



APPENDIX I

**Memorandum—Preliminary Cost Estimate for Removal of Impacted Soil at
Granite Construction Company Facility in Watsonville, California**

Mr. Luis Mendez
December 15, 2009
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The results of the 2005 and 2009 Phase II investigations indicated that soil is impacted with elevated concentrations of petroleum hydrocarbons in the drainage ditch adjacent to the Granite Construction facility at boring locations SB-45, SB-46, SB-98, SB-99, SB-101, and SB-102 (approximate milepost 2.32).

The analytical results indicate that petroleum hydrocarbon impacts that exceed relative screening levels² extend to depths of at least 12 feet bgs, and are generally less than 20 feet bgs. The lateral extent of petroleum hydrocarbon impacts extends over a distance of at least 90 feet along the drainage ditch. Based on the findings, it is likely that the petroleum hydrocarbon impacts are generally confined to the area of the drainage ditch and appear to be related to a discharge pipe emanating from the Granite Construction facility.

POTENTIAL REMEDIAL APPROACH AND SCOPE OF WORK

Based on the results of the Phase II investigations, remediation and/or mitigation measures may be required to address petroleum-affected soil on the Branch Line property adjacent to the Granite Construction facility. The goal of the remedial measures is the long-term protection of human health and the environment. To address this goal we are assuming that remedial measures include removal of petroleum-impacted soil near SB-45 to a depth of approximately 10 to 20 feet bgs over a distance of approximately 100 feet along the ditch (approximately 1500 square feet). The bottom 9 feet of resulting trench will be backfilled with controlled density fill, followed by imported soil that will be nominally compacted.

Prior to construction activities we recommend pre-characterizing the soil to determine the excavation area. For estimating purposes, we have assumed that the excavated soil will be classified as non-hazardous waste. It is unknown whether groundwater, which was observed to occur at a depth of approximately 16.5 feet bgs, is impacted by the petroleum present in soil. It is anticipated that the Santa Cruz County Health Services Agency would require that this potential impact be evaluated. The depth of the excavation would depend on factors such as whether groundwater is impacted and potential future construction requirements along the Branch Line in this area. Further, we recommend that actions be taken to suspend discharge from the Granite Construction facility into the drainage ditch.

PRELIMINARY COST ESTIMATE TO REMOVE IMPACTED SOIL

The preliminary cost estimate for pre-characterizing the excavation area boundaries and performing soil excavation and backfilling activities is presented in Table 1 (attached) and summarized below. These order-of-magnitude costs are based on general assumptions, as

² Human health direct exposure environmental screening levels (ESLs) for industrial/commercial shallow soil.

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presented in Table 1, and may be refined as additional data regarding extent of impacts becomes available.

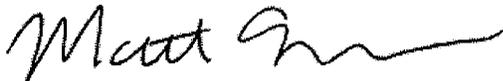
• Pre-Characterization of Excavation Area	\$35,000
• Soil Excavation and Backfilling	\$273,300
Subtotal	\$308,300

The costs presented above do not include significant regulatory interaction or public outreach. We recommend that additional allowances be included to account for these items.

• Regulatory Interaction and Public Outreach	\$ 25,000
Total	<u>\$333,300</u>

Please feel free to call us should you have any questions.

Sincerely yours,
AMEC Geomatrix, Inc.



Matthew Goerz
Senior Scientist



Susan Gallardo, PE
Principal Engineer

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Attachments: Table 1: Preliminary Cost Estimate for Soil Removal for Off-Site Disposal



TABLE 1

PRELIMINARY COST ESTIMATE FOR SOIL REMOVAL FOR OFF-SITE DISPOSAL

Santa Cruz Branch Line

Petroleum-Impacted Soil near Granite Construction Facility, Watsonville, CA

Description: soil excavation of area on right-of-way, estimated to be over an area of 1500 sq. ft. and to a depth between 10 and 20 ft. To minimize disruption, it is assumed that excavation will be conducted by slot-trenching methods. Pre-characterization of excavation area will be performed to vertically and laterally identify the excavation boundaries. We have assumed that only limited regulatory interaction will be required.

Task Description		Quantity	Unit	Unit Cost	Amount
1. PRE-REMEDICATION ACTIVITIES					
1.1 Pre-characterization of Excavation Area		1	allowance	\$25,000	\$25,000
1.2 Work Plan		1	lump sum	\$10,000	\$10,000
TOTAL ESTIMATED PRE-REMEDICATION ACTIVITIES COST					\$35,000
2. CONSTRUCTION					
2.1 Contractor and Equipment					
2.1 a	Site Surveying	1	allowance	\$3,000	\$3,000
2.1 b	Subsurface Utility Locator	1	allowance	\$500	\$500
2.1 c	Mobilization/demobilization	1	allowance	\$3,000	\$3,000
2.1 d	Permits	1	allowance	\$1,000	\$1,000
2.1 e	Soil Excavation (slot trenching) ¹	1,418	ton	\$12	\$17,010
2.1 f	Waste Characterization	1	allowance	\$3,500	\$3,500
2.1 g	Transport and Disposal of Soil (assume 75% is non-haz)	1,063	ton	\$40	\$42,525
2.1 h	Transport and Disposal of Soil (assume 25% CA haz waste due to arsenic)	354	ton	\$85	\$30,122
2.1 i	Controlled Density Fill (approximately bottom 9')	500	cubic yard	\$100	\$50,000
2.1 j	Backfill with Compaction	444	cubic yard	\$11	\$4,700
2.1 k	Compaction Testing	1	allowance	\$4,000	\$4,000
2.1 l	Post-remediation Report	1	lump sum	\$15,000	\$15,000
<i>Estimated Contractor and Equipment Costs</i>					<i>\$174,357</i>
2.2 Capital Contingency Costs²					
2.2 a	Construction Contingency	15%			\$26,154
2.2 b	Scope Contingency	15%			\$26,154
<i>Estimated Capital Contingency Costs</i>					<i>\$52,307</i>
<i>Subtotal Construction Costs</i>					<i>\$226,664</i>
2.3 Capital Supervision & Design					
2.3 a	Project Management	8%			\$13,949
2.3 b	Remedial Design ³	15%			\$15,257
2.3 c	Construction Management	10%			\$17,436
<i>Estimated Supervision & Design Costs</i>					<i>\$46,641</i>
TOTAL ESTIMATED CONSTRUCTION COSTS⁵					\$273,300
TOTAL ESTIMATED PROJECT COST:					\$308,300

Note

- 1 Assume volume of excavation of about 944 cubic yards, at 1.5 tons per cubic yard.
- 2 Costs based on percentage of total estimated contractor and equipment costs.
- 3 Cost based on percentage of total estimated contractor and equipment cost minus transportation and disposal fees.
- 4 The costs presented above are not based on contractor's cost estimates and are intended to present an order-of-magnitude estimate only. The approach for developing the cost estimate is from the U.S. EPA guidance document entitled *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study, July 2000*.
- 5 Rounded to nearest \$100.