

Bentley Mall Soil Sample Results Summary  
Tax Lot 217, Section 2, Township 1 South, Range 1 West  
Fairbanks Meridian  
Fairbanks, Alaska

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**ALASKA RESOURCES & ENVIRONMENTAL SERVICES, LLC**



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## **BENTLEY MALL NOVEMBER 2004 SOIL SAMPLE RESULTS/ SUMMARY**

### **Overview**

As part of the Bentley Mall Phase II Environmental Site Assessment, soil borings and soil samples were collected in November 2004 in accordance with the April 2004 Work Plan that was submitted and approved by the Alaska Department of Environmental Conservation. The purpose of the sampling was to characterize the hydrogeologic structure and to determine the concentration of contaminants in the unsaturated zone.

### **Soil Borings**

Work consisted of taking three soil borings to 70 feet below ground surface (bgs) using a 4 ¼" ID hollow core stem auger with 2 ½" split spoon. A 2 ½ foot sample was collected every 5 foot interval by split spoon method using a 340 lb hammer. Soil samples were collected and logged accordingly.

The soil borings were located in areas estimated to have less than 10 parts per billion (ppb) PCE in the groundwater to avoid the potential of creating a preferential pathway for contaminants. One soil boring (BH-2) was located up-gradient from the contaminant plume, one boring was located cross-gradient (BH-1), and the other boring was located down-gradient (BH-3) from the suspected source area.

The soil borings were triangulated so interpolation of lithology could be inferred between borings. Location of soil borings are shown in Figure 1.

### **Soil Borings Results/Lithology**

Lithology in all three boreholes consisted of unconsolidated sediments to depth of 70 feet bgs. Sediments consisted primarily of course-grained silty and sandy gravels interspersed with layers of well-graded clean sands. Fine-grained sediment (silt) was encountered 2-4' bgs, however, no confining layers or permafrost was encountered during the investigation. Correlation of lithology was fairly consistent in all three borings thus allowing for accurate interpolation between borings.

Groundwater was estimated at 16.0 feet bgs at the time of the investigation.

### **Soil Sample Results**

Soil samples were collected on Bentley Mall property from six different locations based on previous soil-gas survey results (August 2003, June 2004). Samples were collected by split spoon method and laboratory analyzed for volatile organic compounds (VOCs) using EPA Method SW8260B. A soil grab sample was collected from the 5, 10, and 15

foot interval from each sample location. Field blanks and duplicate samples were also collected for quality assurance/quality control purposes. Laboratory results indicate that the only VOC detected in all samples was tetrachloroethene (PCE). Samples were non-detect for all other VOCs. Sample locations are shown in Figure 2. Summary of laboratory results are shown in Table 1. Full laboratory analysis report is included as Appendix A.

**Table 1  
Laboratory Soil Sample Results**

<b>Sample ID</b>	<b>Depth bgs (feet)</b>	<b>Results/PCE (ppb)</b>	<b>ADEC Soil Cleanup Level/PCE (ppb)</b>
BM1-5	5	<b>160</b>	30
BM1-10	10	<b>79</b>	30
BM1-15	15	<b>47</b>	30
BM2-5	5	<b>460</b>	30
BM2-10	10	<b>370</b>	30
BM2-15	15	<b>390</b>	30
BM3-5	5	<b>41</b>	30
BM3-10	10	<b>120</b>	30
BM3-15	15	<b>140</b>	30
BM4-5	5	<b>590</b>	30
BM4-10	10	<b>160</b>	30
BM4-15	15	<b>59</b>	30
BM5-5	5	<b>42</b>	30
BM5-10	10	<b>31</b>	30
BM5-15	15	0	30
BM6-5	5	0	30
BM6-10	10	9.7	30
BM6-15	15	8.5	30
DUP1		<b>170</b>	30
DUP2		0	30

ppb = parts per billion  
**BOLD** Results above ADEC Regulatory Limit

- Note: 1) All other VOC compounds were non-detect (less than the practical quantitation limit)  
 2) DUP1 is a duplicate sample to BM3-15  
 3) DUP2 is a duplicate sample to BM5-10

## **Conclusion**

Soil borings indicate that there are no confining layers or aquatards present down to the sampling depth of 70 feet bgs. Laboratory soil sample results indicate that PCE is above

ADEC soil cleanup levels for all locations with the exception of the site identified as BM6 which is located south of the West Satellite Building and was the furthest west sampling point. The levels of PCE were found to generally decrease with depth which may be attributed to dissolution and sorption processes as a result of the fluctuating groundwater table.

### **Recommendations**

Based on soil sample results, it is recommended that groundwater samples be concentrated in areas showing highest levels of PCE in the soil. Results collected from groundwater and soil samples will be used to update the conceptual site model and will also be used to evaluate potential vapor intrusion into buildings within the source area.