

**Final Meeting Notes: Community Advisory Group (CAG) –  
Aerojet General Corporation Superfund Site Issues  
Meeting Date: September 17, 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])	Janis Heple (CAG Chair)
Alta Tura (Sacramento Area Creeks Council)	Jessica Cooper (Recorder, Sullivan International Group, Inc.)
Burt Hodges (Save the American River Association)	Jimmy Spearow (CAG)
Chris Fennessy (Aerojet Rocketdyne [Aerojet])	Julie Santiago (EPA)
Jackie Lane (U.S. Environmental Protection Agency [EPA])	Kathy Lawson (Golden State Water)
	Kevin Mayer (EPA)
	Steven Ross (Department of Toxic Substances Control [DTSC])

The Draft Meeting Notes from the meeting on July 16, 2014 were finalized.

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

Mr. Fennessy said there is a lot of drilling activity of new monitoring and extraction wells. Monitoring wells were installed in Carmichael. A couple of wells were installed near Groundwater Extraction Treatment (GET) H. The installation of two monitoring wells, one on Newton Way and one on Ellenbrook, is expected soon. Another monitoring well on Queenston Court is also expected. The extraction well 4718 well rehabilitation is ongoing in GET K area; GET K was turned off for cleanup of the creek by the City of Rancho Cordova.

Question: How will things be affected during construction of the creek? Mr. Fennessy said effects are unknown, but because the system cannot be stopped for that long, pumping may occur around the sections with work in progress.

Question: Are there a lot of wells planned for construction? Mr. Fennessy said yes, in addition to those already mentioned, Aerojet just completed installation of six extraction wells in the Inactive Rancho Cordova Test Site (IRCTS), located south of White Rock Road. These are located in remote areas, and most are not expected to impact neighborhoods.

Question: Will the area be expanded to capture flow? Mr. Fennessy said Aerojet is continuing to evaluate effectiveness, assess plume capture, and expand as needed. Mr. Mayer explained that for Perimeter Groundwater Operable Unit (OU-5) and other areas, the approved designs are being implemented. He continued that the wells tell us what is

happening, and we develop updated plans while investigating effectiveness. He said we also evaluate current conditions, such as droughts, and make adjustments if needed. He said Aerojet is doing a great job keeping up with current conditions.

Question: When do you conduct the effectiveness evaluation, and do you require changes where needed? Mr. Mayer said that the first evaluation started four years ago after the remedy for Western Groundwater was fully constructed. EPA's Administrative Order required Aerojet to provide an annual Performance Evaluation Report once the system was operating. Mr. Fennessy said Aerojet is continuing to adapt and examine data, while making decisions to add extraction wells and other changes. Mr. MacDonald said lines of evidence are continually gathered and examined to show plume capture.

Question: How do you address increasing use of groundwater? Are we still going to be able to capture the plume? Mr. MacDonald said groundwater is not affected as much as we get closer to Aerojet property, and we haven't seen it affect much in the west either. We assess data, such as groundwater elevation, as it comes in biannually. He said things could change, but data is monitored so we can address changes when/if they come up. Mr. Fennessy said in addition to that, the sentinel wells are monitored and will continue to be monitored to protect drinking water. He said there is less groundwater pumping and a drop in demand this year due to conservation.

### **3. Aerojet Cleanup Updates – Julie Santiago, EPA and Kevin Mayer, EPA**

Ms. Santiago said the OU-6 Record of Decision (ROD) projected release date has been delayed from September 30<sup>th</sup> to December 31<sup>st</sup>. This delay is based on comments received, especially from EPA headquarters indicating the possible need for additional justification for alternatives and actions selected. She said as a result, the tables will be larger and include all contaminants of concern (COCs) identified as well as more information and justification for selected actions. She said additionally, the updated Regional Screening Levels (RSLs) from May will be incorporated. She said the Human Health Risk Assessment (HHRA) Note Number 3 (referred to as "Note 3") was recently released in July 2014. Mr. Ross indicated Note 3 is a description of DTSC analysis of the RSLs and compares alternative screening levels. Mr. Fennessy said Note 3 addresses indoor air levels, and we collect in-situ soil vapor samples, so the concentrations from the field investigations cannot be directly compared to Note 3 values. Ms. Santiago said Institutional Controls (ICs) on a property will affect monitoring events, and regular sampling would ensure that compliance with cleanup goals is maintained.

Question: Do the ICs include any sort of emergency response if risk is detected in the future? Mr. Mayer said that the ROD and the order enforcing the ROD should include contingencies, and EPA conducts reviews for protectiveness every five years.

Ms. Santiago continued to discuss the Aerojet Cleanup Updates. She said the Sampling and Analysis Plan for Area 40 sampling completed by Aerojet is in review by EPA, and sampling is expected to be conducted in October and November. Mr. Fennessy reminded the group that Area 40 was the site discussed during the last meeting.

Question: Ms. Heple asked if the City of Folsom was moving ahead on developments, and if so, are they starting in areas close to Area 40? Mr. Fennessy responded in the negative. He said Aerojet owns the property north and south of Area 40, and there are no immediate plans for development in those areas. He said there were plans for a road to connect Prairie City Road to the new development in the City of Folsom, which will start east of Area 40. Ms. Heple said there was a previous discussion on concerns with levels of trichloroethylene (TCE) levels between 10,000 and 50,000 µg/L in groundwater and with just a 100-foot buffer; is this buffer a general EPA guideline? Mr. Fennessy said yes, but it is a 100-foot buffer from the non-detect levels to ensure protectiveness.

Question: There was also a concern with ambient air, and the detection of 7,700 µg/m<sup>3</sup>, which is almost 4,000 times the screening level. Mr. Fennessy said that area is not intended to be built as a residential area.

Question: What about people picnicking in the area? Mr. Fennessy said Aerojet does monitor ambient air. Soil vapor data can be modeled into ambient air to evaluate risk to receptors. He said Aerojet is in direct contact with the City of Folsom and Easton Development Company, and we are all working together to ensure whatever development occurs in Area 40 is appropriate and takes into account the environmental restrictions. He said additionally, some areas may be fenced off from the public, and the team is working on making some beneficial use of the land.

Mr. Mayer discussed additional Aerojet Cleanup Updates. He said for soil in Perimeter Groundwater Operable Unit (OU-5) at Area 49000, the selected remedy was a soil vapor extraction system. This system was constructed, the pilot test was conducted, and it is expected to be fully operational this week. He said it is currently extracting approximately two pounds of TCE per day. He said as it operates, there are monitoring points to examine the vacuum and capture zone. He said the system was designed so that it could be expanded and additional wells could be added easily. Also, he said the vapor goes through carbon filter treatment vessels.

Mr. Mayer said the 5-Year Review will be coming up by July 2016. For a site as complex as Aerojet, EPA will be doing performance evaluations now with current cleanup goals, which will be used for the 5-Year Review. He said at that point, EPA will examine if standards have changed, especially in areas where excavation was completed.

#### **4. Island Operable Unit (OU-7) Remedial Investigation, Hog-Out – Chris Fennessy, Aerojet**

Note: A schedule and maps were distributed (see attachments with final meeting notes).

Mr. Fennessy discussed the Hog-Out area, which is an area where residual propellant was removed from used rocket motor casings. He described the location of Island Operable Unit (OU-7) as areas or “islands” between other Operable Units, which are areas identified with the highest COC concentrations. He said the line areas were built to build

specific types of equipment, such as motors; and manufacturing was conducted in those areas to develop each type of equipment. He stated that one of the OU-7 sites was in the central disposal area.

Question: Were the surface impoundments lined? Mr. Fennessy responded that they were gunite lined.

Question: Did they contain pooled liquid or did they dry up? Mr. Fennessy said that was unknown. Mr. MacDonald said it was likely pooled liquid at one time.

Mr. Fennessy said propellant was removed from solid rocket casings with a water knife; casings were cleaned with industrial solvents like TCE.

Question: Are there any other contaminants? Mr. Fennessy said perchlorate was the primary component. Mr. Mayer said it was solid rocket propellant, which contained ammonium and sodium perchlorate, fine metals (as electron donors), and binder material (organic compounds) to allow the material to hold its shape. We found some spongy and dense material, which is not quite as dense as an eraser and like a yellow sponge.

Question: Were the rocket engines cleaned out to reuse them? Mr. Fennessy responded in the affirmative; the rocket engines were retrofitted.

Mr. Fennessy described the history of the Aerojet Superfund Site Operable Units, which contains approximately 315 potential source areas. He mentioned that the Program Plan Modification Report (PPMR) dated 2004 identified the operable units and which sites went into each operable unit. The PPMR is updated annually. Five source area operable units have been developed, OU-4 (Area 41 Soil and Groundwater OU), OU-6 (Boundary OU), OU-7 (Island OU), OU-8 (Eastern OU), and OU-9 (Central OU). He said following the submittal of the draft PPMR, Aerojet conducted a study of the Central Operable Unit (OU-9) source areas to ensure none of them warranted earlier investigation in OU-7. Following this evaluation, several source areas were transferred from OU-9 to OU-7.

Question: Is this area no longer owned by Aerojet? Mr. Fennessy said Chemical Plant 1 is Aerojet property, but it is under a long-term lease to AMPAC Chemical Company. He discussed the areas called I-7 lands and said that in the Partial Consent Decree, all construction within the I-7 lands, including in Chemical Plant 1 must have approval before any construction is completed.

Question: Are there now 73 areas in the Island Operable Unit (OU-7)? Mr. Fennessy responded in the affirmative.

Mr. Fennessy said during the remedial investigation of the IOU source areas in 2006 and 2007, the 2004 Preliminary Remediation Goals (PRGs) were used. For reporting purposes, these screening levels have been updated to more recent levels. He said Area 39 transferred due to ecological habitat risk and is now within Island Operable Unit (OU-7).

Question: Where was Area 40? Mr. Fennessy said it was always in Island Operable Unit (OU-7) due to the high COC concentrations detected.

Mr. Fennessy said aerial photographs were reviewed during the preparation of the Field Sampling Plan, for ground scarring or other indications of environmental contamination. If areas were found that were not already source areas, they were added to the investigation as Open Space Areas for investigation. He explained Remedial Management Decision Boundaries (RMDB) were developed to identify areas that contained elevated concentrations of chemicals (100 times the industrial screening levels) and; therefore, would be brought forward to the FS without further evaluation in the RI.

Question: Is it too late to change the term “Remedial Management Decision Boundaries” because it is confusing? Mr. Mayer responded in the affirmative, and said the intention is to examine outside of that area or RMDB to evaluate the extent of contamination. He said to remember we are not ruling out anything inside or outside of this boundary.

Mr. Fennessy continued, and indicated the maps with contours have been revised based on new data. He said “open space” areas that could not be related to the source areas were identified based on the aerial photograph review.

Question: Was the propellant kept wet, and then was that water pumped to the slickens area? Mr. Fennessy said a water knife was used to clean and it was flushed to a gunite-lined pond, TCE was used to clean the casings and it was flushed to the pond. It was then pumped into drums (with water and the solvents), which was taken to the burn area to dry out and set on fire.

Mr. Fennessy presented the pre-2000 data. He said the pre-2000 human health data evaluation was based upon 100 times the 2004 PRGs. He said there are lots of unknowns and data gaps that need to be filled. He mentioned that lots of soil vapor samples were collected. He said all the data was evaluated with new screening levels, and explained the dashed line on figures indicated where data is needed. He mentioned sampling could not be conducted in the cobble piles, and further evaluation is in progress. He said a Field Sampling Plan will be released in a few months to resolve these data gaps.

Mr. Fennessy described the perchlorate contamination compared to industrial RSLs. He said soil samples were collected from 0 to 12 feet below ground surface (bgs) to be compared to human health screening levels, but there were also deeper soil samples collected. He said groundwater was encountered at depths between 35 and 70 feet bgs.

Mr. Fennessy described the diesel contamination compared to industrial RSLs. He described the Layer A plume, and that groundwater doesn't move much in the slickens area because it is clay. He said the slickens was due to dredging; clay settled in the dredged areas and cobbles were spread out to the sides.

Question: Where is Buffalo Creek and Morrison Creek in relation to this site? Mr. Fennessy described the location and surface water features.

Mr. Fennessy described TCE in Layer B, which has migrated from the source area.

Question: What was the depth of the dredges? Mr. Fennessy explained dredging disturbed down to 100 feet bgs. He said most of the impact was in Layer A, and reached to Layer C.

Mr. Fennessy described the vertical wall bioreactor (VWB) pilot study that was conducted at Hogout. He said the VWB consisted of drilling a 5 foot diameter hole to groundwater and installing a 3 foot diameter pipe inside the hole. The area between the edge of the bore hole and the 3 foot diameter pipe was filled with gravel. The 3 foot diameter pipe was filled with an air stripping media (to allow bacteria to attach and grow). Contaminated groundwater was pumped into the bottom of the VWB. Citric acid was added as an electron donor. He said this feeds the bugs which destroy the perchlorate. The VWB had a mixing zone at the bottom of the reactor to ensure good mixing of the water and citric acid. He said bioremediation of this water was challenging because of the nitrates, and ammonia concentrations were very high. He said parameters were evaluated, such as pH and temperature, to assess the treatment; for example, a temperature greater than 60 degrees Fahrenheit is needed for bacteria to be active enough for treatment. He said this could be another topic for a CAG presentation.

Mr. Fennessy and Ms. Santiago presented a schedule and recent maps for Aerojet. Ms. Santiago said there was a suggestion from the EPA Technical Assistance Needs Assessment that the schedule read from left to right. Mr. Mayer said EPA is working with Aerojet to update boundaries and clarify some soil areas, to add latitude and longitude, and to clarify that the red outline represents the outer edge of the contaminant plume (also known as the “composite plume”) without regard for which aquifer layer or specific COC. He said it is a general depiction of the outermost area where contaminants are detected. He said the study area is different than the impact area where the contaminants have reached.

Ms. Santiago mentioned the CAG wished to add White Rock Road Dump sites to the schedule. Mr. Fennessy said EPA was not the lead agency on these sites and they were just a part of the semi-annual reports.

Ms. Lane suggested to color-coordinate the map legend colors with the colors on the schedule.

Ms. Heple said the map does not depict risk areas, and suggested to portray risk somehow.

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

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

**6. 2014 Meeting Dates**

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

The subsequent meeting is tentatively scheduled for Wednesday, January 21, 2015 in the American River South Room.