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MEMORANDUM TO FILE

TO: File, KAFB/red/93

THROUGH: Edward Horst, RCRA Program Manager, and Steve Alexander, Technical Section Supervisor

FROM: Ron Kern, Technical Program

DATE: January 28, 1993

SUBJECT: **Summary and Review of Investigations at KAFB-Battery Shop French Drain**

The Technical Section, as requested by Stephanie Stoddard of the RCRA Permitting Program, was asked to do a technical review of the documents listed below concerning a demonstration of clean closure of the French Drain (**FD**) unit at Kirtland Air Force Base (**KAFB**).

H+GCL, as consultant to KAFB on the Battery Shop French Drain site, has prepared a (draft) Closure Plan (May 12, 1989); a Soil-Vapor Survey report (May 22, 1992); and a Results of Subsurface Investigation report (September 30, 1992).

The Waste Management Unit has a FD located approximately 30' northwest of Bldg. 20423, a Battery Shop (Fig. 1). The FD was constructed to receive wastewater, battery acid, and wash water from vehicle maintenance operations conducted in Bldg. 20423.

The FD was built in 1977. The FD was constructed of precast concrete pipe (4' diameter X 4' length) set vertically in the ground at 10" below surface (Fig. 2). Wastewater flowed to the FD through two 3" PVC pipes buried 18" below surface. The original excavation (4' diameter) extended to 20' underground and was filled with gravel and limestone (**LS**) chips to neutralize acid. Discharges to the FD ceased in June, 1988. The FD was subsequently closed by filling and capping with concrete (date unknown).

The KAFB site is located on a broad alluvial fan composed of thick sand and gravel channel deposits, interbedded with minor, silt and clay-rich overbank and abandoned channel deposits. At the FD site, the water table is approximately 460' below surface. The groundwater gradient is very slight to the northeast.

The contaminant of concern is lead (**Pb**) which may have been transported within the battery acid. Volatile Organic Contaminants (**VOC**) are also of concern because of proximity of the FD to a vehicle maintenance shop (Bldg. 20423). Acidity (**pH**) of the soil

is also of concern (approx. 350 gals./yr. of spent sulfuric acid was discharged to the drain). VOC's were not reported as having been discharged to the FD.

RESULTS OF INVESTIGATIONS:

1. Soil Boring Program (March, 1989):
   Program was designed to determine lateral and vertical extent, plus magnitude, of any hazardous constituent(s). Six boreholes were drilled and sampled to a depth of 50' (see Fig. 3 for borehole locations). Samples were collected using a hollow-stem auger rig with a continuous-core sampling device (5' length). Samples were analyzed accordingly for EP Toxicity levels of Pb, for pH, and for chlorinated and aromatic solvents.

   Pb (**36.6 mg/kg**) was detected in the FD hole (**SB-5**) at a depth of 30'. Pb values of 3.2 mg/kg or less occurred in other sampling intervals and holes. VOC's (**Methods 8010 & 8020**) detected included measurable amounts of toluene, xylene, methylene chloride (**MeCl**), chloroform, ethylbenzene, and 1,2-trans dichloroethane.

   Based on these data, NMED requested additional work at the site. The Work Plan included a soil-vapor survey to screen for VOC's and a subsequent soil boring and sampling program. The Work Plan was approved by NMED on March 5, 1992.

2. Soil-Vapor Survey (May, 1992):
   Survey points were placed on a 100' X 100' grid centered on the FD. Samples were taken from a 5' depth using a probe and portable gas chromatograph. There were 32 sample stations. Survey results are shown in Fig. 4. TCE occurs in 15 of 32 samples and is apparently sourced in the Contractor's Yard west of Bldg. 20423. Analysis also indicated 38 ppb of PCE and 1 ppb of O-Xylene near the PVC pipes that led to the FD. Ethylbenzene was detected in 5 of 32 samples, located at 100' to 300' to the west, north, northeast, and southeast of the FD (Fig. 4). Benzene and P,M Xylene were also detected in some samples of the survey.

3. Subsurface Investigation (July, 1992):
   Program was designed to determine horizontal and vertical extent of soil contamination at the battery shop. Five boreholes were drilled and sampled to depths ranging from 65' to 100' below surface (see Fig. 5 for borehole locations and depths). Soil samples were obtained using split spoon sampling (2' length) at 10' intervals in advance of auger

boring. Soils were checked on site for approximate VOC content by using an Hnu Photoionization Detector (**PID**) to determine when the borehole progressed at least 30' beneath the limit of any VOC plume. Samples were analyzed for total Pb (Method 200.7/6010) and for VOC's (Method 8240).

Pb values in analyzed samples (not all samples were analyzed) varied from less than 5 ppm to 11 ppm (mg/kg). H+GCL concluded that these values were well below interim action level of 200 ppm level for total Pb stipulated by NMED and Superfund.

MeCl was the only VOC detected and it was found in 2 samples (Table 1). H+GCL concluded that these detectable levels of MeCl were probably due to laboratory contamination.

CONCERNS:

1. No material (LS chips, gravel, or soil) was apparently removed from the FD prior to being filled with concrete and capped. The Draft Closure Plan, which became the Closure Plan (per Stephanie Stoddard) did not really stipulate necessity for removal of material.

2. During H+GCL's soil-vapor survey, there was an apparent "halo" of ethylbenzene (5 of 32 samples) within 100' to 300' of the FD. The last program of soil boring and analysis may not have tested for this possible contamination.

3. During H+GCL's soil-vapor survey, PCE and O-Xylene were detected near the former pipes (removed) leading from Bldg. 20423 to the FD. Subsequent borehole drilling and analysis may not have addressed this possible contamination.

4. Detectable MeCl occurred in two samples from hole SB-4 in the last drilling program. H+GCL assumed laboratory contamination, but there was no support for this contention (**analytical reports for those samples are not included in NMED's copy of H+GCL's last report**).

5. There is no indication if laboratory Detection Levels (**DL**) and Practical Quantitation Limits (**PQL**) are the same or if DL is less than the PQL, which may be preferable.

The above-mentioned concerns were written and related to Stephanie Stoddard, RCRA Permitting Program, on January 28, 1993.

cc: Steve Alexander, Technical Section Supervisor
Stephanie Stoddard, RCRA Permitting Program

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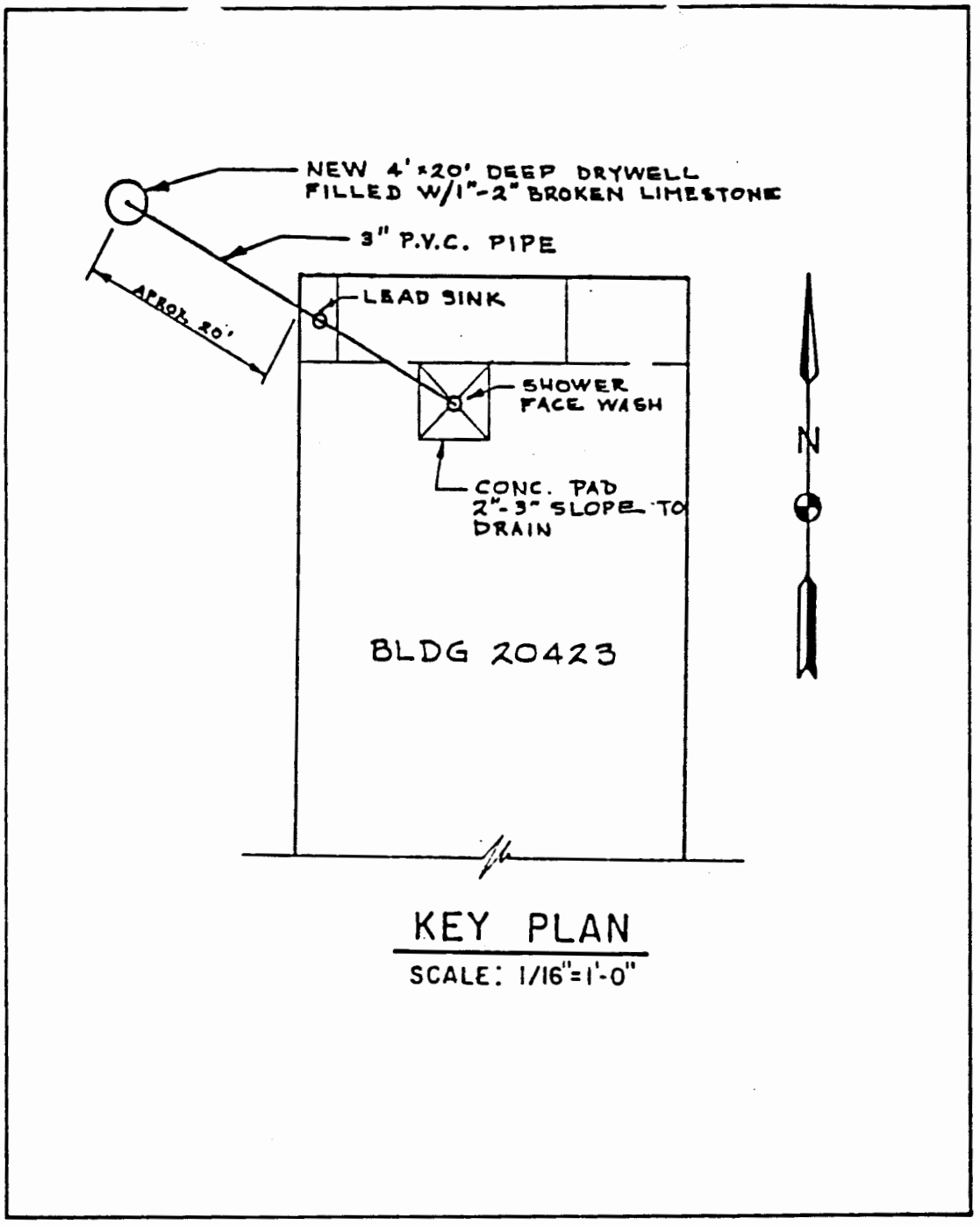

FIGURE 1

DETAIL LOCATION OF FRENCH DRAIN (DRY WELL)

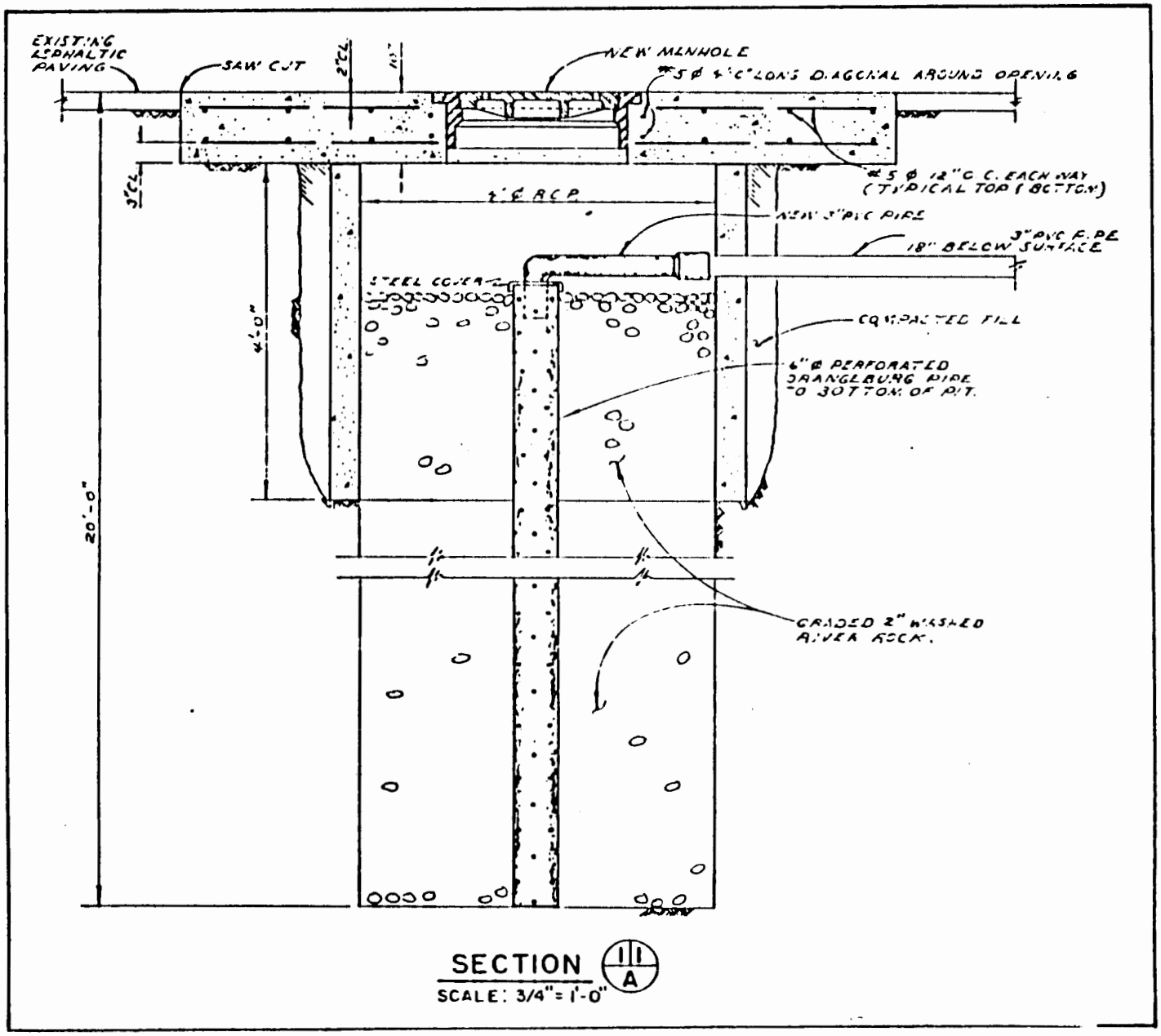

FIGURE 2

CROSS-SECTION OF FRENCH DRAIN

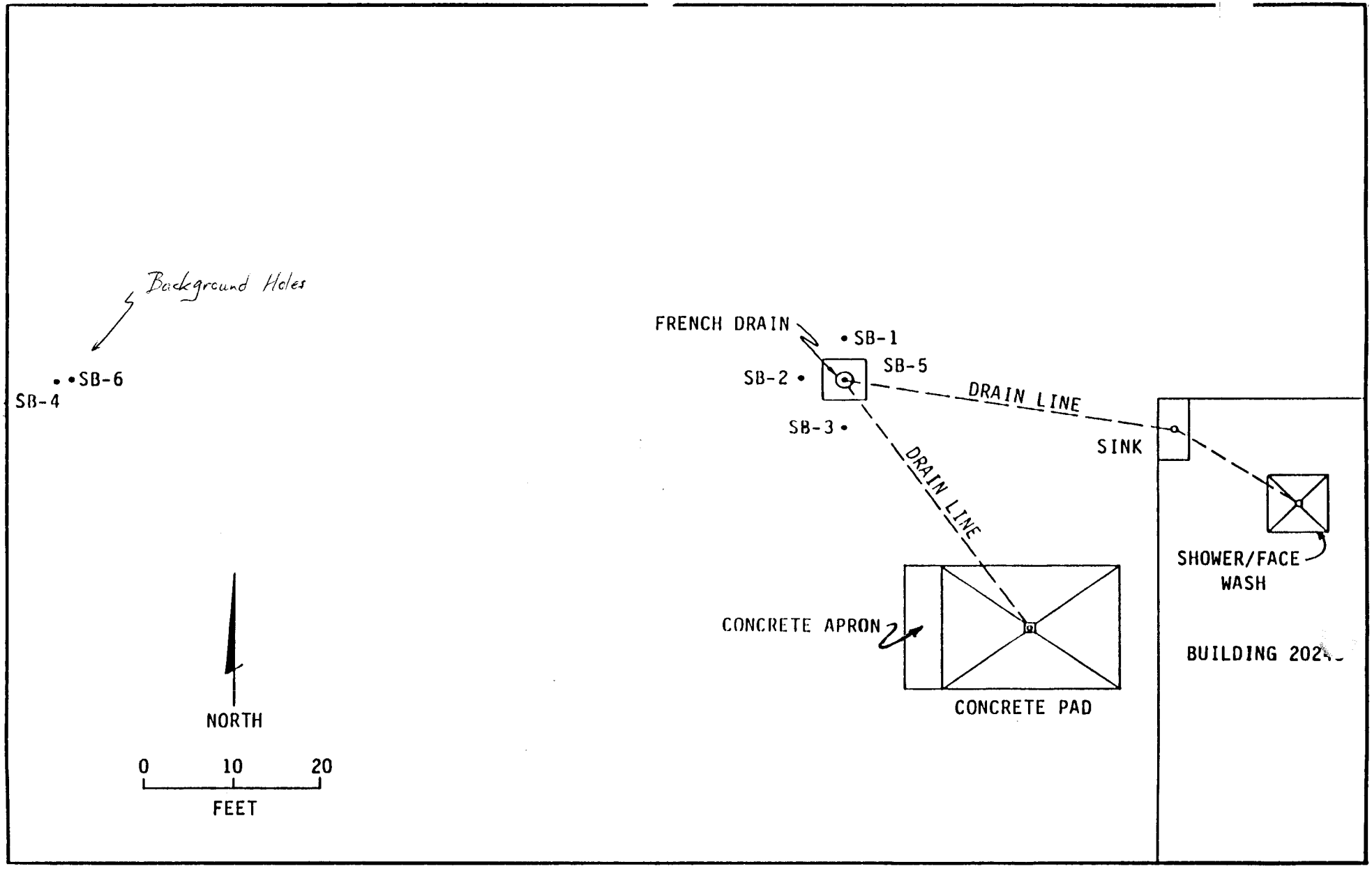

FIGURE 3

BOREHOLE LOCATION MAP

(MARCH, 1989 PROGRAM)

KAFB-BATTERY SHOP

SOIL VAPOR ANALYTICAL RESULTS (ppb) (MAY, 1992 PROGRAM)

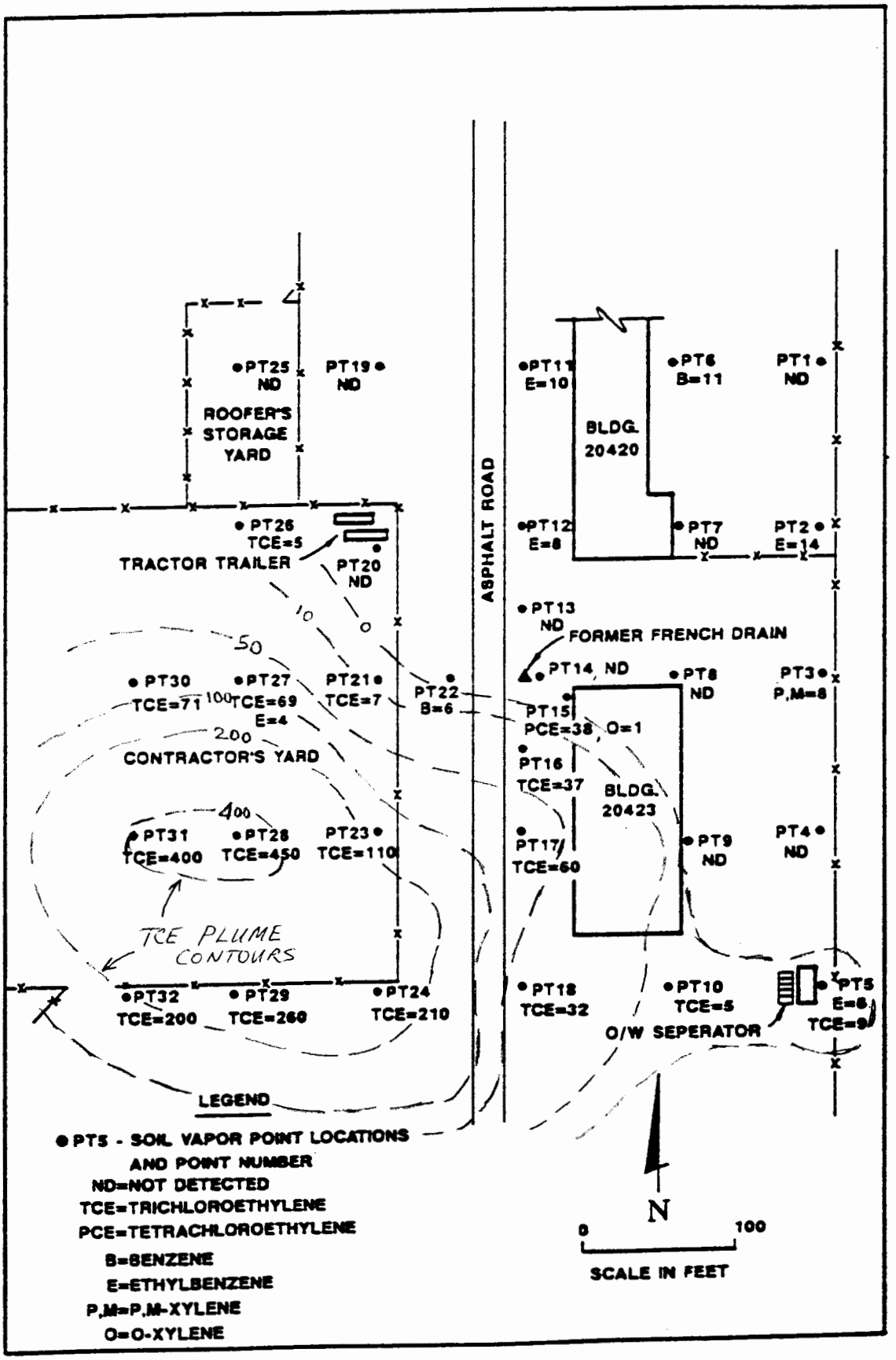

FIGURE 4

Battery Shop Soil Boring Locations

(JULY, 1992 PROGRAM)

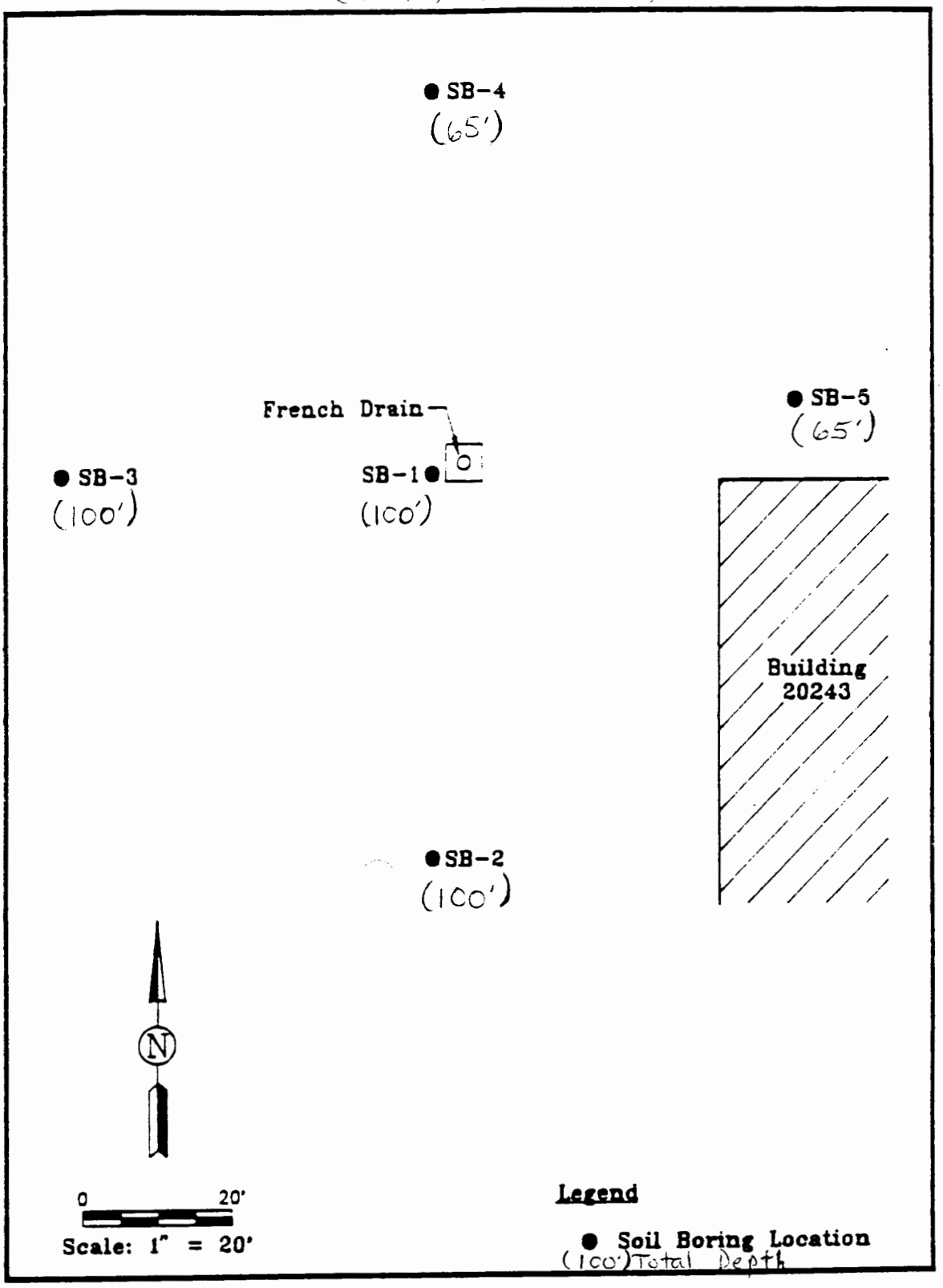

FIGURE 5

Table 1

KAFB Battery Shop French Drain
Laboratory Sample Analyses
Volatile Organics (µg/Kg)/(ppb) - Method 8240
(JULY, 1992 PROGRAM)

Depth (Feet)	Borehole SB-1	SB-2	SB-3	SB-4	SB-5
10	ND	ND	ND	ND	ND
20	ND	ND	ND	6*	ND
30	ND	ND	ND	ND	ND
40	ND	ND	ND	7*	ND
50	ND	ND	ND	ND	ND
60	ND	ND	ND	ND	ND
70	ND	ND	ND	ND	ND
80	ND	ND	ND	ND	ND
90	ND	ND	ND	ND	ND
100	ND	ND	ND	ND	ND

*Methylene Chloride

54021/BATTERY.TBL