Meeting Minutes

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BACKGROUND

Defense Logistics Agency (DLA) Energy and Kinder Morgan Energy Partners (KMEP) are conducting environmental cleanup activities at the area in and surrounding the former Defense Fuel Support Point (DFSP) Norwalk facility, formerly known as the Tank Farm, located at 15306 Norwalk Boulevard, Norwalk, California. The Restoration Advisory Board (RAB) is an advisory committee of local citizens and project members that review and comment on documents relating to the environmental cleanup. All RAB meetings are open to the public and are scheduled semiannually on the fourth Thursday at 4:00 p.m. in the months of February and August unless otherwise voted on by the RAB community membership.

1. <u>Introduction</u> Mary Jane McIntosh, RAB Co-Chair, Meeting Chair Stuart Strum, DLA Energy

Mary Jane McIntosh, RAB Co-Chair, Meeting Chair, called the meeting to order at 5:21 p.m.

Stuart Strum of DLA Energy introduced the new remediation contractor, The Source Group, Inc. (SGI) of Signal Hill. SGI employees introduced were Neil Irish, Ken Wall, Molly Black, and Angela Czuba. The Source Group, Inc. has long-term DFSP Norwalk experience and is also the contractor for DFSP San Pedro for compliance and remediation.

Ms. McIntosh asked for comments on the draft minutes from the February 27, 2014 RAB meeting. Ms. McIntosh made a motion for the minutes to be approved as written. Charles Emig seconded the motion. The minutes were approved without opposition.

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2. <u>DLA Energy Update</u> Neil Irish, The Source Group, Inc.

Neil Irish, SGI Project Manager for the DFSP Norwalk site presented the Facilities Planning, Construction and Management Update on behalf of DLA Energy.

Mr. Irish began by thanking DLA and the RAB for the opportunity to once again work on the DFSP Norwalk project and with the RAB. Mr. Irish first began work with DFSP Norwalk in 1989 and has significant experience on the project, as do other SGI employees.

Status of Remediation System Update

Mr. Irish provided a status update of the remediation system, stating that during the contract transition period the soil vapor extraction (SVE) system was turned off pending required permits. During that time, SGI conducted testing of the soil vapor to determine the condition of the soil and soil gas on the site under non-remediation status. Concentrations during that time were low; indicating that the system has been effective in removing the volatile components of the fuel from the soil and that the soil vapor extraction has reached the end of its effectiveness as a remedial measure. Thus, indicating the need to implement other remediation methods.

In response to a question from Mr. Charles Emig of the City of Cerritos, Mr. Irish stated that sampling commenced approximately one month after the system was shut down to allow time for conditions to rebound to natural status.

Mr. Irish stated that SGI is also evaluating re-injection of treated groundwater and actively looking at changing the system to avoid future discharge of water under the National Pollutant Discharge Elimination System (NPDES) permit.

Work Plan for Assessment at GMW-62 Updates

Mr. Irish discussed the request from the Regional Water Quality Control Board (RWQCB) for additional assessment of the free product plume around offsite well GMW-62 located in the northwest portion of Holifield Park adjacent to the site's eastern property fence.

Mr. Irish stated that a work plan to fully assess the extent of the free product plume was submitted to the RWQCB for review and approval. The work plan includes the installation of three additional wells on Holifield Park. SGI is also working with the City of Norwalk to obtain the necessary access agreements. The assessment is anticipated to commence in September 2014.

Soil Remediation – Site Wide

Mr. Irish stated that for the land to be returned for commercial use and a portion conveyed for use as a city park, a minimum of the upper 10 feet of soil must be remediated, as discussed during the previous RAB meeting.

For the record, Mr. Adriana Figueroa of the City of Norwalk clarified that this was not discussed during the February 2014 RAB meeting as indicated by Mr. Irish and as indicated in the Summer 2014 Fact Sheet (No. 27) that was distributed to the public.

Mr. Emig stated that what was discussed was the concern of trucks transporting soil off- and on-site.

Mr. Irish continued by stating that the original plan was to only remediate the upper 10 feet of soil; however, after discussions with the DLA, the scope of work has been expanded to increase the excavation depth to remediate deep soil contamination (>10 feet) and treat contaminated groundwater. In addition, remediation plans were expanded to include the treatment of shallow "oily sand" present near the former clarifier. The "oily sand" is approximately 6,000 tons of buried material with high hydrocarbon concentrations. This material does not pose a health risk and is not leaching; therefore, the RWQCB had previously approved a no further action closure status. At that time, no further action was acceptable; however, to convey the land this option is not favorable because it would leave approximately one acre of the property unusable for anything

other than empty space. Mr. Irish stated that discussions with the RWQCB will be required to essentially reopen the case to include in "oily sand" in the clean up plan.

Mr. Irish discussed the following three candidate soil treatment options to treat approximately 100,000 tons of petroleum-contaminated soil and to address groundwater contamination (free product) underlying Holifield Park in the northeast corner:

1) Transport and Disposal

Mr. Irish discussed the option of transportation and disposal of the contaminated soil. Mr. Irish stated that this option would require approximately 4,500 trucks (each hauling approximately 22 tons) which would generate approximately three million pounds of carbon dioxide during the 180 mile round trip from the site to the approved disposal facility. This includes trucks returning to the site with clean soil for backfill.

Mr. Irish included that two additional goals of the remediation activities are to minimize the impact to the Norwalk community and reduce greenhouse gas emissions. The transportation and disposal of contaminated soil is not a favorable option to meet these additional goals. This option, however, is one of the most inexpensive, at approximately \$50-\$60 per ton.

Mr. Emig brought up the fact that the maps depicted on slides 9-12 of the presentation do not include soil to be removed from Holifield Park.

Mr. Irish addressed this stating that the reason for the exclusion is because excavation of soil on Holifield Park is not included because previous assessments show that the soil is clean down to groundwater. Assessments have indicated that the source zone has been removed; however, free product still exists in groundwater. An alternate plan to treat the groundwater will be implemented.

Ms. Figueroa indicated that slides 9 and 10 do show that there is soil contamination at 0-10 feet.

Mr. Irish explained that there are small pockets of contamination at 0-10 feet on the northeast portion of the site, near Holifield Park; however, this contamination is associated with settling ponds previously present on the site. The contamination is not associated with the free product plume that is present under Holifield Park as the contamination does not extend to groundwater. If during excavation of soil in the northeast corner of the site, SGI encounters evidence of deeper contamination it will be addressed. Mr. Irish reiterated that data does not suggest that contamination extends down to the groundwater in that area.

Ms. McIntosh stated that transportation and disposal is not acceptable for the community because of the number of trucks required.

Mr. Irish stated that although this is not a favorable option, some trucks would be required during remediation activities because of the possibility that some soil may not be amenable to onsite treatment.

2) Thermal Desorption (Reterro)

Mr. Irish introduced the technology of thermal desorption. This option essentially heats the soil to allow for the hydrocarbons to be released and the released vapors to be captured onto adsorptive carbon or to be destroyed in a permitted, thermal oxidizer.

Mr. Irish indicated that some of the pros of this technology are low emissions, use of power from the grid rather than a diesel generator, the equipment is quiet, the South Coast Air Quality Management District (SCAQMD) is a fan of the technology and the technology is effective. Mr. Irish stated that SGI has conducted pilot tests that result in reduction of soil contamination to zero parts per million (0 ppm).

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Ms. McIntosh questioned if this technology is financially responsible with the amount of soil that is required to be remediated? Additionally, Mr. Emig inquired about the cost per ton for this technology.

Mr. Irish answered by stating that the technology does requires a significant amount of energy to bring the equipment to operating temperature. Therefore, a petition to the City of Norwalk would be required to request the approval of operating that equipment approximately 20 hours per day. This would allow approximately 600-700 tons per day to be processed providing enough volume to be cost effective. Mr. Irish responded to the noise concerns stating that the noise will not be as great as heavy equipment being operated during the transportation and disposal option. Mr. Irish stated that this technology is expensive and preliminary costs below (excluding electricity) are still being evaluated:

- 20,000 tons: \$102 per ton (assuming work hours 7am-4pm, 5 days per week)
- 100,000 tons: \$70 per ton (assuming longer work hours, 7 days per week)

Ms. McIntosh questioned the amount of manpower required to operate this technology 20 hours per day.

Mr. Irish answered by stating that another site in Fullerton treating the same amount of soil is currently running two units, 20 hours per day.

Mr. Figueroa requested a tour of the Fullerton site during full operation with the highest noise levels.

Mr. Irish stated that he would arrange a tour for interested RAB members.

3) On-Site SVE and Bio-enhanced Treatment (F4)

Mr. Irish described the bio-enhanced (F4) treatment option stating that bacteria called *Pseudomonas* occurs in all soil and a particular strain of the bacteria which like hydrocarbons can be utilized for soil remediation. The bacteria are basically freeze-dried and then inoculated on site to be used for soil clean up.

Mr. Irish proceeded to state that on a limited scale, the F4 technology has been tested at DFSP Norwalk on both the "oily sand" and on general contamination of representative material on the site. Between June and August 2014, the concentration of hydrocarbons was reduced from 12,000 ppm to below the 1,000 ppm clean up goal and is essentially non-detect for the gasoline range (as depicted in the graph on slide 16).

Mr. Irish stated that the SCAQMD permit for the current SVE system would require modification to continue the recovery of vapors while utilizing the F4 technology.

Mr. Irish discussed the pros of this technology indicating that more soil can be treated at a faster rate than the thermal desorption method at approximately half the cost.

Mr. Emig requested clarification of process for F4 technology.

Mr. Irish clarified by stating that the soil is excavated from the ground, a surfactant is added to help liberate the hydrocarbons from the soil and the bacteria is added simultaneously. The soil is then stockpiled on to plastic and covered with plastic and vent pipes are installed.

In response to several questions, Mr. Irish explained that the bacteria are only viable when they have hydrocarbons to consume. Once the bacteria no longer have hydrocarbons to consume they die off. Mr. Irish reiterated that these are naturally occurring bacteria in the soil.

Ms. Tracy Winkler asked what the negatives would be for using this F4 technology.

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Mr. Irish reminded the RAB that only a small study was conducted. When using the bacteria on the "oily sand", concentrations were reduced; however, increased and then decreased again during subsequent sampling. Mr. Irish stated that the concern would be that there is not complete certainty that this will work well for DFSP Norwalk.

Mr. Irish stated that if he had to chose between all of the proposed technologies today he would chose F4 because to date it has proven to work well, be the most cost effective, and is the "greenest" option. Mr. Irish stated that SGI would start by treating 5-10% of the soil utilizing the F4 technology to determine effectiveness. Mr. Irish stated that the option to utilize the thermal desorption will still be available and the price for 90,000 tons will remain competitive. Mr. Irish reminded the RAB that the thermal desorption technology will bring the concentrations to zero.

Ms. McIntosh suggested perhaps utilizing thermal desorption for the portions of the site with the heaviest concentrations and F4 with the lower concentrations.

Mr. Irish responded that although an option, cost must be considered. Mr. Irish stated for Reterro to mobilize to the site the cost is \$250,000 just to set up equipment to begin soil treatment (\$150,000 of the \$250,000 is to set up power). For Reterro to operate in a cost effective manner, multiple units are required to run.

Mr. Irish suggests using F4 to treat a large spectrum of soil to determine efficiency and then consider thermal desorption if necessary.

Mr. Irish also addressed concerns about the electricity required to power the Reterro thermal desorption units stating that SGI has been working closely with KMEP to discuss challenges they have had with obtaining and maintaining power. Mr. Irish also stated that an additional challenge would be the amount of time it may take to get power set up on the site to operate the Reterro units.

Ms. McIntosh inquired about another technology that utilizes heat to reduce soil contamination.

Mr. Irish responded that the technology is TerraTherm, which utilizes electrodes in the soil to heat the soil to reduce contamination. The technology is very expensive and energy requirements are high. This technology has been used for projects with heavier hydrocarbons and is not the best option for the contamination at DFSP Norwalk.

Schedule

Mr. Irish stated that the proposed schedule is to begin this Fall with initial focus on the property planned for conveyance to the City and to complete treatment of soil by the end of next year (2015).

Ms. Figueroa recommended scheduling a meeting with all City of Norwalk departments that will be involved (Engineering, City Planners, etc.) to discuss permits, work restrictions and other requirements.

Ms. McIntosh stated that she would like to ensure that the resampling of the soil berms is included as part of the treatment plan for the site.

Mr. Irish stated that plans include exploratory sampling of areas (including berms) to confirm no contamination is present in areas previously identified as clean.

In response to Ms. McIntosh, Mr. Irish stated that the "oily sand" area is part of the treatment plan and has already been initially tested by the F4 technology.

Ms. Winkler asked if the City has decided which 15 acres will be donated as the park. Ms. Figueroa and Mr. Irish answered by indicating a portion adjacent to the existing park will be donated; with some exception to maintain an easement required for the pipeline.

Mr. Irish added that the scope of work includes a groundwater in situ chemical oxidation (ISCO) pilot test to accelerate clean up of groundwater as well as removal of free product.

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Ms. McIntosh and Mr. Emig commended SGI and the DLA for their dedication to obtaining site cleanup.

3. <u>KMEP Update Mark Wuttig, CH2M HILL</u>

Remediation Operations Update

Mark Wuttig provided an update on KMEP's remediation operations, biosparge well installation, planned activities and the first semiannual 2014 groundwater monitoring.

Mr. Wuttig stated that overall objectives are to remove contaminated mass and contain the contamination. To accomplish these objectives KMEP maintains an SVE system, a groundwater extraction (GWE) system and a total fluids extraction (TFE) system. These remediation systems are located in the south-central and south-east area which provide very good coverage across the contaminant plume. Mr. Wuttig mentioned the former remediation system referred to as "The West Side Barrier" was discontinued in August of 2008 based on low contaminant concentrations that no longer pose a risk.

Mr. Wuttig also discussed the treatment and discharge of the systems.

Mr. Wuttig discussed operation and maintenance activities and summarized KMEP's SVE operations. Since 1995, approximately 485,000 gallons (3.2 million pounds) have been treated. Mr. Wuttig displayed a graph depicting the cumulative fuel removed by vapor extraction to date.

Regarding KMEP's TFE/GWE system, Mr. Wuttig stated that groundwater extracted from the south-central and southeast areas is 64 million gallons and from the West Side Barrier is 26.9 million gallons since 1995. A total of 667 gallons (4,402 pounds) of total petroleum hydrocarbons (TPH) mass has been removed in groundwater extracted since implementation of the remedial action plan (RAP) Second Addendum in 2007.

Mr. Wuttig said that free product recovery has increased as related to the decline of the water table elevation to historical lows, which has allowed some of the trapped product within the smear zone to be released and float out onto the groundwater table for recovery. Former wells with zero to minimal product now contain several feet of product that has been recovered using hand bailing or a vacuum truck. A total of 9,988 gallons has been recovered since 1995. Mr. Wuttig displayed a graph of free product recovered over time.

Mr. Stephen Defibaugh stated that when the water table dropped an increase in product thickness was expected; however, there was product observed in a well (MW-SF-9) where product had not been detected in many years; therefore, protocol was followed to rule out the potential release from KMEP's active pipelines. The pipelines were shut down and pressure tests were conducted which confirmed that there were no active leaks. In addition, a few key areas along the pipelines (block valves) were excavated to further rule out that a release had occurred. No staining or odors were encountered during excavation activities.

Mr. Wuttig also stated that forensic analysis of product samples was conducted to evaluate the degree of weathering or age of the hydrocarbon components. Results indicate that the gasoline component of the samples was significantly weathered and not indicative of a new release.

Mr. Wuttig presented a hydrograph showing the historical groundwater elevations in the upper aquifer and the underlying exposition aquifer from 1993 to present, which depicts the groundwater table at a historical low which has exposed free product trapped in the smear zone.

Mr. Wuttig said that the SVE system was in operation 93 percent of the time (without planned shutdowns) and 74 percent of the time (with planned shutdown) during the second quarter of 2014. The TFE/GWE system operated 88 percent of the time during the second quarter 2014, or 97 percent excluding planned shutdowns for groundwater monitoring.

Mr. Wuttig summarized reasons for SVE system downtime and discussed preventative maintenance activities.

Mr. Wuttig discussed remediation system status which included the shut down of the SVE system to repair a

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leaky heat exchanger and modification of the 1998 SCAQMD permit to ensure inclusion of the latest groundwater treatment system modifications and the new biosparge system. An expedited review process was requested and the system is expected to be operable within two months. The SVE system has been down since late July 2014.

In response to Ms. Winkler's question, Mr. Wuttig stated that CH2M HILL's subcontractor that conducts the site wide groundwater monitoring and sampling also conducts the hand bailing of free product and properly disposes of the liquid in the oil/water separator, which is ultimately, transported offsite.

Ms. McIntosh asked what efforts are put out each year for the West Side Barrier wells. Mr. Wuttig responded that the West Side Barrier wells are sampled twice a year under the current revised sampling plan to ensure concentrations continue to decline or are steady.

Ms. McIntosh asked if it is necessary to continue to sample so frequently seeing as it has been six years and the concentrations are so low. Mr. Wuttig stated that there are still some detectible concentrations and the current monitoring program has already been streamlined.

Alternate Interim Remedy Status

Mr. Wuttig discussed the conceptual site model and proposed alternate interim remedy that includes horizontal biosparging with SVE. The horizontal biosparging will be more effective at removing and destroying hydrocarbon mass than the current remedial approach. The SVE system will mitigate potential offgassing as a result of biosparging. In addition to the installation of horizontal biosparge wells, the operation of the TFE for hydraulic containment will continue until the plume is stable and natural source zone depletion can address remaining hydrocarbon material that is not removed from the ground with the biosparge wells and SVE.

Pilot Biosparge System

Mr. Wuttig stated that the Construction and Pilot Test Work Plan was approved by the RWQCB on February 26, 2014. Detailed planning and implementation have been underway and pilot well construction was completed a few days ago. To supplement monitoring and performance, additional soil vapor monitoring points will be installed during third quarter 2014. Mr. Wuttig stated that pilot testing would occur for approximately 1 year. Monitoring will be conducted using the current groundwater monitoring plan; however, sampling will be conducted at a higher frequency.

Mr. Wuttig provided detailed explanation of the biosparge well layout and conceptual design.

Mr. Wuttig addressed questions from the RAB stating that additional horizontal biosparge wells will be installed after the pilot test and, if wells are to be installed under homes, property owners will be contacted and current access agreements may require modification.

Ms. McIntosh added that biosparging with vertical wells was previously conducted in 2000 in the southeastern area and was effective.

Mr. Wuttng addressed Ms. Figueroa's question and stated that the project would last less than 10 years after system is built out. Biosparging entails injecting air at the proper rate to provide the bugs (microbes) just enough air to allow them to work effectively. Biosparging will be conducted in a controlled manner.

Ms. McIntosh asked if air sparging could be conducted in the 24-inch block valve near Holifield Park. Mr. Wuttig said that it is a possibility if it could be determined that it would pose no risks to the community.

Ms. Figueroa asked how soil cleanup be expedited in the KMEP area. In which, Mr. Wuttig responded that extensive soil sampling has been conducted by KMEP and the upper 15 feet of soil is clean.

Mr. Wuttig addressed Mr. Emig's question of the possibility of injecting more air by stating that it is more difficult to control the release of volatile organic compounds (VOCs) when high volumes of air are injected.

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Mr. Wuttig continued with his presentation and provided photographs and explanations of drill rig and support equipment, mud system, drilling activities, borehole navigation using gyroscopic steering tool, casing and screen installation and well development.

Planned Activities

Mr. Wuttig stated that planned remediation activates include continuing weekly product recovery by hand bailing in select wells, installing five triple nested soil vapor monitoring probes to monitor the planned biosparge pilot test, conducting baseline pilot test soil vapor monitoring, and the initiating the pilot testing of biosparge wells.

4. First Semiannual 2014 Groundwater Monitoring Report Mark Wuttig, CH2M HILL

Mr. Wuttig summarized the First Semiannual 2014 Groundwater Monitoring Report and restated that groundwater elevations are at historical lows.

Mr. Wuttig displayed and discussed groundwater elevation maps for the uppermost groundwater zone and the exposition aquifer.

Mr. Wuttig stated that free product was measured in a number of wells and thicknesses range from 0.01 feet to 6.8 feet and in general the free product is thicker and more widespread than it has historically been.

Mr. Cho asked if the groundwater gradient for the exposition aquifer is similar or different from last quarter. Mr. Wuttig stated that it is stable.

Mr. Wuttig presented an animation depicting light non-aqueous phase liquids (LNAPL) extent from 1998 to 2014. The animation shows that the product steadily reduces overtime; however, it recently increases due to the historically low groundwater table.

Mr. Wuttig discussed the sampling of the exposition aquifer wells and indicated that all analytical results were non detect, except for tert-butyl alcohol (TBA), which was detected at EXP-2 in the DLA Energy split sample at a concentration of 8.5 J micrograms per liter (ug/L) (near the laboratory reporting limit). In the uppermost aquifer wells in most areas, the lateral extents of TPH, benzene, 1,2-dichloroethane (1,2-DCA), methyl tertiary-butyl ether (MTBE), and TBA in groundwater remain similar to those interpreted during previous monitoring events.

Mr. Wuttig discussed contour maps.

Mr. Defibaugh addressed Ms. McIntosh's concern that the southern product plume appears to have increased by stating that the product was always there; however, it was not visible until the groundwater table began to drop and the product was mobilized.

5. <u>Regulatory Agency Update</u> Paul Cho, Regional Water Quality Control Board

Paul Cho, the Regional Water Quality Control Board (RWQCB) Project Manager for the Norwalk site, stated that the RWQCB met on June 12, 2014 to discuss project development and is delighted with the current progress.

Mr. Cho stated that the RWQCB has received KMEP's no further action request for shallow soil and discussions regarding logistics will take place.

6. <u>Set Date and Agenda for Next Meeting</u>

Ms. Figueroa made a motion to change meeting time to 4:00 p.m. rather than 5:00 p.m. All attendees approved the time change without opposition.

The next two semiannual RAB meetings will be held on Thursday, February 26, 2015 and Thursday, August

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27, 2015, at 4:00 p.m. in the Norwalk Arts & Sports Complex.

Dinner will be provided.

7. Public Comment Period

Ms. McIntosh made a motion to adjourn the meeting. Meeting adjourned at 7:50 p.m.

ACTION ITEMS		
Item	Responsible Party	Due Date
Schedule tour of Reterro technology at Fullerton site.	SGI	9/8/14
Work with Ms. Figueroa to schedule a meeting with all City of Norwalk departments that will be involved (Engineering, City Planners, etc.) to discuss permits, work restrictions and other requirements.	SGI	9/12/14
Inform Mr. Eugene Garcia of the RAB meeting schedule and start time change.	SGI	9/12/14
Next RAB meeting	All	02/26/15

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