



CONSOLIDATED ENGINEERING
L A B O R A T O R I E S

November 18, 2005
Revised December 14, 2005

RECEIVED

By loprojectop at 4:12 pm, May 24, 2006

City of Livermore
City Hall, Engineering Division
1052 South Livermore Avenue
Livermore, California 94550-4899

Attention: Robert Tingley - Associate Engineering Technician

Subject: **Environmental Sampling, Testing and Evaluation of Soil**
Livermore Airport Jet Fuel Line Replacement
Livermore, California
CEL Proposal No. 81-01824-PW (10-00431-PW-CS)

Dear Mr. Tingley:

Pursuant to your request, Consolidated Engineering Laboratories (CEL) has provided environmental testing services for onsite soil at the subject site. The project site is located in Livermore Municipal Airport, off of Airway Boulevard, just inside the airport boundary near the airport entrance, just east of Terminal Circle. Our representative visited the site on November 10, 2005, and collected 15 individual soil samples at various locations within and near a jet fuel line excavation located at the Livermore Airport, Livermore, California. Soil samples were collected by hand in the trench excavation bottoms and nearby stockpiles.

The sample locations are shown on the attached Figure 1. Sample 1-1 was obtained in the trench excavation at a depth of two-feet. Samples 1-2 through 1-5 were collected at the trench bottom at a depth of about 3.5-feet and 1-6 and 1-7 was obtained at a depth of three-feet. The remaining samples, 1-8 through 1-15, were obtained about one-foot into the two soil stockpiles shown on Figure 1. The small stockpile is a mixture of soil and pea gravel and the large stockpile is dirty pea gravel.

The soil samples were transported to a California state-certified laboratory for testing. Proper chain-of-custody procedures were followed. The soil samples were analyzed for the presence of Volatile Organic Compounds by GC/MS (EPA 8260B), Nonhalogenated Organics using GC/FID – Modified (Diesel Range Organics) (EPA8015B), Inductively Coupled Plasma – Atomic Emission Spectrometry (EPA 6010B/7471A), Inductivity Coupled Plasma – Atomic Emission Spectrometry – STLC Citrate (EPA 6010B), and Mercury in Solid or Semisolid Waster (Manual Cold Vapor Technique). Copies of the laboratory reports are attached.



Analytical results were compared to pertinent Soluble Threshold Limit Concentration (STLC), Total Threshold Limit Concentration (TTLC), Environmental Screening Levels (ESL's) for surface soil, and Preliminary Remediation Goals (PRG). Contaminant concentrations in soil are generally considered to be nonhazardous if they are equal or less than the TTLC, and less than 10 times the STLC as defined by the State of California, Title 22. Two other screening tools used to assess the acceptability of soils are the Preliminary Remediation Goals (PRGs) for industrial soil provided by the US EPA, and the Environmental Screening Levels provided by the San Francisco Bay Regional Water Quality Control Board for shallow soils where groundwater is not a current or potential source of drinking water (commercial/industrial land use area). The attached Table 1 summarizes the results of the analytical testing. Test results in bold indicate contaminant concentrations in excess of various regulatory guidelines.

Several constituents were found to be above regulatory guidelines. Gasoline concentrations in Samples 1-1, 1-8, 1-9, 1-10 and 1-11 were high. Concentrations ranged from 6,000 ppm to 360,000 ppm. Toluene was detected over the ESL limit in Samples 1-1, 1-9, and 1-11. In particular, the concentration of Toluene in Sample 1-11 was about 420% higher than the ESL limit. The concentration of Total Xylenes in Sample 1-1 exceeded the ESL. Diesel Range Organics were detectable above the ESL limit. The ESL for DRO is 500 ppm, and concentrations reported in Samples 1-8, 1-9, 1-10, and 1-11 ranged from 710 to 1,100 ppm. Motor oil and MTBE were below action levels or were non-detectable in all the samples.

Concentrations of metals were generally below the screening levels. However, the concentration of Cobalt was above the ESL of 10 ppm in Samples 1-1, 1-2, 1-3, 1-5, 1-13, 1-14, and 1-15. High Chromium levels were detected in Samples 1-1 and 1-14. The STLC limit for Chromium is 50 ppm, and concentrations were detected at 54 and 55 ppm in the two samples. Additional WET (Waste Extraction Test) testing was performed on samples 1-1, 1-2, and 1-14 on December 12, 2005. The WET Chromium results were well below the STLC limit for Chromium.

It should be noted that the above screening tools are generally for action levels for contaminants in soil that is to remain in place, and different criteria may apply for soil that is to be transferred to or from a site. The local landfill or other location of proposed exported soil should be contacted to determine their requirements for accepting this material. The reported results are from representative samples of the soil, and do not necessarily represent the cleanliness of the entire site. These results should not be considered a clean bill of health, or prognosis of soil cleanliness. Local governing agencies may have stricter guideline standards that will govern this disposal of the soil.



The test results indicate that the trenches for the jet fuel line are below action levels except the small stub out trench in the area of Sample 1-1. Further study in this area is warranted. The small stockpile of soil and pea gravel can be utilized onsite for backfill. The larger pea gravel stockpile will either have to be remediated or disposed properly.

We hope this provides the necessary information. If you should have any questions regarding this letter, please contact the undersigned at (925) 314-7100.

Sincerely,

CONSOLIDATED ENGINEERING LABORATORIES

William R. Stevens, PE 43010, GE 2339
Principal Geotechnical Engineer



Marc Hachey, P.G. 7833
Project Geologist

Attachments: Figure 1 Site plan
Table 1 – Summary of Analytical Data
STL San Francisco Analytical Lab Report, 11/15/05, 66 pp
STL San Francisco Analytical Lab Report, 12/12/05, 12 pp

Distributions: 2 plus email to Addressee, (925/960-4551, Fax 925/960-4504, rctingley@ci.livermore.ca.us)

MAH/WRS:pmf

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TABLE 1 (Samples 1-1 through 1-15)
SUMMARY OF ANALYTICAL DATA

Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Gasoline Range Organic		NA	400	NA	NA
1-1 (2)	8,000				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8 (2)	260,000				
1-9 (2)	6,000				
1-10 (2)	310,000				
1-11 (2)	360,000				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Benzene		NA	0.38	NA	NA
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Toluene		NA	9.3	NA	NA
1-1 (2)	59				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9 (2)	12				
1-10	ND				
1-11 (2)	3,900				
1-12	ND				
1-13	8.3				
1-14	5.6				
1-15	ND				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels –ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Ethyl Benzene		NA	32	NA	NA
1-1	17				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Total Xylenes		NA	2.3	NA	NA
1-1 (2)	210				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Diesel Range Organics		NA	500	NA	NA
1-1	200				
1-2	ND				
1-3	ND				
1-4	6.1				
1-5	61				
1-6	ND				
1-7	ND				
1-8 (2)	1,100				
1-9 (2)	710				
1-10 (2)	750				
1-11 (2)	800				
1-12	16				
1-13	15				
1-14	7.5				
1-15	3				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels--ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Motor Oil Range Organics		NA	1,000	NA	NA
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	65				
1-13	68				
1-14	ND				
1-15	ND				
MTBE		NA	5.6	NA	620
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	NA				
1-9	ND				
1-10	NA				
1-11	NA				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Antimony		15	40	500	31
1-1	3.8				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Arsenic		5	5.5	500	39
1-1	5.5				
1-2	3.9				
1-3	4.1				
1-4	2.1				
1-5	3.1				
1-6	2.7				
1-7	1.6				
1-8	ND				
1-9	1.2				
1-10	1.4				
1-11	1.3				
1-12	1.7				
1-13	4.2				
1-14	4.1				
1-15	4.1				
Barium		100	1,500	10,000	5,400
1-1	170				
1-2	190				
1-3	180				
1-4	35				
1-5	140				
1-6	45				
1-7	26				
1-8	35				
1-9	27				
1-10	46				
1-11	46				
1-12	49				
1-13	160				
1-14	170				
1-15	150				
Beryllium		0.75	8.0	75	150
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels --ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Cadmium		1	7.4	100	3.7
1-1	1.6				
1-2	1.5				
1-3	1.5				
1-4	1.0				
1-5	1.3				
1-6	1.2				
1-7	0.8				
1-8	0.5				
1-9	0.5				
1-10	0.8				
1-11	1.2				
1-12	0.9				
1-13	1.5				
1-14	1.5				
1-15	1.4				
Chromium -- Total		5	58	NA	210
1-1 (1)	54				
1-1 WET	0.12				
1-2	50				
1-2 WET	0.89				
1-3	48				
1-4	15				
1-5	41				
1-6	15				
1-7	14				
1-8	11				
1-9	11				
1-10	19				
1-11	41				
1-12	18				
1-13	48				
1-14 (1)	55				
1-14 WET	0.17				
1-15	50				
Cobalt		80	10	8,000	4,700
1-1 (2)	14				
1-2 (2)	14				
1-3 (2)	14				
1-4	4.7				
1-5 (2)	11				
1-6	7.8				
1-7	3.4				
1-8	3.9				
1-9	3.5				
1-10	5.9				
1-11	8.2				
1-12	9.7				
1-13 (2)	13				
1-14 (2)	14				
1-15 (2)	13				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Copper		25	230	2,500	2,900
1-1	35				
1-2	30				
1-3	31				
1-4	11				
1-5	26				
1-6	15				
1-7	8.3				
1-8	9.1				
1-9	7.5				
1-10	13				
1-11	17				
1-12	19				
1-13	27				
1-14	29				
1-15	27				
Lead - Total		5	750	1,000	400
1-1	7.5				
1-2	6.6				
1-3	6.9				
1-4	4.0				
1-5	6.1				
1-6	4.4				
1-7	3.0				
1-8	10				
1-9	8.7				
1-10	10				
1-11	5.2				
1-12	2.6				
1-13	7.3				
1-14	7.4				
1-15	7.8				
Molybdenum		350	40	3,500	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels –ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Nickel		20	150	2,000	1,600
1-1	100				
1-2	93				
1-3	92				
1-4	28				
1-5	73				
1-6	28				
1-7	19				
1-8	16				
1-9	22				
1-10	32				
1-11	28				
1-12	40				
1-13	100				
1-14	110				
1-15	98				
Selenium		1	10	100	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Silver		5	40	500	390
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				



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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels -ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Thallium		7	13	700	5.2
1-1	ND				
1-2	ND				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	ND				
1-14	ND				
1-15	ND				
Vanadium		24	200	2,400	550
1-1	25				
1-2	25				
1-3	25				
1-4	12				
1-5	22				
1-6	28				
1-7	11				
1-8	11				
1-9	6.7				
1-10	12				
1-11	28				
1-12	13				
1-13	22				
1-14	22				
1-15	23				
Zinc		250	600	5,000	23,000
1-1	47				
1-2	42				
1-3	45				
1-4	72				
1-5	39				
1-6	31				
1-7	20				
1-8	17				
1-9	22				
1-10	24				
1-11	26				
1-12	30				
1-13	43				
1-14	44				
1-15	41				



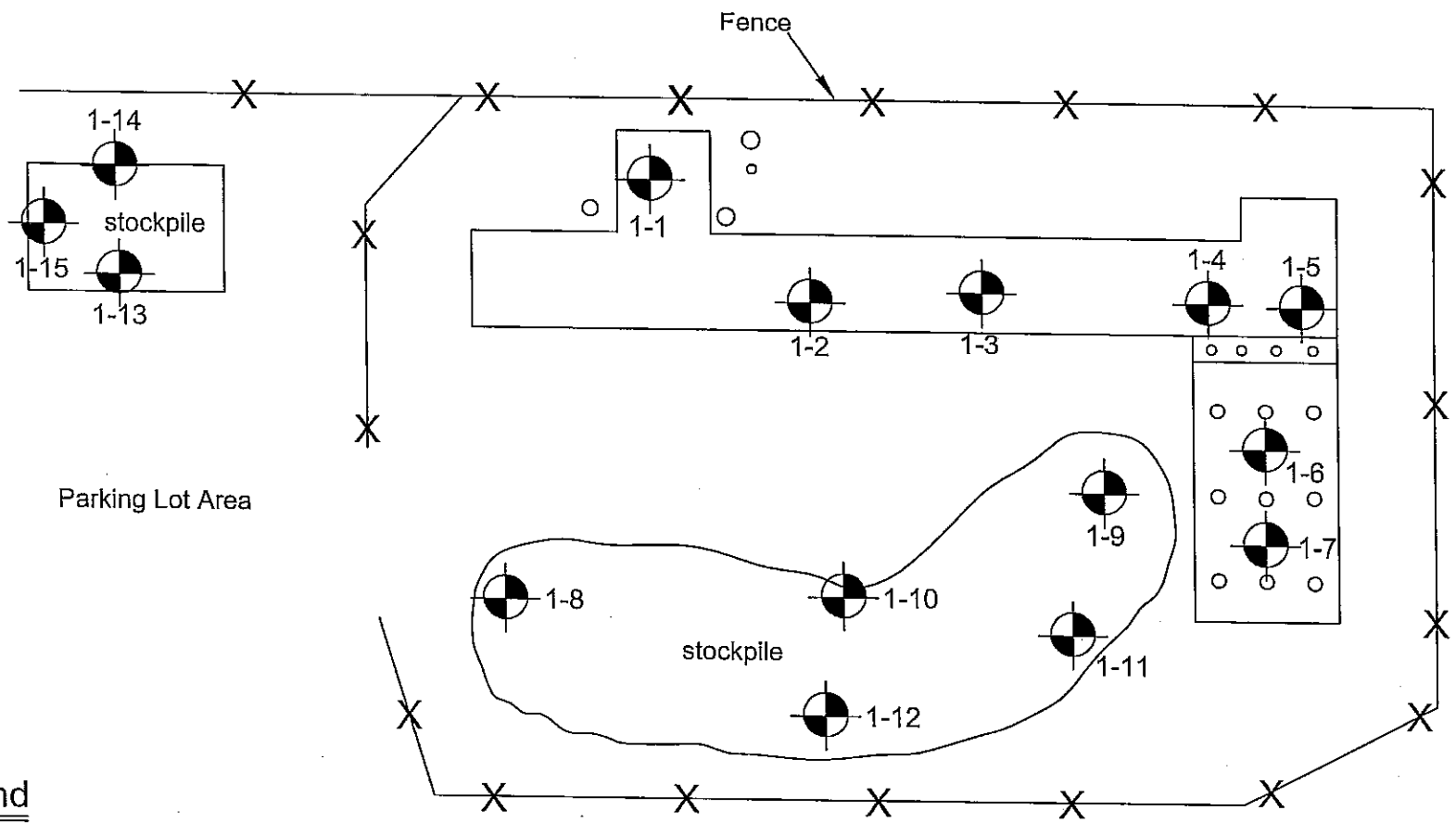
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Constituent	Reported Concentration (ppm)	California Title 22 STLC (ppm)	SFBRWQCB Environmental Screening Levels --ESLs (ppm)	California Title 22 TTLC (ppm)	US EPA Residential PRG (ppm)
Mercury		0.2	10	20	2.3
1-1	0.06				
1-2	0.06				
1-3	ND				
1-4	ND				
1-5	ND				
1-6	ND				
1-7	ND				
1-8	ND				
1-9	ND				
1-10	ND				
1-11	ND				
1-12	ND				
1-13	0.06				
1-14	0.05				
1-15	0.05				



ND Non Detectable

NA Not Applicable/Available

- (1) More than 10 times the California STLC. However, the test results are below the California TTLC, San Francisco Bay Regional Water Quality Board ESLs, and the US EPA PRG.
- (2) More than the San Francisco Bay Regional Water Quality Board ESLs. However, the test results are below the California TTLC, STLC and US EPA PRG.



Legend

-  1-1 - Approximate Boring Location
-  - Bollards



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Airport Jet Fuel Line Replacement

81-01824

November 2005

Livermore, California

Figure 1
Site Plan