4.1.1 Field Headspace Screening of Soil Sampling. Headspace screening was conducted on the 518 soil samples collected as part of these investigations. Headspace readings ranged from 0 ppm in several samples to 499 ppm in a sample from 8 to 10 feet in boring B-112. Samples with headspace readings greater than 100 ppm were collected from borings B-2, B-5, B-112, B-126, B-150, and B-151. In general, elevated headspace readings were obtained for samples in which the laboratory analyses indicated halogenated volatile organic compounds were present. Although the jar-headspace and the laboratory analysis did not correlate directly, this technique was useful as a screening tool in identifying samples for further laboratory analysis.

4.1.2 Field GC Analysis of Selected Volatile Organic Compounds. Six of nine calibrated VOCs were detected at least once in samples analyzed on the field laboratory GC (Table 4-2). Compounds detected included: TCE; PCE; cis-1,2-DCE; trans-1,2-DCE; 1,1,1-TCEA; and toluene. TCE was found in 86 percent of samples analyzed, and was the only compound present at a concentration greater than 1 milligram per kilogram (mg/kg) in the soil. Toluene was the next most frequently detected VOC, and was found in 20 percent of the samples analyzed. The remaining four VOCs were detected sporadically and at low concentrations.

TABLE 4-2

SUMMARY OF FIELD GAS CHROMATOGRAPH ANALYSIS OF SOIL SAMPLES
AT GENERAL ALUM AND CHEMICAL CORPORATION FACILITY
SEARSPORT, MAINE

Compound	Range (µg/kg)	Frequency of Detection	Percent Occurence (%)	Borings Containing VOCs >1 mg/kg
TCE	8-1,100	77/90	86	B101,B150,B151,B153
PCE	140	1/90	1	--
t-1,2-DCE	5-620	7/90	8	--
c-1,2-DCE	28-110	10/90	11	--
1,1,1-TCEA	180-530	2/90	2	--
Toluene	9-110	18/90	20	--

Soil data maps showing the distribution of VOCs detected in the field GC analysis are in Figure 4-1. Concentrations of TCE exceeding 1 mg/kg in the soil were detected in borings B-150, B-151, and B-153 at depths ranging from 6 to 14 feet below ground surface. These borings are located in the former pre-heater degreasing area (Area 2). Low levels of TCE (0.5 to 1 mg/kg) were also detected in samples obtained from B-101, B-107, B-112, and B-140 at depths ranging from 2 to 14 feet, as shown on Figure 4-1. Generally, the higher concentrations of TCE are restricted to the shallow glaciomarine sediment layer overlying the till unit at these locations.

4.1.3 Laboratory Chemical Analysis. Low levels of five VOCs: trichloroethene, 1,2-dichloroethene, toluene, ethylbenzene, and xylene, were detected in soil samples submitted for laboratory chemical analysis during the three phases of the field investigation. Table 4-1A presents the analytical laboratory VOC sampling detections, Table 4-1B presents all the soils analyses, and Table 4-4 summarizes the results. Note that the 11 samples (B-100-series) submitted during the Phase 2 field investigation which exceeded the required method holding time are included in Table 4-1A and Table 4-1B, but we did not include this data in our calculations on Table 4-3. TCE and toluene were the most frequently detected VOCs found in the laboratory chemical data, occurring in 27 and 46 percent, respectively, of the samples