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January 10, 2012

Paul Cho, P.G.
Water Resources Control Engineer
California Regional Water Quality Control Board, Site Cleanup Unit IV
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Remedial Action Plan Addendum for Soil
Defense Fuel Support Point Norwalk
15306 Norwalk Boulevard, Norwalk, California
SCP NO. 0286A, Site No. 16638

Dear Mr. Cho:

Parsons has prepared this letter on behalf of the Defense Logistics Agency (DLA) Energy, to provide an addendum to the 2006 Revised Remedial Action Plan[1] for the Defense Fuel Support Point (DFSP) Norwalk Facility in Norwalk, California. This addendum letter only addresses soil and proposes soil cleanup goals for the site. Groundwater will be addressed at a later date.

The Remedial Action Plan (RAP) was submitted in 1995[2] by Groundwater Technology Government Services, Inc. and was revised in 2006 by Parsons[3]. In addition, Parsons submitted a revised RAP progress update in a letter to the Regional Water Control Board (RWQCB), Los Angeles Region on March 15, 2010[4].

IMPLEMENTATION AND CURRENT STATUS OF THE 2006 REVISED RAP

This section discusses any recommendations in the 2006 revised RAP, implementation, and current status.

[1] Parsons, 2006, *Revised Remedial Action Plan, Defense Fuel Support Point Norwalk*, 15306 Norwalk Boulevard, Norwalk, California, September 7.
[2] Groundwater Technology Government Service, Inc. (GSI), 1995, *Final Remedial Action Plan Report, Defense Fuel Supply Point Tank Farm Area*, Norwalk, California. September 14.
[3] Parsons, 2006, *Revised Remedial Action Plan, Defense Fuel Support Point Norwalk*, 15306 Norwalk Boulevard, Norwalk, California, September 7.
[4] Parsons, 2010, *Revised Remedial Action Plan Progress Update, Defense Fuel Support Point Norwalk*, 15306 Norwalk Boulevard, Norwalk, California, SCP No. 0286A, Site No. 16638, March 15.

Soil Vapor Extraction System (SVES): Further SVES operation was recommended to reduce the total petroleum hydrocarbon (TPH) concentrations. The SVES was expanded in various areas, including the truck fueling station area and the north eastern area.

Baseline monitoring of the expanded/redesigned SVES began in January 2011 and continuous operation commenced on January 10, 2011. The SVES is currently operating continuously except for scheduled shut-downs or operation and maintenance (O&M) activities from the four horizontal wells that cover the entire former aboveground storage tank (AST) area and six extraction wells in the north eastern area.

Free Product Recovery System (FPRS): It was concluded that the FPRS using the total fluids wells had reached asymptotic levels and using this system was no longer economical for further product removal at this stage. Parsons recommended using absorbent socks to remove any residual free product remaining in any wells. Absorbent socks were installed in GMW-4 and MW-9 in October 2007 and in GMW-21, GMW-58, TF-9, TF-17, TF-18, TF-20, and PZ-3 during the second quarter of 2007. Currently there are only absorbent socks installed in GMW-21 and TF-17. Change-outs of the absorbent socks are conducted as-needed as part of the routine monitoring at the site. The October 2011 gauging data collected shows product thicknesses ranging between 0.02 and 0.94 feet.

Groundwater Treatment System (GWTS): It was concluded that the GWTS is not an effective treatment technology to reduce the TPH as fuel product concentrations or for mass removal; however, the system does work to maintain hydraulic control of the TPH plume. In the north eastern area it was concluded that additional groundwater extraction wells are needed to prevent off-site migration of the plume. In the north western boundary of the site it was concluded that the GWTS has not been effective in maintaining hydraulic control and additional wells may be needed in this area. In addition, operation of GWTS was recommended in areas where groundwater TPH concentrations exceeded 10,000 µg/L.

Four new groundwater extraction wells with 6-inch diameter casing and screen were installed throughout the site at the following locations: GW-13 in the northwest corner of the site near MW-14, GW-14 in the central tank farm area, GW-15 and GW-16 in the eastern area bordering Holifield Park. The GWTS was also upgraded and expanded to include adequate equipment to handle the additional flow capacity, including switching to GAC and taking the air stripper off-line. The GWTS is currently operating continuously except for schedule shut-downs or O&M activities from two wells in the north western area and two wells in the north eastern area.

Biosparge System: The biosparge system operated on-going before April 24, 2006 when the SVES was shut down. The system operated again between January 2007 and February 2008. In the tank farm area additional biosparge points were recommended near tanks 80006, 80007, and 55004. The biosparge system has been expanded and can begin operation once remedial action for groundwater has been fully assessed and implementation begins.

REMEDIATION PROGRESS AND PLANNED ACTION

Fuel thickness and extent of free product in wells have decreased as a result of the FPR/GWTS and absorbent sock installations. Based on evaluations of the rebound monitoring, some areas have shown decreases in soil gas concentrations while other areas still show high impacts. Groundwater extraction from the northwest corner (extraction wells GW-2 and GW-13) and north-eastern area (extraction wells GW-15 and GW-16) for containment has been effective. Off-site wells continue to show non-detect or decreasing trends in TPH and benzene, toluene, ethylbenezene, and xylenes (BTEX) concentrations. Although TPH concentrations in most wells throughout the site are lower and/or are declining, groundwater extraction has not been effective at mass removal at the site.

One off-site well in Holifield Park adjacent to the east site boundary (GMW-62) continues to contain light non-aqueous phase liquid (LNAPL). A product recovery baildown test was conducted at this well and it was determined that vacuum recovery is an appropriate technology at this well. Once the LNAPL thickness at GMW-62 reaches 1 foot, the LNAPL will be recovered and containerized and disposed of off-site.

Two respiration/rebound monitoring events of the SVES were completed as well as confirmation soil sampling at selected areas, including the containment berms and under concrete foundations (which has not been completed and will continue in the first quarter of 2012). Additional impacted areas were discovered, including the water tank, truck fill station, and the pump house to the south of the truck fill station. A cost analysis and technical evaluation for soil impacts will be conducted to determine the optimal remedial solution and technology to best achieve soil cleanup goals in a reasonable time frame at each area. As an interim remedial measure, SVES should be reactivated and operate for 6 to 9 months then shut down for respiration/rebound monitoring if applicable.

GWTS will be continued for containment of plume and prevent off-site migration in the northwest corner and the north-eastern boundary and will be evaluated after 9 months of operation. Biosparging operation should commence and after one year of biosparging operation, an assessment will be conducted to determine if dissolved groundwater concentrations have decreased. The groundwater remedial options will be assessed and a determination made if more aggressive solutions should be implemented.

PROPOSED SOIL REMEDIATION CLEANUP GOALS

Following the RWQCB's Los Angeles Region 1996 Guidebook[1], Parsons calculated site-specific soil screening levels for TPH and BTEX compounds. These calculations were based specifically on the values provided on Table 4-1 of the guidebook, Maximum Soil Screening Levels for TPH and BTEX above Drinking Water Aquifers. A summary of the calculated soil screening levels for TPH and BTEX compounds is provided on Table 1 of this report. These

[1] California Regional Water Quality Control Board, Los Angeles Region, 1996, *Interim Site Assessment & Cleanup Guidebook,* May.

calculations are primarily based on average lithology types and thicknesses between the sampling depths and the underlying groundwater. The average depth to groundwater beneath the DLA Norwalk site is 26 feet below ground surface.

The RWQCB's Los Angeles Region 1996 Guidebook was also used to calculate soil screening levels for detected volatile organic compounds (VOCs) with established maximum contaminant levels (MCLs). These calculations were based specifically on the attenuation factors provided on Table 5-1 of the guidebook, Average Attenuation Factor for Different Distance above Groundwater and Lithology. A summary of the calculated soil screening levels for these COCs is provided on Table 2 of this report. Similar to above, these calculations are based on average lithology types and thicknesses between the sampling depths and the underlying groundwater.

For other VOCs without MCLs, the regional screening levels (RSLs) for industrial settings were used following the November 2011 USEPA guidelines[5]. These VOCs and corresponding RSLs are provided on Table 3.

UPDATED REMEDIATION SCHEDULE

The revised RAP presented a general estimated project schedule for the soil and groundwater remediation efforts. The updated remediation schedule for soil is presented below and the groundwater remediation schedule will be provided at a later date once a complete assessment and evaluation has been done. The estimated projected schedule could change depending on various elements including site conditions, new technology availability and applicability, regulatory approvals, and subcontract availabilities. In addition, this schedule will be updated on-going as necessary based on observed remedial progress and new findings. However, we will strive to address the remediation as aggressively as possible, and keep the project team updated.

Task:	Date Projected
Soil Remediation Technologies	
SVE &/or Bioventing Operation	January 2012 - May 2014
Conduct Additional Soil Investigation (under concrete foundations)	January 2012 - August 2012
Respiration Test & Soil Confirmation Sampling	May 2014 - October 2014
Potential New Remedial Solution	TBD

[5] USEPA 2011, Regional Screening Level (RSL) Summary Table, November.

Groundwater Remediation Technologies

Groundwater extraction for containment will continue. An evaluation of groundwater remediation technologies will be conducted and remedial action will be proposed and implemented. At this time, the date projected for groundwater remedial implementation is the second half of 2012 through the end of 2014. We are anticipating reaching monitored natural attenuation by the end of 2014 and thereafter continue with a proposed groundwater monitoring plan and schedule.

We await your response to this letter confirming the proposed soil cleanup goals for the DFSP Norwalk site. If you have any questions, please call me at 602-734-1083.

Sincerely,

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Redwan N Hassan, P.G.
Project Manager

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Table 1
Calculated Soil Screening Levels for TPH and BTEX by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 0.5 feet Below Ground Surface (25.5 feet Above Groundwater)				
Soil Types (0.5 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	18.76	6.11	0.63	
Soil Type Percentage	0.74	0.24	0.02	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	500,000	500,000	500,000	**500,000**
TPH as JP-5 (C8-C17)	500,000	500,000	500,000	**500,000**
TPH as Diesel (C5-C25)	1,000,000	1,000,000	1,000,000	**1,000,000**
Benzene	13.02	16.04	71.13	**15.18**
Toluene	456	775	3,739	**614**
Ethylbenzene	1,278	3,192	14,867	**2,072**
Xylenes	3,423	8,481	40,588	**5,553**

Screening Levels for Soil at 5 feet Below Ground Surface (21 feet Above Groundwater)				
Soil Types (5 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	15.08	5.30	0.62	
Soil Type Percentage	0.72	0.25	0.03	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	500,000	500,000	500,000	**500,000**
TPH as JP-5 (C8-C17)	500,000	500,000	500,000	**500,000**
TPH as Diesel (C5-C25)	1,000,000	1,000,000	1,000,000	**1,000,000**
Benzene	11.37	11.92	48.93	**12.61**
Toluene	328	509	2,562	**440**
Ethylbenzene	805	2,217	10,067	**1,435**
Xylenes	2,054	5,878	27,425	**3,768**

Table 1
Calculated Soil Screening Levels for TPH and BTEX by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 10 feet Below Ground Surface (16 feet Above Groundwater)				
Soil Types (10 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	12.81	2.65	0.53	
Soil Type Percentage	0.80	0.17	0.03	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	100,000	100,000	100,000	**100,000**
TPH as JP-5 (C8-C17)	100,000	100,000	100,000	**100,000**
TPH as Diesel (C5-C25)	100,000	100,000	100,000	**100,000**
Benzene	11.00	11.00	44.00	**12.09**
Toluene	300	450	2,300	**391**
Ethylbenzene	700	2,000	9,000	**1,190**
Xylenes	1,750	5,300	24,500	**3,090**

Screening Levels for Soil at 15 feet Below Ground Surface (11 feet Above Groundwater)				
Soil Types (15 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	8.53	1.94	0.53	
Soil Type Percentage	0.78	0.18	0.05	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	100,000	100,000	100,000	**100,000**
TPH as JP-5 (C8-C17)	100,000	100,000	100,000	**100,000**
TPH as Diesel (C5-C25)	100,000	100,000	100,000	**100,000**
Benzene	11.00	11.00	44.00	**12.59**
Toluene	300	450	2,300	**423**
Ethylbenzene	700	2,000	9,000	**1,329**
Xylenes	1,750	5,300	24,500	**3,472**

Table 1
Calculated Soil Screening Levels for TPH and BTEX by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 20 feet Below Ground Surface (6 feet Above Groundwater)				
Soil Types (20 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	4.72	1.19	0.08	
Soil Type Percentage	0.79	0.20	0.01	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	100,000	100,000	100,000	**100,000**
TPH as JP-5 (C8-C17)	100,000	100,000	100,000	**100,000**
TPH as Diesel (C5-C25)	100,000	100,000	100,000	**100,000**
Benzene	11.00	11.00	44.00	**11.42**
Toluene	300	450	2,300	**356**
Ethylbenzene	700	2,000	9,000	**1,067**
Xylenes	1,750	5,300	24,500	**2,755**

Screening Levels for Soil at 25 feet Below Ground Surface (1 foot Above Groundwater)				
Soil Types (25 - 26 feet bgs)	**Sand**	**Silt**	**Clay**	
Average Soil Thickness	0.80	0.18	0.02	
Soil Type Percentage	0.80	0.18	0.02	
Constituent	**Sand Screening Level (µg/kg)**	**Silt Screening Level (µg/kg)**	**Clay Screening Level (µg/kg)**	**Adjusted Screening Level (µg/kg)**
TPH as Gasoline (C4-C12)	100,000	100,000	100,000	**100,000**
TPH as JP-5 (C8-C17)	100,000	100,000	100,000	**100,000**
TPH as Diesel (C5-C25)	100,000	100,000	100,000	**100,000**
Benzene	11.00	11.00	44.00	**11.66**
Toluene	300	450	2,300	**367**
Ethylbenzene	700	2,000	9,000	**1,100**
Xylenes	1,750	5,300	24,500	**2,844**

Notes:
Screening level calculations based on Interim Site Assessment & Cleanup Guidebook (Table 4-1 and examples).
bgs = below ground surface
µg/kg = micrograms per kilogram

Table 2
Calculated Soil Screening Levels for Other VOCs
with Established MCLs by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 0.5 feet Below Ground Surface (25.5 feet Above Groundwater)			
Soil Types (0.5 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	18.76	6.11	0.63
Soil Type Percentage	0.74	0.24	0.02
Attenuation Factor	1.55	3.55	16.58
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	2.40	**1.20**
Methylene Chloride	5	2.40	**12.00**
Methyl-t-Butyl Ether (MTBE)	13	2.40	**31.21**
Styrene	100	2.40	**240.04**
1,1,2,2-Tetrachloroethane	1	2.40	**2.40**
1,1,2-Trichloroethane	5	2.40	**12.00**
Trichloroethene	5	2.40	**12.00**
1,2,4-Trimethylbenzene	5	2.40	**12.00**

Screening Levels for Soil at 5 feet Below Ground Surface (21 feet Above Groundwater)			
Soil Types (5 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	15.08	5.30	0.62
Soil Type Percentage	0.72	0.25	0.03
Attenuation Factor	1.10	3.10	13.65
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	1.98	**0.99**
Methylene Chloride	5	1.98	**9.88**
Methyl-t-Butyl Ether (MTBE)	13	1.98	**25.68**
Styrene	100	1.98	**197.53**
1,1,2,2-Tetrachloroethane	1	1.98	**1.98**
1,1,2-Trichloroethane	5	1.98	**9.88**
Trichloroethene	5	1.98	**9.88**
1,2,4-Trimethylbenzene	5	1.98	**9.88**

Table 2
Calculated Soil Screening Levels for Other VOCs
with Established MCLs by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 10 feet Below Ground Surface (16 feet Above Groundwater)			
Soil Types (10 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	12.81	2.65	0.53
Soil Type Percentage	0.80	0.17	0.03
Attenuation Factor	1.00	2.20	10.60
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	1.52	**0.76**
Methylene Chloride	5	1.52	**7.58**
Methyl-t-Butyl Ether (MTBE)	13	1.52	**19.71**
Styrene	100	1.52	**151.61**
1,1,2,2-Tetrachloroethane	1	1.52	**1.52**
1,1,2-Trichloroethane	5	1.52	**7.58**
Trichloroethene	5	1.52	**7.58**
1,2,4-Trimethylbenzene	5	1.52	**7.58**

Screening Levels for Soil at 15 feet Below Ground Surface (11 feet Above Groundwater)			
Soil Types (15 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	8.53	1.94	0.53
Soil Type Percentage	0.78	0.18	0.05
Attenuation Factor	1.00	1.20	7.60
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	1.35	**0.68**
Methylene Chloride	5	1.35	**6.77**
Methyl-t-Butyl Ether (MTBE)	13	1.35	**17.59**
Styrene	100	1.35	**135.33**
1,1,2,2-Tetrachloroethane	1	1.35	**1.35**
1,1,2-Trichloroethane	5	1.35	**6.77**
Trichloroethene	5	1.35	**6.77**
1,2,4-Trimethylbenzene	5	1.35	**6.77**

Table 2
Calculated Soil Screening Levels for Other VOCs
with Established MCLs by Depth
DFSP Norwalk, Norwalk, CA

Screening Levels for Soil at 20 feet Below Ground Surface (6 feet Above Groundwater)			
Soil Types (20 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	4.72	1.19	0.08
Soil Type Percentage	0.79	0.20	0.01
Attenuation Factor	1.00	1.00	4.60
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	1.05	**0.52**
Methylene Chloride	5	1.05	**5.23**
Methyl-t-Butyl Ether (MTBE)	13	1.05	**13.60**
Styrene	100	1.05	**104.63**
1,1,2,2-Tetrachloroethane	1	1.05	**1.05**
1,1,2-Trichloroethane	5	1.05	**5.23**
Trichloroethene	5	1.05	**5.23**
1,2,4-Trimethylbenzene	5	1.05	**5.23**

Screening Levels for Soil at 25 feet Below Ground Surface (1 foot Above Groundwater)			
Soil Types (25 - 26 feet bgs)	**Sand**	**Silt**	**Clay**
Average Soil Thickness	0.80	0.18	0.02
Soil Type Percentage	0.80	0.18	0.02
Attenuation Factor	1.00	1.00	1.60
Constituent	**Maximum Contaminant Level (µg/kg)**	**Total Attenuation Factor (Af^t)**	**Calculated Screening Level (µg/kg)**
1,2-Dichloroethane	0.5	1.01	**0.51**
Methylene Chloride	5	1.01	**5.06**
Methyl-t-Butyl Ether (MTBE)	13	1.01	**13.16**
Styrene	100	1.01	**101.20**
1,1,2,2-Tetrachloroethane	1	1.01	**1.01**
1,1,2-Trichloroethane	5	1.01	**5.06**
Trichloroethene	5	1.01	**5.06**
1,2,4-Trimethylbenzene	5	1.01	**5.06**

Notes:
Screening level calculations based on Interim Site Assessment & Cleanup Guidebook (Table 5-1 and example) and MCLs.
bgs = below ground surface
µg/kg = micrograms per kilogram

Table 3

Soil Screening Levels for Other VOCs with No MCLs by Depth

DFSP Norwalk, Norwalk, CA

Other Detected VOCs	Highest Reported Concentration (µg/kg)	Regional Screening Level* (µg/kg)
Acetone	160	630,000,000
Bromomethane	460j	32,000
2-Butanone	51	200,000,000
n-Butylbenzene	72,000	51,000,000
sec-Butylbenzene	22,000	Not established
tert-Butylbenzene	1,300j	Not established
Carbon disulfide	4.3j	3,700,000
Chlorobenzene	32j	1,400,000
Chloroethane	2.1	Not established
Chloroform	220	1,500
2-Chlorotoluene	310j	Not established
4-Chlorotoluene	110j	Not established
1,2-Dibromo-3-chloropropane	990j	69
1,2-Dibromoethane	8.5	170
Dichlorodifluoromethane	7.2	400,000
Diisopropyl Ether (DIPE)	0.46j	10,000
Ethanol	130j	Not established
2-Hexanone	46	1,400,000
Isopropylbenzene	39,000	Not established
p-Isopropyltoluene	25,000	Not established
Naphthalene	55,000	18,000
n-Propylbenzene	98,000	Not established
Tert-Butyl Alcohol (TBA)	420	Not established
1,2,3-Trichlorobenzene	220j	490,000
1,2,3-Trichloropropane	5,900	95
1,3,5-Trimethylbenzene	180,000	10,000,000

Notes:

* Regional Screening Levels obtained from the USEPA, November 2011 Regional Screening Level (RSL) Summary Table (industrial settings).

µg/kg = micrograms per kilogram