APPENDIX E

Response to Comments

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

No.	Comment Type / Report Section	Comment/Response
1	EPA Specific Comment: Section 2.0, Site Description, Paragraph 3, Page 2	**Comment:** Please replace this paragraph with the following: This RD/RA LUCI O&M Plan was prepared as a result of the selection of LUCs as a component of the remedy in accordance with the ROD for Parker Flats MRA Phase I. In connection with the Early Transfer of a portion of the former Fort Ord, including the Parker Flats MRA Phase I, FORA assumed some of the Army's cleanup obligations under an Environmental Services Cooperative Agreement Grant. Pursuant to the associated Administrative Order on Consent (AOC) for Cleanup of Portions of the Former Fort Ord, Docket No. R9-2007-003, effective July 25, 2008, and the Environmental Services Cooperative Agreement, dated March 27, 2007, FORA agreed to implement the selected remedy for this portion of the Parker Flats MRA Phase I. This RD/RA LUCI O&M Plan is intended to fulfill the requirements of Tasks 6, 7, and 8 of the AOC for the Parker Flats MRA Phase I. **Response:** This section was revised as follows: "This RD/RA LUCI O&M Plan was prepared as a result of the selection of LUCs as a component of the remedy in accordance with the ROD for Parker Flats MRA Phase I ~~and the FFA for the former Fort Ord. This RD/RA LUCI O&M Plan shall be subject to the enforcement provisions of the FFA~~. In connection with the early transfer of a portion of the former Fort Ord, including the Parker Flats MRA Phase I, FORA assumed some of the Army's cleanup obligations under an Environmental Services Cooperative Agreement grant. Pursuant to the associated Administrative Order on Consent (AOC) for Cleanup of Portions of the Former Fort Ord, Docket No. R9-2007-03, effective July 25, 2008, and the Environmental Services Cooperative Agreement, dated march 27, 2007, FORA agreed to implement the selected remedy for ***this portion of*** the Parker Flats MRA Phase I. This RD/RA LUCI O&M Plan is intended to fulfill the requirements of Tasks 6, 7, and 8 of the AOC for the Parker Flats MRA Phase I."
2	EPA Specific Comment: Section 3.0, Land Use Control	**Comment**: Please clarify the intent of this sentence by modifying the sentence to state: "to preclude residential development or modification to residential restrictions without approval by EPA and DTSC."

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

No.	Comment Type / Report Section	Comment/Response
	Performance Objectives, Restrictions Against Residential Use, Page 3	**Response**: This section was revised as follows: "to ~~ensure that any proposals to allow~~ ***preclude*** residential development or modification~~s~~ to residential restrictions ~~are approved~~ ***without approval*** by EPA in coordination with DTSC."
3	EPA Specific Comment: Section 4.9, Notification of Discovery of MEC Items During Ground-Disturbing and/or Intrusive Activities, Page 5	**Comment**: Please replace the last two paragraphs of this section with the following: "After the response, EPA, DTSC and the Army will assess the probability of encountering additional MEC. If the probability of encountering MEC remains low, construction may resume with construction monitoring. If EPA, in consultation with DTSC, determines that additional investigation is required, FORA, or its successor under the AOC, will conduct such investigation in accordance with an approved Workplan. EPA, in consultation with DTSC, will evaluate and approve the results of the investigation. If the investigation indicates that additional MEC is likely to be present, FORA will propose, and the Army will select, an appropriate response action to be implemented by FORA or its successor under the AOC if within the scope of its obligation under the ESCA. If an existing CERCLA decision document has addressed this contingency, FORA, or its successor under the AOC, will implement the required action if within the scope of its obligation under the ESCA." **Response**: The language above was provided by the EPA in their original comment letter received January 21, 2009. However, after discussions with the Army, the EPA sent FORA revised language addressing this comment in an email dated February 24, 2009. FORA responded to this email in a memorandum which proposed adding some additional information to the EPA's proposed language. The Army and EPA provided some minor modifications and the following final text was agreed upon by FORA, the Army, and the EPA, in consultation with the DTSC. The last three sentences of Section 4.9 were revised as follows: FORA and/or the subsequent property owner shall stop work and notify the

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

No.	Comment Type / Report Section	Comment/Response
		local law enforcement agency immediately (as well as notifying the Army, DTSC, and EPA within 24 hours) if any known or suspected MEC items are encountered during ground-disturbing and/or intrusive activities. The standard procedure for reporting any encounter with a known or suspected MEC item in the transferred former Fort Ord property is to report the encounter immediately to 911, which will transfer the call to the appropriate local law enforcement agency. The local law enforcement agency will promptly request Department of Defense support for response (e.g., an Explosive Ordnance Disposal Unit). ~~After the response, the Army, along with DTSC and EPA, will reassess the probability of encountering MEC. If the Army, in consultation with DTSC and EPA, determines that the probability of encountering MEC remains low, construction may resume with construction monitoring. If the Army, in consultation with DTSC and EPA, determines that the probability of encountering MEC remains moderate to high, then MEC removal will be conducted in the construction footprint before construction resumes.~~ ***After the EOD response, and if within the scope of its obligations under the AOC and the ESCA, FORA will assess the probability of encountering additional MEC based on guidance from the DDESB. Such assessment may include additional investigation, which will be coordinated with the Army, EPA, and DTSC. As part of the assessment FORA will evaluate available historical records, on-site investigation data, and other physical evidence, such as:*** • ***MEC items that have been found to-date during the ongoing construction project.*** • ***Most recent five-year review.*** • ***Annual reports since the most recent five-year review.*** ***If EPA, in consultation with DTSC, determines that additional investigation is required as part of the assessment, FORA, or its successor under the AOC, will conduct such investigation in accordance with an approved work plan, if within the scope of its obligation under the AOC and the ESCA. EPA, in consultation with DTSC, will evaluate and approve the results of the investigation. FORA will propose to the Army, EPA, and DTSC an appropriate site level designation (low or moderate/high), and a recommendation for the level of UXO support appropriate for the site condition. The agency consultation process will be completed as expeditiously as practicable. The probability of encountering MEC and the resulting level of UXO support will be determined jointly by the Army and EPA, in consultation with DTSC. If the probability of encountering MEC is***

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

No.	Comment Type / Report Section	Comment/Response
		low, construction may resume with construction monitoring. If the probability of encountering MEC is moderate/high, FORA will propose, and the Army and EPA in consultation with DTSC will determine, an appropriate follow-up action to be implemented by FORA or its successor under the AOC if within the scope of its obligation under the AOC and the ESCA. If an existing CERCLA decision document has addressed this contingency, FORA, or its successor under the AOC, will implement the required action if within the scope of its obligation under the AOC and the ESCA. ***If the Army and EPA in consultation with DTSC, determine that the selected remedy is no longer protective, FORA will propose and the Army and EPA will jointly select, an additional response action or modification of the remedy to be implemented by FORA or its successor under the AOC if within the scope of its obligation under the AOC and the ESCA. DTSC will be provided an opportunity to review and comment on the proposal. The additional actions required and their remedial objectives will be documented in an Explanation of Significant Differences (ESD) or ROD Amendment, as appropriate.*** ***Notwithstanding the foregoing, nothing herein shall be construed to require FORA, or its successor under the AOC, to assume responsibility for any Army Obligation, as such term is defined in the ESCA and the AOC. After the EOD response, if EPA, in consultation with the DTSC, determines that additional investigation and/or action is required, and EPA determines that such investigation and/or response is <u>not</u> within the scope of FORA's obligations under the AOC and the ESCA, EPA will advise the Army that it is obligated under the FFA to conduct the investigation and/or response. The probability of encountering MEC and the resulting level of UXO support will be determined jointly by the Army and EPA, in consultation with the DTSC.***
4	EPA Specific Comment: Section 5.0, Remedial Action Sequence, Bullet Number 1, 3rd Line,	**Comment**: Please replace the word "requesting" with "advising". **Response**: The section has been revised as follows:

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

No.	Comment Type / Report Section	Comment/Response
	Page 6	Within 30 days of finalizing this RD/RA LUCI O&M Plan, FORA shall provide a copy of the survey plat, the RD/RA LUCI O&M Plan, and written notification to the County and the City ~~requesting~~ ***advising*** that no permits be issued for ground-disturbing or intrusive activities unless the land users involved in ground-disturbing or intrusive activities provide MEC recognition and safety training and construction monitoring with UXO-qualified personnel to the personnel that would be involved in these ground-disturbing and/or intrusive activities.
5	EPA Specific Comment: Section 5.0, Remedial Action Sequence, Bullet Number 2, 3rd Line, Page 6	**Comment**: Please replace the word "shall" with "should". **Response**: The section has been revised as follows: • Within 30 days of finalizing this RD/RA LUCI O&M Plan, FORA shall provide a copy of the survey plat, the RD/RA LUCI O&M Plan, and written notification to the County and the City that the area ~~shall~~ ***should*** not be zoned for residential use without further evaluation and approval from EPA in coordination with DTSC.
6	EPA Specific Comment: Appendix B, Land Use Control Inspection Methodology, Action 1, Page B-1	**Comment**: Currently the text states: "The after-action reports are also submitted to the director of community development, the United States Department of the Army (Army), and the Department of Toxic Substances Control (DTSC)." Please revise the text to state that a copy of the after action report will also be submitted to the EPA. **Response**: The sentence has been revised as follows: The after-action reports are also submitted to the director of community development, the United States Department of the Army (Army), ~~and~~ the Department of Toxic Substances Control (DTSC)***, and the U.S. Environmental Protection Agency (U.S. EPA).***

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Judy Huang of EPA, dated January 21, 2009

[this page intentionally left blank]

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
1	General Comment	**Comment**: For clarity, please include descriptions of the land use controls that are the subject of this plan. **Response**: Section 1.2 "Description of Selected Remedy" has been added to the plan, and reads as follows: **"1.2 Description of Selected Remedy** ***The LUCs that will be implemented at the Parker Flats MRA were described in the Army's Parker Flats MRA Track 2 Munitions Response Site ROD and include: (1) MEC recognition and safety training for workers that will conduct ground-disturbing or intrusive activities, (2) construction monitoring for ground-disturbing or intrusive activities to address MEC that potentially remains in the subsurface, and (3) restrictions against residential use. The following paragraphs present a summary of the LUCs described in the ROD. The discussion has been modified slightly from the ROD language to reflect that the Parker Flats MRA Phase I property, and therefore the responsibilities described in the ROD have been transferred from the Army to FORA.*** **1.2.1 MEC Recognition and Safety Training** ***For the eight land use areas within the Parker Flats MRA addressed in this RD/RA LUCI O&M Plan, ground-disturbing or intrusive activities are expected to occur. People conducting such activities will be required to attend the "MEC recognition and safety training" to increase their awareness of and ability to recognize MEC. The MEC recognition training will be modeled on the Fort Ord Site Security Program and will consist of an approximately 30-minute training session. Prior to conducting any planned ground-disturbing or intrusive activities, the landowner will be required to notify FORA or FORA's representative to arrange for MEC recognition and safety training. This training will be provided to all workers that are to perform ground-***

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		disturbing or intrusive activities.
		1.2.2 Construction Monitoring
		Construction monitoring will be provided by UXO-qualified personnel during any ground-disturbing or intrusive activities at the Parker Flats MRA to address potential explosive safety risks posed by MEC to construction personnel. Construction monitoring will be arranged during the planning stages of a construction project, prior to the start of any ground-disturbing or intrusive activities. UXO-qualified personnel will monitor ground-disturbing and intrusive construction activities for the potential presence of MEC. During ground-disturbing activities, if MEC is encountered, ground-disturbing activities in the area and adjacent areas will cease and the encounter will be reported to local law enforcement. The local law enforcement agency will promptly request U.S. Department of Defense support for response (e.g., an Explosive Ordnance Disposal unit). After the response, FORA will assess the probability of encountering additional MEC based on guidance from the Department of Defense Explosives Safety Board (DDESB). Such assessment may include additional investigation, which will be coordinated with the Army, EPA, and DTSC (notification and additional investigation requirements are discussed further in Section 4.9).
		1.2.3 Restrictions Against Residential Use
		Based on the Remedial Investigation/Feasibility Study (RI/FS), the Army's position is that the additional layer of protection provided by a residential use restriction is not necessary for the Parker Flats MRA; however, in consideration of regulatory input, the preferred remedial alternative included a LUC prohibiting residential use. For the purpose of this RD/RA LUCI O&M Plan, residential use includes, but is not limited to: single-family or multi-family residences; childcare facilities; nursing homes or assisted living facilities; and any type of educational purpose for children or young adults in grades kindergarten through 12 (Army 2007b). Any proposal for residential development in the Parker Flats MRA will be subject to regulatory review. It should be noted that, per the

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		Fort Ord Base Reuse Plan (FORA 1997) only the "development reserve" could include residential development as a potential future use."
2	p.2, Second Paragraph	**Comment**: The second full paragraph states that this plan is subject to the enforcement provisions of the Federal Facility Agreement (FFA). Please clarify that "FFA" means the 1990 FFA that was amended by the Amendment No. 1. **Response**: Due to revisions requested by the EPA, the aforementioned reference to the FFA Amendment No. 1 has been removed. The paragraph has been revised as follows: "This RD/RA LUCI O&M Plan was prepared as a result of the selection of LUCs as a component of the remedy in accordance with the ROD for Parker Flats MRA Phase I ~~and the FFA for the former Fort Ord. This RD/RA LUCI O&M Plan shall be subject to the enforcement provisions of the FFA~~. In connection with the Early Transfer of a portion of the former Fort Ord, including the Parker Flats MRA Phase I, FORA assumed some of the Army's cleanup obligations under an Environmental Services Cooperative Agreement Grant. Pursuant to the associated Administrative Order on Consent (AOC) for Cleanup of Portions of the Former Fort Ord, Docket No. R9-2007-03, effective July 25, 2008, and the Environmental Services Cooperative Agreement, dated march 27, 2007, FORA agreed to implement the selected remedy for ***this portion of*** the Parker Flats MRA Phase I. This RD/RA LUCI O&M Plan is intended to fulfill the requirements of Tasks 6, 7, and 8 of the AOC for the Parker Flats MRA Phase I."
3	p.2, Bullet List	**Comment**: The bulleted list of planned land uses lists Monterey Horse Park and Habitat Reserve together as one use. We'd like to suggest that these land uses be listed in separate bullets since they are not similar uses under the Fort Ord Reuse Authority (FORA) Base Reuse Plan or the Fort Ord Installation-wide Multispecies Habitat Management Plan (HMP). **Response**: The Monterey Horse Park and the Habitat Reserve have been listed as

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		separate bullets as suggested. The section has been revised as follows: "The planned future land uses for the Parker Flats MRA Phase I include the following: • Monterey Peninsula College Emergency Vehicle Operation Center; • Monterey Horse Park~~, Habitat Reserve~~; • ***Habitat Reserve;*** • Veterans Cemetery; • Monterey County Development Reserve; and • Monterey County Public Facilities." **Comment**: The last sentence of this section states: "Although FORA may transfer these procedural responsibilities to another party… the Army shall retain ultimate responsibility for remedy integrity." It is stated in the Environmental Services Cooperative Agreement (ESCA) between FORA and the Army that FORA is responsible for obtaining regulatory Site Closeout as well as performance of Long-Term Obligations associated with Areas Covered by Environmental Services (ACES). The army objects to the suggestion that the Army remains responsible for the performance of FORA tasks under the ESCA while FORA transfers its responsibility to others. Please revise the above-mentioned sentence so as not to contradict with FORA's responsibilities under the ESCA. A sample language that was discussed in the ESCA regulatory meeting on November 13, 2008 was "FORA and/or the Army shall retain ultimate responsibilities." **Response**: The sentence has been revised as follows: "Although FORA may transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, and not withstanding any language in this section or elsewhere in this document, ***FORA and/or*** the Army shall retain ultimate responsibility for remedy integrity."
4	p.5, Sec 4.7, Army Responsibilities with Respect to Future LUC Inspections, Reporting, and Enforcement	

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
5	p.5, Sec.4.8, Notification Should Any Action(s) Interfere with LUC Effectiveness	**Comment**: The last sentence of this section states that, in the event of a discovery of activities that interfere with LUC effectiveness, FORA's reporting requirement does not preclude the Army from taking immediate action to prevent exposure. So that the Army may take such an action in a timely fashion, the Army should be copied on all notices required by this section. **Response**: This section has been revised as follows: "FORA shall notify EPA**,** ~~and~~ DTSC***, and the Army*** within 72 hours of discovery of any activity on the property that is inconsistent with the Parker Flats MRA LUC objectives. Within 45 days, FORA shall identify the cause of the problem with the LUC process, evaluate how to correct the problem to avoid future noncompliance, and implement any necessary changes. In accordance with the MOA, the County has agreed to take on this responsibility when FORA ceases to exist. This reporting requirement does not preclude the Army from taking immediate action to prevent exposure."
6	p.5, Sec.4.9, Notification of Discovery of MEC Items During Ground-Disturbing and/or Intrusive Activities	**Comment**: This section describes that, if a suspected munitions item is discovered in the property, the local law enforcement agency will request Department of Defense (DOD) support such as an Explosives Ordnance Disposal (EOD) unit, and that after such response the Army will reassess the probability of encountering MEC in the subject location. Please note that our office is in discussions with Army headquarters and EPA regarding long-term implementation procedure for such reassignments in the ACES and will further comment on this item at a later date. **Response**: On February 24, 2009, FORA received additional language regarding this section of the RD/RA LUCI O&M Plan from the EPA. The EPA indicated that the language had been generated following discussions with the Army. Please see the response to EPA Comment No. 3, which addresses Section 4.9 of the report.

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
7	p.6, Sec.5.0, Remedial Action Sequence	**Comment**: The second bullet indicates that the City of Seaside and Monterey County have addressed the issue of residential area zoning "as described in the MOA." However, the Memorandum of Agreement (MOA) concerning monitoring and reporting on environmental restrictions on the former Fort Ord (which was introduced earlier in this plan) does not seem to discuss zoning process. Please clarify the sentence/paragraph. **Response**: The sentence referencing the MOA has been deleted. As stated in the MOA, the City and County will be responsible for monitoring compliance with the LUCs, which will include a restriction on residential use until residential reuse is approved by the EPA in coordination with the DTSC. Residential reuse of the properties will be restricted in the deeds and the deeds will be filed with the County recorder's office. The second bullet has been modified as follows: • Within 30 days of finalizing this RD/RA LUCI O&M Plan, FORA shall provide a copy of the survey plat, the RD/RA LUCI O&M Plan, and written notification to the County and the City that the area ~~shall~~ ***should*** not be zoned for residential use without further evaluation and approval from EPA in coordination with DTSC. ~~As described in the MOA, the County and the City have amended the county and municipal codes, respectively, in anticipation of implementing the LUCs.~~
8	p.6, Sec.5.0, Remedial Action Sequence	**Comment**: The fifth bullet, first sentence, please clarify who the "concerned party" is. The first sentence, please provide additional information regarding "County and City ordinances" so that a reader can locate and read the specific County and/or City ordinances that is being referenced. Fifth sentence states "the agreement shall… include construction support…" Please clarify what agreement this sentence is referring to. **Response**: To address the issues identified above, the bullet has been revised as follows:

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		• ***The City of Seaside and Monterey County have adopted ordinances related to soil disturbing activities that may occur on the portions of the former Fort Ord that fall within their respective jurisdictions. The City of Seaside has adopted Ordinance 924, amending the Municipal Code to add Chapter 15.34. Monterey County has adopted Ordinance No. 5012, amending the County Code to include Chapter 16.10, titled "Digging and Excavation on the Former Fort Ord."*** Prior to any ground-disturbing or intrusive activities, ~~the concerned party~~ ***an owner or user of the property within the former Fort Ord wishing to conduct intrusive activities*** must first go through a notification and permitting process per ***the*** County and City ordinances. Once an application for a permit is received by the City or the County, the City or County shall review the permit to verify ***the*** location of the proposed excavation and to determine if any sites with known LUCs will be affected. If the work involved is located within the Parker Flats MRA Phase I, the City or County shall contact the Army, EPA, FORA, and DTSC by email or written correspondence prior to granting the permit application. ~~As outlined in the permit procedures of the excavation ordinances, it is the responsibility of the excavation permit applicant to comply with the requirements placed on the property by the MOA.~~ ***As described in the excavation ordinances, the permit applicant may not move or disturb any soil unless the applicant is in compliance with the requirements placed on the property by an agreement executed between the city, the city redevelopment agency, FORA, and DTSC.*** The agreement shall, at a minimum, include construction support and shall be attached to and become a part of any permit issued. This process will be reviewed during the five-year review ***for the former Fort Ord site under CERCLA, prepared by the Army,*** to determine if any changes need to be implemented. ***However, under the ESCA, FORA should provide an evaluation of the above-mentioned notification and permitting process for inclusion in the Army's five-year review reports. In order for such evaluation, and any recommendation for changes, to be incorporated into a five-year review, it must be submitted by FORA to the Army by February of the year of the review. The next five-year review will be conducted***

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		in 2012.
9	p.6, Sec.5.0, Remedial Action Sequence	**Comment**: The fifth bullet indicates that the notification and permitting processes to implement the LUCs will be reviewed during the five-year review to determine if any changes need to be implemented. The Army will conduct five-year reviews for the former Fort Ord site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), however, under the ESCA, FORA should provide its own evaluation of the above-mentioned notification and permitting process for inclusion in the Army's five-year review reports. In order for such evaluation, and any recommendation for changes, to be incorporated into a five-year review, it must be submitted to the Army by February of the year of the review. The next five-year review will be conducted in 2012. **Response**: The information required for inclusion in the 5-year review will be submitted by FORA (or its successor) to the Army by February of the year of the report. The information submitted to the Army will contain the results of annual reviews conducted as of July 1 of the previous year (for instance, if the information for the five-year review report in 2012 is submitted to the Army in February 2012, the information provided by FORA will contain the results of the inspection conducted through July 1, 2011). The section has been revised as follows: • ***The City of Seaside and Monterey County have adopted ordinances related to soil disturbing activities that may occur on the portions of the former Fort Ord that fall within their respective jurisdictions. The City of Seaside has adopted Ordinance 924, amending the Municipal Code to add Chapter 15.34. Monterey County has adopted Ordinance No. 5012, amending the County Code to include Chapter 16.10, titled "Digging and Excavation on the Former Fort Ord."*** Prior to any ground-disturbing or intrusive activities, ~~the concerned party~~ ***an owner or user of the property within the former Fort Ord wishing to conduct intrusive activities*** must first go through a notification and permitting process per ***the*** County and City ordinances. Once an application for a permit is received by the City or the County, the City or County shall review the permit to

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

No.	Comment Type / Report Section	Comment/Response
		verify the location of the proposed excavation and to determine if any sites with known LUCs will be affected. If the work involved is located within the Parker Flats MRA Phase I, the City or County shall contact the Army, EPA, FORA, and DTSC by email or written correspondence prior to granting the permit application. ~~As outlined in the permit procedures of the excavation ordinances, it is the responsibility of the excavation permit applicant to comply with the requirements placed on the property by the MOA.~~ ***As described in the excavation ordinances, the permit applicant may not move or disturb any soil unless the applicant is in compliance with the requirements placed on the property by an agreement executed between the city, the city redevelopment agency, FORA, and DTSC.*** The agreement shall, at a minimum, include construction support and shall be attached to and become a part of any permit issued. This process will be reviewed during the five-year review ***for the former Fort Ord site under CERCLA, prepared by the Army,*** to determine if any changes need to be implemented. ***However, under the ESCA, FORA should provide an evaluation of the above-mentioned notification and permitting process for inclusion in the Army's five-year review reports. In order for such evaluation, and any recommendation for changes, to be incorporated into a five-year review, it must be submitted by FORA to the Army by February of the year of the review. The next five-year review will be conducted in 2012.***

Response to Comments
DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated November 25, 2008
Review Comments provided by Gail Youngblood of the Army, dated December 19, 2008

[this page intentionally left blank]

No.	Comment Type / Report Section	Comment/Response
1	FOJEN Comment	**Comment:** Two unclear issues remain, however. The first step in the remedial action sequence mentions safety training in Munitions and Explosives of Concern (MEC) recognition and construction monitoring, but it does not go into detail about the training process. The remedial action sequence should provide more information about the safety training for future landowners, including information on who will be teaching these courses to the future landowners (FORA employees, outside contractors?) as well as whether or not there will be the possibility of failing the training courses (Is there a certification required before the land owner is allowed to proceed to the next step?). Army personnel and contractors have conducted these trainings in the past, and the document needs to give more details of the training. **Response:** The MEC recognition training will be modeled on the Fort Ord Site Security Program and will consist of an approximately 30-minute training session. The training will be provided by FORA representatives or FORA's approved subcontractors. This training session provides information on what types of MEC might be found at the Parker Flats MRA and the procedure to follow if suspect MEC is found. The training includes the warning to workers performing soil disturbance that MEC items may be present and, because of this fact, appropriate care must be taken. The training class is for information only and is not meant to be a certification class; therefore, the possibility of failing the training is not possible (see the Fort Ord Site Security Program). Section 1.2 has been added to the report to clarify the MEC recognition and safety training (see response to Army Comment No. 1). No other modifications have been made to the report based upon this comment.
2	FOJEN Comment	**Comment**: Finally, in regards to the Land Use Control Inspection Methodology (Appendix B), what are the qualifications of the representative of the appropriate jurisdiction? The methodology states that this representative is responsible for ensuring that new landowners are in compliance with the LUCs, but it does not specify the professional qualifications which would authorize them to do so. Will there be training available to these representatives? For the sake of consistency, ESC believes it would be prudent to select one person from within FORA to conduct the evaluation, rather than several different people who are not familiar with FORA's stated purpose and goals. This step is critically important and we can envision room for errors in completing this step.

No.	Comment Type / Report Section	Comment/Response
		Response: No specific qualifications are required of the jurisdictional representative conducting the inspections. In accordance with the MOA, it is the responsibility of each jurisdiction to certify the accuracy and validity of the annual land use monitoring report. FORA or its successor will be responsible for reviewing and compiling the information obtained from each jurisdiction and placing the compiled information into a single annual report, but as stated in the MOA, it is not the expectation that FORA will verify the accuracy of the reports. As stated in the MOA, the DTSC will be responsible for verifying the accuracy of these reports by performing audits of the sites where Land Use Controls are implemented. No modifications have been made to the report based upon this comment.

Response to Comments
DRAFT FINAL Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated April 22, 2009
Review Comments provided by Mike Weaver of FOCAG, dated May 21, 2009

No.	Comment Type / Report Section	Comment/Response
1	General	**Comment**: *On May 21, 2009, FORA received a letter from Mr. Mike Weaver of the Fort Ord Community Advisory Group (FOCAG) on the Draft Final Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan (RD/RA LUCI O&M Plan). A copy of this letter has been included in its entirety in this appendix. Below are FORA's responses to the issues raised in that letter.* **Response**: A Record of Decision (ROD) for the Parker Flats Munitions Response Area (MRA) Phase I has been signed by the United States Department of the Army (Army), the United States Environmental Protection Agency (EPA), and the Department of Toxic Substances Control (DTSC; Administrative Record No. OE-0661). This RD/RA LUCI O&M Plan addresses only the portion of the Parker Flats MRA that is the subject of the Army's ROD. The reference to MRS-27 has been changed to MRS-27B.

Response to Comments
DRAFT FINAL Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, dated April 22, 2009
Review Comments provided by Lance Houston of FOCAG, dated May 22, 2009

No.	Comment Type / Report Section	Comment/Response
1	General	**Comment**: *On May 22, 2009, FORA received a letter from Mr. Lance Houston of FOCAG on the Draft Final RD/RA LUCI O&M Plan. A copy of this letter has been included in its entirety in this appendix. On May 29, 2009, FORA sent an initial response to FOCAG's May 22, 2009 letter (Administrative Record No. ESCA-0158). Below are FORA's responses to the issues raised in FOCAG's letter.* **Response**: A ROD for the Parker Flats MRA Phase I has been signed by the Army, the EPA, and the DTSC (Administrative Record No. OE-0661). This RD/RA LUCI O&M Plan addresses only the portion of the Parker Flats MRA that is the subject of the Army's ROD. Responses to FOCAG comments received on the Draft Final Group 2 Remedial Investigation/Feasibility Study (RI/FS) Work Plan were submitted with the Final Group 2 RI/FS Work Plan dated July 8, 2009 (Administrative Record No. ESCA-0161). Responses to FOCAG comments received on the Draft Group 3 RI/FS Work Plan were submitted with the Draft Final Group 3 RI/FS Work Plan dated July 20, 2009 (Administrative Record No. ESCA-0163). As stated in FORA's May 29, 2009 letter, soil and groundwater remediation is not included in the FORA Environmental Services Cooperative Agreement (ESCA). Remediation of munitions constituents is undertaken by the Army's Base Realignment and Closure (BRAC) office as potential soil or groundwater contaminants. As such, FOCAG's questions regarding munitions constituents should be addressed to the BRAC office. As a courtesy, FORA forwarded FOCAG's May 22, 2009 letter to the BRAC office.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 21, 2009

Mr. Stan Cook
Fort Ord Reuse Authority
100 12th Street, Building 2880
Marina, CA 93933

Re: EPA Comments on the Draft Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, Parker Flats Munitions Response Area, Phase I, Former Fort Ord, Monterey County, California Dated November 25, 2008

Dear Stan:

EPA reviewed the "*Draft Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, Parker Flats Munitions Response Area Phase I, Former Fort Ord, Monterey County, California*", dated November 25, 2008, and has the following comments:

1. **Section 2.0, Site Description, Paragraph 3, Page 2:** Please replace this paragraph with the following:

   "This RD/RA LUCI O&M Plan was prepared as a result of the selection of LUCs as a component of the remedy in accordance with the ROD for Parker Flats MRA Phase I. In connection with the Early Transfer of a portion of the former Fort Ord, including the Parker Flats MRA Phase I, FORA assumed some of the Army's cleanup obligations under an Environmental Services Cooperative Agreement Grant. Pursuant to the associated Administrative Order on Consent (AOC) for Cleanup of Portions of the Former Fort Ord, Docket No. R9-2007-003, effective July 25, 2008, and the Environmental Services Cooperative Agreement, dated March 27, 2007, FORA agreed to implement the selected remedy for this portion of the Parker Flats MRA Phase I. This RD/RA LUCI O&M Plan is intended to fulfill the requirements of Tasks 6, 7, and 8 of the AOC for the Parker Flats MRA Phase I."

2. **Section 3.0, Land Use Control Performance Objective, Restriction Against Residential Use, Page 3:** Please clarify the intent of this sentence by modifying the sentence to state: "to preclude residential development or modification to residential restrictions without approval by EPA and DTSC."

3. **Section 4.9, Notification of Discovery of MEC Items During Ground-Disturbing and/or Intrusive Activities, Page 5:** Please replace the last two paragraphs of this section with the following:

   "After the response, EPA, DTSC and the Army will assess the probability of encountering additional MEC. If the probability of encountering MEC remains low, construction may resume with construction monitoring. If EPA, in consultation with DTSC, determines that additional investigation is required, FORA, or its successor under the AOC, will conduct such investigation in accordance with an approved Workplan. EPA, in consultation with DTSC, will evaluate and approve the results of the investigation. If the investigation

indicates that additional MEC is likely to be present, FORA will propose, and the Army will select, an appropriate response action to be implemented by FORA or its successor under the AOC if within the scope of its obligation under the ESCA. If an existing CERCLA decision document has addressed this contingency, FORA, or its successor under the AOC, will implement the required action if within the scope of its obligation under the ESCA."

4. **Section 5.0, Remedial Action Sequence, Bullet Number 1, 3rd Line, Page 6:** Please replace the word "requesting" with "advising".

5. **Section 5.0, Remedial Action Sequence, Bullet Number 2, 3rd Line, Page 6:** Please replace the word "shall" with "should".

6. **Appendix B, Land Use Control Inspection Methodology, Action 1, Page B-1:** Currently, the text states: "The after-action reports are also submitted to the director of community development, the United States Department of the Army (Army), and the Department of Toxic Substances Control (DTSC)." Please revise the text to state that a copy of the after action report will also be submitted to the EPA.

If you have any questions, please do not hesitate to call me at (415) 972-3681 or e-mail me at huang.judy@epa.gov.

Sincerely,

Judy C. Huang, P.E.
Remedial Project Manager

cc:

Roman Racca (DTSC)
Site Mitigation/Office of Military Facilities
8800 Cal Center Drive
Sacramento, CA 95826

Kristie Reimer, AICP
Principal Planner
BRAC / Federal Programs
LFR Inc.
1900 Powell Street, 12th Floor
Emeryville, CA 94608

Ms. Gail Youngblood
Fort Ord Base Realignment and Closure Office
P.O. Box 5008
Monterey, CA 93944-5004

DEPARTMENT OF THE ARMY
FORT ORD OFFICE, ARMY BASE REALIGNMENT AND CLOSURE
P.O. BOX 5008, BUILDING #4463 GIGLING ROAD
MONTEREY, CALIFORNIA 93944-5008

REPLY TO
ATTENTION OF

DEC 19 2008

Base Realignment and Closure

Stan Cook
ESCA Remediation Program Manager
Fort Ord Reuse Authority
100 12th Street
Marina, CA 93933

Subject: *Draft Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan, Parker Flats Munitions Response Area Phase I,* dated November 25, 2008, received December 1, 2008.

Dear Mr. Cook:

Thank you for an opportunity to review and comment on the subject document. The Army's comments are enclosed. Please note our comments are focused on "big picture" issues such as the consistency with the Army's cleanup program. A copy of this letter will be furnished to U.S. Environmental Protection Agency (Judy Huang) and California Department of Toxic Substances Control (Roman Racca).

Sincerely,

Gail Youngblood
BRAC Environmental Coordinator
Fort Ord Field Office

Enclosure

DRAFT Remedial Design/Remedial Action, Land Use Controls Implementation (LUCI), and Operation and Maintenance Plan, Parker Flats Munitions Response Area (MRA) Phase I

November 25, 2008

Army Comments:

1. For clarity, please include descriptions of the land use controls that are the subject of this plan.

2. p.2, the second full paragraph states that this plan is subject to the enforcement provisions of the Federal Facility Agreement (FFA). Please clarify that "FFA" means the 1990 FFA that was amended by the Amendment No.1.

3. p.2, the bulleted list of planned land uses lists Monterey Horse Park and Habitat Reserve together as one use. We'd like to suggest that these land uses be listed in separate bullets since they are not similar uses under the Fort Ord Reuse Authority (FORA) Base Reuse Plan or the Fort Ord Installation-wide Multispecies Habitat Management Plan (HMP).

4. p.5, Sec.4.7 Army Responsibilities with Respect to Future Land Use Control (LUC) Inspections, Reporting, and Enforcement. The last sentence of this section states: "Although FORA may transfer these procedural responsibilities to another party...the Army shall retain ultimate responsibility for remedy integrity." It is stated in the Environmental Services Cooperative Agreement (ESCA) between FORA and the Army that FORA is responsible for obtaining regulatory Site Closeout as well as performance of Long-Term Obligations associated with Areas Covered by Environmental Services (ACES). The Army objects to the suggestion that the Army remains responsible for the performance of FORA tasks under the ESCA while FORA transfers its responsibilities to others. Please revise the above-mentioned sentence so as not to contradict with FORA's responsibilities under the ESCA. A sample language that was discussed in the ESCA regulatory meeting on November 13, 2008 was "FORA and/or the Army shall retain ultimate responsibilities."

5. p.5, Sec.4.8 Notification Should Any Action(s) Interfere with LUC Effectiveness. The last sentence of this section states that, in the event of a discovery of activities that interfere with LUC effectiveness, FORA's reporting requirement does not preclude the Army from taking immediate action to prevent exposure. So that the Army may take such an action in a timely fashion, the Army should be copied on all notices required by this section.

6. p.5, Sec.4.9 Notification of Discovery of Munitions and Explosives of Concern (MEC) Items During Ground-Disturbing and/or Intrusive Activities. This section describes that, if a suspected munitions item is discovered in the property, the local law enforcement agency will request Department of Defense (DOD) support such as an Explosives Ordnance Disposal (EOD) unit, and that after such response the Army will reassess the probability of encountering MEC in the subject location. Please note that our office is in discussions with Army headquarters and EPA regarding long-term implementation procedure for such reassessments in the ACES and will further comment on this item at a later date.

7. p.6, Sec.5.0 Remedial Action Sequence. Second bullet indicates that the City of Seaside and Monterey County have addressed the issue of residential area zoning "as described in the MOA." However, the Memorandum of Agreement (MOA) concerning monitoring and reporting on

environmental restrictions on the Former Fort Ord (which was introduced earlier in the plan) does not seem to discuss zoning process. Please clarify the sentence/paragraph.

8. p.6, Sec.5.0 Remedial Action Sequence. Fifth bullet. First sentence, please clarify who the "concerned party" is. The first sentence, please provide additional information regarding "County and City ordinances" so that a reader can locate and read the specific County and/or City ordinances that is being referenced. Fifth sentence states "the agreement shall...include construction support..."; please clarify what agreement this sentence is referring to.

9. p.6, Sec.5.0 Remedial Action Sequence. Fifth bullet indicates that the notification and permitting processes to implement the LUCs will be reviewed during the five-year review to determine if any changes need to be implemented. The Army will conduct five-year reviews for the former Fort Ord site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERLA), however, under the ESCA, FORA should provide its own evaluation of the above-mentioned notification and permitting process for inclusion in the Army's five-year review reports. In order for such evaluation, and any recommendation for changes, to be incorporated into a five-year review, it must be submitted to the Army by February of the year of the review. The next five-year review will be conducted in 2012.

Received 1/27/2009 Sleese

Fort Ord Environmental Justice Network, Inc.
Mailing address - P.O. Box 361....Marina, CA. 93933
831-582-0803 voice & fax...831-277-5241
www.foejn.org -.ejustice@mbay.net

January, 22, 2009

Ms Gail Youngblood
BRAC Environmental Coordinator
P.O. Box 5004
Monterey, CA. 93944-5004

RE: **Draft Remedial Design/Remedial Action, Land Use Controls Implementation and Operation and Maintenance Plan**

Dear Ms. Youngblood:

Please see attached hard copy, enclosed report submitted by Fort Ord Environmental Justice Network, Inc. for inclusion in the Administrative Records.

In addition this report reflects additional comments from the community.

The Restoration Advisory Board was concerned that contaminated and toxic parcels would be used for development of residences, schools and other buildings where the public use would cause health exposure. The Record of Decision (ROD) restricts certain types of sensitive development The Fort Ord Environmental Justice Network questions the sale of land where munitions have been used for many years and various other kings of military training. Land use controls should not allow any type of development that would involve the public. This draft report discusses the controls that will ensure these types of developments do not occur. The three land use control performance objectives are: Miunitions & Explosives of concern (MEC), recognition and safety training; construction monitoring; and restrictions against residential use.

If you wish to discuss contents of this report further, please contact LeVonne Stone, FOEJN TAG Program Manager at 831-582-0803

Thank You,

LeVonne Stone, Fort Ord Environmental Justice Network, Executive Director/TAG Manager

Cc: Viola Cooper, USEPA, Region 1X P

Comments on
Draft Remedial Design/Remedial Action, Land Use Controls Implementation and Operation and Maintenance Plan
Parker Flats Munitions Response Area Phase I
Prepared by
Environmental Stewardship Concepts
On Behalf of
The Fort Ord Environmental Justice Network
20 January 2008

These comments were prepared at the request of the Fort Ord Environmental Justice Network (FOEJN) to provide technical comments regarding the clean up of contamination at the former base. FOEJN represents the affected community in the greater Fort Ord area in the clean up of contamination and ordnance related waste.

Summary

This document, the Draft Remedial Design/Remedial Action, Land Use Controls Implementation and Operation and Maintenance Plan for Parker Flats Munitions Response Area Phase I details the land use controls (LUCs) that will be put into place to promote responsible, safe reuse of the 700 acres that make up Phase I of Parker Flats Munitions Response Area (MRA). The Record of Decision (ROD) restricts certain types of sensitive development including residences, hospitals and schools. This draft RD/RA discusses the controls that will ensure these types of developments do not occur and the criteria that future landowners must meet prior to developing the property and for development on the property thereafter. The three land use control performance objectives are: Miunitions & Explosives of concern (MEC) recognition and safety training; construction monitoring; and restrictions against residential use.

Comments

The system of remedy implementation and review is thorough and creates a system of checks and balances to provide an accurate account of development in the Parker Flats MRA Phase I. Conducting annual and five-year monitoring will provide oversight from two distinct parties, the Army and FOR A, which will benefit all stakeholders. ESC also supports the delineation of responsibility between FORA and the Army for future LUC inspections, reporting and enforcement; it will be important to know who to contact if/when the LUCs are violated or MECs are detected. The remedial action sequence (page 6) presents a logical progression that appropriately incorporates all relevant regulatory agencies prior to permitting and continues their involvement following development in Parker Flats MRA Phase I.

Two unclear issues remain, however. The first step in the remedial action sequence mentions safety training in Munitions and Explosives of Concern (MEC) recognition and construction monitoring, but it does not go into detail about the training process. The remedial action sequence should provide more information about the safety training for future landowners, including information on who will be teaching these courses to the future landowners (FORA employees, outside contractors?) as well as whether or not there will be the possibility of failing the training courses (Is there a certification required before the land owner is allowed to proceed to the next step?). Army personnel and

contractors have conducted these trainings in the past, and the document needs to give more details of the training.

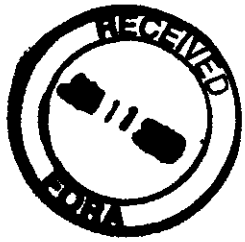
Finally, in regards to the Land Use Control Inspection Methodology (Appendix B), what are the qualifications of the representative of the appropriate jurisdiction? The methodology states that this representative is responsible for ensuring that new landowners are in compliance with the LUCs, but it does not specify the professional qualifications which would authorize them to do so. Will there be training available to these representatives? For the sake of consistency, ESC believes it would be prudent to select one person from within FORA to conduct the evaluation, rather than several different people who are not familiar with FORA's stated purpose and goals. This step is critically important and we can envision room for errors in completing this step.

Disclaimer

"This document has been funded partly or wholly through the use of U.S EPA Technical Assistance Grant Funds. Its contents do not necessarily reflect the policies, actions or positions of the U.S. Environmental Protection Agency. The Fort Ord Environmental Justice Network Inc. does not speak for nor represent the U.S. Environmental Protection Agency."

Mention of any trade name or commercial product or company does not constitute endorsement by any individual or party that prepared or sponsored this report.

Fort Ord Community Advisory Group
P.O. Box 1139
Marina, CA 93933
Email: focagemail@yahoo.com



Fort Ord Reuse Authority
100 12th Street, Building 2880
Marina, CA 93933
c/o Stan Cook,
FOR A ESCA Remediation Program Manager

Via fax: 831-883-3675, followed by hard copy

Re: Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation Maintenance Plan
Parker Flats Munitions Response Area Phase 1
Former Fort Ord
Monterey County, California

Dated April 22, 2009

FOR THE ADMINISTRATIVE RECORD

May 21, 2009

Dear Mr. Stan Cook,

Review of this document finds it to be premature to start with. We question why FOCAG written comments with concerns have gone unanswered by you and the FOR A/ESCA team, in some cases for several months. Many of these concerns address the Parker Flats area of former Fort Ord.

Reading this document and situating the areas it addresses using the Munitions Response Site Map dated 3/27/06 provided by the United States Army still leaves me trying to find MRS 27 referenced in your description as being part of it. Perhaps I missed it, but I could not find it, nor could I find it on the map done by the Company, Parsons in 2001 (former "OE- numbers, see attachment).

The attachment I am sending includes two copies of letters sent by the Ventana Chapter of the Sierra Club in 2001 and 2002. The total attachment is five pages and includes the Parker Flats boundaries, Parker Flats Status, and probably most importantly, a Summary of Excavations. Please note, the Excavations are broken down into categories of, Surface, 0 to 12 inches, 12 to 24 inches, 24 to 36 inches, and 36 to 48 inches. Areas were sample-cleared looking for metal ordnance up to four feet deep.

We now know that Parker Flats was an Army tank training area, in addition to being bombed and used as a practice target area for aerial bombing runs from the nearby

Salinas Airbase (airport), during World War II. These type of bombs can permeate soil up to ten feet.

Almost 12% of the UXO items found and recorded in the Summary, circa 2001 were at a depth up to four feet deep. How much more is below four feet?

We now also know that Army practice was to regularly trench burial pits using bulldozers and then bury vast amounts of leftover ordnance from infantry training maneuvers. These pits are randomly scattered about and are deeper than four feet. Infantry foxholes are also in many cases deeper than four feet where ordnance was left behind prior to a march back to the barracks.

Letters to ESCA/FOR A have included research and questions regarding the Army arbitrarily stopping the search for Perchlorate about 2004. There are questions about DU, Depleted Uranium, in addition to chemical warfare training packets.

Parker Flats is some of the dirtiest and most dangerous property on former Fort Ord.

Regarding Land Use Controls, Monterey County has spent about the past six years trying to put together a code enforcement staff and rules. How this is going to work out remains to be seen. The jury is still out, so to speak. The LUC's are mostly wishful thinking.

The Leeper lawsuit several years ago against the County of Monterey revealed departments needing help on mitigation monitoring, code enforcement, and condition compliance.

Ultimately, it will be the County of Monterey, and its taxpayers, that will be saddled with the very serious risks still on site at Parker Flats, as FOR A will expire in 2012. Why isn't FOR A addressing the existing development footprint at former Fort Ord like the old barracks first, prior to moving out into the still dangerous wildlands?

Sincerely,

Mike Weaver
Secretary, FOCAG

Attachments: 5 pages

c.c.
Jim Cook, Monterey County Housing and Redevelopment Agency
DTSC, c/o Joyce Whiten
US EPA, c/o Viola Cooper
Fort Ord Environmental Justice, c/o LeVonne Stone
US Army, c/o Gail Youngblood
Sierra Club, Ventana Chapter

SIERRA CLUB

VENTANA CHAPTER
P.O. Box 5667 Carmel, California 93921 408 • 624 • 8032

March 23, 2001

Garrison Commander
Presidio of Monterey
Monterey, CA 93944

Dear Col. Rice:

The Ventana Chapter Sierra Club would like to thank the Army for its OEW removal at Parker Flats on the former Fort Ord. As Michael Houlemard indicated at the March 15 SMART meeting, it was because of the discovery of the OEW issues at Parker Flats that urban use development at that site will be constrained.

FORA and the County will now need to revise the Reuse Plan to reflect the new information. Inasmuch as this revision will take time and memory fades, we request that the Army provide the Ventana Chapter a brief summary of the OWE located to date at Parker Flats.

Please send this information to the address below.

Thank you for you attention.

Gudrun Beck

Gudrun Beck, Conservation Committee Co-Chair
23765 Spectacular Bid Lane
Monterey, CA 93940
Phone & fax 655-8586

GB/GT

DEPARTMENT OF THE ARMY
Defense Language Institute Foreign Language Center and Presidio of Monterey
OFFICE OF THE COMMANDER
1759 Lewis Road, Suite 230A
MONTEREY, CALIFORNIA 93944-3227

REPLY TO
ATTENTION OF
Office of the Commander

April 18, 2002

Ms. Gudrun Beck
Conservation Committee Co-Chair
23765 Spectacular Bid Lane
Monterey, CA 93940

Dear Ms. Beck:

The following information is provided in response to your letter, dated March 23, 2002, that requested a brief summary of the ordnance and explosives (OE) removed from the Parker Flats area at the former Fort Ord (Enclosure 1).

Enclosed is a map showing the location of Parker Flats on the former Fort Ord (Enclosure 2), and a map showing where the OE was cleared from Parker Flats (Enclosure 3). A chart showing the depths of unexploded ordnance items recovered from Parker Flats is at Enclosure 4. Ordnance and explosives removed from the Parker Flats area include: 1) rifle and hand grenades; 2) 37mm, 75mm and 76mm projectiles; 3) 3 inch stokes mortars and 4.2 inch mortars; 4) 2.36 inch and 3.5 inch rockets; 5) TNT and blasting caps.

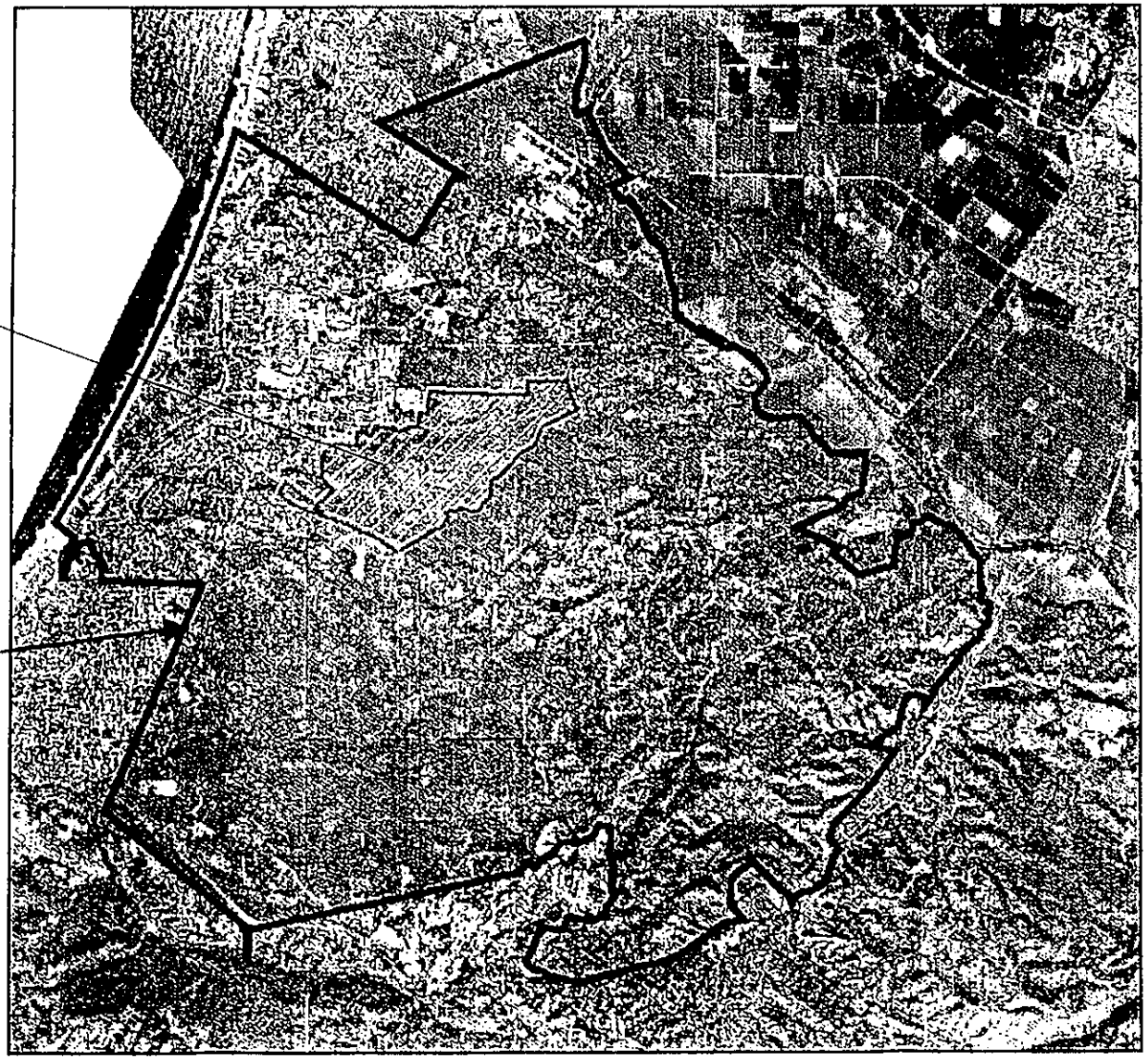
Thank you for your interest in our Environmental Cleanup Program at the former Fort Ord. If you have additional questions regarding the OE cleanup at Parker Flats, please contact Mr. James Willison, Directorate of Environmental and Natural Resources Management at (831) 242-2924.

Sincerely,

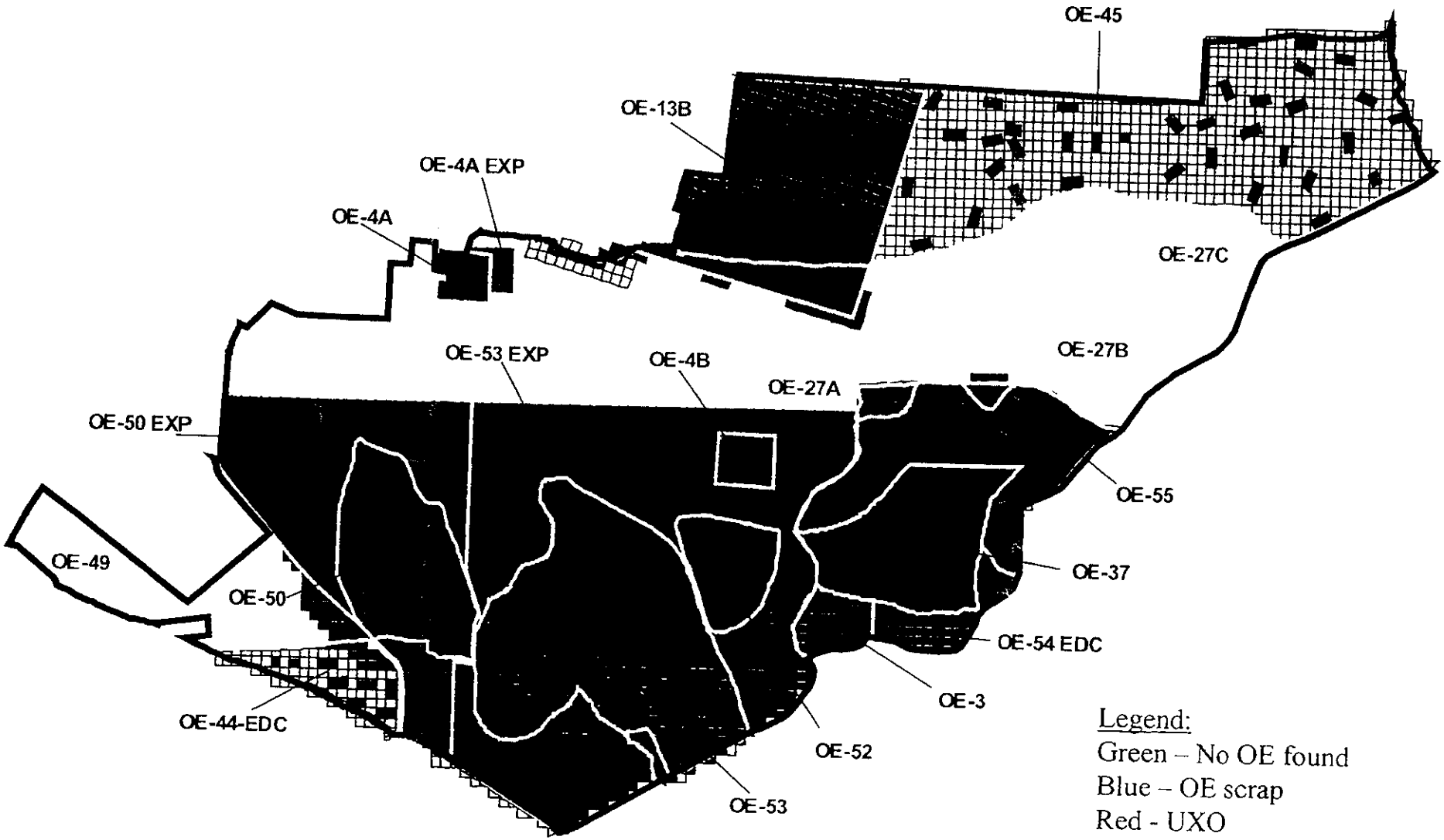
Kevin M. Rice
Colonel, US Army
Commander

Enclosures

Parker Flats Boundaries



Parker Flats Status



Legend:
Green – No OE found
Blue – OE scrap
Red - UXO

Summary of Excavations

Type	Surface	0 to 12 inches	12 to 24 inches	24 to 36 inches	36 to 48 inches
Anomalies	271,672 (26.3%)	689,912 (66.2%)	64,468 (6.2%)	11,266 (1.1%)	2,398 (0.2%)
UXO Items	124 (4.1%)	1399 (45.7%)	696 (22.7%)	478 (15.6%)	364 (11.9%)

Total Number of Excavations	**1,034,716**
Total Number of UXO Items Encountered	**3,061 (0.3%)**
Total Number of OE Scrap Items Encountered	**17,559 (1.9%)**

Fort Ord Community Advisory Group (FOCAG)
PO Box 1139
Marina, CA 93933
Email: focagemail@yahoo.com
Website: www.fortordcag.org

FOR THE ADMINISTRATIVE RECORD
Please distribute to all FORA Board Members
Letter Pages 2 Attachments 71 Pages

May 22, 2009

Fort Ord Reuse Authority (FORA)
100 12th St., Building 2880
Marina, CA 93933
FORA ESCA Program Manager
c/o Stan Cook

RE: Remedial Design/Remedial Action, Land Use Controls Implementation, and Operation and Maintenance Plan; Parker Flats Munitions Response Area Phase I Environmental Services Cooperative Agreement Doc. No. W9128F-07-2-01621

"The Fort Ord Community Advisory Group is a public interest group formed to review, comment and advise on the remediation (cleanup) of the Fort Ord Army Base, Superfund Site, to ensure that human health, safety and the environment are protected to the greatest extent possible." - Mission Statement.

Dear Mr. Cook,

There are a wide range of concerns and issues that have been raised by the Fort Ord CAG over the years, most of which remain unaddressed and unanswered. It would be helpful in the future to 1) answer the questions, 2) give the name and AR number of the document the answer is found in, and 3) give the page or section number and paragraph that the answer came from.

The outstanding issues with Park Flats munitions areas are numerous. Recently, the CAG has sent comments on RI/FS Work Plans and cleanup proposals in the Parker Flats and other Munitions Response Areas. To date, no meaningful response to our questions have been received. The comment papers raise significant questions on unaddressed issues and the inadequate cleanup of UXO/OEW in these areas and former Fort Ord in general.

The Remedial Design/Remedial Action Work Plan and the Land Use Controls for Munitions Response Areas are inadequate and premature given the limited investigations and uncertainties that remain unaddressed.

Perchlorate
In 2004 the Army exempted itself from sampling for perchlorate at Fort Ord.

New scientific studies show the EPA standard should be lowered from 6ppb to 1ppb in order to be protective to human health.

Environmental groups and physicians are urging a 1ppb drinking water standard. http://www.environmentcalifornia.org/reports/clean-water/clean-water-program-reports/perchlorate-and-children39s-health-the-case-for-a-strong-cleanup-standard-for-rocket-fuel-in-drinking-water

One of the lies that have been repeatedly told, solid rocket fuel was not used in sufficient quantities to be a concern. However, what has been left out is the fact, perchlorate is a major component of flares, pyrotechnics, practice munitions etc.. Perchlorate containing munitions may well be the most widely used munitions in the training of troops in that they are extensively used in all training exercises in all areas, at all times of the day and night.

The regulators have tuned a blind eye to this significant contaminate. Has the 2004 Army perchlorate exemption been rescinded? If not, why not? When will the Basewide Health Assessment for **all** known and suspected Munitions Constituents be available for public comments.

The unanswered questions and concerns in the Administrative Record;
Draft Group 3 RI/FS work Plan; 3-28-09 **ESCA-0154**
Draft Final Group 2 RI/FS work Plan; 3-17-09 **ESCA-0144**
Environmental Contamination; 8-12-09 **ESCA-0100**
FORA ESCA Remediation Program (RP); 3-11-09 **ESCA-0102**

It is premature to create or implement a Remedial Design/Remedial Action Plan until these significant issues are adequately addressed.

We look forward to your substantive response to these serious issues and questions. Please include the entirety of this letter and attachments in the final document.

Sincerely,

Lance Houston

Lance Houston
FOCAG Member

Cc.
California DTSC
U.S. EPA
FORA
Monterey County Redevelopment and Housing

Attachments:
Draft Group 3 RI/FS work Plan; Former Fort Ord, ESCA-0154
Draft Final Group 2 RI/FS work Plan; Former Fort Ord, ESCA-0144
Environmental Contamination; Former Fort Ord, ESCA-0100
FORA ESCA Remediation Program (RP); Former Fort Ord, ESCA-0102
Fort Ord Munitions Constituents; Table 1 and 2 constituents
Perchlorate information / Former Fort Ord
Perchlorate and Children's Health

Fort Ord Community Advisory Group (FOCAG)
PO Box 1139
Marina, CA 93933
Email: focagemail@yahoo.com
Website: www.fortordcag.org

FOR THE ADMINISTRATIVE RECORD
Please distribute to all FORA Board Members
Letter Pages 15 Attachments and Maps 182 Pages

March 28, 2009

Fort Ord Reuse Authority (FORA)
100 12th St., Building 2880
Marina, CA 93933
FORA ESCA Program Manager
c/o Stan Cook

RE: Fort Ord CAG Comments: FORA ESCA Remediation Program Draft Group 3 RI/FS Study Work Plan; Interim Action Ranges, Military Operations in Urban Terrain, Laguna Seca Parking, and Del Rey Oaks / Monterey Munitions Response Areas, Doc. Control Number: 09595-09-079-001

Concerns: Military Munitions Residual Contamination, OE/UXO/OEW/MEC Detection, OE/UXO/OEW/MEC Clearance Depths, Administrative Record Keeping, Military Munitions Database, Omissions of Pertinent Historical Site Documentation and Information, Compliance with Cleanup Standards

The "Fort Ord Community Advisory Group is a public interest group formed to review, comment and advise on the remediation (cleanup) of the Fort Ord Army Base, Superfund Site, to ensure that human health, safety and the environment are protected to the greatest extent possible." - Mission Statement.

Dear Mr. Cook;

There are a wide range of concerns and issues that have been raised by the Fort Ord CAG over the years, most of which remain unaddressed and unanswered.[1] In a recent CAG letter sent to FORA and the Regulators raising old and new concerns, the Army responded instead, on behalf of FORA and the Regulators. The public has often not been privy to the decision making process.[2] A great deal of time and taxpayer money is being spent to avoid answering our questions by referring us to documents that do not answer our specific questions and concerns. It would be helpful in the future to 1) answer the questions, 2) give the name and AR number of the document the answer is found in, and 3) give the page or section number and paragraph that the answer came from.

As is evident from OE Sampling and Removal Actions, extensive Troop Training and Munitions use occurred throughout areas that were not previously identified as Training Areas. This drives home the point that Fort Ord trained several million troops over a

[1] Attachment 1: FOCAG 8-12-08 letter to FORA, DTSC, US EPA
[2] Attachment 15: email; Regulators and Developer discussing Superfund UXO/OEW cleanup policy

period of 77 years, kept extremely poor records, used unknown millions of pounds/tons of munitions, and that these are found in unexpected places. Areas East of General Jim Moore Blvd. and Eighth St. are highly contaminated with military munitions the extent of which is unknown. [3] [4]

The Military Munitions Response Program (MMRP) database information the FORA ESCA RP is relying on is a far cry from what the historical record shows. The MMRP is arbitrarily omitting significant information from the Group 3 RI/FS. In doing so, a new record is being created that gives the appearance the land is cleaner than it really is.[5]

Critical documents (The Fort Ord Projectile Penetration Study) used for assessing potential explosive hazards associated with excavation activities and required remediation depths contains erroneous Site specific ordnance discovered information.[6] What type penetration ordnance is being used for the evaluations of the Group 3 RI/FS parcels?

A new scheme is unfolding. The Insufficient Data category (ISD) is a scary one. Has money spent on past contractors been for nothing because they didn't know how to identify the ordnance they were finding? [7] The FORA ESCA RP is arbitrarily throwing whatever munitions they want into the ISD category. There is no supporting documentation or explanation other than, because they say so.

Critical Administrative Record (AR) documents that contain pertinent Site specific information of known or suspected OE uses and depths that OEW contamination may be found have been omitted from the Group 3 RI/FS Work Plan.[8] By doing so, bogus claims of site specific conditions found in the "new" SEDR database cannot be refuted. Findings for suitability to transfer the parcels are being made based on this manipulation of data rather than data reflecting the actual site specific conditions, and potential remaining health hazards. The FORA ESCA RP is becoming what many of us feared, a dumbing-down of the extent of, and the danger of conditions existing on this former Army base. FORA political decisions based on real estate desires are not effective in protecting the community and future residents health and safety.

In addition, a great hazard remains largely unaddressed. Residual contamination from military Munitions Constituents (MC) exists. The Fort Ord ESCA Cleanup Program has failed to initiate a comprehensive MC sampling plan. To date, we are unaware of a list of MC for **all** military munitions and Training Devices used at former Fort Ord. If the list exists, please forward a copy to the CAG. Some 3300 acres are slated for turnover to the public without addressing this significant threat to human health.

---

[3] Attachment 3: Excerpts, training areas and range configurations are unknown: OE-0005A: "Site 16 Rocket moving target range...only discovered 18 months ago, this area was saturated with 2.36"rockets both HEAT and practice.... 400-500 were HEAT warheads."

[4] Map 2: CSU Footprint, previously unidentified Training Areas highly contaminated with Ordnance and Explosive Waste (OEW) live and inert ammunition.

[5] Attachment 4: California Real Estate Disclosure Law; requires full disclosure of hazardous waste

[6] Attachment 14: penetrating ordnance Group 3 parcels; projectiles; 22mm, 40mm, 37mm, 57mm, 60mm, 75mm, 81mm, 84mm, 4.2in mortar, 105mm, 155mm, 8 inch naval rounds

[7] Attachment 11: EOD Specialist Résumé, 27 years experience UXO identification and removal

[8] Attachment 5: IA Ranges 43-48 White Phosphorous (WP) Range, 1993 ASR munitions 7-10 feet deep.

1) In order to better understand the extent of military training at former Fort Ord, and the potential contamination from training activities, fundamental questions need to be answered or at least estimated.

> A story told by a retired sergeant that trained Fort Ord troops:
> A retired sergeant said he trained soldiers to fire 60mm and 81mm mortars in the northern and northeastern portions of Site 39. He would take out 400 soldiers for bivouac maneuvers (multi day outings in the field). When asked how many rounds each soldier fired in a day, he estimated each man would fire 30 to 60 Mortar rounds. He indicated they were practice mortars. Using a median number of 45 mortars multiplied by 400 soldiers, 18,000 mortars were fired in a day by a single group of trainees. It is understood practice munitions unlike High Explosive (HE) munitions use pyrotechnics for identifying were the rounds hit (spotting).[9] [10]
>
> Note: at the height of training there where 50,000 soldiers at Fort Ord. Estimates are, from 1940-1974 1.5 million troops trained at Fort Ord.[11]
>
> a) Several million troops trained at Fort Ord. How many millions or billions of pounds of military munitions were used in the training of troops? Any estimates? If not, why not?

Detailed Issues, Concerns, and Questions:

2) The Group 3 RI/FS Work Plan, Interim Action Ranges and other parcels are some of the most highly contaminated areas at former Fort Ord. The FORA ESCA RP is based in large part on the creation of a data set based on sampling and removals to a depth of 4 feet. The MMRP is assuming no UXO/OEW will be found below 4 feet. However, it appears deep penetrating UXO/OEW is not being looked for.

From early on in the Superfund cleanup of UXO/OEW, the use of quantified science has been absent. The Enron/Arthur Anderson creative accounting style of data collection and manipulation is detrimental to human health and safety and is **not** in the communities best interest. If protection of human health and safety is the goal, a scientific approach to UXO/OEW cleanup requires the inclusion of all potential exposure scenarios to explosive and residual contamination, and that **all** aspects of munitions use be quantified. To date UXO/OEW investigations and removals have been limited to the explosive hazard and soil sampling for a few constituents arbitrarily chosen by DOD. Cal EPA (DTSC) and US EPA are concurring with this absurd approach.

Another dangerous approach to Ordnance and Explosives Site assessments has been, lack of evidence of OE use through Archive Searches and Site Walks is sufficient to conclude OE and training devices were not used at suspected training areas.[12] This rational defies

---

[9] Attachment 9: Practice Bombs, toxic hazards of practice ammunition
[10] Attachment 6: Pyrotechnic Devices, Military Munitions (Chemistry) Chapter 10
[11] Attachment 19: Fort Ord History
[12] Attachment 21: Article; Buried munitions in residential development, deed restriction was lifted

commonsense. To date, several training areas previously unidentified as UXO/OEW sites, have proven to be highly contaminated with munitions and training devices. Unresolved issues with the Fort Ord MMRP approach exist:

a) The Army kept extremely poor records. Why isn't a precautionary approach being taken when it comes to potential training areas?(assume it is UXO/OEW contaminated unless proven otherwise rather than assuming it was not used for training based on Archive Search Records and Site Walks) Never assume Fort Ord land is safe.[13]

b) Identifying past range uses is critical. It is understood range reconfigurations where a common practice.[14] Site 39 historical maps show ranges over tops of ranges, the extent of which is unknown. If wanting to know the extent of range and training area uses is a goal, compiling a list of **all** known and suspected munitions and training device constituents and extensive site soil sampling would be very helpful. Is there a list of all constituents associated with munitions and training devices used at former Fort Ord?[15] If not, why not?

c) It is understood a common practice was to cover over former training ranges with earth, out of sight out of mind.[16] Is there a cleanup document that discusses in detail the practice of covering over old ranges and training areas? If not, why not?

d) It was a common practice to bury OE/OEW. [17] Is there a cleanup document that discusses in detail the practice of burying OE/OEW? If not, why not?

e) The MMRP does not appear to be looking for deeply buried munitions. Why isn't the MMRP looking for UXO/OEW deeper than 4 feet?

f) OE/OEW is likely deeply buried in ranges and training areas. The approach the MMRP has taken with OE/OEW is, don't look, don't find. Superfund cleanup as the FOCAG understands it, is a program intended to identify and remove hazardous waste and substances to the greatest extent possible. If OE/OEW and training devices aren't being looked for, they surely won't be found. Is the MMRP doing a cleanup to the greatest extent possible? If not, why not?

g) Former uses at Site 39 have been omitted from the record, aerial bombing runs were carried out in the MRA. Why has this significant historical use been omitted from the record?[18] What is the penetration depth of a 100, 250, and 500 lb bomb? Is there a cleanup document that discusses in detail these types munitions and their use at former Fort Ord? If not, why not?

---

[13] Attachment 16: The Precautionary Principle; 1998 Wingspread Statement
[14] Attachment 3: Excerpt, Range 48; 40mm, 60mm, 81mm, 4.2 in, and 4 in mortars found 10 feet deep
[15] Attachment 10: DOD to identify contamination from over 200 military Munitions Constituents (MC)
[16] Attachment 3: Excerpt, Site 13B sink hole Practice Mortar Range under 30 feet of fill
[17] Attachment 21: Article Buried munitions. Deeply buried ordnance is not being looked for.
[18] Attachment 3: Excerpts, Bombing runs where carried out at Fort Ord. A live 250 lb. bomb found in front of Ranges 41-43. A 100lb. Found at CSUMP parcel Site 8.

h) It is understood large amounts of Practice and HE munitions were used to train troops the extent of which is unknown. How many troops are estimated to have trained at Ranges 43-48? Any estimates? If not, why not?

i) It is understood burning off ranges to remove old munitions was a common practice. The extent of munitions constituents contamination is unknown. A site were UXO/OEW has been discovered may have been cleared of munitions annually for many years. A range used in this manner would likely have significant COC's on-site. Where is the list of known ranges that had this done? Is there a cleanup document that discusses in detail this potential health and safety issue? If not, why not?

j) The significant hazards of Practice munitions have not been addressed. It is well documented Practice munitions were extensively used in the training of troops. The FOCAG has discovered these munitions contain highly toxic substances. The FOCAG is unaware of a cleanup document or report that discusses in detail Practice munitions and their constituents. If a document exists addressing practice munitions and their constituents please forward a copy to the FOCAG.

k) The FOCAG has discovered a map showing the Interim Action Ranges. Range 44 is identified as a LT antiarmor WP Range.[19] [20] The 1993 ASR indicates White Phosphorous munitions use occurred at Site 39. Is Range 44 a White Phosphorous Range? Is there a cleanup document that discusses in detail these types munitions and where they were used at Fort Ord? If not, why not?

l) It is understood incendiary, armor piercing munitions were used at Site 39.[21] Have armor piercing munitions such as Depleted Uranium been discovered at Site 39? [22] Is Depleted Uranium being looked for? Is there a cleanup document that discusses in detail these types munitions and their use at former Fort Ord? If not, why not? Could you please send the FOCAG a copy of the full scale map that map1 was generated from?

m) Range 43 is identified as a 81mm and 4.2 in mortar range.[23] Is the he MMRP looking beyond 4 feet for deep penetrating ordnance? If not, why not? Could you please send the FOCAG a hard copy and a CD of the full scale map that Map1 was generated from?

The 1993 ASR states Range 48 has ordnance at 10 feet and the Impact Area of which the entire IA Ranges are located, has munitions at 7-10 feet.[24] According to listed ordnance used at 43-48,[25] Penetration depths should not exceed 4.1 ft.. A

---

[19] Attachment 3: Excerpts, types munitions used at Site 39
[20] Attachment 16: White Phosphorous is highly toxic
[21] Map 1: shows Range 44 as White Phosphorous (WP) Range (must enlarge map to see)
[22] Attachment 2: DOD document indicating Spent Uranium anti tank munitions use at former Fort Ord
[23] Map 1: shows Range 43 as a 81mm, 4.2 mortar range (must enlarge map to see)
[24] Attachment 3: Excerpts, depths OE is expected to be found Ranges 43-48 and the MRA/impact area.
[25] Attachment 3: Excerpts, list of OE expected to be found at Site 39, Ranges 43-48

couple of possibilities. 1) these ranges were covered over to reduce hazards from past OE use, or 2) Ranges 43-48 are a impact area from old artillery ranges located in the North and Eastern portion of Fort Ord,[26] perhaps old Camp Ord. Historical records indicate early Fort Ord was a Artillery training facility. Regardless, there is a high likelihood, explosive and residual hazards remain unaddressed with the IA and adjacent ranges. When will the Army begin a RI/FS that targets artillery OEW?

n) Have there been any excavations to investigate whether OE is found at 10 ft. in the IA Ranges? If not, why not? Is the era and size of munitions fired from the artillery ranges in map 3 known? Have the firing points and impact areas been looked for and located? If not, why not?

o) 4.2 in. and 4 in. Stokes mortars are identified as being used and found in the IA Ranges.[27] In addition, Livens projectiles have been found nearby. It is understood these types WW I mortars and munitions have been found to contain titanium tetrachloride, a CWM. Is there a cleanup document that discusses in detail these types munitions and their use at former Fort Ord? If not, why not?

p) Why aren't the Regulators asking and getting answers to these fundamental questions? Its not to late to get it right.

3) Most military munitions constituents are known or suspected endocrine disruptors, carcinogens, mutagens, toxicants, etc.. The CAG has compiled a list of military munitions constituents found in the types of munitions used at Fort Ord. The list includes the potential negative human health impacts that may result from exposure to each of the constituents. Former Military Training Areas are highly contaminated with hazardous chemicals.[28] If you knew of the potential risk, would you want or allow your children to live on and play in soil possibly contaminated with the Table 1 and Table 2 constituents?

a) Has the Fort Ord Cleanup Program prepared a list of Munitions Constituents (MC) for **all** Military Munitions and Training Devices used at former Fort Ord. If not, Why not?

b) Of the millions or billions of pounds of military munitions used, how many pounds of their constituents were released into the environment? Any estimates? If not, why not?

c) Were did the residual contaminates go?

d) Could all the contaminates simply disappear?

e) Does soil analysis of ranges include every known or suspected OEW/UXO constituent used at Fort Ord? If not, why not?

---

[26] Map 3: Shows 2 old artillery range fans extending into MRA
[27] Attachment 3: Excerpts, list of OE expected to be found at Site 39, Ranges 43-48. Add new items
[28] Attachment 7: military munitions constituents and health hazards Table 1 and Table 2 constituents

f) Babies and toddlers commonly eat soil and other substances off the ground. Has this risk been analyzed? If not, why not?

g) Have Maximum Residual Levels (MRL's) been established for the constituents in the attached Military Munitions Chemicals Of Concern Table 1 and 2? If not, why not?

h) If the extent of residual contamination and MRL's have not been established, how can an acceptable level of cleanup be known for residential or commercial use?

i) Is there a screening program in place to monitor for hazardous substances at Fort Ord? If not, why not? Will there be a program to monitor potential negative health impacts of residents living in homes built on former training areas and ranges? If not, why not?

j) Perchlorate is known to be a widely used constituent in military munitions used at Fort Ord . Is there testing being conducted to identify the extent of Perchlorate contamination in former training areas and ranges? If not, why not? If yes, the remediation documents don't appear to include any discussion or analysis.[29]

k) Synergism and synergistic effects of chemicals should be part of Risk Assessment. I don't recall seeing any analysis in the Fort Ord Base Wide RI/FS addressing synergism. Is synergism covered in any Fort Ord Human Health Risk or Environmental Assessments? If not, why not?

4) The parcels have not been adequately cleared of Ordnance and Explosives Waste (OEW), Unexploded Ordnance (UXO), or identified the extent of Munitions Constituents (MC) contamination. The extent of contamination is unknown.

Because the extent of deep penetration ordnance and deep OEW burial pits are unknown, scanning equipment capable of detecting deeply buried metallic anomalies should be used.[30]

Thankfully, early in the cleanup process, DOD and the Regulators understood the significant threats from Ammunition and Explosives. A few quotes:

> "It is necessary to identify and remove ammunition and explosives located from the surface to the applicable depth indicated (Commercial/Residential, Utility Construction Activity: Clearance depth; 10 ft. or excavation depth plus 4 feet, whichever is greater)"[31]

> "Chapter 12, DOD 6055-9 STD (1992), DOD Ammunition and Explosives

---

[29] Attachment 17: Perclorate summary DOD 16-106 ppb Fort Ord Site 39
[30] Attachment 14: Fort Ord Ordnance Penetration Table and Range Penetration Analysis
[31] Attachment 12: DDESB OEW site remediation depth for intended use

Safety Standard; DOD real property known to be contaminated with ammunition and explosives that may endanger the general public may not be released from DOD custody until the most stringent efforts have been made to ensure appropriate protection to the public."[32]

" The Presidio of Monterey does not intend to transfer by deed any known or suspect ordnance and explosive site on former Fort Ord land, prior to the completion of all required OE related actions. We do, however, intend to transfer by deed areas that may have been identified on training maps , but through the archive search process were not identified as potential ordnance sites, i.e. Machine Gun Proficiency Training Areas, Machine Gun Squares, and Mortar Squares." [33]

"Chapter 12 of DOD 6055-9STD requires a cleanup plan be presented to the DDESB for leasing, transferring, or disposing of DOD real property when ammunition and explosives contamination is known or suspected. The DDESB will review the plan for explosives safety considerations. The following matrix is to be used to identify the appropriate clearance depth. The ability to clear to a given depth will depend on the technology and funds available. It is necessary to identify and remove ammunition and explosives located from the surface to the applicable depth indicated."[34]

a) UXO/OEW cleanup efficiencies have not advanced as a result of new detection technologies and methods, but rather by changing of the rules in order to meet development goals. What happened?

Projectiles capable of penetration depths beyond the Shonstedt GA-52CX detection range have been found in the Group 3 parcels.[35] There is good reason to be looking beyond the 4 foot removal depths at Fort Ord.[36]

b) To date, what efforts have been made to locate deeply buried ordnance?

c) Today, what technology is being deployed to locate deep penetrating ordnance?

d) The Shonstedt GA-52CX has been used at Fort Ord for 15 years. Is the RP using the best technologies available?

e) Is the GA-52CX the best hand held OE detection technology available?[37] It is understood better overall detection equipment exists. Why isn't it being used?

---

[32] Attachment 3: Excerpts, OE-0122 found in HFA/CSU After Action Report

[33] Attachment 5: DOD letter; no known or suspect OE land to transfer by deed prior to completion of all required OE related actions.

[34] Attachment 14: Penetration Analysis Table; Range/site design UXO wrong. Deep penetrating ordnance found CSUMB footprint and 13B

[35] Map 3: Two artillery Range fans extend into the MRA. Deep penetrating ordnance should be looked for.

[36] Attachment 14: Ordnance penetration Table and Penetration Analysis Table

[37] Attachment 5: OE-0036 1996 Evaluation and Comparison of UXO Detectors. Better overall detector

f) Does the EM61-MK2 detect metallic anomaly's as well or better than the GA-52CX or the MK 26?

g) It is understood the Forester Ferex MK 26 ordnance locator is used by U.S. Military EOD forces. This magnetometer detects deep penetrating ordnance well beyond the capacity of the 52CX. Is the MK 26 being used at Fort Ord? If not, why not?[38] [39]

h) Which of the following is the UXO/OEW cleanup goal; to locate and remove Ordnance and Explosive Waste to the greatest extent possible or to the extent it is financially practical?

i) If finding all UXO/OEW items is a goal, would using detection equipment capable of deeper detection capabilities be desired?

j) Is UXO/OEW in itself, being looked for beyond 4 feet ? If not, why not?

The practice of characterizing former Fort Ord land through the archive search process and visually looking around while walking down bunny trails to identify potential training areas should be abolished. It is abundantly clear, areas not suspected of training activities have turned out to be highly contaminated with dangerous training items, and that dangerous training items show up in the most unexpected places.

5) Chemical Warfare Materials (CWM) and their use in training areas have not been adequately addressed. These types of training devices outside their packaging are not detectable with magnetometers.

On March 10, 1997, 24 ampoules CAIS Chemical Warfare Materials were discovered 2 ft. below ground near 4500 motor pool during ordnance and removal activities at Site OE-13B [40]

On April 14, 1994 during the HFA/CSU OE removal, 2 EOD specialists were overcome by a Hazardous Material and required medical attention at the hospital. Their equipment was confiscated due to concerns of HAZ MAT contamination. Hazardous Material monitoring devices were required for all subsequent OEW removal.

The known CWM were unexpectedly found in a Range/Training area that was not previously identified as a potential CWM training area. It may have been a rare event except it is well documented these CWM are commonly found and buried in training areas. According to Fort Ord records, CAIS Sets were used at Fort Ord until 1974. The K951 ampoules (also called vials) are frequently found in burial

[38] Attachment 13: DTSC letter to Army, 3.5" Rocket found after Army declared site safe for unrestricted use
[39] Attachment 3: Excerpts, Forester Ferex MK 26 ordnance locator, detects ordnance up to 19 feet deep
[40] Attachment 5: OE-0265D, OE-0265E; CAIS CWM found during OEW clearance activities 13B

sites at old WWII training areas.[41]

a) Early Fort Ord cleanup documents state CWM were thought not to have been used at Fort Ord. We now know that these training devices were used to train troops at Fort Ord the extent of which is unknown. Is there a cleanup document that discusses in detail these types training devices? If not, why not?

b) How were these incidents resolved?

c) Army certainly saw this as significant concern. How will the public be protected from potential exposure to these chemical agents?

d) Why haven't these incidents been included in all training area documents?

e) Due to the common practice of discarding these training devices in the field, what is the justification for allowing the transfer, reuse, and development of training areas and training sites (TS) where these devices have been found or may have been used?

f) Is there technology that can identify individual glass vials below the ground surface?

g) These CWM materials are contained in glass vials. Has there been any discussions of how this hazard should or will be addressed?

h) How can workers be protected from these types of hazards during excavation activities?

i) Are there plans to cap (earth fill), military training areas rather than remediate them of UXO/OEW and military constituents? It is evident through limited sampling throughout training sites, most stringent efforts are not being made to find UXO/OEW.

6) Critical Administrative Record (AR) documents that contain pertinent site specific known or suspected uses, and OEW contamination information have been omitted.[42]

a) Known OE uses have not been included the FORA ESCA RP parcels documents [43] [44]

b) UXO/OEW discovered during site sampling and removal actions has disappeared from the FORA ESCA RP parcels historical record.[45]

---

[41] Attachment 3: Excerpts OE-0202, OE-0265D, OE-0265E

[42] Attachment 5: Omitted AR documents and dates made available on Fort Ord Cleanup web site

[43] Attachment 3: Excerpts, bombing runs were carried out at the MRA the extent of which is unknown

[44] Attachment 3: Excerpts, Site 15 Range 48, White Phosphorous munitions used in the MRA

[45] Attachment 3: Excerpts, Attachment 3: Excerpts; sinkhole practice mortar range Site 13B, area backfilled with up to 30' feet of fill during 4400/4500 Block Motor pool construction . The was Range covered over.

c) Why has the SEDR, MMRP, and FORA ESCA RP databases failed to include **all** OEW items discovered within the Group 3 RI/FS

It appears the Administrative Record is being manipulated in a way that misrepresents important facts. The public, now and in the future, has a right to know the full extent of the past military training use of individual parcels, and the full historical record of OEW items found within their boundaries. To omit or alter any part of this historical information misleads the reader into believing the parcel is cleaner and safer than it actually is. By keeping the record straight, the public can decide for themselves if they wish to be exposed to the potential remaining OEW hazards. Remediation by data manipulation will have a disastrous outcome and harm someone.

d) How has this critical issue slipped by the FORA officials and the regulators?

e) Are the officials aware of what's happening?

f) Is this acceptable to the officials and the regulators?

g) When someone gets blown up or sick, who will be liable?

h) Is this in the best interest of the taxpayers?

i) California has strict real estate disclosure laws. How will parcel specific OEW information be known and disclosed?[46]

Additionally, these critical documents have not been included in the Fort Ord cleanup AR web site until very late in the process. The public has had no reasonable way of viewing site specific information. The FORA ESCA RP is omitting key documentation that tells a very different story of the extent of OEW/UXO contamination in the Training Areas.[47]

j) What steps will be taken to inform the public and future residents of the potential health hazards associated with living over former Training Areas?

7) The Fort Ord Military Munitions Response Program (MMRP) database has lost very important AR documentation needed to make accurate and well informed decisions by the Regulators and the Public.

Most training/practice ammunition contains highly toxic, hazardous substances. These munitions, and their constituents are a significant health hazard that remain relatively unaddressed. Many of these practice/inert ammunitions have been

[46] Attachment 4: California Real Estate Disclosure Law; requires full disclosure of hazardous waste
[47] Attachment 5: Omitted AR documents and dates made available on Fort Ord Cleanup web site

omitted in the new SEDR database. Withholding this information from new cleanup documents deprives the public of significant, and critical information.[48] [49]

Early in the OE cleanup process, ordnance and explosive training range areas were first referred to as "Sites". They then were referred to as "OE" areas, and now "MRS' areas. As the changing of acronyms has progressed, so has the omission of old site data of UXO/OEW items discovered. Hence a "new" record has emerged.

There's a new FORA ESCA RP concoction of data referred to as the Summary of Existing Data Report (SEDR). The SEDR which evolved from information supplied from the MMRP database is being relied upon to support the Group 3 RI/FS Work Plan. Site Characterizations, Findings, and Determinations of safety are being based on the compilation of the new data resulting from the omission and manipulation of the old data. This new data is resulting in the sites appearing to be relatively benign. This will undoubtedly result in a finding of "no further action". By creating this fictitious new record, RP parcels are being represented as being safer than they really are.

The MMRP database is not being properly maintained as is evident by the omission of large quantities of UXO/OEW discovered in the 3300 acres of the FORA ESCA RP documents.[50]

a) What Agency or Organization is in charge of the Military Munitions Database, a critical element of the Fort Ord Superfund cleanup?

b) Has the administration of the Military Munitions Database been privatized?

c) Is there oversight of the OE/OEW/MEC data that is entered into and/or omitted from the database?

d) What is the protocol for adding, deleting, or changing data in the Military Munitions Database?

e) Who is responsible for maintaining the UXO/OEW/MEC AR and ensuring the information is preserved and not tampered with.

f) Does the database compile all past discovered Ordnance and Explosives i.e., OE, OEW, UXO, DMM, MEC, MD etc. into the same OE dataset?

g) How could such significant historical site information be missed by the FORA ESCA RP officials and the Regulators?

h) Is there a public notification and input process of how the database(s) will be maintained?

---

[48] Map 2: Lists of OEW items found Site 13B and CSUMB footprint.
[49] Attachment 9: Practice Bombs, toxic hazards of practice ammunition, widely used at Fort Ord
[50] Map 2: Lists of OEW items found Site 13B and CSUMB footprint.

i) Acronyms, synonyms and descriptions of Ordnance and Explosives (OE), Ordnance and Explosives Waste (OEW) have been changed over the years. As a result, valuable and critical information is being lost. Coincidentally, this appears to corresponded with the privatization of Fort Ord Superfund cleanup, the FORA ESCA RP, and the new centralized database. Are the Regulators keeping track of the Fort Ord historical Military Munitions Database and taking steps to prevent this potential travesty?

j) Significant OE data for the Group 3 parcels has been lost . Which regulatory Agency is responsible for oversight that will ensure the historical facts of each parcel are preserved?

k) It is understood small arms are considered hazardous waste. Is the ESCA Cleanup Program still required to report types, amounts, and locations of **all** OEW discovered including Small Arms ammunition, 50 cal. or less, and practice and inert ordnance? [51] If not, why not?

l) It is understood small arms tracer ammunition was used for troop training. Is there a cleanup document that discusses in detail these types munitions and their use at former Fort Ord? If not, why not?

7) It is understood non-metallic landmines have been found at Fort Ord. Discovery of these types of munitions raise the same questions as with the CWM issue.

a) How is this issue being addressed?

b) Is there technology that can identify individual non-metallic ordnance below the ground surface?

c) Is it safe to develop areas were CWM and non-metallic landmines may have been used? If so, how so?

8) Additional comments and questions

The Group 3 RI/FS Work Plan states: Section 3.1, IA Ranges 43-48
The MMRP database indicates that the majority of the MEC removed from the Interim Action Ranges MRA were located on the surface; however, these data may not include subsurface MEC removed during the Range 45 scraping and sifting operations.

The record shows large quantities of UXO/OEW discovered are subsurface[52] [53]

a) Subsurface OEW is being diminished. To discover such high quantities of penetrating ordnance on the surface is all the better reason to look harder and deeper for OEW. As with the Group 2 RI/FS comments, is the FORA ESCA RP,

---

[51] Attachment 5: DTSC letter stating State of California and US EPA position on OEW
[52] Attachment 20: List of UXO/OEW found prior to 2002, large quantity subsurface
[53] Attachment 3: Excerpt, Range 48; 40mm, 60mm, 81mm, 4.2 in, and 4 in mortars found 10 feet deep.

SEDR, and MMRP database commingling a good idea? "data may not include subsurface MEC". Who is interpreting the MMRP data. Is this type data collection in the taxpayers best interest. Do the Officials and Regulators concur?

b) According to Sec.3.1, 10,165 UXO items and 196,996 pounds of MD have been discovered, This is a much larger quantity than we were aware of. Would you please forward to the CAG a complete list of the UXO items with dates found, depths and the grid location information. Additionally please forward a list of the AR document numbers were the10,165 UXO items are found. Is there a document that describes the type munitions the196,996 pounds of MD came from? If so, please provide the AR document number. If not, why not?

We look forward to your substantive response to these serious issues and questions. Please include the entirety of this letter and attachments in the final document.

Sincerely,

Lance Houston, for the FOCAG

Cc.
California DTSC
U.S. EPA
Monterey County Planning Department
California State University Monterey Bay

ATTACHMENTS:

1 FOCAG 8-12-09 Position Paper; Environmental Contamination Fort Ord, CA

2 DOD document indicating Spent Uranium munitions use at former Fort Ord

3 Excerpts Fort Ord UXO/OEW cleanup documents

4 California Real Estate Disclosure

5 Omitted Documentation and dates posted to Fort Ord Cleanup web site

6 Pyrotechnic Devices: uses and constituents

7 Military Munitions Constituents (MC) Table 1 and Table 2

8 Explosives and Propellants: uses and constituents

9 Toxic Hazards of Practice Ammunition

10 GAO: DOD to identify contamination from over 200 military Munitions Constituents

11 EOD Specialist résumé; 27 years experience OE detection and removal

12 UXO Site Remediation Depths

13 DTSC letter to Army OEW cleanup concerns

14 Fort Ord Ordnance Penetration Table and Range Penetration Analysis

15 email, regulators and developer discussing cleanup policy

16 White Phosphorous (WP) Profiles

17 Perchlorate summary Fort Ord, CA DOD 16-106 ppb Site 39

18 1998 Wingspread Statement, Precautionary Principal

19 Fort Ord History

20 Ranges 43-48 list of UXO/OEW found, many subsurface

21 Article: Buried ordnance has residents wondering if their yards hold hidden danger

MAPS

1 Ranges 43-48, shows Range 44 Lt. anti-armor WP Range

2 Ordnance and explosives Training Sites CSUMB Parcel and UXO/OEW items found

3 1994 ASR map shows Artillery range fans extending into Multi Range Area (MRA)

4 1994 ASR maps

Fort Ord Community Advisory Group (FOCAG)
PO Box 1139
Marina, CA 93933
Email: focagemail@yahoo.com
Website: www.fortordcag.org

FOR THE ADMINISTRATIVE RECORD
Please distribute to all FORA Board Members
Letter 15 Pages Attachments and Maps 143 Pages

March 17, 2009

Fort Ord Reuse Authority (FORA)
100 12th St., Building 2880
Marina, CA 93933
FORA ESCA Program Manager
c/o Stan Cook

RE: Fort Ord CAG Comments: FORA ESCA Remediation Program Draft Final Group 2 RI/FS Study Work Plan; California State University Monterey Bay (CSUMB) and County North parcels, Doc. Control Number: 09595-08-079-006

Concerns: Military Munitions Residual Contamination, OE/UXO/OEW/MEC Detection, OE/UXO/OEW/MEC Clearance Depths, Administrative Record Keeping, Military Munitions Database, Omissions of Pertinent Historical Site Documentation and Information, Compliance with Cleanup Standards

The "Fort Ord Community Advisory Group is a public interest group formed to review, comment and advise on the remediation (cleanup) of the Fort Ord Army Base, Superfund Site, to ensure that human health, safety and the environment are protected to the greatest extent possible." - Mission Statement.

Foreword: The FOCAG has been looking over Parker Flats and CSUMB cleanup records, early 1994 to present.

Early reports show a 247 acre practice mortar range, 1/3 of which is within the CSUMB Footprint.

In 1994 sampling occurred at Site 4C, Site 7, Site 8, site 13B, and Site 18 within the CSU Footprint. Most of these Sites were declared OE contaminated and all operations were halted. These sites were/are highly contaminated with UXO/OEW.

As of post 1998 documents, Site OE-13B has disappeared completely from the CSU Footprint. The 2008 FOSET 5 for the CSUMB parcel includes OE Sites; Site 4C, Site 7, Site 8, Site 18, Site CSU, Site HFA/CSU, but omits the 1/3 of Site 13B. 13B has simply disappeared.

OE-13B has morphed into MRS-13B Horse Park, a portion of OE-13B about a 1/4 of its original size. Regarding OE cleanup for a portion of the CSUMB Footprint, the EE/CA II states, "no data available." At this point it appears a

significant portion of the CSUMB site may not have been cleared of OE despite claims that it was. The FOCAG has come across a partial list of OE discovered in the area where there's "no data available". This area is highly contaminated with a wide range of ordnance, but was only partially cleared.

Dear Mr. Cook;

There are a wide range of concerns and issues that have been raised by the Fort Ord CAG over the years, most of which remain unaddressed and unanswered.[1] In a recent CAG letter sent to FORA and the Regulators raising old and new concerns, the Army responded instead, on behalf of FORA and the Regulators. The public has often not been privy to the decision making process.[2] A great deal of time and taxpayer money is being spent to avoid answering our questions by referring us to documents that do not answer our specific questions and concerns. It would be helpful in the future to 1) answer the questions, 2) give the name and AR number of the document the answer is found in, and 3) give the page or section number and paragraph that the answer came from.

As is evident from OE Sampling and Removal Actions in the CSUMB/County North areas and elsewhere, extensive Troop Training and Munitions use occurred throughout areas that were not previously identified as Training Areas. This drives home the point that Fort Ord trained several million troops over a period of 77 years, kept extremely poor records, used unknown millions of pounds/tons of munitions, and that these are found in unexpected places. Areas East of General Jim Moore Blvd. and Eighth St. are highly contaminated with military munitions the extent of which is unknown. [3] [4] [5]

The Military Munitions Response Program (MMRP) database shows 1,552 UXO/ISD[6] items were found on the CSUMB parcel. The historical record shows 274,585 UXO/OEW[7] items were found on the CSUMB parcel. Information the FORA ESCA RP is relying on is a far cry from what the historical record shows. The MMRP is arbitrarily omitting significant information from the Group 2 RI/FS. In doing so, a new record is being created that gives the appearance the land is cleaner than it really is.[8]

A UXO/OEW contaminated Site referred to as Site 13B, a Practice Mortar Range, has been omitted from the CSUMB MRA record.[9] This area turned out to be highly contaminated with UXO/OEW of all types.[10]

---

[1] Attachment 1: FOCAG 8-12-08 letter to FORA, DTSC, US EPA

[2] Attachment 15: email; Regulators and Developer discussing Superfund UXO/OEW cleanup policy

[3] Map 4: Site13B 63 acres, West end of County North parcel, expanded to 247 acres

[4] Attachment 3: Excerpts, training areas and range configurations are unknown: OE-0005A: "Site 16 Rocket moving target range...only discovered 18 months ago, this area was saturated with 2.36"rockets both HEAT and practice.... 400-500 were HEAT warheads."

[5] Attachment 2: CSU Footprint, previously unidentified Training Area highly contaminated with Ordnance and Explosive Waste (OEW) Live and inert ammunition.

[6] Attachment 16: Summary of Existing Data Report (SEDR) CSUMB MRA Types of MEC Removed

[7] Map 2: historical record of OE Sites and military munitions found on CSUMP parcel

[8] Attachment 4: California Real Estate Disclosure Law; requires full disclosure of hazardous waste

[9] Map 3: SEDR Figure 6.1-3 map shows no sign of Site 13B on the CSUMB parcel

[10] Attachment 18: OE-0012 SOW Phase 1, Feb. 94, Sec. 1.3 Sites 4C, 7, 13B,18, all Sites live UXO items

Critical documents (The Fort Ord Projectile Penetration Study) used for assessing potential explosive hazards associated with excavation activities and required remediation depths contains erroneous Site specific ordnance discovered information.[11] [12]

A new scheme is unfolding. The Insufficient Data category (ISD) is a scary one. Has money spent on past contractors been for nothing because they didn't know how to identify the ordnance they were finding? [13] The FORA ESCA RP is arbitrarily throwing whatever munitions they want into the ISD category. There is no supporting documentation or explanation other than, because they say so.

Critical Administrative Record (AR) documents that contain pertinent Site specific information of known or suspected OE uses and OEW contamination have been omitted from the Group 2 RI/FS Work Plan. By doing so, bogus claims of site specific conditions found in the "new" SEDR database cannot be refuted. Findings for suitability to transfer the parcels are being made based on this manipulation of data rather than data reflecting the actual site specific conditions, and potential remaining health hazards. The FORA ESCA RP is becoming what many of us feared, a dumbing-down of the extent of, and the danger of conditions existing on this former Army base. FORA political decisions based on real estate desires are not effective in protecting the community and future residents health and safety.

In addition, a great hazard remains largely unaddressed. Residual contamination from military Munitions Constituents (MC) exists. The Fort Ord ESCA Cleanup Program has failed to initiate a comprehensive MC sampling plan. To date, we are unaware of a list of MC for **all** military munitions and Training Devices used at former Fort Ord. If the list exists, please forward a copy to the CAG. Some 3300 acres are slated for turnover to the public without addressing this significant threat to human health.[14]

Detailed Issues, Concerns, and Questions:

1) In order to better understand the extent of military training at former Fort Ord, and the potential contamination from training activities, fundamental questions need to be answered or at least estimated.

> A story told by a retired sergeant that trained Fort Ord troops:
> A retired sergeant said he trained soldiers to fire 60mm and 81mm mortars in the northern and northeastern portions of Site 39. He would take out 400 soldiers for bivouac maneuvers (multi day outings in the field). When asked how many rounds each soldier fired in a day, he estimated each man would fire 30 to 60 Mortar rounds. He indicated they were practice mortars. Using a median number of 45 mortars multiplied by 400 soldiers, 18,000 mortars were fired in a day by a single

---

[11] Attachment 14: penetrating ordnance found CSUMB parcel; 25mm, 37mm, 60mm, 81mm, 105mm
[12] Map 2: historical record of OE Sites and military munitions found on CSUMB parcel
[13] Attachment 11: EOD Specialist Résumé, 27 years experience UXO identification and removal
[14] Attachment 10: DOD to identify contamination from over 200 military Munitions Constituents (MC)

group of trainees. It is understood practice munitions unlike High Explosive (HE) munitions use pyrotechnics for identifying were the rounds hit (spotting).[15] [16]

Note: at the height of training there where 50,000 soldiers at Fort Ord. Estimates are, from 1940-1974 1.5 million troops trained at Fort Ord.[17]

a) 1.5 million or more troops trained at Fort Ord. How many millions or billions of pounds of military munitions were used in the training of troops? Any estimates? If not, why not?

2) Most military munitions constituents are known or suspected endocrine disruptors, carcinogens, mutagens, toxicants, etc.. The CAG has compiled a list of military munitions constituents found in the types of munitions used at Fort Ord. The list includes the potential negative human health impacts that may result from exposure to each of the constituents. Former Military Training Areas are highly contaminated with hazardous chemicals.[18] If you knew of the potential risk, would you want or allow your children to live on and play in soil possibly contaminated with the Table 1 and Table 2 constituents?

a) Has the Fort Ord Cleanup Program prepared a list of Munitions Constituents (MC) for **all** Military Munitions and Training Devices used at former Fort Ord. If not, Why not?

b) Of the millions or billions of pounds of military munitions used, how many pounds of their constituents were released into the environment? Any estimates? If not, why not?

c) Were did the residual contaminates go?

d) Could all the contaminates simply disappear?

e) Does soil analysis of ranges include every known or suspected OEW/UXO constituent used at Fort Ord? If not, why not?

f) Babies and toddlers commonly eat soil and other substances off the ground. Has this risk been analyzed? If not, why not?

g) Have Maximum Residual Levels (MRL's) been established for the constituents in the attached Military Munitions Chemicals Of Concern Table 1 and 2? If not, why not?

---

[15] Attachment 9: Practice Bombs, toxic hazards of practice ammunition
[16] Attachment 6: Pyrotechnic Devices, Military Munitions (Chemistry) Chapter 10
[17] Attachment 19: Fort Ord History
[18] Attachment 7: military munitions constituents and health hazards Table 1 and Table 2 constituents

h) If the extent of residual contamination and MRL's have not been established, how can an acceptable level of cleanup be known for residential or commercial use?

i) Is there a screening program in place to monitor for hazardous substances at Fort Ord? If not, why not? Will there be a program to monitor potential negative health impacts of residents living in homes built on former training areas and ranges? If not, why not?

j) Perchlorate is known to be a widely used constituent in military munitions used at Fort Ord . Is there testing being conducted to identify the extent of Perchlorate contamination in former training areas and ranges? If not, why not? If yes, the remediation documents don't appear to include any discussion or analysis.[19]

k) Synergism and synergistic effects of chemicals are a significant part of Risk Assessment. I don't recall seeing any analysis in the Fort Ord Base Wide RI/FS addressing synergism. Is synergism covered in any Fort Ord Human Health Risk or Environmental Assessments? If not, why not?

3) The parcels have not been adequately cleared of Ordnance and Explosives Waste (OEW), Unexploded Ordnance (UXO), or identified the extent of Munitions Constituents (MC) contamination. The extent of contamination is unknown.

The Shonstedt models GA-52C and GA-72CV were used for OEW/UXO clearance prior to Oct.1994. The GA-52CX was used thereafter.[20] This raises several issues and concerns.

According to the After Action Report for OEW Sampling and Removal, Sites 4C, 7, 8, 13B, 18 were sampled, and a large portion of the CSU Footprint was cleared of UXO/OEW to a depth of 3 feet. According to the Work Plans (WP), the GA-52C was used for the OEW removal actions.[21]

Additionally, ordnance capable of penetrating beyond the old GA-52C and newer GA-52CX detection range has been found in the CSUMB parcel. Because the extent of deep penetration ordnance and deep OEW burial pits are unknown, scanning equipment capable of detecting deeply buried metallic anomalies should be used. The former Fort Ord areas cleared, CSUMB, using the old detection equipment should undergo a full wall to wall removal using the newer GA-52CX magnetometer and deploy deep scanning metallic detection equipment.[22]

Thankfully, early in the cleanup process, DOD and the Regulators understood the significant threats from Ammunition and Explosives. A few quotes:

---

[19] Attachment 17: Perclorate summary DOD 16-106 ppb Fort Ord Site 39
[20] Attachment 5: OE-0029 EE/CA I Sec. 4.2.1.4, GA-52CX in service since Oct. 1994, Sweep efficiencies
[21] Attachment 5: OE-0007 OEW removal, Phase III Work Plan, Sec. 6.3, CSU footprint
[22] Attachment 14: Fort Ord Ordnance Penetration Table and Range Penetration Analysis

"It is necessary to identify and remove ammunition and explosives located from the surface to the applicable depth indicated (Commercial/Residential, Utility Construction Activity: Clearance depth; 10 ft. or excavation depth plus 4 feet, whichever is greater)"[23]

"Chapter 12, DOD 6055-9 STD (1992), DOD Ammunition and Explosives Safety Standard; DOD real property known to be contaminated with ammunition and explosives that may endanger the general public may not be released from DOD custody until the most stringent efforts have been made to ensure appropriate protection to the public."[24]

" The Presidio of Monterey does not intend to transfer by deed any known or suspect ordnance and explosive site on former Fort Ord land, prior to the completion of all required OE related actions. We do, however, intend to transfer by deed areas that may have been identified on training maps , but through the archive search process were not identified as potential ordnance sites, i.e. Machine Gun Proficiency Training Areas, Machine Gun Squares, and Mortar Squares." [25]

"Chapter 12 of DOD 6055-9STD requires a cleanup plan be presented to the DDESB for leasing, transferring, or disposing of DOD real property when ammunition and explosives contamination is known or suspected. The DDESB will review the plan for explosives safety considerations. The following matrix is to be used to identify the appropriate clearance depth. The ability to clear to a given depth will depend on the technology and funds available. It is necessary to identify and remove ammunition and explosives located from the surface to the applicable depth indicated."[26]

a) UXO/OEW cleanup efficiencies have not advanced as a result of new detection technologies and methods, but rather by changing of the rules in order to meet development goals. What happened?

Projectiles capable of penetration depths beyond the Shonstedt GA-52CX detection range have been found in the CSUMB and County North parcels. There is good reason to be looking beyond the 4 foot removal depths at Fort Ord.[27]

b) To date, what efforts have been made to locate deeply buried ordnance?

c) Today, what technology is being deployed to locate deep penetrating ordnance?

---

[23] Attachment 12: DDESB OEW site remediation depth for intended use

[24] Attachment 3: Excerpts, OE-0122 found in HFA/CSU After Action Report

[25] Attachment 5: DOD letter; no known or suspect OE land to transfer by deed prior to completion of all required OE related actions.

[26] Attachment 14: Penetration Analysis Table; Range/site design UXO wrong. Deep penetrating ordnance found CSUMB footprint and 13B

[27] Attachment 14: Ordnance penetration Table and Penetration Analysis Table

d) The Shonstedt GA-52CX has been used at Fort Ord for 15 years. Is the RP using the best technologies available?

e) Is the GA-52CX the best hand held OE detection technology available?[28]

f) Does the EM61-MK2 detect metallic anomaly's as well or better than the GA-52CX?

g) Which of the following is the UXO/OEW cleanup goal; to locate and remove Ordnance and Explosive Waste to the greatest extent possible or to the extent it is financially practical?

h) If finding all UXO/OEW items is a goal, would using detection equipment capable of deeper detection capabilities be desired?

i) Is UXO/OEW in itself, being looked for beyond 4 feet ? If not, why not?

The practice of characterizing former Fort Ord land through the archive search process and visually looking around while walking down bunny trails to identify potential training areas should abolished. It is abundantly clear, areas not suspected of training activities have turned out to be highly contaminated with dangerous training items, and that dangerous training items show up in the most unexpected places.[29]

4) Chemical Warfare Materials (CWM) and their use in training areas have not been adequately addressed. These types of training devices outside their packaging are not detectable with magnetometers.

On March 10, 1997, 24 ampoules CAIS Chemical Warfare Materials were discovered 2 ft. below ground near 4500 motor pool during ordnance and removal activities at Site OE-13B (1/3 of which lies in the CSUMB parcel). This area is within the Group 2 County parcel and adjacent to the CSUMB parcel.[30]

On April 14, 1994 during the HFA/CSU OE removal, 2 EOD specialists were overcome by a Hazardous Material and required medical attention at the hospital. Their equipment was confiscated due to concerns of HAZ MAT contamination. Hazardous Material monitoring devices were required for all subsequent OEW removal. It should be noted the HAZ MAT incident occurred in a site adjacent to OE-4C a Chemical, Biological, Radiological (CBR) site. The substance was not disclosed .[31] These significant issues have been omitted from the new RP record. Was this a CWM incident?

---

[28] Attachment 5: OE-0036 1996 Evaluation and Comparison of UXO Detectors. Better overall detector
[29] Attachment 13: DTSC letter to Army raising cleanup issues
[30] Attachment 5: OE-0265D, OE-0265E; CAIS CWM found during OEW clearance activities 13B
[31] Attachment 3: Excerpts OE-0011 Operational Daily Journals

The known CWM were unexpectedly found in a Range/Training area that was not previously identified as a potential CWM training area. It may have been a rare event except it is well documented these CWM are commonly found and buried in training areas. According to Fort Ord records, CAIS Sets were used at Fort Ord until 1974. The K951 ampoules (also called vials) are frequently found in burial sites at old WWII training areas.[32]

a) How were these incidents resolved?

b) Army certainly saw this as significant concern. How will the public be protected from potential exposure to these chemical agents?

c) Why haven't these incidents been included in the CSUMB parcel history?

d) Due to the common practice of discarding these training devices in the field, what is the justification for allowing the transfer, reuse, and development of training areas and training sites (TS) where these devices have been found or may have been used?

e) Is there technology that can identify individual glass vials below the ground surface?

f) These CWM materials are contained in glass vials. Has there been any discussions of how this hazard should or will be addressed?

g) How can workers be protected from these types of hazards during excavation activities?

h) Are there plans to cap military training areas rather than remediate them of UXO/OEW and military constituents?

5) Critical Administrative Record (AR) documents that contain pertinent site specific known or suspected uses, and OEW contamination information have been omitted.[33]

a) Known OE sites have disappeared from the FORA ESCA RP parcels historical record.[34]

b) UXO/OEW discovered during site sampling and removal actions has disappeared from the FORA ESCA RP parcels historical record.[35]

The CSUMB Site has several ordnance and explosive (OE) sites within its boundaries. The Group 2 RI/FS identifies OE sites OE-4C, OE-7, OE-8, OE-18, OE-31. A OE site not included within the CSUMB parcel is a OE Site referred to

[32] Attachment 3: Excerpts OE-0202, OE-0265D, OE-0265E
[33] Attachment 5: Omitted AR documents and dates made available on Fort Ord Cleanup web site
[34] Map 3: SEDR Fig. 6.1-3 new map of CSUMB parcel, Site 13B omitted
[35] Attachment 2: Lists of OEW items found Site 13B and CSUMB footprint

as Site 13B or OE-13B, a practice mortar range. In the Annex J WP, Site 13B is 63 acres. For unknown and unexplained reasons, Site 13B was expanded to 247 acres. Approximately 80 acres, the northern 1/3 of OE-13B extends into the western portion of the CSUMB parcel. OE-13B has simply vanished from the CSUMB parcel OE record.[36]

Documentation that discusses Site 13B, OEW sampling and removal actions, its heavy OEW contamination, and lists of OEW found have been omitted. Omitted cleanup documents contain well documented lists of UXO/OEW discovered.

c) Why has the SEDR, MMRP, and FORA ESCA RP databases failed to include **all** OEW items discovered within the CSUMB parcel?

d) Why has OE-13B been omitted from the CSUMB record?

The Administrative Record seems to be being manipulated in a way that misrepresents important facts. The public, now and in the future, has a right to know the full extent of the past military training use of individual parcels, and the full historical record of OEW items found within their boundaries. To omit or alter any part of this historical information misleads the reader into believing the parcel is cleaner and safer than it actually is. By keeping the record straight, the public can decide for themselves if they wish to be exposed to the potential remaining OEW hazards. Remediation by data manipulation will have a disastrous outcome and harm someone.[37]

e) How has this critical issue slipped by the FORA officials and the regulators?

f) Are the officials aware of what's happening?

g) Is this acceptable to the officials and the regulators?

h) When someone gets blown up or sick, who will be liable?

i) Is this in the best interest of the taxpayers?

j) California has strict real estate disclosure laws. How will parcel specific OEW information be known and disclosed?[38]

Additionally, these critical documents have not been included in the Fort Ord cleanup AR web site until very late in the process. The public has had no reasonable way of viewing site specific information. The FORA ESCA RP is omitting key documentation that tells a very different story of the extent of

---

[36] Attachment 3: Excerpts; sinkhole practice mortar range Site 13B, area backfilled with up to 30' feet of soil during 4400/4500 Block Motor pool construction . Range covered over?

[37] Maps 2: historical record of OE Sites and military munitions found on CSUMB parcel

[38] Attachment 4: California Real Estate Disclosure Law; requires full disclosure of hazardous waste

OEW/UXO contamination in the Training Areas.[39]

k) What steps will be taken to inform the public and future residents of the potential health hazards associated with living over former Training Areas?

6) The Fort Ord Military Munitions Response Program (MMRP) database has lost very important AR documentation needed to make accurate and well informed decisions by the Regulators and the Public.

Most training/practice ammunition contains highly toxic, hazardous substances. These munitions, and their constituents are a significant health hazard that remain relatively unaddressed. Many of these practice/inert ammunitions have been omitted in the new SEDR database. Withholding this information from new cleanup documents deprives the public of significant, and critical information.[40] [41]

Early in the OE cleanup process, ordnance and explosive training range areas were first referred to as "Sites". They then were referred to as "OE" areas, and now "MRS' areas. As the changing of acronyms has progressed, so has the omission of old site data of UXO/OEW items discovered. Hence a "new" record has emerged.

There's a new FORA ESCA RP concoction of data referred to as the Summary of Existing Data Report (SEDR). The SEDR which evolved from information supplied from the MMRP database is being relied upon to support the Group 2 RI/FS Work Plan. Site Characterizations, Findings, and Determinations of safety are being based on the compilation of the new data resulting from the omission and manipulation of the old data. This new data is resulting in the sites appearing to be relatively benign. This will undoubtedly result in a finding of "no further action". By creating this fictitious new record, RP parcels are being represented as being safer than they really are.

The MMRP database is not being properly maintained as is evident by the omission of large quantities of UXO/OEW discovered in the 3300 acres of the FORA ESCA RP documents.[42] [43]

a) What Agency or Organization is in charge of the Military Munitions Database, a critical element of the Fort Ord Superfund cleanup?

b) Has the administration of the Military Munitions Database been privatized?

c) Is there oversight of the OE/OEW/MEC data that is entered into and/or omitted from the database?

---

[39] Attachment 5: Omitted AR documents and dates made available on Fort Ord Cleanup web site
[40] Attachment 2: Lists of OEW items found Site 13B and CSUMB footprint
[41] Attachment 9: Practice Bombs, toxic hazards of practice ammunition
[42] Attachment 16: SEDR Table 6.3-2 CSUMB MEC found
[43] Attachment 2: Lists of OEW items found Site 13B and CSUMB footprint

d) What is the protocol for adding, deleting, or changing data in the Military Munitions Database?

e) Who is responsible for maintaining the UXO/OEW/MEC AR and ensuring the information is preserved and not tampered with.

f) Does the database compile all past discovered Ordnance and Explosives i.e., OE, OEW, UXO, DMM, MEC, MPPEH, MD etc. into the same OE dataset?

g) How could such significant historical site information be missed by the FORA ESCA RP and the Regulators?

h) Is there a public notification and input process of how the database will be maintained?

i) Acronyms, synonyms and descriptions of Ordnance and Explosives (OE), Ordnance and Explosives Waste (OEW) have been changed over the years, Valuable and critical information is being lost. Coincidentally, this appears to corresponded with the privatization of Fort Ord Superfund cleanup, the FORA ESCA RP, and the new centralized database. Are the Regulators keeping track of the Fort Ord historical Military Munitions Database and taking steps to prevent this potential travesty?

j) Significant OE data for the CSUMB parcel has been lost . Which regulatory Agency is responsible for oversight that will ensure the historical facts of each parcel are preserved?

k) Is the ESCA Cleanup Program still required to report types, amounts, and locations of **all** OEW discovered including Small Arms ammunition, 50 cal. or less, and practice and inert ordnance? If not, why not?

7) It is understood non-metallic landmines have been found at Fort Ord. Discovery of these types of munitions raise the same questions as with the CWM issue.

a) How is this issue being addressed?

b) Is there technology that can identify individual non-metallic ordnance below the ground surface?

c) Is it a good idea to develop areas were CWM and non-metallic landmines may have been used?

8) Additional comments and questions

The Group 2 RI/FS Sec 3.1 States OEW found:

MRS-04C
• Training (practice hand grenade fuze)
MRS-07
• Training (practice mines, practice rockets, practice hand grenade fuzes, and practice rifle grenades)
• Illumination (trip flares)
• Smoke (smoke hand grenades)
• Riot / Crowd Control (riot hand grenades)
MRS-08
• Illumination (illumination signals and trip flares)
MRS-13C
• Training (practice projectiles, practice mines, simulators, and practice hand grenade fuzes)
• Illumination (illumination signals, illumination hand grenades, trip flares, and parachute projectiles)
• Smoke (smoke rifle grenades and smoke hand grenades)
• Demolition (blasting caps and demolition charges)
• Igniters (electric squibs and hand grenade fuzes)
• Riot / Crowd Control (riot hand grenade)
MRS-18
• Training (recoilless training round)
• Igniters (trip flares and firing devices)
MRS-31
• Direct and Indirect Firing (antitank rockets, armor-piercing tracer projectiles, and fragmentation hand grenades)
• Training (practice hand grenade fuzes, practice hand grenades, practice rifle grenades, practice mine fuzes, practice mines, practice rockets, and simulators)
• Illumination (illumination signals, illumination hand grenades, trip flares, parachute illumination projectiles, and pyrotechnic mixtures)
• Smoke (smoke rifle grenades, smoke hand grenades, smoke signals, smoke pots, and pyrotechnic smoke mixtures)
• Demolition (blasting caps and demolition charges)
• Igniters (firing devices, electric squibs, hand grenade fuzes, practice mine activators, mine fuzes, and time fuse igniters)
• Riot / Crowd Control (riot hand grenades)

Sampling and Removal docs. tell a different story [44]

a) Is the AR record different than the MMRP record?

b) Why such a discrepancy between what the FORA ESCA RP shows and what the AR found?

Sec. 3.1 states:

Only the MEC items from MRS-13C were recovered from depths below ground surface

[44] Attachment 2: Lists of OEW items found Site 13B and CSUMB footprint

(ranging from 1 to 48 inches). The MEC items from MRS-04C, MRS-07, MRS-08, MRS-18, and MRS-31 were reportedly recovered from the ground surface according to the Fort Ord Military Munitions Response Program (MMRP) database; however, the depth information may be inaccurately represented in the database and will be evaluated during the RI as described in Section 4.0 of this work plan.

Sampling and Removal docs. tell a different story [45]

Note: To date, the1940's-1950's mortar range Site 13B has not been located. What lesson should be learned from this story? Range uses and locations are unknown.

Sec. 3.1 states:

There was no evidence of a mortar impact area associated with the practice mortar ranges (MRS-31 and MRS-13C) and no evidence of tear gas or chemical agents associated with the CBR training area (MRS-04C) identified on historical maps.

Sampling and Removal and WP docs.[46] [47] tell a different story

Note: The HAZ MAT incident that occurred very near the OE-4C site remains unresolved. The precautionary approach would be to assume it was a CWM incident related to 4C training. Under no circumstance should the incident be omitted from the record. Taking into account the 13B CWM incident along with the HFA/CSU HAZ MAT incident, the Group 2 RI/FS training areas and others are potentially contaminated with CWM training devices.

c) Why has the HAZ MAT incident been omitted from the record?

Sec. 3.1 states:

The initial evaluation of previous munitions response actions within the CSUMB Off-Campus MRA indicated that the existing data is of sufficient quantity to characterize the MRA. However, these removal actions were conducted using analog magnetometers, and requirements for data collection were not as detailed at the time of the removal actions as the current requirements. Therefore, data quality has been identified as an issue that needs to be evaluated as part of the RI.

Removal Action docs. show record keeping requirements[48]

d) Are the FORA ESCA RP record keeping requirements more stringent the SOW phase 1? If so, why aren't all the OEW items in the SEDR database?

e) Not all records are in the AR. Where did the missing records go?

---

[45] Attachment 5: OE-0011 Journals refer to thousands of digs and backhoe excavations of UXO/OEW
[46] Attachment 3: Excerpts CSUMB 2 EOD specialists were over come by a Hazardous Material, unresolved
[47] Map 4: map shows the old 63 acre 13B location. This would be a good area to look deep and test soil.
[48] Attachment 18: SOW Phase 1 Sec 3.4.5 , extensive record keeping requirements.

We look forward to your substantive response to these serious issues and questions. Please include the entirety of this letter and attachments in the final document.

Sincerely,

Lance Houston, for the FOCAG

Cc.
California DTSC
U.S. EPA
Monterey County Planning Department
California State University Monterey Bay

ATTACHMENTS:

1 FOCAG 8-12-09 Position Paper; Environmental Contamination Fort Ord, CA

2 UXO/OEW items found CSUMB Parcel

3 Excerpts Fort Ord UXO/OEW cleanup documents

4 California Real Estate Disclosure

5 Omitted Documentation and dates posted to Fort Ord Cleanup web site

6 Pyrotechnic Devices: uses and constituents

7 Military Munitions Constituents (MC) Table 1 and Table 2

8 Explosives and Propellants: uses and constituents

9 Toxic Hazards of Practice Ammunition

10 GAO: DOD to identify contamination from over 200 military Munitions Constituents

11 EOD Specialist résumé; 27 years experience OE detection and removal

12 UXO Site Remediation Depths

13 DTSC letter to Army OEW cleanup concerns

14 Fort Ord Ordnance Penetration Table and Range Penetration Analysis

15 email, regulators and developer discussing cleanup policy

16 SEDR Table 6.3-2 CSUMB MRA MEC found

17 Perchlorate summary Fort Ord, CA DOD 16-106 ppb Site 39

18 Scope Of Work (SOW) Phase 1 Removal, CSU footprint

19 Fort Ord History

MAPS

1 Historical maps CSUMB boundary and OE Sites

2 Historical map CSUMB Parcel and UXO/OEW items found

3 SEDR Fig. 6.1-3 new map of CSUMB parcel

4 Historical map shows Site 13B 63 acres

Fort Ord Community Advisory Group (FOCAG)
PO Box 2173
Monterey, CA 93942
Email: focag@fortordcag.org
Website: www.fortordcag.org

August 12, 2008

Fort Ord Reuse Authority (FORA)
100 12th St., Building 2880
Marina, CA 93933
c/o FORA Board Members

FINAL
FOR THE ADMINISTRATIVE RECORD
Please distribute to all FORA Board Members
Position Paper 6 pp. Attachments 75 pp.

RE: FOCAG Position Paper; Environmental Contamination; Remediation and Development of Military Munitions Training Areas at Former Fort Ord: Request for a revised Base Wide EIR

To whom it may concern;

The "Fort Ord Community Advisory Group is a public interest group formed to review, comment and advise on the remediation (cleanup) of the Fort Ord Army Base, Superfund Site, to ensure that human health, safety and the environment are protected to the greatest extent possible." - Mission Statement.

The intent of this document is to inform the public and the decision makers of the potential danger of hazardous waste to human health. The FOCAG simply does not what to see anyone harmed. FORA has approved plans to allow local jurisdictions to develop residential housing and commercial space on many former military munitions training areas including Site 39 despite the clear history of people being harmed by such activities. Allowing people to live on top of former Military Munitions Training Areas is a recipe for disaster. There is new and significant information that justify a new EIR.

Many environmental contaminates at levels of a few parts per billion can have lifelong adverse human health effects. Most military munitions constituents are known or ***suspected*** endocrine disruptors, carcinogens, mutagens, toxicants, ect.. Attached is a list of military munitions constituents found in the types of munitions used at Fort Ord and Site 39. The list includes the potential negative human health impacts that may result from exposure to each of the constituents. Former Military Training Areas are highly contaminated with hazardous chemicals.(1) If you knew of the potential risk, would you allow your children to live on and play in soil contaminated with the Table 1 constituents?

The extent of contamination at former Fort Ord from military munitions training and disposal is unknown. Fort Ord was used by the U.S. Army for weapons testing. Site 39 has been described as the grand dad of all U.S. Military Munitions Training Sites.

Contamination is likely worse that suspected. Historically, dangerous military munitions and constituents show up in the most unlikely places. No square inch of Fort Ord can be assumed to be free or safe from dangerous ordnance and chemicals. The Seaside, Del Rey

Oaks, and Monterey County parcels within Historical Site 39 have been designated for residential and commercial development despite the clear threat to human health. Tens of thousands of pounds of OEW/UXO have been removed from these parcels yet the Army and FORA still refuse to acknowledge the fact that these Parcels were used for ordnance training. In the 1995 RI/FS Site 39, onsite receptor analysis for residential and commercial use was not included because these uses were not expected. "Available future land use plans indicate that the site is not expected to be developed for residential, industrial, or commercial use." (1995 RI/FS Vol. III Baseline Risk Assessment For Site 39) Site 39 was expected to be off limits to development because of the known threats to human health and safety from military munitions. Site 39 should have been categorized as one Range due to the clear evidence of military munitions being used thorough the entire Historical Site 39, wall to wall.

Historical Range maps indicate that over the years as ranges were decommissioned, new ranges were opened. It appears that over time there are literally layers and overlaps of ranges the extent of which is unknown.(2)

"Site 39 was used Since the early 1900s for ordinance training activities. As a result, OEW, including UXO, is present at the site. OEW is defined as bombs and war heads; guided and unguided ballistic missiles; artillery, mortar, and rocket ammunition; small arms ammunition; anti-personnel and anti-tank mines; demolition charges; pyrotechnics; grenades; torpedoes and depth charges; containerized or uncontainerized high explosives and propellants; nuclear materials; chemicals and radiological agents; and all similar or related items designed to cause damage to personnel or materials. Oil in which explosive compounds are detected will be considered OEW if the concentration is sufficient to present an imminent hazard. UXO is a subset of OEW and consists of unexploded bombs, warheads, artillery shells, mortar rounds, and chemical weapons. Components or ordnance items (e.g., boosters, bursters, fuzes, igniter tubes) are also included in the UXO definition. Nonuclear materials, chemical agents, or biological agents have been found or reported to have been used at the site." (1995 RI/FS Site 39)(3)

A partial list of military munitions, live and inert, found within the Seaside1-4, Del Rey Oaks, and Monterey County parcels include but is not limited to the following; "fragment hand grenades MKII , smoke hand grenades M18, hand grenade M10, 4inch trench mortars MK1, 4.2 inch mortars, 4inch trench mortars FM, 4inch trench ordnance components, blasting caps M6, blasting caps M7, hand grenade fuzes M228, 75mm Shrapnel MK1, 37mm LE MK1 , 75mm HE MK1, Livens projector FM, surface trip flare M49, 3.5inch rocket M29, 35mm Rockets M73, 3inch Hotchkiss projector, activator mine AT M1, mine AT M1, primer igniter tube M57, cartridge ignition M2, signal illumination M125, mine fuze M6A1, rifle grenade M22, 57mm projector HE M306, flash artillery M110, projectile PD M503ch mortars HC, 3inch trench mortars MK1, 81mm mortar HE M43, 4.2 inch mortars, 40mmprojector M781." (USACE documents)

Seaside Parcels; "The teams dug up and removed 43,695 specific anomalies, weighing nearly 50,000 pounds, and consisting of debris and munitions from the areas. Most of the material was range debris, totaling 46,745 lbs; 2963 lbs were munitions debris, and 292 items were identified as munitions. 52 of these munitions and explosives were too deteriorated and unsafe to remove from the site. These unsafe items were blown in place.

These items included Stokes mortars and 4.2 inch mortars, plus Livens projectiles. These items were scrutinized carefully, and when the contents could not be confirmed, the contractors called in the Army special unit that deals with chemical warfare materials (CWM). This unit examined the three types of Munitions and Explosives of Concern for chemical weapons materials and found titanium tetrachloride in all of them. Titanium tetrachloride was used during WW I as a smoke agent in projectiles that were fired at enemy lines to obscure sight lines and decrease visibility." (Dr. Peter L. Defer Comments Draft MRS-SEA 1-4 Time Critical Removal Action 2004)(4)

Environmental contamination is now directly linked to adverse human health effects. Illness in the U.S. has reached epidemic levels likely due to lax regulation, oversight, and enforcement of environmental laws in place to protect human health, safety and the environment. Nationally, conservatively, 1 in 150 children has Autism. Asthma, Alzheimer's Disease, Diabetes, Immune System Disorders, Dementia, Cancers, Organ Diseases to list a few are at epidemic levels. Today, the U.S. public is sicker than ever before. It is time to seriously consider the cause of illness rather than treating the symptoms. What part is environmental contamination playing in this unprecedented epidemic?

Studies now show the unborn fetus, nursing mothers, infants, and children are especially vulnerable to extremely low levels of environmental contamination.

"The periods of embryonic, foetal and infant development are remarkably susceptible to environmental hazards. Toxic exposures to chemical pollutants during these windows of increased susceptibility can cause disease and disability in infants, children and across the entire span of human life. Among the effects of toxic exposures recognized in the past have been spontaneous abortion, congenital malformations, lowered birthweight and other adverse effects. These outcomes may be readily apparent. However, even subtle changes caused by chemical exposures during early development may lead to important functional deficits and increased risks of disease later in life. The timing of exposure during early life has therefore become a crucial factor to be considered in toxicological assessments." (2007 Faroes Statement)(5)(6)

In addition to munitions constituents, it is understood pesticide use was wide spread throughout military bases and in training areas. Did the Base Wide RI/FS address this serious contaminate?

The FOCAG has regularly raised questions, concerns, and objections to Army's and FORA's Remediation Plans to no avail. The FOCAG's concerns have been ignored by Army, FORA and the Regulatory Agencies. To date, there has been no meaningful change of course or willingness to adopt the FOCAG's recommendations. FORA, EPA, and DTSC failed to respond to the FOCAG 3-11-08 FORA ESCA RP Letter.(7) Officials have allowed CERCLA to be waived and are responsible for the abomination of law.

There is a history of slicing up OEW/UXO Site Remediation into pie pieces and placing the pieces of information into multiple documents. Anyone looking at a single document is only given a partial picture of the extent of the potential contamination within a Site or Parcel. This makes it virtually impossible for the decision makers and the public to be fully

informed. In order to make sound decisions, full disclosure of all aspects of remediation and potential contamination should be compiled in a single document for each Site or Parcel.

For Example; the Seaside Parcels 1-4 are now referred to as former small arms ranges. Soil sampling for residual contaminates has been limited to Lead, Antimony, and Copper. According to the 1995 RI/FS Ranges 22, 23, 24 are shown to have included the use of 40mm grenades, hand grenades, rifle launched smoke grenades, and other ordnance.(8) It is understood Old Range 22 which runs parallel with Gen. Jim Moore Rd. was a Ordnance Range. Ordnance with an array of constituents has been discovered and removed throughout these parcels yet testing for their constituents is not part of the soil analysis. This is a major omission of critical information. This information would have been a significant factor in the selection of the Site remedy and remedial action chosen for the Sites. The City of Seaside plans to build ***1500*** homes and commercial space on these Sites. Historical maps indicate these areas within historical Site 39, were military ordnance training areas prior to small arms ranges. The extensive discovery of OEW/UXO on the Seaside parcels right down to General Jim Moore Rd. supports the 1995 RI/FS suspected uses as military ordnance training areas. The fact is Seaside Parcels 1-4 are former military ordnance and small arms ranges. The unwillingness to acknowledge military ordnance training occurred within the Seaside Parcels is a significant omission. The argument has been "there's no evidence this area was used for ordnance training". The fact is the entire Site 39, boundary to boundary is one big enmeshment of Training Areas and Ranges.

Additionally, it appears when a new cleanup document is released, often, previously discovered and removed OEW/UXO items have been omitted. It concerns the public that the breadth of contamination may be diminished thru data manipulation. By omitting critical information the reader could get the impression the land is cleaner and safer than it really is. If the reader is given the full extent of discovered munitions, the potential contamination from their use, and the potential health risks resulting from exposure to the contamination, the wisdom of residential and commercial use would be questionable.

There should be a maintained file with a set of data that compiles all the Site specific remedial actions and findings and is updated regularly upon receipt of new information. All documents should have a running tally of all the previously discovered and removed OEW/UXO items including their constituents. It would be helpful for A reader to be able to know the total number and poundage of OEW/UXO items found to date.

There are very serious unanswered questions with the remediation and development of former Fort Ord military training areas.

1) Millions of troops trained at Fort Ord. How many millions or billions of pounds of military munitions were used in the training of troops? Any estimates? If not, why not?

2) Of the millions or billions of pounds of military munitions used, how many pounds of their constituents were released into the environment? Any estimates? If not, why not?

3) Were did the residual contaminates go?

4) Could all the contaminates simply disappear?

5) How many gallons of pesticides are suspected to have been used at Fort Ord?

6) Was the use of pesticides in training areas a common practice?

7) What types/names of pesticides were used at Fort Ord?

8) Is there testing for pesticides? If not, why not?

9) Does Soil analysis of ranges include every known or suspected OEW/UXO constituent used at Fort Ord? If not, why not?

10) Babies and toddlers commonly eat soil and other substances off the ground. Has this phenomena been analyzed? If not, why not?

11) Have Maximum Residual Levels (MRL's) been established for the constituents in the attached Military Munitions Chemicals Of Concern Table 1? If not, why not?

12) If the extent of residual contamination and MRL's have not been established, how can an acceptable level of cleanup be know for residential or commercial use?

13) Is there a screening program in place to monitor for hazardous substances at Fort Ord? If not, why not? Will there be a program to monitor potential negative health impacts of residents living in homes built on former training areas and ranges? If not, why not?

14) Perchlorate is known to be a widely used constituent in military munitions used at Fort Ord . Is there testing being conducted to identify the extent of Perchlorate contamination in former training areas and ranges? If not, why not? If yes, the remediation documents don't appear to include any discussion or analysis.(9)

15) Synergism and synergistic effects of chemicals are a very important part of Risk Assessment.(10) I don't recall seeing any analysis in the Fort Ord Base Wide RI/FS addressing synergism. Is synergism covered in any Fort Ord Human Health Risk or Environmental Assessments? If not, why not?

16) Is there endocrine disruption screening being conducted at former Fort Ord? If not, why not?(11)

If a single person becomes ill or dies, as a result of ambitious economic development interests, the publics trust will have been breached. Under no circumstance should peoples health be compromised for a profit. Nothing is more important than a persons well being. With so many unanswered questions, and in light of new and significant information on health hazards of environmental contamination, former military munitions training areas and ranges should be prohibited from being developed. Residential housing, commercial and other public uses should not be allowed due to the high probability of adverse health effects from exposure to military munitions OEW/UXO and residual contamination.

The Fort Ord Base Wide EIR is outdated. It is in the publics best interest to begin the new EIR process. Again we ask, when will the Scoping Session for a revised Base Wide EIR be held?

Please Provide a detailed written response to this paper and the 3-11-08 paper within 15 working days and send a copy to all FOCAG Members and the Regulators.

Sincerely,

Lance Houston
Fort Ord Community Advisory Group

Attachments; available at http://fortordcag.org/Superfund/CleanUp/StatusStats/8_12_08_FOCAG_position_paper_attachments_1_12.PDF

1) Table1: Military Munitions OEW/UXO, 103 Contaminates of Concern (COC's)
2) Archive Search Report ASR; Site 39: 12 Range Maps
3) Site 39 Military Munitions; Types and Functions
4) Dr. Peter L. Defer comments; TCRA MRA SEA.1-4 Sept. 21, 2004
5) The Faroes Statement 2007
www.ncrlc.com/1-pfd-files/faroes_statement.pdf
6) Neurodevelopmental Disorders in Children
http://environmentalchemistry.com/yogi/environmental/200804childrenautismadhd.html
7) FOCAG Position Letter 3-11-08; FORA ESCA Remediation Program
www.fortordcag.org/PrivateCleanup/3_13_08_FORA_ESCA_RP_Letter_final.pdf
8) Fort Ord; Site 39 Training Ranges
9) GAO 2005 Report; Perchlorate A System to Track Sampling and Cleanup / Fort Ord
www.gao.gov/cgi-bin/getrpt?GAO-05-462
10) Synergism; Potential Synergistic effects of chemicals
www.ccohs.ca/oshanswers/chemicals/synergism.html
11) Endocrine-Disrupting Chemicals Threaten Animal--and Human Reproduction
www.checnet.org/HealtheHouse/education/articles-detail.asp?Main_ID=489
12) Civil War cannonball kills Virginia relic collector / ordnance can kill 150 years later
http://www.newsweek.com/id/135153?tid=relatedcl
13) 1999 EPA Position Paper Range Rule - FOCAG Position Letter 3-13-08 attachments
www.epa.gov/fedfac/documents/uxomemo.htm
14) 1998 Wingspread statement - FOCAG Position Letter 3-13-08 attachments
www.rachel.org/library/getfile.cfm?ID=189

Cc. Roman Rocca, Cal DTSC
Viola Cooper, U.S. EPA, Region 9
Michael Weaver, FOCAG
Bruce Becker, FOCAG Web Smith
Debra Michelson, FORA Founder
David Dilworth, HOPE, FOCAG
Vienna Merrit Moore, FOCAG

FORT ORD SUPERFUND SITE
FORT ORD COMMUNITY ADVISORY GROUP
POSITION PAPER

Fort Ord Community Advisory Group
PO Box 2173
Monterey, CA 93942
Email: focag@fortordcag.org
Website: www.fortordcag.org

3-11-08

FOR THE ADMINISTRATIVE RECORD
Hand delivered to FORA 3-12-08

Fort Ord Reuse Authority (FORA)
100 12th St., Building 2880
Marina, CA 93933
c/o Mr. Stan Cook, Ms. Laura Baldwin

RE: Comments; FORA ESCA Remediation Program (RP) / Document Control Number: 09595-07-078-001

Dear Mr. Cook and Ms. Baldwin,

Most agree the Army needs to clean up the mess it made at Fort Ord. However, under no circumstance should munitions cleanup be privatized and a waiver granted exempting adherence to Environmental laws in place to protect the publics health, safety, and the environment. To do so would be an abomination of due diligence and process. What is the justification for the Covenant Deferral Request?

"Because of missing or incomplete range activity records , misdirected shots, and poor or undocumented disposal practices, no area in Site 39 can be considered clear of UXO/ OEW". This statement is typical of military munitions training ranges at former Fort Ord. The proposed 3300 acres to be transferred for residential housing, commercial and other public uses is highly contaminated with UXO, OEW, and military munitions constituents.

1994 RI/FS;
"Site 39 was used Since the early 1900s for ordinance training activities. As a result, OEW, including UXO, is present at the site. OEW is defined as bombs and war heads; guided And unguided ballistic missiles; artillery, mortar, and rocket ammunition; small arms ammunition; anti-personnel and anti-tank mines; demolition charges; pyrotechnics; grenades; torpedoes and depth charges; containerized or uncontainerized high explosives and propellants; nuclear materials; chemicals and radiological agents; and all similar or related items designed to cause damage to personnel or materials. Oil in which explosive

compounds are detected will be considered OEW if the concentration is sufficient to present an imminent hazard. UXO is a subset of OEW and consists of unexploded bombs, warheads, artillery shells, mortar rounds, and chemical weapons. Components or ordnance items (e.g., boosters, bursters, fuzes, igniter tubes) are also included in the UXO definition. Many of the UXO/OEW items listed above have been found at Site 39. Nonuclear materials, chemical agents, or biological agents have been found or reported to have been used at the site."

To date only limited sampling and removal has been conducted at most of the sites part of the Remediation Program (RP). The proposed FOSET and remediation is in large part based on assumptions rather than sound scientific methodology. There is a significant difference between sampling and clearance to a prescribed depth for a particular use. CERCLA would require a revised RI/FS and ROD for this program. Since the 1994 Base Wide RI/FS, the scope of land uses have changed significantly. Many sites included in the RP were not considered for residential uses because of the exposure dangers to public health and safety from UXO, OEW, and residual contamination.(1) (2) The extent of contamination at former Fort Ord from military munitions training and disposal is unknown. Historically, dangerous military munitions and constituents show up in the most unlikely places. No square inch of former training ranges should be assumed to be free or safe from dangerous ordnance and chemicals. A example of military munitions live and inert found in parcels slated for residential development include but are not limited to the following;

fragment hand grenades MKII ,smoke hand grenades M18, hand grenade M10, 4inch trench mortars MK1, 4inch trench mortars FM, 4inch trenordnance components, blasting caps M6, blasting caps M7, hand grenade fuzes M228, 75mm Shrapnel MK1 , 37mm LE MK1 , 75mm HE MK1, Livens projector FM, surface trip flare M49, 3.5inch rocket M29, 35mm Rockets M73, 3inch Hotchkiss projector, activator mine AT M1, mine AT M1, primer igniter tube M57, cartridge ignition M2, signal illumination M125, mine fuze M6A1, rifle grenade M22, 57mm projector HE M306, flash artillery M110, projectile PD M503ch mortars HC, 3inch trench mortars MK1, 81mm mortar HE M43, 40mm projector M781

Because of the nature of military munitions use and cleanup, the strictest standards available, i.e. CIRCLA should be implemented to the greatest extent possible. Any attempts to side step or circumvent this public health and environmental law must not be allowed . To do so will likely result in negative human health and environmental impacts.

FORT ORD SUPERFUND SITE
FORT ORD COMMUNITY ADVISORY GROUP
POSITION PAPER

Historical maps indicate that over the years as ranges were decommissioned, new ranges were opened. It appears that over time there are literally layers and overlaps of ranges the extent of which is unknown. How many millions of troops trained at Fort Ord? How many millions of pounds of munitions were used at former fort Ord? Of the millions of pounds of munitions used , how many millions of pounds of constituents were released into the environment? Were did the residual contamination go?

A new previously unidentified exposure pathway to human and ecological receptors now exists. The burning of former training ranges has resulted in a new and significant threat to human health and safety. A new RI/FS should include Ash analysis for all sites burned purposely or accidentally, and the potential onsite and offsite exposure to human and ecological receptors. This new exposure and potential effects on human and ecological receptors was never analyzed in the 1994 Base Wide RI/FS.

In the Monterey Herald dated 12-05-07 Pg. B6, there was a brief account of a recent U.S. Geological Survey study of ash resulting from the Southern California wild fires. The USGS study found caustic alkali materials and elevated levels of arsenic, lead, and other metals. The studies led author said that USGS found that "rainwater runoff from burned areas may hurt eco systems, aquatic wildfire habitat and surface water quality." Has the ESCA process analyzed the data revealed in this study? If not, why not?

It appears USGS is well equipped with staff and technology to analyze potential significant negative impacts resulting from burning wild land habitat. USGS participation in analyzing burn impacts at former Fort Ord could result in significant new information that would greatly benefit the full disclosure of impacts resulting from the burning. This new significant information will greatly benefit the understanding of potential adverse impacts by the public, regulators, decision makers, Army and all those involved in the ESCA process.

If USGS is not required to analyze data at the former Fort Ord, what justification exists for this decision?

Many military munitions constituents are known endocrine disruptors, carcinogens, mutagens, ect.. Environmental contamination is reaching epidemic levels likely due to lax regulation, oversight, and enforcement of environmental laws over industry and commerce. Nationally, conservatively, 1 in 150 children has autism. Asthma, Alzheimer's Disease, cancer, to list a few are at epidemic levels. Today, the U.S. public is sicker than ever before. USGS studies show pharmaceuticals are increasingly showing up in U.S. reclaimed and drinking water supplies. Is there endocrine disruptor screening being conducted at former Fort Ord? If not, why not? Does Soil analysis of ranges include every known or suspected OEW constituent used at For Ord? If not, why not?

FORT ORD SUPERFUND SITE
FORT ORD COMMUNITY ADVISORY GROUP
POSITION PAPER

The public is very concerned with the undermining of the Regulatory agencies and their current ability to protect human health, safety, and the environment. A 1999 EPA Range Rule position letter addressing Military Base Closures states; "During the last several years an increasing number of issues have arisen relative to UXO, hazardous contaminants, and military range cleanup. The following represents a description of the major EPA issues or concerns along with installations where we have encountered these problems. This list should not be construed as exhaustive." Since this EPA position letter it appears efforts are being made to circumvent the environmental laws in place to protect the public.(3)

FORA should adopt the Precautionary Principle (1998 Wingspread Statement) and apply it to the Fort Ord Reuse Plan to ensure safety for current and future generations to the greatest extent possible.(4)

Thank you for the opportunity to comment on this project. We look forward to your response to our concerns.

Sincerely,

Lance Houston
FOCAG Member

Cc.
Assemblyman John Laird
Cal DTSC, c/o Joyce Whiten and Yolanda Gaarza
U.S. EPA, Region 9, c/o Viola Cooper
Mick Weaver, FOCAG
Bruce Becker, FOCAG
Debra Mickelson
David Dilworth, HOPE

Attachments;
(1) Scientific Integrity in Policy Making Update-July 2004 Introduction / Union of Concerned Scientists / Full Repot @ www.ucsusa.org
(2) EPA - Why we need a code of professional ethics www.nteu280.org/Issues/NTEU-%20Professional%20Ethics.htm
(3) 1999 EPA letter to DoD, Range Rule www.epa.gov/fedfac/documents/uxomemo.htm
(4) 1998 Wingspread statement www.rachel.org/library/getfile.cfm?ID=189

Table 1: Military Munitions UXO/OEW Contaminates of Concern (COC's) Potentiall Soil Contaminats at Fort Ord, California

Compound	CAS No.	Recognized/Suspected Human Health Hazards
1) Bis(2-chloroethyl)ether	111-44-4	Recognized: Carcinogen P65 Suspected: Neurotoxicant HAZMAP,Respiratory Toxicant EPA-HEN,Skin or Sense Organ Toxicant EPA-HEN
2) 4-Chlorophenyl phenyl ether	7005-72-3	Listed: Hazardous Substances (Superfund) Priority Pollutants (Clean Water Act)
3) 2-Nitrophenol	88-75-5	Suspected: Cardiovascular or Blood Toxicant HAZMAP, Neurotoxicant EPA-SARA
4) 1,3-Dichlorobenzene	541-73-1	Suspected: Cardiovascular or Blood Toxicant NJ-FS, Gastrointestinal or Liver Toxicant NJ-FS, Kidney Toxicant NJ-FS, Respiratory Toxicant NJ-FS
5) Fluorene	86-73-7	Suspected: Gastrointestinal or Liver Toxicant ATSDR
6) 2,4-Dimethylphenol	105-67-9	Suspected: Cardiovascular or Blood Toxicant IRIS, Kidney Toxicant NJ-FS , Gastrointestinal or Liver Toxicant NJ-FS, Skin or Sense Organ Toxicant NJ-FS
7) 1,2-Dichlorobenzene	95-50-1	Suspected: Endocrine Toxicant RTECS, Gastrointestinal or Liver Toxicant RTECS, Immunotoxicant HAZMAP,Neurotoxicant DAN HAZMAP, Skin or Sense Organ Toxicant HAZMAP
8) Azobenzene	103-33-3	Recognized: Carcinogen P65
9) 2,4-Dichlorophenol	120-83-2	Suspected: Cardiovascular or Blood Toxicant LADO RTECS, Endocrine Toxicant JNIHS KEIT, Immunotoxicant ATSDR
10) 1,4-Dichlorobenzene	106-46-7	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant LADO RTECS, Developmental Toxicant ATSDR JANK, Gastrointestinal or Liver Toxicant ATSDR EPA-HEN OEHHA-CREL RTECS,Kidney Toxicant KLAA OEHHA-CREL RTECS,Neurotoxicant DAN EPA-HEN OEHHA-CREL RTECS,Respiratory Toxicant OEHHA-CREL RTECS, Skin or Sense Organ Toxicant EPA-HEN LU RTECS
11) Hexachlorobenzene	118-74-1	Recognized: Carcinogen P65, Developmental Toxicant P65, Suspected: Cardiovascular or Blood Toxicant LADO RTECS, Endocrine Toxicant BKH BRUC IL-EPA JNIHS KEIT RTECS, Gastrointestinal or Liver Toxicant EPA-HEN OEHHA-CREL RTECS ZIMM, Immunotoxicant IPCS,Kidney Toxicant RTECS, Neurotoxicant EPA-SARA, Reproductive Toxicant ATSDR EPA-SARA FRAZIER,Skin or Sense Organ Toxicant EPA-HEN
12) 4-Chloro-3-Methylphenol	59-50-7	Suspected: Immunotoxicant NAP

13) Bis(2-chloroisopropyl)ether	39638-32-9	Suspected: Carcinogen SCDM
14) Phenanthrene	85-01-8	Suspected: Respiratory Toxicant NTP-HS, Skin or Sense Organ Toxicant NTP-HS
15) 2,4,6-Trichlorophenol	88-06-2	Recognized: Carcinogen P65, Suspected: Gastrointestinal or Liver Toxicant RTECS, Respiratory Toxicant EPA-HEN
16) Uranium	7440-61-1	Recognized: Carcinogen P65-MC, Suspected: Cardiovascular or Blood Toxicant EPA-HEN Kidney Toxicant ATSDR HAZMAP LAND MERCK, Neurotoxicant DAN, Reproductive Toxicant FRAZIER, Respiratory Toxicant EPA-HEN NEME
17) Anthracene	120-12-7	Suspected: Endocrine Toxicant KEIT, Gastrointestinal or Liver Toxicant ATSDR RTECS, Skin or Sense Organ Toxicant KLAA TIMB
18) 2,4-Dinitrophenol	51-28-5	Suspected: Cardiovascular or Blood Toxicant EPA-HEN RTECS, Developmental Toxicant EPA-SARA, Gastrointestinal or Liver Toxicant EPA-HEN, Neurotoxicant EPA-HEN RTECS, Reproductive Toxicant EPA-SARA, Skin or Sense Organ Toxicant EPA-HEN LU
19) Hexachloroethane	67-72-1	Recognized: Carcinogen P65, Suspected: Developmental Toxicant EPA-SARA, Gastrointestinal or Liver Toxicant ATSDR EPA-HEN OEHHA-CREL RTECS, Kidney Toxicant OEHHA-CREL RTECS, Neurotoxicant ATSDR EPA-HEN OEHHA-CREL,
20) Dibutyl phthalate	84-74-2	Suspected: Developmental Toxicant ATSDR CERHR EPA-SARA JANK NTP-R P65-CAND, Endocrine Toxicant BKH JNIHS KEIT WWF,Gastrointestinal or Liver Toxicant RTECS,Immunotoxicant HAZMAP, Kidney Toxicant RTECS, Neurotoxicant DAN RTECS, Reproductive Toxicant EPA-SARA NTP-R P65-CAND,Skin or Sense Organ Toxicant HAZMAP
21) 4-Nitrophenol	100-02-7	Suspected: Cardiovascular or Blood Toxicant HAZMAP, Neurotoxicant EPA-HEN EPA-SARA RTECS, Skin or Sense Organ Toxicant EPA-HEN RTECS
22) Nitrobenzene	98-95-3	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant EPA-HEN HAZMAP MALA RTECS, Kidney Toxicant MERCK, Neurotoxicant EPA-HEN RTECS, Reproductive Toxicant EPA-SARA, Respiratory Toxicant OEHHA-CREL RTECS, Skin or Sense Organ Toxicant HAZMAP
23) Fluoranthene	206-44-0	Suspected: Gastrointestinal or Liver Toxicant ATSDR
24) 2-Methyl-4,6-Dinitrophenol	534-52-1	Suspected: Cardiovascular or Blood Toxicant EPA-HEN HAZMAP RTECS, Gastrointestinal or Liver Toxicant EPA-HEN RTECS,Kidney Toxicant HAZMAP,Neurotoxicant ATSDR DAN EPA-HEN RTECS,Respiratory Toxicant EPA-HEN, Skin or Sense Organ Toxicant EPA-HEN

25) Isophorone	78-59-1	Suspected: Carcinogen EPA-HEN IRIS OPP-CAN SCDM, Developmental Toxicant OEHHA-CREL Gastrointestinal or Liver Toxicant ATSDR OEHHA-CREL, Kidney Toxicant RTECS, Neurotoxicant EPA-HEN HAZMAP, Respiratory Toxicant EPA-HEN RTECS, Skin or Sense Organ Toxicant EPA-HEN HAZMAP RTECS
26) Pyrene	129-00-0	Suspected: Neurotoxicant RTECS, Skin or Sense Organ Toxicant RTECS
27) Pentachlorophenol	87-86-5	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant EPA-HEN LADO RTECS, Developmental Toxicant ATSDR EPA-SARA OEHHA-CREL, Endocrine Toxicant ATSDR BRUC IL-EPA JNIHS KEIT RTECS WWF, Gastrointestinal or Liver Toxicant EPA-HEN OEHHA-CREL RTECS, Immunotoxicant EPA-HEN, Kidney Toxicant EPA-HEN OEHHA-CREL, Neurotoxicant DAN EPA-HEN RTECS, Reproductive Toxicant ATSDR EPA-SARA, Respiratory Toxicant RTECS, Skin or Sense Organ Toxicant EPA-HEN HAZMAP RTECS
28) Bis(2-chloroethoxy)methane	111-91-1	Suspected: Skin or Sense Organ Toxicant NTP-HS
29) Butylbenzyl phthalate	85-68-7	Suspected: Carcinogen IRIS, Developmental Toxicant CERHR P65-CAND, Endocrine Toxicant BKH JNIHS KEIT WWF, Neurotoxicant RTECS, Reproductive Toxicant CERHR
30) 1,2,4-Trichlorobenzene	120-82-1	Suspected: Carcinogen OEHHA-TCD P65-CAND, Developmental Toxicant EPA-SARA, Neurotoxicant DAN HAZMAP RTECS
31) 3,3'-D Dichlorobenzidine	91-94-1	Recognized: Carcinogen P65, Suspected: Gastrointestinal or Liver Toxicant EPA-HEN RTECS Immunotoxicant EEC HAZMAP, Kidney Toxicant RTECS, Neurotoxicant EPA-HEN, Respiratory Toxicant EPA-HEN, Skin or Sense Organ Toxicant EEC HAZMAP
32) Naphthalene	91-20-3	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant EPA-HEN HAZMAP LADO MALA, Developmental Toxicant EPA-HEN EPA-SARA, Gastrointestinal or Liver Toxicant EPA-HEN, Neurotoxicant ATSDR DAN EPA-HEN RTECS, Respiratory Toxicant ATSDR FOTH OEHHA-CREL, Skin or Sense Organ Toxicant EPA-HEN LU RTECS
33) Benzo(a)anthracene	56-55-3	Recognized: Carcinogen P65
34) Hexachlorobutadiene	87-68-3	Suspected: Carcinogen EPA-HEN IRIS P65-CAND SCDM, Cardiovascular or Blood Toxicant RTECS, Developmental Toxicant EPA-SARA JANK, Endocrine Toxicant RTECS,Gastrointestinal or Liver Toxicant OEHHA-CREL RTECS, Kidney Toxicant ATSDR HAZMAP KLAA OEHHA-CREL RTECS STAC, Neurotoxicant DAN, Reproductive Toxicant EPA-SARA
35) Chrysene	218-01-9	Recognized: Carcinogen P65

36) 2-Chloronaphthalene	91-58-7	Listed: Hazardous Constituents (Resource Conservation and Recovery Act), Hazardous Substances (Superfund), Priority Pollutants (Clean Water Act), Lacks at least some of the data required for safety assessment
37) Bis(2-ethylhexyl)phthalate	117-81-7	Recognized: Carcinogen P65, Developmental Toxicant P65, Reproductive Toxicant P65 Suspected: Endocrine Toxicant BKH BRUC IL-EPA JNIHS KEIT WWF,Gastrointestinal or Liver Toxicant EPA-HEN OEHHA-CREL RTECS,Respiratory Toxicant OEHHA-CREL RTECS Skin or Sense Organ Toxicant RTECS
38) Dimethyl phthalate	131-11-3	Suspected: Immunotoxicant HAZMAP, Neurotoxicant DAN RTECS, Respiratory Toxicant EPA-HEN,Skin or Sense Organ Toxicant EPA-HEN HAZMAP
39) Di-n-octyl phthalate	117-84-0	Suspected: Endocrine Toxicant BRUC JNIHS, Gastrointestinal or Liver Toxicant ATSDR
40) 2,6-Dinitrotoluene	606-20-2	Recognized: Carcinogen P65, Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant ATSDR RTECS, Neurotoxicant EPA-SARA
41) Benzo(b)fluoroanthene	205-99-2	Recognized: Carcinogen P65
42) Acenaphthylene	208-96-8	Suspected: Respiratory Toxicant RTECS
43) Benzo(k)fluoroanthene	207-08-9	Recognized: Carcinogen P65
44) Acenaptheme	83-32-9	Suspected: Gastrointestinal or Liver Toxicant ATSDR
45) Benzo(a)pyrene	50-32-8	Recognized: Carcinogen P65, Suspected: Developmental Toxicant JANK P65-PEND, Endocrine Toxicant KEIT WWF, Gastrointestinal or Liver Toxicant RTECS, Immunotoxicant IPCS, Respiratory Toxicant EPA-HEN FOTH RTECS, Skin or Sense Organ Toxicant LADO RTECS
46) 2,4-Dinitrotoluene	121-14-2	Recognized: Carcinogen P65, Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant ATSDR EPA-HEN RTECS,Gastrointestinal or Liver Toxicant OEHHA-CREL , Neurotoxicant ATSDR EPA-HEN EPA-SARA OEHHA-CREL RTECS
47) Ideno(1,2,3-cd)pyrene	193-39-5	Suspected: Carcinogen EPA-IRIS, Developmental, Reproductive, Endocrine, Genotoxicity,
48) Diethyl phthalate	84-66-2	Suspected: Endocrine Toxicant JNIHS WWF, Gastrointestinal or Liver Toxicant ATSDR RTECS, Immunotoxicant HAZMAP,Neurotoxicant RTECS,Reproductive Toxicant ATSDR,Respiratory Toxicant RTECS, Skin or Sense Organ Toxicant HAZMAP RTECS

49) Dibenzo(a,h)anthracene	53-70-3	Recognized: Carcinogen P65, Suspected: Skin or Sense Organ Toxicant LADO
50) Benzidine	92-87-5	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant HAZMAP, Gastrointestinal or Liver Toxicant OEHHA-CREL RTECS, Immunotoxicant IPCS, Kidney Toxicant EPA-HEN KLAA RTECS, Neurotoxicant OEHHA-CREL
51) Benzo(g,h,l)perylene	191-24-2	Listed: Hazardous Constituents (Resource Conservation and Recovery Act), Hazardous Substances (Superfund), Priority Pollutants (Clean Water Act), Lacks at least some of the data required for safety assessment
52) 4-Bromophenyl phenyl ether	101-55-3	Listed: Hazardous Constituents (Resource Conservation and Recovery Act), Hazardous Substances (Superfund), Priority Pollutants (Clean Water Act), Lacks at least some of the data required for safety assessment
53) N-Nitrosodiphenylamine	86-30-6	Recognized: Carcinogen P65, Suspected: Kidney Toxicant RTECS, Respiratory Toxicant RTECS
54) N-Nitrosodimethylamine	62-75-9	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant EPA-HEN KLAA RTECS, Developmental Toxicant JANK, Gastrointestinal or Liver Toxicant DOSS EPA-HEN HAZMAP LADO MALA RTECS ZIMM, Immunotoxicant IPCS, Neurotoxicant RTECS, Respiratory Toxicant RTECS, Skin or Sense Organ Toxicant RTECS
55) Phenol	108-95-2	Suspected: Cardiovascular or Blood Toxicant EPA-HEN HAZMAP OEHHA-CREL RTECS, Developmental Toxicant EPA-SARA JANK,Gastrointestinal or Liver Toxicant EPA-HEN OEHHA-CREL,Kidney Toxicant OEHHA-CREL,Neurotoxicant DAN EPA-HEN OEHHA-CREL, RTECS,Reproductive Toxicant FRAZIER P65-CAND,Respiratory Toxicant EPA-HEN OEHHA-AREL RTECS,Skin or Sense Organ Toxicant EPA-HEN HAZMAP KLAA OEHHA-AREL RTECS
56) Hexachlorocyclopentadiene	77-47-4	Suspected: Developmental Toxicant EPA-SARA, Gastrointestinal or Liver Toxicant RTECS, Kidney Toxicant ATSDR RTECS,Neurotoxicant EPA-SARA ,Reproductive Toxicant EPA-SARA, Respiratory Toxicant ATSDR EPA-HEN HAZMAP OEHHA-CREL RTECS,Skin or Sense Organ Toxicant EPA-HEN HAZMAP
57) 2-Chlorophenol	95-57-8	Suspected: Neurotoxicant RTECS, Skin or Sense Organ Toxicant RTECS
58) 1-Methylnaphthalene	90-12-0	Suspected: Respiratory Toxicant ATSDR
59) Acetophenone	98-86-2	Suspected: Skin or Sense Organ Toxicant EPA-HEN

60) Diphenylamine	122-39-4	Suspected: Cardiovascular or Blood Toxicant HAZMAP, Gastrointestinal or Liver Toxicant EPA-TRI, Immunotoxicant HAZMAP, Kidney Toxicant EPA-TRI, Neurotoxicant DAN RTECS, Respiratory Toxicant RTECS,
61) 2-Aminonaphthalene	91-59-8	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant HAZMAP, Gastrointestinal or Liver Toxicant RTECS, Kidney Toxicant RTECS
62) 1-Nitropyrene	5522-43-0	Recognized: Carcinogen P65
63) 2,5-Diphenyloxazole (Biphenyl)	92-52-4	Suspected: Cardiovascular or Blood Toxicant RTECS, Developmental Toxicant EPA-SARA, Gastrointestinal or Liver Toxicant EPA-HEN HAZMAP RTECS, Kidney Toxicant EPA-HEN MERCK, Neurotoxicant EPA-HEN HAZMAP RTECS, Respiratory Toxicant RTECS, Skin or Sense Organ Toxicant EPA-HEN
64) 2-Nitronaphthalene	581-89-5	Suspected: Cardiovascular or Blood Toxicant HAZMAP, Gastrointestinal or Liver Toxicant RTECS, Kidney Toxicant RTECS
65) Triethylaluminum	97-93-8	6 of 8 basic tests to identify chemical hazards have not been conducted on this chemical or are not publicly available according to US EPA's 1998 hazard data availability study.
66) 2 Methylnaphthalene	91-57-6	Suspected: Respiratory Toxicant ATSDR FOTH
67) 2-Methylphenol (o-Crestol)	95-48-7	Suspected: Carcinogen IRIS, Cardiovascular or Blood Toxicant OEHHA-CREL, Endocrine Toxicant RTECS, Gastrointestinal or Liver Toxicant RTECS, Neurotoxicant ATSDR DAN EPA-SARA RTECS, Respiratory Toxicant EPA-HEN, Skin or Sense Organ Toxicant EPA-HEN RTECS
68) 3-Methylphenol (m-Crestol)	108-39-4	Suspected: Carcinogen IRIS OPP-CAN, Cardiovascular or Blood Toxicant OEHHA-CREL, Gastrointestinal or Liver Toxicant RTECS, Kidney Toxicant RTECS, Neurotoxicant DAN RTECS, Respiratory Toxicant ATSDR EPA-HEN, Skin or Sense Organ Toxicant EPA-HEN RTECS
69) 4-Methylphenol (p-Crestol)	106-44-5	Suspected: Carcinogen IRIS, Cardiovascular or Blood Toxicant OEHHA-CREL, Gastrointestinal or Liver Toxicant RTECS, Kidney Toxicant RTECS, Neurotoxicant ATSDR DAN RTECS, Respiratory Toxicant EPA-HEN, Skin or Sense Organ Toxicant EPA-HEN LADO RTECS
70) 2,4,5-Trichlorophenol	95-95-4	Suspected: Cardiovascular or Blood Toxicant LADO, Respiratory Toxicant EPA-HEN, Skin or Sense Organ Toxicant EPA-HEN
71) HMX	2691-41-0	Suspected: Gastrointestinal or Liver Toxicant ATSDR, Neurotoxicant ATSDR RTECS

72) RDX	121-82-4	Suspected: Carcinogen IRIS SCDM, Gastrointestinal or Liver Toxicant RTECS, Neurotoxicant ATSDR HAZMAP RTECS, Reproductive Toxicant ATSDR
73) 2,4,6-Trinitrotoluene (TNT)	118-96-7	Suspected: Carcinogen IRIS SCDM, Cardiovascular or Blood Toxicant HAZMAP LADO MALA RTECS STAC, Gastrointestinal or Liver Toxicant ATSDR DIPA HAZMAP LADO RTECS ZIMM,Neurotoxicant RTECS,Respiratory Toxicant RTECS,Skin or Sense Organ Toxicant LU
74) 1,3,5-Trinitrobenzine	99-35-4	Suspected: Cardiovascular or Blood Toxicant RTECS, Neurotoxicant RTECS, Respiratory Toxicant RTECS
75) 2-Amino-4,6-Dinitrotoluene (2ADNT)	35572-78-2	Recognized: Carcinogens
76) 4-Amino-2,6-Dinitrotoluene (4ADNT)	19406-51-0	Recognized: Carcinogens
77) 1,3- Dinitrobenzine	99-65-0	Recognized: Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant ATSDR HAZMAP RTECS, Gastrointestinal or Liver Toxicant DIPA MALA, Neurotoxicant DAN RTECS,Respiratory Toxicant RTECS
78) Nitroglycerin	55-63-0	Suspected: Carcinogen ORD-SF, Cardiovascular or Blood Toxicant HAZMAP KRIS LADO RTECS Gastrointestinal or Liver Toxicant RTECS, Immunotoxicant HAZMAP,Kidney Toxicant MERCK, Neurotoxicant DAN RTECS, Respiratory Toxicant RTECS,Skin or Sense Organ Toxicant HAZMAP
79) Dioxin (TCDD)	1746-01-6	Recognized: Carcinogen P65, Developmental Toxicant P65, Suspected: Cardiovascular or Blood Toxicant ATSDR EPA-HEN LADO OEHHA-CREL RTECS,Endocrine Toxicant BKH BRUC IL-EPA JNIHS KEIT OEHHA-CREL RTECS WWF,Gastrointestinal or Liver Toxicant EPA-HEN LADO OEHHA-CREL RTECS ZIMM ,Immunotoxicant ATSDR NAP,Kidney Toxicant MERCK RTECS,Neurotoxicant STAC,Reproductive Toxicant OEHHA-CREL,Respiratory Toxicant OEHHA-CREL RTECS,Skin or Sense Organ Toxicant EPA-HEN HAZMAP KLAA RTECS
80) Furan	110-00-9	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant RTECS, Gastrointestinal or Liver Toxicant RTECS,Kidney Toxicant RTECS,Respiratory Toxicant RTECS
Other Constituents, Flash Composition, Smoke Charge, Pyrotechnics		
81) Potassium Perchlorate	7778-74-7	Suspected: Cardiovascular or Blood Toxicant MALA
82) Flaked Aluminum (Aluminum)	7429-90-5	Suspected: Cardiovascular or Blood Toxicant LADO, Neurotoxicant ATSDR DAN KLAA LU, Reproductive Toxicant FRAZIER, Respiratory Toxicant KLAA LU NEME

83) Sulfur	7704-34-9	Listed: Registered Pesticides (Federal Insecticide, Fungicide, and Rodenticide Act) Air Contaminants (California Occupational and Safety Health Act) Lacks at least some of the data required for safety assessment
84) Pentaerythritol tetranitrate (PETN)	78-11-5	Suspected: Cardiovascular or Blood Toxicant HAZMAP, Skin or Sense Organ Toxicant RTECS
85) Magnesium Powder (Magnesium)	7439-95-4	Suspected: Respiratory Toxicant NEME
86) Sodium Nitrate	7631-99-4	Suspected: Cardiovascular or Blood Toxicant RTECS, Respiratory Toxicant RTECS
87) Barium Nitrate	10022-31-8	Suspected: Carcinogen, A poison via ingestion subcutaneous, parenteral, and intravenous routes (Toxnet)
88) Phosphorus, white	7723-14-0	Suspected: Cardiovascular or Blood Toxicant EPA-HEN RTECS, Gastrointestinal or Liver Toxicant DIPA DOSS EPA-HEN LADO MALA RTECS ZIMM,Kidney Toxicant EPA-HEN HAZMAP, Musculoskeletal Toxicant EPA-HEN, Neurotoxicant EPA-HEN RTECS,Reproductive Toxicant ATSDR EPA-SARA OEHHA-CREL,Respiratory Toxicant ATSDR EPA-HEN HAZMAP RTECS,Skin or Sense Organ Toxicant HAZMAP KLAA RTECS
89) Polyvinal Chloride	9002-86-2	Suspected: Gastrointestinal or Liver Toxicant DIPA, Respiratory Toxicant HAZMAP
90) Titanium Tetrachloride	7550-45-0	Suspected: Respiratory Toxicant ATSDR EPA-HEN HAZMAP, Skin or Sense Organ Toxicant EPA-HEN HAZMAP
Metals:		
91) Copper	7440-50-8	Suspected: Cardiovascular or Blood Toxicant HAZMAP KLAA, Developmental Toxicant EPA-SARA, Gastrointestinal or Liver Toxicant ATSDR DOSS KLAA RTECS ZIMM, Kidney Toxicant MERCK, Reproductive Toxicant EPA-SARA FRAZIER,Respiratory Toxicant NEME OEHHA-AREL OEHHA-CREL
92) Barium	7440-39-3	Suspected: Developmental Toxicant EPA-SARA, Neurotoxicant DAN, Reproductive Toxicant FRAZIER, Respiratory Toxicant NEME

93) Cadmium	7440-43-9	Recognized: Carcinogen P65, Developmental Toxicant P65, Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant BENO KLAA LADO RTECS, Endocrine Toxicant IL-EPA KEIT WWF, Immunotoxicant IPCSKidney Toxicant ATSDR EPA-HEN HAZMAP KLAA LAND MERCK OEHHA-CREL RTECS STAC, Neurotoxicant DAN ,Respiratory Toxicant EPA-HEN HAZMAP NEME OEHHA-CREL RTECS
94) Lead	7439-92-1	Recognized: Carcinogen P65, Developmental Toxicant P65, Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant BENO EPA-HEN HAZMAP KLAA KRIS LADO MALA STAC, Endocrine Toxicant BRUC IL-EPA KEIT WWF,Gastrointestinal or Liver Toxicant EPA-HEN RTECS STAC, Immunotoxicant IPCS,Kidney Toxicant EPA-HEN HAZMAP KLAA LAND MERCK STAC,Neurotoxicant DAN EPA-HEN EPA-SARA FELD HAZMAP KLAA LU RTECS STAC, Respiratory Toxicant NEME,Skin or Sense Organ Toxicant KLAA
95) Nickel	7440-02-0	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant OEHHA-CREL, Developmental Toxicant EPA-SARA, Immunotoxicant EEC HAZMAP OEHHA-AREL SNCI, Kidney Toxicant KLAA, Neurotoxicant FELD, Reproductive Toxicant EPA-SARA FRAZIER JANK, Respiratory Toxicant ATSDR EPA-HEN HAZMAP KLAA LU NEME OEHHA-AREL OEHHA-CREL RTECS, Skin or Sense Organ Toxicant EEC EPA-HEN HARV HAZMAP KLAA LADO TIMB
96) Aluminum	7429-90-5	Suspected: Cardiovascular or Blood Toxicant LADO, Neurotoxicant ATSDR DAN KLAA LU, Reproductive Toxicant FRAZIER, Respiratory Toxicant KLAA LU NEME
97) Chromium	7440-47-3	Suspected: Carcinogen HAZMAP SCDM, Gastrointestinal or Liver Toxicant CARB TAC, Immunotoxicant HAZMAP, Kidney Toxicant HAZMAP KLAA MERCK, Reproductive Toxicant FRAZIER, Respiratory Toxicant HAZMAP NEME, Skin or Sense Organ Toxicant HAZMAP KLAA LADO TIMB
98) Potassium	7440-09-7	Lacks at least some of the data required for safety assessment
99) Calcium	7440-70-2	Air Contaminants (California Occupational and Safety Health Act) Lacks at least some of the data required for safety assessment
100) Mercury	7439-97-6	Recognized: Developmental Toxicant P65, Suspected: Cardiovascular or Blood Toxicant KLAA, Endocrine Toxicant IL-EPA KEIT WWF, Gastrointestinal or Liver Toxicant RTECS STAC, Immunotoxicant HAZMAP SNCI, Kidney Toxicant HAZMAP KLAA LAND MERCK STAC, Neurotoxicant ATSDR DAN EPA-HEN EPA-SARA FELD HAZMAP KLAA OEHHA-CREL RTECS STAC, Reproductive Toxicant EPA-SARA FRAZIER HAZMAP OEHHA-AREL, Respiratory Toxicant HAZMAP NEME, Skin or Sense Organ Toxicant HAZMAP KLAA RTECS
101) Zinc	7440-66-6	Suspected: Cardiovascular or Blood Toxicant ATSDR, Developmental Toxicant EPA-SARA, Immunotoxicant OEHHA-CREL, Reproductive Toxicant EPA-SARA, Respiratory Toxicant NEME OEHHA-CREL RTECS, Skin or Sense Organ Toxicant RTECS

102) Titanium Metal Powder	7440-32-6	Suspected: Respiratory Toxicant NEME
103) Antimony	7440-36-0	Suspected: Cardiovascular or Blood Toxicant BENO LADO, Neurotoxicant DAN, Reproductive Toxicant EPA-SARA FRAZIER, Respiratory Toxicant EPA-HEN NEME, Skin or Sense Organ Toxicant EPA-HEN
104) Beryllium	7440-41-7	Recognized: Carcinogen P65, Suspected: Cardiovascular or Blood Toxicant KLAA, Gastrointestinal or Liver Toxicant ATSDR DOSS LADO MALA, Immunotoxicant EEC OEHHA-CREL,Kidney Toxicant LAND, Reproductive Toxicant FRAZIER, Respiratory Toxicant EPA-HEN HAZMAP KLAA LU NEME OEHHA-CREL, Skin or Sense Organ Toxicant EEC
105) Cadium	7440-43-9	Recognized: Carcinogen P65, Developmental Toxicant P65, Reproductive Toxicant P65, Suspected: Cardiovascular or Blood Toxicant BENO KLAA LADO RTECS,Endocrine Toxicant IL-EPA KEIT WWF,Immunotoxicant IPCS,Kidney Toxicant ATSDR EPA-HEN HAZMAP KLAA LAND MERCK OEHHA CREL RTECS STAC,Neurotoxicant DAN,Respiratory Toxicant EPA-HEN HAZMAP NEME OEHHA-CREL RTECS

Most Table 1 Constituents compiled from 1994 Basewide RI/FS Vol. II Table 12

Human Health Hazard Information source: Scorecard Database http://www.scorecard.org/chemical-profiles/index.tcl

Cancer References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=cancer

Developmental Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=endo

Endocrine Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=endo

Gastrointestinal or Liver Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=liver

Immunotoxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=immun

Kidney Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=kidn

Neurotoxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=neuro

Reproductive Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=repro

Skin or Sense Organ Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=skin

Respiratory Toxicants: www.scorecard.org/health-effects/explanation.tcl?short_hazard_name=resp

Cardiovascular or Blood Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=cardio

Musculoskeletal Toxicity References: www.scorecard.org/health-effects/references.tcl?short_hazard_name=musc

Table 2: Military Munitions UXO/OEW Contaminates of Concern (COC's) Potential Soil Contaminats Fort Ord, California

Compound	CAS No.	Recognized/Suspected Human Health Hazards
1) Lead Azide	13424-46-9	Suspected: Carcinogen P65
2) Mercury Fulminate	628-86-4	Recognized: Developmental Toxicant P65-MC
3) Diazodinitrophenol (DDNP)	87-31-0	No Health data found
4) Lead Styphnate	15245-44-0	No Health data found
5) Tetracene (hydrocarbon)?	92-24-0	Suspected: Carcinogen CCRIS
6) Potassium Dinitrobenzofuroxane (KDNBF)	29267-75-2	No Health data found
7) Lead Mononitroresorcinate (LMNR)	51317-24-9	No Health data found
8) Antimony sulfide	1315-04-4	No Health data found
9) Zirconium	7440-67-7	No Health data found
10) Lead dioxide	1309-60-0	Recognized: Carcinogen P65-MC, Developmental Toxicant P65-MC, Reproductive Toxicant P65-MC
11) Gum Arabic	no match	No Health data found
12) Potassium chlorate	3811-04-9	HAZMAP: Methemoglobinemia, Anemia,
13) Lead mononitroresorcinate	51317-24-9	HAZMAP: Neurotoxin, Hepatotoxin, Nephrotoxin, Reproductive Toxin
14) Nitrocellulose (BK2-W)	9004-70-0	HAZMAP: Neurotoxin,
15) Lead thiocyanate	592-87-0	HAZMAP: Neurotoxin, Hepatotoxin, Nephrotoxin, Reproductive Toxin
16) Nitrostarch	?	No Health data found
17) 1,2,4-Butanetriol Trinitrate (BTN)	6659-60-5	HAZMAP DOT listed Hazardous Materials
18) Diethyleneglycol Dinitrate (DEGN)	693-21-0	HAZMAP DOT listed Hazardous Materials, Suspected: Neurotoxicant RTECS, Respiratory Toxicant RTECS
19) Triethylene Glycoldinitrate (TEGN)	111-22-8	No Health data found
20) 1,1,1 Trimethylolethane Trinitrate (TMETN)	3032-55-1	No Health data found
21) Ethylenediamine Dinitrate (EDDN)	20829-66-7	No Health data found
22) Ethylenedinitramine (Haleite)	505-71-5	No Health data found
23) Nitroguanidine (NQ)	556-88-7	Suspected: Respiratory Toxicant RTECS
24) 2,4,6Trinitrophenylmethylnitramine (Tetryl)	479-45-8	Suspected: Immunotoxicant HAZMAP, Neurotoxicant DAN RTECS, Respiratory Toxicant HAZMAP, Skin or Sense Organ Toxicant HAZMAP RTECS
25) Ammonium Picrate	131-74-8	HAZMAP: Skin Sensitizer, Hepatotoxin
26) Hexamethylene	110-82-7	Suspected: Neurotoxicant DAN HAZMAP RTECS
27) Dechlorane	2385-85-5	Recognized: Carcinogen P65, Suspected: Endocrine Toxicant BKH EPA-SDWA IL-EPA JNIHS KEIT RTECS,Gastrointestinal or Liver Toxicant ATSDR RTECS, Kidney Toxicant MERCK
28) Sulfur trioxide	7446-11-9	Suspected: Respiratory Toxicant RTECS, Skin or Sense Organ Toxicant RTECS
29) Calcium resinate	9007-13-0	No Health data found
30) Barium peroxide	1304-29-6	New Jersey Haz. Sub. Fact Sheet: http://nj.gov/health/eoh/rtkweb/documents/fs/0190.pdf

Table 2: Military Munitions UXO/OEW Contaminates of Concern (COC's) Potential Soil Contaminats Fort Ord, California

31) Zinc stearate	557-05-1	Skin, eye, and respiratory tract irritant CAMEO
32) Toluidine red	2425-85-6	No Health data found
33) Strontium nitrate	10042-76-9	NJ-HSFS: Repeated exposure may damage the lungs, heart, liver, and kidneys and affect the nervous system.
34) Strontium oxalate	814-95-9	No Health data found
35) Auramine hydrochloride (yellow)	2465-27-2	Suspected: Carcinogen CPDB, Gastrointestinal or Liver Toxicant RTECS
36) 1,4-Di-p-toluidinoanthraquinone (green)	128-80-3	No Health data found
37) 1-Methylanthraquinone (red)	954-07-4	HAZMAP: Possible Carcinogen, Hepatotoxin, Skin Sensitizer
38) 1-(4-Phenylazo)-2-naphthol (orange dye)	?	No Health data found
39) N,N-Dimethyl-p-phenylazoaniline (yel dye)	60-11-7	IARC: Possible Carcinogen, HAZMAP: Hepatotoxin, Skin Sensitizer
40) 1,4-Diamylaminoanthraqdinone (blue dye)	2646-15-3	No Health data found
41) Ammonium dichromate	7789-09-5	Recognized: Carcinogen P65-MC, Suspected: Cardiovascular or Blood Toxicant RTECS, Gastrointestinal or Liver Toxicant RTECS, Immunotoxicant EEC SNCI, Kidney Toxicant RTECS, Skin or Sense Organ Toxicant EEC
42) Asphaltum	8052-42-4	Recognized: Carcinogen P65
43) Barium chromate	10294-40-3	Recognized: Carcinogen P65-MC
44) Boron	7440-42-8	Suspected: Cardiovascular or Blood Toxicant KLAA, Developmental Toxicant ATSDR, Neurotoxicant LU, Respiratory Toxicant LU
45) Potassium nitrate	7757-79-1	HAZMAP: Methemoglobinemia
46) Laminac	?	No Health data found
47) Sodium nitrate	7631-99-4	Suspected: Cardiovascular or Blood Toxicant RTECS, Respiratory Toxicant RTECS
48) Parlon (Chlorinated rubber)	9006-03-5	EPA Pesticide Inert Ingredient
49) Superfloss	7631-86-9	No Health data found
50) Vistanex (polyisobutylene)	9003-27-4	No Health data found
51) Thorium Tu	7440-29-1	Recognized: Carcinogen P65-MC
52) Zirconium Zr	7440-67-7	Suspected: Respiratory Toxicant NEME
53) Hafnium Hf	7440-58-6	No Health data found
54) Cerium Ce	7440-45-1	Suspected: Respiratory Toxicant NEME, Dermatotoxin HAZMAP
55) Lanthanum La	7439-91-0	No Health data found
56) Praseodymium Pr	7440-10-0	No Health data found
57) Neodymium Nd	7440-00-8	No Health data found
58) Samarium Sm	7440-19-9	HAZMAP: Internal Toxicity: High
59) Yttrium Y	7440-65-5	HAZMAP: Hepatotoxin, Fibrogenic
60) Rubidium Nitrate	13126-12-0	No Health data found
61) Cesium Nitrate	7789-18-6	Substance may be toxic to blood central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.
62) Specular Hematite	14808-60-7	No Health data found
63) Magnetite	1309-38-2	No Health data found

Constituents compiled from: Chapter 10 Pyrotechnic Devices: Military Explosives (Chemistry) 30 September 1984

BW-2214D.2
AR

Shaw Environmental, Inc.

Field Work Variance No. TII-091

Page 1 of 1

FIELD WORK VARIANCE

Project Name/Number	Fort Ord / 783751	CTO/WAD	04
Applicable Document	Sampling and Analysis Plan, Characterization of Small Arms and Multi-Use Ranges, Former Fort Ord, California, Revision 0	Date	December 6, 2004

Problem Description:

Perchlorate is currently included in the sampling and analytical requirement for ranges where munitions and explosives of concern containing perchlorate may have been used during training at basewide ranges at the former Fort Ord. The Army has issued the *Department of Army Guidance for Assessing Potential Perchlorate Contamination* (Interim Guidance, Army, 2004) that presents criteria for determining the need for perchlorate sampling at these sites. After review of the Interim Guidance, the Army has determined that conditions at the fomer Fort Ord do not satisfy the requirements for perchlorate sampling.

Recommended solution:

Perchlorate sampling will be removed from the sampling and analytical requirements for basewide ranges.

Impact on present and completed work:

No impact on present work. Cost savings on sampling and analysis.

Requested by: Jen Moser

Recommended solution/disposition:

Implemented as recommended above.

Clarification ☐ Minor Change ☐ Major Change ☒

Signature _____ Date _____

Technical Reviewer

Shaw Approvals: *If Major Change:*

Signature _____ Date 12/6/04 Signature _____ Date 12/6/04

Project Task Manager *Sr. Project Manager*

Signature _____ Date _____

Project QC System Manager

USACE Approval: *If Major Change:*

Approved ☐ Rejected ☐ Signature _____ Date 12/6/04

USACE COR or TM

Interpretative Differences Between Massachusetts' and California's Perchlorate Health Assessments

Prepared By

Office Of Research And Standards
Massachusetts Department Of Environmental Protection
1 Winter Street
Boston, MA 02043 USA

May 2004

INTRODUCTION

The Massachusetts Department of Environmental Protection (MA DEP) completed in January 2004 a technical assessment of the toxicity and health effects of perchlorate that was released in May 2004 (MA DEP, 2004). In that document, MA DEP identified a chronic oral reference dose (RfD) of 3×10^{-5} mg/kg-d. This RfD would be associated with a drinking water exposure limit of 1 ug/L using standard exposure assumptions and methodologies used to derive drinking water guidance. The State of California recently released its most current assessment of the toxicology and health effects of perchlorate (CA OEHHA, 2004) in which it identified a Public Health Goal for perchlorate in drinking water of 6 ug/L. Given that the same data sets were available to both agencies for their respective evaluations and guidance development and that the agencies have reached differing conclusions about the appropriately protective concentration of perchlorate in drinking water, MA DEP has prepared the following set of questions and answers related to the two groups conclusions and its position on the issue.

- **Why Did MA DEP Use a Weight of the Evidence Approach Rather Than Rely Solely On The Greer (2002) Study Performed on Human Volunteers?**

The Greer study, although very informative, has a number of inherent limitations that introduce considerable uncertainty when the study's results are extrapolated to long-term exposures of infants and other susceptible people to perchlorate. These limitations include:

1) The study included only a small number of people, from 7-10, per dose group.
2) Only healthy adults were included—known sensitive subgroups such as pregnant women, infants, children, those suffering from thyroid insufficiency and those with iodide insufficiency were not included in the study (indeed many of these groups could not be included due to ethical concerns)
3) The study was of short duration, precluding evaluation of potential longer-term effects.

Despite these limitations, the Greer study is very useful in that it provides quality data on the degree to which perchlorate interferes with iodine uptake by the human thyroid. Thus, MA DEP did include this study in its assessment. However, because of the limited nature of this study, MA DEP chose to use a weight of the evidence approach, which considered additional data on effects of perchlorate on fetal and neonatal development, in assessing perchlorate toxicity.

In addition, MA DEP concluded that the Greer study results themselves support a lower interim exposure guidance value for sensitive individuals than that adopted by CA EPA.

- **Why Did MA DEP Derive a Lower Interim Exposure Guidance Value for Perchlorate than CA EPA?**

Data from the Greer study was used by CA EPA to calculate a perchlorate dose associated with a 5% decrease in iodide uptake in the thyroid using a benchmark dose approach. The 95% lower confidence limit on this dose was 0.0037 mg/kg-day. CA EPA used this benchmark dose $_{\text{lower 95\% CI}}$ (BMDL) as the starting point, or point of departure (POD), in deriving their public health goal of 6 ppb perchlorate in drinking water. The POD is the dose estimate from which an acceptable human exposure value is derived using adjustments to account for uncertainties in the available scientific information as well as differences in exposures.

For the reasons discussed below, MA DEP has concluded that the currently available data support a lower value in order to be sufficiently protective of sensitive individuals, including pregnant women and infants.

1) **Uncertainty Regarding Selection of the Starting Point or POD.** The CA EPA BMDL estimate from the Greer study is higher than that derived recently by US EPA scientists (who helped develop and have extensive experience with the methods used to calculate BMDL values). Based on their evaluation of the Greer study, US EPA derived a BMDL value of 0.002 mg/kg-day, which is about 2-fold lower than the estimate derived by CA EPA (0.0037 mg/kg-day). The recent US EPA estimate was not considered in the CA EPA perchlorate assessment report, probably due to timing issues. MA DEP has reviewed both the CA EPA and US EPA BMDL analyses. Although the CA EPA calculations were of high quality and were appropriately conducted, the recent US EPA analyses were more robust in scope. US EPA considered multiple data sets from the Greer study and data outliers were addressed. Accounting for this difference alone, would result in a PHG of 3 ppb.

   In part because of uncertainty over what level of iodide uptake inhibition constitutes an adverse effect (as discussed in more detail below, modeling data suggests that 5% inhibition of iodide uptake may be associated with adverse effects), MA DEP used a traditional no observed adverse effect level (NOAEL) approach rather than a benchmark approach to establish a POD. This approach is computationally simpler, more transparent and, given the uncertainty in selection of the target response level, no less accurate. Using this approach, MA DEP determined that the results of the Greer study support an exposure of 0.007 mg/kg-day as a minimum effect level. This value was selected as the POD. MA DEP applied an uncertainty factor (UF) of 3 to this minimum effect level value to derive a NOAEL estimate of approximately 0.002 mg/kg-day. This value is the same as the POD derived by US EPA in their recent BMDL analysis. Thus, the US EPA BMDL analysis and the MA DEP approach using the simpler NOAEL methodology yield values about 2-fold lower than that derived by CA EPA.

2) Choice of Uncertainty Factors to Account for Scientific Uncertainty and to Protect the Health of All Citizens

Because of concern for children's health, MA DEP also choose a more health protective approach when accounting for uncertainties in the scientific information on perchlorate's toxicity. CA EPA used a total uncertainty factor of 10 to account for all uncertainty in deriving their PHG. As discussed below, based on its review of the data, MA DEP scientists concluded that a higher UF was needed. These uncertainties are discussed below.

Interindividual Variability in Sensitivity. CA EPA used a single UF of 10 (or in the case of infants, only 3), to account for *all* uncertainty in the derivation of its PHG. An uncertainty factor of 10 is used in most federal and state environmental programs to account for inter-individual variability in sensitivity to chemicals attributable to differences in how individuals absorb, process and excrete toxins (pharmacokinetics) and differences in physiological responses. Evaluations of variations in sensitivity to toxic chemicals indicate that a factor of 10 accounts for inter-individual variability in most cases. However, for some chemicals, experimental data indicate that such differences are smaller than 10-fold and in others substantially larger. An UF for inter-individual variability is needed in this case because the underlying study involved a small number of healthy adults likely to be iodide sufficient, and did not include sensitive members of the population.

MA DEP concluded that an UF of 10 was needed to account for differences in sensitivity to perchlorate even among infants. In its assessment, CA EPA applied an UF of 3 when considering risks to infants, arguing that a full factor of 10 was not needed because a dose adjustment was applied to account for size and drinking water consumption differences between adults and infants. They also cite earlier US EPA documents as indicating that only minor differences in perchlorate pharmacokinetics exist between adults and infants, supporting a smaller UF. However, US EPA guidelines state that reduction of the intraspecies UF from 10 should be considered only if data are sufficiently representative of the exposure/response data for the most susceptible populations. MA DEP concluded that this was not the case for perchlorate. Additionally, US EPA notes in their October 2003, responses to comments received on their perchlorate review, that the fetus and infant in fact have different dosimetry than adults because they are dependent on iodide delivery from the placenta and mammary tissues. Thus, EPA also concluded that an UF of 10 is warranted when extrapolating from the Greer study to infants and fetuses. MA DEP's Scientific Advisory Committee also recommended that a full UF of 10 be used to account for variability in sensitivity among infants. MA DEP scientists have concluded that, even adjusting for exposure differences, perchlorate's mechanism of action suggests that infants, because of limited stores of thyroid hormones and differing dosimetry, potentially limited iodide intake and ongoing neurological development, may well be greater than 3-fold more sensitive to perchlorate compared to the adults included in the

Greer study. Additionally, variation *among* infants in sensitivity, for example due to differences in dietary iodine intake, genetic factors etc, is also likely.

If one applies a 10-fold UF for infants rather than 3-fold, this adjustment alone would reduce the PHG (for infants) to 2 ppb. Combined with the lower POD (as discussed above) the PHG would be 1 ppb.

Other Uncertainties. In its initial draft document CA EPA included an additional UF of 3 to account for database deficiencies when extrapolating from the Greer study to the whole population. This UF was not included in their final report. Because of the many residual uncertainties, as briefly summarized below, MA DEP has concluded that a larger composite uncertainty factor is warranted when extrapolating from the Greer study to the whole population.

Some of these additional uncertainties include:

a. **Duration of Exposure Uncertainty**. The Greer study was only 14 days in duration. Effects might well have been detected at lower doses in this study with longer-term exposures.
    i. Some have argued that longer exposures would not influence toxicity because perchlorate does not accumulate in the body. However, perchlorate accumulation in the thyroid at low doses has not been ruled out and the downstream effects of perchlorate may themselves be cumulative (e.g. depletion of stored thyroid hormones). In fact, a recent US EPA analysis of the Greer study itself indicates that perchlorate effects were greater at later time points in that study, supporting a duration of exposure effect over a relatively short period of 2-weeks. In risk assessment, when extrapolating from shorter-duration studies to long-duration exposures, as could occur from the consumption of drinking water, an UF of from 3-10 is usually included, unless compelling data exists to demonstrate that this is not appropriate.

b. **Uncertainty as to the Appropriate Level for the Starting Point or POD.** CA EPA treated the benchmark dose associated with a 5% inhibition of iodide uptake in healthy adults as a no adverse effect level (i.e. that such inhibition would not result in any adverse physiological effects). However, significant effects, including changes in thyroid hormone status and brain development, have been reported in animals exposed to perchlorate at doses associated with predicted iodide uptake inhibition of ***as low as 1.5%***, based on a physiologically based pharmacokinetic model developed in large part by military scientists. Although there has been debate about the quality of the data on the brain development effects and over the physiological significance of the reported thyroid hormone changes, the mechanistic concordance between these observations combined with fundamental uncertainty over the level

and timing of hormone concentration changes with respect to fetal and neonatal neurological development, argue for caution in selecting a NOAEL. The 5% inhibition level could reasonably be treated as an effect level, suggesting use of an additional UF or the use of a 1% iodide uptake inhibition level (rather than a 5% level) as the POD. Either option would result in a lower PHG.

c. **Uncertainties regarding mode of action.**
   i. The kinetics, dose response and impacts of perchlorate induced discharge of stored iodide from the thyroid, which has been reported to occur, and which would be expected to exacerbate the effects of concurrent blockage of iodide uptake, has not been fully addressed. If iodide discharge occurs at low doses concomitant with blockage of uptake, depletion of thyroidal iodide and hormone stores could occur over longer exposure durations.
   ii. The potential physiological significance of perchlorate inhibition of the thyroid pendren protein has not been elucidated.
   iii. Uncertainties remain about the mode of action and kinetics of inhibition of iodide uptake. Whether perchlorate is transported intracellularly, as previously assumed, is now questioned. The duration of the "blockage" of function at the level of the receptor is also uncertain and potential non-reversible effects, for example due to receptor-ligand "aging", have not been fully addressed.
   iv. The development of tumors in offspring of animals maternally exposed to perchlorate raises concern regarding long-term changes in physiological status, or "imprinting", as a result of *in utero* exposures.
   v. Emerging data on the importance of cyclical variations in thyroid hormone levels in development (which would require close tracking of thyroid hormone status in response to perchlorate, which has not routinely been done), as well as questions about the sensitivity of the thyroid hormone assays used to detect small but potentially significant changes, would both bias the thyroid hormone results of various studies towards the null hypothesis of no perchlorate effect. More extensive diurnal sampling and use of more sensitive assays could well result in a lower effect level.
   vi. Potential interactions of perchlorate with other thyroid toxicants, especially ones that interact with other targets, are also of concern and have been not addressed.

MA DEP scientists have concluded that, taken together, these uncertainties necessitate a composite uncertainty factor well in excess of 10-fold, when extrapolating from the results of the Greer study to sensitive subgroups in the population. If using the benchmark dose approach and data from the Greer study, use of a composite UF of at least 30 is clearly justified and values of from100-300 can be supported. Combined with the lower POD derived by US EPA for the Greer study, drinking water guidance values

to protect sensitive subgroups of from approximately 1 ppb to the sub ppb range would result.

In choosing a drinking water interim guidance value for sensitive groups of 1 ppb, MA DEP used a weight of the evidence approach that considered additional data, including results from more extensive studies on biological responses to perchlorate in animals. These studies assessed a number of additional endpoints beyond iodide uptake inhibition and evaluated the effects of perchlorate on the developing fetus and nursing neonate. By relying on studies of healthy adults *and* younger life stages, as well as more thoroughly accounting for uncertainties in the science, MA DEP is recommending a lower limit than California for sensitive subgroups. Although a value below 1 ppb can be supported on the basis of the toxicity data, sampling and laboratory methodologies in use are not capable of routine, accurate measurements of perchlorate in drinking water below 1 ppb. Thus, 1 ppb was selected as the interim guidance level.

REFERENCES

CA OEHHA, 2004. Public Health Goal For Perchlorate In Drinking Water. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. Sacramento, CA. March 2004. (http://www.oehha.ca.gov/water/phg/pdf/finalperchlorate31204.pdf).

Greer MA, Goodman G, Pleus RC, and Greer SE (2002). Health effects assessment for environmental perchlorate contamination: The dose-response for inhibition of thyroidal radioiodine uptake in humans. Environ Health Perspect. 110:927-37

MA DEP, 2004. Final Draft Perchlorate Toxicological Profile And Health Assessment. Masssachusetts Department of Environmental Protection. Office of Research and Standards. Boston, MA. May 2004. (http://www.mass.gov/dep/ors/files/chemical.htm).

California Regional Water Quality Control Board
Central Coast Region

Alan C. Lloyd, Ph.D.
Secretary for Environmental Protection

Internet Address: http://www.swrcb.ca.gov/rwqcb3
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401-7906
Phone (805) 549-3147 • FAX (805) 543-0397

Arnold Schwarzenegger
Governor

BW-2353
AR

September 8, 2005

Ms. Gail Youngblood
Environmental and Natural Resources
P.O. Box 5004
Monterey, CA 93944-5004

Dear Ms. Youngblood:

DoD - FORMER FORT ORD; PERCHLORATE SAMPLING RESULTS FOR MONITORING WELLS MW-05-02 AND MW-05-03

After abandonment discussion of wells MW-05-02 and MW-05-03 at the July 20, 2005 BCT meeting, Water Board staff requested that the Army have these historically dry monitoring wells checked for water. We reasoned that the unusually high rainfall of the previous winter might allow these wells to be sampled. The next day, Army contracting staff examined the wells, and was able to purge MW-05-02 before sampling, and though MW-05-03 did not have sufficient flow for purging, a grab sample was obtained from standing water.

Groundwater samples from these wells were collected and subsequently split. One sample set was sent to the Water Board's contract lab, BC Laboratories, for a USEPA 314 perchlorate analysis. As previously transmitted, MW-05-02 had no detectable levels of perchlorate (Method Detection Level was 0.11 µg/L). MW-05-03 measured 1.5 µg/L. The latter value is an estimated value due to levels coming in above the Method Detection Level, yet below the Practical Quantification Limit of 4.0 µg/L. Essentially, the 1.5 µg/L detection can be considered qualitatively, yet not quantitatively accurate.

Grant Himebaugh of our staff has recently examined report information regarding placement of the subject wells relative to the site 36A ordnance location. Well locations and sampling depth have been considered in respect to our empirical knowledge regarding what types of perchlorate use have and have not generated significant groundwater impacts. The result, in this case, is we do not believe there is sufficient perchlorate at this location to generate a significant groundwater impact. Analytical results from the two monitoring well samples confirms this belief. The major factors we considered in making this determination are as follows.

The relatively shallow unconfined water-bearing strata from which the samples were taken may also be a perched aquifer, and either way these waters are of higher susceptibility to evaporative concentration of minerals and salts. Since perchlorate is a salt, it's not surprising that it was found at a detectable concentration in the stagnant water of MW-05-03. The MW-05-03 water was of such insufficient quantity that the well could not be purged before sampling, and likely represents water quality in the capillary fringe at the very top of the aquifer. Conversely, water from MW-05-02 was readily purged several times before sampling. Thus, it's not surprising that MW-05-02 yielded no detectable levels of perchlorate. As the 1.5 µg/L detection was well short of the current regulatory limit of 6 µg/L, and both

sample results are consistent with our conceptual understanding of conditions associated with perchlorate transport, we are requiring no further perchlorate sampling or investigation at site 36A.

As previously discussed, our staff's experience at the Sierra Army Depot's Open Burning Open Detonation and TNT leaching beds strongly indicates that exploded ordnance alone does not typically result in perchlorate quantities sufficient to significantly impact groundwater. We consequently prefer to concentrate any perchlorate assessment efforts in areas where perchlorate exists in association with solid rocket motors, flares, or other proven sources. We emphasize that this determination of no further groundwater sampling has been made on a site-specific basis, and should not be inappropriately extrapolated or applied by the Army or any third party.

We thank you and your staff for the rapid response to our concerns. If you have any questions or comments concerning this letter, please contact **Grant Himebaugh at (805) 542-4636,** or Eric Gobler at (805) 549-3467.

Sincerely,

FOR Roger W. Briggs
Executive Officer

S:\DoD\DoD Facilities\Fort Ord\Ford Correspondance\BASEWIDE\MRAperchlorateresults.doc

cc:

Mr. David Eisen
P. O. Box 5004
Monterey, CA 93944-5004

Mr. George Siller
Department of the Army
Sacramento District Corps of Engineers
1325 J Street
Sacramento, CA 95814-2922

Mr. Martin Hausladen
USEPA, Region IX
Mail Code: SFD-8-3
75 Hawthorne Street
San Francisco, CA 94105

Mr. Bill Mabey
Techlaw, Inc.
90 New Montgomery Street
Suite 1010
San Francisco, CA 94105

Mr. Roman Racca
DTSC, Region 1
8800 Cal Center Drive
Sacramento, CA 95826

Perchlorate Summaries

Fort Ord, CA

Facility & Location

Fort Ord is located near Monterey Bay in central California, approximately 80 miles south of San Francisco. Since 1917, the installation has served primarily as training and staging facility for infantry troops. In 1940, the 7th Infantry Division (ID) was activated, then 4th, 5th and 6th Divisions as well. In 1957, Fort Ord became a United States Army Infantry Training Center. In 1974, the 7th ID was reactivated at Fort Ord. In 1983, the 7th ID was converted to a light division, operating without heavy tanks or armor. Fort Ord was selected in 1991 for closure under the Base Realignment and Closure (BRAC) process. Troops were reassigned in 1994 when the post formally closed. Although Army personnel still operate a small portion of the post, active Army divisions are not stationed at Fort Ord.

EPA identified Fort Ord as a Superfund site in 1990 due to groundwater contamination. A Multi-Range Area (MRA) located in the south-central portion of Fort Ord is expected to have the highest density of munitions and explosives of concern such as artillery and mortar, containerized and uncontainerized explosives and propellants.

Media Sampled

The Army has tested soil at Fort Ord for perchlorate.
Soil -- The Army tested 442 samples from the Site 39 - Multi-Range Area. Of these, 41 samples detected perchlorate ranging from 13 ppb to 106 ppb. The Army also tested ten soil samples from Site 39-Range 36A. Perchlorate was not detected in any of these samples.

Appropriate Action

Not applicable

POC Information

Malcolm Garg, Army Cleanup Programs, Emergent Contaminant Issues
malcolm.garg@us.army.mil
Created: 01-MAR-08
Updated: (null)

These Munitions are widely used in the training of US Military troops.

Pyrotechnics are used to send signals, to illuminate areas of interest, to simulate other weapons during training, and as ignition elements for certain weapons.(1)

Pyrotechnic Devices

Military Explosives (Chemistry) 30 September 1984

UNITED STATES PYROTECHNICS; CHAPTER 10

All pyrotechnic compositions contain oxidizers and fuels. Additional ingredients present in most compositions include binding agents, retardants, and waterproofing agents. Ingredients such as smoke dyes and color intensifiers are present in the appropriate types of compositions.

Oxidizers: are substances in which anoxidizing agent is liberated at the high temperatures of the chemical reaction involved.

Fuels: include finely powdered aluminum, magnesium, metal hydrides, red phosphorus, sulfur, charcoal, boron, silicon, and suicides. The most frequently used are powdered aluminum and magnesium.

Binding agents: include resins, waxes, plastics, and oils. These materials make the finely divided particles adhere to each other when compressed into pyrotechnic items.

Retardants are materials that are used to reduce the burning rate of the fuel-oxidizing agent mixture, with a minimum effect on the color intensity of the composition.

Waterproofing agents are necessary in many pyrotechnic compositions because of the susceptibility of metallic magnesium to reaction with moisture, the reactivity of metallic aluminum with certain compounds in the presence of moisture, and the hygroscopicity of nitrates and peroxides.

Color intensifiers:

hexachloroethane (C_2Cl_6)
hexachlorobenzene (C_6Cl_6)
polyvinyl chloride
dechlorane ($C_{10}Cl_{12}$).

Smoke dyes are azo and anthraquinone dyes. These dyes provide the color in smokes used for signaling, marking, and spotting.

Flares and Signals The illumination provided by a flare is produced by both the thermal radiation from the product oxide particles and the spectral emission from excited metals.

Infrared Flare Formulas:

Silicon
Potassium nitrate (KNO3)
Cesium Nitrate (CsNO3)
Rubidium Nitrate (RbNO3)
Hexamethylene
tetramine
Epoxy resin

Red-Green Flare System:

Barium nitrate
Strontium nitrate 13
Potassium perchlorate
Magnesium
Dechlorane
Polyvinyl acetate resin

Signal flares are smaller and faster burning than illuminating flares. Various metals are added these compositions to control the color of the flame.

Colored and White Smoke The pyrotechnic generation of smoke is almost exclusively a military device for screening and signaling. Screening smokes are generally white because black smokes are rarely sufficiently dense. Signal smokes, on the other hand, are colored so as to assure contrast and be distinct in the presence of clouds and ordinary smoke.

Venturi thermal generator type. The smoke producing material and the pyrotechnic fuel block required to volatilize the smoke material are in separate compartments. The smoke producing material is atomized and vaporized in the venturi nozzle by the hot gases formed by the burning of the fuel block.

Burning type. Burning type smoke compositions are intimate mixtures of chemicals. Smoke is produced from these mixtures by either of two methods. In the first method, a product of combustion forms the smoke or the product reacts with constituents of the atmosphere to form a smoke. In the second method, the heat of combustion of the pyrotechnic serves to volatilize a component of the mixture which then condenses to form the smoke. White phosphorus, either in bulk or in solution, is one example of the burning type of smoke generator.

Explosive dissemination type. The smoke producing material is pulverized or atomized and then vaporized, or a preground solid is dispersed by the explosion of a bursting charge. The explosive dissemination smoke generator may contain metallic chlorides which upon dispersal, hydrolyze in air. Examples are titanium, silicon, and stannic tetrachloride.

Smoke Agent Mixtures:

White phosphorus
Sulfur trioxide
FS agent

HC mixture
FM agent
Crude oil

The preferred method of dispersing colored smokes involves the vaporization and condensation of a colored organic volatile dye. These dyes are mixed to the extent of about 50 percent with a fuel such as lactose (20 percent) and an oxidizer (30 percent) for which potassium chlorate is preferred.

Tracers and Fumers The principal small arms application of military pyrotechnics is in tracer munitions where they serve as incendiaries, spotters, and as fire control. Two types of tracers are used. The difference between the two types is the method of tracking. The more frequently used tracer uses the light produced by the burning tracer composition for tracking. Smoke tracers leave a trail of colored smoke for tracking. Red is the flame color most often employed in tracers.

Igniter and Tracer Compositions

Strontium peroxide
Magnesium
1-136 Igniter
Calcium resinate
Barium peroxide
Zinc stearate
Toluidine red (identifier)
Strontium nitrate
Strontium oxalate
Potassium perchlorate
Polyvinyl chloride

Incendiaries Two types of incendiaries are commonly used. The traditional type is a bomb containing a flammable material. These materials include thermite (a mixture of aluminum and rust), phosphorus, and napalm. In addition, the case of the bomb may be constructed of a material such as magnesium that will burn at a high temperature once ignited.Depleted uranium is used extensively in pyrotechnics which have armor piercing capabilities.

Depleted uranium deficient in the more radioactive isotope U235, is the waste product of the uranium enrichment process. The depleted uranium is formed into projectiles that can penetrate armor because of their high density and mechanical properties. The impact of the projectile causes the uranium to form many pyrophoric fragments which can ignite fuel and munition items.

Pyrophoric Metals

U	Uranium
Th	Thorium
Zr	Zirconium
Hf	Hafnium
Ce	Cerium
La	Lanthanum

Pr	Praseodymium
Nd	Neodymium
Sm	Samarium
Y	Yttrium
Ti	Titanium

Delays and Fuses Delay compositions are mixtures of oxidants and powdered metals which produce very little gas during combustion.

Photoflash Compositions Photoflash compositions are the single most hazardous class of pyrotechnic mixtures. The particle size of the ingredients is so small that burning resembles an explosion. The various photoflash devices are similar, differing principally in size and the amount of delay.

Colored smokes:

Yellow: Auramine hydrochloride
Green: 1,4-Di-p-toluidinoanthraquinone with auramine hydrochloride
Red: 1-Methylanthraquinone
Blue: Not suitable for signaling because of excessive light scatter.

Currently used dyes:

Orange: 1-(4-Phenylazo)-2-naphthol
Yellow: N, N-Dimethyl-p-phenylazoaniline
Blue: 1,4-Diamylaminoanthraqdinone

Black Powders Used in Pyrotechnics

Potassium nitrate
Sodium nitrate
Charcoal
Coal (semibituminous)
Sulfur

Ignition Mixtures Components

Aluminum (powdered)
Ammonium dichromate
Asphaltum
Barium chromate
Barium peroxide
Boron (amorphous)
Calcium resinate
Charcoal
Diatomaceous earth (See also superfloss)
Specular Hematite / Barshot (Fe203) (Red) CAS 14808-60-7 / 14464-46-1
Magnetite/Black Iron Oxide (Fe304) Powder from READE (Black)
Potassium nitrate
Potassium perchlorate
Laminac
Magnesium (powdered)

Sodium nitrate
Nitrocellulose
Parlon (chlorinated rubber)
Pb02 -
Paleo Bond Adhesive Pb304
Sr peroxide
Sugar
Superfloss
Titanium
Toluidine red toner
Vegetable oil
Vistanex (polyisobutylene)
Zinc Stearate
Zirconium

Referances:

1) Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges and Other Sites; December 2001 www.epa.gov/fedfac/pdf/IFUXOCTTHandbook.pdf

US EPA 2002: Handbook on the Management of Ordnance and Explosives at Closed, Transferring, and Transferred Ranges and Other Sites

Chemicals Found in Pyrotechnics
Aluminum
Barium
Chromium
Hexachlorobenzene
Hexachloroethane
Iron
Magnesium
Manganese
Titanium
Tungsten
Zirconium
Boron
Carbon
Silicon
Sulfur
White Phosphorus
Zinc
Chlorates
Chromates
Dichromates
Halocarbons
Iodates
Nitrates
Oxides
Perchlorates

Perchlorate and Children's Health: The Case for a Strong Cleanup Standard for Rocket Fuel in Drinking Water

http://www.environmentcalifornia.org/reports/clean-water/clean-water-program-reports/perchlorate-and-children39s-health-the-case-for-a-strong-cleanup-standard-for-rocket-fuel-in-drinking-water

2005-01-10

Executive Summary

In order to protect expecting mothers, their developing fetuses and their infant children, the California Department of Health Services (DHS) should set a final health standard for perchlorate in drinking water at one part per billion or less.

Perchlorate, the primary ingredient in solid rocket fuel, is emerging as a major contaminant of California's food and water supplies. The U.S. Food and Drug administration recently documented widespread contamination in milk and lettuce from grocery stores in California and across the country. Many water suppliers in California have detected perchlorate in their wells at levels suggested by the U.S. Environmental Protection Agency (EPA) as unsafe.

Perchlorate contaminates the drinking water supply of 16 million Californians.
- State agencies have discovered perchlorate pollution in more than 350 water sources, including the Colorado River and hundreds of municipal wells.

- The bulk of the contamination was caused by the military, aerospace contractors and other users and manufacturers of explosive chemicals.

- Communities with contaminated water supplies include Riverside, Loma Linda, San Bernardino, San Fernando, Pasadena, Rancho Cordova, West Orange County, and Otay.
Perchlorate exposure threatens expecting mothers, developing fetuses and infant children.
- Perchlorate affects the thyroid hormone system at very low levels of exposure. It acts by preventing uptake of iodine into the thyroid gland, reducing the gland's ability to produce enough hormone.

- Thyroid hormone and iodine are critical for normal brain development in fetuses and young infants. Children born to mothers with thyroid problems or iodine deficiency can have lower IQ, impaired learning, hyperactive behavior, delayed growth, or can suffer a range of serious neurodevelopmental problems, including mental retardation.

- Exposure to perchlorate during specific and important windows of time during the growth and development of a child increases the risk of neurodevelopmental disability.

Neurodevelopmental disabilities, like attention deficit and hyperactivity disorder (ADHD), are a serious and growing problem in California.

- Learning-disabled students increased 65 percent faster than the general school population from 1985 to 1999.

- Perchlorate exposure could be contributing to this trend in combination with exposure to a variety of other chemicals polluting the environment, such as toxic flame retardants, lead, mercury, and polychlorinated biphenyls (PCBs).

The evidence of perchlorate's toxicity warrants a strong drinking water standard of one part per billion or less.

- Exposure to low levels of perchlorate in utero leads to changes in brain structure and behavior in infant rats.

- Humans are as sensitive as rats to iodine uptake inhibition by perchlorate.

After evaluating the full spectrum of available science on perchlorate, the U.S. Environmental Protection Agency and the states of Massachusetts, Maryland and New Mexico have recommended preliminary drinking water health guidelines of one part per billion or less to provide a margin of safety for developing fetuses and infants. Accounting for widespread exposure to perchlorate in the food supply and for the combined effects of other thyroid toxicants in addition to perchlorate would justify an even lower standard. However, the state of California is unofficially moving forward with a final drinking water standard equivalent to the public health goal of six parts per billion issued in March 2004. The process used to arrive at the public health goal did not live up to the criteria established by California law, and a standard set at this level would be inadequate for several reasons:

• California EPA chose a single scientific study as the main basis for calculating a safe level. The study examined the effect of perchlorate on healthy adults exposed for a short period of time, as opposed to including other research involving fetal and newborn rats with long-term perchlorate exposure.

• California EPA applied an atypically small margin of safety to ensure protection of especially vulnerable people. Almost all established public health goals in California use a larger margin of safety.

• California EPA failed to consider how perchlorate may be interacting with other thyroid toxicants (like toxic flame retardants, nitrates, PCBs and other common environmental contaminants) to contribute to neurodevelopmental problems in children.

• A final standard of six parts per billion could leave the contamination of the Colorado River and nearly one-third of the polluted wells in California unaddressed.

In setting a final perchlorate standard, the state should use the weight of scientific evidence, including experiments showing neurobehavioral damage to infant rats exposed to small amounts of perchlorate in the womb, as well as considering the possible interaction of perchlorate with other toxicants. In addition, the state should set larger margins of safety to account for uncertainties in the vulnerability of fetuses and infants to long-term exposure to low levels of perchlorate. After taking these steps, the state should arrive at a drinking

water standard for perchlorate of one part per billion or less, ensuring a comprehensive cleanup and providing a margin of safety for pregnant women, their developing babies and their infant children.

Policy Recommendations

• The California Department of Health Services should set the drinking water standard for perchlorate at one part per billion or less.

• In addition, the State of California, local governments, and water suppliers should hold responsible parties fully liable for cleanup and for supplying replacement drinking water to affected communities. Congress should not exempt the Department of Defense.

• Congress should reinstate Superfund fees for polluting industries to ensure that contamination caused by now-bankrupt companies will be cleaned up.

• Federal and state agencies should require American Pacific, Kerr-McGee Chemical and other responsible parties to accelerate clean up of perchlorate contamination currently leaking into the Colorado River and local aquifers.