

**Final Meeting Notes: Community Advisory Group (CAG) –  
Aerojet General Corporation Superfund Site Issues  
Meeting Date: July 16, 2014**

**1. Introductions and Attendees**

Janis Heple, CAG Chair, began the meeting with introductions at 7:00 p.m.

Attendees:

Alex MacDonald (Regional Water Quality Control Board [RWQCB])	Jessica Cooper (Recorder, Sullivan International Group, Inc.)
Alta Tura (Sacramento Area Creeks Council)	Jimmy Spearow (CAG)
Ben Dutro (Aerojet Rocketdyne [Aerojet])	Julie Santiago (EPA)
Brit Snipes (City of Rancho Cordova)	Kevin Mayer (EPA)
Chris Fennessy (Aerojet)	Larry Ladd (CAG)
Dan York (Sacramento Suburban Water District)	Roy Brewer (Aerojet)
Dan Stralka (U.S. Environmental Protection Agency [EPA])	Stephen Green (Save the American River Association)
Jackie Lane (EPA)	Steven Ross (Department of Toxic Substances Control [DTSC])
Janis Heple (CAG Chair)	Tom Lae (CH2M HILL, Inc.)

The May 21, 2014, Draft Meeting Notes were finalized, pending review by Mr. Spearow and one noted correction.

Ms. Heple said a meeting was held prior to this CAG meeting regarding the implementation of recommendations that resulted from the recent Technical Assistance Needs Assessment (TANA). She said she may coordinate with EPA to experiment with a time and date for the next meeting regarding the needs assessment that is different than the CAG meeting.

**2. Aerojet Community Update – Chris Fennessy, Aerojet**

Mr. Fennessy said there are no updates other than what will be shared by Mr. MacDonald later in the meeting.

**3. Aerojet Cleanup Updates, including Operable Unit (OU)-6 Summary of Remedial Action Area, Appendix A Table – Julie Santiago, EPA and Kevin Mayer, EPA**

Note: The presentation and map were distributed (see attachments with final meeting notes).

Ms. Santiago said the Boundary Operable Unit (BOU) (OU-6) Record of Decision (ROD) is in draft mode, and comments were received from the agencies. She said EPA is

currently sorting through the peer review comments. She said one of the goals of this presentation was to incorporate recommendations that resulted from the TANA, specifically the recommendation to provide the CAG with a better understanding of the overall remedial process and specific cleanup details for each OU at the Site. She said EPA is taking all TANA recommendations into consideration.

Ms. Santiago explained that the EPA is sorting out potential and existing sources at OU-6. She presented the background of OU-6. She said EPA is working on producing a figure with more landmarks to help the CAG identify the location of the site relative to the general vicinity, especially within the City of Rancho Cordova, in response to past CAG comments. She discussed the Management Area, which is comprised of the East and West Administrative Area, and source area designation.

Question: In Area 3D, liquid rocket fuel appears to be the main mechanism of contamination. Is it feasible to identify the type of rocket that was used for testing to help identify the source areas? Mr. MacDonald replied that rocket testing was not conducted at this site; liquid rocket engine manufacturing was conducted in the Administrative Area.

Mr. Mayer said for previous OUs, most areas that were investigated turned out to be No Further Action (NFA). He asked if these NFA areas were included in the ROD, and Ms. Santiago responded in the affirmative.

Question: Will there be Institutional Controls (ICs) for groundwater? Mr. Ross said yes, there will be site-wide ICs for groundwater.

Ms. Santiago described the nomenclature for the sub areas based on the media affected, which included “R” “Retained” area, “S” for soil and “SV” for soil vapor. She described the Remedial Action Summary Table, and suggested using this table as a template for future sites if useful to the CAG because it is easy to track site status. She said EPA would like the CAG’s feedback on the format and content, such as the presentation of ICs, if included in the selected remedy alternative. Mr. Mayer added that he has made the mistake of assuming his audience understood that ICs were included in the alternative selected; therefore, EPA hopes this table will make that clear in the future.

Question: Mr. MacDonald asked why ICs could not be included in the “Selected Remedy” column of the table. Ms. Lane said ICs could be included, but it is not included for this particular site because it might not be identified yet.

Question: Where is the selected remedy for groundwater on this table? Ms. Santiago said groundwater is not a potential risk at this particular site; therefore, it is not included in the table. She said if groundwater was a potential risk, then it would be included in the “Protection of Groundwater COCs” column.

Question: Is the Western Groundwater OU (OU-3) outside of the Aerojet boundary? Mr. Mayer said no; portions of it are included within the Aerojet boundary (specifically, portions of the Inner Barrier).

Question: If the “Human Health Contaminants of Concern (COCs)” column for the groundwater medium is blank, indicating there is no potential risk to COCs; do we know with confidence that the COCs have not reached groundwater? Mr. MacDonald said we would base this on modeled groundwater concentrations from soil data. Sampling is generally done to depth; therefore, a clear picture of the vertical delineation is obtained.

Ms. Santiago continued to present examples of the RA Summary Table. She showed an example of a site with a source removal remedy and COCs threatened to impact groundwater.

Question: Why is trichloroethylene (TCE) an ecological COC, but not a human health COC? Also, do you use the most recent screening levels? Mr. Ross said the concentrations are above or below the screening levels for either the ecological or human health COCs. Mr. Mayer said the most recent screening levels are utilized.

Ms. Santiago further described the following remedial alternatives developed for OU-6 intended to address the range of site conditions and contaminant types:

- Alternative 1: No Action
- Alternative 2: ICs
- Alternative 3: Containment/Operational Controls
- Alternative 4: Source Removal/Reduction

She said Alternative 1, the “No Action” alternative, was not selected for any of the sites. Mr. Ross said Alternative 4, the “Source Removal/Reduction” alternative, may include ICs depending on the final level of cleanup.

Ms. Santiago said EPA would like to utilize this RA Summary Table template starting with Island OU (OU-7), so by the time the proposed plan is presented the community is not surprised. Ms. Heple said it will be good to starting learning details about the site sooner rather than later. She thanked the EPA for their hard work on addressing this recommendation based on the TANA.

#### **4. Detailed Presentation of Island Operable Unit (OU-7) Sub Area Results, Area 40 – Chris Fennessy, Aerojet**

Note: The presentation and map were disseminated (see attachments with final meeting notes).

Mr. Fennessy discussed the background of Area 40 (Slide 4), which is within a portion of the Island OU (OU-7), east of Prairie City Road and north of White Rock Road.

He said the Program Plan Modification Report for Island OU is updated on December 25<sup>th</sup> annually. Based on the 2004 report, this OU contains 73 potential source areas with very high concentrations of volatile organic compounds (VOCs) in either groundwater or

soil vapor and/or very high concentrations of perchlorate in soil and/or groundwater. He said the Priority Evaluation for Central OU Source Areas conducted in 2006 contained an evaluation of all the Central OU source areas to determine if any contained concentrations of TCE or perchlorate that warranted early evaluation during the Island OU investigations. As a result, nine source areas were transferred to the Island OU. He said the Sampling and Analysis Plan (SAP) was completed in 2006, and the Remedial Investigation field work took place in 2007 to 2008; therefore, the 2014 screening levels were not used at that time. Additionally, he said the BOU investigation was a priority for Aerojet and the Island OU was a priority for the agencies; therefore, work was done simultaneously. He mentioned that Area 39 (the state vehicular area) was transferred to the Island OU following completion of the BOU investigation and remedial action.

Mr. Fennessy said the Island OU field sampling plan included a re-evaluation with updated Preliminary Remediation Goals (PRGs). Additionally, he said Aerojet researched site history and examined aerial photographs, particularly looking for scarring to the ground or discoloring. With this investigation, he said “open space areas” were identified for additional investigation within Island OU to identify the presence of and, if necessary, the extent of COCs.

He explained that areas of high concentrations were identified and designated as Risk Management Decision Boundaries (RMDB). He said sampling would not be conducted again within the RMDB areas because concentrations were so high, these areas will automatically be included in the Feasibility Study. He said instead, the extent of RMDB areas were evaluated.

He further explained that screening levels used for soil, soil vapor, or groundwater, were multiplied by 10 to determine if step-out sampling was needed.

Question: If you don't know the concentrations in the RMDB areas, how do you determine risk? Mr. Fennessy said during the Risk Assessment, all historical data will be evaluated. He said greater than  $1 \times 10^{-4}$  risk for industrial use will be used for the RMDB areas. He said all data will be kept and re-evaluated with the newest screening levels at the time the report is prepared.

Mr. Fennessy described the hydrogeology and source areas of Area 40 (Slide 6). He said the site is underlain by bedrock outcrops and dips to the west. He said on the east side of the site, there is no groundwater unless in bedrock. He said bedrock is encountered at about 30 feet below ground surface (bgs). The following source areas are identified in Area 40 (Slide 6):

- 36B and 37B – former 50 foot square, 4 to 5 foot deep gunite-lined solvent separation sumps.
- 38B, 39B, and 40B – former lab waste and waste propellant burn areas.
- Three features were identified during aerial photography review and added as open space areas

Mr. Fennessy described the 36B and 37B areas, which were areas used to separate out the solvent and perchlorate wastes from the hog-out area and other sites. He explained, in the “hog-out” process, casings were super-cleaned with TCE and drained to sumps. The resulting waste from this process included perchlorate chunks, which were stored in 55-gallon drums with water. The perchlorate chunks were then decanted or drained from the water. The perchlorate chunks were compiled and burned at 38B, 39B, and 40B areas.

Question: Mr. Ladd said thank you to Mr. Fennessy for the recent site visit, and he asked if the City of Folsom had planned for this area to be slated for residential use? Mr. Fennessy responded in the negative. He added that Aerojet is responsible for the land use plan, and while the City of Folsom may have presented this idea initially, Aerojet indicated this area is not acceptable for residential use.

Mr. Fennessy discussed the pre-2000 data (Slides 9 to 13), and Aerojet will need to define the extent of COCs from RMDB in the upcoming data gap investigations. He said groundwater is at 15 feet bgs, therefore only one vapor sample was collected (10-foot only, no 20-foot soil vapor samples were collected).

Question: Does groundwater flow into the Aerojet site, onto the main part of Aerojet’s property? Mr. Fennessy said yes, the groundwater flow is directly to the west, and the extent of COCs is not known. The investigation plan is to define the extent of COCs to 10 times the screening levels.

Question: If the concentrations of COCs are too high for ecological use, how is that reuse mitigated? Mr. Fennessy said the remedy would be to discourage ecological use, for example, by placing a membrane down in the area or layering the area with cobbles to prevent burrowing.

Question: How large is the ecological impact area and is it currently open space? Mr. Fennessy said the area is a couple of acres and there are currently no structures at the site.

Question: Can the site be seen from Prairie City Road? Mr. Fennessy said the ecologically affected area cannot be seen from the road.

Question: Based on old documentation, there was an area where lab waste was dumped, then excavated, and delivered to an unknown location in the 1970s, which also contained radioactive material. Does Aerojet know where this lab waste delivered? Mr. Fennessy said the material was disposed to the G9 dump site.

Mr. Fennessy described the COCs compared to screening levels (Slides 15 to 24). He then described the extent of TCE, tetrachloroethylene (PCE), and perchlorate in groundwater, (Slides 25, 26, and 27, respectively). He said this is definitely a volatile organic compound impact area, with levels of TCE ranging from 50,000 to 60,000 micrograms/Liter ( $\mu\text{g/L}$ ). He said perchlorate concentrations were detected up to 20,000  $\mu\text{g/L}$ . He continued that perchlorate concentrations extend further south, and that this

area is not defined yet. He said this area has been investigated to bedrock, and Aerojet did not encounter groundwater.

Questions: Does the solvent go through the cracks of bedrock without dissolving into groundwater? Mr. Fennessy said Aerojet has some bedrock wells, but bedrock monitoring is more challenging. Mr. Mayer asked if there was any sign of non-aqueous phase, and Mr. Fennessy responded in the negative.

Mr. Fennessy discussed the Permeable Reactive Barrier installed at the site (Slide 28). He said it is a dual-wall system that is approximately 50 feet long and 20 feet deep, with an upgradient and a downgradient walls. He said the upgradient wall was filled with a 50/50 blend of sand and iron, and the downgradient wall included a bio-effective gravel-packed trench. He said the system has been operating for six or seven years, and concentrations have decreased to non-detect in the downgradient direction.

Questions: Is there currently biological treatment ongoing? Mr. Fennessy said a carbon injection treatment was included in the pilot testing phase, but is no longer needed because concentrations of perchlorate decreased significantly without it. He said it is unknown exactly what chemical reaction has taken place. He said there is too much iron for bio-reaction to occur in the upgradient wall; however, maybe the increased hydrogen caused by iron corrosion is causing bio-reaction upgradient of the barrier, reducing the perchlorate concentration. Mr. Mayer asked if chloride was measured on the downgradient side, and Mr. Fennessy responded in the affirmative.

Mr. Fennessy discussed the Folsom Sphere of Influence (SOI) Land Use Plan (Slide 29), and Area 40 being designated as a park. He said Aerojet is working with the Easton Development Company to identify the appropriate land use. He said the development folks are working closely with the remediation folks to ensure no unacceptable exposure to COCs.

Questions: Will there be a buffer around these areas? Mr. Fennessy said EPA recommends a 100-foot buffer. Will there be any restrictions for building around a buffer, for instance, could there be a soil vapor extraction system? Mr. Fennessy said Aerojet hasn't determined the remedy yet; however, there will be a significant monitoring program to ensure an early warning if there is anything out there that could cause a potential unacceptable exposure.

Question: How many sites does this include? Mr. Fennessy said it includes 5 out of 72 Island OU sites, and that does not count the potential from the open space areas.

Mr. Fennessy said a positive aspect of the site is that groundwater is relatively shallow, so we have had more remedial options such as the Permeable Reactive Barrier.

Question: Is the Permeable Reactive Barrier a single barrier now? Mr. Fennessy said Aerojet has not injected into the second or downgradient barrier since the pilot test, and it is just filled with gravel. He said corn syrup (or some sugar source) was injected and

because perchlorate concentrations decreased sufficiently in the upgradient barrier, further injections in the downgradient barrier were not needed.

Ms. Heple said this kind of informative presentation by Mr. Fennessy was a result of the TANA recommendations, and has been extremely valuable. Mr. Fennessy asked the CAG if there was any information they would like him to expand on, especially for future presentations.

Question: Why is TCE detected in the southern area, but the extent of contamination could not be determined? Mr. Fennessy said there is a geologic feature on the site that bifurcates the plume. This plume is on this boundary and flows to Groundwater Extraction and Treatment (GET) system (GET-A). He said Aerojet is now in the middle of writing the SAP for data gaps investigations.

Ms. Heple and CAG members recommended a more in-depth presentation on the hog-out area for a future CAG meeting.

Question: Is perchlorate detected at 20,000 µg/L across Prairie City Road? Mr. Fennessy said the concentrations are approximately 6,000 µg/L across Prairie City Road. He added that there may be maps with all the COCs plotted; Mr. MacDonald said the monitoring plan has maps, and this may be a good topic for a future meeting.

## **5. Regional Board Aerojet Cleanup Overview – Alex MacDonald, RWQCB**

Note: Presentation notes and activities map were distributed (see attachments with final meeting notes).

Mr. MacDonald said a lot of new monitoring and extraction wells were installed and proposed for installation.

He said Aerojet has finished construction at GET-AB, and the full scale system is expected to operate at 3,500 to 4,000 gallons per minute (gpm). He reminded the CAG that this water is sent to the industrial water supply.

He said the GET-EF expansion is underway, and an additional air stripper and of ion exchange units for perchlorate removal are now operational. The flow from this GET will increase significantly.

He explained the installation of the proposed monitoring well north of GET-LB is on hold; it will be installed if needed.

He said new extraction wells are proposed in Layer E upgradient of supply wells AC-22A/B and AC-17, and Aerojet hopes to complete installation of the one closest to the Gold River Discovery Center before school begins in the fall.

He described the past clogging issues with AC-18 which occurred if it was shut off for a period of time. This issue has been mitigated by periodically turning it off for shorter periods of time, therefore it is essentially operating continuously. He said fine glass was found in the extraction wells, and it could not be determined why.

Question: Could the clogging with AC-18 have been a precipitate? Mr. MacDonald said it was determined to be fines from a geologic layer in which the well is screened..

Mr. MacDonald said pilot testing of soil vapor extraction at Area 49000 will begin after installation of the soil vapor extraction system at the end of this month (July). He said Aerojet will examine the radius of influence and the pilot test will help determine how many wells may be needed to provide cleanup.

He said the drafting of ICs are in progress for White Rock Road Dumps 1 and 2.

## **6. 2014 Meeting Dates**

The next CAG meeting is scheduled for Wednesday, September 17, 2014 in the American River South Room.

The subsequent meeting is tentatively scheduled for Wednesday, November 19, 2014 in the American River South Room.