other ailments.
19.16 Martinez Letter F08 Attachment J28	History has taught us, that toxic contamination is leathal and final for those who are exposed to it. There are no do overs, no second chances, it is permanent. I know from experience that when humans are involved, there will be some forms of contamination, be it accidental or intentional.

DTSC agrees that hazardous wastes at PTI could potentially cause harm if exposure to concentrations above levels known to be protective to human health occur. Extensive human health risk assessments required by DTSC have demonstrated that there is no significant exposure to Los Nietos residents from either historical releases or current operations at PTI.

RESPONSE 29

Comment Number	Comment
19.14 Martinez Letter F08 Attachment J28	The Local news media reported that the population in CALIFORNIA has increased from 38 million to 39.1 million and increasing with time. Fifty One years ago, we moved our family into the LOS NIETOS/WEST WHITTIER area. Slauson Ave. at that time, was a regular street. Now it is classified as a highway. We have a lot of exhaust smoke from cars and big trucks that travel EAST and WEST on SLAUSON AVE. We get clouds of tiny particles that are created by the grinding of the tires on the black top on SLAUSON AVE.
19.15 Martinez Letter F08 Attachment J28	The traffic in this area is horrendous and with it bring large tanker trucks with highly toxic and flameable liquids too.

Comment noted concerning high levels of diesel truck traffic in the vicinity of Slauson Avenue. The Current Operation Health Risk Assessment (COHRA) evaluated the truck traffic directly related to operations at PTI and determined that exposure to diesel particulate emissions is below a level of health concern.

Comment noted concerning large tanker truck traffic.

RESPONSE 30

Comment Number	Comment
4.1 Aquino Yellow Card J28	Nick Aquino Corrective Action Consent order -- Did PTI conduct or have conducted the Human Health Risk Plan

Yes. Human health risk assessments (HHRA) were approved by DTSC on February 6, 2015. The two HHRA evaluated the human health and ecological risk associated with:

- Facility operation; and
- Historic releases of hazardous waste or hazardous waste constituents.

Both of these health risk assessments demonstrated that there was no significant risk above a level that would be considered health protective to residents of the Los Nietos and West Whittier neighborhoods, including the residences of maximal exposure which are located in the vicinity of Burke Street and Skabo Avenue.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

RESPONSE 31

Comment Number	Comment
22.42 Chandler Letter F15	• In its long and seedy history of CEQA compliance this takes the cake. Four discrete mostly dissimilar, CEQA "projects" at a RCRA facility are being addressed by a single blow-it off CEQA analysis. This is not acceptable.
22.43 Chandler Letter F15	• ... Four discrete mostly dissimilar, CEQA "projects" at a RCRA facility are being addressed by a single blow-it off CEQA analysis. This is not acceptable. • The Pond 1 Closure Plan Modification (CP Mod), being addressed under the expired permit is not the same CEQA project as the Corrective Action (CMS and IM) activities being addressed---albeit improperly---under a CACO that was issued to circumvent the expired permit ("Site Mitigation being ever the "cowboy" and Permitting never having any guts to do things right and being ever fearful to upset things with its screwed-up renewal process). • Neither of the three forgoing discrete CEQA "projects" (CP Mod, IM, and CMS) has anything in common with Permitting's permit renewal. ...
22.44 Chandler Letter F15	• Neither of the three forgoing discrete CEQA "projects" (CP Mod, IM, and CMS) has anything in common with Permitting's permit renewal. In point-of-fact, the "Site Mitigation Cowboys" and the Permitting folk are conspiring to eliminate the use of either the expired permit or a renewed permit to address corrective action at all.

22.51 Chandler Letter F15	I request that because of the failure to follow the applicable statutes and regulations, established processes, lumping of incompatible CEQA projects and ignoring consistency with historical U.S. EPA agreements concerning corrective action at PTI that this noticed material in this notice be withdrawn. The technical elements of the IM and CMS need some tweaking, but implementation of the IM is, on the whole, an environmentally sound thing to do---take care of the hexchrome before the dry aquifer units re-saturate. However, the corrective action needs to be incorporated into the corrective action section of the expired permit, re-noticed, and the revised corrective action remedy as was given in 1995 by EPA and DTSC.

DTSC must comply with the requirements of CEQA whenever DTSC considers approving any proposed action defined by CEQA as a "project." Section 15378 of Title 14 of the California Code of Regulations, defines “project” in part to mean the whole of an action “which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment,” and meets additional requirements. Section 15378 further clarifies that “The term ‘project’ refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies. The term ‘project’ does not mean each separate governmental approval.” (Cal. Code Regs., tit. 14 s 15378). The project description and related impact assessments are required to account for reasonably foreseeable future phases or other foreseeable consequences of proposed projects. Therefore, DTSC must examine the potential environmental effects of proposed activities, as well as all other reasonably foreseeable activities on-site and in the vicinity of the Phibro-Tech Facility, upon the current physical environmental conditions in the vicinity of the proposed project.

The proposed project involves the approval of the Revised Pond 1 Closure Plan and Interim Measure Work Plan. Other reasonably foreseeable activities on-site include the permit renewal and CMS. PTI has submitted to DTSC a permit application to renew its hazardous waste facility permit and a CMS to propose a remedy to replace the groundwater treatment selected and required to be implemented in their current permit. DTSC is currently reviewing the permit application and CMS. If DTSC proposes to approve these activities, DTSC will review the project activity and the environmental setting. If the project activity or environmental setting has triggered the conditions set forth in Sections 15162 or 15163 of the CEQA Guidelines, DTSC will prepare a subsequent or supplemental negative declaration or EIR as required.

RESPONSE 32

Comment Number	Comment
22.45 Chandler Letter F15	• Moreover, the CEQA analysis with regard to the permit renewal seems inappropriate since the current business activities are so much different from those activities in the 1980's. If the business changes, the permit needs to change along with it (all of this should have been addressed years ago in modifications---since timely permit renewal seems to be so much beyond DTSC capabilities---twenty years beyond. DTSC needs to analyze and discuss these changes for the permit renewal but not for the CP Mod or the IM and CMS.

DTSC prepared a negative declaration when it issued a hazardous waste facility permit for the Facility in 1991. Since the permit was issued, the permitted hazardous waste management activities at the facility have not significantly changed. Pursuant to California Public Resources Code, Section 21166, and California Code of Regulations, title 14, Sections 15162, 15163 and 15164, DTSC prepared an environmental analysis (referred to as an Environmental Document Analysis) to assess whether previously approved adopted Negative Declaration(s) remain sufficient for purposes of the DTSC’s approval of proposed Interim Measure Work Plans and the Revised Modified Pond 1 Closure Plan. The Environmental Document Analysis identified whether there were any changed circumstances or new information of substantial importance and evaluated each environmental resource categories for any identified changed circumstances that may result in environmental impact significance conclusions different from those found in the previously adopted Negative Declarations. The Environmental Document Analysis also examined the potential environmental effects of proposed activities, as well as all other reasonably foreseeable activities on-site and in the vicinity of the Phibro-Tech Hazardous Waste Facility, upon the current physical environmental conditions in the vicinity of the proposed project and in light of the current regulatory standards and new information, as required by California Code of Regulations, title 14, Section 15162.

RESPONSE 33

Comment Number	Comment
22.46 Chandler Letter F15	• Further, the huge number of environmental violations associated with PTI and various governmental agencies seems to be glossed over. ...

DTSC's environmental analysis evaluates the project under the circumstances that all applicable laws and regulations will be followed because PTI is required to do so. If PTI fails to comply, then PTI may be subject to fines or other penalties under the law.

RESPONSE 34

Comment Number	Comment
22.48 Chandler Letter F15	• In a previous letter to Debbi Rafael, dated February 12, 2013, it should be noted that the failure to comply with CEQA for the de facto modification (removal of corrective action and alteration of the previously approved remedy) of the currently applicable permit by removing corrective action could subject DTSC to a lawsuit under Public Resources Code statutes.

DTSC has not removed or modified the corrective action or remedy specified in the 1995 Permit Modification issued to PTI.

RESPONSE 35

Comment Number	Comment
14.23 Sanchez Documents J28	The residents of Los Nietos and Santa Fe Springs requested that the DTSC conduct an "Environmental Impact Report" to determine the probable dangers to the surrounding community, ...

DTSC completed an environmental analysis (referred to as an Environmental Document Analysis) pursuant to the California Environmental Quality Act (CEQA) to determine if these two activities would change the determinations DTSC made in previously adopted Negative Declarations or whether previously approved Negative Declarations remain sufficient for purposes of DTSC's approval of those activities. DTSC determined that none of the conditions described in CEQA Guidelines section 15162 calling for the preparation of an Environmental Impact Report (EIR) or Negative Declaration have occurred. Specifically, DTSC determined that the currently proposed project will not result in new significant environmental effects or substantially increase the severity of previously identified significant effects; nor have there been substantial changes to the circumstances under which the project is being undertaken. Further, the currently proposed project consists of only minor changes that do not raise important new information of substantial importance. Although DTSC determined that there are changes in conditions from those previously described in previously adopted negative declarations, DTSC does not consider these changes to be substantial. Additionally, implementation of the Interim Measure Work Plan, if approved, would be a minor action taken to prevent, minimize, mitigate, or eliminate the release or threat of release of a Hazardous Waste or Hazardous Substance. The Environmental Document Analysis evaluated the potential environmental effects of the Interim Measures Work Plan as part of the cumulative activities on-site and concluded that this activity would be appropriately addressed in an Addendum. The minor changes and additions to the project identified are consistent with Section 15164 of the CEQA Guidelines, and an addendum to the previously negative declarations is the appropriate CEQA documentation.

RESPONSE 36

Comment Number	Comment
22.47 Chandler Letter F15	• ... The permit renewal needs to be addressed by an EIR. The CMS and IM could be addressed by a single negative declaration (ND) or mitigated ND for a PERMIT MODIFICATION of the existing remedy selection in the expired permit. The CP needs to be a similar modification of the expired permit but should have its own ND or mitigated ND--- again for the permit renewal but not for the CP Mod or the IM and CMS. **PLEASE PULL THIS NOTICE BACK AND GET IT DONE PROPERLY.**

DTSC is currently reviewing the CMS and PTI's permit renewal application and has not made a decision on the revised permit application or CMS. Those decisions are subject to CEQA and therefore if DTSC proposes to approve these activities, DTSC will again review the project activity and the environmental setting. If the project activity or environmental setting has triggered the conditions set forth in Sections 15162 or 15163 of the CEQA Guidelines, DTSC will prepare a subsequent or supplemental negative declaration or environmental impact report (EIR) as required.

DTSC completed an environmental analysis (referred to as an Environmental Document Analysis) to evaluate the potential environmental effects of proposed activities, as well as all other reasonably foreseeable activities other foreseeable consequences of proposed projects on-site and in the vicinity of the Phibro-Tech Hazardous Waste Facility. The Environmental Document Analysis also evaluated other, off-site projects for potential cumulative impacts. DTSC determined that none of the conditions described in CEQA Guidelines section 15162 calling for the preparation of an EIR or a subsequent or supplemental Negative Declaration have occurred.

CORRECTIVE ACTION (CLEANUP)

RESPONSE 37

Comment Number	Comment
22.22 Chandler Letter F15	• The IM Work plan Introduction states, "A draft Corrective Measures Study (CMS) report was submitted to DTSC in December 2013 proposing CPS solution injection as an alternative to groundwater extraction and treatment. DTSC reviewed and provided comments to PTI on September 5, 2014. A revised CMS is currently in preparation" Is the revised CMS part of this public notice?
22.23 Chandler Letter F15	• The IM Work Plan Introduction states, "The Corrective Measures Study Report evaluated groundwater cleanup alternatives and recommended the selection of CPS solution injection as the corrective measure to be taken at PTI to address hexavalent chromium in the subsurface." Great, why didn't DTSC immediately develop a permit modification that included the development of the IM Work Plan? The pilot test had been done five years earlier?
22.24 Chandler Letter F15	• The IM Work Plan Introduction states, a "...proposed remedy outlined in the Corrective Measures Study Report. DTSC's request that PTI implement CPS injections as an Interim Measure is further evidence that this treatment technology is appropriate for the site." Proposed remedy sounds a lot like the permit. Fine, incorporate it into the permit, why the continued monkey-motion?

The revised CMS is not a part of this public notice. This public notice is for the Corrective Action Interim Measure Work Plan and the Revised Pond 1 Closure Plan (including the DTSC initiated permit modification to incorporate the Revised Pond 1 Closure Plan).

At DTSC's request, PTI submitted an Interim Measure Work Plan to DTSC on dated June 1, 2015 for approval. DTSC determined that interim measures are necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated. Significant concentrations of contaminants of concern (hexavalent chromium) are present in the vadose zone at the Phibro-Tech Hazardous Waste Facility and pose a potential threat to groundwater if not remediated. The Interim Measure activities described in the Work Plan consist of in-situ remediation of soils through the injection of a calcium polysulfide (CPS) solution to stabilize hexavalent chromium. The proposed interim measure cleanup is identified for an area of the Facility that presents the biggest threat to groundwater, should rising groundwater levels come into contact with hexavalent chromium impacted soil.

The proposed Interim Measure should not be confused with the remedy modification PTI has proposed to DTSC. Following the successful implementation of the 2012 pilot test to treat hexavalent chromium impacted vadose zone soils and in groundwater using CPS injections, PTI proposed modifying the selected groundwater remedy required in the Permit and submitted a Corrective Measures Study Report (CMS), dated December 13, 2013 to DTSC for approval. The purpose of the CMS was to evaluate groundwater remediation alternatives and propose a remedy to replace groundwater treatment selected and required to be implemented in the Permit. PTI submitted a Revised Corrective Measures Study Report (Revised CMS), dated October 6, 2015. The Revised CMS addressed DTSC comments submitted to PTI on September 5, 2014.

The Revised CMS evaluated the following four corrective measures alternatives:

- No action;
- Groundwater pump and treat;
- In-situ injection of calcium polysulfide; and,
- Zero-valent iron nanoparticle injection.

The Revised CMS recommends modifying DTSC-selected groundwater remedy and permit conditions to allow In-situ injection of CPS of facility-wide groundwater contamination. Such modification will require a modification to either the existing permit or may be made as part of a subsequent permit decision. DTSC is reviewing the Revised CMS. In making this decision, DTSC will provide the public with an opportunity to review and comment on the DTSC's proposed decision on the cleanup alternative.

The Pilot Test groundwater data was submitted a little over two and a half years ago. The Pilot Test injection began in March of 2012, followed by four quarters of groundwater monitoring, a requirement of the Regional Water Quality Control Board Waste Discharge Requirement. Approximately two and a half years ago, a July of 2013 report presented the groundwater monitoring data.

RESPONSE 38

Comment Number	Comment
14.49 Sanchez Documents J28	... In addition, we request that the DTSC require Phibro - Tech, Inc. to clean-up the entire facility, ...
15.6 Hearing Transcript J28	MR. [ART] ESCOBEDO: ... This is a problem that, in their eyes, the only way that can be corrected is if -- is the removal of the company and the removal of the contaminated soil. They do not want Phibro-Tech here.

19.10 Martinez Letter F08 Attachment J28	Also clean-up all the land in use now of toxic apills and or contamination by the process under which they operated since 1991.

PTI is required to implement the corrective measures selected and required in its existing permit, as modified by DTSC in a DTSC-Initiated Permit Modification, effective August 2, 1995. All but two of the elements of the selected cleanup have been implemented including:

1) Deed Restriction;
2) Quarterly Groundwater Monitoring;
3) Soil Vapor Survey;
4) Soil Vapor Extraction to cleanup Halogenated Volatile Organic Compounds in soil;
5) In-Situ Bioventing for petroleum hydrocarbons constituents in soil;
6) Containment Measures to prevent further contamination;
7) Berming facility boundary to prevent potential off-site contamination; and
8) Vadose Zone Monitoring to prevent any potential impact to soil or to provide early warning of potential releases to soil.

The Surface Water Monitoring requirement of the Permit Modification has been eliminated, as surface water no longer discharges offsite. The Plant portion of the facility has been regraded so that surface water runoff drains to interior sumps where it is pumped into the nearby waste water treatment tanks, treated, and either used on Site or discharged to the sanitary sewer.

Cleanup of the VOCs and petroleum hydrocarbons (gasoline and diesel) was accomplished with a soil vapor extraction and bioventing system (SVES). The removal of VOC and petroleum hydrocarbon vapor from the soil removed these chemicals from the ground. The SVES removed over 13,000 pounds of chemical waste after operating for five years. The SVES data is currently being reviewed to determine if soil vapor cleanup is complete.

The remaining corrective measure required to be implemented at the Facility is groundwater remediation. PTI is required to remediate contaminated groundwater through pumping of contaminated groundwater and treatment. Hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility. The pump and treat method of groundwater cleanup would not remediate hexavalent chromium impacted soil and would not effectively eliminate the long term threat to the groundwater from the hexavalent chromium impacted soil at the facility. The proposed interim measure cleanup is identified for an area of the facility that presents the biggest threat to groundwater, should rising groundwater levels come into contact with hexavalent chromium impacted soil. In addition, PTI has proposed to modify required groundwater cleanup of hexavalent chromium by pump and treat methods to injection of CPS. DTSC is currently reviewing PTI's submittal.

RESPONSE 39

Comment Number	Comment
14.44 Sanchez Documents J28	Removing the contamination from the ground water and soil would be extensive. Since July 1991, the Department of Toxic Substances Control has **not** removed the threat posed by the **hexavalent chromium** tainted soil and ground water. The department has **not** earmarked any money for residential cleanup, and has **not** required PTI to expand testing and cleanup of the surrounding community, if homes are found to be contaminated.

The proposed interim measure targets the soil below the Facility that is the biggest threat to groundwater from hexavalent chromium contamination. The historic releases of chemicals at the Facility were from former underground storage tanks that were present below the ground surface and pavement including a chromic acid

tank, removed in 1979, and two, 10,000 gallon underground fuel tanks, both removed in 1985. The releases migrated below ground from the tanks to the soil. DTSC believes that cleanup of the hexavalent chromium impacted soil by injection of calcium polysulfide will eliminate the concentration spikes in groundwater historically seen when groundwater levels rise up to the impacted soil zone.

The hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility. The depth to groundwater has continued to drop since the start of the drought in the Los Nietos/Santa Fe Springs area. The hexavalent chromium concentrations in groundwater now reflect the background concentrations found in the Omega Plume.

DTSC does not have evidence to suggest that residential cleanup is currently necessary. The Phibro-Tech facility does not process or handle any hazardous wastes that produce particulate air contamination. There is no evidence from air monitoring stations at the Phibro-Tech facility that would suggest that soil in the surrounding community may be impacted from any facility air emission. Inhalation exposure pathways do not exist from these chemicals in the soil, below the ground, to the public or the surrounding neighborhoods.

RESPONSE 40

Comment Number	Comment
5.1 Soto Yellow Card J28	ANDREI SOTO 1. IS THE WATER COMPANY INVOLVES?
5.2 Soto Yellow Card J28	ANDREI SOTO 2. HAS THE WATER BEEN TESTED?

The San Gabriel Valley Water Company supplies the domestic water to the Los Nietos community. The production wells that supply the water are located in the San Gabriel Valley. The domestic water supplied to the Los Nietos community is tested by the San Gabriel Valley Water Company. Staff from the San Gabriel Valley Water Company has stated that the water meets the Federal, State and Local water quality requirements for domestic use.

Another well, Santa Fe Springs Well No. 1 (SFS Well 1), is located upgradient of the Phibro-Tech Facility in the Fire Department compound at the corner of Burke Street and Dice Road. SFS Well 1 is not the source of drinking water supplied to the Los Nietos community. This well supplies water to the industrial areas east of Los Nietos from deep aquifers that are below the shallow aquifer impacted with the Omega Plume contamination.

Groundwater monitoring at Phibro-Tech, including groundwater sampling and testing, has been on-going since 1985. The groundwater is monitored on a quarterly basis and includes collection and chemical testing for groundwater quality in wells at the facility and upgradient of the facility in Dice Road. In general, the groundwater chemical testing includes petroleum hydrocarbons, volatile organic compounds, and metals. The groundwater chemistry data is reviewed by DTSC staff for chemical trends and any signs of new releases. The chemicals detected in the facility monitoring wells are currently at or below background concentrations that reflects the shallow groundwater quality conditions in the Omega Plume. The local water company is not involved with the Phibro-Tech groundwater monitoring program.

CORRECTIVE ACTION CONSENT AGREEMENT, ORDER, PERMIT

RESPONSE 41

Comment Number	Comment
22.13 Chandler Letter F15	DTSC's "Site Mitigation Cowboys "signed a CACO with PTI on March 2012 for the express purpose of avoiding compliance with RCRA and has apparently proceeded to implement corrective action according to that CACO rather than the 1995 modified Permit---- that is actually still in force per the DTSC regulations. **THEREFORE, DTSC HAS DE FACTO MODIFIED THE 1995 MODIFIED PERMIT WITHOUT MEETING THE REQUIREMENTS OF CALIFORNIA CODE OF REGULATIONS, TITLE 22, SECTIONS 66270.41 AND 66270.42.** In addition to failing all of the associated public notification requirements, comment period, response to comments, appeal period and appeal review (if necessary) required by California Code of Regulations, title 22, section 66270.41 and 66270.42, ...
22.14 Chandler Letter F15	[DTSC] has apparently proceeded to implement corrective action according to that CACO rather than the 1995 modified Permit ... **DTSC FAILED TO IMPLEMENT CEQA ON ITS DISCRETIONARY DECISION TO ILLICITLY "MODIFY" THE 1995 MODIFIED PERMIT by converting implementation of the approved remedy to a CACO.**
22.15 Chandler Letter F15	This is not the first time at PTI that DTSC has played fast and sneaky by "changing" the elements of the remedy without going through the applicable permit modification process. For example, the requirement of a Conceptual Site Model, a host of schedule delays, and other new "things" were added without permit modification while the permit and corrective action were being handled in DTSC's Cypress Office---**ALL AFTER THE EPA AND DTSC HAD SELECTED THE REMEDY**. Since the project was moved to the Chatsworth Office, other changes appear to be in the works as evinced in the CACO---- all without modifying the currently applicable expired permit.
22.16 Chandler Letter F15	• DTSC has cleverly modified the expired 1995 modified Permit by moving corrective action from the Permit to a Corrective Action Consent Order (CACO). This deviation was clear when it noticed a draft permit renewal in 2010 and incorporated that CACO by reference into the permit effectively expunging the 1995 DTSC/EPA jointly approved remedy.
22.49 Chandler Letter F15	• I again request that DTSC rescind the 2012 CACO until: (a) such time as a renewed permit is issued because CACO now represents a de facto illegitimate permit modification (b) if DTSC wants to implement the new elements of the CACO without waiting for the permit renewal and appeal to play out, it should modify the currently applicable 1995 permit to substitute the CACO for the 1995 Class 3 modification----complying with all of the modification requirements; (c) that if DTSC refuses to re-notice the draft permit, that the CACO be submitted for public review and comment---complying with all of the original permit renewal requirements.
22.51 Chandler Letter F15	I request that because of the failure to follow the applicable statutes and regulations, established processes, lumping of incompatible CEQA projects and ignoring consistency with historical U.S. EPA agreements concerning corrective action at PTI that this noticed material in this notice be withdrawn. The technical elements of the IM and CMS need some tweaking, but implementation of the IM is, on the whole, an environmentally sound thing to do---take care of the hexchrome before the dry aquifer units re-saturate. However, the corrective action needs to be incorporated into the corrective action section of the expired permit, re-noticed, and the revised corrective action remedy as was given in 1995 by EPA and DTSC.

PTI is required to implement the corrective measures selected and required in its existing permit, as modified by DTSC in a DTSC-Initiated Permit Modification, effective August 2, 1995. These corrective measures were selected jointly by DTSC and U.S. Environmental Protection Agency. Any changes to the substantive

requirements of the selected remedy in the existing permit will require a permit action, such as a permit modification.

DTSC did not modify the Permit through a Corrective Action Consent Order. PTI currently operates under the terms of the previously issued Permit which continues to be in effect until a final decision is issued on its current permit renewal application. If a new permit is issued, PTI will be required to conduct corrective action as authorized in the new Permit. In 2012, DTSC and PTI executed a Corrective Action Consent Order which preserves the corrective action required by the PTI's permit and did not make substantive changes to the selected remedy.

If DTSC agrees that the corrective action remedy should be modified, DTSC will provide the public with an opportunity to review and comment on the remedy change proposal and DTSC's justification for selection of the corrective measures before any final decision.

RESPONSE 42

Comment Number	Comment
14.3 Sanchez Documents J28	Specifically, PTI entered into a *Corrective Action Consent Order* on July 29, 1991, with the U. S. EPA and DTSC, which was later modified (on August 2, 1995). Consequently, PTI was compelled to conduct corrective action "within one year". Approximately 25 years later, **DTSC** has **failed** to obtain **compliance** from **PTI**.
14.21 Sanchez Documents J28	On that basis, ***Neighbors Against Phibro Tech*** submits the following comparison as further evidence of the DTSC' s failure to fulfill its mandate ... and to demonstrate the shocking disregard for compliance with the consent decree entered into by Phibro-Tech, Inc.
14.35 Sanchez Documents J28	In 1991, PTI was subject to criminal prosecution for its historic non-compliance with obligations related to groundwater and soil contamination. On July 29, 1991, the USEPA, the DTSC, and PTI entered into a *Corrective Action Consent Order* (CACO), which included provisions for prosecution, but avoided potential litigation on the basis of compliance. On August 2, 1995, the Consent Order was **modified**, which included the elimination of the threat of **criminal prosecution**. The parties agreed that the more stringent requirements "*shall govern the corrective action required*". Consequently, PTI was compelled to conduct corrective action "***within one year***". The record clearly shows that from July 29, 1991 to the present, **PTI** has **failed to comply** with the Corrective Action Consent Order.
14.51 Sanchez Documents J28	... Finally, that after almost a quarter of a century of failure on the part of Phibro Tech to comply with the consent decree, we request that the DTSC implement the "***Existing Facility Closure Plan***" in accordance' the provisions provided by statute. ...
15.23 Hearing Transcript J28	MS. DE LOZA: Thank you. Jaime Sanchez is our last speaker. Is there any other speakers that would like to turn in a card? MR. [JAIME] SANCHEZ: Neighbors Against Phibro-Tech is a group of concerned residents of Los Nietos and Santa Fe Springs who have previously requested from the DTSC to deny the hazardous waste facility permit for Phibro-Tech. ... Specifically, Phibro-Tech entered into a consent -- corrective action consent order in 1991. Phibro-Tech modified the -- the consent order was modified in 1995, at which time Phibro-Tech was compelled to conduct corrective action within one year. Approximately 25 years later, the DTSC has failed to obtain compliance from Phibro-Tech.

It is not clear which consent decree or Corrective Action Consent Order the commenter is referring too. DTSC does not have record of a July 29, 1991 Corrective Action Consent Order. DTSC believes the commenter may be referencing either the Federal Permit for a Hazardous Waste Management Facility issued by the U.S. Environmental Protection Agency ("U.S. EPA") to the Facility effective July 29, 1991 or the Hazardous Waste Facility Permit issued by the Department of Health Services to the Facility effective July 29,1991. Both permits required corrective action for Solid Waste Management Units. The Federal permit was superseded when the state permit was modified by DTSC in a DTSC-Initiated Permit Modification, effective August 2, 1995 to require PTI to conduct corrective action or cleanup. All but two of the corrective action elements of the selected cleanup have been implemented.

A reoccurring public comment continues to refer to a one year deadline alleging Phibro-Tech has failed to comply with a corrective action consent order within one year. DTSC is not aware or has yet to find this deadline in any corrective action consent orders or similar language in a corrective action consent order.

RESPONSE 43

Comment Number	Comment
22.4 Chandler Letter F15	I have no quibble with the specific activity, however as you are aware, I have worked at DTSC for an embarrassing number of years. I recall in 1995 embedding a Selected Remedy into the long-expired Phibro-tech, Inc. (PTI) permit at the behest of U.S. Environmental Protection Agency (EPA). As I am sure you are aware, this was done through means of a Class 3 permit modification. EPA had made the inclusion of their selected cleanup remedy into the Permit a principle condition of EPA allowing DTSC to take over as lead on corrective action. Up to that point EPA had been lead.
22.5 Chandler Letter F15	After that permit modification, DTSC was supposed to implement corrective action by overseeing the selected remedy. DTSC of course failed miserably at implementing many elements of that remedy. EPA had intended that corrective action go forward with all of the supposed rigor and strength of permit enforceability. It reckoned without DTSC's ability to screw things up. The rigor for the most part became rigormortis for the next 10-15 years.
22.6 Chandler Letter F15	However the selected remedy is still embedded in the expired permit and PTI is bound to continue implementing that expired permit until their permit is renewed.
22.7 Chandler Letter F15	However the selected remedy is still embedded in the expired permit and PTI is bound to continue implementing that expired permit until their permit is renewed. No problem, it has only been 20 years since their permit expired---gee-whiz I remember when the preliminary evaluation of their renewal application was first done in 1996.
22.18 Chandler Letter F15	• For various and sundry reasons, DTSC has failed to enforce all of the remedy implementation in a timely fashion----that envisioned in the detailed schedule of compliance in the 1995 Class 3 modification that made the remedy part of the permit. ...

DTSC appreciates that the commenter does not have any quibble with the specific activity proposed. The proposed interim measure is necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated. The proposed interim measure targets the soil below the facility that is the biggest threat to groundwater from hexavalent chromium contamination. DTSC believes that cleanup of the hexavalent chromium impacted soil by injection of calcium polysulfide will eliminate the concentration spikes in groundwater historically seen when groundwater levels rise up to the impacted soil zone.

PTI is required to implement the corrective action measures selected and required in its existing permit, as modified by DTSC in a DTSC-Initiated Permit Modification, effective August 2, 1995. These corrective measures were selected jointly by DTSC and U.S. Environmental Protection Agency. Any changes to the substantive

requirements of the selected remedy in the existing permit will require a permit action, such as a permit modification.

All but two of the elements of the selected cleanup have been implemented including:

1) Deed Restriction;
2) Quarterly Groundwater Monitoring;
3) Soil Vapor Survey;
4) Soil Vapor Extraction to cleanup Halogenated Volatile Organic Compounds in soil;
5) In-Situ Bioventing for petroleum hydrocarbons constituents in soil;
6) Containment Measures to prevent further contamination;
7) Berming facility boundary to prevent potential off-site contamination; and
8) Vadose Zone Monitoring to prevent any potential impact to soil or to provide early warning of potential releases to soil.

The Surface Water Monitoring requirement of the Permit Modification has been eliminated as surface water no longer discharges offsite. The Plant portion of the facility has been regraded so that surface water runoff drains to interior sumps where it is pumped into the nearby waste water treatment tanks, treated, and either used on Site or discharged to the sanitary sewer.

Cleanup of the VOCs and petroleum hydrocarbons (gasoline and diesel) was addressed with a soil vapor extraction and bioventing system (SVES). The removal of VOC and petroleum hydrocarbon vapor from the soil removed these chemicals from the ground. The SVES removed over 13,000 pounds of chemical waste after operating for five years. The SVES data is currently being reviewed to determine if soil vapor cleanup is complete.

The remaining corrective measure required to be implemented at the Facility is groundwater remediation. PTI is required to remediate contaminated groundwater through pumping of contaminated groundwater and treatment. Hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility. The pump and treat method of groundwater cleanup cannot effectively eliminate the long term threat to the groundwater from the hexavalent chromium impacted soil at the facility. The proposed interim measure targets a specific area below the Facility that is the biggest threat to groundwater from hexavalent chromium contamination, should rising groundwater levels come into contact with hexavalent chromium impacted soil. DTSC believes that cleanup of the hexavalent chromium impacted soil by injection of calcium polysulfide (CPS) will eliminate the concentration spikes in groundwater historically seen when groundwater levels rise up to the impacted soil zone. The groundwater will be monitored for decades to come to verify that the cleanup does not have adverse impacts on the environment.

PTI has also proposed to modify required groundwater cleanup of hexavalent chromium by pump and treat methods to injection of CPS. Following the successful implementation of the 2012 pilot test to treat hexavalent chromium impacted vadose zone soils and in groundwater using CPS injections, PTI proposed modifying the selected groundwater remedy required in the Permit and submitted a Corrective Measures Study Report (CMS) to DTSC for approval. The purpose of the CMS is to evaluate groundwater remediation alternatives and propose a remedy to replace groundwater treatment selected and required to be implemented in the Permit. DTSC is reviewing the Revised CMS. Such modification will require a permit action, such as a modification to either the existing permit or a subsequent permit decision.

PENDING RENEWAL PERMIT FOR PHIBRO-TECH

RESPONSE 44

Comment Number	Comment
2.9 Aquino EMail J21	Let me be clear, the pending permit needs to be denied and the plant needs to close anything else is unacceptable. If necessary additional and appropriate steps will be taken including filing a formal claim for damages with the State by every homeowner in our community. If those claims are denied seeking appropriate legal remedies.
14.50 Sanchez Documents J28	... In addition, we request that the DTSC ... and that they **deny** the pending Hazardous Waste Facility Permit. ... ...
15.5 Hearing Transcript J28	MR. [ART] ESCOBEDO: ... This is a problem that, in their eyes, the only way that can be corrected is if -- is the removal of the company .... They do not want Phibro-Tech here. ...
15.8 Hearing Transcript J28	MR. [ART]ESCOBEDO: ... Therefore, and to conclude my statement, we want Phibro-Tech gone. That simple and that quick. We want it gone. We want the soil gone. We all want it to end now and today. ....
15.21 Hearing Transcript J28	MR. [ISAAC] HERNANDEZ : My name is Isaac Hernandez, I-s-a-a-c. Cities and big companies, we are sure you will tell us everything we want to hear. In order to make your dollars at the expense of the residents and communities, of the course to get a permit renewed this companies were hired the best advisors and put any connections they have. Of course they will say there is no health risk, otherwise they would not get permits, and no permits means no money in their pockets and in the cities. Why renew permits when everybody knows that this company is handling toxic chemicals? Why not shut this company once and for all?
19.9 Martinez Letter F08 Attachment J28	I Benjamin Martinez, Jr. am of the opinion, that PHIBRO-TECH should close their facility at 8851 Dice Road, Santa Fe Springs, California.

These comments raise issues, which do not deal directly with the Revised Pond 1 Closure Plan, the Corrective Action Interim Measure Work Plan, and the DTSC initiated permit modification to revise the Pond 1 Closure Plan that was circulated for public comment.

DTSC continues to review PTI's submitted Renewal Permit Application and has not made a final determination.

RESPONSE 45

Comment Number	Comment
1.1 Local Neighbor Letter J19	I am for the closure of the facility because around the area houses lots of families.
2.6 Aquino EMail J21	This plant needs to be closed because of the close proximity (550 ft) to homes, schools, senior centers and library.

19.3 Martinez Letter F08	The population of SANTA FE SPRINGS is not affected by the contamination around their city. On the other hand, we in WEST WHITTIER/LOS NIETOS area are exposed and affected by their business model. I am asking you to DENY a CLASS 2 PERMIT to PHIBRO-TECH, INC. or any type of permit to operate in our environment.

DTSC is aware that the Los Nietos residents are near an area of Santa Fe Springs zoned for Industrial Use. The PTI facility, located within this Industrial Zone, is within a 550 feet to the nearest residential area.

DTSC continues to evaluate and monitor the potential for impacts to the community. A number of health risk assessments have been conducted over the course of the last several years under DTSC's oversight, which assess the potential for releases and contamination from PTI to affect the nearby population.

Two recent risk assessments were released in 2015:

- [PTI] Current Operations Health Risk Assessment, dated January 15, 2015
- [PTI] Final Human Health Risk Assessment for historical Releases to Soil and Groundwater, dated February 2015

Both of these health risk assessments demonstrated that there was no significant risk above a level that would be considered health protective to residents of the Los Nietos and West Whittier neighborhoods, including the residences of maximal exposure which are located in the vicinity of Burke Street and Skabo Avenue.

RESPONSE 46

Comment Number	Comment
2.7 Aquino EMail J21	This plant needs to be closed ... They have been cited numerous times and have active violations that still have not been corrected sounds like another Exide Battery Plant (Commerce) to me.
14.2 Sanchez Documents J28	***Neighbors Against Phibro Tech*** is a group of concerned residents of Los Nietos and Santa Fe Springs, who have previously requested that the Department of Toxic Substances Control (DTSC) **deny the Hazardous Waste Facility Permit** for Phibro-Tech, Inc. (PTI) The request is based on the historic and ongoing **failure** of **PTI** to comply with laws, regulations, and policies governing hazardous materials and hazardous waste.
14.29 Sanchez Documents J28	**PTI:** Has run afoul of environmental regulations for years. Local, state and federal officials **cited the plant** <u>over and over</u>. Ground water and soil have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, and for violating hazardous waste laws.
14.32 Sanchez Documents J28	**PTI:** The California Department of Toxic Substances Control (**DTSC**), had **known** for years that PTI was violating environmental laws by releasing pollutants into the **soil and water**, but **failed** to stop it. ...
14.47 Sanchez Documents J28	It is without question, that on the basis the historical failure to comply with the laws governing toxic substances and the appalling degree of contamination, a serial polluter such as Exide deserved to be shut down. It is our opinion that Phibro Tech too is a serial polluter, and that their conduct is just as egregious as that of Exide. Indeed, a valid argument can be made that Phibro - Tech, Inc. deserves the same fate. ...

15.9 Hearing Transcript J28	MR. [ART]ESCOBEDO: ... ... They invited me out to their company, and I refused to go out, as my colleague on the board has indicated they have been cited 34 times and every time they invite me to go out I say, "Before I do that , show me proof that you have made corrections to each one of those infractions." And I am still waiting for it. Thank you.
15.16 Hearing Transcript J28	MR. [NICK] AQUINO: ... My colleague mentioned some violations. Why – in fact -- and this is a history that I think is relevant to the permit process. 16 major violations, 6 Class 2 violations, and 12 minor violations, for a grand total of 34 since Phibro-Tech has opened the plant.
15.17 Hearing Transcript J28	MR. [NICK] AQUINO: ... You know, I'm curious -- the health department goes out and they go to a restaurant. And let's say, for example, the inspector discovers the restaurant doesn't have any hot potable water. What happens? The restaurant gets shut down. We have 34 violations, and this plant is still operating.
15.22 Hearing Transcript J28	MR. [JAIME] SANCHEZ: Neighbors Against Phibro-Tech is a group of concerned residents of Los Nietos and Santa Fe Springs who have previously requested from the DTSC to deny the hazardous waste facility permit for Phibro-Tech. The request is based on historical and on-going failure of PTI to comply with laws, regulations, policies governing hazardous materials and hazardous waste. ...

The type and history of violations at PTI has relevance to the permit renewal decision, but not to the projects under consideration, which are the modifications to the Pond 1 Closure Plan and the Interim Measure Work Plan.

When considering a permit application, DTSC carefully evaluates a facility's compliance history to determine whether approval of the application is warranted. For all permit applicants, DTSC also considers the severity and pattern of any violations, potential for environmental or human health impact and the applicant's cooperation and timeliness in returning to compliance. DTSC considers the full picture of a facility's history, with an emphasis placed on facility activities since DTSC's last permit decision.

DTSC is currently conducting an analysis of the PTI's compliance history. As part of this analysis, DTSC includes compliance review inspections conducted by the most active and relevant agencies with oversight responsibilities at PTI, including DTSC, the Regional Water Quality Control Board, the Air Quality Management District, and the Los Angeles County Environmental Health Department (the Certified Unified Program Agency, or CUPA). DTSC will make its analysis available with its Final Permit Decision

RESPONSE 47

Comment Number	Comment
4.2 Aquino Yellow Card J28	Nick Aquino -- The pending Permit involves no Expansion @ the Facility
15.10 Hearing Transcript J28	MS. DE LOZA: So we will have Benjamin Martinez followed by Nick Aquino. MR. [BENJAMIN] MARTINEZ: Okay. I am back to what I said earlier. I went to Phibro-Tech' s facility. I took a tour of their facility. I was impressed with what they were doing, and I said so. However, they have outgrown their facility. ...

15.11 Hearing Transcript J28	MS. DE LOZA: So we will have Benjamin Martinez followed by Nick Aquino. MR. [BENJAMIN] MARTINEZ: ... It is too small for what they are doing, and whatever residue they develop from their processing facility, the are there recycling those chemicals -- it's going to go in the air. I mean, Exxon Mobile is a classic example. I keep bringing that up. They are small, but they created the same issue.
19.6 Martinez Letter F08 Attachment J28	PHIBRO-TECH 01/28/2016 I have toured their facility and have seen their work enviroment in action. Unfortunately, they have outgrown their location of operation.

Comments noted.

RESPONSE 48

Comment Number	Comment
14.26 Sanchez Documents J28	PTI received an Interim Status Document effective in December 1981 and obtained Hazardous Waste Facility Permits in July 1991 from both the U.S. Environmental Protection Agency and the DTSC. Before PTI's permit expired in 1996, the facility submitted a permit renewal application. DTSC has allowed PTI to continue operating under the existing expired permit until a final permit determination is made on the renewal application.
14.33 Sanchez Documents J28	**PTI:** The California Department of Toxic Substances Control (**DTSC**), had **known** for years that PTI was violating environmental laws by releasing pollutants into the **soil and water**, but **failed** to stop it. For almost **25 years** the state allowed the plant to operate **with an expired permit**, even as inspectors documented numerous violations.
19.8 Martinez Letter F08 Attachment J28	PHIBRO-TECH has been operating with an expired permit as of July 29, 1996. The California Department of Toxic Substances Control, has allowed PHIBRO-TECH to operate under the 1991 permit, until a new and revised permit is issued.
22.8 Chandler Letter F15	So, PTI has managed to operate on an expired permit for 20 years ....

This comment raises issues, which do not deal directly with the Revised Pond 1 Closure Plan, the Corrective Action Interim Measure Work Plan, and the DTSC initiated permit modification to revise the Pond 1 Closure Plan that was circulated for public comment.

DTSC continues to review Phibro-Tech's submitted Renewal Permit Application and has not made a final determination.

However, to address your concern, DTSC provides the following response.

DTSC issued Phibro-Tech, Inc. a Hazardous Waste Facility Permit (Permit) on July 29, 1991. This Permit was valid for five years and expired on July 29, 1996. Phibro-Tech reapplied for a new permit on March 29, 1995. Pursuant to California law, Phibro-Tech is authorized to continue operating pursuant to the existing permit conditions until the Department makes a final decision of the renewal application. DTSC is currently reviewing Phibro-Tech's permit renewal application and therefore, Phibro-Tech currently operates its facility under its expired permit. (Health & Saf. Code §25200 (c)(1)(B); Cal.Code Regs., tit. 22, § 66270.51). DTSC continues to inspect the Facility to ensure Phibro-Tech's compliance with its permit, and the state's environmental laws and regulations.

VIOLATIONS at PHIBRO-TECH

RESPONSE 49

Comment Number	Comment
2.1 Aquino EMail J21	**First:** How many DTSB citations/violations have been issued to PTI over the course of operation of the plant? If you don't know the answers to these question please delegate them to someone on your staff that can answer them. Please don't refer me somewhere to look them up this is not the public service that your agency is tasked with and I find it offensive.
2.2 Aquino EMail J21	**Second:** Are there open citations/violations that PTI has failed to correct and if so when were they issued? If you don't know the answers to these question please delegate them to someone on your staff that can answer them. Please don't refer me somewhere to look them up this is not the public service that your agency is tasked with and I find it offensive.
2.3 Aquino EMail J21	**Third:** Concerning the stipulated settlement reached with the plant several years ago how much of the $400,000+ award to DTSB was used to remediate the existing violations and how much was retained by DTSB and for what purpose. If you don't know the answers to these question please delegate them to someone on your staff that can answer them. Please don't refer me somewhere to look them up this is not the public service that your agency is tasked with and I find it offensive.
15.19 Hearing Transcript J28	MR. [NICK] AQUINO: ... Additionally, there was a settlement agreement wherein your department received $425,000. The settlement is dated November 3, 2003, and I would like to state where that money went, according to your very own press release. The consent order was signed on October 9, 2003. "PTI will pay a total of $425,000, of which $399,200 is an administrative penalty, and $25,800 is reimbursement of cost incurred. "I'm lost. None of that money was used for remediation of any of those issues?

All administrative penalties received by DTSC in settlement of hazardous waste violations are deposited into the Toxic Substances Control Account. (Health & Saf. Code § 25187). Uses of the Toxic Substances Control Account is prescribed by California law and was not used to "remediate" the violations found.

DTSC inspects Phibro-Tech on a regular basis for compliance with California Laws, regulations and its Hazardous Waste Facility Permit conditions. DTSC conducted inspections of PTI in 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2008, 2006, 2005, 2004, 2003, 2002, 2001, 2000, 1999, 1998, 1996, 1995, 1993, 1992 and 1991. As a result of most of these inspections, DTSC found violations and took enforcement action. Most of these cases have been resolved; however, DTSC currently has enforcement actions pending against Phibro-Tech. For information regarding PTI's enforcement history, please see DTSC's EnviroStor website.

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

RESPONSE 50

Comment Number	Comment
22.9 Chandler Letter F15	So, PTI has managed to operate on an expired permit for 20 years but I continue to be amazed by DTSC's efforts to avoid transparency in its dealings with the public on permit matters ...
22.21 Chandler Letter F15	• I plan on requesting EPA to audit DTSC's specific compliance with the RCRA- equivalent statutes and regulations as I would add that the water boards should also be subject to such compliance reviews. Further, I will ask EPA, because of its increasing emphasis on enhanced transparency, to examine DTSCs **LACK OF TRANSPARENCY** in its specific **ACTIONs** with respect to PTI as opposed to DTSC's sterling generalized **WORDs** in that regard.

Comment noted.

RESPONSE 51

Comment Number	Comment
22.11 Chandler Letter F15	This is not to mention a breach of faith with the U.S. Environmental Protection Agency (EPA) from which DTSC has obtained authorization to administer the state hazardous waste program in lieu of the federal program.
22.17 Chandler Letter F15	• What makes this whole business much worse is that as lead agency EPA selected the remedy, albeit with some last minute help from DTSC, required DTSC to put the remedy into the then-current permit and on that condition passed implementation of the remedy as lead agency to DTSC. **EPA WANTED THE REMEDY TO BE ENFORCED THROUGH THE MECHANISM OF THE PERMIT.**
22.20 Chandler Letter F15	• I plan on requesting EPA to audit DTSC's specific compliance with the RCRA- equivalent statutes and regulations as I would add that the water boards should also be subject to such compliance reviews. ...
22.21 Chandler Letter F15	• I plan on requesting EPA to audit DTSC's specific compliance with the RCRA- equivalent statutes and regulations as I would add that the water boards should also be subject to such compliance reviews. Further, I will ask EPA, because of its increasing emphasis on enhanced transparency, to examine DTSCs **LACK OF TRANSPARENCY** in its specific **ACTIONs** with respect to PTI as opposed to DTSC's sterling generalized **WORDs** in that regard.

DTSC is in frequent contact with EPA officials regarding on-going activities at Phibro-Tech.

Nearly all the corrective action activities identified in the permit have been completed under DTSC's oversight. The sole significant element that has not been implemented is the pump-and-treat groundwater remediation. The monitoring wells that historically have had the biggest impacts from hexavalent chromium contamination currently have hexavalent chromium concentrations that are at or below the Omega Plume background concentrations. Hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility. The pump and treat method of groundwater cleanup cannot effectively eliminate the long term threat to the groundwater from the hexavalent chromium impacted soil at the facility. DTSC believes that cleanup of the hexavalent chromium

impacted soil by injection of calcium polysulfide will eliminate the concentration spikes in groundwater historically seen when groundwater levels rise up to the impacted soil zone.

The proposed interim measures to treat hexavalent chromium in the soil address a deficiency of the corrective action requirements of the permit, which had no specific corrective action activities to address hexavalent chromium in soil. Additionally, the interim measures will protect groundwater from future contamination by eliminating the potential for rising groundwater levels or surface water infiltration to leach hexavalent chromium currently present in soil into the groundwater.

PTI has also proposed modifying required groundwater cleanup pump and treat methods to in situ treatment (injection of calcium polysulfide (CPS)). The success of this type of treatment was evaluated by a pilot and appears to have been successful at reducing hexavalent chromium concentrations in the subject area to below the cleanup goals. DTSC is reviewing a draft Corrective Measures Study proposed by PTI.

RESPONSE 52

Comment Number	Comment
22.50 Chandler Letter F15	• In a previous letter to Debbi Rafael, dated February 12, 2013, it should be noted that the failure to comply with CEQA for the de facto modification (removal of corrective action and alteration of the previously approved remedy) of the currently applicable permit by removing corrective action could subject DTSC to a lawsuit under Public Resources Code statutes. • Please note, that I do not show DTSC ever responding to the February 12, 2013 letter. While it is standard practice for DTSC to ignore me and fail to respond to issues that I raise, it remains annoying and is a sign that DTSC is hypocritical about its transparency and public responsiveness. As part of this public notice process, I renew my request for a meaningful response to the subject comment letter.

DTSC's records indicate that the commenter's letter of February 12, 2013 was regarding the Exide Facility and not the Phibro-Tech Facility. The commenter submitted another letter, dated February 16, 2013, regarding the Phibro-Tech Facility, which DTSC responded to in a letter dated April 25, 2013.

RESPONSE 53

Comment Number	Comment
14.38 Sanchez Documents J28	**PTI:** State regulators have **failed** to order PTI to test soil in nearby homes. DTSC has not revealed how far ground water and soil (and in the opinion of residents, the air as well) have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, which are **dangerous** to **human health** and / or cause **harm** to the **environment**.

DTSC is not aware of any current or historic PTI processing operations that would have been responsible for particulate deposition in soil in surrounding neighborhoods. There is no evidence from air monitoring stations at the PTI facility that would suggest particulate air emissions from the facility operations. The historic releases of chemicals from the facility to the soil were from former underground storage tanks and surface impoundments that were present below the ground surface and pavement. Inhalation exposure pathways do not exist from these chemicals in the soil, below the ground, to the public or the surrounding neighborhoods.

RESPONSE 54

Comment Number	Comment
2.8 Aquino EMail J21	Your Board receives public tax dollars to PROTECT the PUBLIC from toxic substances and if your Board is unable to do the job it was tasked with than it serves no purpose and should be eliminated and the State held accountable for its failure to protect the tax payers and residents of communities that are affected by these types of facilities.
15.20 Hearing Transcript J28	MR. [NICK] AQUINO: ... Look. Here's the bottom line, folks. I work for the government as well, and if we were as effective as you are in the job that you do, we wouldn't exist as you do. I think it's time the state defunds your organization and taxpayers and residents get benefits of their tax dollars in another fashion. Thank you for allowing me the opportunity to comment.

Comment noted. DTSC is committed to protect Californians and their environment from exposure to hazardous wastes. DTSC takes enforcement action against violators; oversees cleanup of hazardous wastes on contaminated properties; and makes decisions on permit applications from companies that want to store, treat or dispose of hazardous waste. Finally, DTSC is committed to engaging the public in a way that gives those most affected by its decisions opportunities to voice their concerns and ask questions, such as this public comment process.

CLASS 2 PERMIT MODIFICATION REQUEST

RESPONSE 55

Comment Number	Comment
19.4 Martinez Letter F08	I am asking you to DENY a CLASS 2 PERMIT to PHIBRO-TECH, INC. or any type of permit to operate in our environment. History has taught us that contamination and humans can not co-exist. Contamination only gets worse and humana pay ultimate price with their health and well being.
23.2 Amira EMail F21	I have lived and worked in Los Nietos over 50 years, consequently I have witnessed the many changes to the area, which have been mostly negative. I have attended various Phibro-Tech meetings, presentations and toured the facility. ...
23.4 Amira EMail F21	In regard to the permit modification, my position is that it be denied. ...
23.5 Amira EMail F21	In regard to the permit modification, my position is that it be denied. I find it interesting, that at the meetings presented to the public, the information on violations were not disclosed. ...
23.6 Amira EMail F21	In regard to the permit modification, my position is that it be denied. ... Phibro-Tech has been allowed to operate on an expired permit for over 20 years. ...
23.7 Amira EMail F21	In regard to the permit modification, my position is that it be denied. ... If you want cooperation from the community that is most affected by Phibro-Tech practices, it is vital that there be more communication and transparency. ...

23.8 Amira EMail F21	In regard to the permit modification, my position is that it be denied. ... It is obvious that low income, minority communities are subject to a disproportional number of environmental hazards resulting in many health issues. Why?
23.9 Amira EMail F21	I appreciate the outreach efforts Phibro-Tech has attempted and I feel that the involvement by the D.T.S.C. would have been the necessary step to adequately represent both the residents and the company. ...
23.10 Amira EMail F21	... My hope, is that the D.T.S.C. be impartial during the process of permit authorization and not be pressured by City leaders and corporate greed.
23.11 Amira EMail F21	Respectfully, Christine Amira

DTSC issued a “DTSC-Initiated Permit Modification” for the Pond 1 Closure Plan, which included the closing of Pond 1, and the closing of four wastewater treatment tanks: W1, W2, W3 and W4. A public review comment period was held starting December 15, 2015, ending February 15, 2016.

This Response to Comments document includes responses to comments concerning the Pond 1 Closure Plan.

During the same time-frame, Phibro-Tech Inc. submitted a Class 2 Permit Modification Request, which asked for authorization to install four tanks to replace W1-W4, increase the storage area footprint of two container storage areas without increasing the volume capacity, and close / replace a filter press. The public comment period for the PTI’s Class 2 Permit Modification Request began December 22, 2015 until February 22, 2016. PTI hosted a public meeting on February 3 at the Gus Velasco Neighborhood Center, in Santa Fe Springs.

DTSC intends to provide responses to PTI’s Class 2 Permit Modification Request under a separate document.

COMMUNITY CONCERNS

RESPONSE 56

Comment Number	Comment
14.28 Sanchez Documents J28	**PTI:** The plant operates in the industrial city of Santa Fe Springs, bordering Los Nietos, and has contaminated ground water and soil over decades. ...
14.30 Sanchez Documents J28	**PTI:** Has run afoul of environmental regulations for years. Local, state and federal officials **cited the plant** over and over. Ground water and soil have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, and for violating hazardous waste laws.
14.31 Sanchez Documents J28	In 1997, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" at **concentrations nearly 3 million times the state public health goal**.

14.37 Sanchez Documents J28	State officials believe PTI's hazardous waste and hazardous materials contaminated soil and ground water in two southeast L.A. County communities: Los Nietos and Santa Fe Springs. State regulators have **failed** to order PTI to test soil in nearby homes. DTSC has not revealed how far ground water and soil (and in the opinion of residents, the air as well) have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, which are **dangerous** to **human health** and / or cause **harm** to the **environment**.
14.39 Sanchez Documents J28	DTSC has not revealed how far ground water and soil (and in the opinion of residents, the air as well) have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, which are **dangerous** to **human health** and / or cause **harm** to the **environment**.
14.43 Sanchez Documents J28	In 1997, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" **at concentrations nearly 3 million times the state public health goal.** Removing the contamination from the ground water and soil would be extensive.
15.24 Hearing Transcript J28	MR. [JAIME] SANCHEZ: . .. In 1997, the established maximum contaminate level for hexavalent chromium established by the EPA was two parts per billion. The EPA determined that the concentrations of hexavalent chromium were three million -- and let me repeat that -- three million times greater than the public health goal. The interim measure proposed by the DTSC seeks to treat the contamination with calcium polysulfide solutions. Hexavalent chromium refers to compounds that contain elements of chromium in the positive 6 oxide state.

Comments noted.

The proposed interim measure is necessary to abate an imminent threat to the environment and to prevent or minimize the spread of contaminants while long-term corrective action is being evaluated. The proposed interim measure targets specific areas of soil below the facility that is the biggest threat to groundwater from hexavalent chromium contamination. The historic releases of chemicals at the facility were from former underground storage tanks that were present below the ground surface and pavement including a chromic acid tank, removed in 1979, and two, 10,000 gallon underground fuel tanks, both removed in 1985. The releases migrated below ground from the tanks to the soil.

DTSC believes that cleanup of the hexavalent chromium impacted soil by injection of calcium polysulfide will eliminate the concentration spikes in groundwater historically seen when groundwater levels rise up to the impacted soil zone. The hexavalent chromium concentrations in groundwater have dropped now that the groundwater is no longer in contact with the soil impacted with hexavalent chromium below the facility. (The depth to groundwater has continued to drop since the start of the drought in the Los Nietos/Santa Fe Springs area.) The hexavalent chromium concentrations in groundwater now reflect the background concentrations found in the Omega Plume.

DTSC does not have evidence or information suggesting that residential cleanup is currently necessary. The Phibro-Tech Facility does not process or handle any hazardous wastes that produce particulate air contamination. There is no evidence from air monitoring stations at the Phibro-Tech facility that would suggest that soil in the surrounding community may be impacted from any facility air emission. Inhalation exposure pathways do not exist from these chemicals in the soil, below the ground, to the public or the surrounding neighborhoods.

Historic field investigations have revealed the nature and extent of soil and groundwater contamination at the facility. Data from these investigations can be found in numerous historical reports including the RCRA Facility Investigation Phase I Report and the Data Gap Investigation Report. Two, recent Human Health Risk Assessments (HHRA) have been submitted to DTSC. One assessed the risk to human health from historic releases of chemicals to the soil and groundwater at the facility and the other assessed the risk to human health

from the current facility operations. Both HHRAs found that the facility conditions are fully protective of the health of current offsite residential populations. These reports and many others can be found on the DTSC's EnviroStor page.

RESPONSE 57

Comment Number	Comment
14.25 Sanchez Documents J28	The residents of Los Nietos and Santa Fe Springs requested that the DTSC conduct an "Environmental Impact Report" to determine the probable dangers to the surrounding community, and a "Health Risk Assessment" to determine the degree of risk to human health. The failure of the DTSC to do so has stirred outrage in working-class, Latino communities near the plant and raised questions about why state regulators failed to act sooner.
15.4 Hearing Transcript J28	MS. DE LOZA: Our first speaker is Art Escobedo. MR. [ART] ESCOBEDO: The reason why I am here is one -- for one specific reason, and that is I am the president of the Los Nietos Board of Education. ... I also represent a community of not only frightened people but very angry people.
15.21 Hearing Transcript J28	MS . DE LOZA : Thank you. Isaac Hernandez followed By Jaime Sanchez. MR. [ISAAC] HERNANDEZ : My name is Isaac Hernandez, I-s-a-a-c. Cities and big companies, we are sure you will tell us everything we want to hear. In order to make your dollars at the expense of the residents and communities, of the course to get a permit renewed this companies were hired the best advisors and put any connections they have. Of course they will say there is no health risk, otherwise they would not get permits, and no permits means no money in their pockets and in the cities. Why renew permits when everybody knows that this company is handling toxic chemicals? Why not shut this company once and for all?
16.2 Alvarado EMail J28	As a lifetime Los Nietos resident who has very often experienced negative issues in regard to Santa Fe Springs' industrial companies, I would like to yet again express my dismay at the continuing environmental racism that seems to be a never ending vicious cycle for Los Nietos.
16.3 Alvarado EMail J28	In the past few years we've had to tolerate the plans for a MRF despite our protests at meetings, through letter-writing, e-mails, phone calls and informing the public.
16.4 Alvarado EMail J28	As was the case with the MRF, the Phibro-Tech issue continues to repeat never-ending meetings (of various sizes)/workshops, information, definitions, statistics ad nauseum. It begins to remind me of the definition of insanity. Please help an already overburdened community find some sanity and GENUINE CARE by my simple request: CLOSE DOWN PHIBRO-TECH NOW!
19.19 Martinez Letter F08 Attachment J28	By ignoring all the warning signs around us, we are leaving to those who come after us, a world of contamination. Industrial contamination is both lethal and final, no do overs. So I say again, PHIBRO-TECH has to move away from.here.

DTSC understands that the public reasonably expects that DTSC exercise a high level of care when considering permitting and cleanup decisions within its jurisdiction, and in particular with respect to Phibro-Tech. DTSC is mindful of the commenters' heightened concern. DTSC continues to inspect the Facility to ensure Phibro-Tech's compliance with its permit, and the state's environmental laws and regulations. DTSC is determined to use the full authority in the law and regulations to assure that PTI operates the facility in compliance and in a manner that is protective of public health and the environment.

DTSC is committed to protect Californians and their environment from exposure to hazardous wastes. DTSC takes enforcement action against violators; oversees cleanup of hazardous wastes on contaminated properties; and makes decisions on permit applications from companies that want to store, treat or dispose of hazardous waste. Finally, DTSC is committed to engaging the public in a way that gives those most affected by its decisions opportunities to voice their concerns and ask questions.

RESPONSE 58

Comment Number	Comment
15.7 Hearing Transcript J28	MR. [ART] ESCOBEDO: ... ...They do not want Phibro-Tech here. As a representative -- we are a small community. We do not have a city council. In fact, the city council that has jurisdiction over Phibro-Tech is not here tonight. Not even somebody from the city. That tells you that they don't care about this community or they wouldn't be placing companies like Phibro-Tech to this community and our schools.

Comment noted. DTSC is committed to protect Californians and their environment from exposure to hazardous wastes. DTSC takes enforcement action against violators; oversees cleanup of hazardous wastes on contaminated properties; and makes decisions on permit applications from companies that want to store, treat or dispose of hazardous waste. Finally DTSC is committed to engaging the public in a way that gives those most affected by its decisions opportunities to voice their concerns and ask questions.

APPENDIX A

COMMENT-RESPONSE INDEX

The Comment-Response Index provides a cross reference between the submitted comment documents, the comment numbers and DTSC's responses for the Response to Comments Document dated May 25, 2016.

DTSC received 22 documents from the public during a public review period held December 15, 2015 to February 15, 2016. These documents were assigned a document number (1 – 22) in the order of when they were received.

DTSC identified comments within the documents and assigned a comment number for each. For instance, if document #50 contained 3 comments, they were assigned comment number 50.1, 50.2, and 50.3 respectively. A list of the documents is provided below the Index.

Appendix B contains copies of the documents with comment numbers identified in the margin. The numbers may be out of sequence or some numbers skipped based on the way some comments were grouped together for response.

COMMENT-RESPONSE INDEX

Response to Comment Document
May 25, 2016

Commenter Document	Comment Number	Response Number
Local Neighbor Letter J19	1.1	45
Aquino EMail J21	2.1	49
Aquino EMail J21	2.2	49
Aquino EMail J21	2.3	49
Aquino EMail J21	2.5	17
Aquino EMail J21	2.6	45
Aquino EMail J21	2.7	46
Aquino EMail J21	2.8	54
Aquino EMail J21	2.9	44
Durand Yellow Card J28	3.1	24
Durand Yellow Card J28	3.2	23
Durand Yellow Card J28	3.3	8
Durand Yellow Card J28	3.4	8
Durand Yellow Card J28	3.5	25
Aquino Yellow Card J28	4.1	30
Aquino Yellow Card J28	4.2	47
Soto Yellow Card J28	5.1	40
Soto Yellow Card J28	5.2	40
Soto Yellow Card J28	5.3	16
Soto Yellow Card J28	5.4	17
Martinez Green Card J28	9.1	1
Sanchez Documents J28	14.2	46
Sanchez Documents J28	14.3	42
Sanchez Documents J28	14.4	16
Sanchez Documents J28	14.6	20

Commenter Document	Comment Number	Response Number
Sanchez Documents J28	14.12	18
Sanchez Documents J28	14.13	21
Sanchez Documents J28	14.14	19
Sanchez Documents J28	14.15	19
Sanchez Documents J28	14.15	22
Sanchez Documents J28	14.16	22
Sanchez Documents J28	14.17	22
Sanchez Documents J28	14.21	42
Sanchez Documents J28	14.23	35
Sanchez Documents J28	14.24	24
Sanchez Documents J28	14.25	57
Sanchez Documents J28	14.26	48
Sanchez Documents J28	14.28	56
Sanchez Documents J28	14.29	46
Sanchez Documents J28	14.30	56
Sanchez Documents J28	14.31	56
Sanchez Documents J28	14.32	46
Sanchez Documents J28	14.33	48
Sanchez Documents J28	14.35	42
Sanchez Documents J28	14.37	56
Sanchez Documents J28	14.38	53
Sanchez Documents J28	14.39	56
Sanchez Documents J28	14.41	26
Sanchez Documents J28	14.43	56
Sanchez Documents J28	14.44	39
Sanchez Documents J28	14.47	46
Sanchez Documents J28	14.49	38
Sanchez Documents J28	14.50	44
Sanchez Documents J28	14.51	42
Hearing Transcript J28 - Escobedo	15.3	25
Hearing Transcript J28 - Escobedo	15.4	57
Hearing Transcript J28 - Escobedo	15.5	44
Hearing Transcript J28 - Escobedo	15.6	38
Hearing Transcript J28 - Escobedo	15.7	58
Hearing Transcript J28 - Escobedo	15.8	44
Hearing Transcript J28 - Escobedo	15.9	46
Hearing Transcript J28 - Martinez	15.10	47
Hearing Transcript J28 - Martinez	15.11	47
Hearing Transcript J28 - Martinez	15.12	25
Hearing Transcript J28 - Martinez	15.13	27
Hearing Transcript J28 - Aquino	15.16	46
Hearing Transcript J28 - Aquino	15.17	46
Hearing Transcript J28 - Aquino	15.19	49
Hearing Transcript J28 - Aquino	15.20	54
Hearing Transcript J28 - Hernandez	15.21	44
Hearing Transcript J28 - Hernandez	15.21	57
Hearing Transcript J28 - Sanchez	15.22	46
Hearing Transcript J28 - Sanchez	15.23	42
Hearing Transcript J28 - Sanchez	15.24	56
Hearing Transcript J28 - Sanchez	15.26	21
Hearing Transcript J28 - Sanchez	15.27	22
Alvarado EMail J28	16.2	57
Alvarado EMail J28	16.3	57
Alvarado EMail J28	16.4	57

Commenter Document	Comment Number	Response Number
Wong SCAQMD Letter F02	18.2	2
Wong SCAQMD Letter F02	18.3	15
Wong SCAQMD Letter F02	18.4	15
Wong SCAQMD Letter F02	18.5	15
Wong SCAQMD Letter F02	18.6	15
Martinez Letter F08	19.2	25
Martinez Letter F08	19.3	45
Martinez Letter F08	19.4	55
Martinez Letter F08 Attachment J28	19.6	47
Martinez Letter F08 Attachment J28	19.7	28
Martinez Letter F08 Attachment J28	19.8	48
Martinez Letter F08 Attachment J28	19.9	44
Martinez Letter F08 Attachment J28	19.10	38
Martinez Letter F08 Attachment J28	19.11	19
Martinez Letter F08 Attachment J28	19.12	25
Martinez Letter F08 Attachment J28	19.14	29
Martinez Letter F08 Attachment J28	19.15	29
Martinez Letter F08 Attachment J28	19.16	28
Martinez Letter F08 Attachment J28	19.19	57
Chandler Letter F15	22.4	43
Chandler Letter F15	22.5	43
Chandler Letter F15	22.6	43
Chandler Letter F15	22.7	43
Chandler Letter F15	22.8	48
Chandler Letter F15	22.9	50
Chandler Letter F15	22.11	51
Chandler Letter F15	22.13	41
Chandler Letter F15	22.14	41
Chandler Letter F15	22.15	41
Chandler Letter F15	22.16	41
Chandler Letter F15	22.17	51
Chandler Letter F15	22.18	43
Chandler Letter F15	22.20	51
Chandler Letter F15	22.21	50
Chandler Letter F15	22.21	51
Chandler Letter F15	22.22	37
Chandler Letter F15	22.23	37
Chandler Letter F15	22.24	37
Chandler Letter F15	22.25	10
Chandler Letter F15	22.26	11
Chandler Letter F15	22.27	10
Chandler Letter F15	22.27	11
Chandler Letter F15	22.28	10
Chandler Letter F15	22.29	11
Chandler Letter F15	22.30	12
Chandler Letter F15	22.31	12
Chandler Letter F15	22.32	13
Chandler Letter F15	22.33	13
Chandler Letter F15	22.34	14
Chandler Letter F15	22.36	7
Chandler Letter F15	22.37	7
Chandler Letter F15	22.38	4
Chandler Letter F15	22.39	3
Chandler Letter F15	22.40	5

Commenter Document	Comment Number	Response Number
Chandler Letter F15	22.41	6
Chandler Letter F15	22.42	31
Chandler Letter F15	22.43	31
Chandler Letter F15	22.44	31
Chandler Letter F15	22.45	32
Chandler Letter F15	22.46	33
Chandler Letter F15	22.47	36
Chandler Letter F15	22.48	34
Chandler Letter F15	22.49	41
Chandler Letter F15	22.50	52
Chandler Letter F15	22.51	9
Chandler Letter F15	22.51	31
Chandler Letter F15	22.51	41
Amira EMail F21	23.2	55
Amira EMail F21	23.3	22
Amira EMail F21	23.4	55
Amira EMail F21	23.5	55
Amira EMail F21	23.6	55
Amira EMail F21	23.7	55
Amira EMail F21	23.8	55
Amira EMail F21	23.9	55
Amira EMail F21	23.10	55
Amira EMail F21	23.11	55

SUBMITTED COMMENT DOCUMENTS:

1. Letter, from Local Neighbor, to Stephen Baxter, not dated, mailed 2016 January 19, received 2016 Jan 21.
2. EMail, from Nick Aquino @DCBA.lacounty.gov, to Stephen Baxter @DTSC.ca.gov, sent 2016 January 21 11:40 AM, Subject: PTI
3. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Gloria Durand
4. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Nick Aquino
5. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Andei Soto
6. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Benjamin Martinez, Jr.
7. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Jaime Sanchez
8. Green Hearing Comment Card (2016 Jan 28 Hrg): Art Escubedo
9. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez
10. Green Hearing Comment Card (2016 Jan 28 Hrg): Nick Aquino
11. Green Hearing Comment Card (2016 Jan 28 Hrg): Issac Hernandez
12. Green Hearing Comment Card (2016 Jan 28 Hrg): Jaime Sanchez
13. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez, Jr. (second submittal)
14. hand delivered document, from Jaime Sanchez, presented to Phil Blum, dated January 28, 2016, Comment Document (13 pages) with attached journal article (8 pages)
15. Transcript of DTSC Hearing on Draft Pond 1 Closure Plan and Interim Measure Work Plan and Permit, transcribed January 28, 20
16. EMail, from Suzan Alvarado @gmail.com, to Stephen Baxter, @DTSC.ca.gov, sent 2016 January 28, 12:11 PM, Subject: PHIBRO-TECH, INC. OF SANTA FE SPRINGS, CA
17. EMail, from Jack Cheng @ aqmd.gov, to Stephen Baxter @dtsc.ca.gov, sent February 02, 2016 4:04 PM, Subject: Proposed Interim Measure Work Paln Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, Attachment: “LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf”
18. Letter, from Jillian Wong/SQACMD, to Stephen Baxter / DTSC, dated February 2, 2016, re: Proposed Interim Measure Work Plan, Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, attached to EMail from JCheng @aqmd.gov sent February 02, 2016 (“LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf”)

19a. Letter, from Benjamin Martinez, Jr, to Mr. Stephen Baxter, dated 02/08/2016, with 3-page attachment titled “PHIBRO-TECH” dated 01/28/2016.

19b. Letter, from Benjamin Martinez, Jr, to Mr. Jesus Cruz, dated 02/08/2016, with 3-page attachment titled “PHIBRO-TECH” dated 01/28/2016.

20. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 10:52 PM, subject: COMMENTS ON PTI IM AND CP PUBLIC NOTICE

21. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 11:15 PM, subject: PTI IM AND CP, attachment: “Comments on PTI IM and CP Pub Notice – 2-15-2016.pdf”

22. Letter, from Philip B Chandler, to Stephen Baxter, dated February 15, 2016, re: RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PROPOSED INTERIM MEASURE WORK PLAN AND REVISED POND 1 CLOSURE PLAN FOR PHIBRO-TECH, INC (PTI), 8851 DICE ROAD, SANTA FE SPRINGS, CALIFORNIA 90670 – [EPA ID NUMBER CAD 008 488 025; PERMIT NO. 91-3-TS-002 [pdf file: “Comments on PTI IM and CP Public Notice – 2-15-2016.pdf”]

APPENDIX B

SUBMITTED COMMENT DOCUMENTS
(with Comment Numbers)

Appendix B contains scans of the documents received by DTSC for a public comment period held December 15, 2015 to January 28, 2016. DTSC wrote a Response to Comments Document dated May 25, 2016 for these documents.

DTSC received 22 documents for the public review period. These documents were assigned a document number (1 – 22) in the order of when they were received. A list of the documents is provided below.

DTSC identified comments within the documents and assigned a comment number for each. For instance, if document #50 contained three comments, they were assigned comment number 50.1, 50.2, and 50.3 respectively. The comment numbers are shown in the margins of the documents contained in Appendix B. The numbers may be out of sequence or some numbers skipped based on the way some comments were grouped together for response.

A Comment-Response Index is provided in Appendix A.

<u>SUBMITTED COMMENT DOCUMENTS</u>:

1. Letter, from Local Neighbor, to Stephen Baxter, not dated, mailed 2016 January 19, received 2016 Jan 21.
2. EMail, from Nick Aquino @DCBA.lacounty.gov, to Stephen Baxter @DTSC.ca.gov, sent 2016 January 21 11:40 AM, Subject: PTI
3. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Gloria Durand
4. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Nick Aquino
5. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Andei Soto
6. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Benjamin Martinez, Jr.
7. Yellow Q&A Comment Card (2016 Jan 28 Mtg): Jaime Sanchez
8. Green Hearing Comment Card (2016 Jan 28 Hrg): Art Escubedo
9. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez
10. Green Hearing Comment Card (2016 Jan 28 Hrg): Nick Aquino
11. Green Hearing Comment Card (2016 Jan 28 Hrg): Issac Hernandez
12. Green Hearing Comment Card (2016 Jan 28 Hrg): Jaime Sanchez
13. Green Hearing Comment Card (2016 Jan 28 Hrg): Benjamin Martinez, Jr. (second submittal)
14. hand delivered document, from Jaime Sanchez, presented to Phil Blum, dated January 28, 2016, Comment Document (13 pages) with attached journal article (8 pages)
15. Transcript of DTSC Hearing on Draft Pond 1 Closure Plan and Interim Measure Work Plan and Permit, transcribed January 28, 20
16. EMail, from Suzan Alvarado @gmail.com, to Stephen Baxter, @DTSC.ca.gov, sent 2016 January 28, 12:11 PM, Subject: PHIBRO-TECH, INC. OF SANTA FE SPRINGS, CA
17. EMail, from Jack Cheng @ aqmd.gov, to Stephen Baxter @dtsc.ca.gov, sent February 02, 2016 4:04 PM, Subject: Proposed Interim Measure Work Paln Revised Pond 1

Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, Attachment: "LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf"

18. Letter, from Jillian Wong/SQACMD, to Stephen Baxter / DTSC, dated February 2, 2016, re: Proposed Interim Measure Work Plan, Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670, attached to EMail from JCheng @aqmd.gov sent February 02, 2016 ("LAC151215-02 – Pond 1 Closure – Phibro-Tech.pdf")

19a. Letter, from Benjamin Martinez, Jr, to Mr. Stephen Baxter, dated 02/08/2016, with 3-page attachment titled "PHIBRO-TECH" dated 01/28/2016.

19b. Letter, from Benjamin Martinez, Jr, to Mr. Jesus Cruz, dated 02/08/2016, with 3-page attachment titled "PHIBRO-TECH" dated 01/28/2016.

20. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 10:52 PM, subject: COMMENTS ON PTI IM AND CP PUBLIC NOTICE

21. EMail, from Phil Chandler @earthlink.net, to Stephen Baxter @dtsc.ca.gov, sent February 15, 2016 11:15 PM, subject: PTI IM AND CP, attachment: "Comments on PTI IM and CP Pub Notice – 2-15-2016.pdf"

22. Letter, from Philip B Chandler, to Stephen Baxter, dated February 15, 2016, re: RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PROPOSED INTERIM MEASURE WORK PLAN AND REVISED POND 1 CLOSURE PLAN FOR PHIBRO-TECH, INC (PTI), 8851 DICE ROAD, SANTA FE SPRINGS, CALIFORNIA 90670 – [EPA ID NUMBER CAD 008 488 025; PERMIT NO. 91-3-TS-002 [pdf file: "Comments on PTI IM and CP Public Notice – 2-15-2016.pdf"]

Dear Stephen Baxter,

I am for the closure of the facility because around the area houses lots of families. 1.1

From, a local Neighbor

MAILED
2016 JAN 19

RECEIVED
2016 JAN 21

CA 95656

19 JAN 2016 PM 6 L

RECEIVED

JAN 21 2016

DEPAR OXIC
SUBS

Stephen Baxter
9211 Oakdale Ave. [redacted]
Chatsworth, CA 91311

91311552011

Baxter, Stephen@DTSC

From: Nick Aquino <NAquino@DCBA.lacounty.gov>
Sent: Thursday, January 21, 2016 11:40 AM
To: Baxter, Stephen@DTSC
Cc: Losnietos Mash
Subject: PTI

Importance: High

Mr. Baxter:
Thanks for the opportunity to provide my comments. Before I get started three very simple questions:
First: How many DTSB citations/violations have been issued to PTI over the course of operation of the plant? 2.1
Second: Are there open citations/violations that PTI has failed to correct and if so when were they issued? 2.2
Third: Concerning the stipulated settlement reached with the plant several years ago how much of the $400,000+ award to DTSB was used to remediate the existing violations and how much was retained by DTSB and for what purpose. If you don't know the answers to these question please delegate them to someone on your staff that can answer them. Please don't refer me somewhere to look them up this is not the public service that your agency is tasked with and I find it offensive. 2.3

My Comments:
Your Community Update is so misleading and I'm assuming it was intentionally drafted that way. Buried on page 4 is the real issue at hand the pending Application for Permit Renewal and (Expansion). 2.4

The process you outline to correct the existing problem involves injecting another chemical substance in the ground in hopes that it will act as a counter measure to the contaminated soil and pollutant to our ground water. Why isn't PTI being required to remove the contaminated soil which is the only sure way to address the problem? 2.5

This plant needs to be closed because of the close proximity (550 ft) to homes, schools, senior centers and library. They have been cited numerous times and have active violations that still have not been corrected sounds like another Exide Battery Plant (Commerce) to me. 2.6 2.7

Your Board receives public tax dollars to PROTECT the PUBLIC from toxic substances and if your Board is unable to do the job it was tasked with than it serves no purpose and should be eliminated and the State held accountable for its failure to protect the tax payers and residents of communities that are affected by these types of facilities. 2.8

Let me be clear, the pending permit needs to be denied and the plant needs to close anything else is unacceptable. If necessary additional and appropriate steps will be 2.9

taken including filing a formal claim for damages with the State by every homeowner in our community. If those claims are denied seeking appropriate legal remedies. 2.9

Again, thank you for allowing me the opportunity to provide my comments and I look forward to a reply from your designate providing clear answers to my questions.

Nicholas V. Aquino
Los Nietos School Board

YELLOW COMMENT CARDS

DTSC PUBLIC MEETING and HEARING
LOS NIETOS MIDDLE SCHOOL
2016 JANUARY 28 THURSDAY 18:00

PHIBRO-TECH INC SANTA FE SPRINGS FACILITY
PROPOSED INTERIM MEASURES WORK PLAN
REVISED POND 1 CLOSURE PLAN

The Department of Toxic Substances Control held a Public Meeting and Hearing to present a Proposed Interim Measure Work Plan and Revised Pond 1 Closure Plan, for the Phibro Tech, Inc. Santa Fe Springs Facility.

The YELLOW COMMENT CARDS where used for the Question and Answer portion after the DTSC Presentations.

DTSC received the following Yellow Cards:

- Gloria Duran
- Nick Aquino
- Andrei Soto
- Benjamin Martinez, Jr.
- Jaime Sanchez

Q & A

COMMENT CARD

Gloria Duran

Department of Toxic Substances Control
Public Meeting

Health Risk assessments — 2015

3.1

Testing of Soil

3.2

Closure plan for Tanks W-3 + W-4

3.3

"sludge"

3.4

homes less than 1/4 mile North end of STS

3.5

no info on

Q&A

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

Nick Aquino

Corrective Action Consent Order

— Did PTI conduct or have conducted the Human Health Risk Plan 4.1

— The pending Permit involves no expansion @ the facility 4.2

Q&A

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

ANDREI SOTO

1. IS THE WATER COMPANY INVOLVED? 2. HAS THE WATER BEEN TESTED? 5.1 5.2

3. IS THIS A FIX OR A STOP GAP? 5.3

4. THE PLAN IS TO REDUCE OR ELIMINATE HEXAVALENT CHROMIUM? 5.4

Q&A

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

BENJAMIN MARTINEZ JR.

AGAINST PHYBRO TECH

I WISH TO COMMENT ABOUT THE ISSUE.

Q&A

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

JAIME SANCHEZ

GREEN COMMENT CARDS

DTSC PUBLIC MEETING and HEARING
LOS NIETOS MIDDLE SCHOOL
2016 JANUARY 28 THURSDAY 18:00

PHIBRO-TECH INC SANTA FE SPRINGS FACILITY
PROPOSED INTERIM MEASURES WORK PLAN
REVISED POND 1 CLOSURE PLAN

The Department of Toxic Substances Control held a Public Meeting and Hearing to present a Proposed Interim Measure Work Plan and Revised Pond 1 Closure Plan, for the Phibro Tech, Inc. Santa Fe Springs Facility.

The GREEN COMMENT CARDS where used for the Hearing portion after the DTSC Presentations Q&A.

DTSC received the following Green Cards:

- Art Escubedo
- Benjamin Martinez, Jr.
- Nick Aquino
- Isaac Hernandez
- Jaime Sanchez
- Benjamin Martinez, Jr. (second submittal)

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

ART ESCUBEDO - PRESIDENT OF THE
LOS NIETOS SCHOOL BOARD

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

BENJAMIN MARTINEZ JR.
8514 VICKI DR.
WHITTIER, CA, 90606-3249
562/699-8884

PLEASE MAIL ME THE RESULTS
OF THIS MEETING
REGARDING PHYBRO TECH

9.1

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

Nick Aguilar

Comments

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

Isaac Hernandez

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

JAIME SANCHEZ

COMMENT CARD

Department of Toxic Substances Control
Public Meeting

BENJAMIN MARTINEZ JR

I WANT TO READ A STATEMENT

HAND DELIVERED COMMENTS

FROM: Mr. Jaime Sanchez
Neighbors Against Phibro Tech

TO: Phillip Blum, Hearing Officer
Supervising hazardous Substances Engineer
Department of Toxic Substances Control

DATE: January 28, 2016

LOCATION: DTSC Public Meeting and Hearing
Phibro-Tech Inc. Proposed Interim Measures Work Plan
Phibro-Tech Revised Pond 1 Closure Plan
Los Nietos Middle School, Whittier, California

The enclosed information with attached article is from Mr. Jaime Sanchez, representing Neighbors Against Phibro Tech; and was hand-delivered to Mr. Phillip Blum, DTSC Hearing Officer, during the DTSC Public Meeting/Hearing held January 28, 2016 for the Phibro-Tech Inc. Proposed Interim Measures Work Plan and the Phibro-Tech Revised Pond 1 Closure Plan.

The enclosed information has been included as a public comment.

HAND DELIVERED
to DTSC
during Public Mtg Hrg
January 28, 2016

January 28, 2016

Neighbors Against Phibro Tech

Response to DTSC Proposed

PTI – Pond 1 Closure Plan

Introduction

Neighbors Against Phibro Tech is a group of concerned residents of Los Nietos and Santa Fe Springs, who have previously requested that the Department of Toxic Substances Control (DTSC) **deny the Hazardous Waste Facility Permit** for Phibro-Tech, Inc. (PTI).

14.2

The request is based on the historic and ongoing **failure** of **PTI** to comply with laws, regulations, and policies governing hazardous materials and hazardous waste.

Specifically, PTI entered into a *Corrective Action Consent Order* on July 29, 1991, with the U. S. EPA and DTSC, which was later modified (on August 2, 1995). Consequently, PTI was compelled to conduct corrective action *"within one year"*. Approximately 25 years later, **DTSC** has **failed** to obtain **compliance** from **PTI**. 14.3

With respect to the Department of Toxic Substances Control *"Proposed Interim Measure Work Plan and Revised Pond 1 Closure Plan"* for Phibro Tech, Inc., *Neighbors Against Phibro Tech* questions the validity and effectiveness of the plan, and more importantly, the long term consequences to the community. 14.4

The Proposed Interim Measure Work Plan will require PTI to clean up **hexavalent chromium** in soil near a former underground chromic acid tank. The clean-up

involves injection of chemicals into the ground to reduce the hexavalent chromium to acceptable levels.

In 1997, established the Maximum Contaminant Level (MCL) for hexavalent chromium was 2 parts per billion. That year, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" at **concentrations nearly 3 million times the state public health goal.**

14.6

In 2014, the level was revised. The California Department of Public Health (CDPH) now established the Maximum Contaminant Level (MCL) for hexavalent chromium at 10 micrograms per liter (μg/L).

The Interim Measure Work Plan describes how hexavalent chromium will be remediated in soils and how the soil clean-up will be verified.

The Interim Measure Work Plan proposes treatment of hexavalent chromium in soil with injections of **calcium polysulfide** (CPS) solutions.

Hexavalent chromium

(Source: **Wikipedia**)

Hexavalent chromium (chromium(VI), Cr(VI)) refers to chemical compounds that contain the element chromium in the +6 oxidation state.

(The **oxidation state**, often called the **oxidation number**, is an indicator of the degree of oxidation (loss of electrons) of an atom in a chemical compound. Conceptually, the oxidation state, which may be positive, negative or zero, is the *hypothetical* charge that an atom would have if all bonds to atoms of different elements were 100% **ionic**, with no **covalent** component.)

(**Ionic bonding** is a type of chemical bond that involves the electrostatic attraction between oppositely charged ions, and is the primary interaction occurring in ionic compounds. The ions are atoms that have lost one or more electrons (known as cations) and

atoms that have gained one or more electrons (known as anions). This transfer of electrons is known as **electrovalence** in contrast to **covalence**.)

(A **covalent bond** is a chemical bond that involves the sharing ofelectron pairs between atoms. These electron pairs are known **asshared pairs** or **bonding pairs**, and the stable balance of attractive and repulsive forces between atoms, when they share electrons, is known as covalent bonding.)

Toxicity

Hexavalent chromium compounds are genotoxic carcinogens. Inhaled hexavalent chromium is recognized as a human carcinogen[2] , and chronic inhalation of hexavalent chromium compounds increases the risk of lung cancer. (The lungs are the most vulnerable, followed by the fine capillaries in kidneys and intestines).

(In genetics, **genotoxicity** describes the property of chemical agents that damages the genetic information within a cell causing mutations, which may lead to cancer.)

The **United States EPA** has a Maximum Contaminant Level (**MCL**) for all forms of chromium at 100 parts per billion.[9] **California** has finalized a Public Health Goal of 0.02 parts per billion (ppb or micrograms per liter)[10] and established a MCL of **10 ppb**.[11]

Calcium polysulfide treatment of Cr(VI)-contaminated soil

(Source: Journal of Hazardous Materials 179 (2010) 650–657)

Chromium is one of the most frequently detected metal contaminants in federal facilities, both in Department of Energy (DoE) and Department of Defense (DoD) sites. It is also frequently found in industrial facilities, such as the metallurgic, tanning and plating industries. Much is known about the fate and transport of Cr in **soil** and **aquatic** environments. Rai et al. [1] summarize the main attributes of the environmental chemistry of Cr. **Toxic** and **carcinogenic** hexavalent chromium (Cr(VI)) is mobile at neutral and alkaline pH and forms few precipitates, **thus** it is mobile in most soils.

The use of **calcium polysulfide** (CPS) is proposed as a promising alternative treatment that is inexpensive and can be effective under a range of pH conditions.

Even though the applications indicate that **CPS** could be an effective reductant, **no** peer-reviewed literature was found that methodically investigated the application of CPS in soil as a function of pH, Cr speciation and other geochemical parameters in bench scale studies. 14.12

Regarding Cr contamination of the soil and groundwater, the DTSC proposes a pump-and-treat system to be installed to contain the groundwater contamination and prevent migration of Cr. **However**, similar studies indicate that 99% of the chromium is tightly bound to the soil, resulting in slow leaching rates that render the aquifer **treatment inefficient** over a practical timescale [14]. Thus, direct treatment of the soil phase emerged as a cost-effective alternative. The objective is to evaluate the use of CPS for Cr(VI) treatment in soil by investigating the pH and Cr(VI) speciation effects on the kinetics of the CPS-soil reaction. 14.13

Conclusion

It has been **concluded** in previous studies that, while **CPS** has a long residence time in the environment and is a promising reductant, in situ reduction is **not** an **efficient treatment method** for soils with highly insoluble **Cr(VI)** compounds, especially in surficial layers. 14.14

Hence, assuming that CPS is inefficient form of treatment, our community would be left with a false impression of success. In the final analysis, the threat posed by hexavalent chromium contamination may remain the same, and more time and resources may be wasted. Such a scenario would be unacceptable now and upon discovery in the future. As such, we are **not** convinced that **CPS** treatment is a viable solution. We demand that the DTSC address **all** alternative forms of treatment and share that information with the community before making a final determination. 14.15 14.16

Therefore, and in the interim, the residents of Los Nietos and Santa Fe Springs propose that the DTSC utilize the **most efficient and effective** form of treatment for hexavalent chromium contamination, and that it be applied to Pond 1 at the earliest possible time. 14.17

Neighbors Against Phibro Tech

Historical Comparison of PHIBRO TECH to EXIDE

Note:

The following is a **separate** source of information from the issue regarding the *"Closure of Pond 1"*. It is the community's intent that it be considered within the context of our request to the DTSC to **deny** the **Hazardous Waste Facility Permit** for Phibro-Tech, Inc. (PTI).

Introduction

It is reasonable to assume that the entire environment justice community is familiar with the controversy surrounding Exide Technologies.

On that basis, ***Neighbors Against Phibro Tech*** submits the following comparison as further evidence of the DTSC's failure to fulfill its mandate *"...to **protect** California's **people** and **environment** from **harmful** effects of **toxic** substances ..."*, and to demonstrate the shocking disregard for compliance with the consent decree entered into by Phibro – Tech, Inc. 14.21

The source of the information regarding Exide Technologies is a Los Angeles Times article, dated December 22, 2015. The source of the information regarding Phibro – Tech, Inc. is DTSC records. Certain facts are repeated in order to provide emphasis and consistency to the underlined topics listed below, and in the same sequence, as they appeared in the L. A. Times article.

Facility History

Exide Technologies (Exide), located in Vernon, is a battery recycler company that contaminated homes in the greater ELA area for decades.

Phibro – Tech, Inc. (PTI) manufactures specialty chemicals used in industrial chemical and catalyst industries, and has contaminated ground water and soil in the Los Nietos and Santa Fe Springs area for decades.

EXIDE: Exide's 15-acre facility, known as a lead-acid battery smelter, had been one of only two plants west of the Rocky Mountains that could melt down lead from used car batteries for use in producing new ones. It operated around the clock seven days a week in the industrial city of Vernon, processing about 25,000 batteries a day.

PTI: Phibro – Tech, Inc. operates a 4.8 acre material processing facility in a highly industrialized area of the City of Santa Fe Springs, bordering the unincorporated area of Los Nietos, within the County of Los Angeles, that recycles hazardous materials and hazardous waste.

EXIDE: The U.S. attorney's office announced that soil testing revealed the mess left behind by the Exide plant, which emitted lead, arsenic and other dangerous pollutants.

California regulators now believe as many as 10,000 homes across half a dozen communities could be contaminated with poisonous lead. They are ramping up a massive cleanup that could take years and cost hundreds of millions of dollars.

The expanded cleanup is the latest in a series of revelations that have stirred outrage in working-class, **Latino communities** near the plant and raised questions about **why** state regulators failed to act sooner.

PTI: The residents of Los Nietos and Santa Fe Springs requested that the DTSC conduct an ***"Environmental Impact Report"*** to determine the probable dangers to the surrounding community, and a ***"Health Risk Assessment"*** to determine the degree of risk to human health. The **failure** of the DTSC to do so has stirred outrage in working-class, **Latino communities** near the plant and raised questions about **why** state regulators failed to act sooner. 14.23 14.24 14.25

PTI received an Interim Status Document effective in December 1981 and obtained Hazardous Waste Facility Permits in July 1991 from both the U.S. Environmental Protection Agency and the DTSC. Before PTI's permit expired in 1996, the facility submitted a permit renewal application. DTSC has allowed PTI to continue operating under the existing expired permit until a final permit determination is made on the renewal application. 14.26

How long have Exide and PTI been polluting neighborhoods?

EXIDE: The plant operated in the industrial city of Vernon since 1922, spewing toxic air pollution **over decades**. Georgia-based Exide took over in 2000.

PTI: The plant operates in the industrial city of Santa Fe Springs, bordering Los Nietos, and has contaminated ground water and soil **over decades**. The facility has undergone several name changes throughout the years and has been known as Pacific Western Chemical Company, Southern California Chemical, and CP Chemicals, Inc. The facility's name was changed to Phibro Tech, Inc. (PTI) in 1994. PTI is a subsidiary of C.P. Chemicals, Inc., which is a subsidiary of Phibro Animal Health Corporation. 14.28

EXIDE: Ran afoul of environmental regulations for years. Local, state and federal officials **cited the plant** over and over for emitting too much **cancer-causing** arsenic and lead, a potent neurotoxin, and for violating hazardous waste laws.

PTI: Has run afoul of environmental regulations for years. Local, state and federal officials **cited the plant** over and over. Ground water and soil have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, and for violating hazardous waste laws. 14.29 14.30

In 1997, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" at **concentrations nearly 3 million times the state public health goal**. 14.31

EXIDE: The California Department of Toxic Substances Control (**DTSC**), had **known** for years that Exide was violating environmental laws by releasing pollutants into the **air, soil and water**, but **failed** to stop it. For **33 years** the state allowed the plant to operate **without a full permit**, even as inspectors documented more than 100 violations, including lead and acid leaks, an overflowing pond of toxic sludge, enormous cracks in the floor and hazardous levels of lead in the soil outside.

PTI: The California Department of Toxic Substances Control (**DTSC**), had **known** for years that PTI was violating environmental laws by releasing pollutants into the **soil and water**, but **failed** to stop it. For almost **25 years** the state allowed the plant to operate **with an expired permit**, even as inspectors documented numerous violations. 14.32 14.33

What finally shut down Exide and why should PTI be shut down?

EXIDE: As demands to close the plant mounted from **community groups** and elected officials, the company revealed in 2014 it was under **federal criminal investigation**. The probe of its operations in Vernon was a powerful hammer, threatening the company with charges that could land its **executives in jail**.

In **March 2015**, the company signed an agreement with the U.S. attorney's office to **close permanently**.

The **deal** allowed Exide and its employees to **avoid prosecution for years of environmental crimes**, including illegal storage, disposal and shipment of hazardous waste, while agreeing to pay $50 million to demolish and clean the plant and surrounding communities, including $9 million set aside for removing lead from homes.

PTI: In 1991, PTI was subject to criminal prosecution for its historic non-compliance with obligations related to groundwater and soil contamination.

On July 29, 1991, the USEPA, the DTSC, and PTI entered into a *Corrective Action Consent Order* (CACO), which included provisions for prosecution, but avoided potential litigation on the basis of compliance.

14.35

On August 2, 1995, the Consent Order was **modified**, which included the elimination of the threat of **criminal prosecution**. The parties agreed that the more stringent requirements "*shall govern the corrective action required*". Consequently, PTI was compelled to conduct corrective action ***"within one year"***.

The record clearly shows that from July 29, 1991 to the present, **PTI** has **failed to comply** with the Corrective Action Consent Order.

Which communities are affected?

EXIDE: State officials believe Exide's lead emissions contaminated soil in six southeast L.A. County communities: Boyle Heights, East Los Angeles, Commerce, Bell, Huntington Park and Maywood.

PTI: State officials believe PTI's hazardous waste and hazardous materials contaminated soil and ground water in two southeast L.A. County communities: Los Nietos and Santa Fe Springs. 14.37

EXIDE: When state regulators first ordered Exide to test soil in nearby homes in 2013, they limited it to two small areas of about 200 homes in Boyle Heights and Maywood. **After testing** farther from the plant, officials revealed in August that the **lead contamination extends as far as 1.7 miles from the plant** and may have **fouled** as many as 10,000 homes.

PTI: State regulators have **failed** to order PTI to test soil in nearby homes. DTSC has not revealed how far ground water and soil (and in the opinion of residents, the air as well) have become **contaminated** with heavy metals, halogenated volatile organic compounds (VOCs), aromatic VOCs and chlorides, which are **dangerous** to **human health** and / or cause **harm** to the **environment**. 14.38 14.39

What are the health risks from Exide's and PTI's emissions?

EXIDE: While Exide was operating, air quality officials determined its arsenic emissions posed an increased cancer risk to more than 100,000 residents.

Even more concerning was lead, one of the oldest known poisons. The toxic metal, released over many years, can **cause learning disabilities**, lower IQs and **other developmental problems, even at low levels**. Children are most at-risk.

PTI: The Department of Toxic Substances Control has **failed** to determine the risk posed to the community. The residents of Los Nietos and Santa Fe Springs believe that they are at great risk, both human and environmental, and that they suffer from the occurrence of a greater-than-expected number of serious illnesses and diseases, including a ***"CANCER CLUSTER"***. 14.41

How big is the cleanup?

EXIDE: Removing lead-contaminated soil from thousands of homes would be the most extensive cleanup of its kind in California and among the largest ever conducted in the nation.

Since August 2014, the Department of Toxic Substances Control has removed lead-tainted soil from more than 185 homes. The department has used up most of the $9 million in residential cleanup money Exide placed in a trust fund and is tapping $7 million in state funds to expand testing and cleanup. How long it will take depends on many homes are found to be contaminated and whether officials can find the money to clean them. Each home costs about $40,000 and and a week to complete.

The slow pace of home testing and cleanup has infuriated community groups and local officials, who say a lack of urgency by state regulators forced them to conduct their own soil sampling and door-to-door outreach campaigns.

PTI: In 1997, the EPA traced a carcinogen, **hexavalent chromium**, in the groundwater "directly back to Phibro-Tech" at **concentrations nearly 3 million times the state public health goal.** 14.43

Removing the contamination from the ground water and soil would be extensive. 14.44

Since July 1991, the Department of Toxic Substances Control has **not** removed the threat posed by the **hexavalent chromium** tainted soil and ground water. The department has **not** earmarked any money for residential cleanup, and has **not** required PTI to expand testing and cleanup of the surrounding community, if homes are found to be contaminated.

What else is happening?

EXIDE: L.A. County Supervisor Hilda Solis has urged Gov. Jerry Brown to appoint an independent expert to oversee the cleanup and to establish a commission to investigate what went wrong at Exide and who is responsible.

PTI: L.A. County Supervisor Don Knabe has **failed** to play a leading role in cleaning up PTI.

EXIDE: If the company fails to live up to its cleanup obligations at any point in the next 10 years, it could be charged with felonies it admitted to as part of its agreement with the U.S. attorney's office.

PTI: Since 1991, the company has **failed** to live up to its cleanup obligations, and there is **no threat of criminal prosecution.**

Conclusion

It is without question, that on the basis the historical failure to comply with the laws governing toxic substances and the appalling degree of contamination, a serial polluter such as Exide deserved to be shut down. It is our opinion that Phibro Tech too is a serial polluter, and that their conduct is just as egregious as that of Exide. Indeed, a valid argument can be made that Phibro – Tech, Inc. deserves the same fate. 14.47

Therefore, Neighbors Against Phibro Tech once again calls upon the DTSC to fulfill its mandate and protect our community against the contamination of toxic substances. In addition, we request that the DTSC require Phibro – Tech, Inc. to clean-up the entire facility, and that they **deny** the pending Hazardous Waste Facility Permit. Finally, that after almost a quarter of a century of failure on the part of Phibro Tech to comply with the consent decree, we request that the DTSC implement the ***"Existing Facility Closure Plan"*** in accordance the provisions provided by statute. 14.49 14.50 14.51

As the old adage goes, *"Enough is enough!"*

Journal of Hazardous Materials 179 (2010) 650–657

Contents lists available at ScienceDirect

Journal of Hazardous Materials

journal homepage: www.elsevier.com/locate/jhazmat

Calcium polysulfide treatment of Cr(VI)-contaminated soil

Maria Chrysochoou*, Daniel R. Ferreira, Chad P. Johnston

Department of Civil and Environmental Engineering, University of Connecticut, 261 Glenbrook Road, Storrs, CT 06269, United States

ARTICLE INFO

Article history:
Received 1 December 2009
Received in revised form 11 March 2010
Accepted 11 March 2010
Available online 19 March 2010

Keywords:
Chromium
Reduction
Calcium polysulfide
X-ray absorption spectroscopy

ABSTRACT

Batch treatability studies for a Cr(VI)-contaminated glacial soil from a Cr plating facility were conducted using 1X and 2X the stoichiometric ratio of calcium polysulfide (CPS). The pH of the treated soil increased from 6 to 11 upon CPS addition, but progressively returned to 8–8.5 over the course of 1 year. The 1X dosage maintained a highly reducing environment up to 21 days of monitoring with the samples exposed to atmospheric oxygen, while 2X was reducing up to 180 days of curing. The EPA regulatory method for solid Cr(VI) could not reliably predict Cr(VI) in the treated solid due to ongoing reduction during the test. SPLP results showed that the CPS created an apparent Cr(VI) mobilization during the first 60 days of treatment, with subsequent decrease in soluble Cr(VI) up to 1 year of monitoring. Synchrotron micro-X-ray analyses at 60 days curing showed that Cr(VI) was predominantly bound as highly insoluble $PbCrO_4$ that precipitated in the interstitial pores of the soil, with very little to no Cr(VI) associated with the abundant iron oxyhydroxides. Despite its spatial accessibility and due to its low solubility, $PbCrO_4$ was recalcitrant to treatment, which proceeded only very slowly as judged by the SPLP data. It is concluded that, while CPS has a long residence time in the environment and is a promising reductant, in situ reduction is not an efficient treatment method for soils with highly insoluble Cr(VI) compounds, especially in surficial layers such as the one studied.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

Chromium is one of the most frequently detected metal contaminants in federal facilities, both in Department of Energy (DoE) and Department of Defense (DoD) sites. It is also frequently found in industrial facilities, such as the metallurgic, tanning and plating industries. Much is known about the fate and transport of Cr in soil and aquatic environments. Rai et al. [1] summarize the main attributes of the environmental chemistry of Cr. Toxic and carcinogenic hexavalent chromium (Cr(VI)) is mobile at neutral and alkaline pH and forms few precipitates, thus it is mobile in most soils. In oxic acidic soils it adsorbs on iron and aluminum oxyhydroxides and its mobility is reduced. Cr(VI) reduction to non-toxic Cr(III) is facilitated by naturally occurring sulfides, ferrous iron and soil organic matter. The Cr(III) precipitates as amorphous, insoluble hydroxide at pH values greater than 5.

In Cr(VI)-contaminated sites, remedial approaches have included in situ chemical reduction, monitored natural attenuation under appropriate geochemical conditions [2,3] and bioremediation [4]. The most common approach is the use of inorganic electron donors to reduce Cr(VI) and subsequently immobilize it as insoluble chromium hydroxide. Iron-based reducing agents such as ferrous sulfate, zero-valent iron (ZVI), and pyrite have been previously used [5]. However, these methods can have adverse effects due to the imparted acidity on the soil, are most effective under acidic conditions that are not favorable for Cr(III) immobilization and are costly to apply for source treatment as they are generally solid and thus not injectable. Other common reductants are sulfides delivered as liquid or gas and organic materials, such as molasses and emulsified vegetable oil. The literature on Cr treatment technologies is too extensive to effectively summarize here; a comprehensive list of relevant documents can be found at the relevant EPA website (http://www.clu-in.org/contaminantfocus/default.focus/sec/chromium_VI/cat/Treatment_Technologies/).

This study investigates the use of calcium polysulfide (CPS) as a promising alternative that is inexpensive and can be effective under a range of pH conditions. CPS is a commercially available soil additive and has been used in field applications for contaminated soil treatment; Storch et al. [6] reported on the field application of CPS to reduce Cr(VI) at a former chrome plating facility in Arizona; FRTR [7] lists the use of CPS to treat chromium in an railroad embankment with Cr-laden pigment in Morses Pond Culvert, MA; IETEG [8] described a field application at a wood treatment facility in Ukiah, CA; Charboneau et al. [9] mentions the application of CPS at the Hanford site. Even though these applications indicated that CPS could be an effective reductant, no peer-reviewed literature was found that methodically investigated the application of

* Corresponding author. Tel.: +1 860 486 3694; fax: +1 860 486 2298.
E-mail address: maria.chrysochoou@uconn.edu (M. Chrysochoou).

0304-3894/$ – see front matter © 2010 Elsevier B.V. All rights reserved.
doi:10.1016/j.jhazmat.2010.03.052

CPS in soil as a function of pH, Cr speciation and other geochemical parameters in bench scale studies. The only peer-reviewed literature identified was on the use of CPS to treat chromite ore processing residue (COPR) [10–12]. X-ray absorption near edge structure (XANES) analyses in COPR studies showed that while dissolved Cr(VI) was successfully treated, solid Cr(VI) concentrations remained high [11]. Thus, a thorough investigation on the use of CPS in Cr(VI)-contaminated soils is warranted.

The site at the focus of this study is a chrome plating facility in northeastern Connecticut. The history of the site is described in detail elsewhere [3,13,14]. Briefly, drippings from the Cr plating process and wastewater that was directly discharged into the adjacent wetland caused Cr contamination of the soil and groundwater. A pump-and-treat system was installed to contain the groundwater contamination and prevent migration of Cr into the wetland and adjacent river. However, previous studies at this site indicate that 99% of the chromium is tightly bound to the soil, resulting in slow leaching rates that render the aquifer treatment inefficient over a practical timescale [14]. Thus, direct treatment of the soil phase emerged as a cost-effective alternative. The objective of this study is to evaluate the use of CPS for Cr(VI) treatment in soil by investigating the pH and Cr(VI) speciation effects on the kinetics of the CPS-soil reaction.

2. Materials and methods

2.1. Site description and sampling techniques

The facility is located on the edge of an escarpment formed by glacial deposits that slopes down to a heavily vegetated wetland formed on the flood plain of the adjacent Little River. The site is underlain by a glaciofluvial aquifer and a well-graded silty and clayey-sand soil matrix that is typical of New England morphology.

Soil sampling was conducted in February 2008 with a Geoprobe™ drill rig at four locations within the perimeter of the chromium plume. Two cores were taken adjacent to the building, where the bulk of the Cr(VI) source is. They are denoted S-1 and S-2, and reached depths of 40 ft and 20 ft, respectively, with the water table at a depth of approximately 28 ft S-2 was advanced only down to 20 ft because of a large boulder encountered at that depth. Additionally, 4–5 kg of sample was collected with a hand auger (denoted as HA) to a depth of roughly 4 ft in the unsaturated zone near the building. The cores were separated into fractions representing 4 ft increments of depth and all samples were homogenized and stored in sealed plastic bags at 4 °C. Samples are denoted by core source and depth increment in ft, e.g. S-1 (28–32).

2.2. Soil characterization

Total Cr(VI) analysis was conducted according to methods EPA 3060A and EPA 7196.

SPLP analysis was conducted according to EPA method 1312. Total Cr in the SPLP leachate was analyzed by Phoenix Environmental Labs (Manchester, CT) by EPA method 6010B. Particle size analysis was conducted according to method ASTM D422. Soil pH analysis was conducted according to method ASTM D4980-89 and water content by method ASTM 2216-98. XRF analysis of the soil was conducted according to EPA 6200. Total metal and total organic carbon analyses conducted by Phoenix Environmental Laboratories in Manchester, CT according to EPA methods 3015A, 6010B and 9060.

X-ray diffraction (XRD) analysis was performed using a Bruker D5005 diffractometer with Bragg Brentano geometry using CuKα radiation at 2θ angles between 5° and 65°, with a step size of 0.02° and scanning time of 3 s per step. Samples were pulverized, passed through a U.S. 400 sieve (38 μm), and contained 20 wt.% corundum as an internal standard. XRD data analysis was performed with the Jade software (Materialsdata Inc.), version 8.5, with reference to the International Center for Diffraction Data database [15].

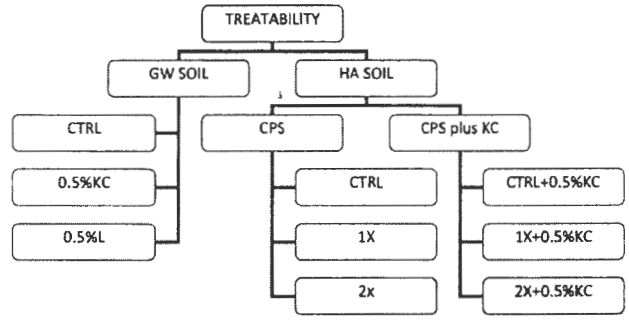

Fig. 1. Overview of treatability matrix (GW = soil under the groundwater table, HA = surficial soil collected with a hand auger, CPS = calcium polysulfide, L = lime, KC = K_2CO_3, 1X = stoichiometric dosage to reduce Cr(VI) in the soil, 2X = double the stoichiometric dosage).

2.3. Treatment design

The site characterization study revealed an uneven vertical distribution of chromium, with the majority of Cr(VI) contamination confined to the near-surface layer (~5 ft depth), whereas Cr(III) was the primary species at depths below 28 ft where the groundwater table was observed (see Section 3.1). Based on these results, the treatability study was split into two parts, addressing the soil underneath the groundwater table and the near-surface soil separately. The notation for the two soil zones is HA (for the surficial sample collected with the hand auger) and GW for the soil collected from the groundwater zone. The GW soil was treated with a pH buffering agent (K_2CO_3) alone, in order to investigate whether Cr(III) immobilization at alkaline pH would be sufficient to reduce Cr mobility below the CT regulatory limit of 0.11 mg/L Cr for non-drinking water aquifers. The HS soil was treated with CPS with and without a buffering agent, to investigate whether the addition of an alkaline agent would further facilitate Cr(VI) mobilization from the soil for reductive treatment. An overview of the experimental matrix is given in Fig. 1.

The theoretical oxidation–reduction reaction between Cr(VI) and CPS under anaerobic conditions is:

$$2CrO_4^{2-} + 3CaS_5 + 10H^+ \Leftrightarrow 2Cr(OH)_{3(s)} + 15S_{(s)} + 3Ca^{2+} + 2H_2O$$

Based on this reaction stoichiometry, the 29% CPS solution concentration, and an average HA sample Cr(VI) concentration of 7852 mg/kg, 156 mL of CPS solution were required per kg dry soil for a 1X stoichiometric relationship and 312 mL for 2X. Batch tests were conducted by placing 300 g of dry soil sieved through a No. 4 sieve (2 mm) in sealed plastic jars and the required CPS solution and kept at a 1:1 liquid to solid (L:S) ratio. Saturated source zone samples were treated with a 0.5% K_2CO_3 (KC) solution and a 0.5% lime (L) solution for comparison. The amounts of potassium carbonate and lime were determined by conducting a preliminary pH buffering study with varying amounts of these agents. All studies were performed in duplicate.

The CPS product used in the study was Cascade®, a 29% CPS solution obtained from Best Sulfur Products, Inc. All other chemicals used are ACS certified reagents. Soil analyses were conducted at 0, 1, 7, 28, 60, 180 and 365 days of curing. Soil pH, redox potential, total Cr(VI) and SPLP analyses were conducted according to the methods previously described.

Table 1
Characterization results of the control samples in the shallow HA and the groundwater GW soil.

Parameter	CTRL – HA soil	CTRL – GW soil
pH	6.3	6.0
Cr(VI) (mg/kg)	7800	30
Cr(total) (mg/kg)	14,800	380
Fe (mg/kg)	25,900	9440
Al (mg/kg)	12,800	7280
Ca (mg/kg)	1000	800
Mn (mg/kg)	260	140
Pb (mg/kg)[a]	15,000	20
TOC (mg/kg)	12,000	260

[a] Pb concentration obtained by XRF analysis.

2.4. X-ray absorption spectroscopy

Representative samples from the 60-day cured samples of the HA soil (CTRL, 1X and 2X without KC addition) were prepared as 30-μm thick diamond-polished thin sections by Spectrum Petrographics (Vancouver, WA) for microprobe analyses. Micro-XRF, μXRD and μXANES measurements were performed on Beamline 10.3.2 at the Advanced Light Source (ALS) [16]. Micro-XRF elemental maps were acquired at 13.5 keV incident energy with a beam size of 7 μm × 7 μm and a counting time of 50 ms/pixel. Fluorescence counts were collected for Ca, Ti, Cr, Mn, Fe, Ni, Cu, Zn and Pb with a seven-element Ge solid-state detector. From elemental distribution maps, various spots of interest were selected for μXRD to identify crystalline phases and for Cr K-edge μXANES to probe Cr redox state. Cr chemical mapping was performed at incident energies of 5960, 5993 and 6250 eV to obtain the background, Cr(VI) and total Cr (Cr(total)) signals, respectively. Energy calibration was performed using a Cr foil (5989.02 eV) [17]. The background map was subtracted from the two others to obtain signals attributable to Cr only. Next, 7% of the Cr(total) signal was subtracted from that of Cr(VI) to account for the finite XANES signal that Cr(III) species typically exhibit at the Cr(VI) energy. The Cr(VI) and Cr(total) maps were then assembled into a composite map.

All μXANES spectra were collected in fluorescence mode, pre-edge background subtracted and post-edge normalized using custom LabView software. Three XANES standards of pure $CaCrO_4$, $PbCrO_4$ and $BaCrO_4$ were obtained at the beamline; μXRD patterns confirmed that the pure chemical corresponded to 100% pure crystalline compound. Additional standards were provided as a courtesy of P. Nico and were also obtained previously at BL 10.3.2.

Microdiffraction patterns were recorded in transmission mode with a Bruker Smart6000 CCD camera at 17 keV for 5 min with a beam size of 16 μm × 7 μm. Two-dimensional patterns were radially integrated and calibrated using the Fit2d software [18] and an α-alumina standard. Analysis was performed with the Jade software v.8.5 and reference to the ICDD database.

3. Results and discussion

3.1. Soil characterization

The soil from both the HA and GW samples was well-graded sand with a slightly higher silt and clay content (12%) in the HA soil. The pH of the soil was acidic and generally decreased with depth, ranging from 6.5 to 7 close to the surface to 5.5 in the GW sample for the source samples close to the building and even below 5 in the aquifer near the extraction well.

Table 1 shows the chemical characterization results for the composite samples that were used in the treatability study. The GW sample was a mix from the 28–32 ft and 32–36 ft sampling depths and had a pH of 6. The Cr(VI) content of this composite sample was 30 mg/kg, while Cr(total) was 380 mg/kg. Thus, Cr(VI) was only 9% of the total chromium in the groundwater zone. This is attributed to the acidic pH conditions that historically prevailed in the soil, and which favored retardation of Cr(VI) in the upper zones and leaching of Cr(III) into the deeper soil. Nikolaidis et al. [13] reported a vertical pH profile that ranged from 3.0 at 25 ft depth up to 5.5 close to the ground surface. This extreme soil acidity was due to the acidic solutions that leached through the facility floor, as well due to the discharged wastewater, both of which were the primary sources of contamination. The soil pH apparently rebounded by almost two pH units over the course of the 15 years that elapsed between the two studies. The mechanism of pH buffering cannot be elicited from the comparison of the two studies, as soil chemistry and mineralogy appears to be the same. Potential buffering processes are deprotonation of the abundant iron hydroxide surfaces, precipitation of calcite (observed by XRD in small amounts) and microbial activity [19].

The Cr(VI) concentration was high (7800 mg/kg) in the HA sample, while individual samples were found to have up to 10,000 mg/kg Cr(VI). The total Cr was at 14,800 mg/kg in the HA sample, so that Cr(VI) was approximately 50% of the total chromium. The HA soil was also found to have considerably higher Fe and TOC content compared to the saturated zone, along with a high Pb content of 15,000 mg/kg. The presence of Pb was a surprising finding, as it was not reported in previous studies and its source was not apparent based on the Cr plating processes. The Pb concentration was only high at the top 5 ft and quickly declined to background concentration of ~20 mg/kg. The saturated soil appeared to be closer to clean sand with lower contents of all major metals. Mn concentrations were low in all zones, so that Mn-induced reoxidation of Cr(III) is not expected to be significant for treatment considerations.

XRD analysis showed that quartz was the predominant soil mineral, with plagioclase and potassium feldspar and some mica as secondary minerals. Traces of kaolinite clay were observed in the shallow soil, along with some crystalline ferrihydrite and calcite.

3.2. pH buffering study for saturated soil

Fig. 2 shows the pH and SPLP results for the buffered saturated soil. The control sample maintained pH 6 over the course of 1 year, while the addition of potassium carbonate led to a constant pH of ~10, which is the pKa_2 value for the carbonate system [20]. Lime raised the pH to 12.4, which is the pH of lime-saturated water [21], but in this case the pH decreased to 9 between 60 and 365 days of curing.

The addition of 0.5% lime corresponds to the addition of 0.18 equiv. OH^-/kg soil, while the addition of 0.5% KC corresponds to 0.04 equiv. OH^-/kg soil, assuming that the main buffering reaction is CO_3^{2-} turning into HCO_3^-. However, lime was less successful than KC to maintain high pH in the long term.

There are two main processes that reduce pH in the amended soil over time: CO_2 sequestration and calcite formation, and release of H^+ from the protonated surfaces of iron and aluminum oxyhydroxides. Other processes such as deprotonation of organic compounds are considered to be of less importance due to their low content in the saturated soil. The desorption of protons from iron hydroxide surfaces is thought to be a fast process [19], while CO_2 sequestration is limited by the rate of diffusion of atmospheric CO_2 into the liquid phase. The buffering capacity related to proton adsorption and desorption of Fe and Al oxyhydroxides has been found to be in the range 0.04–0.4 mol/kg [22], although this referred to the pH range 3.5–8.3. Given the high Fe content of the soil in this study, pH buffering was anticipated to be substantial; however, it was not enough to counteract the effect of KC and lime addition. In the case of lime, CO_2 sequestration was accelerated by the high amounts of added calcium, which produced calcite, removing

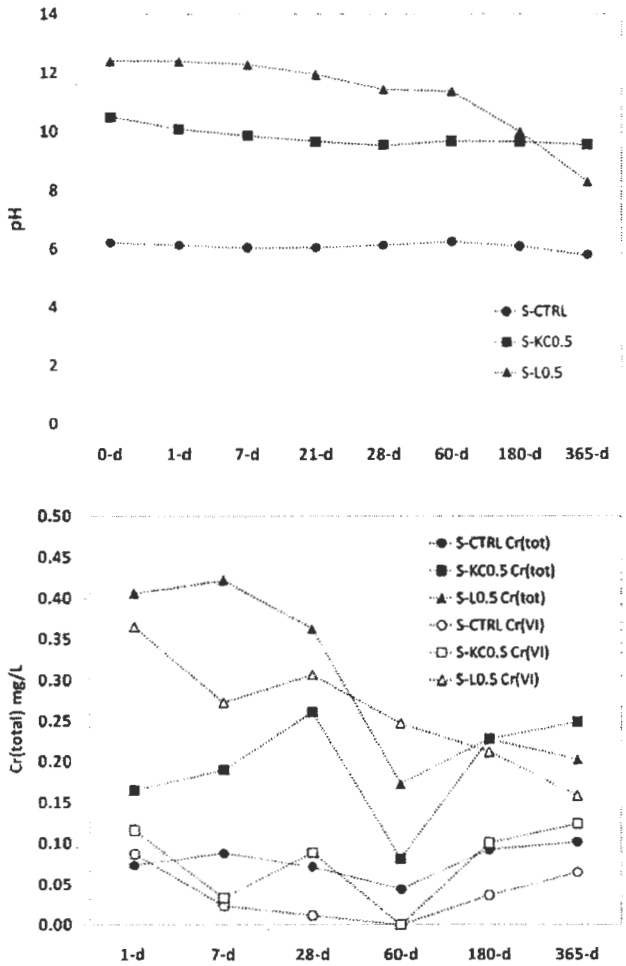

Fig. 2. pH (top) and SPLP Cr and Cr(VI) (bottom) in the buffered GW soil.

CO_3^{2-} from solution. In the KC-amended soil, CO_2-imparted acidity would be limited by its solubility and equilibrium concentration, since Ca was too low for substantial calcite formation.

It should be noted, however, that the access to CO_2 in a field application would be more limited compared to the batch lab conditions, and thus pH decrease in the limed soil would be even slower. Furthermore, carbonate advection and retardation processes are not captured in a batch study, so that the prediction of equilibrium pH concentrations in a field aquifer would require column studies to be more precise.

The addition of alkaline agents resulted in the mobilization of Cr(VI) from the saturated soil, as anticipated. However, Cr(III) immobilization under SPLP conditions was not attained. The SPLP pH of the control sample was in the range 5.5–6, while the SPLP pH of the KC and L samples was 9–9.5. Modeling of Cr(III) solubility with respect to $Cr(OH)_3$ using Visual Minteq showed that the measured concentrations were almost two orders of magnitude higher than the predicted equilibrium concentration of 5 μg/L. The reason for this behavior is unknown. It is possible that it is an artifact of the analytical procedures, whereby Cr(III) is calculated as the difference between Cr(total) and Cr(VI). Since the largest fraction of the mobilized Cr(total) was due to the mobilization of Cr(VI), it is possible that the error associated with the measurement of each Cr species caused an apparent increase in Cr(III) that was not real. In either case, the mobilization of Cr(VI) was such that it rendered a simple buffering treatment prohibitive. Thus, reductive treatment of the saturated zone appeared to be necessary, despite the low Cr(VI) concentrations in the solid.

3.3. CPS treatment of shallow soil

Fig. 3 shows the pH and redox potential over time in the CPS-treated unsaturated soil. The pH in the control sample remained at 6 throughout the 1-year testing period. The addition of 0.5% KC resulted in a steady increase of soil pH to approximately 9. This is a lower value compared to the saturated soil and the pKa_2 (10.3) of carbonate. This difference is attributed to the higher iron content of the unsaturated soil and the associated buffering capacity of the iron oxyhydroxide surfaces. Consistently with the notion that proton release of these surfaces occurs fast, the pH remained at 9 immediately after the addition of KC and until the end of the testing period. The addition of CPS resulted in the increase of soil pH to ~11 for the 1X dosage and 11.4 for the 2X dosage (the natural pH of CPS is 11.5). All CPS-treated samples showed progressive decrease in pH down to 7.2 for 1X and 7.8 for 2X, with the addition of KC not resulting in significant change in the buffering behavior of the soil. Again, the addition of large amounts of Ca is thought to have caused increased sequestration of CO_2 to form calcite; the buffering pH of calcite is 7.3 [19] which is consistent with the observed results. In terms of in situ remediation, these results indicate that the alkalinity imparted of CPS can be buffered over time, and that the rate of buffering will be dictated by the availability of CO_2. This process would likely take longer than 1 year in saturated conditions, where CO_2 diffusion into groundwater would be limited.

The redox potential in the control samples was oxidizing, indicating that in situ conditions at the site do not currently favor Cr(VI) reduction. The addition of CPS resulted in a sharp drop of Eh to −500 mV, at which Cr(VI) reduction to Cr(III) is favored. The Eh

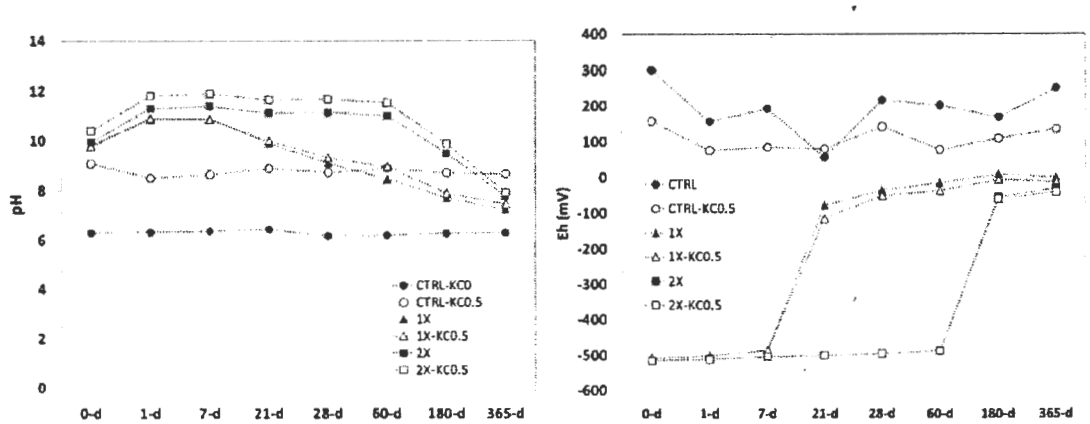

Fig. 3. pH (left) and redox potential (right) in the CPS-treated HA soil.

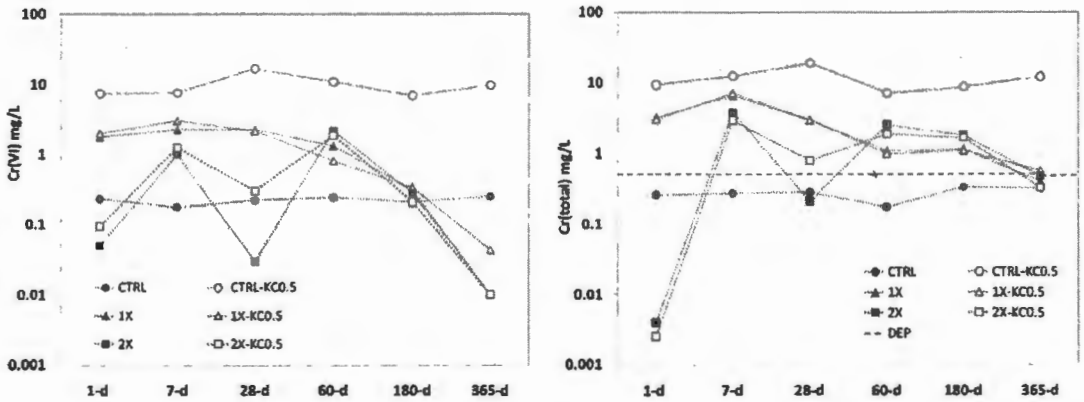

Fig. 4. SPLP Cr(VI) (left) and Cr(total) (right) concentrations in the CPS-treated HA soil.

remained highly reducing in the 1X samples until 21 days, after which it increased sharply to −70 mV and progressively to a mildly oxidizing environment. This signaled a consumption of sulfide that could be due to oxidation by chromate, by diffusing oxygen or by the natural oxidizing capacity of the solid. The 2X sample maintained a reducing environment for longer, with the Eh increasing at some point between 60 and 180 days of curing. It is recognized that subsurface conditions would not expose sulfide to as much oxygen as the batch study did and that sulfide would likely have a longer staying power. Even so, sulfide oxidation appeared to be slower compared to ferrous iron, which can be quickly oxidized in the presence of oxygen [23].

The success of the reductive treatment could not be evaluated using the EPA regulatory method for Cr(VI) measurement in the solid. While the control samples yielded constant Cr(VI) concentrations and spike recoveries over the entire curing period, CPS-treated samples consistently yielded non-detectable (<5 mg/kg) Cr(VI) concentrations, and spiked samples had recoveries of 0%. Clearly, unreacted sulfide in the samples reacted with the released Cr(VI) during the test, resulting in artificially low concentrations. Similar observations have been reported for chromite ore processing residue [24]. Thus, alkaline digestion cannot be used to assess the effectiveness of reductive treatment when the reductant has not been exhausted.

The SPLP results (Fig. 4) confirmed that the alkaline digestion results were an artifact of the test, since there was substantial leaching of Cr(VI) up to 60 days curing. Cr(VI) leaching then declined substantially in both the 1X and 2X treatments, reaching non-detectable values (<10 μg/L) at 365 days of curing. Cr(VI) leaching was below the control sample only at the 1-year point. However, it should be stressed that the creation of alkaline conditions in the CPS samples renders them comparable to the CTRL-KC0.5 sample, in which substantial mobilization of Cr(VI) was observed due to the alkaline pH. It is therefore concluded that Cr(VI) reduction did take place, with the decreasing trend commencing after 28 days of curing in the 1X sample and after 60 days of curing in the 2X sample. These curing times coincide with the increase of the redox potential in these samples (Fig. 3), confirming that sulfide oxidation took place around that time and that chromate reduction was at least partially responsible for sulfide consumption. Thus, chromate reduction by CPS in the soil appeared to be a very slow process. Ongoing studies show that once Cr(VI) is in solution, reduction by CPS occurs very rapidly (unpublished data), so that the limiting step for Cr(VI) reduction is considered to be its release from the solid. Evidence to this end will be presented in Section 3.4.

The SPLP Cr(total) leaching levels in the CPS-treated soil also declined with time and were below the CT regulatory limit of 0.5 mg/L by 365 days of curing. However, the same surprising Cr(III) mobilization in the CTRL-KC0.5 and the CPS-treated samples compared to the control was also observed in the HA soil, as was the case in the GW soil. The SPLP pH could again not account for this observation, as the SPLP pH of the control sample was approximately 7, while the SPLP pH of all other samples was in the range 8–9, in which Cr(III) is theoretically more insoluble. Since Cr(III) was found to be associated with amorphous and crystalline hydroxide by X-ray absorption spectroscopy, it is not apparent why the addition of KC or CPS would cause a mobilization of Cr(III) from the soil. The only plausible hypotheses at this time are (a) analytical artifacts; and (b) increased mobilization caused by physical dissolution of Cr(VI)–Cr(III) mixed grains under alkaline conditions. Overall, SPLP is not the best test to assess the mobility of metal species under in

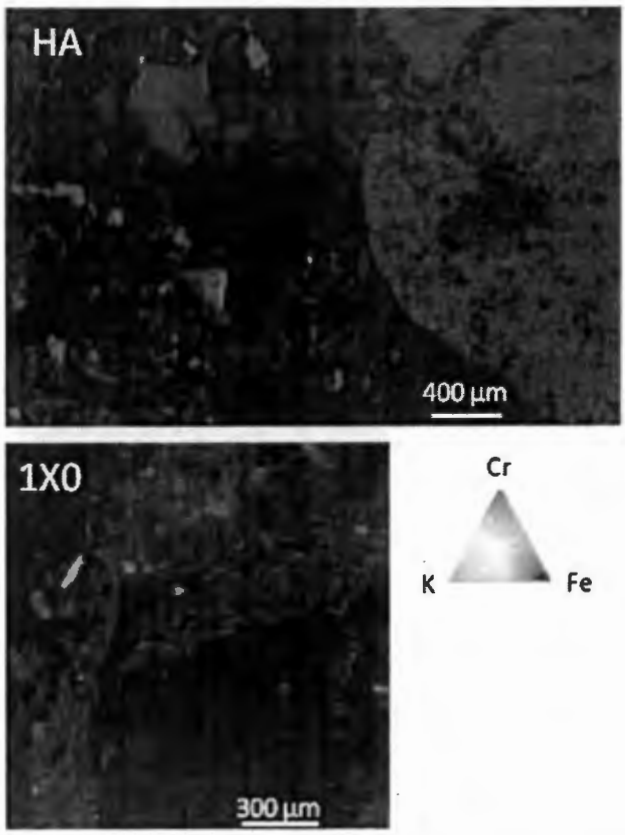

Fig. 5. Tricolor XRF maps of untreated HA sample (top) and 1X-treated HA sample at 60 days (bottom).

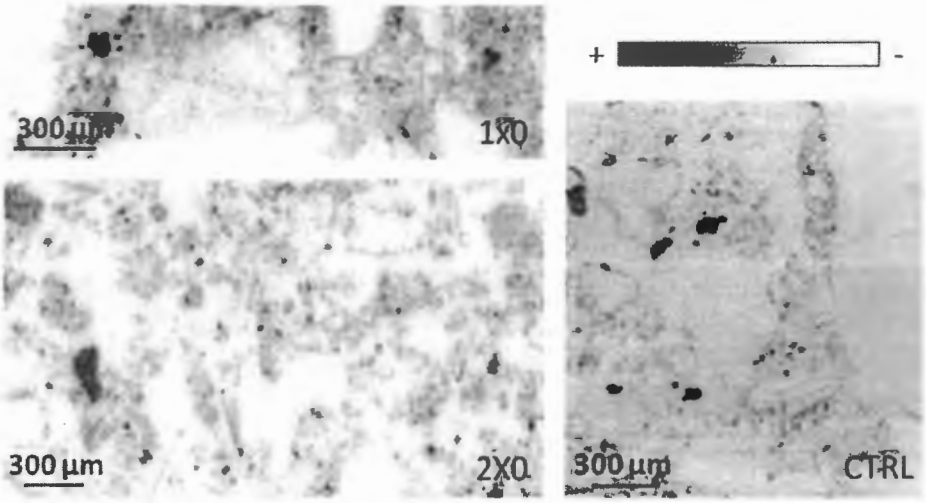

Fig. 6. Inverse grayscale Cr(VI) micro-XRF maps of the control HA sample and the samples treated with 1X and 2X CPS.

situ conditions in the soil, as both the TCLP and SPLP tests have been previously found to change metal speciation during the test in ways that were not consistent with field conditions [25,26]. However, the regulation of the site by the CT Department of Environmental Protection and the Environmental Protection Agency dictated that this test had to be conducted for regulatory purposes.

3.4. Micro-X-ray absorption spectroscopy

Micro-XRF, -XAS and -XRD analyses were conducted on samples cured for 60 days. Fig. 5 shows the distribution of Cr, Fe and K in two of three samples (untreated and 1X-treated). Fe and K were the most abundant elements and thus representative of the presence of solid grains in the sample. Cr was found to be primarily associated with finer grains, either as distinct particles, or as distinct halo on the rim of larger particles. Some Cr was found diffuse within larger grains (e.g. in the large grain of the untreated sample), but its concentration was significantly lower, so that the faint red color is difficult to see. Since thin sections yield two-dimensional images, it is difficult to say whether the diffuse Cr was located within the interior of the larger particle or if it was found adsorbed on its surface. In either case, it appears that the majority of the Cr mass was located on the rims of larger particles and in the finer grained fraction of the soil. Cr-rich particles with diameter ranging from 20 to 100 µm were observed in all three maps, with the largest ones found in the untreated sample. The Cr species associated with each type of particles was further investigated with the use of the chemical maps and XANES.

Fig. 6 shows the Cr(VI) maps for the control and the treated samples, with the intensities drawn to scale, i.e. the intensity of the color corresponds to magnitude of concentration. Table 2 shows the average pixel intensity over these three maps, as well as the corresponding Cr(total) maps of the three samples. There was variability in the average Cr(total) intensity in the three maps, which suggests that there is variability in the Cr distribution within the soil. The area captured in the control sample consisted of fewer larger grains, which tended to have less Cr, whereby the areas in the treated samples appeared to be more fine-grained and have higher Cr concentrations. One of the shortcomings of micro-X-ray analyses is that the time required to collect the µXRF maps limits the size of the areas and the number of samples that can be analyzed within the available beam time, so that sample variability becomes an issue when comparing the untreated and the treated samples. Thus, judging the success of treatment based on the average Cr(VI) intensity was not possible, as differences were attributed to sample variability rather than redox reactions.

The ratio of Cr(VI) to Cr(total) was considered a more suitable indicator of reduction processes in the treated soil, as the total Cr presence would be normalized across different samples. Table 2 shows that the average counts of Cr(VI) were 37% of the Cr(total) in the untreated sample after 60 days of curing in aqueous solution; this value dropped to 19% in the 1X-treated and to 17% in the 2X-treated sample. Chemical analyses yielded a Cr(VI)-to-Cr(total) ratio of 50% in the control sample. The difference between this value and the 37% observed by µXRF may be either due to sample variability or due to the natural reducing capacity of the control soil; the high TOC content in the surficial soil renders organically-induced Cr(VI) reduction a viable possibility. Both treated samples appeared to have a similar level of success in reducing Cr(VI), as the difference between 17% and 19% is not considered statistically significant without looking at more samples. Even though the differences in Cr(total) concentrations make it difficult to draw definitive conclusions as to how much Cr(VI) was reduced, the reduction in the Cr(VI)/Cr(total) ratio suggested that reduction did occur and that it could be up to 50% of the original Cr(VI) content.

The distribution of counts between the pixels was very similar for the two treated samples, but had differences with the untreated sample: as an indication, 50% of the pixels accounted for 9% of the Cr counts in the treated samples and 24% of the Cr counts in the untreated sample. In other words, the distribution of pixel intensity was biased towards pixels with higher counts in the treated samples. This suggests that reduction preferentially targeted areas of low Cr(VI) concentration, while high-Cr(VI) areas remained largely intact. This suggests that high-Cr(VI) compounds were not amenable to treatment after 60 days of curing time. The comparison of the µXRF Cr(VI) maps (Fig. 6) confirms that dark spots persisted in the treated samples, whereby the 2X sample had reduced intensity and smaller dark spots. Interestingly, this is the opposite phenomenon of Cr(VI) reductive treatment of chromite ore processing residue, in which high-Cr(VI) compounds were more

Table 2
Average pixel intensity over the XRF-mapped regions for Cr(VI) and Cr(total) in the untreated vs. the treated samples of the HA soil.

	Cr(VI)	Cr(total)	Cr(VI)/Cr(total) (%)
Control – 60 days	6,700	18,000	37
1X-treated – 60 days	9,600	50,000	19
2X-treated – 60 days	4,600	27,300	17

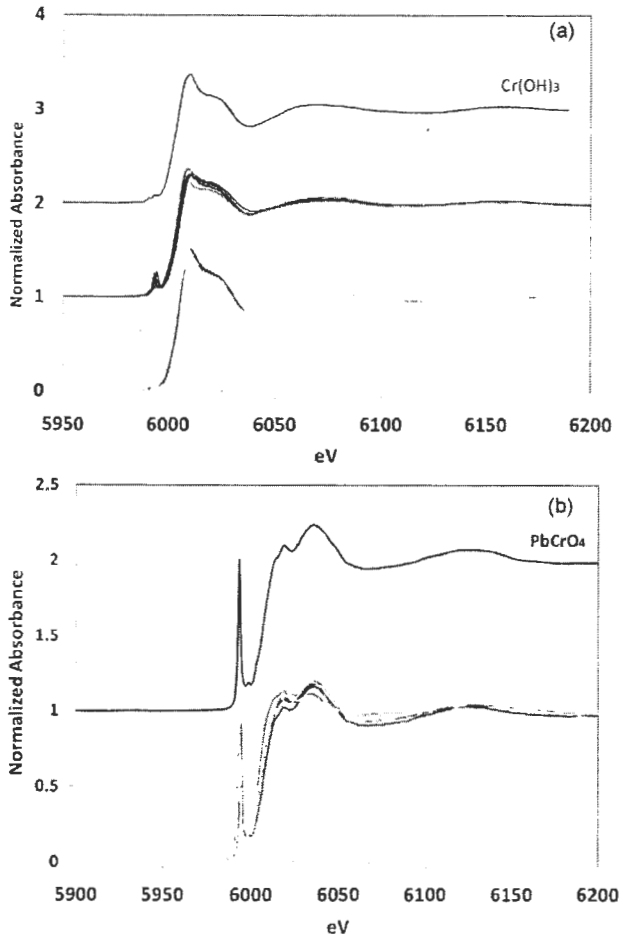

Fig. 7. XANES spectra of selected points as compared to pure $Cr(OH)_3$ (a) and $PbCrO_4$ (b) (spectra offset for clarity).

amenable to treatment [27]. Thus, different mechanisms of Cr(VI) release take place in different geochemical systems.

The speciation of Cr(VI) was also investigated by point μXANES and μXRD in order to further elucidate the reduction mechanisms. Twenty points were analyzed in the control sample and ten points in each of the treated samples; points were chosen to represent a variety of Cr(VI) intensities in the Cr(total) μXRF map.

Fig. 7 shows the XANES spectra of points that resembled pure $Cr(OH)_3$: 8 points belonged to the control sample, 3 to the 1X-treated and 5 to the 2X-treated sample. Additionally, seven points (2 CTRL, 2 1X and 3 2X) resembled $Cr(OH)_3$ in the post-edge region, but still had a discernable Cr(VI) peak at 5993 eV. Based on the μXRF maps these points were obtained from areas with high variability in the element distribution; Cr is associated with either Pb, Fe or no other element in adjacent pixels with a resolution of 10 μm × 10 μm; thus, it is concluded that a physical mixture of Cr(III) and Cr(VI) compounds is responsible for the observed XANES spectra.

The majority (8 out of 13) of high-Cr(VI)-bearing points were found to very closely resemble $PbCrO_4$ (Fig. 7(b)). This was further confirmed by μXRD, which showed crystalline crocoite as the only mineral found in these points. The Pb content of the soil could account for approximately half of the Cr(VI) being present as $PbCrO_4$ (Table 1) at the top 5 ft of the unsaturated zone, while deeper layers contained no appreciable Pb levels (<20 mg/kg). While the Pb source is not known (it is assumed that it is also the discharged wastewater and drippings), it appears that Pb migration into the deeper layers was inhibited by the formation of insoluble

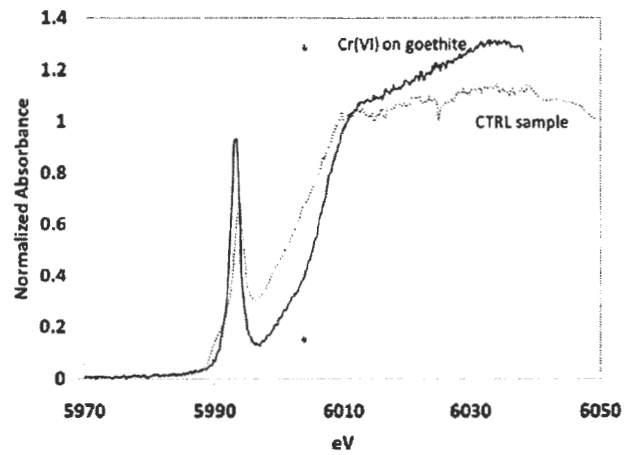

Fig. 8. XANES point of control HA sample and Cr(VI) sorbed on goethite (spectrum courtesy of Rick Wilkin, USEPA).

$PbCrO_4$, while Cr was present in excess and in the trivalent form, which was more mobile in the acidic soil conditions and leached to the saturated zone.

The prevalence of $PbCrO_4$ as the main form of Cr(VI) in the soil also explains the difficulty to treat the HA sample. Dissolution of this highly insoluble Cr(VI) compound could proceed only extremely slowly, kinetically inhibiting the reduction process. Additionally, galena (PbS) was observed in a few of the μXRD patterns, scavenging part of the added sulfide.

The speciation of the remaining Cr(VI) points was a mixture of $Cr(OH)_3$ and $PbCrO_4$ according to linear combination fitting. This agrees with the assumption that increased Cr(III) mobilization could be attributed to the physical dissolution of mixed Cr(III)–Cr(VI) grains. Only one point could not be fitted with the available spectra and it resembled more Cr(VI) sorbed to goethite (Fig. 8). This was the only point that was taken within the interior of one large grain, while other points were located in the more fine-grained areas surrounding the large grains.

Given the bias introduced in the statistical analysis of Cr(VI) speciation by the choice of a few selected points, it was thought that the association of Cr with Fe may have been underestimated through this process, both in terms of Cr(VI) sorption as well as Cr(III) co-precipitation with Fe(III) hydroxides. The association of the two elements was further investigated by examining the correlation between the pixel values of these elements over the entire obtained maps, using the custom XRF map analysis software that was developed at BL 10.3.2. Cr(total) and Cr(VI) correlation with Fe were investigated independently. The analysis showed that Cr was not associated with Fe in the majority of the pixels. The Pearson correlation coefficient between the Fe and Cr pixel intensity was 0.33 in the 1X map, 0.32 in the 2X map and 0.11 in the control HA sample. The analysis further showed that the pixels with high correlation between the Cr and Fe values corresponded to a single isolated particle in the HA and the 1X maps, with a diameter of 50 and 80 μm, respectively. One large (50 μm) and several smaller (20 μm) particles with high Fe–Cr correlation were observed in the 2X map. Thus, co-precipitation of Cr with Fe was not observed to be a dominant mechanism in this soil.

Similar observations were made for the Cr(VI)–Fe correlation. The Pearson coefficient was 0.07 in the control sample, 0.17 in 1X and 0.07 in 2X. A visual inspection of the μXRF maps confirmed that the physical locations of Fe and Cr(VI) did not coincide for the most part. The reason for this appears to be that Fe was mostly contained within the larger soil grains, while Cr(VI) was preferentially

located within the finer grained regions (see Fig. 5). Thus, Cr(VI) sorption on iron hydroxides is considered to be a secondary (if not minor) binding mechanism in this soil,with interstitial $PbCrO_4$ precipitation as the main immobilization mechanism. This observation corroborates with the SPLP Cr(VI) leaching data for the untreated unsaturated soil; the Cr(VI) concentration of 0.2 mg/L in the leachate coincides with the solubility of Cr(VI) with respect to $PbCrO_4$.

4. Conclusions

In this study, it was attempted to treat a Cr-contaminated aquifer soil by simple pH buffering, the rationale being to immobilize the predominant Cr(III) (~500 mg/kg compared to 30 mg/kg Cr(VI)). The addition of lime increased soil pH to >12 as expected, but CO_2 sequestration decreased soil pH to 9 over 1 year. The addition of potassium carbonate increased soil pH to 10 and no substantial acidification mechanism was observed within 1 year of monitoring. The effect of washing-out by groundwater seepage could be an additional buffering mechanism that was not captured in this study. In any case, the treatment approach failed because the complete mobilization of Cr(VI) proved to be prohibitive without additional reductive treatment.

Reductive treatment of the high-Cr(VI) (8000 mg/kg) near-surface soil using calcium polysulfide showed that this soil was extremely difficult to treat and that the addition of the reducing agent initially caused an apparent mobilization of Cr(VI) in the SPLP test. Alkaline digestion and SPLP were both found to be unreliable tests in predicting actual Cr speciation, with ongoing reduction during the tests. Polysulfides were shown to have substantial "staying" power, with the redox potential remaining low up to 180 days for the 2X dosage, even in the presence of oxygen. The extreme low solubility of Cr(VI) in this soil renders the addition of a slow-reacting reductant necessary, if the reduction avenue is to be pursued.

The application of synchrotron micro-X-ray techniques (μXRF, μXANES, μXRD) on the treated near-surface soil at 60 days curing showed that some reduction had taken place compared to the control sample, but also that the bulk of the Cr(VI) remained largely unreacted. Especially high-Cr(VI) areas, shown to be lead chromate, were recalcitrant to treatment. $PbCrO_4$ precipitated in the interstitial pores of the soil, so that Cr(VI) was predominantly associated with the fine-grained material between larger soil grains; little Cr(VI) was found diffuse within larger particles. Even though this was encouraging in terms of mass transfer considerations, the extremely low solubility of $PbCrO_4$ ultimately rendered reductive treatment unattractive. Since Pb was found only in the top 5 ft of the site, it is considered that removal and disposal or capping of this portion is a more cost-effective alternative than treatment, while reductive treatment of deeper zones and especially the aquifer soil with calcium polysulfide remains a viable alternative.

Acknowledgements

We wish to thank John Miller and National Chromium Inc., for the financial support of the investigation. Luke Hellerich of AECOM provided valuable input and guidance for the site investigation and treatment design. We thank Rick Wilkin of U.S.EPA for providing the XANES spectrum of Cr(VI) sorbed on goethite. Sirine Fakra and Matthew A. Marcus of LBNL provided continuous support for the μXAS data acquisition, analysis and interpretation. ALS-LBNL operations are supported by the Director, Office of Science, Office of Basic Energy Sciences, US Department of Energy under contract number DE-AC02-05CH11231.

References

[1] D. Rai, L.E. Eary, J.M. Zachara, Environmental chemistry of chromium, Sci. Tot. Environ. 86 (1989) 15–23.
[2] L.A. Hellerich, N.P. Nikolaidis, Studies of hexavalent chromium attenuation in redox variable soils obtained from a sandy to sub-wetland groundwater environment, Water Res. 39 (2005) 2851–2868.
[3] L.A. Hellerich, N.P. Nikolaidis, G.M. Dobbs, Evaluation of the potential for natural attenuation of hexavalent chromium within a sub-wetland groundwater, J. Environ. Manage. 88 (4) (2008) 1513–1524.
[4] B. Faybishenko, T.C. Hazen, P.E. Long, E.L. Brodie, M.E. Conrad, S.S. Hubbard, J.N. Christensen, D. Joyner, S.E. Borglin, R. Chakraborty, K.H. Williams, J.E. Peterson, J. Chen, S.T. Brown, T.K. Tokunaga, J. Wan, M. Firestone, D.R. Newcomer, C.T. Resch, K.J. Cantrell, A. Willett, S. Koenigsberg, In situ long-term reductive bioimmobilization of Cr(VI) in groundwater using hydrogen release compound, Environ. Sci. Technol. 42 (22) (2008) 8478–8485.
[5] USEPA, In Situ Treatment of Soil and Groundwater Contaminated with Chromium: Technical Resource Guide EPA 625/R-00/004, October 2000.
[6] P. Storch, A. Messer, D. Palmer, R. Pyrih, Pilot test for in situ geochemical fixation of chromium (VI) using calcium polysulfide, in: Proceedings of the Third International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle Press, Monterey, CA, 2002.
[7] FRTR (Federal Remediation Technologies Roundtable), Abstracts of Remediation Case Studies Volume 8, EPA 542-R-04-012, June 2004.
[8] IETEG (Independent Environmental Technical Evaluation Group), in: J. Guertin, J.A. Jacobs, C. Avakian (Eds.), Chromium(VI) Handbook, CRC Press, Boca Raton, FL, 2005.
[9] B. Charboneau, K.M. Thomson, R. Wilde, B. Ford, M. Gerber, Hanford groundwater remediation, in: Proceedings of the WM'06 Conference, Tuscon, AZ, February 26–March 2, 2006.
[10] M.C. Graham, J.G. Farmer, P. Anderson, E. Paterson, S. Hillier, D.G. Lumsdon, R.J.F. Bewley, Calcium polysulfide remediation of hexavalent chromium contamination from chromite ore processing residue, Sci. Tot. Environ. 364 (2006) 32–44.
[11] M. Wazne, S.C. Jagupilla, D.H. Moon, S.C. Jagupilla, C. Christodoulatos, M.G. Kim, Assessment of calcium polysulfide for the remediation of hexavalent chromium in chromite ore processing residue (COPR), J. Hazard. Mater. 143 (2007) 620–628.
[12] D.H. Moon, M. Wazne, S.C. Jagupilla, C. Christodoulatos, M.G. Kim, A. Koutsospyros, Particle size and pH effects on remediation of chromite ore processing residue (COPR) using calcium polysulfide (CaS_5), Sci. Tot. Environ. 399 (2008) 2–10.
[13] N.P. Nikolaidis, G.A. Robbins, M. Scherer, B. McAninch, G. Binkhorst, J. Asikainen, S.L. Suib, Vertical distribution of chromium and partitioning in a glaciofluvial aquifer, Ground Water Monit. Rem. 14 (3) (1994) 150.
[14] N.P. Nikolaidis, L.A. Hellerich, J.A. Lackovic, Methodology for site-specific, mobility-based cleanup standards for heavy metals in glaciated soils, Environ. Sci. Technol. 33 (1999) 2910–2916.
[15] International Centre for Diffraction Data (ICDD), Powder Diffraction File, PDF-2, 2002.
[16] M.A. Marcus, A.A. MacDowell, R. Celestre, A. Manceau, T. Miller, H.A. Padmore, R.E. Sublett, Beamline 10.3.2 at ALS: a hard X-ray microprobe for environmental and materials sciences, J. Synchrotron. Radiat. 11 (2004) 239–247.
[17] S. Kraft, J. Stümpel, U. Kuetgens, High resolution X-ray absorption spectroscopy with absolute energy calibration for the determination of absorption edge energies, Rev. Sci. Instrum. 67 (3) (1996) 681–687.
[18] A.P. Hammersley, FIT2D V9.129 – Reference Manual V3.1, vol. 346 ESRF Internal Report – ESRF98HA01T, 1988.
[19] P.R. Bloom, U.L. Skyllberg, M.E. Sumner, Soil acidity, in: Chemical Processes in Soils, SSSA Book Series No. 8, 2005, p. 411.
[20] V.L. Snoeyink, D. Jenkins, Water Chemistry, John Wiley and Sons, New York, 1980.
[21] M.R. Hausmann, Engineering Principles of Ground Modification, McGraw Hill, New York, 1990.
[22] O.K. Borggaard, Effect of surface area and mineralogy of iron oxides on their surface charge and anion-adsorption properties, Clays Clay Min. 31 (1983) 230–232.
[23] D.W. King, Role of carbonate speciation on the oxidation rate of Fe(II) in aquatic systems, Environ. Sci. Technol. 32 (1998) 2997–3003.
[24] D. Dermatas, M. Chrysochoou, D.H. Moon, D.G. Grubb, M. Wazne, C. Christodoulatos, Ettringite-induced heave in chromite ore processing residue (COPR) upon ferrous sulfate treatment, Environ. Sci. Technol. 40 (18) (2006) 5786–5792.
[25] D. Dermatas, G. Shen, M. Chrysochoou, D.G. Grubb, N. Menounou, P. Dutko, Pb speciation vs. TCLP release in army firing range soils, J. Hazard. Mater. 136 (1) (2006) 34–46.
[26] D. Dermatas, M. Chrysochoou, D.G. Grubb, X. Xu, Phosphate treatment of range soils: Pb fixation or P release? J. Environ. Qual. 37 (2008) 47–56.
[27] M. Chrysochoou, S. Fakra, M.A. Marcus, D.H. Moon, D. Dermatas, Microstructural analyses of Cr(VI) speciation in chromite ore processing residue (COPR), Environ. Sci. Technol. 43 (14) (2009) 5461–5466.

Journal of Hazardous Materials 179 (2010) 650–657

Contents lists available at ScienceDirect

Journal of Hazardous Materials

journal homepage: www.elsevier.com/locate/jhazmat

Calcium polysulfide treatment of Cr(VI)-contaminated soil

Maria Chrysochoou*, Daniel R. Ferreira, Chad P. Johnston

Department of Civil and Environmental Engineering, University of Connecticut, 261 Glenbrook Road, Storrs, CT 06269, United States

ARTICLE INFO

Article history:
Received 1 December 2009
Received in revised form 11 March 2010
Accepted 11 March 2010
Available online 19 March 2010

Keywords:
Chromium
Reduction
Calcium polysulfide
X-ray absorption spectroscopy

ABSTRACT

Batch treatability studies for a Cr(VI)-contaminated glacial soil from a Cr plating facility were conducted using 1X and 2X the stoichiometric ratio of calcium polysulfide (CPS). The pH of the treated soil increased from 6 to 11 upon CPS addition, but progressively returned to 8–8.5 over the course of 1 year. The 1X dosage maintained a highly reducing environment up to 21 days of monitoring with the samples exposed to atmospheric oxygen, while 2X was reducing up to 180 days of curing. The EPA regulatory method for solid Cr(VI) could not reliably predict Cr(VI) in the treated solid due to ongoing reduction during the test. SPLP results showed that the CPS created an apparent Cr(VI) mobilization during the first 60 days of treatment, with subsequent decrease in soluble Cr(VI) up to 1 year of monitoring. Synchrotron micro-X-ray analyses at 60 days curing showed that Cr(VI) was predominantly bound as highly insoluble $PbCrO_4$ that precipitated in the interstitial pores of the soil, with very little to no Cr(VI) associated with the abundant iron oxyhydroxides. Despite its spatial accessibility and due to its low solubility, $PbCrO_4$ was recalcitrant to treatment, which proceeded only very slowly as judged by the SPLP data. It is concluded that, while CPS has a long residence time in the environment and is a promising reductant, in situ reduction is not an efficient treatment method for soils with highly insoluble Cr(VI) compounds, especially in surficial layers such as the one studied.

© 2010 Elsevier B.V. All rights reserved.

1. Introduction

Chromium is one of the most frequently detected metal contaminants in federal facilities, both in Department of Energy (DoE) and Department of Defense (DoD) sites. It is also frequently found in industrial facilities, such as the metallurgic, tanning and plating industries. Much is known about the fate and transport of Cr in soil and aquatic environments. Rai et al. [1] summarize the main attributes of the environmental chemistry of Cr. Toxic and carcinogenic hexavalent chromium (Cr(VI)) is mobile at neutral and alkaline pH and forms few precipitates, thus it is mobile in most soils. In oxic acidic soils it adsorbs on iron and aluminum oxyhydroxides and its mobility is reduced. Cr(VI) reduction to non-toxic Cr(III) is facilitated by naturally occurring sulfides, ferrous iron and soil organic matter. The Cr(III) precipitates as amorphous, insoluble hydroxide at pH values greater than 5.

In Cr(VI)-contaminated sites, remedial approaches have included in situ chemical reduction, monitored natural attenuation under appropriate geochemical conditions [2,3] and bioremediation [4]. The most common approach is the use of inorganic electron donors to reduce Cr(VI) and subsequently immobilize it as insoluble chromium hydroxide. Iron-based reducing agents such as ferrous sulfate, zero-valent iron (ZVI), and pyrite have been previously used [5]. However, these methods can have adverse effects due to the imparted acidity on the soil, are most effective under acidic conditions that are not favorable for Cr(III) immobilization and are costly to apply for source treatment as they are generally solid and thus not injectable. Other common reductants are sulfides delivered as liquid or gas and organic materials, such as molasses and emulsified vegetable oil. The literature on Cr treatment technologies is too extensive to effectively summarize here; a comprehensive list of relevant documents can be found at the relevant EPA website (http://www.clu-in.org/contaminantfocus/default.focus/sec/chromium_VI/cat/Treatment_Technologies/).

This study investigates the use of calcium polysulfide (CPS) as a promising alternative that is inexpensive and can be effective under a range of pH conditions. CPS is a commercially available soil additive and has been used in field applications for contaminated soil treatment; Storch et al. [6] reported on the field application of CPS to reduce Cr(VI) at a former chrome plating facility in Arizona; FRTR [7] lists the use of CPS to treat chromium in an railroad embankment with Cr-laden pigment in Morses Pond Culvert, MA; IETEG [8] described a field application at a wood treatment facility in Ukiah, CA; Charboneau et al. [9] mentions the application of CPS at the Hanford site. Even though these applications indicated that CPS could be an effective reductant, no peer-reviewed literature was found that methodically investigated the application of

* Corresponding author. Tel.: +1 860 486 3694; fax: +1 860 486 2298.
E-mail address: maria.chrysochoou@uconn.edu (M. Chrysochoou).

0304-3894/$ – see front matter © 2010 Elsevier B.V. All rights reserved.
doi:10.1016/j.jhazmat.2010.03.052

CPS in soil as a function of pH, Cr speciation and other geochemical parameters in bench scale studies. The only peer-reviewed literature identified was on the use of CPS to treat chromite ore processing residue (COPR) [10–12]. X-ray absorption near edge structure (XANES) analyses in COPR studies showed that while dissolved Cr(VI) was successfully treated, solid Cr(VI) concentrations remained high [11]. Thus, a thorough investigation on the use of CPS in Cr(VI)-contaminated soils is warranted.

The site at the focus of this study is a chrome plating facility in northeastern Connecticut. The history of the site is described in detail elsewhere [3,13,14]. Briefly, drippings from the Cr plating process and wastewater that was directly discharged into the adjacent wetland caused Cr contamination of the soil and groundwater. A pump-and-treat system was installed to contain the groundwater contamination and prevent migration of Cr into the wetland and adjacent river. However, previous studies at this site indicate that 99% of the chromium is tightly bound to the soil, resulting in slow leaching rates that render the aquifer treatment inefficient over a practical timescale [14]. Thus, direct treatment of the soil phase emerged as a cost-effective alternative. The objective of this study is to evaluate the use of CPS for Cr(VI) treatment in soil by investigating the pH and Cr(VI) speciation effects on the kinetics of the CPS-soil reaction.

2. Materials and methods

2.1. Site description and sampling techniques

The facility is located on the edge of an escarpment formed by glacial deposits that slopes down to a heavily vegetated wetland formed on the flood plain of the adjacent Little River. The site is underlain by a glaciofluvial aquifer and a well-graded silty and clayey-sand soil matrix that is typical of New England morphology.

Soil sampling was conducted in February 2008 with a Geoprobe™ drill rig at four locations within the perimeter of the chromium plume. Two cores were taken adjacent to the building, where the bulk of the Cr(VI) source is. They are denoted S-1 and S-2, and reached depths of 40 ft and 20 ft, respectively, with the water table at a depth of approximately 28 ft S-2 was advanced only down to 20 ft because of a large boulder encountered at that depth. Additionally, 4–5 kg of sample was collected with a hand auger (denoted as HA) to a depth of roughly 4 ft in the unsaturated zone near the building. The cores were separated into fractions representing 4 ft increments of depth and all samples were homogenized and stored in sealed plastic bags at 4 °C. Samples are denoted by core source and depth increment in ft, e.g. S-1 (28–32).

2.2. Soil characterization

Total Cr(VI) analysis was conducted according to methods EPA 3060A and EPA 7196.

SPLP analysis was conducted according to EPA method 1312. Total Cr in the SPLP leachate was analyzed by Phoenix Environmental Labs (Manchester, CT) by EPA method 6010B. Particle size analysis was conducted according to method ASTM D422. Soil pH analysis was conducted according to method ASTM D4980-89 and water content by method ASTM 2216-98. XRF analysis of the soil was conducted according to EPA 6200. Total metal and total organic carbon analyses conducted by Phoenix Environmental Laboratories in Manchester, CT according to EPA methods 3015A, 6010B and 9060.

X-ray diffraction (XRD) analysis was performed using a Bruker D5005 diffractometer with Bragg Brentano geometry using CuKα radiation at 2θ angles between 5° and 65°, with a step size of 0.02° and scanning time of 3 s per step. Samples were pulverized, passed through a U.S. 400 sieve (38 μm), and contained 20 wt.% corundum as an internal standard. XRD data analysis was performed with the Jade software (Materialsdata Inc.), version 8.5, with reference to the International Center for Diffraction Data database [15].

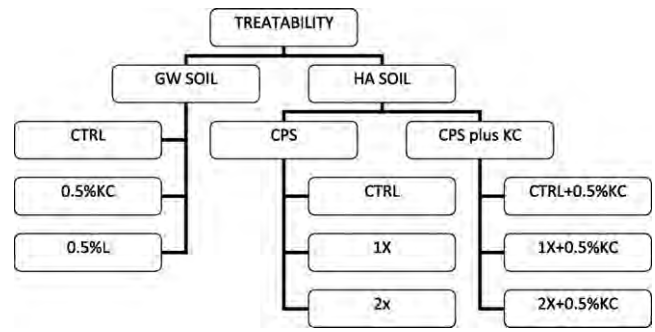

Fig. 1. Overview of treatability matrix (GW = soil under the groundwater table, HA = surficial soil collected with a hand auger, CPS = calcium polysulfide, L = lime, KC = K_2CO_3, 1X = stoichiometric dosage to reduce Cr(VI) in the soil, 2X = double the stoichiometric dosage).

2.3. Treatment design

The site characterization study revealed an uneven vertical distribution of chromium, with the majority of Cr(VI) contamination confined to the near-surface layer (~5 ft depth), whereas Cr(III) was the primary species at depths below 28 ft where the groundwater table was observed (see Section 3.1). Based on these results, the treatability study was split into two parts, addressing the soil underneath the groundwater table and the near-surface soil separately. The notation for the two soil zones is HA (for the surficial sample collected with the hand auger) and GW for the soil collected from the groundwater zone. The GW soil was treated with a pH buffering agent (K_2CO_3) alone, in order to investigate whether Cr(III) immobilization at alkaline pH would be sufficient to reduce Cr mobility below the CT regulatory limit of 0.11 mg/L Cr for non-drinking water aquifers. The HS soil was treated with CPS with and without a buffering agent, to investigate whether the addition of an alkaline agent would further facilitate Cr(VI) mobilization from the soil for reductive treatment. An overview of the experimental matrix is given in Fig. 1.

The theoretical oxidation–reduction reaction between Cr(VI) and CPS under anaerobic conditions is:

$$2CrO_4^{2-} + 3CaS_5 + 10H^+ \Leftrightarrow 2Cr(OH)_{3(s)} + 15S_{(s)} + 3Ca^{2+} + 2H_2O$$

Based on this reaction stoichiometry, the 29% CPS solution concentration, and an average HA sample Cr(VI) concentration of 7852 mg/kg, 156 mL of CPS solution were required per kg dry soil for a 1X stoichiometric relationship and 312 mL for 2X. Batch tests were conducted by placing 300 g of dry soil sieved through a No. 4 sieve (2 mm) in sealed plastic jars and the required CPS solution and kept at a 1:1 liquid to solid (L:S) ratio. Saturated source zone samples were treated with a 0.5% K_2CO_3 (KC) solution and a 0.5% lime (L) solution for comparison. The amounts of potassium carbonate and lime were determined by conducting a preliminary pH buffering study with varying amounts of these agents. All studies were performed in duplicate.

The CPS product used in the study was Cascade®, a 29% CPS solution obtained from Best Sulfur Products, Inc. All other chemicals used are ACS certified reagents. Soil analyses were conducted at 0, 1, 7, 28, 60, 180 and 365 days of curing. Soil pH, redox potential, total Cr(VI) and SPLP analyses were conducted according to the methods previously described.

Table 1
Characterization results of the control samples in the shallow HA and the groundwater GW soil.

Parameter	CTRL – HA soil	CTRL – GW soil
pH	6.3	6.0
Cr(VI) (mg/kg)	7800	30
Cr(total) (mg/kg)	14,800	380
Fe (mg/kg)	25,900	9440
Al (mg/kg)	12,800	7280
Ca (mg/kg)	1000	800
Mn (mg/kg)	260	140
Pb (mg/kg)[a]	15,000	20
TOC (mg/kg)	12,000	260

[a] Pb concentration obtained by XRF analysis.

2.4. X-ray absorption spectroscopy

Representative samples from the 60-day cured samples of the HA soil (CTRL, 1X and 2X without KC addition) were prepared as 30-μm thick diamond-polished thin sections by Spectrum Petrographics (Vancouver, WA) for microprobe analyses. Micro-XRF, μXRD and μXANES measurements were performed on Beamline 10.3.2 at the Advanced Light Source (ALS) [16]. Micro-XRF elemental maps were acquired at 13.5 keV incident energy with a beam size of 7 μm × 7 μm and a counting time of 50 ms/pixel. Fluorescence counts were collected for Ca, Ti, Cr, Mn, Fe, Ni, Cu, Zn and Pb with a seven-element Ge solid-state detector. From elemental distribution maps, various spots of interest were selected for μXRD to identify crystalline phases and for Cr K-edge μXANES to probe Cr redox state. Cr chemical mapping was performed at incident energies of 5960, 5993 and 6250 eV to obtain the background, Cr(VI) and total Cr (Cr(total)) signals, respectively. Energy calibration was performed using a Cr foil (5989.02 eV) [17]. The background map was subtracted from the two others to obtain signals attributable to Cr only. Next, 7% of the Cr(total) signal was subtracted from that of Cr(VI) to account for the finite XANES signal that Cr(III) species typically exhibit at the Cr(VI) energy. The Cr(VI) and Cr(total) maps were then assembled into a composite map.

All μXANES spectra were collected in fluorescence mode, pre-edge background subtracted and post-edge normalized using custom LabView software. Three XANES standards of pure $CaCrO_4$, $PbCrO_4$ and $BaCrO_4$ were obtained at the beamline; μXRD patterns confirmed that the pure chemical corresponded to 100% pure crystalline compound. Additional standards were provided as a courtesy of P. Nico and were also obtained previously at BL 10.3.2.

Microdiffraction patterns were recorded in transmission mode with a Bruker Smart6000 CCD camera at 17 keV for 5 min with a beam size of 16 μm × 7 μm. Two-dimensional patterns were radially integrated and calibrated using the Fit2d software [18] and an α-alumina standard. Analysis was performed with the Jade software v.8.5 and reference to the ICDD database.

3. Results and discussion

3.1. Soil characterization

The soil from both the HA and GW samples was well-graded sand with a slightly higher silt and clay content (12%) in the HA soil. The pH of the soil was acidic and generally decreased with depth, ranging from 6.5 to 7 close to the surface to 5.5 in the GW sample for the source samples close to the building and even below 5 in the aquifer near the extraction well.

Table 1 shows the chemical characterization results for the composite samples that were used in the treatability study. The GW sample was a mix from the 28–32 ft and 32–36 ft sampling depths and had a pH of 6. The Cr(VI) content of this composite sample was 30 mg/kg, while Cr(total) was 380 mg/kg. Thus, Cr(VI) was only 9% of the total chromium in the groundwater zone. This is attributed to the acidic pH conditions that historically prevailed in the soil, and which favored retardation of Cr(VI) in the upper zones and leaching of Cr(III) into the deeper soil. Nikolaidis et al. [13] reported a vertical pH profile that ranged from 3.0 at 25 ft depth up to 5.5 close to the ground surface. This extreme soil acidity was due to the acidic solutions that leached through the facility floor, as well due to the discharged wastewater, both of which were the primary sources of contamination. The soil pH apparently rebounded by almost two pH units over the course of the 15 years that elapsed between the two studies. The mechanism of pH buffering cannot be elicited from the comparison of the two studies, as soil chemistry and mineralogy appears to be the same. Potential buffering processes are deprotonation of the abundant iron hydroxide surfaces, precipitation of calcite (observed by XRD in small amounts) and microbial activity [19].

The Cr(VI) concentration was high (7800 mg/kg) in the HA sample, while individual samples were found to have up to 10,000 mg/kg Cr(VI). The total Cr was at 14,800 mg/kg in the HA sample, so that Cr(VI) was approximately 50% of the total chromium. The HA soil was also found to have considerably higher Fe and TOC content compared to the saturated zone, along with a high Pb content of 15,000 mg/kg. The presence of Pb was a surprising finding, as it was not reported in previous studies and its source was not apparent based on the Cr plating processes. The Pb concentration was only high at the top 5 ft and quickly declined to background concentration of ~20 mg/kg. The saturated soil appeared to be closer to clean sand with lower contents of all major metals. Mn concentrations were low in all zones, so that Mn-induced reoxidation of Cr(III) is not expected to be significant for treatment considerations.

XRD analysis showed that quartz was the predominant soil mineral, with plagioclase and potassium feldspar and some mica as secondary minerals. Traces of kaolinite clay were observed in the shallow soil, along with some crystalline ferrihydrite and calcite.

3.2. pH buffering study for saturated soil

Fig. 2 shows the pH and SPLP results for the buffered saturated soil. The control sample maintained pH 6 over the course of 1 year, while the addition of potassium carbonate led to a constant pH of ~10, which is the pKa_2 value for the carbonate system [20]. Lime raised the pH to 12.4, which is the pH of lime-saturated water [21], but in this case the pH decreased to 9 between 60 and 365 days of curing.

The addition of 0.5% lime corresponds to the addition of 0.18 equiv. OH^-/kg soil, while the addition of 0.5% KC corresponds to 0.04 equiv. OH^-/kg soil, assuming that the main buffering reaction is CO_3^{2-} turning into HCO_3^-. However, lime was less successful than KC to maintain high pH in the long term.

There are two main processes that reduce pH in the amended soil over time: CO_2 sequestration and calcite formation, and release of H^+ from the protonated surfaces of iron and aluminum oxyhydroxides. Other processes such as deprotonation of organic compounds are considered to be of less importance due to their low content in the saturated soil. The desorption of protons from iron hydroxide surfaces is thought to be a fast process [19], while CO_2 sequestration is limited by the rate of diffusion of atmospheric CO_2 into the liquid phase. The buffering capacity related to proton adsorption and desorption of Fe and Al oxyhydroxides has been found to be in the range 0.04–0.4 mol/kg [22], although this referred to the pH range 3.5–8.3. Given the high Fe content of the soil in this study, pH buffering was anticipated to be substantial; however, it was not enough to counteract the effect of KC and lime addition. In the case of lime, CO_2 sequestration was accelerated by the high amounts of added calcium, which produced calcite, removing

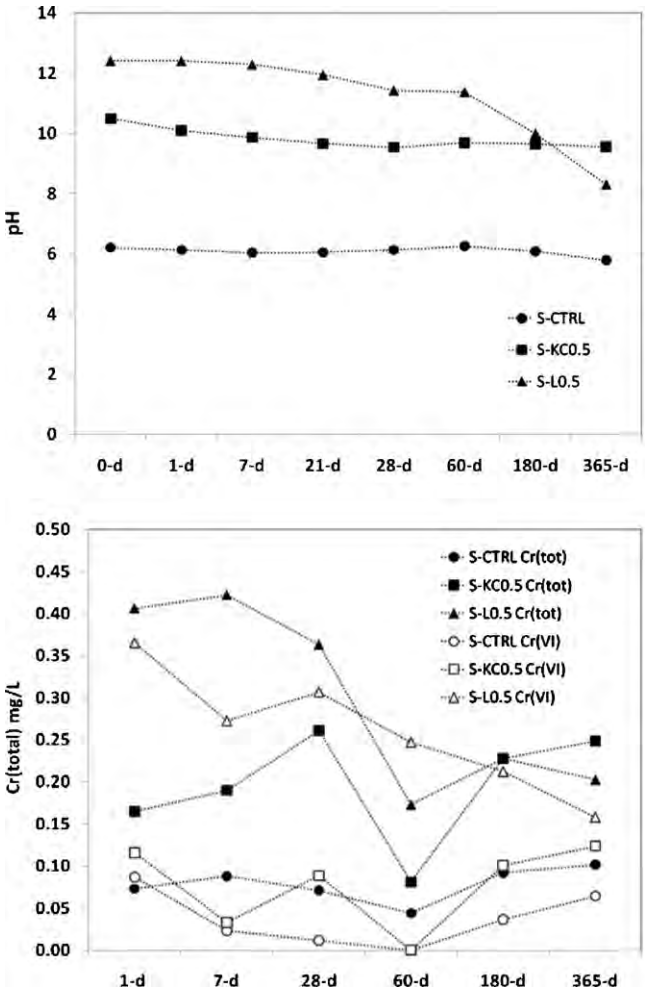

Fig. 2. pH (top) and SPLP Cr and Cr(VI) (bottom) in the buffered GW soil.

CO_3^{2-} from solution. In the KC-amended soil, CO_2-imparted acidity would be limited by its solubility and equilibrium concentration, since Ca was too low for substantial calcite formation.

It should be noted, however, that the access to CO_2 in a field application would be more limited compared to the batch lab conditions, and thus pH decrease in the limed soil would be even slower. Furthermore, carbonate advection and retardation processes are not captured in a batch study, so that the prediction of equilibrium pH concentrations in a field aquifer would require column studies to be more precise.

The addition of alkaline agents resulted in the mobilization of Cr(VI) from the saturated soil, as anticipated. However, Cr(III) immobilization under SPLP conditions was not attained. The SPLP pH of the control sample was in the range 5.5–6, while the SPLP pH of the KC and L samples was 9–9.5. Modeling of Cr(III) solubility with respect to $Cr(OH)_3$ using Visual Minteq showed that the measured concentrations were almost two orders of magnitude higher than the predicted equilibrium concentration of 5 μg/L. The reason for this behavior is unknown. It is possible that it is an artifact of the analytical procedures, whereby Cr(III) is calculated as the difference between Cr(total) and Cr(VI). Since the largest fraction of the mobilized Cr(total) was due to the mobilization of Cr(VI), it is possible that the error associated with the measurement of each Cr species caused an apparent increase in Cr(III) that was not real. In either case, the mobilization of Cr(VI) was such that it rendered a simple buffering treatment prohibitive. Thus, reductive treatment of the saturated zone appeared to be necessary, despite the low Cr(VI) concentrations in the solid.

3.3. CPS treatment of shallow soil

Fig. 3 shows the pH and redox potential over time in the CPS-treated unsaturated soil. The pH in the control sample remained at 6 throughout the 1-year testing period. The addition of 0.5% KC resulted in a steady increase of soil pH to approximately 9. This is a lower value compared to the saturated soil and the pKa_2 (10.3) of carbonate. This difference is attributed to the higher iron content of the unsaturated soil and the associated buffering capacity of the iron oxyhydroxide surfaces. Consistently with the notion that proton release of these surfaces occurs fast, the pH remained at 9 immediately after the addition of KC and until the end of the testing period. The addition of CPS resulted in the increase of soil pH to ~11 for the 1X dosage and 11.4 for the 2X dosage (the natural pH of CPS is 11.5). All CPS-treated samples showed progressive decrease in pH down to 7.2 for 1X and 7.8 for 2X, with the addition of KC not resulting in significant change in the buffering behavior of the soil. Again, the addition of large amounts of Ca is thought to have caused increased sequestration of CO_2 to form calcite; the buffering pH of calcite is 7.3 [19] which is consistent with the observed results. In terms of in situ remediation, these results indicate that the alkalinity imparted of CPS can be buffered over time, and that the rate of buffering will be dictated by the availability of CO_2. This process would likely take longer than 1 year in saturated conditions, where CO_2 diffusion into groundwater would be limited.

The redox potential in the control samples was oxidizing, indicating that in situ conditions at the site do not currently favor Cr(VI) reduction. The addition of CPS resulted in a sharp drop of Eh to −500 mV, at which Cr(VI) reduction to Cr(III) is favored. The Eh

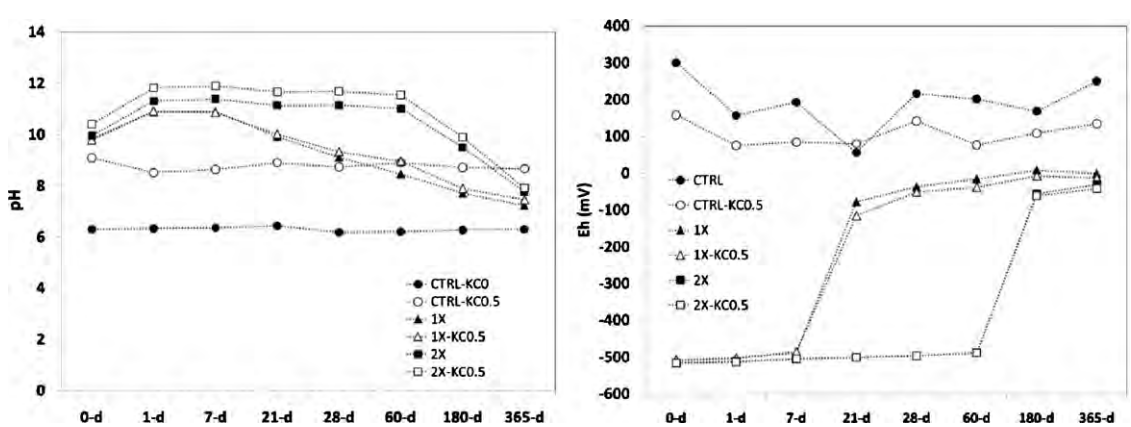

Fig. 3. pH (left) and redox potential (right) in the CPS-treated HA soil.

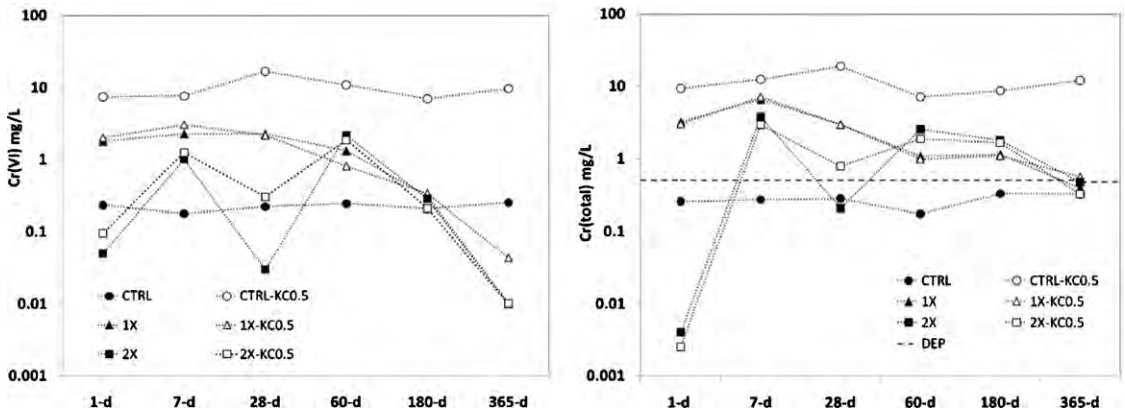

Fig. 4. SPLP Cr(VI) (left) and Cr(total) (right) concentrations in the CPS-treated HA soil.

remained highly reducing in the 1X samples until 21 days, after which it increased sharply to −70 mV and progressively to a mildly oxidizing environment. This signaled a consumption of sulfide that could be due to oxidation by chromate, by diffusing oxygen or by the natural oxidizing capacity of the solid. The 2X sample maintained a reducing environment for longer, with the Eh increasing at some point between 60 and 180 days of curing. It is recognized that subsurface conditions would not expose sulfide to as much oxygen as the batch study did and that sulfide would likely have a longer staying power. Even so, sulfide oxidation appeared to be slower compared to ferrous iron, which can be quickly oxidized in the presence of oxygen [23].

The success of the reductive treatment could not be evaluated using the EPA regulatory method for Cr(VI) measurement in the solid. While the control samples yielded constant Cr(VI) concentrations and spike recoveries over the entire curing period, CPS-treated samples consistently yielded non-detectable (<5 mg/kg) Cr(VI) concentrations, and spiked samples had recoveries of 0%. Clearly, unreacted sulfide in the samples reacted with the released Cr(VI) during the test, resulting in artificially low concentrations. Similar observations have been reported for chromite ore processing residue [24]. Thus, alkaline digestion cannot be used to assess the effectiveness of reductive treatment when the reductant has not been exhausted.

The SPLP results (Fig. 4) confirmed that the alkaline digestion results were an artifact of the test, since there was substantial leaching of Cr(VI) up to 60 days curing. Cr(VI) leaching then declined substantially in both the 1X and 2X treatments, reaching non-detectable values (<10 μg/L) at 365 days of curing. Cr(VI) leaching was below the control sample only at the 1-year point. However, it should be stressed that the creation of alkaline conditions in the CPS samples renders them comparable to the CTRL-KC0.5 sample, in which substantial mobilization of Cr(VI) was observed due to the alkaline pH. It is therefore concluded that Cr(VI) reduction did take place, with the decreasing trend commencing after 28 days of curing in the 1X sample and after 60 days of curing in the 2X sample. These curing times coincide with the increase of the redox potential in these samples (Fig. 3), confirming that sulfide oxidation took place around that time and that chromate reduction was at least partially responsible for sulfide consumption. Thus, chromate reduction by CPS in the soil appeared to be a very slow process. Ongoing studies show that once Cr(VI) is in solution, reduction by CPS occurs very rapidly (unpublished data), so that the limiting step for Cr(VI) reduction is considered to be its release from the solid. Evidence to this end will be presented in Section 3.4.

The SPLP Cr(total) leaching levels in the CPS-treated soil also declined with time and were below the CT regulatory limit of 0.5 mg/L by 365 days of curing. However, the same surprising Cr(III) mobilization in the CTRL-KC0.5 and the CPS-treated samples compared to the control was also observed in the HA soil, as was the case in the GW soil. The SPLP pH could again not account for this observation, as the SPLP pH of the control sample was approximately 7, while the SPLP pH of all other samples was in the range 8–9, in which Cr(III) is theoretically more insoluble. Since Cr(III) was found to be associated with amorphous and crystalline hydroxide by X-ray absorption spectroscopy, it is not apparent why the addition of KC or CPS would cause a mobilization of Cr(III) from the soil. The only plausible hypotheses at this time are (a) analytical artifacts; and (b) increased mobilization caused by physical dissolution of Cr(VI)–Cr(III) mixed grains under alkaline conditions. Overall, SPLP is not the best test to assess the mobility of metal species under in

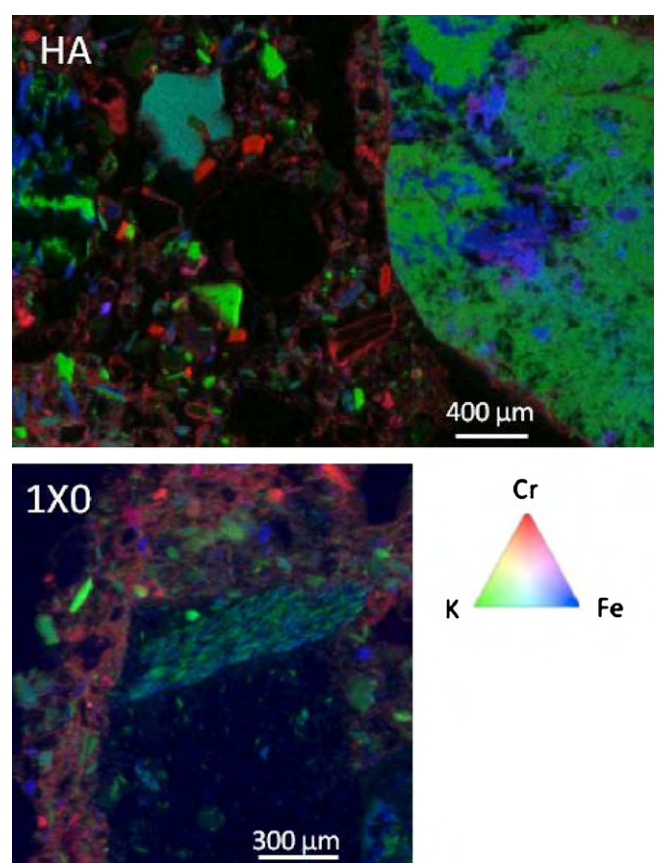

Fig. 5. Tricolor XRF maps of untreated HA sample (top) and 1X-treated HA sample at 60 days (bottom).

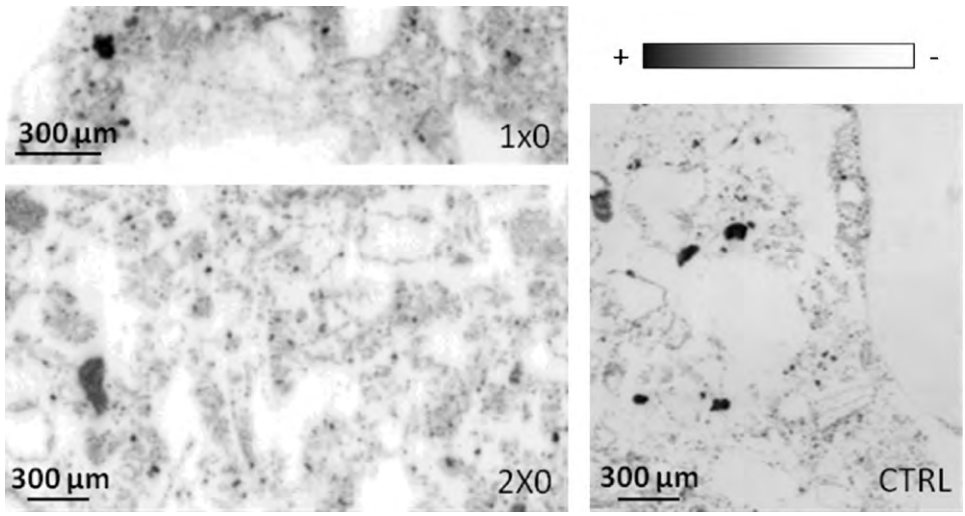

Fig. 6. Inverse grayscale Cr(VI) micro-XRF maps of the control HA sample and the samples treated with 1X and 2X CPS.

situ conditions in the soil, as both the TCLP and SPLP tests have been previously found to change metal speciation during the test in ways that were not consistent with field conditions [25,26]. However, the regulation of the site by the CT Department of Environmental Protection and the Environmental Protection Agency dictated that this test had to be conducted for regulatory purposes.

3.4. Micro-X-ray absorption spectroscopy

Micro-XRF, -XAS and -XRD analyses were conducted on samples cured for 60 days. Fig. 5 shows the distribution of Cr, Fe and K in two of three samples (untreated and 1X-treated). Fe and K were the most abundant elements and thus representative of the presence of solid grains in the sample. Cr was found to be primarily associated with finer grains, either as distinct particles, or as distinct halo on the rim of larger particles. Some Cr was found diffuse within larger grains (e.g. in the large grain of the untreated sample), but its concentration was significantly lower, so that the faint red color is difficult to see. Since thin sections yield two-dimensional images, it is difficult to say whether the diffuse Cr was located within the interior of the larger particle or if it was found adsorbed on its surface. In either case, it appears that the majority of the Cr mass was located on the rims of larger particles and in the finer grained fraction of the soil. Cr-rich particles with diameter ranging from 20 to 100 μm were observed in all three maps, with the largest ones found in the untreated sample. The Cr species associated with each type of particles was further investigated with the use of the chemical maps and XANES.

Fig. 6 shows the Cr(VI) maps for the control and the treated samples, with the intensities drawn to scale, i.e. the intensity of the color corresponds to magnitude of concentration. Table 2 shows the average pixel intensity over these three maps, as well as the corresponding Cr(total) maps of the three samples. There was variability in the average Cr(total) intensity in the three maps, which suggests that there is variability in the Cr distribution within the soil. The area captured in the control sample consisted of fewer larger grains, which tended to have less Cr, whereby the areas in the treated samples appeared to be more fine-grained and have higher Cr concentrations. One of the shortcomings of micro-X-ray analyses is that the time required to collect the μXRF maps limits the size of the areas and the number of samples that can be analyzed within the available beam time, so that sample variability becomes an issue when comparing the untreated and the treated samples. Thus, judging the success of treatment based on the average Cr(VI) intensity was not possible, as differences were attributed to sample variability rather than redox reactions.

The ratio of Cr(VI) to Cr(total) was considered a more suitable indicator of reduction processes in the treated soil, as the total Cr presence would be normalized across different samples. Table 2 shows that the average counts of Cr(VI) were 37% of the Cr(total) in the untreated sample after 60 days of curing in aqueous solution; this value dropped to 19% in the 1X-treated and to 17% in the 2X-treated sample. Chemical analyses yielded a Cr(VI)-to-Cr(total) ratio of 50% in the control sample. The difference between this value and the 37% observed by μXRF may be either due to sample variability or due to the natural reducing capacity of the control soil; the high TOC content in the surficial soil renders organically-induced Cr(VI) reduction a viable possibility. Both treated samples appeared to have a similar level of success in reducing Cr(VI), as the difference between 17% and 19% is not considered statistically significant without looking at more samples. Even though the differences in Cr(total) concentrations make it difficult to draw definitive conclusions as to how much Cr(VI) was reduced, the reduction in the Cr(VI)/Cr(total) ratio suggested that reduction did occur and that it could be up to 50% of the original Cr(VI) content.

The distribution of counts between the pixels was very similar for the two treated samples, but had differences with the untreated sample: as an indication, 50% of the pixels accounted for 9% of the Cr counts in the treated samples and 24% of the Cr counts in the untreated sample. In other words, the distribution of pixel intensity was biased towards pixels with higher counts in the treated samples. This suggests that reduction preferentially targeted areas of low Cr(VI) concentration, while high-Cr(VI) areas remained largely intact. This suggests that high-Cr(VI) compounds were not amenable to treatment after 60 days of curing time. The comparison of the μXRF Cr(VI) maps (Fig. 6) confirms that dark spots persisted in the treated samples, whereby the 2X sample had reduced intensity and smaller dark spots. Interestingly, this is the opposite phenomenon of Cr(VI) reductive treatment of chromite ore processing residue, in which high-Cr(VI) compounds were more

Table 2
Average pixel intensity over the XRF-mapped regions for Cr(VI) and Cr(total) in the untreated vs. the treated samples of the HA soil.

	Cr(VI)	Cr(total)	Cr(VI)/Cr(total) (%)
Control – 60 days	6,700	18,000	37
1X-treated – 60 days	9,600	50,000	19
2X-treated – 60 days	4,600	27,300	17

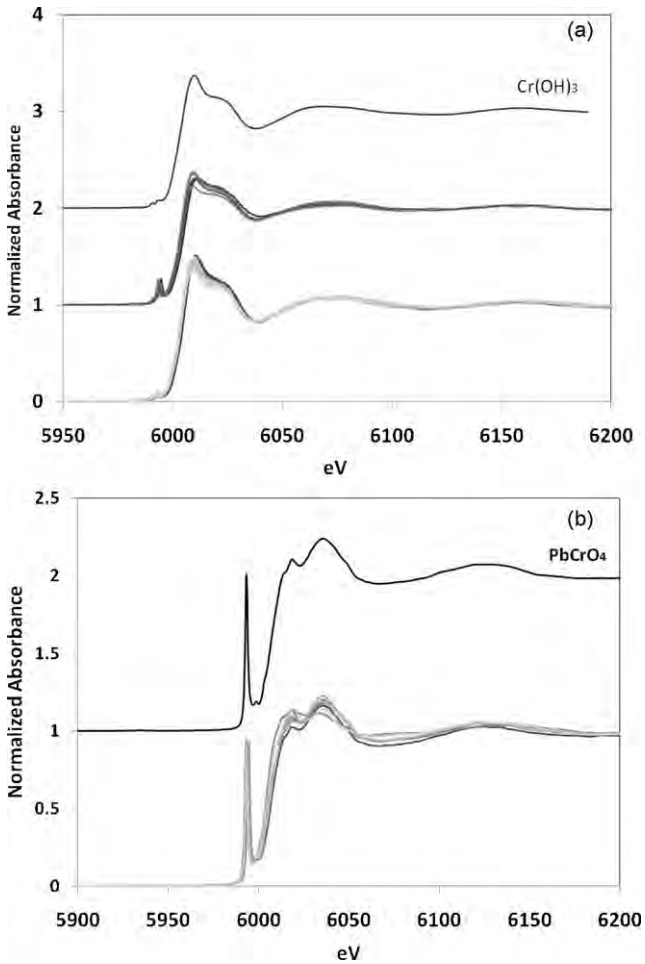

Fig. 7. XANES spectra of selected points as compared to pure $Cr(OH)_3$ (a) and $PbCrO_4$ (b) (spectra offset for clarity).

amenable to treatment [27]. Thus, different mechanisms of Cr(VI) release take place in different geochemical systems.

The speciation of Cr(VI) was also investigated by point μXANES and μXRD in order to further elucidate the reduction mechanisms. Twenty points were analyzed in the control sample and ten points in each of the treated samples; points were chosen to represent a variety of Cr(VI) intensities in the Cr(total) μXRF map.

Fig. 7 shows the XANES spectra of points that resembled pure $Cr(OH)_3$: 8 points belonged to the control sample, 3 to the 1X-treated and 5 to the 2X-treated sample. Additionally, seven points (2 CTRL, 2 1X and 3 2X) resembled $Cr(OH)_3$ in the post-edge region, but still had a discernable Cr(VI) peak at 5993 eV. Based on the μXRF maps these points were obtained from areas with high variability in the element distribution; Cr is associated with either Pb, Fe or no other element in adjacent pixels with a resolution of 10 μm × 10 μm; thus, it is concluded that a physical mixture of Cr(III) and Cr(VI) compounds is responsible for the observed XANES spectra.

The majority (8 out of 13) of high-Cr(VI)-bearing points were found to very closely resemble $PbCrO_4$ (Fig. 7(b)). This was further confirmed by μXRD, which showed crystalline crocoite as the only mineral found in these points. The Pb content of the soil could account for approximately half of the Cr(VI) being present as $PbCrO_4$ (Table 1) at the top 5 ft of the unsaturated zone, while deeper layers contained no appreciable Pb levels (<20 mg/kg). While the Pb source is not known (it is assumed that it is also the discharged wastewater and drippings), it appears that Pb migration into the deeper layers was inhibited by the formation of insoluble

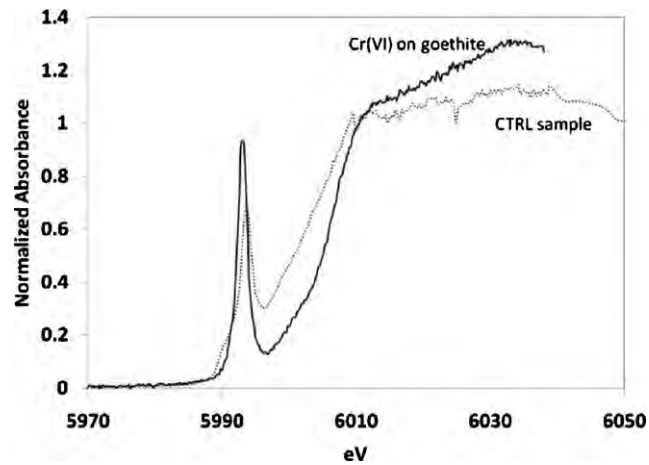

Fig. 8. XANES point of control HA sample and Cr(VI) sorbed on goethite (spectrum courtesy of Rick Wilkin, USEPA).

$PbCrO_4$, while Cr was present in excess and in the trivalent form, which was more mobile in the acidic soil conditions and leached to the saturated zone.

The prevalence of $PbCrO_4$ as the main form of Cr(VI) in the soil also explains the difficulty to treat the HA sample. Dissolution of this highly insoluble Cr(VI) compound could proceed only extremely slowly, kinetically inhibiting the reduction process. Additionally, galena (PbS) was observed in a few of the μXRD patterns, scavenging part of the added sulfide.

The speciation of the remaining Cr(VI) points was a mixture of $Cr(OH)_3$ and $PbCrO_4$ according to linear combination fitting. This agrees with the assumption that increased Cr(III) mobilization could be attributed to the physical dissolution of mixed Cr(III)–Cr(VI) grains. Only one point could not be fitted with the available spectra and it resembled more Cr(VI) sorbed to goethite (Fig. 8). This was the only point that was taken within the interior of one large grain, while other points were located in the more fine-grained areas surrounding the large grains.

Given the bias introduced in the statistical analysis of Cr(VI) speciation by the choice of a few selected points, it was thought that the association of Cr with Fe may have been underestimated through this process, both in terms of Cr(VI) sorption as well as Cr(III) co-precipitation with Fe(III) hydroxides. The association of the two elements was further investigated by examining the correlation between the pixel values of these elements over the entire obtained maps, using the custom XRF map analysis software that was developed at BL 10.3.2. Cr(total) and Cr(VI) correlation with Fe were investigated independently. The analysis showed that Cr was not associated with Fe in the majority of the pixels. The Pearson correlation coefficient between the Fe and Cr pixel intensity was 0.33 in the 1X map, 0.32 in the 2X map and 0.11 in the control HA sample. The analysis further showed that the pixels with high correlation between the Cr and Fe values corresponded to a single isolated particle in the HA and the 1X maps, with a diameter of 50 and 80 μm, respectively. One large (50 μm) and several smaller (20 μm) particles with high Fe–Cr correlation were observed in the 2X map. Thus, co-precipitation of Cr with Fe was not observed to be a dominant mechanism in this soil.

Similar observations were made for the Cr(VI)–Fe correlation. The Pearson coefficient was 0.07 in the control sample, 0.17 in 1X and 0.07 in 2X. A visual inspection of the μXRF maps confirmed that the physical locations of Fe and Cr(VI) did not coincide for the most part. The reason for this appears to be that Fe was mostly contained within the larger soil grains, while Cr(VI) was preferentially

located within the finer grained regions (see Fig. 5). Thus, Cr(VI) sorption on iron hydroxides is considered to be a secondary (if not minor) binding mechanism in this soil,with interstitial $PbCrO_4$ precipitation as the main immobilization mechanism. This observation corroborates with the SPLP Cr(VI) leaching data for the untreated unsaturated soil; the Cr(VI) concentration of 0.2 mg/L in the leachate coincides with the solubility of Cr(VI) with respect to $PbCrO_4$.

4. Conclusions

In this study, it was attempted to treat a Cr-contaminated aquifer soil by simple pH buffering, the rationale being to immobilize the predominant Cr(III) (~500 mg/kg compared to 30 mg/kg Cr(VI)). The addition of lime increased soil pH to >12 as expected, but CO_2 sequestration decreased soil pH to 9 over 1 year. The addition of potassium carbonate increased soil pH to 10 and no substantial acidification mechanism was observed within 1 year of monitoring. The effect of washing-out by groundwater seepage could be an additional buffering mechanism that was not captured in this study. In any case, the treatment approach failed because the complete mobilization of Cr(VI) proved to be prohibitive without additional reductive treatment.

Reductive treatment of the high-Cr(VI) (8000 mg/kg) near-surface soil using calcium polysulfide showed that this soil was extremely difficult to treat and that the addition of the reducing agent initially caused an apparent mobilization of Cr(VI) in the SPLP test. Alkaline digestion and SPLP were both found to be unreliable tests in predicting actual Cr speciation, with ongoing reduction during the tests. Polysulfides were shown to have substantial "staying" power, with the redox potential remaining low up to 180 days for the 2X dosage, even in the presence of oxygen. The extreme low solubility of Cr(VI) in this soil renders the addition of a slow-reacting reductant necessary, if the reduction avenue is to be pursued.

The application of synchrotron micro-X-ray techniques (μXRF, μXANES, μXRD) on the treated near-surface soil at 60 days curing showed that some reduction had taken place compared to the control sample, but also that the bulk of the Cr(VI) remained largely unreacted. Especially high-Cr(VI) areas, shown to be lead chromate, were recalcitrant to treatment. $PbCrO_4$ precipitated in the interstitial pores of the soil, so that Cr(VI) was predominantly associated with the fine-grained material between larger soil grains; little Cr(VI) was found diffuse within larger particles. Even though this was encouraging in terms of mass transfer considerations, the extremely low solubility of $PbCrO_4$ ultimately rendered reductive treatment unattractive. Since Pb was found only in the top 5 ft of the site, it is considered that removal and disposal or capping of this portion is a more cost-effective alternative than treatment, while reductive treatment of deeper zones and especially the aquifer soil with calcium polysulfide remains a viable alternative.

Acknowledgements

We wish to thank John Miller and National Chromium Inc., for the financial support of the investigation. Luke Hellerich of AECOM provided valuable input and guidance for the site investigation and treatment design. We thank Rick Wilkin of U.S.EPA for providing the XANES spectrum of Cr(VI) sorbed on goethite. Sirine Fakra and Matthew A. Marcus of LBNL provided continuous support for the μXAS data acquisition, analysis and interpretation. ALS-LBNL operations are supported by the Director, Office of Science, Office of Basic Energy Sciences, US Department of Energy under contract number DE-AC02-05CH11231.

References

[1] D. Rai, L.E. Eary, J.M. Zachara, Environmental chemistry of chromium, Sci. Tot. Environ. 86 (1989) 15–23.
[2] L.A. Hellerich, N.P. Nikolaidis, Studies of hexavalent chromium attenuation in redox variable soils obtained from a sandy to sub-wetland groundwater environment, Water Res. 39 (2005) 2851–2868.
[3] L.A. Hellerich, N.P. Nikolaidis, G.M. Dobbs, Evaluation of the potential for natural attenuation of hexavalent chromium within a sub-wetland groundwater, J. Environ. Manage. 88 (4) (2008) 1513–1524.
[4] B. Faybishenko, T.C. Hazen, P.E. Long, E.L. Brodie, M.E. Conrad, S.S. Hubbard, J.N. Christensen, D. Joyner, S.E. Borglin, R. Chakraborty, K.H. Williams, J.E. Peterson, J. Chen, S.T. Brown, T.K. Tokunaga, J. Wan, M. Firestone, D.R. Newcomer, C.T. Resch, K.J. Cantrell, A. Willett, S. Koenigsberg, In situ long-term reductive bioimmobilization of Cr(VI) in groundwater using hydrogen release compound, Environ. Sci. Technol. 42 (22) (2008) 8478–8485.
[5] USEPA, In Situ Treatment of Soil and Groundwater Contaminated with Chromium: Technical Resource Guide EPA 625/R-00/004, October 2000.
[6] P. Storch, A. Messer, D. Palmer, R. Pyrih, Pilot test for in situ geochemical fixation of chromium (VI) using calcium polysulfide, in: Proceedings of the Third International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle Press, Monterey, CA, 2002.
[7] FRTR (Federal Remediation Technologies Roundtable), Abstracts of Remediation Case Studies Volume 8, EPA 542-R-04-012, June 2004.
[8] IETEG (Independent Environmental Technical Evaluation Group), in: J. Guertin, J.A. Jacobs, C. Avakian (Eds.), Chromium(VI) Handbook, CRC Press, Boca Raton, FL, 2005.
[9] B. Charboneau, K.M. Thomson, R. Wilde, B. Ford, M. Gerber, Hanford groundwater remediation, in: Proceedings of the WM'06 Conference, Tuscon, AZ, February 26–March 2, 2006.
[10] M.C. Graham, J.G. Farmer, P. Anderson, E. Paterson, S. Hillier, D.G. Lumsdon, R.J.F. Bewley, Calcium polysulfide remediation of hexavalent chromium contamination from chromite ore processing residue, Sci. Tot. Environ. 364 (2006) 32–44.
[11] M. Wazne, S.C. Jagupilla, D.H. Moon, S.C. Jagupilla, C. Christodoulatos, M.G. Kim, Assessment of calcium polysulfide for the remediation of hexavalent chromium in chromite ore processing residue (COPR), J. Hazard. Mater. 143 (2007) 620–628.
[12] D.H. Moon, M. Wazne, S.C. Jagupilla, C. Christodoulatos, M.G. Kim, A. Koutsospyros, Particle size and pH effects on remediation of chromite ore processing residue (COPR) using calcium polysulfide (CaS_5), Sci. Tot. Environ. 399 (2008) 2–10.
[13] N.P. Nikolaidis, G.A. Robbins, M. Scherer, B. McAninch, G. Binkhorst, J. Asikainen, S.L. Suib, Vertical distribution of chromium and partitioning in a glaciofluvial aquifer, Ground Water Monit. Rem. 14 (3) (1994) 150.
[14] N.P. Nikolaidis, L.A. Hellerich, J.A. Lackovic, Methodology for site-specific, mobility-based cleanup standards for heavy metals in glaciated soils, Environ. Sci. Technol. 33 (1999) 2910–2916.
[15] International Centre for Diffraction Data (ICDD), Powder Diffraction File, PDF-2, 2002.
[16] M.A. Marcus, A.A. MacDowell, R. Celestre, A. Manceau, T. Miller, H.A. Padmore, R.E. Sublett, Beamline 10.3.2 at ALS: a hard X-ray microprobe for environmental and materials sciences, J. Synchrotron. Radiat. 11 (2004) 239–247.
[17] S. Kraft, J. Stümpel, U. Kuetgens, High resolution X-ray absorption spectroscopy with absolute energy calibration for the determination of absorption edge energies, Rev. Sci. Instrum. 67 (3) (1996) 681–687.
[18] A.P. Hammersley, FIT2D V9.129 – Reference Manual V3.1, vol. 346 ESRF Internal Report – ESRF98HA01T, 1988.
[19] P.R. Bloom, U.L. Skyllberg, M.E. Sumner, Soil acidity, in: Chemical Processes in Soils, SSSA Book Series No. 8, 2005, p. 411.
[20] V.L. Snoeyink, D. Jenkins, Water Chemistry, John Wiley and Sons, New York, 1980.
[21] M.R. Hausmann, Engineering Principles of Ground Modification, McGraw Hill, New York, 1990.
[22] O.K. Borggaard, Effect of surface area and mineralogy of iron oxides on their surface charge and anion-adsorption properties, Clays Clay Min. 31 (1983) 230–232.
[23] D.W. King, Role of carbonate speciation on the oxidation rate of Fe(II) in aquatic systems, Environ. Sci. Technol. 32 (1998) 2997–3003.
[24] D. Dermatas, M. Chrysochoou, D.H. Moon, D.G. Grubb, M. Wazne, C. Christodoulatos, Ettringite-induced heave in chromite ore processing residue (COPR) upon ferrous sulfate treatment, Environ. Sci. Technol. 40 (18) (2006) 5786–5792.
[25] D. Dermatas, G. Shen, M. Chrysochoou, D.G. Grubb, N. Menounou, P. Dutko, Pb speciation vs. TCLP release in army firing range soils, J. Hazard. Mater. 136 (1) (2006) 34–46.
[26] D. Dermatas, M. Chrysochoou, D.G. Grubb, X. Xu, Phosphate treatment of range soils: Pb fixation or P release? J. Environ. Qual. 37 (2008) 47–56.
[27] M. Chrysochoou, S. Fakra, M.A. Marcus, D.H. Moon, D. Dermatas, Microstructural analyses of Cr(VI) speciation in chromite ore processing residue (COPR), Environ. Sci. Technol. 43 (14) (2009) 5461–5466.

COURT REPORTING
REGAL
BIG ENOUGH TO DELIVER
SMALL ENOUGH TO CARE

In the Matter Of:

DTSC HEARING ON DRAFT POND 1 CLOSURE PLAN, INTERIM MEASURE WORK PLAN AND PERMIT

HEARING

January 28, 2016

Case No.

DTSC HEARING ON THE DRAFT POND 1 CLOSURE PLAN,

INTERIM MEASURE WORK PLAN AND PERMIT MODIFICATION

REPORTER'S TRANSCRIPT OF PROCEEDINGS

THURSDAY, JANUARY 28, 2016

Reported by: Denise Talancon, CSR No. 14047

1 Whittier, California Thursday, January 28, 2016
2 ---oOo---
3 MS. DE LOZA: Do we have any green cards for people
4 who want to make comments? So when you come up to speak,
5 please state your name so that the court reporter can
6 document who you are and the card will allow her to spell
7 your name. State your name, your address, and you will have
8 three minutes to speak.
9 Phillip Blum is the hearing officer. The hearing
10 officer is Phil this evening.
11 MR. BLUM: Thank you very much, Lilian. My name is
12 Phil Blum. I am the hearing officer of the public hearing
13 portion of the meeting. So just for the record, we are all
14 clear on this, this now begins the hearing about the Pond 1
15 Closure Plan for Phibro-Tech, the Permit Modification that is
16 required for that closure plan, and the Interim Measures Work
17 Plan. I will be receiving those comments. Our court
18 reporter will be recording all the comments, and so for those
19 that -- who want to make comments, like Lilian said, as you
20 begin your comment please be sure to state your name, but
21 also it will be helpful to spell it so that we get it right,
22 and then give me your comment. She will record it for the
23 record and then once we finalize our decision on these
24 activities that we talked about tonight, we will then provide
25 a written response to all those comments including all of

the comments we receive tonight and any comment that we receive in writing before the end of the comment period, which ends February 15th.

So if everyone is clear on that -- you can give us verbal comments during the hearing or submit them in writing either by e-mail or by mail or you can walk them into our office or hand them over tonight. Anyway you do that, we will provide written responses to those comments when we make our decision on these activities. With that all said, it is now one minute to 8:00 p.m., and we are going to begin the hearing portion of the meeting.

MS. DE LOZA: Our first speaker is Art Escobedo.

MR. ESCOBEDO: The reason why I am here is one -- for one specific reason, and that is I am the president of the Los Nietos Board of Education. Our schools lie within a 20 minute proximity to Phibro-Tech. That means they are very close, within a half mile. I also represent a community of not only frightened people but very angry people.

15.3

15.4

This is a problem that, in their eyes, the only way that can be corrected is if -- is the removal of the company and the removal of the contaminated soil. They do not want Phibro-Tech here. As a representative -- we are a small community. We do not have a city council. In fact, the city council that has jurisdiction over Phibro-Tech is not here tonight. Not even somebody from the city. That tells you

15.5

15.6

that they don't care about this community or they wouldn't be 15.7
placing companies like Phibro-Tech to this community and our
schools.

Therefore, and to conclude my statement, we want 15.8
Phibro-Tech gone. That simple and that quick. We want it
gone. We want the soil gone. We all want it to end now and
today. They invited me out to their company, and I refused 15.9
to go out, as my colleague on the board has indicated they
have been cited 34 times and every time they invite me to go
out I say, "Before I do that, show me proof that you have
made corrections to each one of those infractions." And I am
still waiting for it. Thank you.

MS. DE LOZA: So we will have Benjamin Martinez
followed by Nick Aquino.

MR. MARTINEZ: Okay. I am back to what I said
earlier. I went to Phibro-Tech's facility. I took a tour of
their facility. I was impressed with what they were doing, 15.10
and I said so. However, they have outgrown their facility.
It is too small for what they are doing, and whatever residue
they develop from their processing facility, the are there
recycling those chemicals -- it's going to go in the air. I 15.11
mean, Exxon Mobile is a classic example. I keep bringing
that up. They are small, but they created the same issue.

The population has gone from 38 million to 39.1 million,
and it is going to go bigger. The population in our area 15.12

here has grown since 2010. More people are coming this way. If this keeps up and other companies like Phibro-Tech keep operating, we are going to take people out in body bags because they are going to die of one contaminate or another. That's the reality. 15.12

I've learned through the years that people who are exposed to contamination, industrial contamination, suffer greatly and endure a slow death. And it is permanent. There is no do-overs. No makeovers. No second chance. That is final. And unless Phibro-Tech leaves the area, the body count is going to go up. It will be slow, but it will get there because we are getting more people in there and there is going to be more sick people. Thank you. 15.13

MS. DE LOZA: Nick Aquino followed by Isaac Hernandez.

MR. AQUINO: That's okay. The mic isn't that important.

Good evening. My name is Nick Aquino, A-q-u-i-n-o. I'm a 50 year plus residence of this community. First, I'd like to start off by thanking Mr. Baxter for replying -- or should I say not replying -- to my e-mail that was sent January 21st with some questions.

My colleague mentioned some violations. Why -- in fact -- and this is a history that I think is relevant to the permit process. 16 major violations, 6 Class 2 violations, 15.16

1 and 12 minor violations, for a grand total of 34 since 15.16
2 Phibro-Tech has opened the plant.
3 You know, I'm curious -- the health department goes
4 out and they go to a restaurant. And let's say, for example,
5 the inspector discovers the restaurant doesn't have any hot 15.17
6 potable water. What happens? The restaurant gets shut down.
7 We have 34 violations, and this plant is still operating.
8 What does it take? Is this the same logic you use
9 with Exide Battery? You know you did a bang up job there.
10 We don't want to see another Exide battery.
11 Additionally, there was a settlement agreement
12 wherein your department received $425,000. The settlement is
13 dated November 3, 2003, and I would like to state where that
14 money went, according to your very own press release. The
15 consent order was signed on October 9, 2003. "PTI will pay a 15.19
16 total of $425,000, of which $399,200 is an administrative
17 penalty, and $25,800 is reimbursement of cost incurred." I'm
18 lost. None of that money was used for remediation of any of
19 those issues?
20 Look. Here's the bottom line, folks. I work for
21 the government as well, and if we were as effective as you
22 are in the job that you do, we wouldn't exist as you do. I
23 think it's time the state defunds your organization and 15.20
24 taxpayers and residents get benefits of their tax dollars in
25 another fashion. Thank you for allowing me the opportunity

to comment.

MS. DE LOZA: Thank you. Isaac Hernandez followed by Jaime Sanchez.

MR. HERNANDEZ: My name is Isaac Hernandez, I-s-a-a-c. Cities and big companies, we are sure you will tell us everything we want to hear. In order to make your dollars at the expense of the residents and communities, of the course to get a permit renewed this companies were hired the best advisors and put any connections they have. Of course they will say there is no health risk, otherwise they would not get permits, and no permits means no money in their pockets and in the cities. Why renew permits when everybody knows that this company is handling toxic chemicals? Why not shut this company once and for all? 15.21

MS. DE LOZA: Thank you. Jaime Sanchez is our last speaker. Is there any other speakers that would like to turn in a card?

MR. SANCHEZ: Neighbors Against Phibro-Tech is a group of concerned residents of Los Nietos and Santa Fe Springs who have previously requested from the DTSC to deny the hazardous waste facility permit for Phibro-Tech. The request is based on historical and on-going failure of PTI to comply with laws, regulations, policies governing hazardous materials and hazardous waste. Specifically, Phibro-Tech entered into a consent -- corrective action consent order in 15.22 15.23

1991. Phibro-Tech modified the -- the consent order was modified in 1995, at which time Phibro-Tech was compelled to 15.23
conduct corrective action within one year. Approximately 25 years later, the DTSC has failed to obtain compliance from Phibro-Tech.

In 1997, the established maximum contaminate level for hexavalent chromium established by the EPA was two parts per billion. The EPA determined that the concentrations of hexavalent chromium were three million -- and let me repeat that -- three million times greater than the public health 15.24
goal. The interim measure proposed by the DTSC seeks to treat the contamination with calcium polysulfide solutions. Hexavalent chromium refers to compounds that contain elements of chromium in the positive 6 oxide state.

Regarding chromium, the contamination in the soil and the groundwater, the DTSC proposes to pump and treat the information with the CPS. However, similar studies indicate that 99% of the chromium study found in the soil resulting in slow leaching rates that rendered the aquifer treatment 15.26
inefficient. In conclusion, CPS has a long residence time in the environment. In situ reduction is not an efficient treatment method for soils with high insoluble chromium 6 compounds. We are not convinced that CPS treatment is a viable solution. We demand that the DTSC 15.27
provide us with all viable alternatives and the DTSC use the

most efficient and effective method.

MS. DE LOZA: Thank you. I believe that concludes our public hearing. Testifiers, is there anyone else?

MR. BLUM: Okay. Well, thank you everybody for participating in our public meeting and hearing and for hearing what we have to say and for your comments.

So it is now 12 minutes after 8:00 p.m., Thursday night, January 28, and that concludes the public hearing for tonight. Thank you very much. Just as a reminder, the comment period ends on February 15th, so if you have a written comment, we need to receive it at DTSC by that date. Thank you.

(End of proceedings at 8:12 p.m.)

---oOo---

CERTIFICATE

OF

CERTIFIED SHORTHAND REPORTER

* * * *

The undersigned Certified Shorthand Reporter of the State of California does hereby certify:

That the foregoing Proceeding was taken before me at the time and place therein set forth.

That the testimony and all objections made at the time of the Proceeding were recorded stenographically by me and were thereafter transcribed, said transcript being a true and correct copy of the proceedings thereof.

In witness whereof, I have subscribed my name, this date: January 28, 2016.

DENISE TALANCON, CSR No. 14047

$

$25,800 6:17
$399,200 6:16
$425,000 6:12,16

1

1 2:14
12 6:1 9:7
15th 3:3 9:10
16 5:25
1991 8:1
1995 8:2
1997 8:6

2

2 5:25
20 3:16
2003 6:13,15
2010 5:1
21st 5:22
25 8:3
28 9:8

3

3 6:13
34 4:9 6:1,7
38 4:24
39.1 4:24

5

50 5:19

6

6 5:25 8:14,23

8

8:00 3:10 9:7
8:12 9:13

9

9 6:15
99% 8:18

A

A-q-u-i-n-o 5:18
action 7:25 8:3
activities 2:24 3:9
Additionally 6:11
address 2:7
administrative 6:16
advisors 7:9
agreement 6:11
air 4:21
allowing 6:25
alternatives 8:25
angry 3:18
Approximately 8:3
aquifer 8:19
Aquino 4:14 5:14,16,18
area 4:25 5:10
Art 3:12

B

back 4:15
bags 5:3
bang 6:9
based 7:22
battery 6:9,10
Baxter 5:20
begin 2:20 3:10
begins 2:14
benefits 6:24
Benjamin 4:13
big 7:5
bigger 4:25
billion 8:8
Blum 2:9,11,12 9:4
board 3:15 4:8
body 5:3,10
bottom 6:20
bringing 4:22

C

calcium 8:12
card 2:6 7:17
cards 2:3
care 4:1
chance 5:9
chemicals 4:21 7:13
chromium 8:7,9, 13,14,15,18,23
cited 4:9
cities 7:5,12
city 3:23,25
Class 5:25
classic 4:22
clear 2:14 3:4
close 3:17
closure 2:15,16
colleague 4:8 5:23
comment 2:20,22 3:1,2 7:1 9:10,11
comments 2:4, 17,18,19,25 3:1, 5,8 9:6
communities 7:7
community 3:17, 23 4:1,2 5:19
companies 4:2 5:2 7:5,8
company 3:20 4:7 7:13,14
compelled 8:2
compliance 8:4
comply 7:23
compounds 8:13, 23
concentrations 8:8
concerned 7:19
conclude 4:4
concludes 9:2,8
conclusion 8:20
conduct 8:3
connections 7:9
consent 6:15 7:25 8:1
contaminate 5:4 8:6
contaminated 3:21
contamination 5:7 8:12,15
convinced 8:23
corrected 3:20
corrections 4:11
corrective 7:25 8:3
cost 6:17
council 3:23,24
count 5:11
court 2:5,17
CPS 8:17,20,23
created 4:23
curious 6:3

D

date 9:11
dated 6:13
DE 2:3 3:12 4:13 5:14 7:2,15 9:2
death 5:8
decision 2:23 3:9
defunds 6:23
demand 8:24
deny 7:20
department 6:3, 12
determined 8:8
develop 4:20
die 5:4
discovers 6:5
do-overs 5:9
document 2:6
dollars 6:24 7:7
DTSC 7:20 8:4, 11,16,24,25 9:11

E

e-mail 3:6 5:21
earlier 4:16
Education 3:15
effective 6:21 9:1
efficient 8:22 9:1
elements 8:13
end 3:2 4:6 9:13
ends 3:3 9:10
endure 5:8
entered 7:25
environment 8:21
EPA 8:7,8
Escobedo 3:12, 13
established 8:6,7
evening 2:10 5:18
Exide 6:9,10
exist 6:22
expense 7:7
exposed 5:7
Exxon 4:22
eyes 3:19

F

facility 4:16,17, 18,20 7:21
fact 3:23 5:24
failed 8:4
failure 7:22

fashion 6:25
Fe 7:19
February 3:3 9:10
final 5:10
finalize 2:23
folks 6:20
found 8:18
frightened 3:18

G

give 2:22 3:4
goal 8:11
Good 5:18
governing 7:23
government 6:21
grand 6:1
greater 8:10
greatly 5:8
green 2:3
groundwater 8:16
group 7:19
grown 5:1

H

half 3:17
hand 3:7
handling 7:13
hazardous 7:21, 23,24
health 6:3 7:10 8:10
hear 7:6
hearing 2:9,12, 14 3:5,11 9:3,5, 6,8
helpful 2:21
Hernandez 5:15 7:2,4
hexavalent 8:7,9, 13
high 8:22
hired 7:8
historical 7:22
history 5:24
hot 6:5

I

I-s-a-a-c 7:5
important 5:17
impressed 4:17
including 2:25
incurred 6:17
industrial 5:7
inefficient 8:20
information 8:17
infractions 4:11
insoluble 8:22
inspector 6:5
interim 2:16 8:11
invite 4:9
invited 4:7
Isaac 5:14 7:2,4
issue 4:23
issues 6:19

J

Jaime 7:3,15
January 5:21 9:8
job 6:9,22
jurisdiction 3:24

L

laws 7:23
leaching 8:19
learned 5:6
leaves 5:10
level 8:6
lie 3:15
Lilian 2:11,19
logic 6:8
long 8:20
Los 3:15 7:19
lost 6:18
LOZA 2:3 3:12 4:13 5:14 7:2,15 9:2

M

made 4:11
mail 3:6
major 5:25
make 2:4,19 3:8 7:6
makeovers 5:9
Martinez 4:13,15
materials 7:24
maximum 8:6
means 3:16 7:11
measure 8:11
Measures 2:16
meeting 2:13 3:11 9:5
mentioned 5:23
method 8:22 9:1
mic 5:16
mile 3:17
million 4:24 8:9, 10
minor 6:1
minute 3:10,16
minutes 2:8 9:7
Mobile 4:22
Modification 2:15
modified 8:1,2
money 6:14,18 7:11

N

Neighbors 7:18
Nick 4:14 5:14, 18
Nietos 3:15 7:19
night 9:8
November 6:13

O

obtain 8:4
October 6:15
office 3:7
officer 2:9,10,12
on-going 7:22
opened 6:2
operating 5:3 6:7
opportunity 6:25
order 6:15 7:6,25 8:1
organization 6:23
outgrown 4:18
oxide 8:14

P

p.m. 3:10 9:7,13
participating 9:5
parts 8:7
pay 6:15
penalty 6:17
people 2:3 3:18 5:1,3,6,12,13
period 3:2 9:10
permanent 5:8
permit 2:15 5:25 7:8,21
permits 7:11,12
Phibro-tech 2:15 3:16,22,24 4:2,5 5:2,10 6:2 7:18, 21,24 8:1,2,5
Phibro-tech's 4:16
Phil 2:10,12
Phillip 2:9
placing 4:2
plan 2:15,16,17
plant 6:2,7
pockets 7:12
policies 7:23
polysulfide 8:12
Pond 2:14
population 4:24, 25
portion 2:13 3:11
positive 8:14
potable 6:6
president 3:14
press 6:14
previously 7:20
problem 3:19
proceedings 9:13
process 5:25
processing 4:20
proof 4:10
proposed 8:11
proposes 8:16
provide 2:24 3:8 8:25
proximity 3:16
PTI 6:15 7:22
public 2:12 8:10 9:3,5,8
pump 8:16
put 7:9

Q

questions 5:22
quick 4:5

R

rates 8:19
reality 5:5
reason 3:13,14
receive 3:1,2 9:11
received 6:12
receiving 2:17
record 2:13,22, 23
recording 2:18

recycling 4:21
reduction 8:21
refers 8:13
refused 4:7
regnlatious 7:23
reimbnrsement 6:17
release 6:14
relevant 5:24
remediation 6:18
reminder 9:9
removal 3:20,21
rendered 8:19
renew 7:12
renewed 7:8
repeat 8:9
replying 5:20,21
reporter 2:5,18
represent 3:17
representative 3:22
request 7:22
requested 7:20
required 2:16
residence 5:19 8:20
residents 6:24 7:7,19
residue 4:19
response 2:25
responses 3:8
restaurant 6:4,5,6
resulting 8:18
risk 7:10

S

Sanchez 7:3,15,18
Santa 7:19
schools 3:15 4:3
seeks 8:11
settlement 6:11,12
show 4:10
shnt 6:6 7:14
sick 5:13
signed 6:15
similar 8:17
simple 4:5
situ 8:21
slow 5:8,11 8:19
small 3:22 4:19,23
soil 3:21 4:6 8:15,18
soils 8:22
solution 8:24
solutions 8:12
speak 2:4,8
speaker 3:12 7:16
speakers 7:16
specific 3:14
Specifically 7:24
spell 2:6,21
Springs 7:20
start 5:20
state 2:5,7,20 6:13,23 8:14
statement 4:4
studies 8:17
study 8:18
submit 3:5
suffer 5:7

T

talked 2:24
tax 6:24
taxpayers 6:24
tells 3:25
Testifiers 9:3
thanking 5:20
Thursday 9:7
time 4:9 6:23 8:2,20
times 4:9 8:10
today 4:7
tonight 2:24 3:1,7,25 9:9
total 6:1,16
tour 4:16
toxic 7:13
treat 8:12,16
treatment 8:19,22,24
tnrn 7:16

V

verbal 3:5
viable 8:24,25
violations 5:23,25 6:1,7

W

waiting 4:12
walk 3:6
waste 7:21,24
water 6:6
work 2:16 6:20
writing 3:2,5
written 2:25 3:8 9:11

Y

year 5:19 8:3
years 5:6 8:4

Baxter, Stephen@DTSC

From: Suzan Alvarado <etherea05@gmail.com>
Sent: Thursday, January 28, 2016 12:11 PM
To: Baxter, Stephen@DTSC; Cruz, Jesus@DTSC
Cc: naquino@dcba.lacounty.gov
Subject: PHIBRO-TECH, INC. OF SANTA FE SPRINGS, CA

Hello DTSC Staff,

I am writing as a concerned Los Nietos, CA resident regarding the Phibro-Tech, Inc. proposals.

As a lifetime Los Nietos resident who has very often experienced negative issues in regard to Santa Fe Springs' industrial companies, I would like to yet again express my dismay at the continuing environmental racism that seems to be a never ending vicious cycle for Los Nietos. 16.2

In the past few years we've had to tolerate the plans for a MRF despite our protests at meetings, through letter-writing,e-mails, phone calls and informing the public. 16.3

As was the case with the MRF, the Phibro-Tech issue continues to repeat never-ending meetings (of various sizes)/workshops, information, definitions, statistics ad nauseum. It begins to remind me of the definition of insanity. Please help an already overburdened community find some sanity and GENUINE CARE by my simple request: CLOSE DOWN PHIBRO-TECH NOW! 16.4

Thank you,
Suzan Alvarado

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

February 2, 2016

Sent via USPS and E-Mail
stephen.baxter@dtsc.ca.gov

Stephen Baxter, Project Manager
Department of Toxic Substances Control
9211 Oakdale Ave.,
Chatsworth, CA 91311

Proposed Interim Measure Work Plan
Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document and would like to be included in future public participation activities associated with the cleanup effort. If remediation or any on-site activity involves equipment or operations which either emits or controls air pollution, SCAQMD staff should be consulted in advance of the project start to determine whether or not any permits or plans are required to be filed and approved by SCAQMD prior to start of the operation. The following comments are intended to provide guidance to the lead agency and should be incorporated into the Proposed Interim Measure Work Plan. 18.2 18.3 18.4 18.5

As stated in the Proposed Interim Measure Workplan, the lead agency will remove and properly dispose of soils contaminated with hexavalent chromium at the project site in order to reduce the potential threat to human health and the environment. Approximately 800 cubic yards of potentially impacted soil and demolition debris will be excavated, segregated, and sampled. Based on analytical results, soil that exceeds the Site cleanup criteria will be transported offsite to a permitted disposal facility. Additionally, the PTI should also discuss how the project will comply with SCAQMD Rule 402 – Nuisance and SCAQMD Rule 403 – Fugitive Dust and Rule. 18.6

Furthermore, should the lead agency encounter asbestos, storage tank/pipe degassing, or VOC contaminated soil during demolition and excavation, the lead agency should ensure compliance with SCAQMD Rule 1403 (Asbestos Emissions From Demolition/Renovation Activities), SCAQMD Rule 1149 (Storage Tank and Pipeline Cleaning and Degassing), and SCAQMD Rule 1166 (Volatile Organic Compound Emissions From Decontamination of Soil). It may be appropriate to perform air monitoring for dust, lead, hexavalent chrome or other contaminants.

The SCAQMD staff is available to work with the DTSC to ensure that project emissions are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact me Jack Cheng, Air Quality Specialist, at (909) 396-2448.

Sincerely,

Jillian Wong

Jillian Wong, Ph.D.
Program Supervisor
Planning, Rule Development & Area Sources

JW:JC
LAC151215-02
Control Number

Baxter, Stephen@DTSC

From: Jack Cheng <jcheng@aqmd.gov>
Sent: Tuesday, February 02, 2016 4:04 PM
To: Baxter, Stephen@DTSC
Cc: Jillian Wong
Subject: Proposed Interim Measure Work Plan Revised Pond 1 Closure Plan – Phibro-Tech, Inc. Santa Fe Springs, CA 90670
Attachments: LAC151215-02 - Pond 1 Closure - Phibro-Tech.pdf

The South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the attached document. The following comments are meant as guidance for the Lead Agency and should be incorporated into the Proposed Interim Measure Work Plan. The SCAQMD staff is available to work with the Lead Agency to address these issues and any other questions that may arise. Please contact me if you have any questions regarding these comments.

Jack Cheng - Air Quality Specialist
jcheng@aqmd.gov
(909) 396-2448
South Coast Air Quality Management District
21865 Copley Dr., Diamond Bar, CA 91765

02/08/2016

Dear Mr. Stephen Baxter,

I am sending you this statement that I wanted to read at the 01/28/2016 meeting at the LOS NIETOS middle school meeting. I didn't get to so at the time.

I checked into the demographics of the CITY of SANTA FE SPRINGS,CA. The city is 8.7 to 8.9 square miles with a population at about 16,200 residents. 19.2

The population of SANTA FE SPRINGS is not affected by the contamination around their city. On the other hand, we in WEST WHITTIER/ LOS NIETOS area are exposed and affected by their business model. 19.3

I am asking you to DENY a CLASS 2 PERMIT to PHIBRO-TECH,INC. or any type of permit to operate in our environment.

History has taught us that contamination and humans can not co-exist.

Contamination only gets worse and humana pay ultimate price with their health and well being.

Respectfully,

Benjamin Martinez, Jr.
8514 Vicki Dr.
Whittier, Ca., 90606-3249
562/699-8884

PHIBRO-TECH

01/28/2016

I have toured their facility and have seen their work enviroment in action. 19.6

Unfortunately, they have outgrown their location of operation.

PHIBRO-TECH processes hazardous liquids and/or solids for recycling. 19.7

These elements are known to cause cancer and other ailments.

PHIBRO-TECH has been operating with an expired permit as of July 29, 1996

The California Department of Toxic Substances Control, has allowed 19.8

PHIBRO-TECH to operate under the 1991 permit, until a new and revised permit is issued.

I Benjamin Martinez, Jr. am of the opinion, that PHIBRO-TECH should 19.9

close their facility at 8851 Dice Road, Santa Fe Springs, California.

Also clean-up all the land in use now of toxic apills and or 19.10

contamination by the process under which they operated since 1991.

Pumping more chemicals into the ground at the PHIBRO-TECH facility

to reduce contamination to acceptable levels is not the answer. 19.11

It is nothing more, than additional contamination on top of contamination.

People exposed to industrial contamination, suffer greatly and

endure a slow death. 19.12

As of the 2010 U.S. Census, the combined Los Nietos-West Whittier area has a population of 25,540 people within 2.519 square miles. This puts the population density at 10,138.5 people per square mile.

This being 2016, a New Year, I suspect that population is larger now.

We have seen what happened with OXIDE the Battery Recycler in the City of VERNON. They claimed that their safety proceedures were the best in the country. They were shut down whem it was determined that OXIDE had contaminated the air, land people,within a radius of three miles around the OXIDE facility.

Now we have the PORTER RANCH gas leak and contamination in SIMI VALLEY. Granted these facilities may be necessary but their locations need to be relocated out of the population centers.

The Local news media reported that the population in CALIFORNIA has increased from 38 million to 39.1 million and increasing with time.

Fifty One years ago, we moved our family into the LOS NIETOS/WEST WHITTIER area. Slauson Ave. at that time, was a regular street. 19.14

Now it is classified as a highway. We have a lot of exhaust smoke from cars and big trucks that travel EAST and WEST onSLAUSON AVE.

We get clouds of tiny particles that are created by the grinding of the tires on the black top on SLAUSON AVE.

The traffic in this area is horrendous and with it bring large tanker trucks with highly toxic and flameable liquids too. 19.15

History has taught us, that toxic contamination is leathal and final for those who are exposed to it. 19.16

There are no do overs, no second chances, it is permanent.

I know from experience that when humans are involved, there will be some forms of contamination, be it accidental or intentional.

The U.S. Chemical Safety Board submitted a report on the EXXON-MOBIL explosion at the TORRANCE refinery, last February 2015.

They stated that explosion belched industrial debris up toa mile away from the site.

There are 333,000 residents, 71 schools and 8 hospitals within a three mile radius of the refinery.

Now we have Flint, Michigan where the Governor of the state, rather than file for bankruptcy protection. Decided to poison the local 19.18
population to save money on the cost of clean water.

By ignoring all the warning signs around us, we are leaving to those who come after us, a world of contamination. 19.19

Industrial contamination is both lethal and final, no do overs.

So I say again, PHIBRO-TECH has to move away from here.

02/08/2016

Dear Mr. Ste

at the 01/28 nted to read

I didn't get hool meeting.

I checked in FE SPRINGS,CA.

The city is at about

16,200 resi

The populati y the

contaminatio e in WEST WHITTIER/

LOS NIETOS a iness model.

I am asking CH,INC.

or any type

History has an not

co-exist.

Contaminatio price with

their health

y,

rtinez, Jr.
Dr.
a., 90606-3249
4

U.S. POSTAGE PAID
WHITTIER,CA
90605
FEB 09,16
AMOUNT
$0.49
00116858-02

91311

1000

UNITED STATES POSTAL SERVICE.

Stephen Baxter
Project Manager
9211 Oakdale Avenue
Chatsworth, California, 91311

91311$E520 C014

RECEIVED

DEPAR
SUBST

Benjamin Martinez, Jr.
8514 Vicki Dr.
Whittier, Ca., 90606-3249

02/08/2016

Dear Mr. Jesus Cruz,

I am sending you this statement that I wanted to read at the 01/28/2016 meeting at the LOS NIETOS middle school meeting. I didn't get to so at the time.

I checked into the demographics of the CITY of SANTA FE SPRINGS,CA. The city is 8.7 to 8.9 square miles with a population at about 16,200 residents. 19.2

The population of SANTA FE SPRINGS is not affected by the contamination around their city. On the other hand, we in WEST WHITTIER/ LOS NIETOS area are exposed and affected by their business model. 19.3

I am asking you to DENY a CLASS 2 PERMIT to PHIBRO-TECH,INC. or any type of permit to operate in our environment.

History has taught us that contamination and humans can not co-exist.

Contamination only gets worse and humana pay ultimate price with their health and well being.

Respectfully,

Benjamin Martinez, Jr.
8514 Vicki Dr.
Whittier, Ca., 90606-3249
562/699-8884

PHIBRO-TECH

01/28/2016

I have toured their facility and have seen their work enviroment in action. 19.6

Unfortunately, they have outgrown their location of operation.

PHIBRO-TECH processes hazardous liquids and/or solids for recycling. 19.7

These elements are known to cause cancer and other ailments.

PHIBRO-TECH has been operating with an expired permit as of July 29, 1996

The California Department of Toxic Substances Control, has allowed 19.8

PHIBRO-TECH to operate under the 1991 permit, until a new and revised permit is issued.

I Benjamin Martinez, Jr. am of the opinion, that PHIBRO-TECH should 19.9

close their facility at 8851 Dice Road, Santa Fe Springs, California.

Also clean-up all the land in use now of toxic apills and or 19.10

contamination by the process under which they operated since 1991.

Pumping more chemicals into the ground at the PHIBRO-TECH facility

to reduce contamination to acceptable levels is not the answer. 19.11

It is nothing more, than additional contamination on top of contamination.

People exposed to industrial contamination, suffer greatly and endure a slow death.

As of the 2010 U.S. Census, the combined Los Nietos-West Whittier area 19.12

has a population of 25,540 people within 2.519 square miles. This puts the population density at 10,138.5 people per square mile.

This being 2016, a New Year, I suspect that population is larger now.

We have seen what happened with OXIDE the Battery Recycler in the City of VERNON. They claimed that their safety proceedures were the best in the country. They were shut down whem it was determined that OXIDE had contaminated the air, land people,within a radius of three miles around the OXIDE facility.

Now we have the PORTER RANCH gas leak and contamination in SIMI VALLEY. Granted these facilities may be necessary but their locations need to be relocated out of the population centers.

The Local news media reported that the population in CALIFORNIA has increased from 38 million to 39.1 million and increasing with time.

Fifty One years ago, we moved our family into the LOS NIETOS/WEST WHITTIER area. Slauson Ave. at that time, was a regular street. 19.14

Now it is classified as a highway. We have a lot of exhaust smoke from cars and big trucks that travel EAST and WEST onSLAUSON AVE.

We get clouds of tiny particles that are created by the grinding of the tires on the black top on SLAUSON AVE.

The traffic in this area is horrendous and with it bring large tanker trucks with highly toxic and flameable liquids too. 19.15

History has taught us, that toxic contamination is leathal and final for those who are exposed to it.

There are no do overs, no second chances, it is permanent. 19.16

I know from experience that when humans are involved, there will be some forms of contamination, be it accidental or intentional.

The U.S. Chemical Safety Board submitted a report on the EXXON-MOBIL explosion at the TORRANCE refinery, last February 2015.

They stated that explosion belched industrial debris up toa mile away from the site.

There are 333,000 residents, 71 schools and 8 hospitals within a three mile radius of the refinery.

Now we have Flint, Michigan where the Governor of the state, rather than file for bankruptcy protection. Decided to poison the local 19.18
population to save money on the cost of clean water.

By ignoring all the warning signs around us, we are leaving to those who come after us, a world of contamination. 19.19

Industrial contamination is both lethal and final, no do overs.

So I say again, PHIBRO-TECH has to move away from here.

Baxter, Stephen@DTSC

From: Phil Chandler <philipbchandler@earthlink.net>
Sent: Monday, February 15, 2016 10:52 PM
To: Baxter, Stephen@DTSC
Cc: Lavinger, Steve@DTSC
Subject: COMMENTS ON PTI IM AND CP PUBLIC NOTICE

See attached. Paper copy to follow. Sorry about the over-the-top snark--wrote it after talking to McCardle and Lavinger and am stuck with it. Phil

Baxter, Stephen@DTSC

From: Phil Chandler <philipbchandler@earthlink.net>
Sent: Monday, February 15, 2016 11:15 PM
To: Baxter, Stephen@DTSC
Subject: PTI IM AND CP
Attachments: Comments on PTI IM and CP Pub Notice - 2-15-2016.pdf

Attached is a pdf of a signed copy. Phil

February 15, 2016

Mr. Stephen Baxter, P.E.
Department of Toxic Substances Control
Chatsworth Office "Permit Program"
9211 Oakdale Avenue
Chatsworth, California 91311
Stephen.Baxter@dtsc.ca.gov.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) PROPOSED INTERIM MEASURE WORK PLAN AND REVISED POND 1 CLOSURE PLAN FOR PHIBRO-TECH, INC (PTI), 8851 DICE ROAD, SANTA FE SPRINGS, CALIFORNIA 90670 - [EPA ID NUMBER CAD 008 488 025; PERMIT NO. 91-3-TS-002

Dear Mr. Baxter:

Yippee kayah, the Department of Toxic Substances Control (DTSC)Site Mitigation Program cowboys ride again even under the banner of "One Cleanup Program" or Brownfields and Environmental Restoration Program (BERP) or whatever, aided and abetted by the "Permit Program." You noticed a *Proposed Interim Measure Work Plan* that"...would require PTI to clean up hexavalent chromium in soil near a former underground chromic acid tank. The clean up would involve injection of treatment chemicals into the ground to reduce the hexavalent chromium to acceptable levels." I have no quibble with the specific activity, however as you are aware, I have worked at DTSC for an embarrassing number of years. I recall in 1995 embedding a Selected Remedy into the long-expired Phibro-tech, Inc. (PTI) permit at the behest of U.S. Environmental Protection Agency (EPA). As I am sure you are aware, this was done through means of a Class 3 permit modification. EPA had made the inclusion of their selected cleanup remedy into the Permit a principle condition of EPA allowing DTSC to take over as lead on corrective action. Up to that point EPA had been lead. After that permit modification, DTSC was supposed to implement corrective action by overseeing the selected remedy. DTSC of course failed miserably at implementing many elements of that remedy. EPA had intended that corrective action go forward with all of the supposed rigor and strength of permit enforceability. It reckoned without DTSC's ability to screw things up. The rigor for the most part became rigormortis for the next 10-15 years. However the selected remedy is still embedded in the expired permit and PTI is bound to continue implementing that expired permit until their permit is renewed. No problem, it has only been 20 years since their permit expired---gee-whiz I remember when the preliminary evaluation of their renewal application was first done in 1996. So, PTI has managed to operate on an expired permit for 20 years but

22.4
22.5
22.6
22.7
22.8
22.9

I continue to be amazed by DTSC's efforts to avoid transparency in its dealings with the public on permit matters and its intent on abusing the regulations to achieve this. This is not to mention a breach of faith with the U.S. Environmental Protection Agency (EPA) from which DTSC has obtained authorization to administer the state hazardous waste program in lieu of the federal program. 22.9 22.11

CORRECTIVE ACTION CONSENT AGREEMENT (CACO)

DTSC's "Site Mitigation Cowboys "signed a CACO with PTI on March 2012 for the express purpose of avoiding compliance with RCRA and has apparently proceeded to implement corrective action according to that CACO rather than the 1995 modified Permit---- that is actually still in force per the DTSC regulations. **THEREFORE, DTSC HAS DE FACTO MODIFIED THE 1995 MODIFIED PERMIT WITHOUT MEETING THE REQUIREMENTS OF CALIFORNIA CODE OF REGULATIONS, TITLE 22, SECTIONS 66270.41 AND 66270.42**. In addition to failing all of the associated public notification requirements, comment period, response to comments, appeal period and appeal review (if necessary) required by California Code of Regulations, title 22, section 66270.41 and 66270.42, **DTSC FAILED TO IMPLEMENT CEQA ON ITS DISCRETIONARY DECISION TO ILLICITLY "MODIFY" THE 1995 MODIFIED PERMIT** by converting implementation of the approved remedy to a CACO. 22.13 22.14

This is not the first time at PTI that DTSC has played fast and sneaky by "changing" the elements of the remedy without going through the applicable permit modification process. For example, the requirement of a Conceptual Site Model, a host of schedule delays, and other new "things" were added without permit modification while the permit and corrective action were being handled in DTSC's Cypress Office---**ALL AFTER THE EPA AND DTSC HAD SELECTED THE REMEDY.** Since the project was moved to the Chatsworth Office, other changes appear to be in the works as evinced in the CACO---- all without modifying the currently applicable expired permit. 22.15

CORRECTIVE ACTION AT PTI

- DTSC has cleverly modified the expired 1995 modified Permit by moving corrective action from the Permit to a Corrective Action Consent Order (CACO). This deviation was clear when it noticed a draft permit renewal in 2010 and incorporated that CACO by reference into the permit effectively expunging the 1995 DTSC/EPA jointly approved remedy. 22.16

- What makes this whole business much worse is that as lead agency EPA selected the remedy, albeit with some last minute help from DTSC, required DTSC to put the remedy into the then-current permit and on that condition 22.17

passed implementation of the remedy as lead agency to DTSC. **EPA WANTED THE REMEDY TO BE ENFORCED THROUGH THE MECHANISM OF THE PERMIT**. 22.17

- For various and sundry reasons, DTSC has failed to enforce all of the remedy implementation in a timely fashion----that envisioned in the detailed schedule of compliance in the 1995 Class 3 modification that made the remedy part of the permit. **APPARENTLY DTSC HAS FOUND THAT IT DOESN'T HAVE THE COMPETANCY OR DESIRE TO ENFORCE SUCH PERMIT CONDITIONS IN THE FASHION THAT EPA APPARENTLY ENVISIONED WHEN IT AUTHORIZED DTSC TO ADMINISTER THE STATE HAZARDOUS WASTE PROGRAM IN LIEU OF THE FEDERAL PROGRAM**. 22.18

- I plan on requesting EPA to audit DTSC's specific compliance with the RCRA-equivalent statutes and regulations as I would add that the water boards should also be subject to such compliance reviews. Further, I will ask EPA, because of its increasing emphasis on enhanced transparency, to examine DTSCs **LACK OF TRANSPARENCY** in its specific **ACTIONs** with respect to PTI as opposed to DTSC's sterling generalized **WORDs** in that regard. 22.20 22.21

DECEMBER 2013 CORRECTIVE MEASURES STUDY (CMS)

- The IM Work plan Introduction states, "A draft Corrective Measures Study (CMS) report was submitted to DTSC in December 2013 proposing CPS solution injection as an alternative to groundwater extraction and treatment. DTSC reviewed and provided comments to PTI on September 5, 2014. A revised CMS is currently in preparation" Is the revised CMS part of this public notice? 22.22

- The IM Work Plan Introduction states, "The Corrective Measures Study Report evaluated groundwater cleanup alternatives and recommended the selection of CPS solution injection as the corrective measure to be taken at PTI to address hexavalent chromium in the subsurface." Great, why didn't DTSC immediately develop a permit modification that included the development of the IM Work Plan? The pilot test had been done five years earlier? 22.23

- The IM Work Plan Introduction states, a "...proposed remedy outlined in the Corrective Measures Study Report. DTSC's request that PTI implement CPS injections as an Interim Measure is further evidence that this treatment technology is appropriate for the site." Proposed remedy sounds a lot like the permit. Fine, incorporate it into the permit, why the continued monkey-motion? 22.24

JULY15, 2015, INTERIM MEASURE (IM) WORK PLAN AND OCTOBER 15, 2015, APPROVAL LETTER

- **October 15, 2015 Approval Letter** - It is singularly inappropriate to approve the IM ahead of the public notice. Mr. Stephen McCredie's October 15, 2015 "approval" letter does just this. 22.25
- The following clip pays lip service to the selected remedy but raises the CACO to the same level. Inappropriate to say the least.

22.26

The proposed interim measure was submitted pursuant to part V, section E.13.b of the Hazardous Waste Facility Permit, as modified by the1995 Corrective Action Permit Modification, and section 5.3 of the Corrective Action Consent Order dated February 22, 2012.

- The following states that the IM Work Plan is approved by DTSC----NO PUBLIC NOTICE, JUST FLAT OUT APPROVED!!!!!!!!

22.27

DTSC reviewed the June 1, 2015 Interim Measure Work Plan submitted by Iris Environmental and provided comments and a cover letter, dated June 15, 2015. This draft Work Plan adequately addresses the June 2015 comments and is approved by DTSC.

- The following states that the "draft Work Plan" will be public noticed----after already stating that it is approved. This is ridiculous. DTSC should be proposing to approve the IM Work Plan in the public notice, except that it has already approved it. How is public input going to affect the approval already given? The

22.28

Please note that DTSC will provide the public with an opportunity to review and comment on interim measures. DTSC will be preparing a public notice and factsheet announcing that the draft Work Plan will be made available for public review and that DTSC will be accepting public comments on the interim measures. After considering and responding to public comments (if any), DTSC will decide to either adopt the proposed the in-situ treatment, adopts it with changes or other alternatives.

- **1.0 INTRODUCTION** – This section states that the IM is "Pursuant to part V, section E.13.b of the Hazardous Waste Facility Permit 1995 Corrective Action Permit Modification and section 5.3 of the Corrective Action Consent Order dated, February 22, 2012…" Really now! Such hypocrisy. The expired permit is cited as a basis for the IM but DTSC chooses to ignore the need to modify the permit to incorporate changes to the Selected Remedy. 22.29

- **1.0 INTRODUCTION** – PTI states that it "…implemented a calcium polysulfide (CPS) solution interim Pilot Test in 2012 to treat impacted vadose zone soils and dissolved hexavalent chromium in groundwater"---outside of the context of the 22.30

conditions in the expired Permit. The kicker is that PTI then states that "Because of the pilot test's success, the Department of Toxic Substances Control (DTSC) indicated it **would consider a permit modification to change the treatment technology from groundwater extraction and treatment**, as reflected in the facility's 1995 Corrective Action Permit Modification." Instead DTSC comes up with a circumvention of the permit process. How nice. 22.30

- **2.0 INTERIM REMEDIAL MEASURES OVERVIEW –** "The activities discussed herein will be conducted using similar methods to the May 29, 2008 *Revised Groundwater Corrective Action Pilot Test Work Plan* submitted to DTSC and approved June 27, 2008." This demonstrates that DTSC was ignoring the expired permit and the appropriate process as far back as 2008. Nearly ten years should have been enough to do a permit modification to reflect changes in the selected remedy. Well maybe not since DTSC has not renewed the 1985 permit that was modified in 1995----say 30 years for that. 22.31

- **5.3 Injection Zones** – **"**Three injection zones will be targeted at each borehole: unsaturated fill materials and the upper silty sand and sand of the Gage Aquifer, extending from 10 feet bgs to 30 feet bgs; the unnamed aquitard extending from approximately 30 to 50 feet bgs; and the upper 5 feet of the upper Hollydale Aquifer extending from approximately 50 to 55 feet bgs." A graphical representation of the overlap of influence of individual injection points would be useful here to illustrate the coverage projected. 22.32

- **5.4 Process and Performance Monitoring** – **"**Process monitoring will be conducted for the Gage Aquifer, unnamed aquitard, and unsaturated upper Hollydale Aquifer by collecting discrete soil samples after the first four adjacent borings are injected." It is suggested that the zone of saturation in the lower Hollydale be monitored as well. 22.33

- **6.1 Data Quality Objectives** – Nice to have a section entitled Data Quality Objectives (DQOs), but it would be even nicer to have the DQOs actually present as per U.S.EPA guidance. Just saying that they are "...qualitative and quantitative statements that specify the quality of the data required to support decisions made during testing activities." and that "DQOs are based on the end uses of the data to be collected" is insufficient. The Data Quality Objective (DQO) process consists of seven steps that result in the development of a sampling plan. The output of Step 1 defines the factors that need to be considered in Step 2; the output of Step 2 defines the factors to be considered in Step 3. This process continues through each step and, ultimately, a sampling strategy is formulated in Step 7 based on the outputs from Steps 1 through 6. By establishing the DQOs for this project, the data collection is supported by a technical rationale and will meet the requirements of the project objectives. The IM should be pulled back and revised to include real DQO's using applicable EPA guidance and re-noticed. **THIS IS A MAJOR FLAW.**

REVISED POND 1 CLOSURE PLAN

- The Public Notice statement "The Revised Pond 1 Closure Plan proposes to revise and update a previously approved Closure Plan for a former surface impoundment (known as Pond 1)." Does not seem to mean a permit modification is being noticed. Even if DTSC argues ambiguities in the earlier authorization and the 1988 approval of a modified closure /post-closure plan, the 1995 Class Permit Modification clearly embedded the Pond 1 closure issues into the expired permit. DTSC is not adhering to the statutes and regulations regarding closure process. The "revised" Closure Plan (CP) is really a modification for a CP for a unit within the expired permit and must be re-noticed as a permit modification. 22.36

- The December 3, 2015, letter from Iris Environmental further emphasizes that fact in that it is titled Pond 1 Closure Plan Package Submittal---not permit modification submittal. It is not even titled Closure Plan Modification as would be appropriate if DTSC were making an argument for the Pond 1 to be subject to ISD regulations rather than permit regulations. 22.37

- Iris Environmental states that "Because Pond 1 is regulated by an Interim Status Document as a surface impoundment, this Closure Plan addresses applicable requirements of 22 CCR 66265.110 et seq., 22 CCR 66265.220 et seq., Chapter 15 Article 7, and 22 CCR 66265.310." This is incorrect. Since the Pond 1 closure issue was made part of the expired permit by the Class 3 remedy selection in 1995, and since the facility contained to utilize the pond as secondary containment which periodically contained leakage liquid from waste water treatment and holds a filter press and tanks under a long out-of-date variance, 22 CCR 662654 regulations apply. 22.38

- The Public Notice statements "The Revised Pond 1 Closure Plan requires PTI to remove the pond structure, hazardous waste tanks, and clean up the underlying soils." and "The removal and clean up would involve excavation of the top 10 feet of soil and treatment of the deeper soil using the same process as proposed for the interim measure." are useful as far as they go. The closure performance standards should also be cited in the Public Notice. Iris Environmental states "It is intended that soils will be excavated until: 1) confirmation sampling indicates that either background levels or a risk-based closure performance standard was achieved, or 2) that closure performance standards can be met using in-situ soil treatment technologies demonstrated to be effective by the pilot test conducted in accordance with the Corrective Action Consent Order. If background levels are selected for screening criteria, a background study work plan will be submitted to DTSC for review and approval prior to implementing the background study." This is too ambiguous to be considered an adequate set of performance standards. What background? What health-based standards? Deferral to corrective action is not acceptable? Table 4-1 answers most of this. The TCE and PCE soil numbers are not acceptable----these seem to be based on the TTLC? 22.39 22.40

- Has the Assurance of Financial Responsibility been revised adequately to address the forgoing ambiguities? 22.41

CEQA

- In its long and seedy history of CEQA compliance this takes the cake. Four discrete mostly dissimilar, CEQA "projects" at a RCRA facility are being addressed by a single blow-it off CEQA analysis. This is not acceptable. 22.42
- The Pond 1 Closure Plan Modification (CP Mod), being addressed under the expired permit is not the same CEQA project as the Corrective Action (CMS and IM) activities being addressed---albeit improperly---under a CACO that was issued to circumvent the expired permit ("Site Mitigation being ever the "cowboy" and Permitting never having any guts to do things right and being ever fearful to upset things with its screwed-up renewal process). 22.43
- Neither of the three forgoing discrete CEQA "projects" (CP Mod, IM, and CMS) has anything in common with Permitting's permit renewal. In point-of-fact, the "Site Mitigation Cowboys" and the Permitting folk are conspiring to eliminate the use of either the expired permit or a renewed permit to address corrective action at all. 22.44
- Moreover, the CEQA analysis with regard to the permit renewal seems inappropriate since the current business activities are so much different from those activities in the 1980's. If the business changes, the permit needs to change along with it (all of this should have been addressed years ago in modifications---since timely permit renewal seems to be so much beyond DTSC capabilities---twenty years beyond. DTSC needs to analyze and discuss these changes for the permit renewal but not for the CP Mod or the IM and CMS. 22.45
- Further, the huge number of environmental violations associated with PTI and various governmental agencies seems to be glossed over. The permit renewal needs to be addressed by an EIR. The CMS and IM could be addressed by a single negative declaration (ND) or mitigated ND for a PERMIT MODIFICATION of the existing remedy selection in the expired permit. The CP needs to be a similar modification of the expired permit but should have its own ND or mitigated ND--- again for the permit renewal but not for the CP Mod or the IM and CMS. **PLEASE PULL THIS NOTICE BACK AND GET IT DONE PROPERLY.** 22.46 22.47
- In a previous letter to Debbi Rafael, dated February 12, 2013, it should be noted that the failure to comply with CEQA for the de facto modification (removal of corrective action and alteration of the previously approved remedy) of the currently applicable permit by removing corrective action could subject DTSC to a lawsuit under Public Resources Code statutes. 22.48

- I again request that DTSC rescind the 2012 CACO until: (a) such time as a renewed permit is issued because CACO now represents a de facto illegitimate permit modification (b) if DTSC wants to implement the new elements of the CACO without waiting for the permit renewal and appeal to play out, it should modify the currently applicable 1995 permit to substitute the CACO for the 1995 Class 3 modification----complying with all of the modification requirements; (c) that if DTSC refuses to re-notice the draft permit, that the CACO be submitted for public review and comment---complying with all of the original permit renewal requirements. 22.49
- Please note, that I do not show DTSC ever responding to the February 12, 2013 letter. While it is standard practice for DTSC to ignore me and fail to respond to issues that I raise, it remains annoying and is a sign that DTSC is hypocritical about its transparency and public responsiveness. As part of this public notice process, I renew my request for a meaningful response to the subject comment letter. 22.50

I request that because of the failure to follow the applicable statutes and regulations, established processes, lumping of incompatible CEQA projects and ignoring consistency with historical U.S. EPA agreements concerning corrective action at PTI that this noticed material in this notice be withdrawn. The technical elements of the IM and CMS need some tweaking, but implementation of the IM is, on the whole, an environmentally sound thing to do---take care of the hexchrome before the dry aquifer units re-saturate. However, the corrective action needs to be incorporated into the corrective action section of the expired permit, re-noticed, and the revised corrective action remedy as was given in 1995 by EPA and DTSC. 22.51

Thank you for your consideration.

Philip B. Chandler
4501 W. Channel Islands Blvd., # 86
Oxnard, CA 93035
Oxnard (805) 382-3365

Topanga (310) 455-1962
Work (818) 717-6608
[philipbchandler@earthlink.net]

CC:

State Senator Fran Pavley
Calabasas District Office
5010 N. Parkway Calabasas, #202,
Calabasas, CA 91302
c/o [elizabeth.fenton@sen.ca.gov and max.reyes@sen.ca.gov]

State Assemblyman Das Williams
Oxnard District Office
Oxnard Transportation Center
201 East Fourth Street, Ste. 209A
Oxnard, CA 93030
c/o [hillary.blackerby@asm.ca.gov]

Steven S. Arman
Manager
RCRA Corrective Action Office
United States Environmental Protection Agency , Region 9
75 Hawthorne Street
San Francisco, CA 94105

Dr. Joe Lyou
Executive Director
California Environmental Rights Alliance
P.O. Box 116
El Segundo, CA 90245-01 16
[jlyou@enviroriqhts.org]

Liza Tucker
Consumer Advocate
Consumer Watchdog
2701 Ocean Park Blvd, Suite 112
Santa Monica, CA 90405
[liza@consumerwatchdog.org]

Baxter, Stephen@DTSC

From: Christine Amira <camira1@verizon.net>
Sent: Sunday, February 21, 2016 7:26 PM
To: Baxter, Stephen@DTSC
Subject: Phibro-tech class 2 permit

Dear Mr. Baxter & D.T.S.C. staff,

I have lived and worked in Los Nietos over 50 years, consequently I have witnessed the many changes to the area, which have been mostly negative. I have attended various Phibro-Tech meetings, presentations and toured the facility. I understand the need to clean up the contaminated soil. Unfortunately, we are presented with only ONE process to accomplish that clean up. I believe it would have been appropriate to offer various forms of cleanup, thus, establishing a level of confidence to the community members, that you are working on their behalf.

In regard to the permit modification, my position is that it be denied. I find it interesting, that at the meetings presented to the public, the information on violations were not disclosed. Phibro-Tech has been allowed to operate on an expired permit for over 20 years. If you want cooperation from the community that is most affected by Phibro-Tech practices, it is vital that there be more communication and transparency. It is obvious that low income, minority communities are subject to a disproportional number of environmental hazards resulting in many health issues. Why?

I appreciate the outreach efforts Phibro-Tech has attempted and I feel that the involvement by the D.T.S.C. would have been the necessary step to adequately represent both the residents and the company. My hope, is that the D.T.S.C. be impartial during the process of permit authorization and not be pressured by City leaders and corporate greed.

Respectfully,
Christine Amira