Soil and Soil Gas Sampling in Old Ellenton, the SRL Oil Test Site, the Fire Training Area and the Miscellaneous Chemicals Basin

by

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FINAL REPORT

RFP86-89

"SOIL AND SOIL GAS SAMPLING IN OLD ELLENTON, THE SRL OIL TEST SITE, THE FIRE TRAINING AREA AND THE MISCELLANEOUS CHEMICALS BASIN"

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"SOIL AND SOIL GAS SAMPLING IN OLD ELLENTON, THE SRL OIL TEST SITE, THE FIRE TRAINING AREA AND THE MISCELLANEOUS CHEMICALS BASIN"

I. General

Presented herein are the soil and soil gas analytical results from RFP86-89 which were carried out by Microseeps, Ltd. at the SRL site. In summary, we have collected and analyzed on-site:

390 soil gas samples for light hydrocarbons (C_1-C_4),

85 soil samples for gasoline range (C_5-C_8) hydrocarbons, and

136 soil samples for specified chlorinated hydrocarbons

using gas chromatography. The sampling and analytical techniques are described and the data presented in both tabular and mapped formats. The data have already been transmitted to SRL personnel on IBM diskettes and on field maps.

II. Collection and Analysis of Samples

Soil Gas Samples. Samples of soil air were taken from a hole created by driving a 5/8 inch diameter steel rod with a slide hammer. Depth of sampling was mostly at 3 ft, although samples from depths ranging from 1 ft to 6 ft were taken at selected sites as a means of establishing depth profiles. After the rod was removed, a probe sampler was inserted into the hole in order to obtain the sample. The probe was equipped with a rubber packer to prevent dilution of the soil gas sample by air. A volume of gas greater than the internal volume of the probe was discarded before a 200 cc soil gas sample was extracted from the

bottom of the hole using a 250 cc syringe. This sample was injected into a previously evacuated 100 cc serum bottle equipped with a septum. The sample pressure after filling the serum bottle was ~14 psig. Any leakage, which we have determined to be extremely small, is out of the bottle; thus, no dilution or contamination of the sample is incurred.

Sample analysis was carried out using a gas chromatograph equipped with a flame ionization detector. The chromatograph was designed and built by Microseeps, Ltd. personnel. It provides sensivity in the range of 1 ppb for light hydrocarbons, C_1 through C_4, and allows rapid analysis time for this suite of compounds. Each soil gas sample was analyzed for methane, ethane, propane, iso-butane, n-butane, ethylene and propylene.

Soil Samples. Soil samples were collected mostly from a depth of 18 to 24 inches, except where depth profiles were determined to a depth of 60 inches. Samples were obtained using a 1¼ inch stainless steel pipe which was driven to a depth of 18 inches, removed from the hole and the core discarded. The pipe was again inserted into the hole and a 6 inch sample core obtained. An analogous procedure was followed at other depths.

A portion of this sample core was placed directly into a screw cap sample bottle and sealed with a cap lined with aluminum foil. Each bottle had been washed, rinsed and baked at 90°C for a minimum of one hour before use.

Immediately upon return to the laboratory, an 8.0 ± 0.1 gram portion of each sample core was obtained using a small soil coring tool, and

placed in a 22 ml headspace vial. Each vial had similarly been washed, rinsed and baked at 90°C before use.

To each vial was added a 5 ml aliquot of a solution consisting of 1000 ml distilled water, 50 gm Na_2SO_4 and 1.5 ml conc H_3PO_4. The headspace volume of each vial was constant at about 10 ml.

Halocarbon and gasoline range hydrocarbon analyses were performed on-site at a laboratory provided by SRL using automated headspace gas chromatography. These methods were implemented using a Hewlett-Packard 5890A Gas Chromatograph equipped with an HP 19395A Headspace Sampler, an HP3392A Networking Inegrator, an electron capture detector (ECD) for the halocarbons, and a flame ionization detector (FID) for the hydrocarbons. One halocarbon, vinyl chloride, was determined using the FID. For both halocarbons and hydrocarbons, a Supelco VOCOL wide bore capillary column, 60 m x 0.75 mm I.D. with a 1.5 um film, was used.

Analytical Standards. Calibration of the chromatograph for the light hydrocarbons, C_1-C_4, is achieved through the use of a commercial certified standard gas which is in the order of 10 ppm for methane and 1 ppm for the other hydrocarbons.

For the gasoline range hydrocarbons and the halocarbons, a standard solution is prepared composed of a blend of each compound. For the halocarbons (except vinyl chloride), the solvent used is methyl alcohol. For the gasoline range hydrocarbons, and vinyl chloride, the solvent is carbon disulfide. In both cases, the solution is made such that when 1 ul of standard solution is added to 8 gm of soil in a headspace vial,

the concentration of compound in the vial was increased as if the soil contained an additional 10 ppb of compound. Thus, by adding appropriate volumes of standard solution to a headspace vial, several standardization points were achieved to form a calibration curve for each compound. A 100 to 1 dilution of the standard solution was used for standards less than 10 ppb.

Detection Limits

Minimum detection limits for the light hydrocarbons, C_1-C_4, based on noise current when only pure nitrogen is injected is less than 1 ppb. In practice, using hand injection techniques, a 100 ppb sample (standard) is reproducible ± 5 ppb.

For the headspace analysis of gasoline range hydrocarbons and halocarbons, reagent blanks were prepared by placing only the Na_2SO_4-H_3PO_4 solution in the headspace vials. At least one blank was prepared and analysed for every ten samples.

For the halocarbons, peak areas for compounds detected in 22 blanks were used to establish minimum values for detection limits which were set at the mean plus two standard deviations of the measured levels in the blanks.

For the gasoline-range hydrocarbons, only toluene could be detected in the blanks and the minimum detection level was set at the mean plus two standard deviations determined from 22 blank runs. For the remainder of the gasoline range hydrocarbons and vinyl chloride, the minimum detection level was estimated from a series of standard runs. In each case a standard equivalent to the presence of 10 ppb or less (see Figures 50 and 51) was prepared and run. The minimum detection level quoted was estimated from the response to this standard.

Minimum detection levels for the halocarbons and gasoline range hydrocarbons are listed in Table 1.

TABLE 1

MINIMUM DETECTION LEVELS (ppb)

Compound	MDL
pentane	1.5
hexane	1.5
heptane	1.5
octane	1.5
benzene	1.5
toluene	2.0
vinyl chloride	3.0
1,1 dichloroethylene	0.3
dichloromethane	0.5
trans 1,2-dichloroethylene	2.8
cis 1,2-dichloroethylene	4.0
1,1-dichloroethane	5.0
1,2-dichloroethane	5.0
trichloromethane (chloroform)	0.03
trichloroethylene	0.04
tetrachloroethylene	0.03

Statistics

Rudimentary statistical analyses were applied to the data for the purpose of deriving map symbols to illustrate the distribution of the species of interest.

For the light hydrocarbons, a mean (m) and standard deviation (σ) were determined for the magnitude of each hydrocarbon of interest. The map symbols relative to this distribution are as follows:

 = $> m + 2\sigma$

 = $m + 1.5\sigma \rightarrow m + 2\sigma$

 = $m + 1.0\sigma \rightarrow m + 1.5\sigma$

 = $m \rightarrow m + 1\sigma$

 = $< m$

All samples in the Old Ellenton Area were considered as one data set for statistical analyses. The Oil Test Site and the Fire Training Area were considered separately.

For the halocarbons, since many of the sites were below the minimum detection levels, normal statistical parameters such as means and standard deviations could not be used to establish map parameters. Therefore, we have assumed that the data (or their logs) are normally distributed and have used conventional percentile distributions as map parameters. For example, the normal distribution is such that 2.28% of the sites (parameters) are more than 2 σ above the mean, 4.4% of the sites between 1.5 σ and 2.0 σ above the mean, etc.

III. Quality Assurance

For the soil gas samples, field quality assurance included purging the soil gas probe at least five times between each site. Additionally, an air sample was taken every 10 sites (in addition to the first and last site of the day) and analyzed for long term contamination. Then by taking and exhausting a volume of air equal to the volume of the soil gas probe at each site before filling of the sample bottle, it was assured that only soil gas from the sampling depth was sampled.

For the soil samples, the sampling tube was carefully cleaned between each site. Then by collecting and discarding the first 18" of soil, the tube was abraded by a portion of the new sample.

Laboratory quality assurance was discussed above in Section II, Collection and Analysis of Samples.

IV. Presentation and Discussion of Data

A. Old Ellenton Area

The purpose of the investigations in the Old Ellenton area shown in Figure 1 was to determine the presence or absence of contamination residual in the soils at several specified locations of highest probability of occurrence. Of particular interest were the light hydrocarbons methane and butane; the gasoline range hydrocarbons, pentane, hexane, heptane, octane, benzene and toluene; and the halocarbons, mainly tetrachoroethylene.

Methane is produced by anaerobic bacterial processes and could be indicative of abandoned septic tanks, buried decomposing organic material (trash) or other such sources.

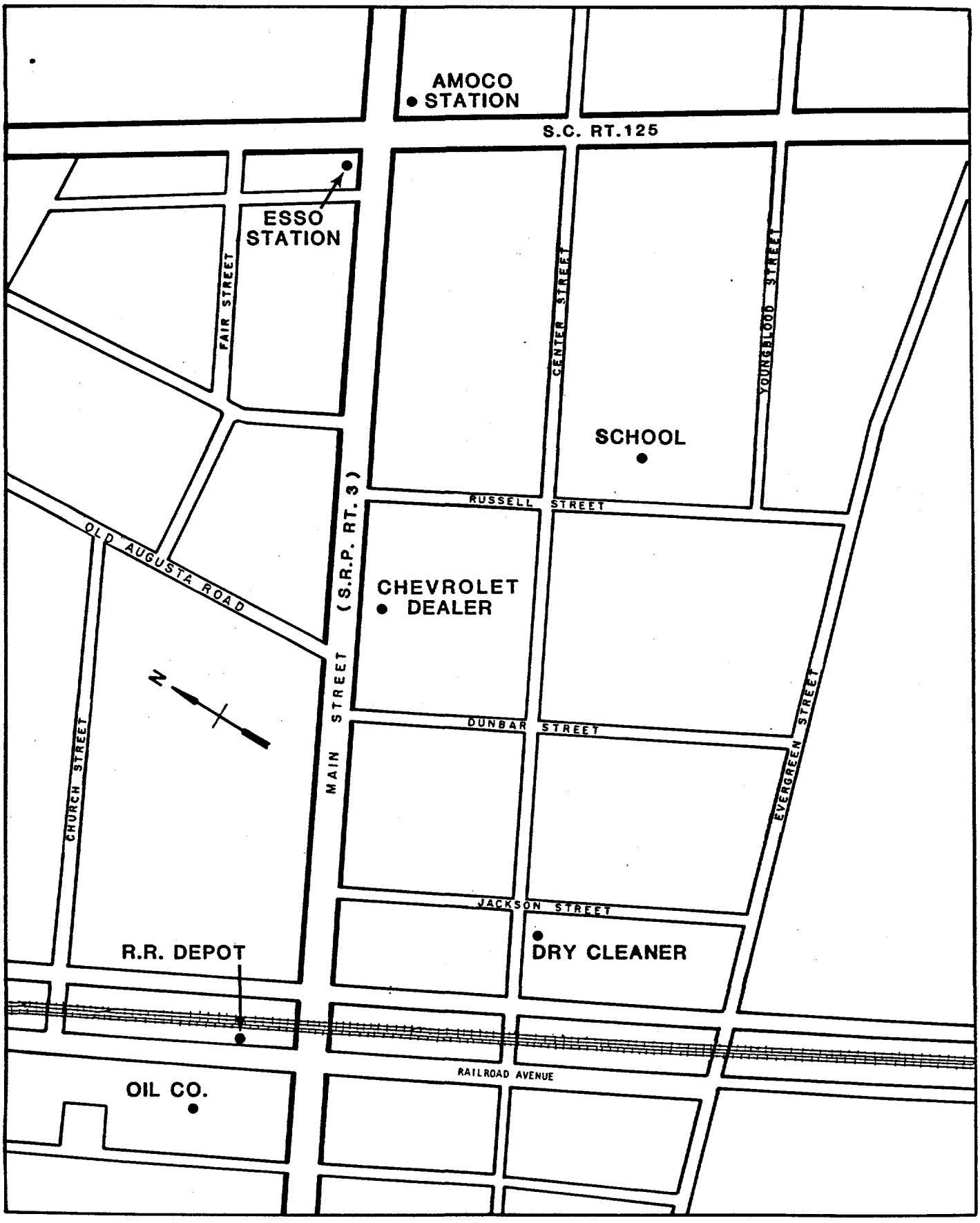
Butane is the lowest molecular weight component of gasoline and the presence of anomalous butane with respect to methane, ethane and propane could be suggestive of gasoline spills or leaking gasoline tanks. Since the light hydrocarbons are relatively quickly determined analytically, they are an ideal survey tool for the presence of gasoline range hydrocarbons in water or soils using the relative quantity of butane as an indicator.

Soil analysis for the gasoline range hydrocarbons, a much more time consuming and expensive analytical procedure, was reserved for areas where evidence from the butane analysis (or other evidence) suggested the potential presence of these compounds.

Soil analysis for halocarbons in the Old Ellenton area was limited to the vicinity of the former dry cleaning store where potentially this material was used as a cleaning fluid.

As indicated on the Old Ellenton Area Index Map (Figure 1) a total of seven specific areas were surveyed and they will be discussed separately.

FIGURE 1



OLD ELLENTON AREA
INDEX MAP

Amoco Gasoline Station

The Old Ellenton Amoco gasoline station site is located on the eastern corner of the intersection of South Caroline Rt. 125 and Main Street (SRP Rt. 3), as shown on the Index Map (Figure 1). The building was vacated in the early to mid-1950's, at which time all surface structures were removed and the site graded over. Currently the site is relatively level, smooth and grass covered, with little or no surficial evidence which would indicate the existence of the original building foundation. Near surface soils are well drained and are composed predominantly of medium to fine grained sand with some silt, but little to no clay.

It was not known whether the underground gasoline tanks were removed at the time the gasoline station was demolished. We were provided with SRP photographs of the building before demolition and these enabled us to establish the approximate location of the building on the lot and the probable location of the underground storage tanks.

Based on the information described above, we initiated our sampling at the Amoco station, using a 7 x 7 site grid on 20 foot centers, both on and off the presumed location of the filling station as shown on the site location map on Figure 2. From this initial grid, a total of 46 soil gas samples were taken at a depth of 3 ft and analyzed for C_1-C_4 hydrocarbons. The results of these analyses revealed anomalously high iso and normal butane (% butane = 25.6, see Table 3). This site was offset 1 ft (site 13-R) and

resampled to confirm the indication of anomalous butane at site 13. At site 13-R, butane was significantly higher (% butane = 53.5, see Table 3) than at site 13, thus confirming the previous results.

Based on these results, we sampled 23 additional sites (sites 47-69) on 5 to 10 ft centers in proximity to sites 13 and 13-R as shown on Figure 2. In additions the sample probe was modified in order to obtain samples from 6 ft depths at 14 sites. All of the data is recorded in Tables 2 and 3, and maps of pertinent parameters are shown in Figures 3, 4 and 5.

It is noted from Figures 4 and 5 that anomalous butane magnitudes and % butanes are localized near the street intersection. During the sampling operation, a metallic object was encountered at several spots near site 52 at a depth of about 18 inches. The audible sound of the probe encountering the object led us to suspect it was a buried gasoline storage tank.

Consideration of the data from sites where both 3 ft and 6 ft samples were taken revealed a decrease of butane with depth at 13 of the 14 such sites. The one site which is excepted was a background (non-anomalous) site and the slight increase with depth at this site is considered normal. We conclude that the source of butane is near the surface, not at depth. This could result from spillage of gasoline during filling of the storage tank, a tank vent near the surface or overflows of automobile gasoline tanks.

Based on the results of the light hydrocarbon analyses, soil samples were collected at 30 sites in the area of anomalous butanes. Soil samples were collected at a depth of 18 to 24 inches at the same sites used for soil gas samples. Soil samples are indicated on the Site Location Map on Figure 2.

As shown on Table 4, the only gasoline range hydrocarbons detected were 3.5 ppb benzene and 2.0 ppb toluene at Site 52. No map of these data was made. The chromatographic trace of the sample at Site 52 is included as Figure 6.

Although some of the highest methane sites of this data set, shown on Figure 3, are found in the area of anomalous butanes, the highest site and several other high sites are not in this area. It is noticed that these latter sites are alligned near and parallel to the streets. On the other hand, the highest methane site is only about 6.8 ppm. This would not be considered to be of great concern. We have observed many methane levels in the 100 to 1000 ppm range in otherwise pristine areas.

In conclusion, a localised area at the Amoco gasoline station in Old Ellenton is characterized by anomalous levels of butane and anomalous % butanes (as measured relative to C_1-C_4). This area is probably that of buried gasoline storage tanks used in this business. Underground objects considered to be these tanks were encountered at about 18 inches depth, as discussed. Only trace residual gasoline range hydrocarbons, specifically benzene and toluene, were encountered. Based on these data, we conclude that the materials encountered are mostly due to surface spillage as opposed to tank leakage.

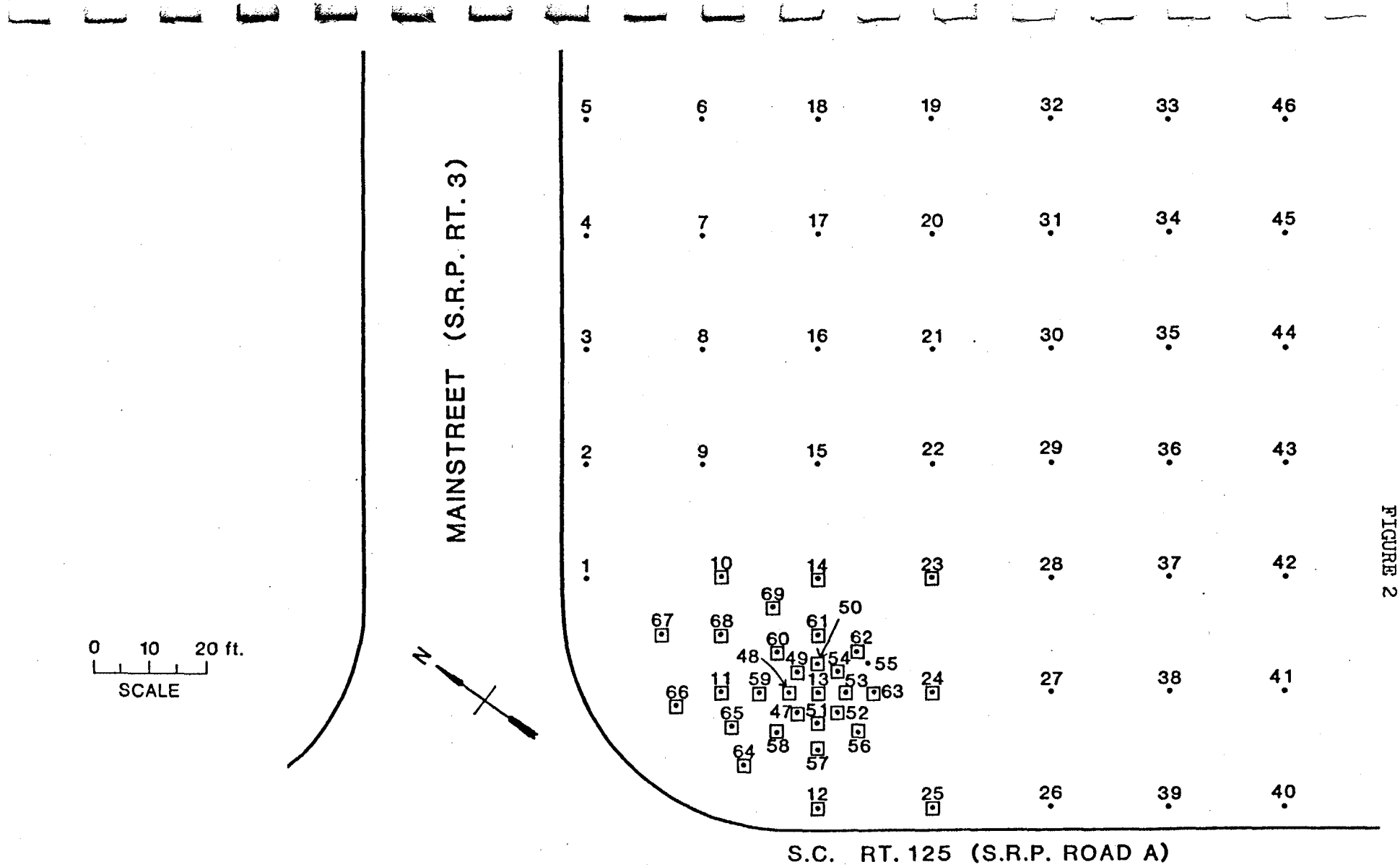


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FIGURE 2

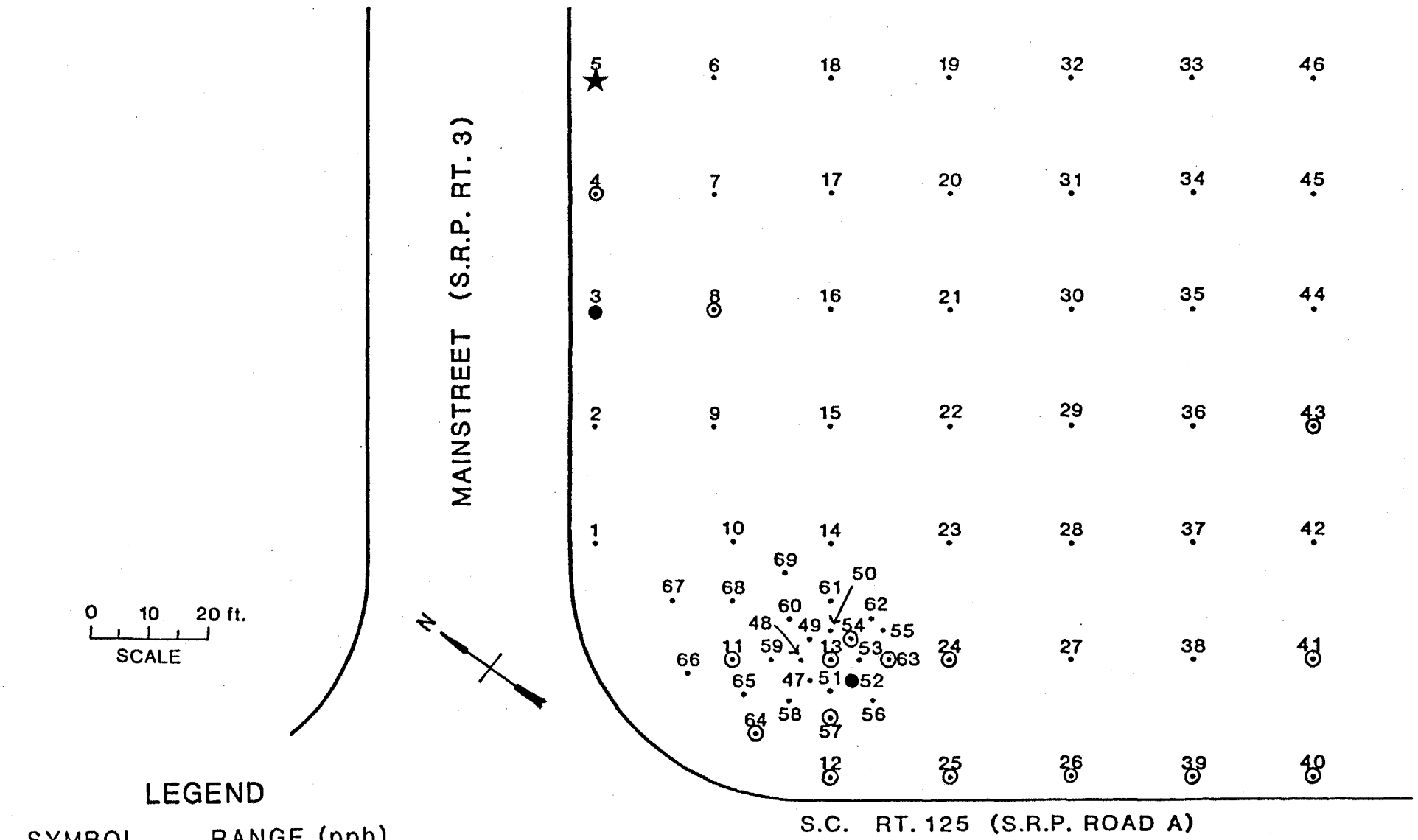
• SOIL GAS SAMPLES

⊡ SOIL GAS & SOIL SAMPLES

OLD ELLENTON AMOCO GAS STATION

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986



OLD ELLENTON
AMOCO GAS STATION

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 3

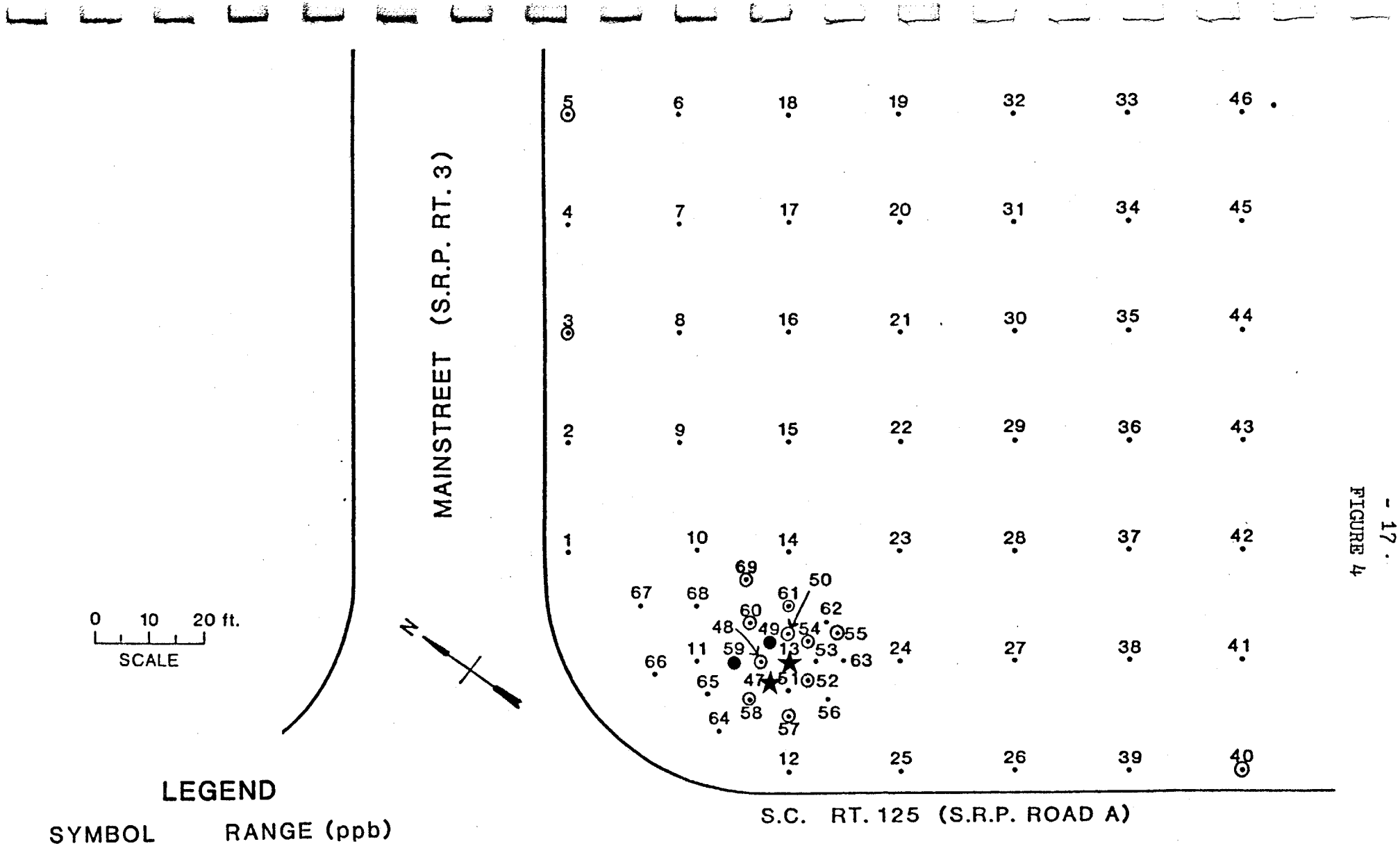
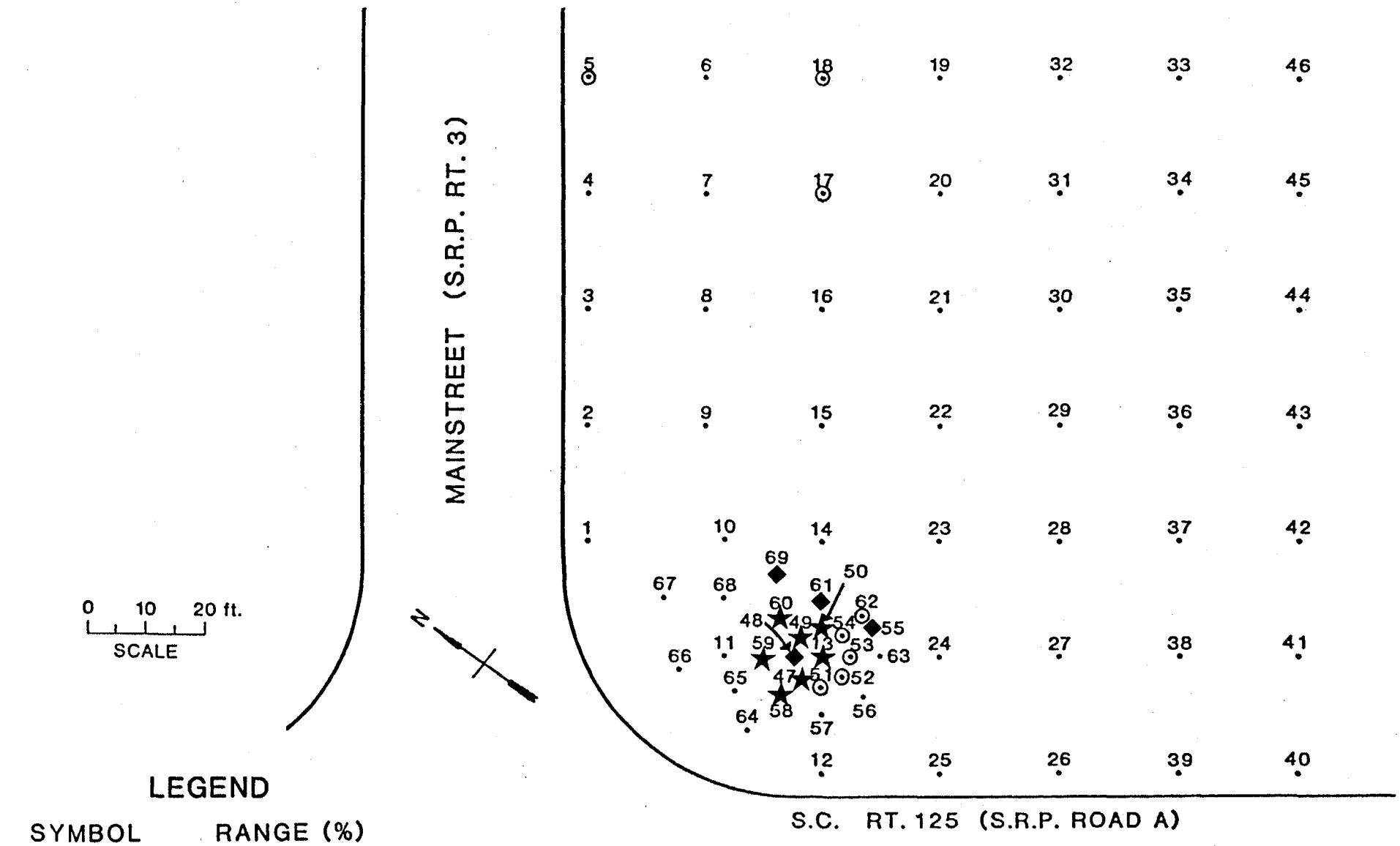

MAINSTREET (S.R.P. RT. 3)
S.C. RT. 125 (S.R.P. ROAD A)
0 10 20 ft.
SCALE
N
LEGEND
SYMBOL RANGE (ppb)
★ > 1020
◆ 787 – 1020
● 553 – 786
⊙ 86 – 552
. < 86
OLD ELLENTON
AMOCO GAS STATION
BUTANE
S.R.P. NOVEMBER, 1986

FIGURE 4



LEGEND

SYMBOL	RANGE (%)
★	> 17.5
◆	14.1 – 17.5
●	10.6 – 14.0
⊙	3.7 – 10.5
·	< 3.7

OLD ELLENTON AMOCO GAS STATION

PERCENT BUTANE

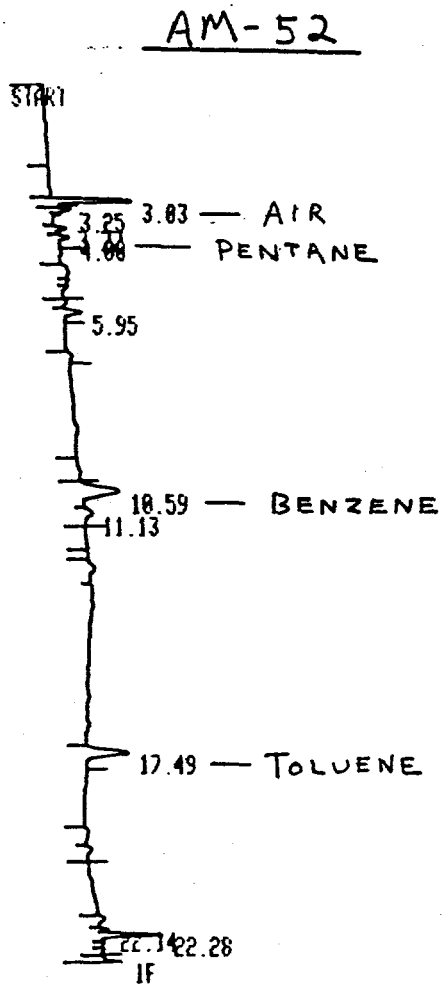
(IN C1–C4)

S.R.P. NOVEMBER, 1986

FIGURE 5

FIGURE 6

GASOLINE RANGE HYDROCARBON
CHROMATOGRAPHIC TRACE AT SITE AM-52



RUN # 47 OCT/06/86 09:38:17
WORKFILE ID: C
WORKFILE NAME:

	RT	AREA	TYPE	AR/HT	AREA%
	3.03	7022	PB	0.102	19.390
	3.25	1222	PV	0.092	3.374
	3.77	1193	PV	0.103	3.294
PENTANE	4.00	1533	VB	0.127	4.233
	5.95	2270	PB	0.136	6.268
BENZENE	10.59	8819	PV	0.251	24.352
	11.13	1995	VB	0.246	5.509
TOLUENE	17.49	6475	BB	0.173	17.879
	22.14	709	PV	0.082	1.958
	22.28	4977	VV	0.090	13.743

TOTAL AREA= 36215
MUL FACTOR= 1.0000E+00

TABLE 2

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / AMOCO STATION -- PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
AM 1	739	38	16	-	-	41	42	AM 1
AM 2	768	40	17	-	-	40	37	AM 2
AM 3	3841	201	69	72	19	126	140	AM 3
AM 4	2014	99	34	56	-	74	81	AM 4
AM 5	6783	387	141	356	81	316	287	AM 5
AM 6	711	47	22	22	-	39	41	AM 6
AM 7	1232	49	16	19	-	29	24	AM 7
AM 8	1913	84	28	29	-	49	44	AM 8
AM 9	1275	80	27	39	-	50	54	AM 9
AM 10	849	45	19	17	-	44	46	AM 10
AM 11	1623	80	26	39	-	48	45	AM 11
AM 12	1478	66	25	25	-	48	46	AM 12
AM 13	1420	58	39	411	111	31	29	AM 13
AM 13-R	2594	301	3553	4738	2681	252	302	AM 13-R
AM 14	768	28	9	24	-	18	15	AM 14
AM 15	877	41	17	26	-	30	30	AM 15
AM 16	657	30	11	9	-	20	19	AM 16
AM 17	985	44	15	41	-	31	26	AM 17
AM 18	1043	30	16	78	-	16	14	AM 18
AM 19	609	15	8	-	-	12	-	AM 19
AM 20	875	31	11	11	-	19	15	AM 20
AM 21	799	19	7	-	-	13	-	AM 21
AM 22	928	41	25	16	-	25	21	AM 22
AM 23	847	42	15	21	-	28	25	AM 23
AM 24	1580	48	17	13	-	28	27	AM 24
AM 25	2870	118	39	58	-	73	67	AM 25
AM 26	2072	131	46	51	-	76	77	AM 26
AM 27	934	47	18	22	-	29	31	AM 27
AM 28	695	28	11	-	-	18	12	AM 28
AM 29	488	18	0	-	-	14	-	AM 29
AM 30	1198	18	-	-	-	20	-	AM 30
AM 31	1000	23	9	37	-	19	13	AM 31
AM 32	619	25	10	14	-	20	18	AM 32
AM 33	598	21	8	-	-	16	14	AM 33
AM 34	891	31	12	28	-	17	17	AM 34
AM 35	881	26	13	-	-	14	13	AM 35
AM 36	442	18	6	-	-	18	-	AM 36
AM 37	574	22	10	-	-	18	15	AM 37
AM 38	654	29	13	10	-	24	22	AM 38
AM 39	1536	81	27	37	-	49	46	AM 39
AM 40	2638	123	47	72	24	104	84	AM 40
AM 41	2174	147	64	48	11	161	131	AM 41
AM 42	913	41	25	22	-	42	30	AM 42
AM 43	1464	56	26	16	-	50	46	AM 43
AM 44	820	26	10	11	-	17	12	AM 44
AM 45	428	16	9	-	-	12	-	AM 45
AM 46	770	26	10	-	-	19	-	AM 46
AM 47	1044	53	142	1184	178	33	36	AM 47
AM 47-R	1491	84	61	562	50	48	48	AM 47-R

TABLE 2 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / AMOCO STATION -- PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
AM 47-6	835	38	31	473	31	31	32	AM 47-6
AM 48	1130	45	32	194	23	31	28	AM 48
AM 48-6	907	29	11	53	-	18	21	AM 48-6
AM 49	1159	48	35	515	103	31	32	AM 49
AM 49-6	1028	30	11	127	-	16	18	AM 49-6
AM 50	1035	39	28	216	38	33	29	AM 50
AM 50-6	951	15	-	17	-	8	-	AM 50-6
AM 51	1019	30	12	48	-	24	15	AM 51
AM 51-6	725	31	13	21	-	21	26	AM 51-6
AM 52	3942	448	247	162	167	480	570	AM 52
AM 52-6	984	27	11	33	-	19	24	AM 52-6
AM 53	1043	38	16	54	-	27	27	AM 53
AM 54	1623	98	61	81	48	76	64	AM 54
AM 54-6	977	29	10	24	-	20	25	AM 54-6
AM 55	1090	36	16	212	19	38	28	AM 55
AM 55-6	38639	35	18	22	-	22	35	AM 55-6
AM 56	1130	27	10	19	-	20	15	AM 56
AM 56-6	1101	38	14	29	-	21	24	AM 56-6
AM 57	2435	179	70	57	35	174	149	AM 57
AM 57-6	927	35	13	25	-	24	32	AM 57-6
AM 58	1217	71	188	223	113	70	52	AM 58
AM 58-6	714	22	9	19	-	16	20	AM 58-6
AM 59	980	43	29	599	65	27	22	AM 59
AM 59-6	1047	30	11	40	-	20	22	AM 59-6
AM 60	896	37	19	262	-	25	26	AM 60
AM 60-6	990	15	8	30	-	10	13	AM 60-6
AM 61	1159	64	103	189	66	44	35	AM 61
AM 61-6	1143	23	8	21	-	11	-	AM 61-6
AM 62	1232	46	21	55	-	40	32	AM 62
AM 63	1348	38	17	23	-	37	28	AM 63
AM 64	1477	62	23	54	-	46	49	AM 64
AM 65	831	25	9	16	-	18	18	AM 65
AM 66	965	12	-	-	-	12	-	AM 66
AM 67	1156	47	19	33	-	40	39	AM 67
AM 68	872	34	12	25	-	21	22	AM 68
AM 69	761	41	15	142	-	23	30	AM 69

NOTE:

AM XX - 3 FT. SAMPLE
AM XX-6 - 6 FT. SAMPLE
AM XX-R - REPEAT SAMPLE

TABLE 3

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / AMOCO STATION -- PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
AM 1	793	93.2	4.8	2.0	0.0	876	4.7	4.8	AM 1
AM 2	825	93.1	4.8	2.1	0.0	902	4.4	4.1	AM 2
AM 3	4202	91.4	4.8	1.6	2.2	4468	2.8	3.1	AM 3
AM 4	2203	91.4	4.5	1.5	2.5	2358	3.1	3.4	AM 4
AM 5	7748	87.5	5.0	1.8	5.6	8351	3.8	3.4	AM 5
AM 6	802	88.7	5.9	2.7	2.7	882	4.4	4.6	AM 6
AM 7	1316	93.6	3.7	1.2	1.4	1369	2.1	1.8	AM 7
AM 8	2054	93.1	4.1	1.4	1.4	2147	2.3	2.0	AM 8
AM 9	1421	89.7	5.6	1.9	2.7	1525	3.3	3.5	AM 9
AM 10	930	91.3	4.8	2.0	1.8	1020	4.3	4.5	AM 10
AM 11	1768	91.8	4.5	1.5	2.2	1861	2.6	2.4	AM 11
AM 12	1594	92.7	4.1	1.6	1.6	1688	2.8	2.7	AM 12
AM 13	2039	69.6	2.8	1.9	25.6	2099	1.5	1.4	AM 13
AM 13-R	13867	18.7	2.2	25.6	53.5	14421	1.7	2.1	AM 13-R
AM 14	829	92.6	3.4	1.1	2.9	862	2.1	1.7	AM 14
AM 15	961	91.3	4.3	1.8	2.7	1021	2.9	2.9	AM 15
AM 16	707	92.9	4.2	1.6	1.3	746	2.7	2.5	AM 16
AM 17	1085	90.8	4.1	1.4	3.8	1142	2.7	2.3	AM 17
AM 18	1167	89.4	2.6	1.4	6.7	1197	1.3	1.2	AM 18
AM 19	632	96.4	2.4	1.3	0.0	644	1.9	0.0	AM 19
AM 20	928	94.3	3.3	1.2	1.2	962	2.0	1.6	AM 20
AM 21	825	96.8	2.3	0.8	0.0	838	1.6	0.0	AM 21
AM 22	1010	91.9	4.1	2.5	1.6	1056	2.4	2.0	AM 22
AM 23	925	91.6	4.5	1.6	2.3	978	2.9	2.6	AM 23
AM 24	1658	95.3	2.9	1.0	0.8	1713	1.6	1.6	AM 24
AM 25	3085	93.0	3.8	1.3	1.9	3225	2.3	2.1	AM 25
AM 26	2300	90.1	5.7	2.0	2.2	2453	3.1	3.1	AM 26
AM 27	1021	91.5	4.6	1.8	2.2	1081	2.7	2.9	AM 27
AM 28	734	94.7	3.8	1.5	0.0	764	2.4	1.6	AM 28
AM 29	506	96.4	3.6	0.0	0.0	520	2.7	0.0	AM 29
AM 30	1216	98.5	1.5	0.0	0.0	1236	1.6	0.0	AM 30
AM 31	1069	93.5	2.2	0.8	3.5	1101	1.7	1.2	AM 31
AM 32	668	92.7	3.7	1.5	2.1	706	2.8	2.5	AM 32
AM 33	627	95.4	3.3	1.3	0.0	657	2.4	2.1	AM 33
AM 34	962	92.6	3.2	1.2	2.9	996	1.7	1.7	AM 34
AM 35	920	95.8	2.8	1.4	0.0	947	1.5	1.4	AM 35
AM 36	466	94.8	3.9	1.3	0.0	484	3.7	0.0	AM 36
AM 37	606	94.7	3.6	1.7	0.0	639	2.8	2.3	AM 37
AM 38	706	92.6	4.1	1.8	1.4	752	3.2	2.9	AM 38
AM 39	1681	91.4	4.8	1.6	2.2	1776	2.8	2.6	AM 39
AM 40	2904	90.8	4.2	1.6	3.3	3092	3.4	2.7	AM 40
AM 41	2444	89.0	6.0	2.6	2.4	2736	5.9	4.8	AM 41
AM 42	1001	91.2	4.1	2.5	2.2	1073	3.9	2.8	AM 42
AM 43	1562	93.7	3.6	1.7	1.0	1658	3.0	2.8	AM 43
AM 44	867	94.6	3.0	1.2	1.3	896	1.9	1.3	AM 44
AM 45	453	94.5	3.5	2.0	0.0	465	2.6	0.0	AM 45
AM 46	806	95.5	3.2	1.2	0.0	825	2.3	0.0	AM 46
AM 47	2601	40.1	2.0	5.5	52.4	2670	1.2	1.3	AM 47
AM 47-R	2248	66.3	3.7	2.7	27.2	2344	2.0	2.0	AM 47-R

TABLE 3 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / AMOCO STATION -- PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
AM 47-6	1408	59.3	2.7	2.2	35.8	1471	2.1	2.2	AM 47-6
AM 48	1424	79.4	3.2	2.2	15.2	1483	2.1	1.9	AM 48
AM 48-6	1000	90.7	2.9	1.1	5.3	1039	1.7	2.0	AM 48-6
AM 49	1860	62.3	2.6	1.9	33.2	1923	1.6	1.7	AM 49
AM 49-6	1196	86.0	2.5	0.9	10.6	1230	1.3	1.5	AM 49-6
AM 50	1356	76.3	2.9	2.1	18.7	1418	2.3	2.0	AM 50
AM 50-6	983	96.7	1.5	0.0	1.7	991	0.8	0.0	AM 50-6
AM 51	1109	91.9	2.7	1.1	4.3	1148	2.1	1.3	AM 51
AM 51-6	790	91.8	3.9	1.6	2.7	837	2.5	3.1	AM 51-6
AM 52	4966	79.4	9.0	5.0	6.6	6016	8.0	9.5	AM 52
AM 52-6	1055	93.3	2.6	1.0	3.1	1098	1.7	2.2	AM 52-6
AM 53	1151	90.6	3.3	1.4	4.7	1205	2.2	2.2	AM 53
AM 54	1911	84.9	5.1	3.2	6.8	2051	3.7	3.1	AM 54
AM 54-6	1040	93.9	2.8	1.0	2.3	1085	1.8	2.3	AM 54-6
AM 55	1373	79.4	2.6	1.2	16.8	1439	2.6	1.9	AM 55
AM 55-6	38714	99.8	0.1	0.0	0.1	38771	0.1	0.1	AM 55-6
AM 56	1186	95.3	2.3	0.8	1.6	1221	1.6	1.2	AM 56
AM 56-6	1182	93.1	3.2	1.2	2.5	1227	1.7	2.0	AM 56-6
AM 57	2776	87.7	6.4	2.5	3.3	3099	5.6	4.8	AM 57
AM 57-6	1000	92.7	3.5	1.3	2.5	1056	2.3	3.0	AM 57-6
AM 58	1812	67.2	3.9	10.4	18.5	1934	3.6	2.7	AM 58
AM 58-6	764	93.5	2.9	1.2	2.5	800	2.0	2.5	AM 58-6
AM 59	1716	57.1	2.5	1.7	38.7	1765	1.5	1.2	AM 59
AM 59-6	1128	92.8	2.7	1.0	3.5	1170	1.7	1.9	AM 59-6
AM 60	1214	73.8	3.0	1.6	21.6	1265	2.0	2.1	AM 60
AM 60-6	1043	94.9	1.4	0.8	2.9	1066	0.9	1.2	AM 60-6
AM 61	1581	73.3	4.0	6.5	16.1	1660	2.7	2.1	AM 61
AM 61-6	1195	95.6	1.9	0.7	1.8	1206	0.9	0.0	AM 61-6
AM 62	1354	91.0	3.4	1.6	4.1	1426	2.8	2.2	AM 62
AM 63	1426	94.5	2.7	1.2	1.6	1491	2.5	1.9	AM 63
AM 64	1616	91.4	3.8	1.4	3.3	1711	2.7	2.9	AM 64
AM 65	881	94.3	2.8	1.0	1.8	917	2.0	2.0	AM 65
AM 66	977	98.8	1.2	0.0	0.0	989	1.2	0.0	AM 66
AM 67	1255	92.1	3.7	1.5	2.6	1334	3.0	2.9	AM 67
AM 68	943	92.5	3.6	1.3	2.7	986	2.1	2.2	AM 68
AM 69	959	79.4	4.3	1.6	14.8	1012	2.3	3.0	AM 69

NOTE:

AM XX - 3 FT. SAMPLE
AM XX-6 - 6 FT. SAMPLE
AM XX-R - REPEAT SAMPLE

TABLE 4

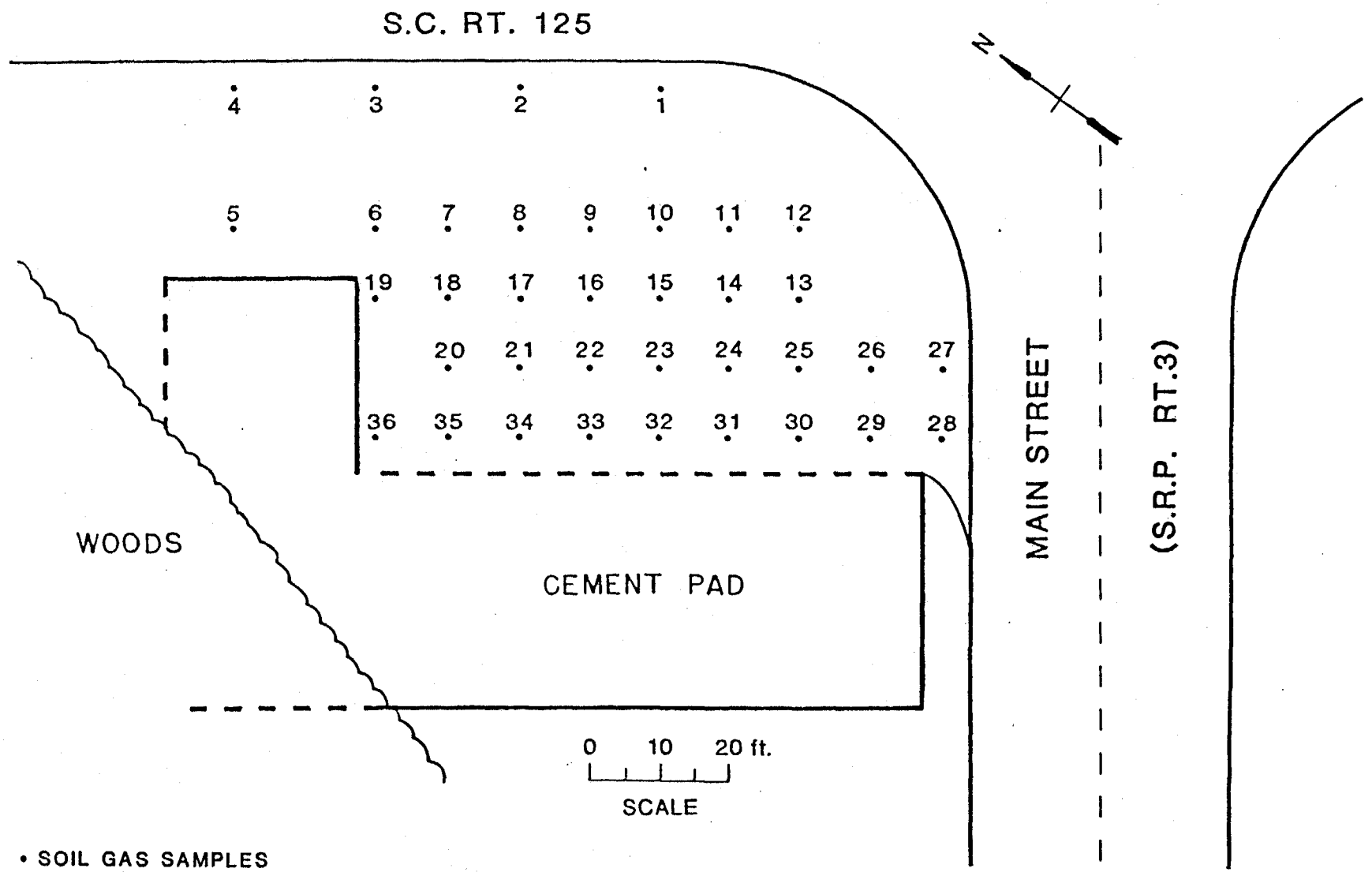
---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN S.C. ----
---- OLD ELLENTON / AMOCO -- SOIL SAMPLES -- OCT. 1986 ----
---- SOIL CONCENTRATIONS BY WEIGHT ----

SAMPLE NUMBER	DEPTH	PENTANE PPB	HEXANE PPB	HEPTANE PPB	BENZENE PPB	OCTANE PPB	TOLUENE PPB	TOTAL AREA	SAMPLE NUMBER	DEPTH
AM 10	2.0	-	-	-	-	-	-	7689	AM 10	2.0
AM 11	2.0	-	-	-	-	-	-	7530	AM 11	2.0
AM 12	2.0	-	-	-	-	-	-	7459	AM 12	2.0
AM 13	0.5	-	-	-	-	-	-	17513	AM 13	0.5
AM 13	2.0	-	-	-	-	-	-	9807	AM 13	2.0
AM 13	3.0	-	-	-	-	-	-	6114	AM 13	3.0
AM 13	4.0	-	-	-	-	-	-	7272	AM 13	4.0
AM 13	4.5	-	-	-	-	-	-	6059	AM 13	4.5
AM 13	5.0	-	-	-	-	-	-	8337	AM 13	5.0
AM 14	2.0	-	-	-	-	-	-	10706	AM 14	2.0
AM 23	2.0	-	-	-	-	-	-	9555	AM 23	2.0
AM 24	2.0	-	-	-	-	-	-	8240	AM 24	2.0
AM 25	2.0	-	-	-	-	-	-	7703	AM 25	2.0
AM 47	2.0	-	-	-	-	-	-	9970	AM 47	2.0
AM 48	2.0	-	-	-	-	-	-	9735	AM 48	2.0
AM 49	2.0	-	-	-	-	-	-	10788	AM 49	2.0
AM 50	2.0	-	-	-	-	-	-	9690	AM 50	2.0
AM 51	2.0	-	-	-	-	-	-	9579	AM 51	2.0
AM 52	2.0	-	-	-	3.5	-	2.0	36215	AM 52	2.0
AM 53	2.0	-	-	-	-	-	-	9661	AM 53	2.0
AM 54	2.0	-	-	-	-	-	-	19375	AM 54	2.0
AM 56	2.0	-	-	-	-	-	-	18986	AM 56	2.0
AM 57	2.0	-	-	-	-	-	-	9372	AM 57	2.0
AM 58	2.0	-	-	-	-	-	-	94416	AM 58	2.0
AM 59	2.0	-	-	-	-	-	-	9293	AM 59	2.0
AM 60	2.0	-	-	-	-	-	-	9532	AM 60	2.0
AM 61	2.0	-	-	-	-	-	-	9560	AM 61	2.0
AM 62	2.0	-	-	-	-	-	-	7356	AM 62	2.0
AM 63	2.0	-	-	-	-	-	-	11460	AM 63	2.0
AM 64	2.0	-	-	-	-	-	-	32072	AM 64	2.0
AM 65	2.0	-	-	-	-	-	-	9135	AM 65	2.0
AM 66	2.0	-	-	-	-	-	-	9443	AM 66	2.0
AM 67	2.0	-	-	-	-	-	-	20690	AM 67	2.0
AM 68	2.0	-	-	-	-	-	-	8928	AM 68	2.0
AM 69	2.0	-	-	-	-	-	-	8868	AM 69	2.0

Esso Gasoline Station

The Old Ellenton Esso gasoline station is located at the intersection of South Carolina Rt. 125 and Main Street (SRP Rt.3), as shown on the Index Map (Figure 1). Using the same rational as discussed with respect to the Amoco station, a grid of 36 sites on 10 and 20 ft centers was sampled for light hydrocarbons C_1-C_4, as shown on Figure 7. Results of these analyses are shown on Figures 8, 9 and 10, and the data are tabulated in Tables 5 and 6.

On the same basis as considered for the Amoco station data, only 4 sites at the Esso station were found marginally anomalous in % butane, and only two of these had anomalous butane magnitudes. Methane magnitudes were likewise found to be normal. No evidence of underground objects was encountered. Based on these data, no soil samples were taken for gasoline range hydrocarbon analysis.

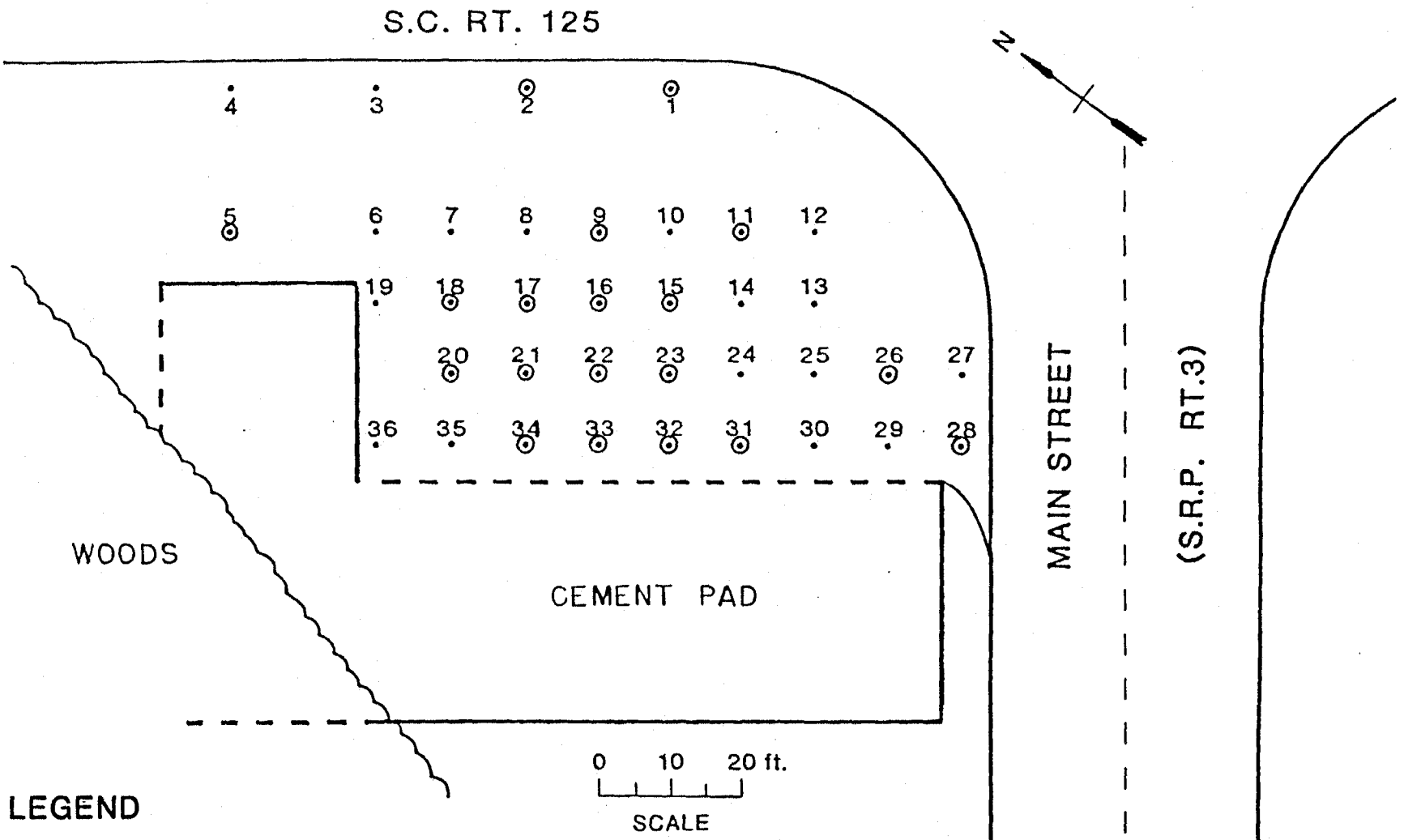


OLD ELLENTON
ESSO GAS STATION

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

FIGURE 7



LEGEND

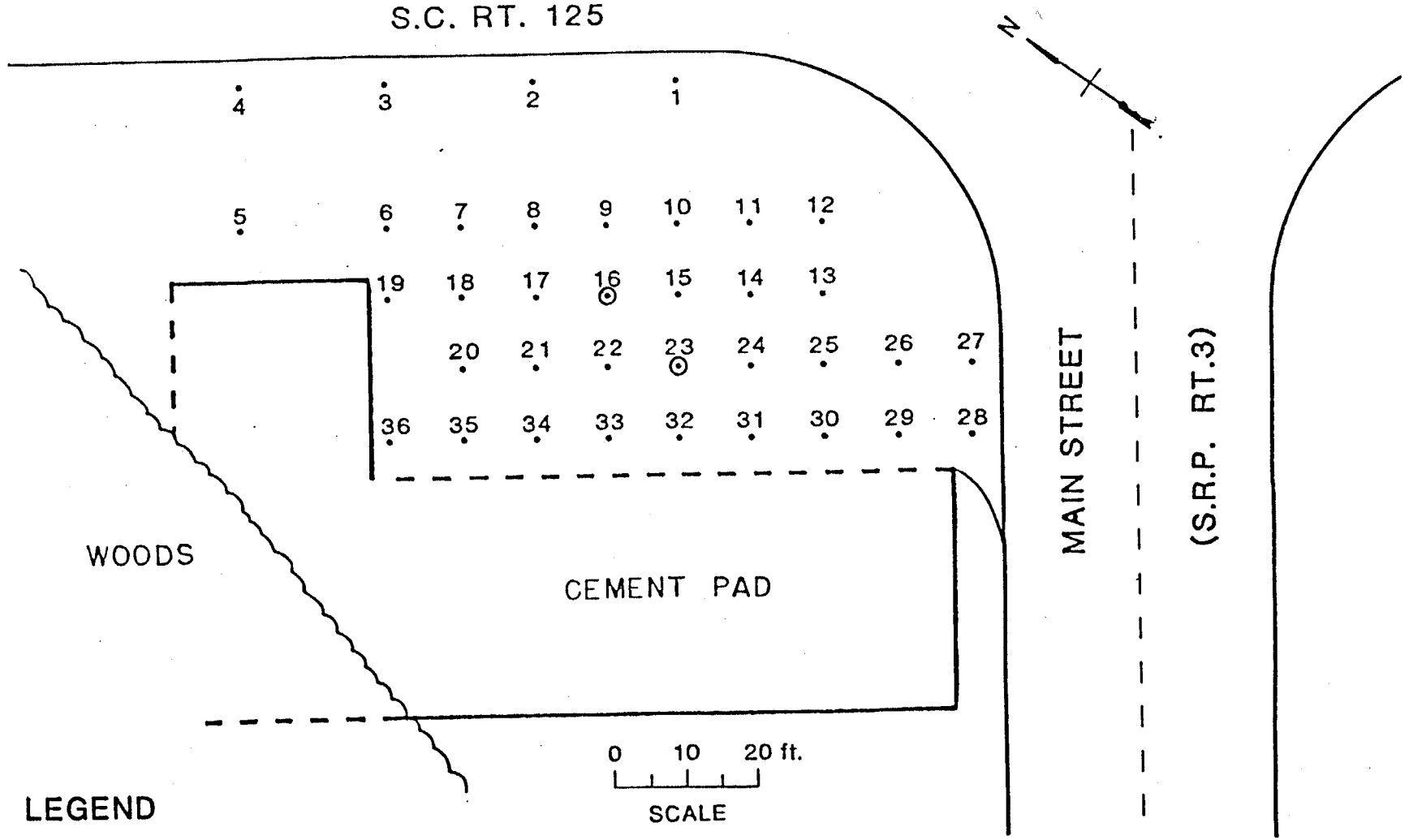
SYMBOL	RANGE (ppb)
★	> 6338
◆	5089 – 6338
●	3840 – 5088
⊙	1342 – 3839
•	< 1342

OLD ELLENTON ESSO GAS STATION

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 8



LEGEND

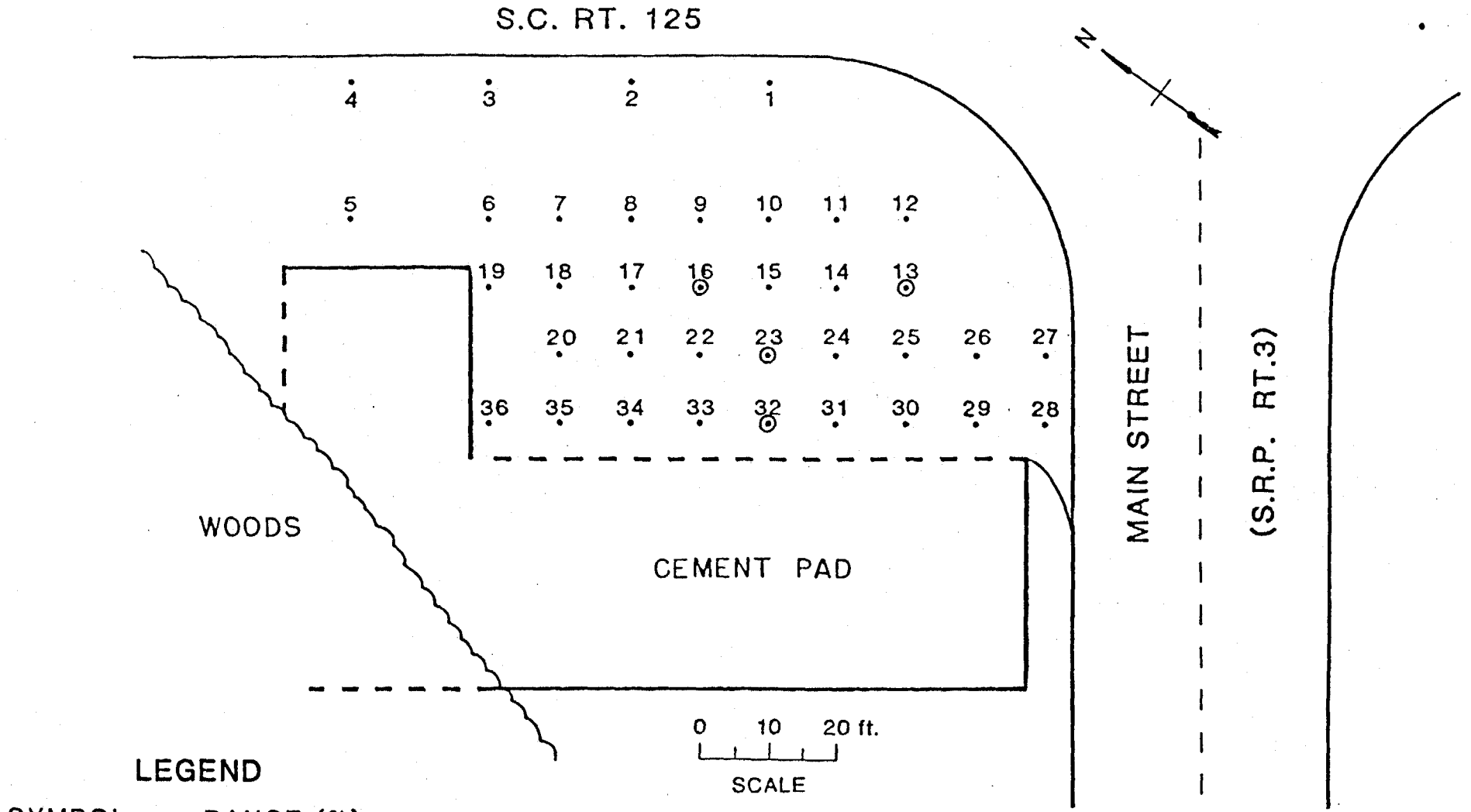
SYMBOL	RANGE (ppb)
★	> 1020
◆	787 – 1020
●	553 – 786
⊙	86 – 552
•	< 86

OLD ELLENTON ESSO GAS STATION

BUTANE

S.R.P. NOVEMBER, 1986

FIGURE 9



LEGEND

SYMBOL	RANGE (%)
★	> 17.5
◆	14.1 – 17.5
●	10.6 – 14.0
⊙	3.7 – 10.5
•	< 3.7

OLD ELLENTON ESSO GAS STATION

PERCENT BUTANE (IN C1–C4)

S.R.P. NOVEMBER, 1986

FIGURE 10

**19-Oct-86 **

TABLE 5

MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / ESSO STATION -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
SO 1	2174	120	45	62	7	100	100	SO 1
SO 2	1551	63	31	27	-	37	26	SO 2
SO 3	1304	33	14	16	-	22	24	SO 3
SO 4	957	37	14	22	-	25	23	SO 4
SO 5	1754	57	19	20	-	36	31	SO 5
SO 6	1217	66	23	20	-	42	38	SO 6
SO 7	567	22	8	-	-	15	-	SO 7
SO 8	1275	59	23	23	-	36	32	SO 8
SO 9	2058	141	53	67	13	111	110	SO 9
SO 10	1041	68	25	24	-	51	53	SO 10
SO 11	2203	115	46	41	-	90	75	SO 11
SO 12	923	21	13	-	-	12	-	SO 12
SO 13	1297	52	24	66	-	62	46	SO 13
SO 14	1116	53	22	31	-	40	62	SO 14
SO 15	1797	108	40	55	-	83	81	SO 15
SO 16	3261	226	82	229	19	190	196	SO 16
SO 17	1391	71	24	36	-	45	50	SO 17
SO 18	1406	61	27	27	-	39	38	SO 18
SO 19	1050	32	21	-	-	26	17	SO 19
SO 20	1478	76	38	33	-	64	49	SO 20
SO 21	1391	65	22	44	-	44	39	SO 21
SO 22	1536	101	36	62	-	81	85	SO 22
SO 23	1623	148	61	96	19	114	144	SO 23
SO 24	1246	72	37	34	-	72	54	SO 24
SO 25	971	41	15	20	-	25	23	SO 25
SO 26	1624	37	12	13	-	22	17	SO 26
SO 27	1232	23	7	-	-	14	-	SO 27
SO 28	1594	33	11	27	-	20	15	SO 28
SO 29	1162	34	33	20	-	40	41	SO 29
SO 30	1062	51	21	35	-	33	64	SO 30
SO 31	1609	89	23	39	-	61	48	SO 31
SO 32	1449	109	44	77	-	86	98	SO 32
SO 33	1913	106	37	49	6	82	67	SO 33
SO 34	1348	88	40	47	6	90	74	SO 34
SO 35	1109	66	51	26	-	73	65	SO 35
SO 36	990	28	34	12	-	37	23	SO 36

**19-Oct-86 **

TABLE 6

MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / ESSO STATION -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
SO 1	2408	90.3	5.0	1.9	2.9	2608	3.8	3.8	SO 1
SO 2	1672	92.8	3.8	1.9	1.6	1735	2.1	1.5	SO 2
SO 3	1367	95.4	2.4	1.0	1.2	1413	1.6	1.7	SO 3
SO 4	1030	92.9	3.6	1.4	2.1	1078	2.3	2.1	SO 4
SO 5	1850	94.8	3.1	1.0	1.1	1917	1.9	1.6	SO 5
SO 6	1326	91.8	5.0	1.7	1.5	1406	3.0	2.7	SO 6
SO 7	597	95.0	3.7	1.3	0.0	612	2.5	0.0	SO 7
SO 8	1380	92.4	4.3	1.7	1.7	1448	2.5	2.2	SO 8
SO 9	2332	88.3	6.0	2.3	3.4	2553	4.3	4.3	SO 9
SO 10	1158	89.9	5.9	2.2	2.1	1262	4.0	4.2	SO 10
SO 11	2405	91.6	4.8	1.9	1.7	2570	3.5	2.9	SO 11
SO 12	957	96.4	2.2	1.4	0.0	969	1.2	0.0	SO 12
SO 13	1439	90.1	3.6	1.7	4.6	1547	4.0	3.0	SO 13
SO 14	1222	91.3	4.3	1.8	2.5	1324	3.0	4.7	SO 14
SO 15	2000	89.9	5.4	2.0	2.8	2164	3.8	3.7	SO 15
SO 16	3817	85.4	5.9	2.1	6.5	4203	4.5	4.7	SO 16
SO 17	1522	91.4	4.7	1.6	2.4	1617	2.8	3.1	SO 17
SO 18	1521	92.4	4.0	1.8	1.8	1598	2.4	2.4	SO 18
SO 19	1103	95.2	2.9	1.9	0.0	1146	2.3	1.5	SO 19
SO 20	1625	91.0	4.7	2.3	2.0	1738	3.7	2.8	SO 20
SO 21	1522	91.4	4.3	1.4	2.9	1605	2.7	2.4	SO 21
SO 22	1735	88.5	5.8	2.1	3.6	1901	4.3	4.5	SO 22
SO 23	1947	83.4	7.6	3.1	5.9	2205	5.2	6.5	SO 23
SO 24	1389	89.7	5.2	2.7	2.4	1515	4.8	3.6	SO 24
SO 25	1047	92.7	3.9	1.4	1.9	1095	2.3	2.1	SO 25
SO 26	1686	96.3	2.2	0.7	0.8	1725	1.3	1.0	SO 26
SO 27	1262	97.6	1.8	0.6	0.0	1276	1.1	0.0	SO 27
SO 28	1665	95.7	2.0	0.7	1.6	1700	1.2	0.9	SO 28
SO 29	1249	93.0	2.7	2.6	1.6	1330	3.0	3.1	SO 29
SO 30	1169	90.8	4.4	1.8	3.0	1266	2.6	5.1	SO 30
SO 31	1760	91.4	5.1	1.3	2.2	1869	3.3	2.6	SO 31
SO 32	1679	86.3	6.5	2.6	4.6	1863	4.6	5.3	SO 32
SO 33	2111	90.6	5.0	1.8	2.6	2260	3.6	3.0	SO 33
SO 34	1529	88.2	5.8	2.6	3.5	1693	5.3	4.4	SO 34
SO 35	1252	88.6	5.3	4.1	2.1	1390	5.3	4.7	SO 35
SO 36	1064	93.0	2.6	3.2	1.1	1124	3.3	2.0	SO 36

Oil Company Site

The oil company site is located near the intersection of Railroad Avenue and Main Street (SRP Rt. 3) as shown on the Index Map on Figure 1. Very little information regarding activity at this site was available. A total of 67 sites were sampled at a depth of 3 ft for light hydrocarbons. Locations of these sites are shown on Figure 11. Data resulting from sample analysis is shown on Figures 12, 13 and 14, and is tabulated in Tables 7 and 8.

A large methane anomaly was encountered at Site 37, as shown on Figure 12. Based on composition, this is probably methane generated from biological activity. Other high methane sites were found in close proximity. No probable source of this methane is known to us.

Several sites were found anomalous with respect to percent butane (see Figure 14), suggesting the presence of gasoline. Based on butane magnitudes, these sites are only marginally anomalous (see Figure 13), suggesting that the level of contamination here is smaller than at the Amoco station.

At five sites, soil samples were taken for gasoline range hydrocarbon analysis. No gasoline range hydrocarbons were found above the minimum detection level (see Table 1).

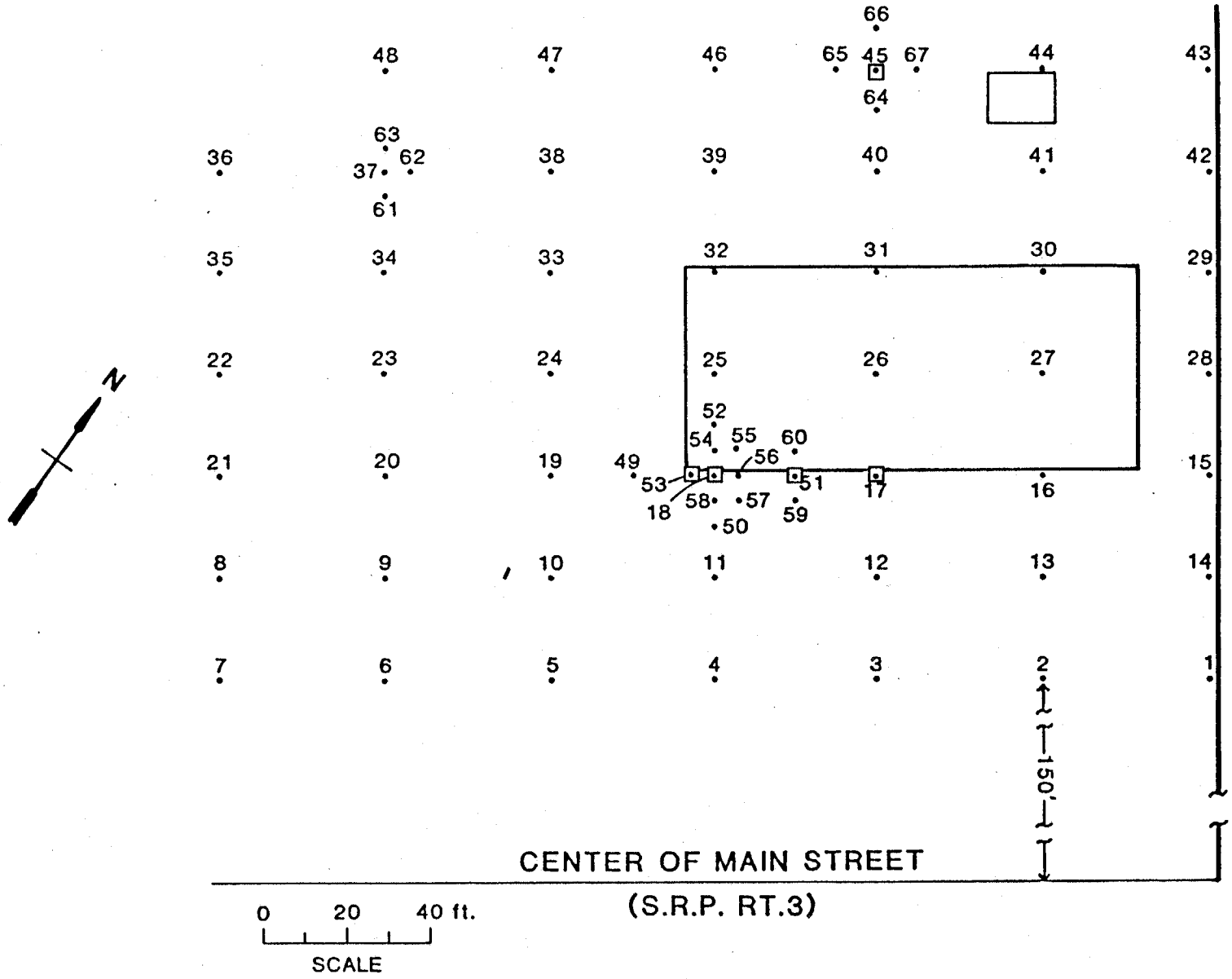


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FIGURE 11

• SOIL GAS SAMPLES

⊡ SOIL GAS & SOIL SAMPLES

OIL COMPANY SITE

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

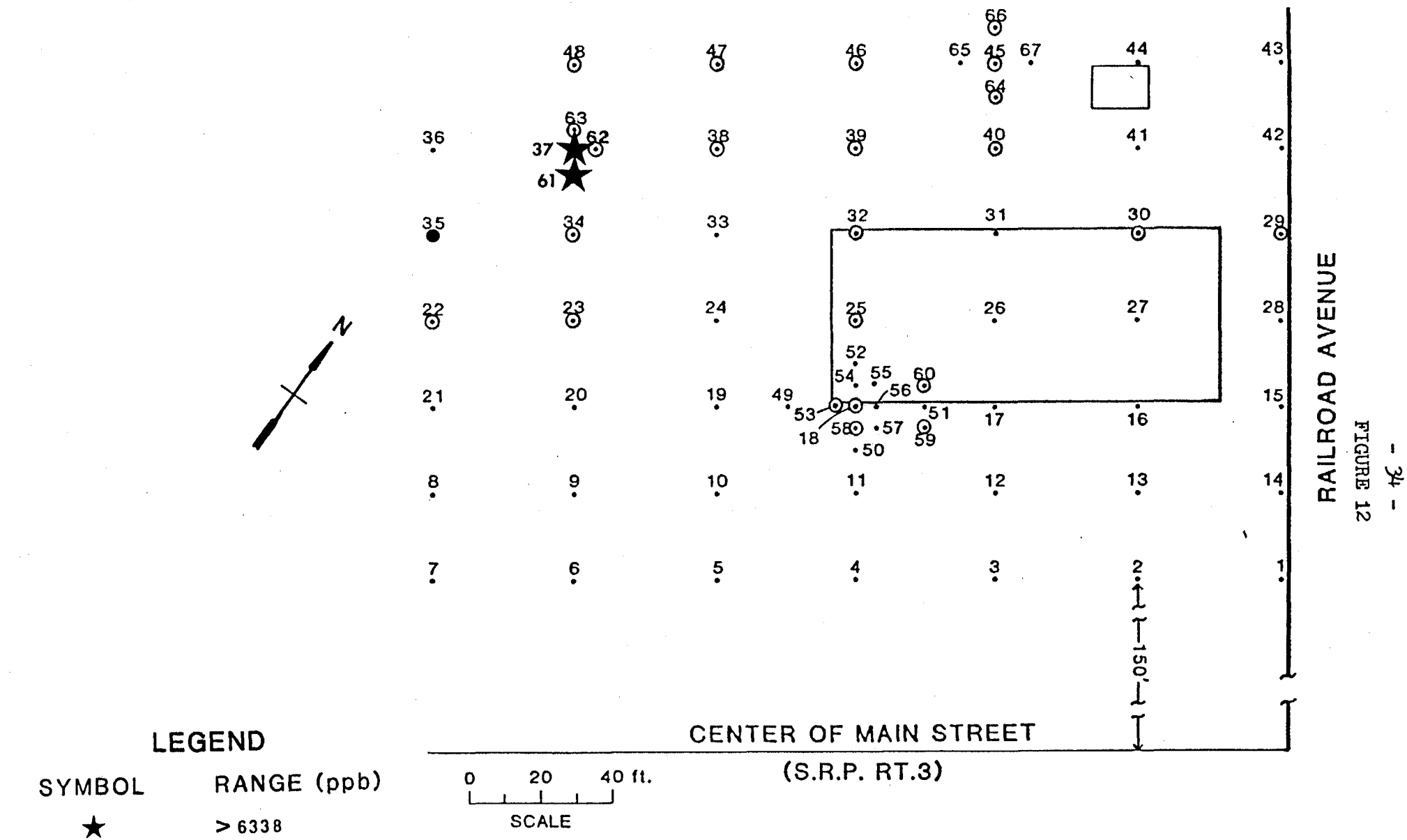
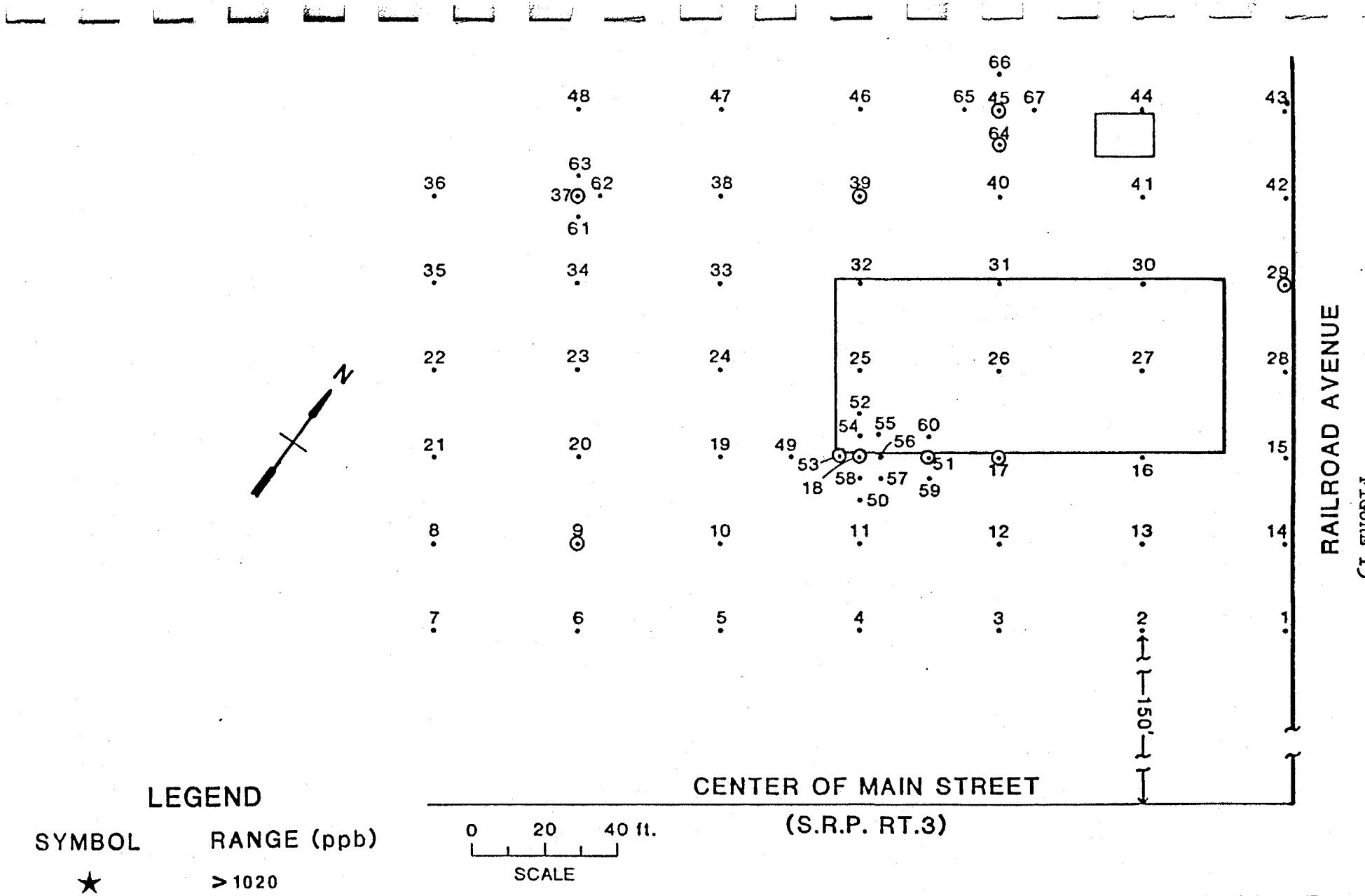


FIGURE 12

OIL COMPANY SITE

METHANE

S.R.P. NOVEMBER, 1986

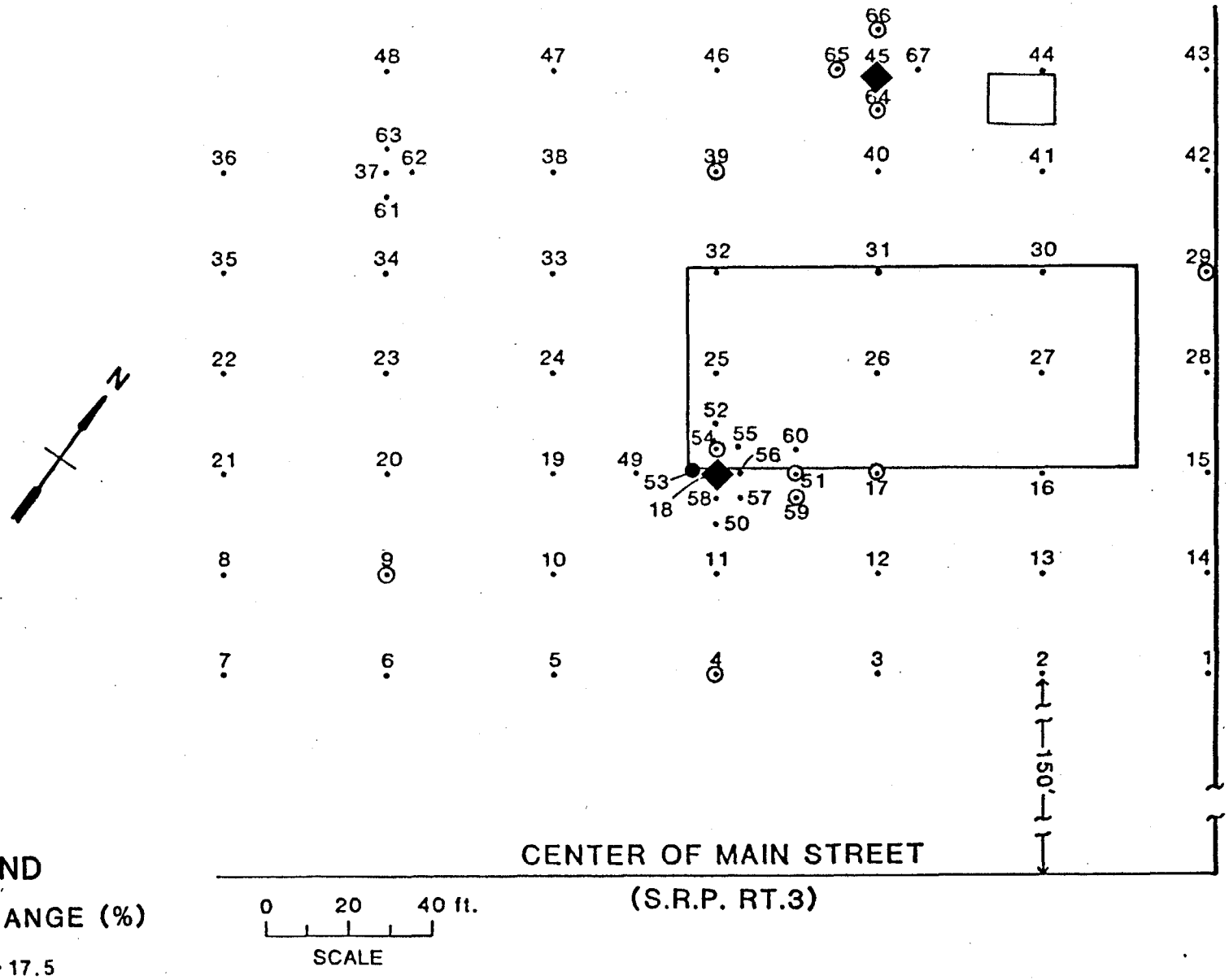


OIL COMPANY SITE

BUTANE

S.R.P. NOVEMBER, 1986

FIGURE 13



OIL COMPANY SITE
PERCENT BUTANE
(IN C1–C4)

S.R.P. NOVEMBER, 1986

FIGURE 14

**19-Oct-86 **

TABLE 7

MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / OIL CO. -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
OC 1	1055	35	14	22	-	30	27	OC 1
OC 2	796	16	-	-	-	11	-	OC 2
OC 3	513	11	-	-	-	14	-	OC 3
OC 4	668	24	14	72	-	16	12	OC 4
OC 5	637	23	11	18	-	16	12	OC 5
OC 6	658	27	12	-	-	16	17	OC 6
OC 7	666	25	9	-	-	16	14	OC 7
OC 8	963	41	21	21	-	25	23	OC 8
OC 9	1333	71	84	116	47	31	36	OC 9
OC 10	1232	33	15	17	-	23	21	OC 10
OC 11	910	26	10	18	-	19	15	OC 11
OC 12	859	17	11	-	-	13	-	OC 12
OC 13	942	34	20	-	-	17	14	OC 13
OC 14	1188	28	17	22	-	24	21	OC 14
OC 15	1181	29	16	18	-	38	30	OC 15
OC 16	1304	46	20	14	-	26	22	OC 16
OC 17	1130	30	80	77	41	18	9	OC 17
OC 18	1449	53	64	248	39	45	35	OC 18
OC 18R	1280	37	29	139	19	39	33	OC 18R
OC 19	1261	39	17	17	-	22	21	OC 19
OC 20	1000	28	33	33	-	22	12	OC 20
OC 21	1181	58	47	47	-	31	30	OC 21
OC 22	1768	88	44	44	-	66	65	OC 22
OC 23	2029	118	57	57	-	67	70	OC 23
OC 24	1115	37	24	24	-	22	19	OC 24
OC 25	2188	48	38	38	-	39	40	OC 25
OC 26	917	34	19	19	-	21	23	OC 26
OC 27	1260	43	17	17	-	23	16	OC 27
OC 28	1041	43	20	20	-	41	27	OC 28
OC 29	3203	357	160	284	70	447	425	OC 29
OC 30	1405	42	16	20	-	29	29	OC 30
OC 31	1275	52	18	27	-	51	42	OC 31
OC 32	1594	32	11	15	-	26	18	OC 32
OC 33	1287	50	18	20	-	26	25	OC 33
OC 34	2652	126	57	72	-	86	76	OC 34
OC 35	4710	246	107	25	39	305	297	OC 35
OC 36	1043	23	20	-	-	14	-	OC 36
OC 37	49468000	*	175	111	72	115	226	OC 37
OC 38	2029	61	22	30	-	40	42	OC 38
OC 39	2899	100	40	153	26	78	71	OC 39
OC 40	1478	52	19	33	-	35	36	OC 40
OC 41	1295	28	12	14	-	18	16	OC 41
OC 42	1290	65	24	38	-	49	46	OC 42
OC 43	1127	46	16	16	-	27	23	OC 43
OC 44	913	41	22	18	-	26	29	OC 44
OC 45	1459	53	26	284	39	34	34	OC 45
OC 45R	1289	44	18	75	-	23	27	OC 45R
OC 46	1667	82	29	36	6	44	42	OC 46
OC 47	2493	44	20	19	-	33	32	OC 47

TABLE 7 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / OIL CO. -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
OC 48	1696	87	30	30	-	46	45	OC 48
OC 49	1152	57	25	40	-	37	31	OC 49
OC 50	1275	33	12	17	-	24	22	OC 50
OC 51	1072	45	47	80	33	29	24	OC 51
OC 52	899	33	19	21	-	20	12	OC 52
OC 53	2340	95	151	296	88	88	79	OC 53
OC 54	1115	29	16	76	-	32	28	OC 54
OC 55	1142	37	18	38	-	24	23	OC 55
OC 56	1168	15	32	30	-	12	12	OC 56
OC 57	1209	39	15	34	-	23	23	OC 57
OC 58	1522	44	17	29	-	28	33	OC 58
OC 59	1371	42	17	60	-	24	25	OC 59
OC 60	1680	59	23	26	-	37	31	OC 60
OC 61	12957	84	39	26	-	51	50	OC 61
OC 62	1663	75	34	35	-	47	50	OC 62
OC 63	2405	15	9	16	-	13	-	OC 63
OC 64	1517	67	29	102	-	43	48	OC 64
OC 65	1311	65	27	69	-	65	40	OC 65
OC 66	1431	59	22	59	-	32	38	OC 66
OC 67	1204	34	13	19	-	18	20	OC 67

TABLE 8

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / OIL CO. -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
OC 1	793	93.2	4.8	2.0	0.0	876	4.7	4.8	OC 1
OC 2	812	98.0	2.0	0.0	0.0	823	1.3	0.0	OC 2
OC 3	524	97.9	2.1	0.0	0.0	538	2.6	0.0	OC 3
OC 4	778	85.9	3.1	1.8	9.3	806	2.0	1.5	OC 4
OC 5	689	92.5	3.3	1.6	2.6	717	2.2	1.7	OC 5
OC 6	697	94.4	3.9	1.7	0.0	730	2.2	2.3	OC 6
OC 7	700	95.1	3.6	1.3	0.0	730	2.2	1.9	OC 7
OC 8	1046	92.1	3.9	2.0	2.0	1094	2.3	2.1	OC 8
OC 9	1651	80.7	4.3	5.1	9.9	1718	1.8	2.1	OC 9
OC 10	1297	95.0	2.5	1.2	1.3	1341	1.7	1.6	OC 10
OC 11	964	94.4	2.7	1.0	1.9	998	1.[illegible]	1.5	OC 11
OC 12	887	96.8	1.9	1.2	0.0	900	1.[illegible]	0.0	OC 12
OC 13	996	94.6	3.4	2.0	0.0	1027	1.[illegible]	1.4	OC 13
OC 14	1255	94.7	2.2	1.4	1.8	1300	1.[illegible]	1.6	OC 14
OC 15	1244	94.9	2.3	1.3	1.4	1312	2.[illegible]	2.3	OC 15
OC 16	1384	94.2	3.3	1.4	1.0	1432	1.[illegible]	1.5	OC 16
OC 17	1358	83.2	2.2	5.9	8.7	1385	1.[illegible]	0.6	OC 17
OC 18	1853	78.2	2.9	3.5	15.5	1933	2.[illegible]	1.8	OC 18
OC 18R	1504	85.1	2.5	1.9	10.5	1576	2.[illegible]	2.1	OC 18R
OC 19	1334	94.5	2.9	1.3	1.3	1377	1.[illegible]	1.5	OC 19
OC 20	1094	91.4	2.6	3.0	3.0	1128	2.0	1.1	OC 20
OC 21	1333	88.6	4.4	3.5	3.5	1394	2.2	2.2	OC 21
OC 22	1944	90.9	4.5	2.3	2.3	2075	3.2	3.1	OC 22
OC 23	2261	89.7	5.2	2.5	2.5	2398	2.8	2.9	OC 23
OC 24	1200	92.9	3.1	2.0	2.0	1241	1.8	1.5	OC 24
OC 25	2312	94.6	2.1	1.6	1.6	2391	1.6	1.7	OC 25
OC 26	989	92.7	3.4	1.9	1.9	1033	2.0	2.2	OC 26
OC 27	1337	94.2	3.2	1.3	1.3	1376	1.7	1.2	OC 27
OC 28	1124	92.6	3.8	1.8	1.8	1192	3.4	2.3	OC 28
OC 29	4074	78.6	8.8	3.9	8.7	4946	9.0	8.6	OC 29
OC 30	1483	94.7	2.8	1.1	1.3	1541	1.9	1.9	OC 30
OC 31	1372	92.9	3.8	1.3	2.0	1465	3.5	2.9	OC 31
OC 32	1652	96.5	1.9	0.7	0.9	1696	1.5	1.1	OC 32
OC 33	1375	93.6	3.6	1.3	1.5	1426	1.8	1.8	OC 33
OC 34	2907	91.2	4.3	2.0	2.5	3069	2.8	2.5	OC 34
OC 35	5127	91.9	4.8	2.1	1.2	5729	5.3	5.2	OC 35
OC 36	1086	96.0	2.1	1.8	0.0	1100	1.3	0.0	OC 36
OC 37	49468358	100.0	0.0	0.0	0.0	49468699	0.0	0.0	OC 37
OC 38	2142	94.7	2.8	1.0	1.4	2224	1.8	1.9	OC 38
OC 39	3218	90.1	3.1	1.2	5.6	3367	2.3	2.1	OC 39
OC 40	1582	93.4	3.3	1.2	2.1	1653	2.1	2.2	OC 40
OC 41	1349	96.0	2.1	0.9	1.0	1383	1.3	1.2	OC 41
OC 42	1417	91.0	4.6	1.7	2.7	1512	3.2	3.0	OC 42
OC 43	1205	93.5	3.8	1.3	1.3	1255	2.2	1.8	OC 43
OC 44	994	91.9	4.1	2.2	1.8	1049	2.5	2.8	OC 44
OC 45	1861	78.4	2.8	1.4	17.4	1929	1.8	1.8	OC 45
OC 45R	1426	90.4	3.1	1.3	5.3	1476	1.6	1.8	OC 45R
OC 46	1820	91.6	4.5	1.6	2.3	1906	2.3	2.2	OC 46
OC 47	2576	96.8	1.7	0.8	0.7	2641	1.2	1.2	OC 47

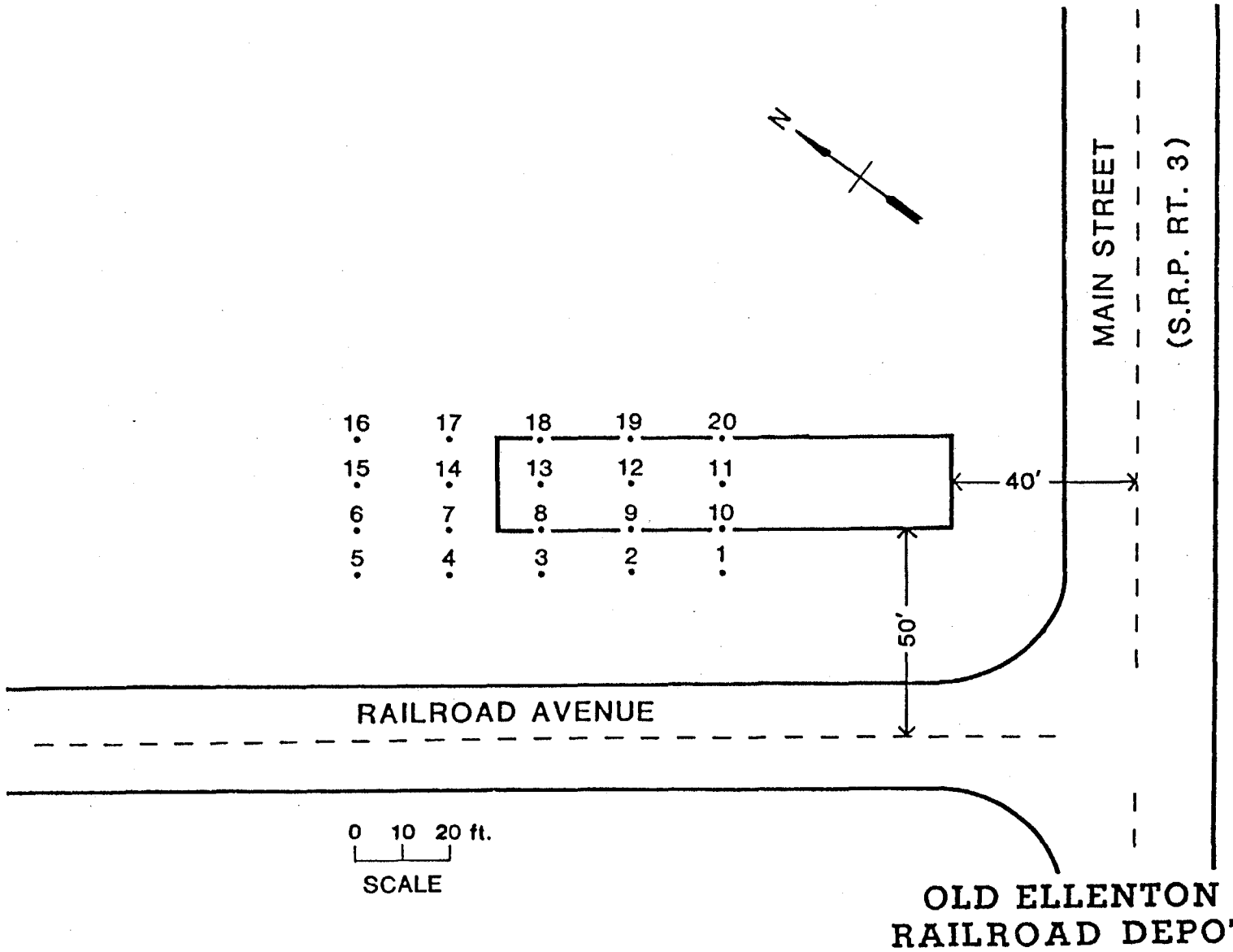
TABLE 8 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / OIL CO. -- 3 FT. PROBE SURVEY, SEPT 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
OC 48	1843	92.0	4.7	1.6	1.6	1934	2.4	2.3	OC 48
OC 49	1274	90.4	4.5	2.0	3.1	1342	2.8	2.3	OC 49
OC 50	1337	95.4	2.5	0.9	1.3	1383	1.7	1.6	OC 50
OC 51	1277	83.9	3.5	3.7	8.8	1330	2.2	1.8	OC 51
OC 52	972	92.5	3.4	2.0	2.2	1004	2.0	1.2	OC 52
OC 53	2970	78.8	3.2	5.1	12.9	3137	2.8	2.5	OC 53
OC 54	1236	90.2	2.3	1.3	6.1	1296	2.5	2.2	OC 54
OC 55	1235	92.5	3.0	1.5	3.1	1282	1.9	1.8	OC 55
OC 56	1245	93.8	1.2	2.6	2.4	1269	0.9	0.9	OC 56
OC 57	1297	93.2	3.0	1.2	2.6	1343	1.7	1.7	OC 57
OC 58	1612	94.4	2.7	1.1	1.8	1673	1.7	2.0	OC 58
OC 59	1490	92.0	2.8	1.1	4.0	1539	1.6	1.6	OC 59
OC 60	1738	94.0	3.3	1.3	1.5	1856	2.0	1.7	OC 60
OC 61	13206	98.9	0.6	0.3	0.2	13207	0.4	0.4	OC 61
OC 62	1907	92.0	4.2	1.9	1.9	1904	2.5	2.6	OC 62
OC 63	2445	98.4	0.6	0.4	0.7	2458	0.5	0.0	OC 63
OC 64	1715	88.5	3.9	1.7	5.9	1806	2.4	2.7	OC 64
OC 65	1472	89.1	4.4	1.8	4.7	1577	4.1	2.5	OC 65
OC 66	1571	91.1	3.8	1.4	3.8	1641	2.0	2.3	OC 66
OC 67	1270	94.8	2.7	1.0	1.5	1308	1.4	1.5	OC 67

Railroad Depot

The Old Ellenton Railroad Depot is located near the intersection of Railroad Avenue and Main Street (SRP Rt. 3), as shown on the Index Map in Figure 1. A 20 site grid on 10 x 20 foot centers was sampled for soil gas and analyzed for C_1-C_4 hydrocarbons. These site locations are shown on Figure 15. The data is shown in Figures 16, 17 and 18, and tabulated on Tables 9 and 10. As shown in Figure 16, and documented in Table 9, no significant methane anomalies were found. One site was found to be somewhat anomalous in terms of percent butane (see Figure 18), however, as shown on Figure 17, it was only moderately significant in terms of butane magnitude, suggesting the level of contamination is small. No soil samples for gasoline range hydrocarbons were taken.



• SOIL GAS SAMPLES

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

FIGURE 15

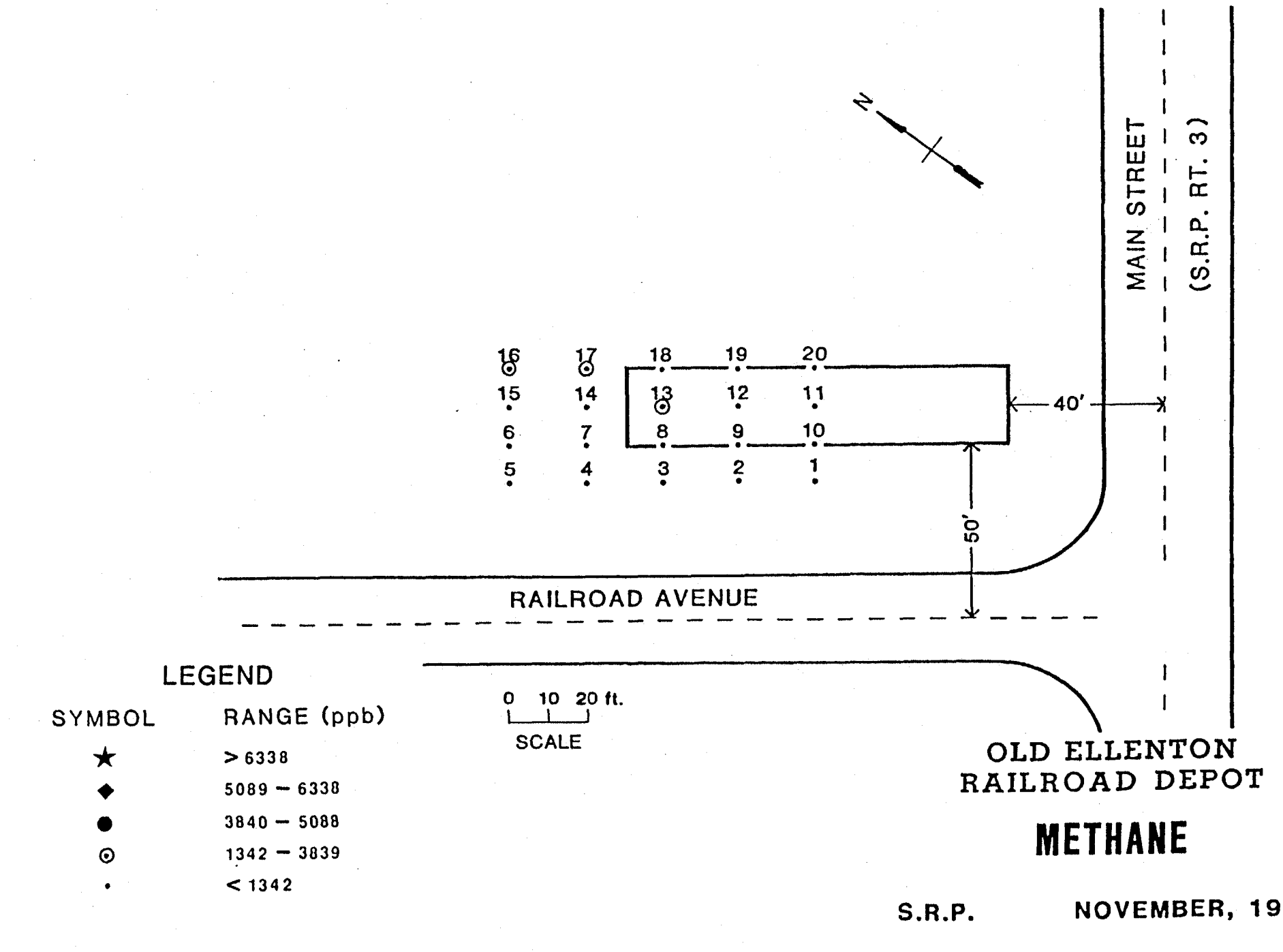
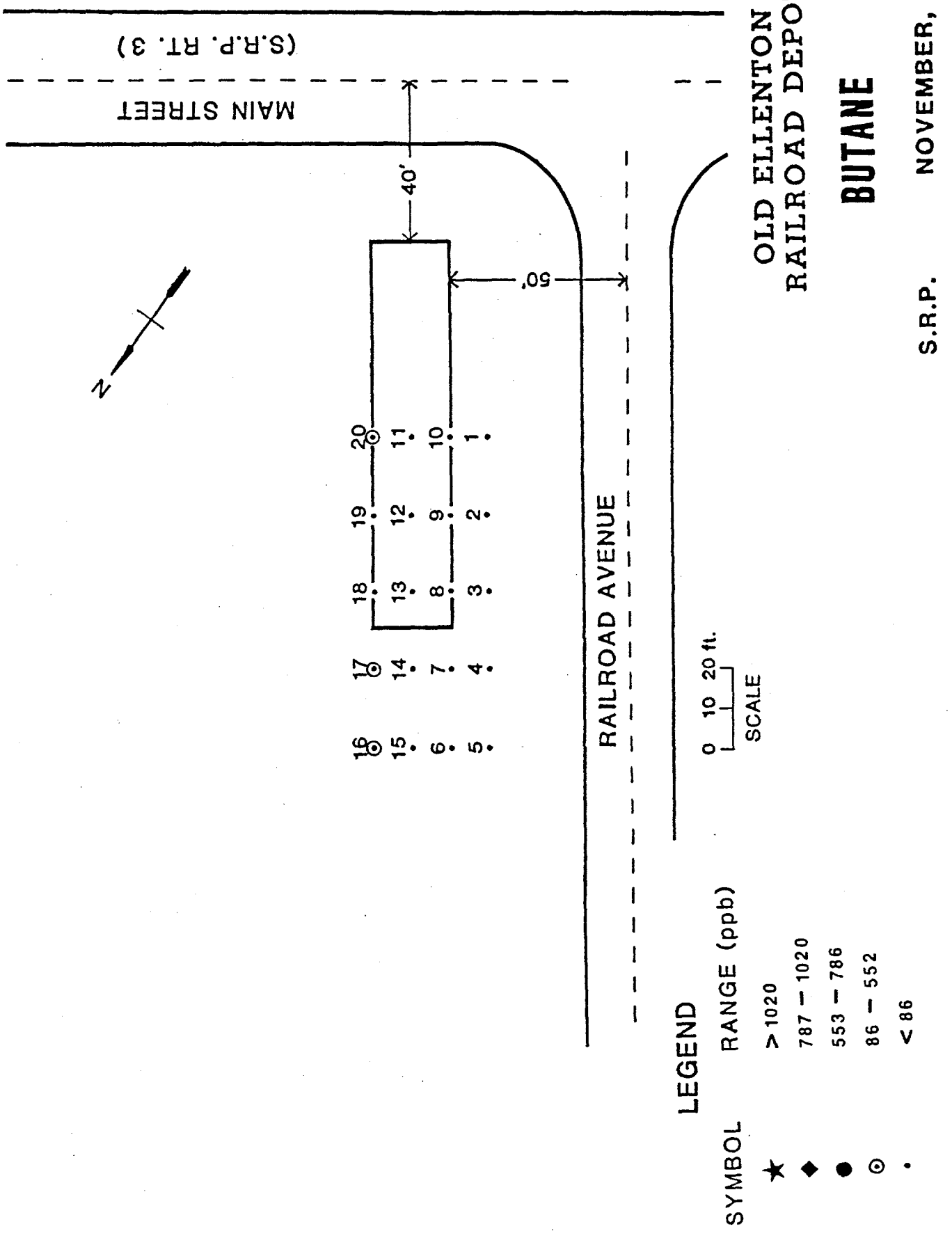

N
MAIN STREET
(S.R.P. RT. 3)
16 17 18 19 20
15 14 13 12 11
6 7 8 9 10
5 4 3 2 1
40'
50'
RAILROAD AVENUE
LEGEND
SYMBOL RANGE (ppb)
★ > 6338
◆ 5089 – 6338
● 3840 – 5088
⊙ 1342 – 3839
• < 1342
0 10 20 ft.
SCALE
OLD ELLENTON
RAILROAD DEPOT
METHANE
S.R.P. NOVEMBER, 1986

FIGURE 16

FIGURE 17


OLD ELLENTON
RAILROAD DEPOT
BUTANE
S.R.P.
NOVEMBER, 1986
MAIN STREET
(S.R.P. RT. 3)
40'
50'
RAILROAD AVENUE
N
20
11
10
1
19
12
9
2
18
13
8
3
17
14
7
4
16
15
6
5
0 10 20 ft.
SCALE
LEGEND
SYMBOL
RANGE (ppb)
> 1020
787 – 1020
553 – 786
86 – 552
< 86

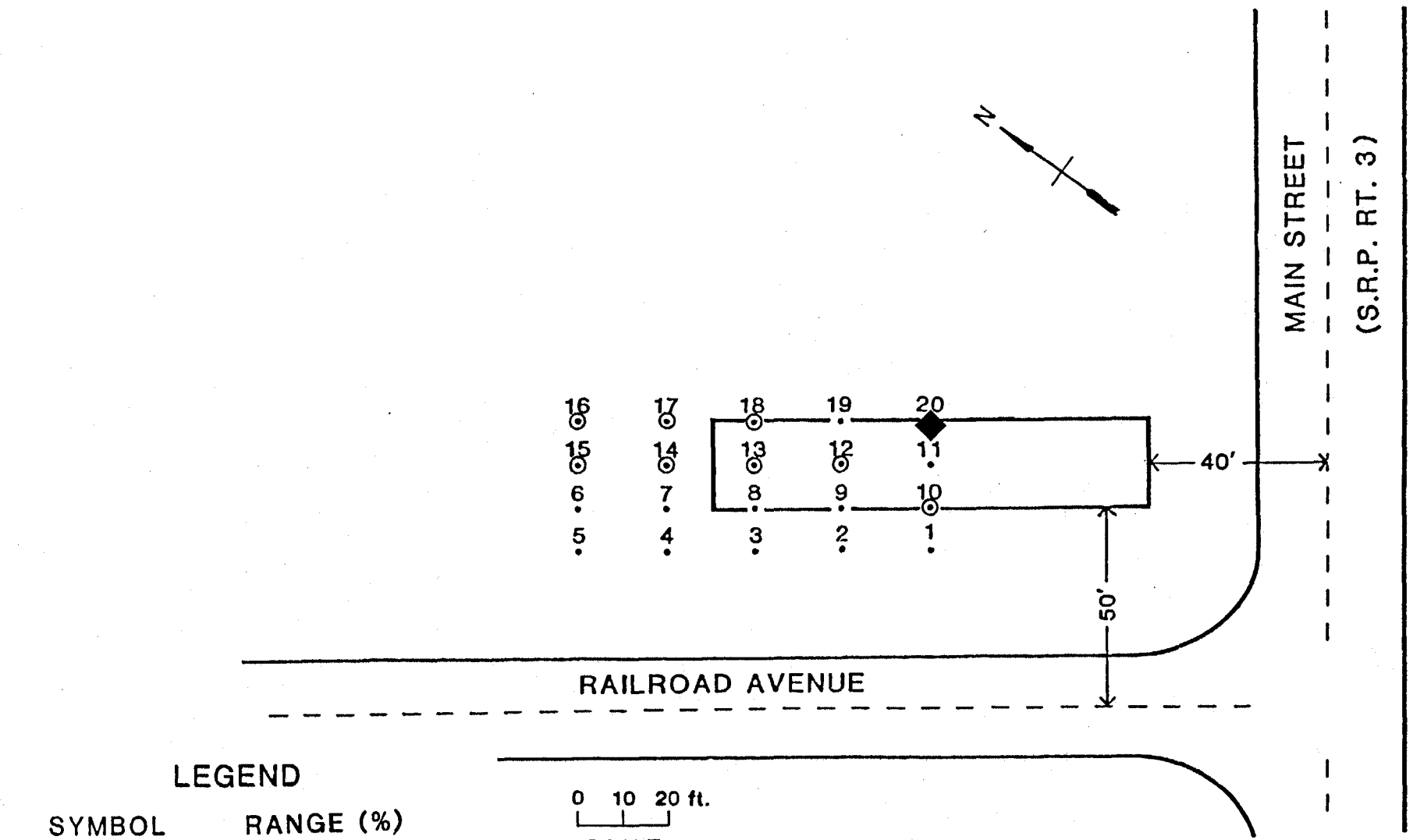

N
MAIN STREET
(S.R.P. RT. 3)
16 17 18 19 20
15 14 13 12 11
6 7 8 9 10
5 4 3 2 1
40'
50'
RAILROAD AVENUE
LEGEND
SYMBOL RANGE (%)
★ > 17.5
◆ 14.1 – 17.5
● 10.6 – 14.0
⊙ 3.7 – 10.5
• < 3.7
0 10 20 ft.
SCALE
OLD ELLENTON
RAILROAD DEPOT
PERCENT BUTANE
(IN C1–C4)
S.R.P. NOVEMBER, 1986

FIGURE 18

TABLE 9

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / R.R. DEPOT -- 3 FT. PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
RD 1	842	29	11	31	-	29	27	RD 1
RD 2	732	28	10	13	-	17	20	RD 2
RD 3	853	27	10	21	-	16	18	RD 3
RD 4	839	29	10	15	-	15	14	RD 4
RD 5	753	20	9	-	-	-	-	RD 5
RD 6	1014	26	10	18	-	14	16	RD 6
RD 7	675	24	8	17	-	12	12	RD 7
RD 8	510	13	-	14	-	-	-	RD 8
RD 9	1000	24	10	19	-	16	17	RD 9
RD 10	1020	28	46	45	33	17	18	RD 10
RD 11	1115	21	7	23	-	13	24	RD 11
RD 12	713	30	12	34	-	21	23	RD 12
RD 13	1663	56	25	76	-	42	35	RD 13
RD 14	896	34	15	61	-	26	29	RD 14
RD 15	817	30	12	47	-	17	19	RD 15
RD 16	1999	73	35	119	14	39	41	RD 16
RD 17	2792	114	42	139	14	156	113	RD 17
RD 18	868	25	10	36	-	12	15	RD 18
RD 19	750	17	8	18	-	13	12	RD 19
RD 20	926	60	62	190	14	22	26	RD 20

**19-Oct-86 **

MICROSEEPS LTD.

TABLE 10

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / R.R. DEPOT -- 3 FT. PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
RD 1	913	92.2	3.2	1.2	3.4	969	3.0	2.8	RD 1
RD 2	783	93.5	3.6	1.3	1.7	820	2.1	2.4	RD 2
RD 3	911	93.6	3.0	1.1	2.3	945	1.7	1.9	RD 3
RD 4	893	94.0	3.2	1.1	1.7	922	1.6	1.5	RD 4
RD 5	782	96.3	2.6	1.2	0.0	782	0.0	0.0	RD 5
RD 6	1068	94.9	2.4	0.9	1.7	1098	1.3	1.5	RD 6
RD 7	724	93.2	3.3	1.1	2.3	748	1.6	1.5	RD 7
RD 8	537	95.0	2.4	0.0	2.6	537	0.0	0.0	RD 8
RD 9	1053	95.0	2.3	0.9	1.8	1086	1.5	1.6	RD 9
RD 10	1172	87.0	2.4	3.9	6.7	1207	1.4	1.5	RD 10
RD 11	1166	95.6	1.8	0.6	2.0	1203	1.1	2.0	RD 11
RD 12	789	90.4	3.8	1.5	4.3	833	2.5	2.8	RD 12
RD 13	1820	91.4	3.1	1.4	4.2	1897	2.2	2.8	RD 13
RD 14	1006	89.1	3.4	1.5	6.1	1061	2.5	2.7	RD 14
RD 15	906	90.2	3.3	1.3	5.2	942	1.8	2.0	RD 15
RD 16	2240	89.2	3.3	1.6	5.9	2320	1.7	1.8	RD 16
RD 17	3101	90.0	3.7	1.4	4.9	3370	4.6	3.4	RD 17
RD 18	939	92.4	2.7	1.1	3.8	966	1.2	1.6	RD 18
RD 19	793	94.6	2.1	1.0	2.3	818	1.6	1.5	RD 19
RD 20	1252	74.0	4.8	5.0	16.3	1300	1.7	2.0	RD 20

The Chevrolet Dealer

The Old Ellenton Chevrolet dealership was located on the south side of Main Street, as shown on the Index Map in Figure 1. Fourteen sites were sampled for soil gas. As shown in Figure 19, 9 sites were located parallel to the building foundation and 5 sites were located at an adjacent area previously used as an "oil can dump." These fourteen samples were analyzed for C_1-C_4 hydrocarbons. No anomalous levels of any hydrocarbons were found. The data is shown in Figures 20, 21 and 22, and is tabulated in Tables 11 and 12. No soil samples were taken for gasoline range hydrocarbon analysis.

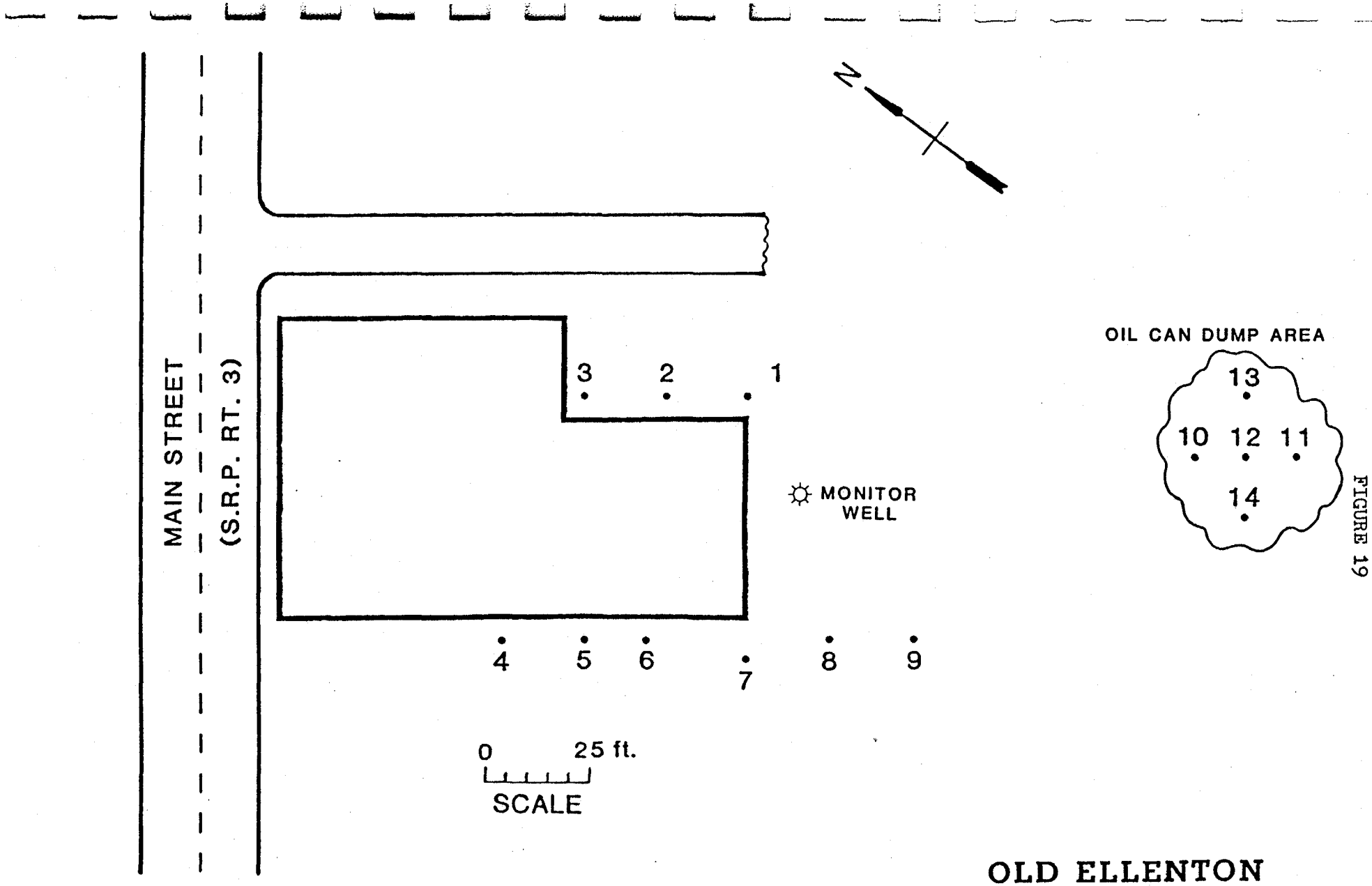
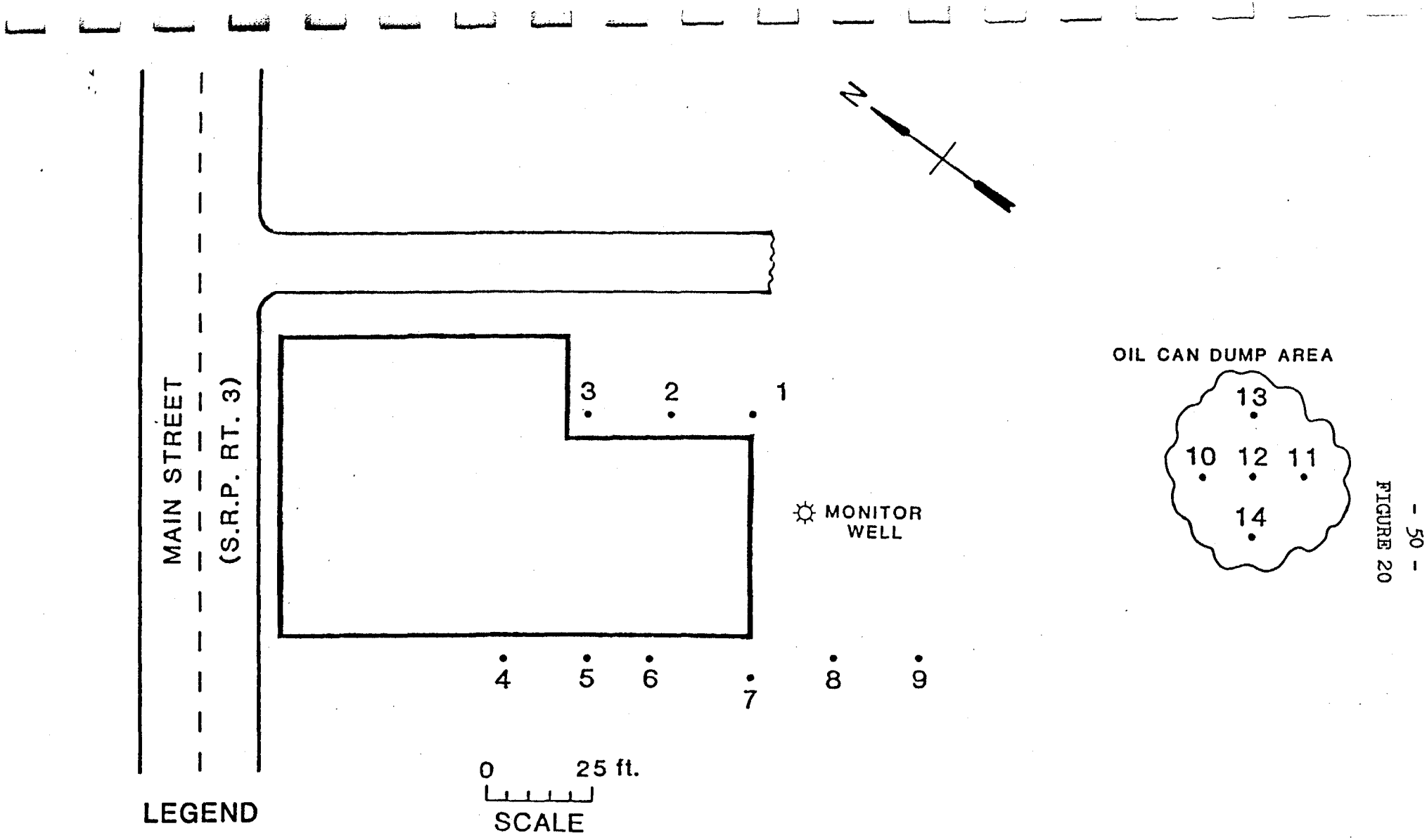


FIGURE 19

OLD ELLENTON CHEVROLET DEALER

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

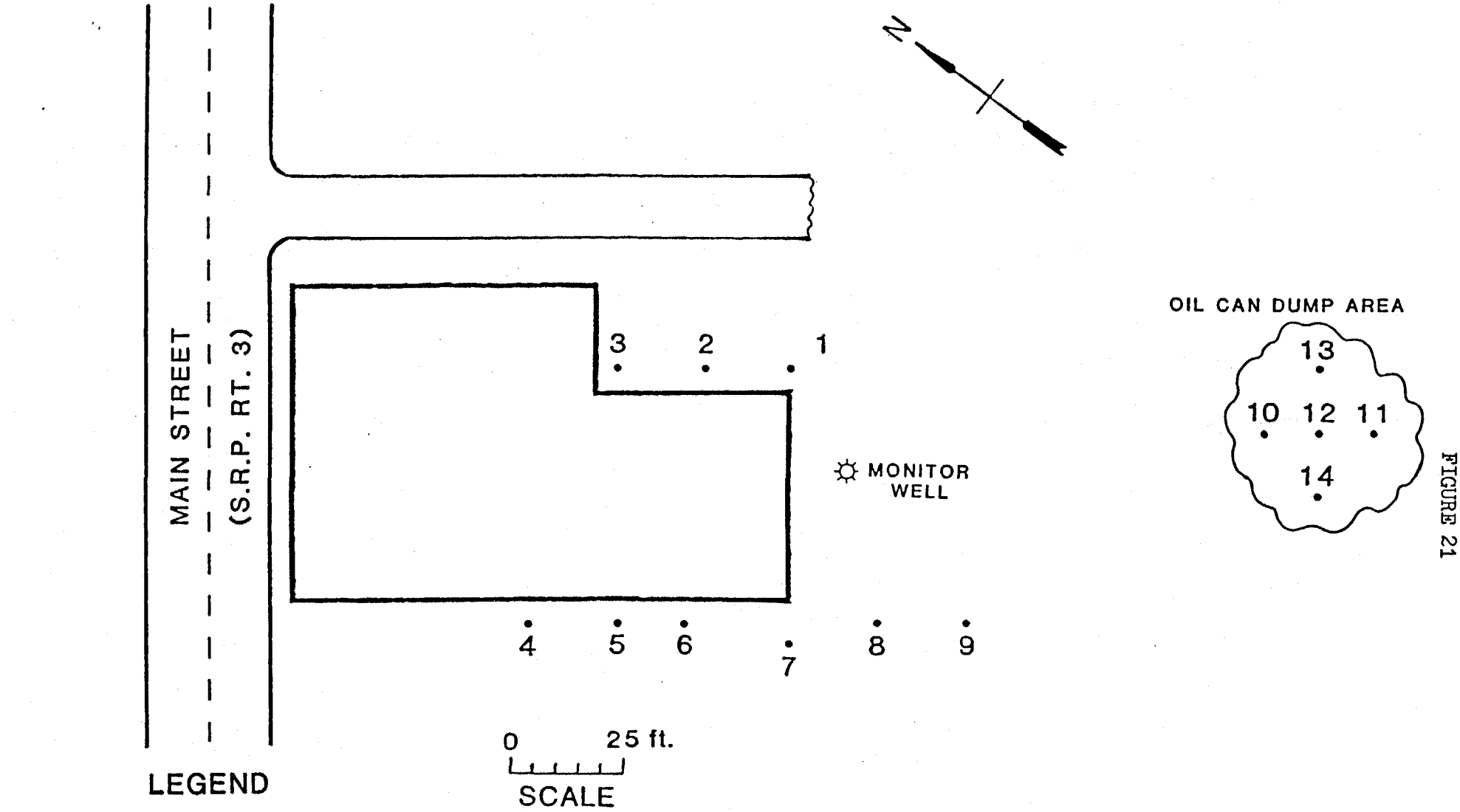


OLD ELLENTON
CHEVROLET DEALER

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 20



OLD ELLENTON CHEVROLET DEALER

BUTANE

S.R.P. NOVEMBER, 1986

FIGURE 21

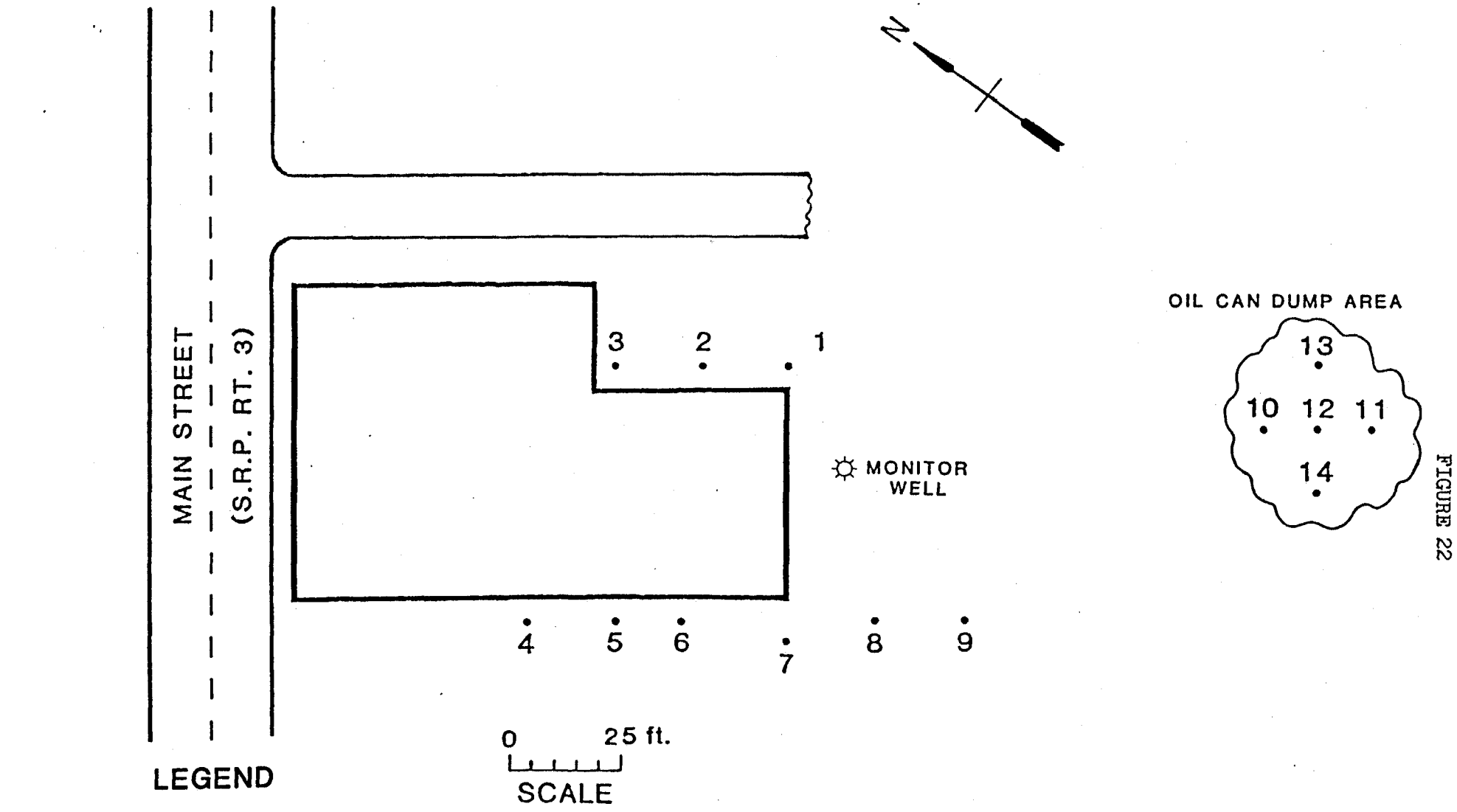


FIGURE 22

OLD ELLENTON
CHEVROLET DEALER

PERCENT BUTANE
(IN C1–C4)

S.R.P. NOVEMBER, 1986

**19-Oct-86 **

TABLE 11

MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / CHEVY DEALER -- 3 FT. PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
CD 1	732	25	8	11	-	19	18	CD 1
CD 2	560	15	5	-	-	13	12	CD 2
CD 3	1047	38	16	27	-	40	40	CD 3
CD 4	923	29	10	-	-	16	15	CD 4
CD 5	514	24	9	-	-	15	16	CD 5
CD 6	726	26	10	12	-	15	15	CD 6
CD 7	711	24	-	-	-	21	-	CD 7
CD 8	783	56	24	21	-	35	39	CD 8
CD 9	771	60	23	-	-	32	35	CD 9
CD 10	530	23	-	-	-	22	-	CD 10
CD 11	609	15	5	-	-	15	11	CD 11
CD 12	494	15	6	-	-	15	-	CD 12
CD 13	528	22	11	12	-	20	20	CD 13
CD 14	304	12	5	-	-	9	-	CD 14

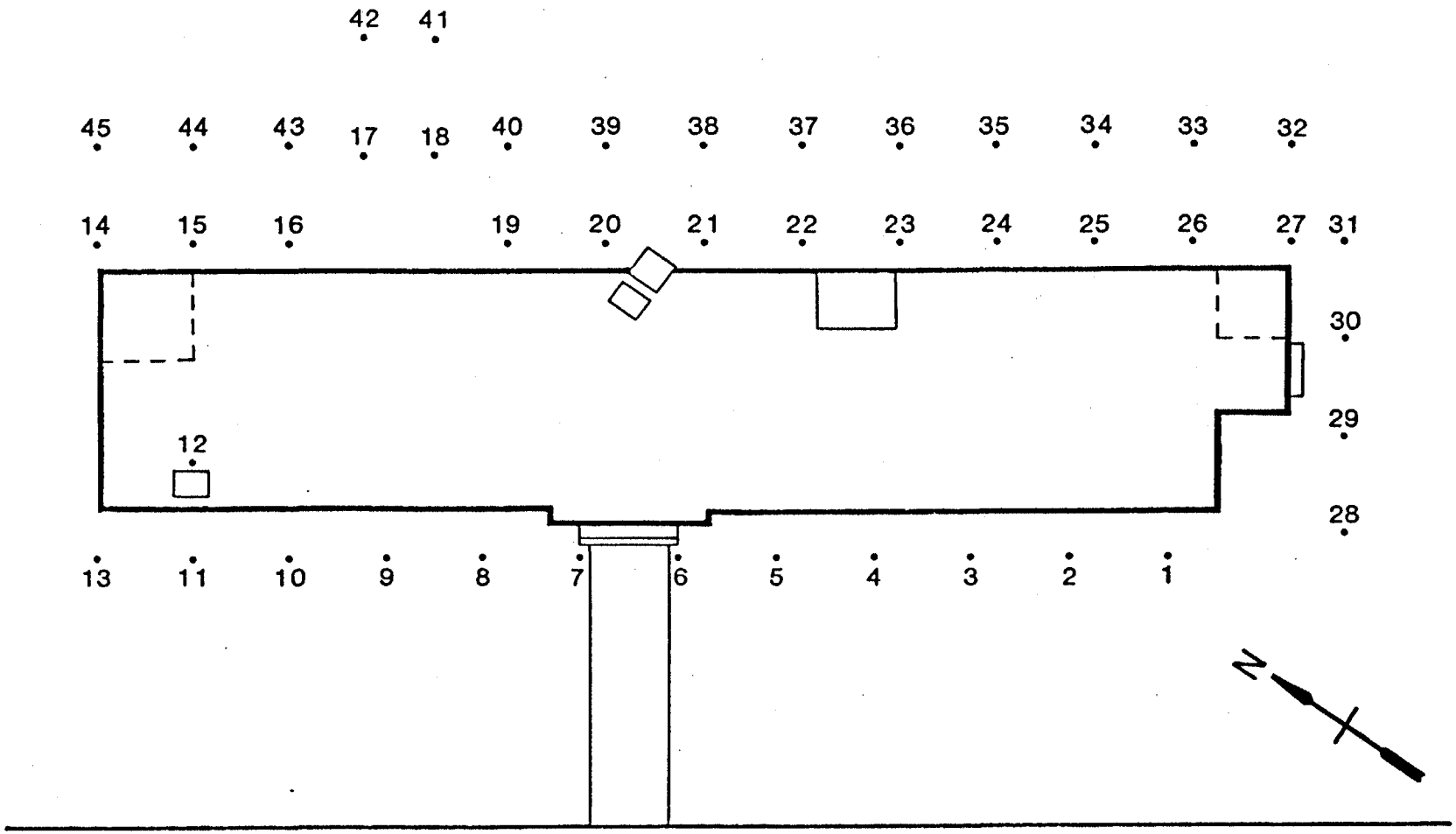
TABLE 12

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / CHEVY DEALER -- 3 FT. PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
CD 1	776	94.3	3.2	1.0	1.4	813	2.3	2.2	CD 1
CD 2	580	96.6	2.6	0.9	0.0	605	2.1	2.0	CD 2
CD 3	1128	92.8	3.4	1.4	2.4	1208	3.3	3.3	CD 3
CD 4	962	95.9	3.0	1.0	0.0	993	1.6	1.5	CD 4
CD 5	547	94.0	4.4	1.6	0.0	578	2.6	2.8	CD 5
CD 6	774	93.8	3.4	1.3	1.6	804	1.9	1.9	CD 6
CD 7	735	96.7	3.3	0.0	0.0	756	2.8	0.0	CD 7
CD 8	884	88.6	6.3	2.7	2.4	958	3.7	4.1	CD 8
CD 9	854	90.3	7.0	2.7	0.0	921	3.5	3.8	CD 9
CD 10	553	95.8	4.2	0.0	0.0	575	3.8	0.0	CD 10
CD 11	629	96.8	2.4	0.8	0.0	655	2.3	1.7	CD 11
CD 12	515	95.9	2.9	1.2	0.0	530	2.8	0.0	CD 12
CD 13	573	92.1	3.8	1.9	2.1	613	3.3	3.3	CD 13
CD 14	321	94.7	3.7	1.6	0.0	330	2.7	0.0	CD 14

The School

The Old Ellenton School was located along Russell Street, as shown on the Index Map in Figure 1. 45 sites were sampled for soil gas around the perimeter of the former schoolhouse. Site locations are shown on Figure 23. The data is shown in Figures 24, 25 and 26, and is presented in Tables 13 and 14. No anomalous levels were found. No soil samples for gasoline range hydrocarbons were taken at this location.



0 10 20 ft.

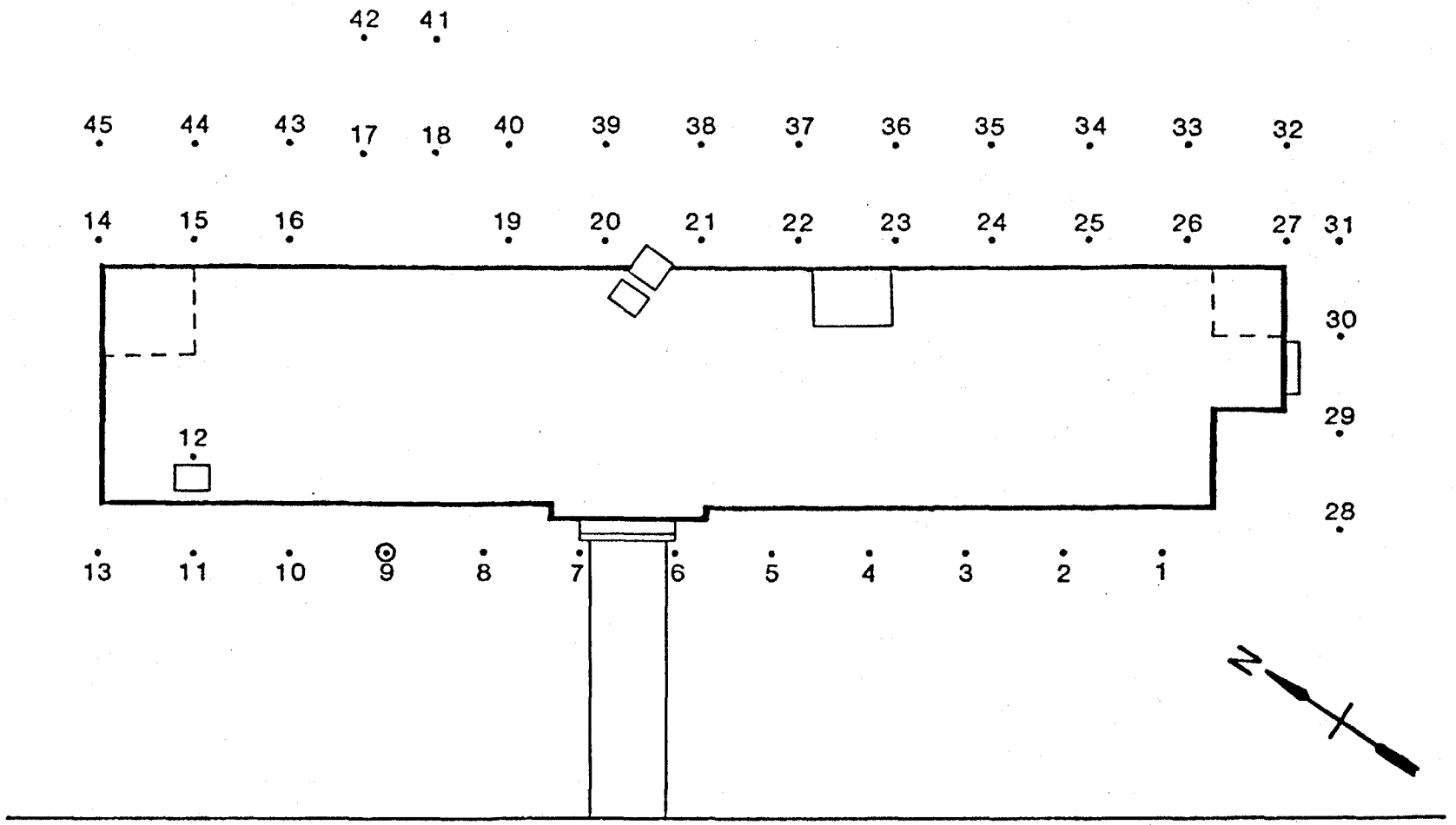
• SOIL GAS SAMPLES

OLD ELLENTON SCHOOL

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

FIGURE 23



LEGEND

SYMBOL	RANGE (ppb)
★	> 6338
◆	5089 – 6338
●	3840 – 5088
⊙	1342 – 3839
•	< 1342

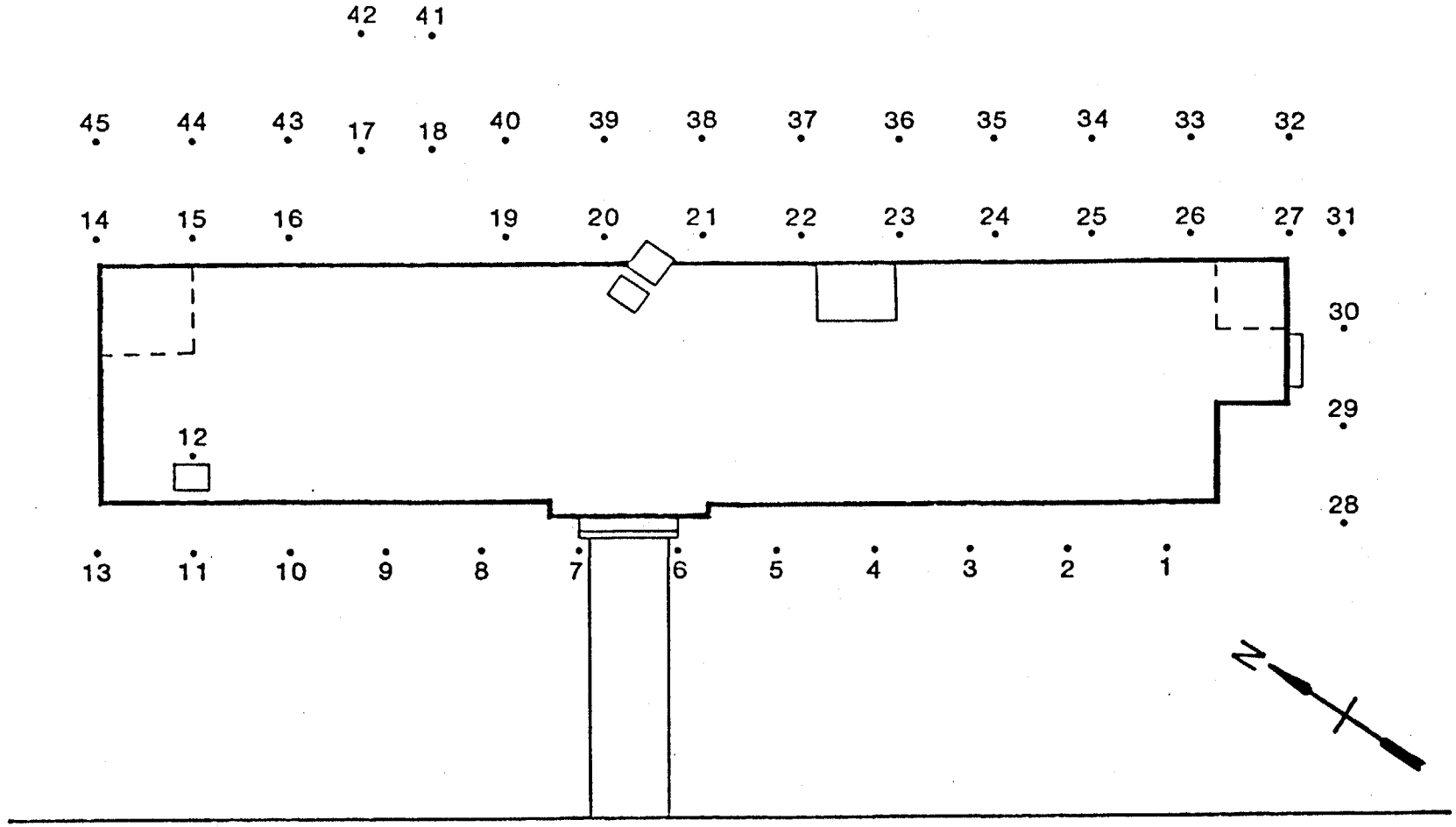
0 10 20 ft.

OLD ELLENTON SCHOOL

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 24



LEGEND

SYMBOL	RANGE (ppb)
★	> 1020
◆	787 – 1020
●	553 – 786
⊙	86 – 552
•	< 86

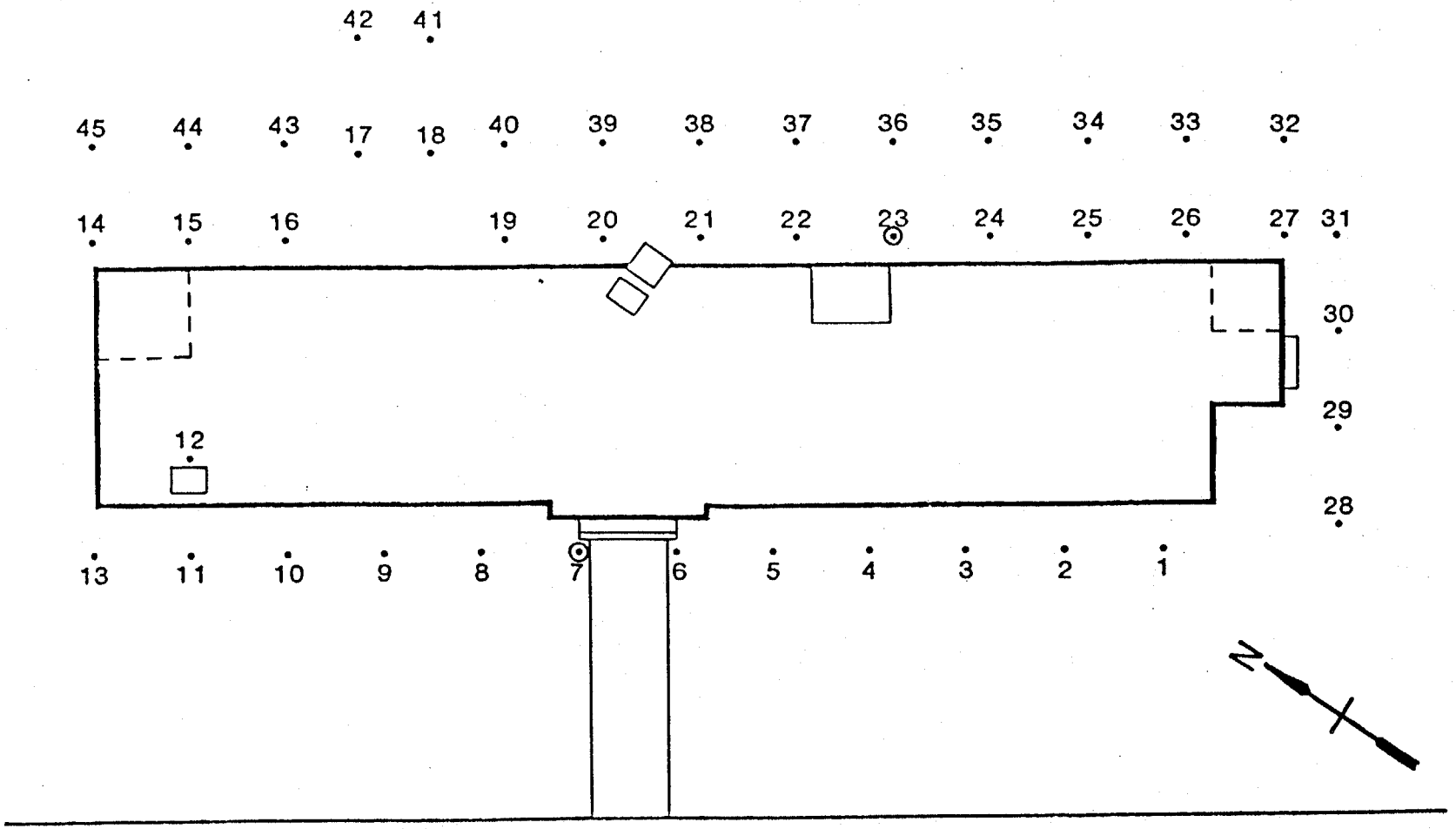
0 10 20 ft.

OLD ELLENTON SCHOOL

BUTANE

S.R.P. NOVEMBER, 1986

FIGURE 25



LEGEND

SYMBOL	RANGE (%)
★	> 17.5
◆	14.1 – 17.5
●	10.6 – 14.0
⊙	3.7 – 10.5
•	< 3.7

0 10 20 ft.

OLD ELLENTON SCHOOL

PERCENT BUTANE (IN C1–C4)

S.R.P. NOVEMBER, 1986

FIGURE 26

**17-Oct-86 **

TABLE 13

MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / SCHOOL HOUSE -- 3 FT. PROBE SURVEY, SEPT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
SH 1	430	9	-	-	-	9	-	SH 1
SH 2	521	15	8	-	-	9	-	SH 2
SH 3	417	10	-	-	-	9	-	SH 3
SH 4	406	8	-	-	-	8	-	SH 4
SH 5	490	31	14	13	-	20	22	SH 5
SH 6	532	20	10	-	-	11	-	SH 6
SH 7	539	17	8	49	-	12	-	SH 7
SH 8	519	10	5	-	-	8	-	SH 8
SH 9	1541	-	-	-	-	6	-	SH 9
SH 10	434	13	6	-	-	10	-	SH 10
SH 11	464	17	7	-	-	10	-	SH 11
SH 12	565	8	-	-	-	8	-	SH 12
SH 13	587	29	12	15	-	17	16	SH 13
SH 14	469	10	5	14	-	10	-	SH 14
SH 15	527	13	6	-	-	10	-	SH 15
SH 16	662	15	8	15	-	10	-	SH 16
SH 17	1016	72	25	29	-	136	103	SH 17
SH 18	568	15	7	-	-	8	-	SH 18
SH 19	672	14	6	-	-	12	-	SH 19
SH 20	529	10	-	-	-	8	-	SH 20
SH 21	489	16	7	-	-	12	-	SH 21
SH 22	758	33	12	29	-	22	21	SH 22
SH 23	823	43	16	46	-	24	25	SH 23
SH 24	651	31	17	25	-	15	17	SH 24
SH 25	744	42	15	28	-	23	27	SH 25
SH 26	618	22	8	15	-	9	15	SH 26
SH 27	472	18	8	16	-	11	-	SH 27
SH 28	316	7	-	-	-	8	-	SH 28
SH 29	291	7	-	-	-	7	-	SH 29
SH 30	1147	35	11	19	-	17	15	SH 30
SH 31	611	24	10	15	-	16	17	SH 31
SH 32	363	14	6	-	-	9	-	SH 32
SH 33	522	15	-	-	-	10	-	SH 33
SH 34	552	19	11	-	-	11	-	SH 34
SH 35	386	15	8	-	-	10	-	SH 35
SH 36	361	15	7	-	-	12	-	SH 36
SH 37	553	26	10	18	-	22	22	SH 37
SH 38	570	23	8	14	-	14	16	SH 38
SH 39	439	15	-	-	-	10	-	SH 39
SH 40	702	33	12	26	-	26	25	SH 40
SH 41	778	27	9	23	-	19	19	SH 41
SH 42	713	25	10	17	-	23	20	SH 42
SH 43	633	25	10	-	-	14	14	SH 43
SH 44	502	17	-	-	-	-	-	SH 44
SH 45	508	-	8	-	-	14	-	SH 45

**17-Oct-86 ** TABLE 14 MICROSEEPS LTD.

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OLD ELLENTON / SCHOOL HOUSE -- 3 FT. PROBE SURVEY, SEPT., 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
SH 1	439	97.9	2.1	0.0	0.0	448	2.0	0.0	SH 1
SH 2	544	95.8	2.8	1.5	0.0	553	1.6	0.0	SH 2
SH 3	427	97.7	2.3	0.0	0.0	436	2.1	0.0	SH 3
SH 4	414	98.1	1.9	0.0	0.0	422	1.9	0.0	SH 4
SH 5	548	89.4	5.7	2.6	2.4	590	3.4	3.7	SH 5
SH 6	562	94.7	3.6	1.8	0.0	573	1.9	0.0	SH 6
SH 7	613	87.9	2.8	1.3	8.0	625	1.9	0.0	SH 7
SH 8	534	97.2	1.9	0.9	0.0	542	1.5	0.0	SH 8
SH 9	1541	100.0	0.0	0.0	0.0	1547	0.4	0.0	SH 9
SH 10	453	95.8	2.9	1.3	0.0	463	2.2	0.0	SH 10
SH 11	488	95.1	3.5	1.4	0.0	498	2.0	0.0	SH 11
SH 12	573	98.6	1.4	0.0	0.0	581	1.4	0.0	SH 12
SH 13	643	91.3	4.5	1.9	2.3	676	2.5	2.4	SH 13
SH 14	498	94.2	2.0	1.0	2.8	508	2.0	0.0	SH 14
SH 15	546	96.5	2.4	1.1	0.0	556	1.8	0.0	SH 15
SH 16	700	94.6	2.1	1.1	2.1	710	1.4	0.0	SH 16
SH 17	1142	89.0	6.3	2.2	2.5	1381	9.8	7.5	SH 17
SH 18	590	96.3	2.5	1.2	0.0	598	1.3	0.0	SH 18
SH 19	692	97.1	2.0	0.9	0.0	704	1.7	0.0	SH 19
SH 20	539	98.1	1.9	0.0	0.0	547	1.5	0.0	SH 20
SH 21	512	95.5	3.1	1.4	0.0	524	2.3	0.0	SH 21
SH 22	832	91.1	4.0	1.4	3.5	875	2.5	2.4	SH 22
SH 23	928	88.7	4.6	1.7	5.0	977	2.5	2.6	SH 23
SH 24	724	89.9	4.3	2.3	3.5	756	2.0	2.2	SH 24
SH 25	829	89.7	5.1	1.8	3.4	879	2.6	3.1	SH 25
SH 26	663	93.2	3.3	1.2	2.3	687	1.3	2.2	SH 26
SH 27	514	91.8	3.5	1.6	3.1	525	2.1	0.0	SH 27
SH 28	323	97.8	2.2	0.0	0.0	331	2.4	0.0	SH 28
SH 29	298	97.7	2.3	0.0	0.0	305	2.3	0.0	SH 29
SH 30	1212	94.6	2.9	0.9	1.6	1244	1.4	1.2	SH 30
SH 31	660	92.6	3.6	1.5	2.3	693	2.3	2.5	SH 31
SH 32	383	94.8	3.7	1.6	0.0	392	2.3	0.0	SH 32
SH 33	537	97.2	2.8	0.0	0.0	547	1.8	0.0	SH 33
SH 34	582	94.8	3.3	1.9	0.0	593	1.9	0.0	SH 34
SH 35	409	94.4	3.7	2.0	0.0	419	2.4	0.0	SH 35
SH 36	383	94.3	3.9	1.8	0.0	395	3.0	0.0	SH 36
SH 37	607	91.1	4.3	1.6	3.0	651	3.4	3.4	SH 37
SH 38	615	92.7	3.7	1.3	2.3	645	2.2	2.5	SH 38
SH 39	454	96.7	3.3	0.0	0.0	464	2.2	0.0	SH 39
SH 40	773	90.8	4.3	1.6	3.4	824	3.2	3.0	SH 40
SH 41	837	93.0	3.2	1.1	2.7	875	2.2	2.2	SH 41
SH 42	765	93.2	3.3	1.3	2.2	808	2.8	2.5	SH 42
SH 43	668	94.8	3.7	1.5	0.0	696	2.0	2.0	SH 43
SH 44	519	96.7	3.3	0.0	0.0	519	0.0	0.0	SH 44
SH 45	516	98.4	0.0	1.6	0.0	530	2.6	0.0	SH 45

Dry Cleaner

The Old Ellenton dry cleaner was located near the intersection of Jackson and Center Streets. Soil samples from a 16 site grid on 40 ft centers were taken from a depth of 18-24 inches and analyzed for nine halocarbons listed in Table 15. The site locations are shown in Figure 27. Particular interest was directed toward tetrachloroethylene which may have been used as a dry cleaning fluid. No halocarbons were found above the minimum detection levels as listed in Table 1. No other analyses were performed at this location.

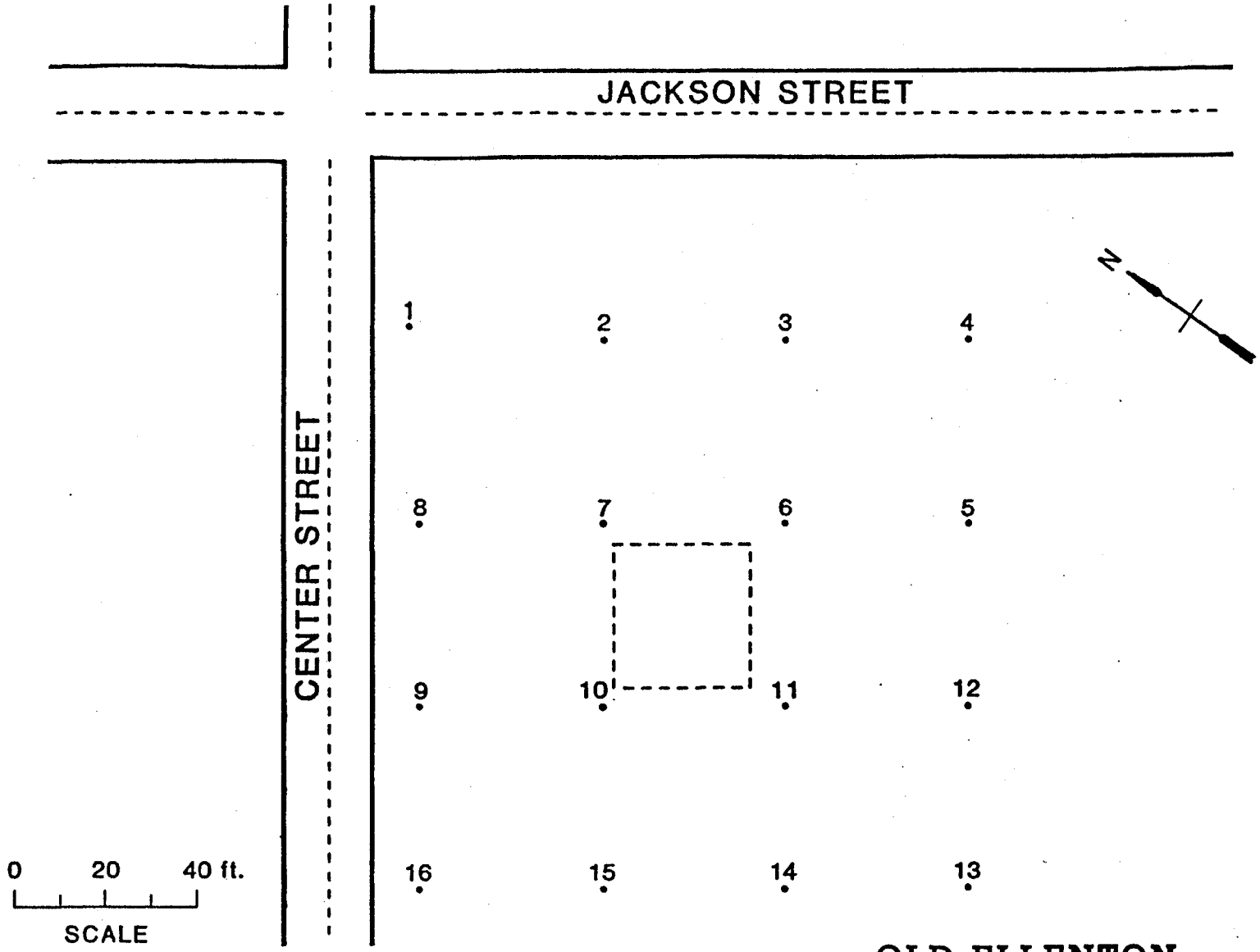


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FIGURE 27

OLD ELLENTON
DRY CLEANER

• SOIL SAMPLE LOCATION

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

TABLE 15

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, SC. ----
---- OLD ELLENTON - DRY CLEANERS -- 2 FT. SOIL SAMPLES, OCTOBER 1986 ----
---- SOIL CONCENTRATION BY WEIGHT IN PPB ----

SAMPLE NUMBER	1,1-DiCl ETHYLENE	DiCl METHANE	T1,2-DiCl ETHYLENE	1,1-DiCl ETHANE	C1,2-DiCl ETHYLENE	TriCl METHANE	1,2-DiCl ETHANE	TriCl ETHYLENE	TetraCl ETHYLENE	SAMPLE NUMBER
DC 1	-	-	-	-	-	-	-	-	-	DC 1
DC 2	-	-	-	-	-	-	-	-	-	DC 2
DC 3	-	-	-	-	-	-	-	-	-	DC 3
DC 4	-	-	-	-	-	-	-	-	-	DC 4
DC 5	-	-	-	-	-	-	-	-	-	DC 5
DC 6	-	-	-	-	-	-	-	-	-	DC 6
DC 7	-	-	-	-	-	-	-	-	-	DC 7
DC 8	-	-	-	-	-	-	-	-	-	DC 8
DC 9	-	-	-	-	-	-	-	-	-	DC 9
DC 10	-	-	-	-	-	-	-	-	-	DC 10
DC 11	-	-	-	-	-	-	-	-	-	DC 11
DC 12	-	-	-	-	-	-	-	-	-	DC 12
DC 13	-	-	-	-	-	-	-	-	-	DC 13
DC 14	-	-	-	-	-	-	-	-	-	DC 14
DC 15	-	-	-	-	-	-	-	-	-	DC 15
DC 16	-	-	-	-	-	-	-	-	-	DC 16

B. The Oil Test Site

At the Oil Test Site, a total of sixty-five sites were sampled for soil gas C_1-C_4 hydrocarbons and twelve soil samples were taken for gasoline range hydrocarbon analysis. Locations of these samples are shown on the Site Location Map in Figure 28.

We were informed that previous tests in this area had revealed that the "oil saturated" zone was generally confined to the upper foot of soil. We confirmed this observation in the hydraulic fluid plot and the oil test plots by digging several shallow trenches. With few exceptions, the upper 6-8" of soil was a dark brown color and contrasted sharply with the lower, apparently unaffected soils.

We conducted soil gas depth tests to establish an optimum sampling depth. Soil gas samples were taken at 1, 2 and 3 foot depths at two oil test plots (sample locations 14 and 25 in Figure 28), and two control plots (sample locations 17 and 22 in Figure 28). Because the surface soils of both the oil test plots and the control plots appeared to have been roto-tilled, we collected both a 1 ft and 3 ft soil gas sample in an undisturbed soil zone (sample location #1 in Figure 28).

The results of the soil gas depth tests showed appreciably higher soil gas magnitudes at the 1 ft level. Therefore, all other soil gas and soil samples in this area were taken from the 1 ft level.

Representative soil gas data is mapped in Figures 29-31 and all soil gas data is tabulated in Tables 16 and 17. Both methane and the unsaturated compounds, ethylene and propylene, are products of biological activity. It is unlikely that either of these compounds was a component of the refined products placed in the soils in this area since all are gases at ambient temperatures. It is obvious, however, from the data that all three of these compounds have greater magnitudes in the soils of the contaminated plots than the soils of the control plots. This would appear to suggest a higher level of biological activity in the contaminated soils. It is noted that other hydrocarbons, such as butane (see Figure 31), which may not be products of biological activity, are also higher in the contaminated soils.

The distribution of ethylene and propylene in the soils between the test and control plots is further illustrated as frequency histograms in Figures 32, 33 and 34. The overall histogram in Figure 32 is clearly bimodal). This bimodality may be understood to be composed of the sum of a background population in the control plots, as shown in Figure 33, and an anomalous population in the test plots, as shown in Figure 34.

At twelve sites shown in Figure 28, soil samples were taken for gasoline range analysis. Although as shown on the chromatograms for Sites 25, 29 and 58 (see Figures 35, 36 and 37) there are numerous peaks, presumably corresponding to oil contamination, none of the peaks (retention times) correspond to the six

gasoline range hydrocarbons monitored in this survey. Identities of compounds could be ascertained using standard gas chromatograph-mass spectral techniques.

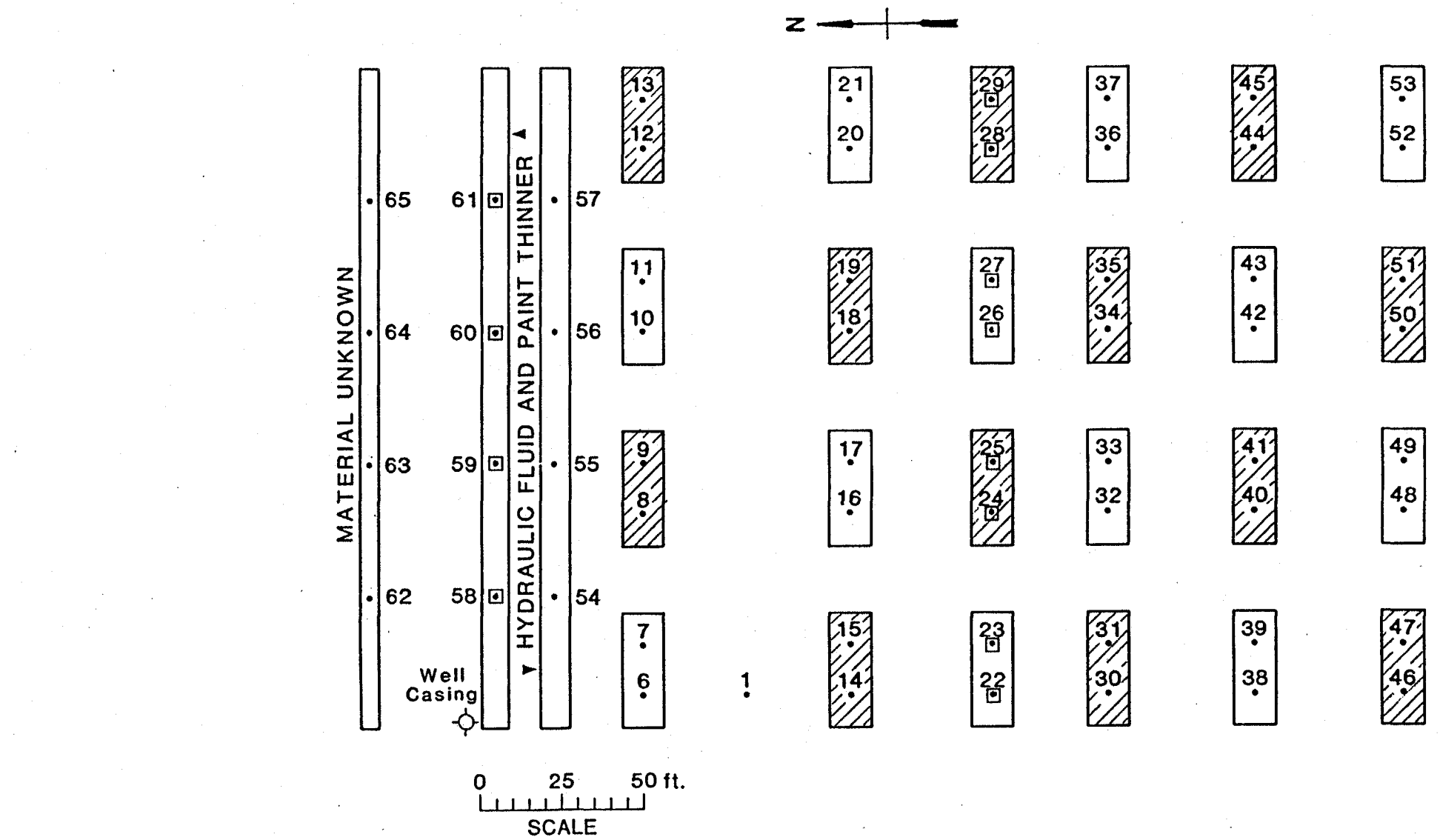

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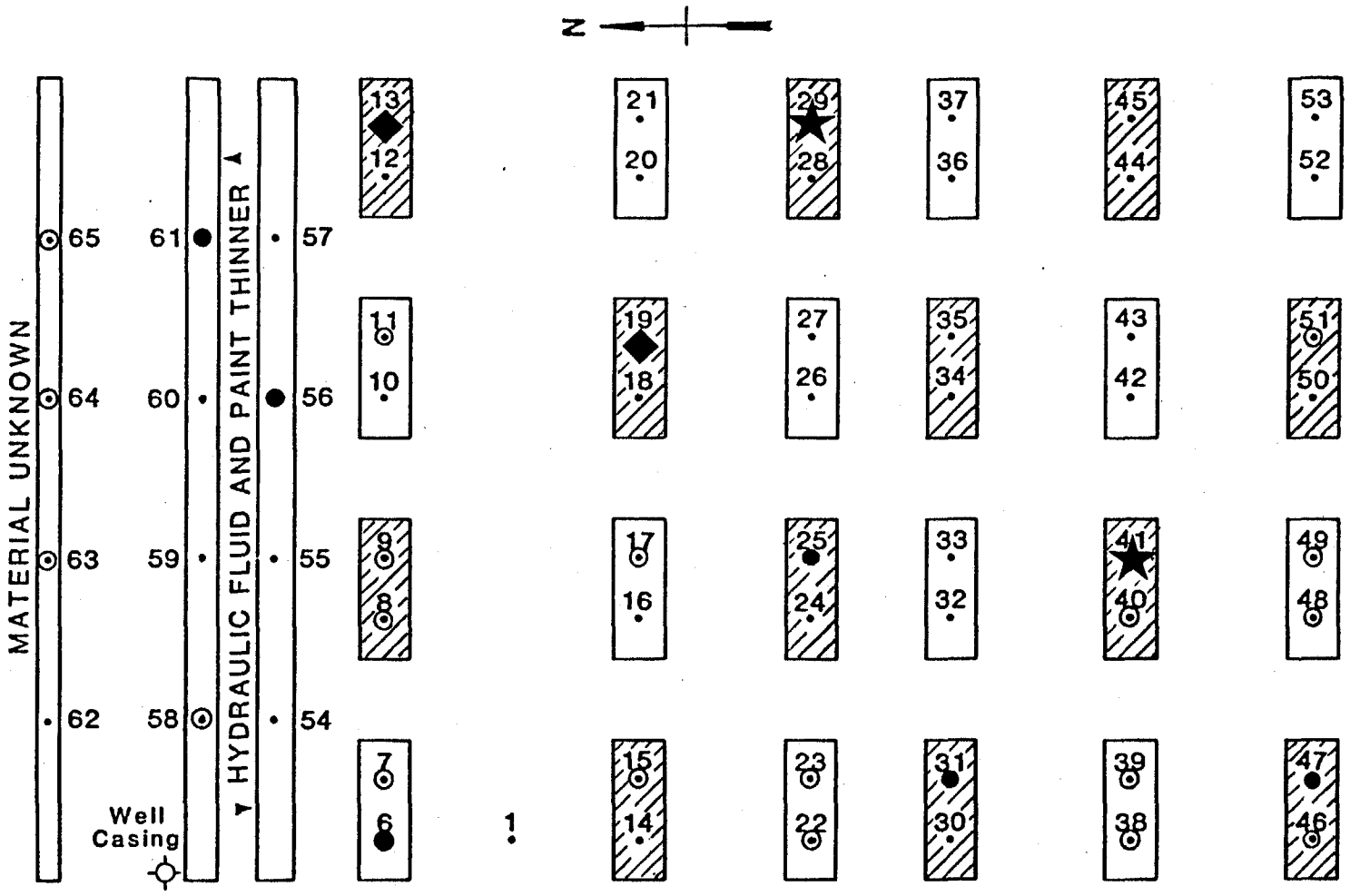
FIGURE 28

- SOIL GAS SAMPLES
- SOIL GAS & SOIL SAMPLES
- OIL TEST PLOT
- CONTROL TEST PLOT

S.R.P. OIL TEST SITE

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986



LEGEND

SYMBOL	RANGE (ppb)
★	> 3926
◆	3503 – 3926
●	3080 – 3502
⊙	2234 – 3079
•	< 2234
▨	OIL TEST PLOT
□	CONTROL TEST PLOT

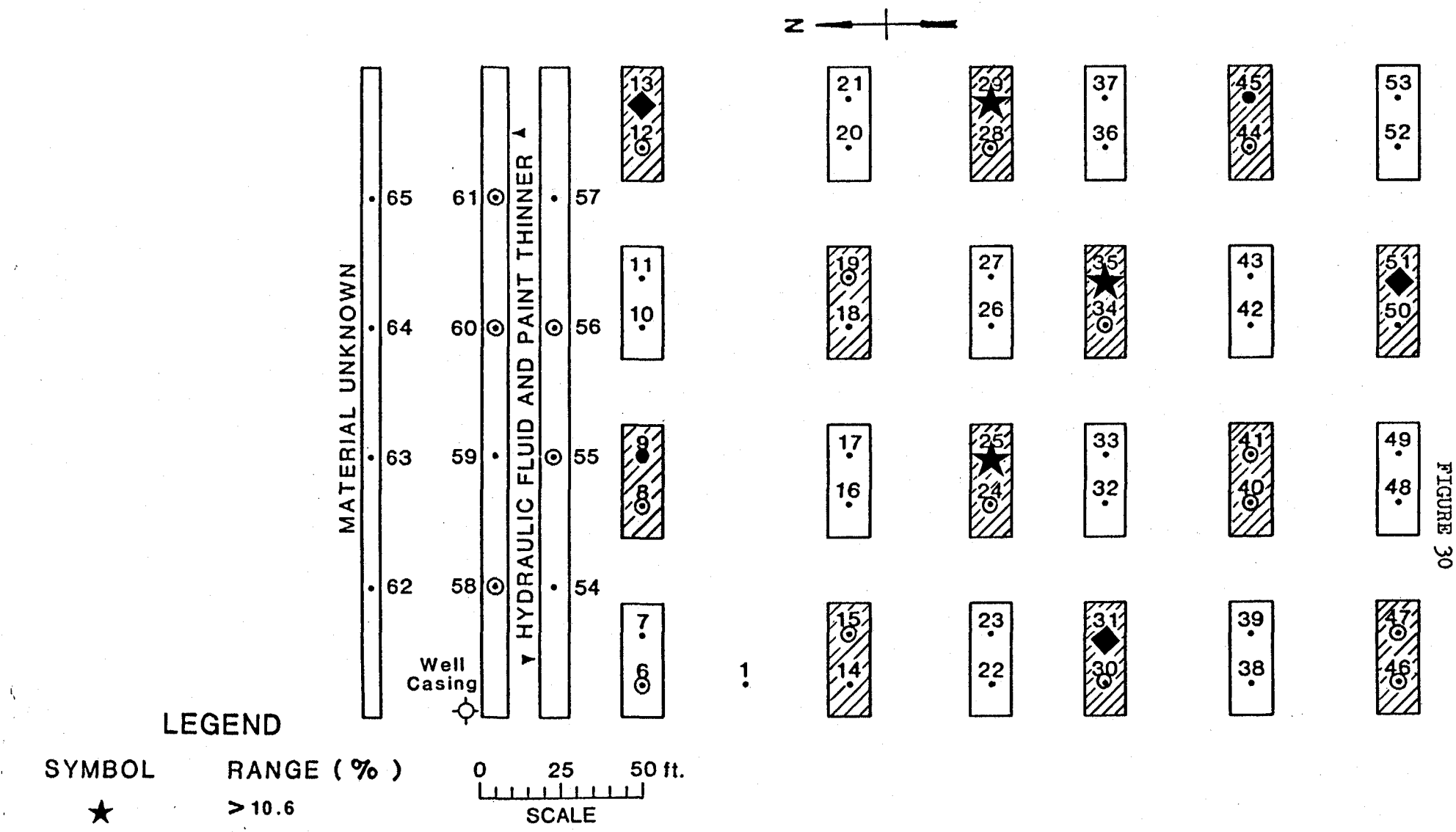
0 25 50 ft.
SCALE

S.R.P. OIL TEST SITE

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 29



LEGEND

SYMBOL	RANGE (%)
★	> 10.6
◆	9.2 – 10.6
●	7.8 – 9.1
⊙	5.0 – 7.7
•	< 5.0
▨	OIL TEST PLOT
□	CONTROL TEST PLOT

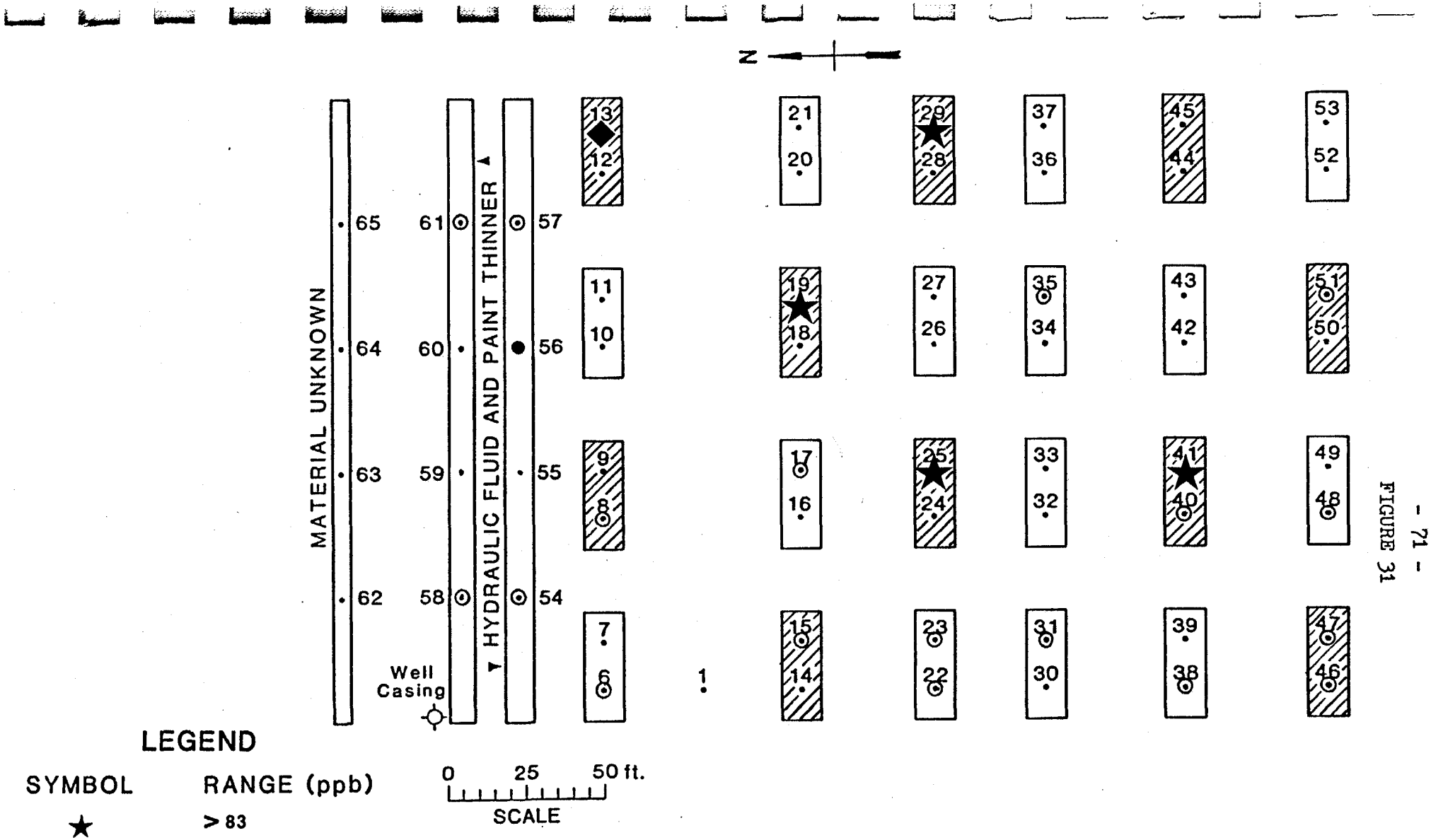
0 25 50 ft.
SCALE

S.R.P. OIL TEST SITE

PERCENT ETHYLENE + PROPYLENE (IN C1–C4)

S.R.P. NOVEMBER, 1986

FIGURE 30



S.R.P. OIL TEST SITE

BUTANE

S.R.P. NOVEMBER, 1986

FIGURE 31

FIGURE 32

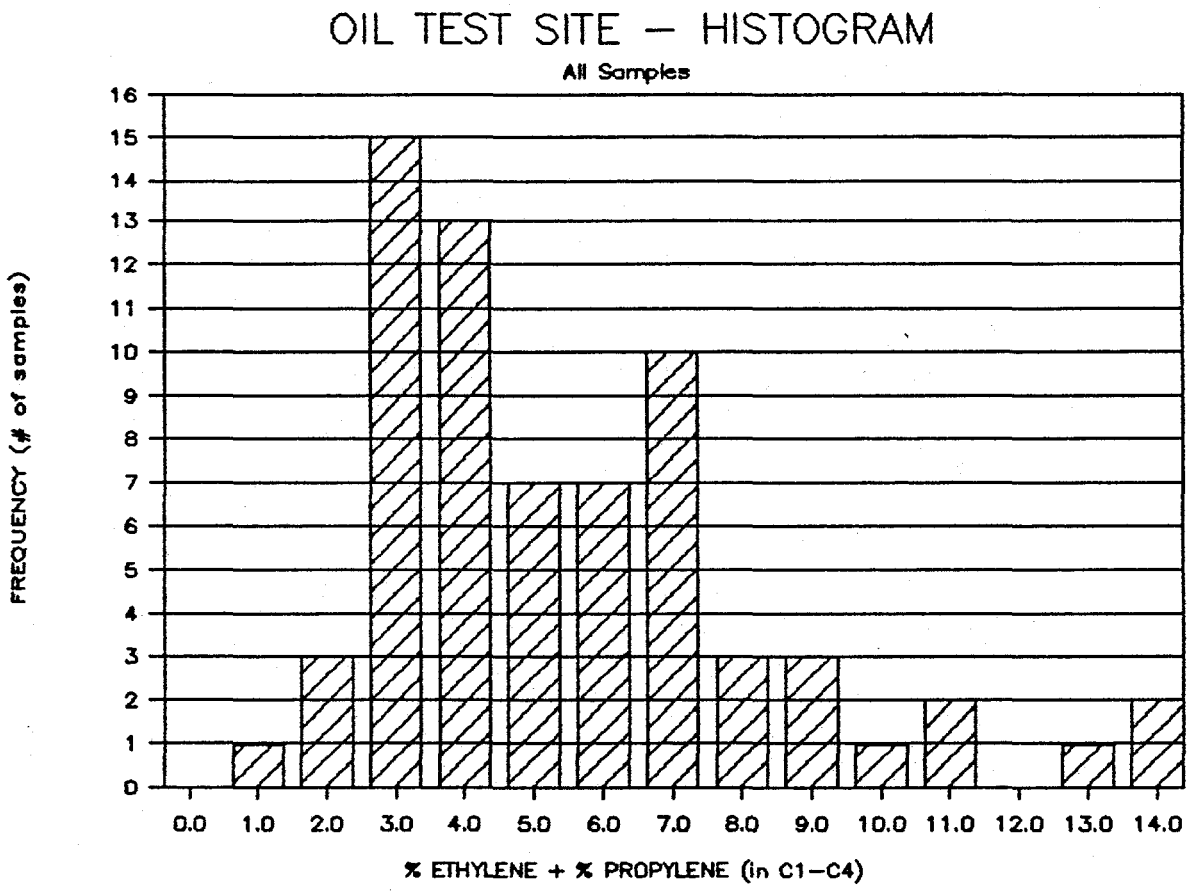
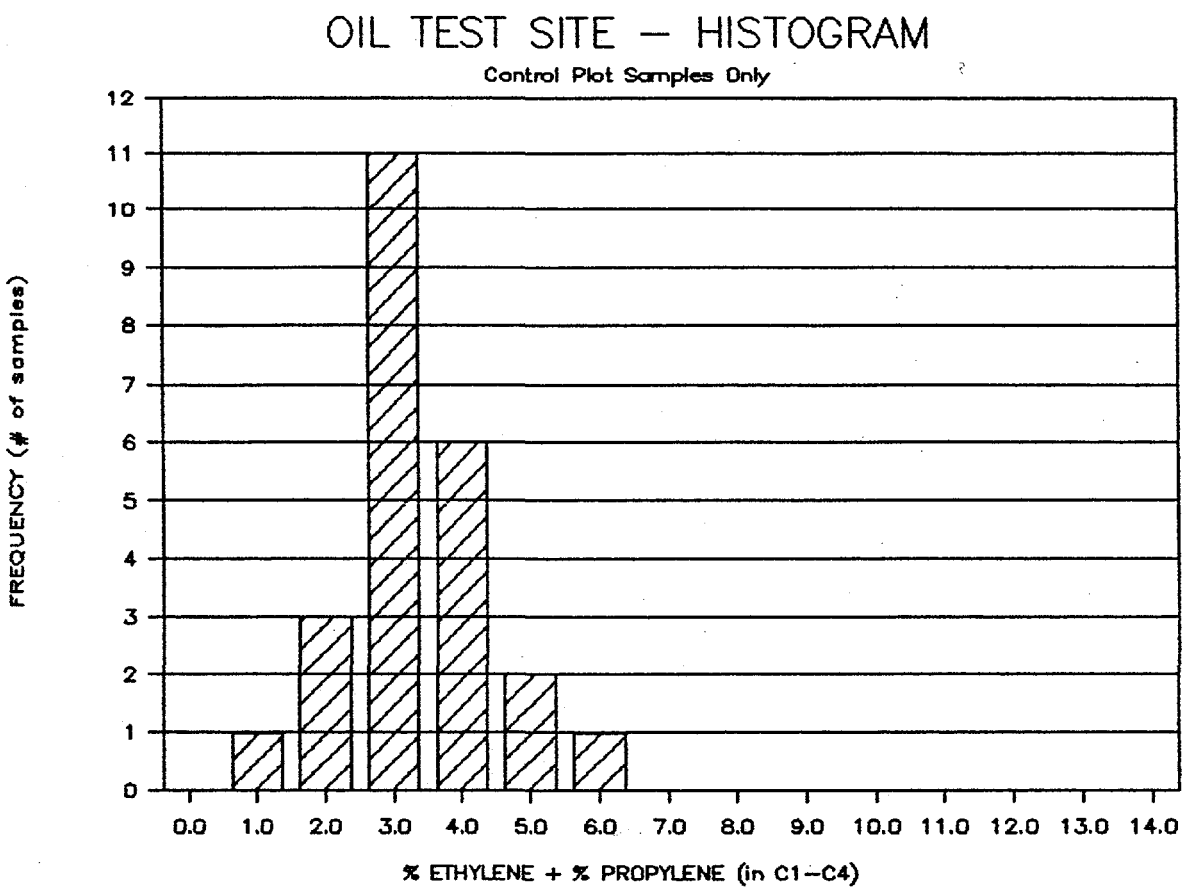

OIL TEST SITE – HISTOGRAM
All Samples
FREQUENCY (# of samples)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
% ETHYLENE + % PROPYLENE (in C1–C4)

FIGURE 33 & 34


OIL TEST SITE — HISTOGRAM
Control Plot Samples Only
FREQUENCY (# of samples)
0
1
2
3
4
5
6
7
8
9
10
11
12
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
% ETHYLENE + % PROPYLENE (in C1–C4)

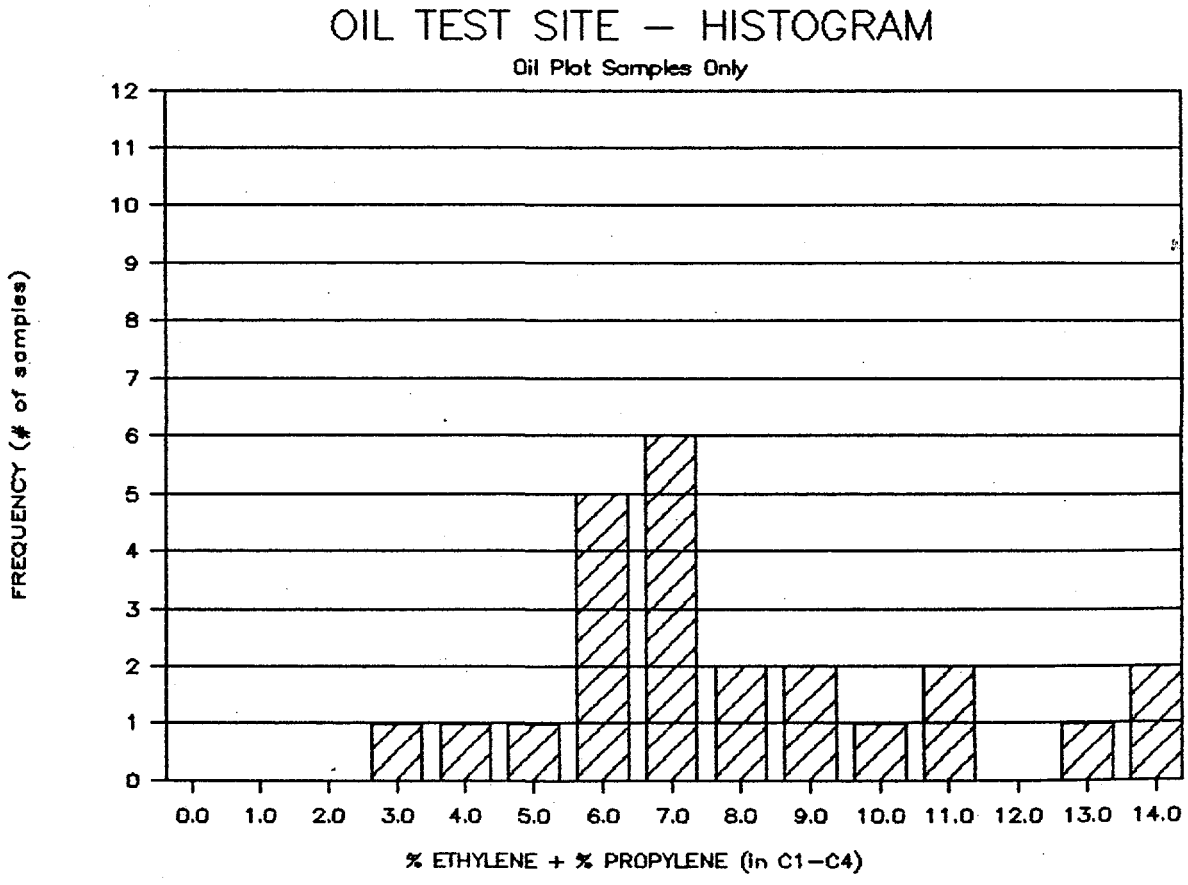

OIL TEST SITE — HISTOGRAM
Oil Plot Samples Only
FREQUENCY (# of samples)
0
1
2
3
4
5
6
7
8
9
10
11
12
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
% ETHYLENE + % PROPYLENE (in C1–C4)

TABLE 16

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OIL TEST SITE -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
OT 1-3	893	23	9	-	-	16	17	OT 1-3
OT 6	3187	100	36	55	-	105	97	OT 6
OT 7	2422	57	20	28	-	37	37	OT 7
OT 8	2982	107	47	38	-	125	100	OT 8
OT 9	2275	79	36	27	-	147	92	OT 9
OT 10	2120	55	24	18	-	44	39	OT 10
OT 11	2286	62	24	17	-	35	36	OT 11
OT 12	2089	67	37	17	-	91	49	OT 12
OT 13	3537	176	68	47	26	273	158	OT 13
OT 14	1688	26	12	-	-	22	18	OT 14
OT 14-2	1807	55	21	21	-	49	51	OT 14-2
OT 14-3	1584	30	9	-	-	21	23	OT 14-3
OT 15	2489	100	38	40	-	99	87	OT 15
OT 16	1730	53	17	17	-	44	37	OT 16
OT 17	2439	84	28	32	-	63	53	OT 17
OT 17-2	1066	45	15	20	-	28	31	OT 17-2
OT 17-3	713	30	11	15	-	21	22	OT 17-3
OT 18	2108	62	25	25	-	56	51	OT 18
OT 19	3754	174	63	60	25	164	142	OT 19
OT 20	1628	21	9	16	-	15	22	OT 20
OT 21	1857	35	13	24	-	25	24	OT 21
OT 22	2259	63	21	31	-	35	54	OT 22
OT 22-2	781	21	7	-	-	14	13	OT 22-2
OT 23	2551	81	24	36	-	42	45	OT 23
OT 24	1804	50	22	18	-	78	58	OT 24
OT 25	3342	127	56	53	23	196	153	OT 25
OT 25-R	3207	175	76	90	32	320	242	OT 25-R
OT 25-2	1243	20	7	11	-	25	20	OT 25-2
OT 25-3	1152	25	10	15	-	21	22	OT 25-3
OT 26	1407	17	-	-	-	9	-	OT 26
OT 27	2067	39	13	17	-	21	23	OT 27
OT 28	2051	53	26	24	-	98	67	OT 28
OT 29	4382	237	96	81	31	456	285	OT 29
OT 30	2184	77	33	27	-	67	70	OT 30
OT 31	3147	186	70	50	4	217	184	OT 31
OT 32	1682	22	8	12	-	15	18	OT 32
OT 33	1467	11	-	-	-	10	12	OT 33
OT 34	2139	70	27	25	-	68	55	OT 34
OT 35	1680	83	35	36	-	162	110	OT 35
OT 36	1652	49	17	23	-	30	31	OT 36
OT 37	1356	30	10	15	-	19	21	OT 37
OT 38	2592	70	22	34	-	36	37	OT 38
OT 39	2439	50	16	21	-	25	26	OT 39
OT 40	2905	126	47	49	-	124	106	OT 40
OT 41	5729	274	97	87	34	287	222	OT 41
OT 42	1314	31	11	14	-	18	29	OT 42
OT 43	1555	34	12	15	-	23	28	OT 43
OT 44	1562	54	22	25	-	47	44	OT 44
OT 45	1926	70	34	23	-	112	74	OT 45

TABLE 16 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OIL TEST SITE -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
OT 46	2751	93	36	51	-	103	98	OT 46
OT 47	3147	124	45	55	-	100	99	OT 47
OT 48	2979	76	25	36	-	39	42	OT 48
OT 49	2455	50	16	23	-	25	30	OT 49
OT 50	2061	50	20	21	-	39	34	OT 50
OT 51	2252	86	38	37	-	145	104	OT 51
OT 52	1666	43	15	17	-	22	25	OT 52
OT 53	1547	37	12	15	-	19	23	OT 53
OT 54	2151	78	27	39	-	58	52	OT 54
OT 55	1401	38	18	16	-	64	44	OT 55
OT 56	3279	129	46	63	-	135	97	OT 56
OT 57	2181	64	22	31	-	34	31	OT 57
OT 58	3059	134	60	46	-	141	89	OT 58
OT 59	2142	56	22	27	-	44	39	OT 59
OT 60	1844	78	29	22	-	79	62	OT 60
OT 61	3244	146	51	44	-	172	116	OT 61
OT 62	2129	54	18	28	-	32	30	OT 62
OT 63	2338	66	29	19	-	61	45	OT 63
OT 64	2927	99	37	26	-	63	62	OT 64
OT 65	2337	62	30	19	-	44	36	OT 65

NOTE:

OT XX - 1 FT. SAMPLE
OT XX-2 - 2 FT. SAMPLE
OT XX-3 - 3 FT. SAMPLE
OT XX-R - REPEAT SAMPLE

TABLE 17

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OIL TEST SITE -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #	SITE TYPE
OT 1-3	925	96.5	2.5	1.0	0.0	958	1.7	1.8	OT 1-3	BKG
OT 6	3378	94.3	3.0	1.1	1.6	3580	2.9	2.7	OT 6	CTR
OT 7	2527	95.8	2.3	0.8	1.1	2601	1.4	1.4	OT 7	CTR
OT 8	3174	94.0	3.4	1.5	1.2	3399	3.7	2.9	OT 8	OIL
OT 9	2417	94.1	3.3	1.5	1.1	2656	5.5	3.5	OT 9	OIL
OT 10	2217	95.6	2.5	1.1	0.8	2300	1.9	1.7	OT 10	*CTR
OT 11	2389	95.7	2.6	1.0	0.7	2460	1.4	1.5	OT 11	CTR
OT 12	2210	94.5	3.0	1.7	0.8	2350	3.9	2.1	OT 12	OIL
OT 13	3854	91.8	4.6	1.8	1.9	4285	6.4	3.7	OT 13	OIL
OT 14	1726	97.8	1.5	0.7	0.0	1766	1.2	1.0	OT 14	OIL
OT 14-2	1904	94.9	2.9	1.1	1.1	2004	2.4	2.5	OT 14-2	OIL
OT 14-3	1623	97.6	1.8	0.6	0.0	1667	1.3	1.4	OT 14-3	OIL
OT 15	2667	93.3	3.7	1.4	1.5	2853	3.5	3.0	OT 15	OIL
OT 16	1817	95.2	2.9	0.9	0.9	1898	2.3	1.9	OT 16	*CTR
OT 17	2583	94.4	3.3	1.1	1.2	2699	2.3	2.0	OT 17	*CTR
OT 17-2	1146	93.0	3.9	1.3	1.7	1205	2.3	2.6	OT 17-2	CTR
OT 17-3	769	92.7	3.9	1.4	2.0	812	2.6	2.7	OT 17-3	CTR
OT 18	2220	95.0	2.8	1.1	1.1	2327	2.4	2.2	OT 18	OIL
OT 19	4076	92.1	4.3	1.5	2.1	4382	3.7	3.2	OT 19	OIL
OT 20	1674	97.3	1.3	0.5	1.0	1711	0.9	1.3	OT 20	CTR
OT 21	1929	96.3	1.8	0.7	1.2	1978	1.3	1.2	OT 21	*CTR
OT 22	2374	95.2	2.7	0.9	1.3	2463	1.4	2.2	OT 22	CTR
OT 22-2	809	96.5	2.6	0.9	0.0	836	1.7	1.6	OT 22-2	CTR
OT 23	2692	94.8	3.0	0.9	1.3	2779	1.5	1.6	OT 23	CTR
OT 24	1894	95.2	2.6	1.2	1.0	2030	3.8	2.9	OT 24	OIL
OT 25	3601	92.8	3.5	1.6	2.1	3950	5.0	3.9	OT 25	OIL
OT 25-R	3580	89.6	4.9	2.1	3.4	4142	7.7	5.8	OT 25-R	OIL
OT 25-2	1281	97.0	1.6	0.5	0.9	1326	1.9	1.5	OT 25-2	OIL
OT 25-3	1202	95.8	2.1	0.8	1.2	1245	1.7	1.8	OT 25-3	OIL
OT 26	1424	98.8	1.2	0.0	0.0	1433	0.6	0.0	OT 26	CTR
OT 27	2136	96.8	1.8	0.6	0.8	2180	1.0	1.1	OT 27	CTR
OT 28	2154	95.2	2.5	1.2	1.1	2319	4.2	2.9	OT 28	OIL
OT 29	4827	90.8	4.9	2.0	2.3	5568	8.2	5.1	OT 29	OIL
OT 30	2321	94.1	3.3	1.4	1.2	2458	2.7	2.8	OT 30	OIL
OT 31	3457	91.0	5.4	2.0	1.6	3858	5.6	4.8	OT 31	OIL
OT 32	1724	97.6	1.3	0.5	0.7	1757	0.9	1.0	OT 32	CTR
OT 33	1478	99.3	0.7	0.0	0.0	1500	0.7	0.8	OT 33	CTR
OT 34	2261	94.6	3.1	1.2	1.1	2384	2.9	2.3	OT 34	OIL
OT 35	1834	91.6	4.5	1.9	2.0	2106	7.7	5.2	OT 35	OIL
OT 36	1741	94.9	2.8	1.0	1.3	1802	1.7	1.7	OT 36	CTR
OT 37	1411	96.1	2.1	0.7	1.1	1451	1.3	1.4	OT 37	CTR
OT 38	2718	95.4	2.6	0.8	1.3	2791	1.3	1.3	OT 38	CTR
OT 39	2526	96.6	2.0	0.6	0.8	2577	1.0	1.0	OT 39	CTR
OT 40	3127	92.9	4.0	1.5	1.6	3357	3.7	3.2	OT 40	OIL
OT 41	6221	92.1	4.4	1.6	1.9	6730	4.3	3.3	OT 41	OIL
OT 42	1370	95.9	2.3	0.8	1.0	1417	1.3	2.0	OT 42	CTR
OT 43	1616	96.2	2.1	0.7	0.9	1667	1.4	1.7	OT 43	CTR
OT 44	1663	93.9	3.2	1.3	1.5	1754	2.7	2.5	OT 44	OIL
OT 45	2053	93.8	3.4	1.7	1.1	2239	5.0	3.3	OT 45	OIL

TABLE 17 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- OIL TEST SITE -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #	SITE TYPE
OT 46	2931	93.9	3.2	1.2	1.7	3132	3.3	3.1	OT 46	OIL
OT 47	3371	93.4	3.7	1.3	1.6	3570	2.8	2.8	OT 47	OIL
OT 48	3116	95.6	2.4	0.8	1.2	3197	1.2	1.3	OT 48	CTR
OT 49	2544	96.5	2.0	0.6	0.9	2599	1.0	1.2	OT 49	CTR
OT 50	2152	95.8	2.3	0.9	1.0	2225	1.8	1.5	OT 50	OIL
OT 51	2413	93.3	3.6	1.6	1.5	2662	5.4	3.9	OT 51	OIL
OT 52	1741	95.7	2.5	0.9	1.0	1788	1.2	1.4	OT 52	CTR
OT 53	1611	96.0	2.3	0.7	0.9	1653	1.1	1.4	OT 53	CTR
OT 54	2295	93.7	3.4	1.2	1.7	2405	2.4	2.2	OT 54	H&P
OT 55	1473	95.1	2.6	1.2	1.1	1581	4.0	2.8	OT 55	H&P
OT 56	3517	93.2	3.7	1.3	1.8	3749	3.6	2.6	OT 56	H&P
OT 57	2298	94.9	2.8	1.0	1.3	2363	1.4	1.3	OT 57	H&P
OT 58	3299	92.7	4.1	1.8	1.4	3529	4.0	2.5	OT 58	H&P
OT 59	2247	95.3	2.5	1.0	1.2	2330	1.9	1.7	OT 59	H&P
OT 60	1973	93.5	4.0	1.5	1.1	2114	3.7	2.9	OT 60	H&P
OT 61	3485	93.1	4.2	1.5	1.3	3773	4.6	3.1	OT 61	H&P
OT 62	2229	95.5	2.4	0.8	1.3	2291	1.4	1.3	OT 62	UNK
OT 63	2452	95.4	2.7	1.2	0.8	2558	2.4	1.8	OT 63	UNK
OT 64	3089	94.8	3.2	1.2	0.8	3214	2.0	1.9	OT 64	UNK
OT 65	2448	95.5	2.5	1.2	0.8	2528	1.7	1.4	OT 65	UNK

NOTE:

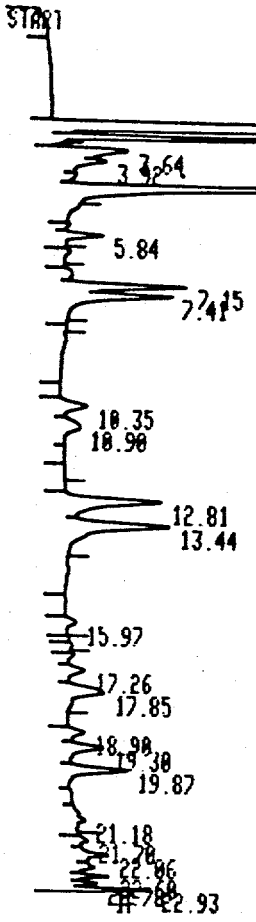
OT XX - 1 FT. SAMPLE
OT XX-2 - 2 FT. SAMPLE
OT XX-3 - 3 FT. SAMPLE
OT XX-R - REPEAT SAMPLE

OIL - OIL SITE
CTR - CONTROL SITE
H&P - HYDRAULIC FLUID & PAINT THINNER
UNK - MATERIAL UNKNOWN
* - POSSIBLE OIL CONTAMINATION
BKG - BACKGROUND SITE

FIGURE 35

GASOLINE RANGE HYDROCARBON
CHROMATOGRAM FOR SITE OT-25

OT - 25



RUN # 75 OCT/07/86 15:22:14
WORKFILE ID: C
WORKFILE NAME:

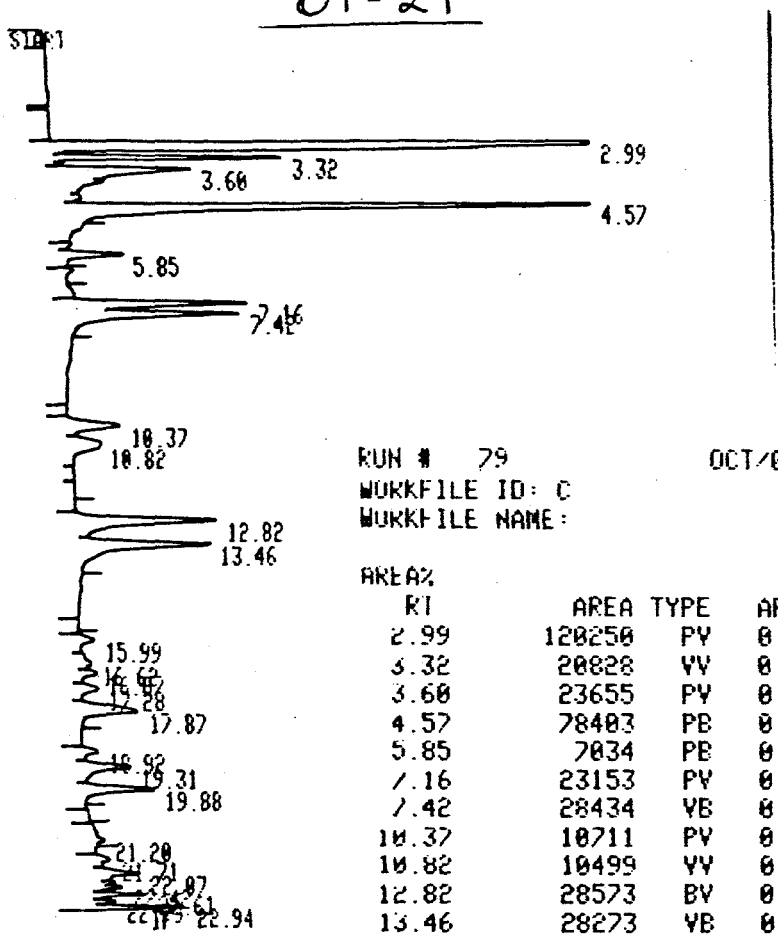
AREA%

RT	AREA	TYPE	AR/HT	AREA%
2.99	217800	PB	0.144	47.746
3.32	21460	BB	0.099	4.705
3.64	13264	BV	0.205	2.908
3.92	8700	VV	0.209	1.907
4.57	49581	PB	0.131	10.869
5.84	4611	PB	0.133	1.011
7.15	16922	VV	0.157	3.710
7.41	19861	VB	0.207	4.354
10.35	5427	PV	0.226	1.190
10.90	5375	VB	0.338	1.178
12.81	20844	BV	0.243	4.570
13.44	23780	VB	0.259	5.213
15.97	1556	BB	0.170	0.341
17.26	3023	PV	0.202	0.663
17.85	9135	VB	0.281	2.003
18.90	2850	BV	0.191	0.625
19.30	6367	VV	0.200	1.396
19.87	9340	VP	0.175	2.048
21.18	1881	PB	0.208	0.412
21.70	1097	BV	0.121	0.241
22.06	4481	VV	0.165	0.982
22.60	2228	VV	0.080	0.488
22.78	1498	VV	0.082	0.328
22.93	5079 I	VH	0.079	1.113

TOTAL AREA= 456160
MUL FACTOR= 1.0000E+00

FIGURE 36

GASOLINE RANGE HYDROCARBON
CHROMATOGRAM FOR SITE OT-29-



RUN # 79 OCT/07/86 18:36:49
WORKFILE ID: C
WORKFILE NAME:

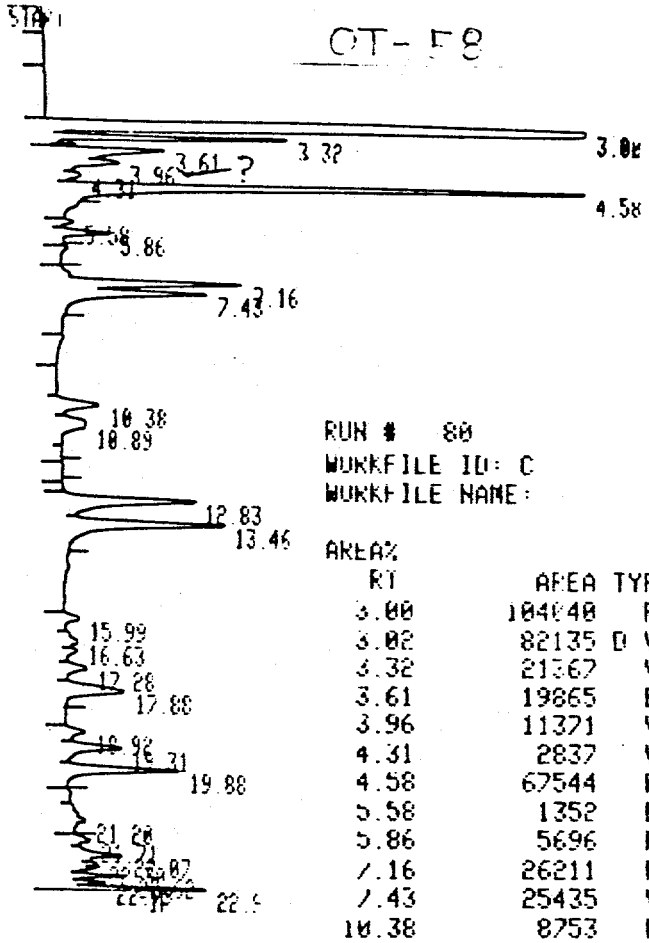
AREA%

RT	AREA	TYPE	AR/HT	AREA%
2.99	120250	PV	0.124	26.437
3.32	20828	VV	0.103	4.579
3.60	23655	PV	0.199	5.201
4.57	78403	PB	0.125	17.237
5.85	7034	PB	0.134	1.547
7.16	23153	PV	0.150	5.090
7.42	28434	VB	0.192	6.251
10.37	10711	PV	0.224	2.355
10.82	10499	VV	0.364	2.308
12.82	28573	BV	0.229	6.282
13.46	28273	VB	0.239	6.216
15.99	2835	BV	0.199	0.623
16.62	2931	VV	0.259	0.644
16.87	3194	VV	0.197	0.702
17.28	3772	VV	0.218	0.829
17.87	13221	VB	0.254	2.907
18.92	2724	BV	0.180	0.599
19.31	9033	VV	0.204	1.986
19.88	11083	VB	0.173	2.437
21.20	1711	BB	0.205	0.376
21.71	2198	BV	0.157	0.483
22.07	7515	VV	0.184	1.652
22.42	2884	VV	0.115	0.634
22.61	3960	VV	0.087	0.871
22.79	1753	VV	0.091	0.385
22.94	6221 I	VH	0.078	1.368

TOTAL AREA= 454850
MUL FACTOR= 1.0000E+00

FIGURE 37

GASOLINE RANGE HYDROCARBON
CHROMATOGRAM FOR SITE OT-58-



RUN # 80 OCT/07/86 19:24:53
WORKFILE ID: C
WORKFILE NAME:

AREA%

RT	AREA	TYPE	AR/HT	AREA%
3.00	104040	PV	0.081	19.597
3.02	82135 D	VV	0.064	15.470
3.32	21367	VB	0.104	4.025
3.61	19865	BV	0.199	3.742
3.96	11371	VV	0.209	2.142
4.31	2837	VP	0.194	0.534
4.58	67544	PB	0.124	12.722
5.58	1352	BP	0.125	0.255
5.86	5696	PB	0.132	1.073
7.16	26211	PV	0.164	4.937
7.43	25435	VB	0.199	4.791
10.38	8753	PV	0.231	1.649
10.89	9039	VV	0.367	1.703
12.83	27566	BV	0.234	5.192
13.46	32652	VB	0.231	6.150
15.99	2866	BV	0.199	0.540
16.63	3257	VV	0.264	0.614
17.28	4408	VV	0.221	0.830
17.88	13425	VB	0.254	2.529
18.92	3380	BV	0.190	0.637
19.31	10046	VV	0.199	1.892
19.88	16773	VB	0.169	3.159
21.20	2993	PB	0.264	0.564
21.71	2171	BV	0.144	0.409
22.07	7877	VV	0.180	1.484
22.30	1911	VV	0.087	0.360
22.62	4186	VV	0.088	0.789
22.79	2682	VV	0.091	0.505
22.94	9076 I	VH	0.078	1.710

TOTAL AREA= 530928

The Fire Training Area

At the Fire Training Area a total of fifty-one sites were sampled for C_1-C_4 hydrocarbon soil gas analysis and seventeen sites were sampled for gasoline range hydrocarbons.

We were told that probably fuel oil and/or kerosene had been dumped in an area surrounded by a small burm. The oils were subsequently burned during fire training exercises. The area has not been used in several years, possibly since 1981. The burm and surrounding area has been graded and today is fairly level with grass over most of the area. There was an area about 40' x 40' where the grass appeared sparse and the ground disturbed. It was assumed that the perimeter of this area was the approximate location of the burm. In the northern corner of this area was an area of oil soaked soil.

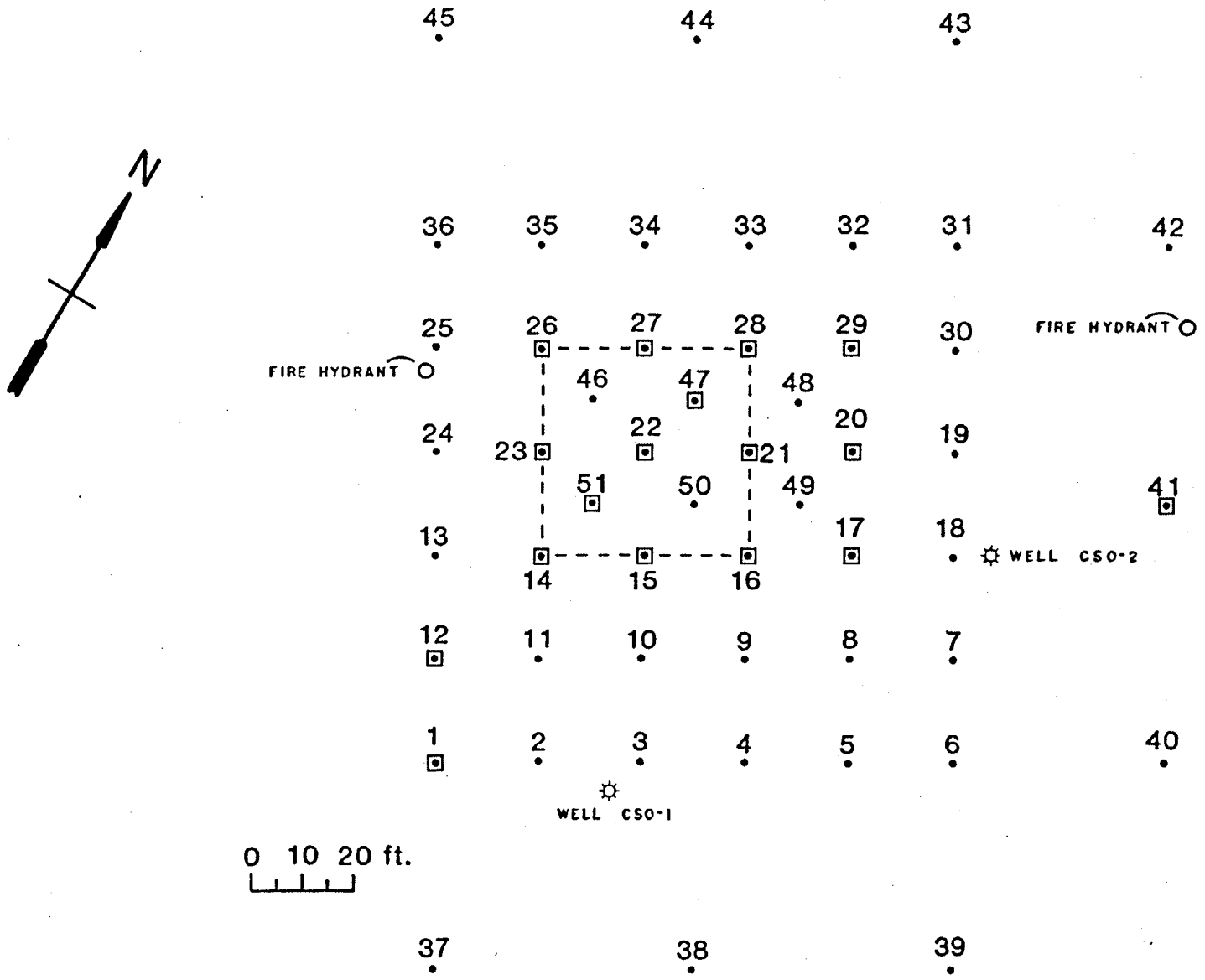
The sample locations, shown in Figure 38, consist of a 6 x 6 site grid on 20 ft centers, with other sites to fill in the grid and to test more distant areas. At Site 15, soil gas samples were taken at 1, 2 and 3 ft. The maximum soil gas magnitudes were found at 3 ft, thus all other soil gas samples were taken at that depth in the Fire Training Area.

The soil gas data is shown in Figures 39-41, and is tabulated in Tables 18 and 19. Clearly the largest soil gas contamination is associated with the fire training pit, with some movement to the south and west. This "displaced" contamination may have

resulted from the movement of soil when the site was leveled. As was the case at the Oil Test Site, the soil gas hydrocarbons at large magnitude sites are mainly composed of methane, ethylene and propylene. These are most probably not primary contamination, but rather result from increased biological activity in oil soaked (organic rich) areas.

At seventeen sites, indicated on Figure 38, soil samples were taken for gasoline range hydrocarbons. As recorded in Table 20, hydrocarbons among the group sought were found at three of these sites, as shown in Figure 42. The largest amounts were found at Site 47, where a depth profile revealed maximum levels at a depth of 2 ft. The hydrocarbon found in greatest concentration was toluene at a level of 59.5 ppb.

The chromatographic trace at Site 47 is shown in Figure 43. In addition to the gasoline range hydrocarbons determined in this survey, it is obvious that many other compounds are present. As mentioned before, their identity could be ascertained using gas chromatographic-mass spectral techniques.



• SOIL GAS SAMPLES

⊡ SOIL GAS & SOIL SAMPLES

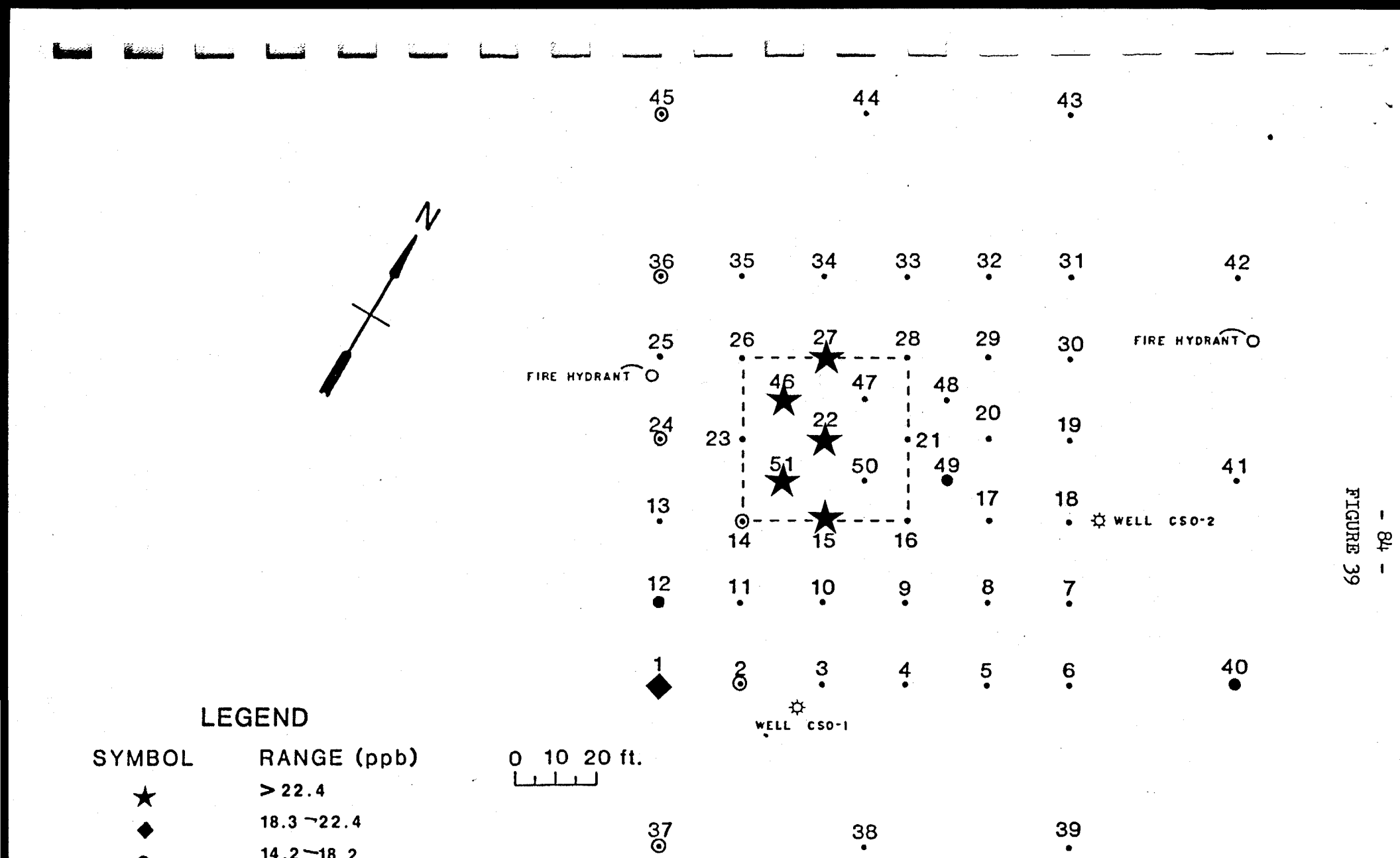
⬚ PROBABLE LOCATION OF OIL PIT

FIRE TRAINING AREA

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

FIGURE 38

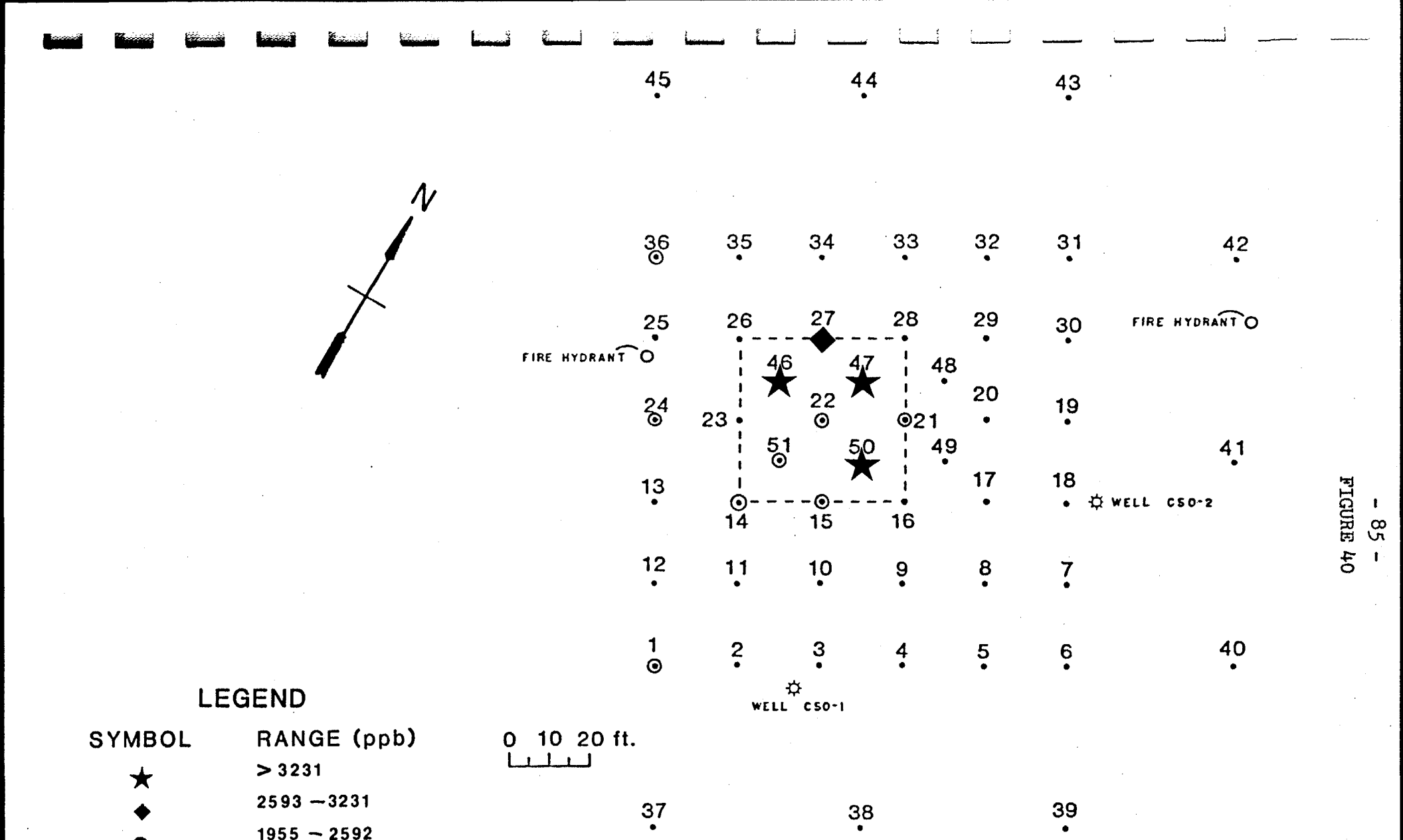


FIRE TRAINING AREA

METHANE

S.R.P. NOVEMBER, 1986

FIGURE 39

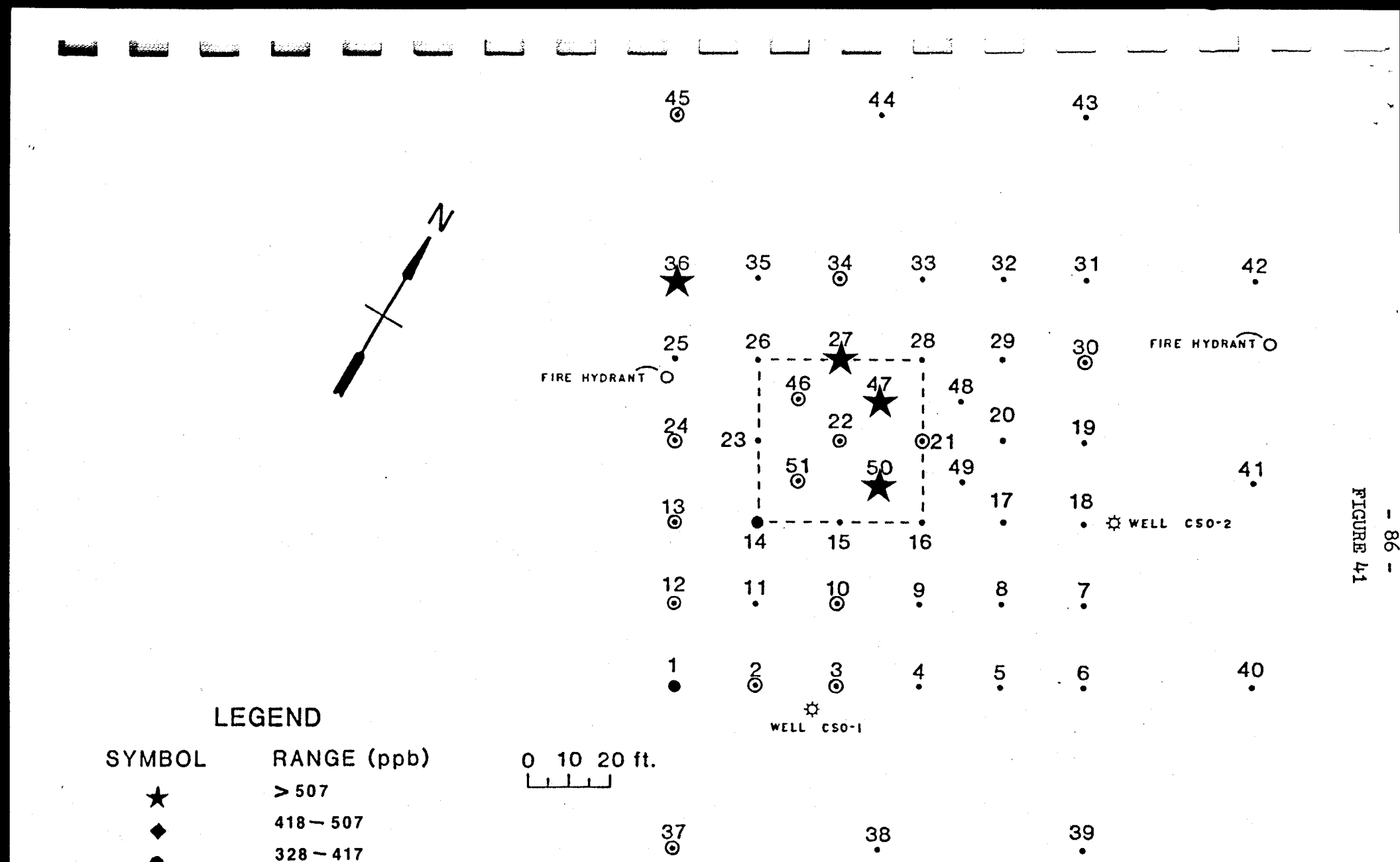


FIRE TRAINING AREA

ETHYLENE + PROPLENE

S.R.P. NOVEMBER, 1986

FIGURE 40


N
45
44
43
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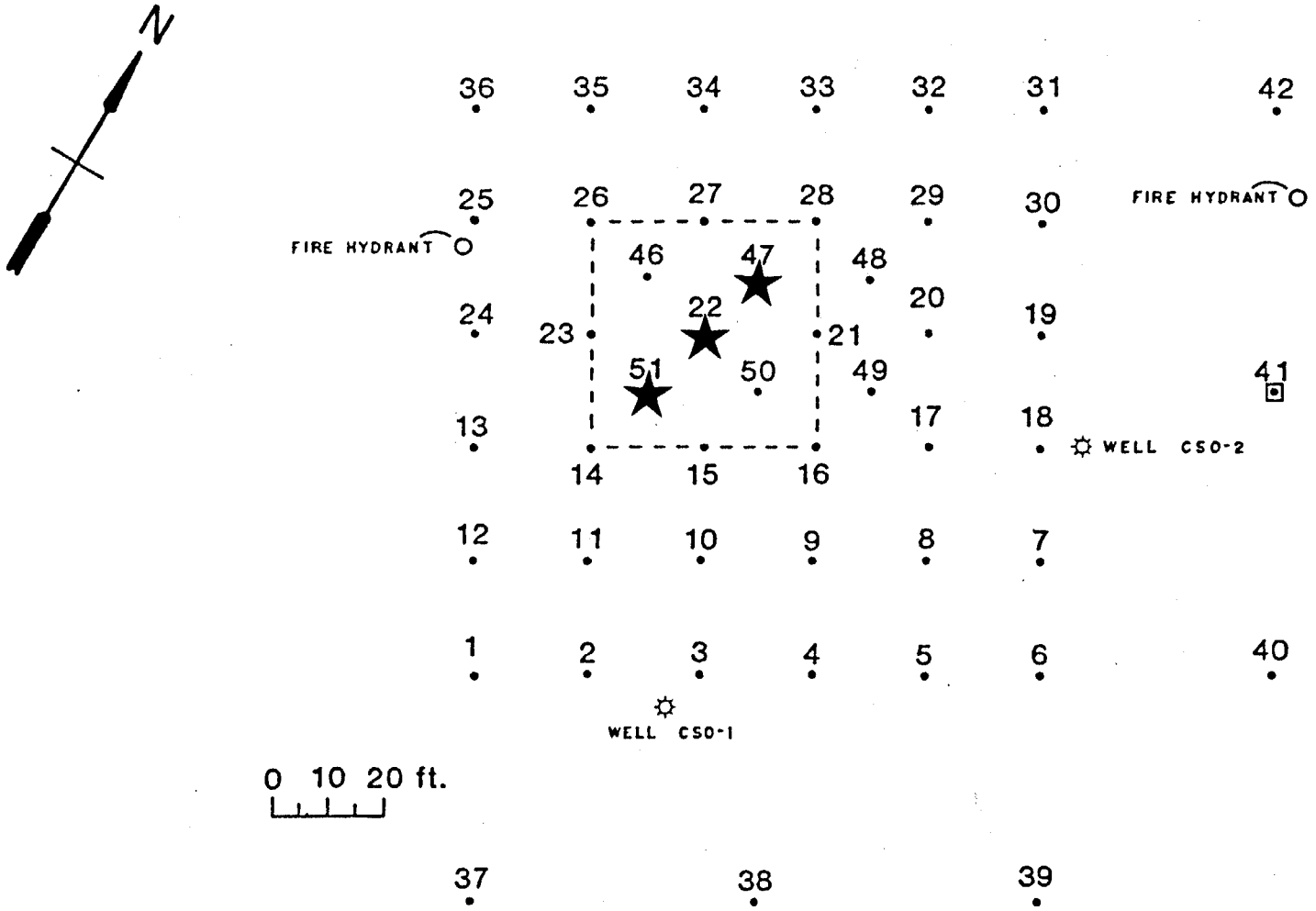
42
25
26
27
28
29
30
FIRE HYDRANT
FIRE HYDRANT
46
47
48
24
22
20
19
23
21
51
50
49
41
13
17
18
WELL CSO-2
14
15
16
12
11
10
9
8
7
1
2
3
4
5
6
40
WELL CSO-1
0 10 20 ft.
37
38
39
LEGEND
SYMBOL
RANGE (ppb)
> 507
418 — 507
328 — 417
149 — 327
< 149
PROBABLE LOCATION OF OIL PIT
FIRE TRAINING AREA
BUTANE
S.R.P.
NOVEMBER, 1986

FIGURE 41



★ COMPOUNDS DETECTED

FIRE TRAINING AREA

GASOLINE RANGE (C5–C8)

S.R.P. NOVEMBER, 1986

FIGURE 42

TABLE 18

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- FIRE TRAINING AREA -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
FT 1	20714	706	210	243	86	441	429	FT 1
FT 2	6003	310	99	169	40	210	222	FT 2
FT 3	4078	224	76	141	34	159	176	FT 3
FT 4	2458	118	39	71	-	83	82	FT 4
FT 5	1843	45	15	29	-	27	30	FT 5
FT 6	1366	79	29	62	-	64	77	FT 6
FT 7	924	23	9	23	-	20	22	FT 7
FT 8	1113	30	11	31	-	23	25	FT 8
FT 9	1233	167	63	41	26	114	124	FT 9
FT 10	4024	224	73	148	40	168	177	FT 10
FT 11	1642	124	44	50	13	91	107	FT 11
FT 12	16401	363	89	240	40	234	218	FT 12
FT 13	2908	301	108	175	42	216	239	FT 13
FT 14	9347	714	246	246	96	534	557	FT 14
FT 15	47505	502	126	53	75	424	429	FT 15
FT 15-1	3398	94	32	61	-	150	98	FT 15-1
FT 15-2	15520	228	64	43	-	183	143	FT 15-2
FT 16	1593	123	43	76	-	95	102	FT 16
FT 17	698	27	10	23	-	22	24	FT 17
FT 18	1316	58	21	38	-	41	45	FT 18
FT 19	2675	160	55	93	14	107	121	FT 19
FT 20	869	30	11	18	-	22	25	FT 20
FT 21	5479	497	170	182	65	331	348	FT 21
FT 22	302630	482	147	108	113	567	722	FT 22
FT 23	1170	142	57	18	19	81	87	FT 23
FT 24	7100	913	305	203	108	514	539	FT 24
FT 25	2049	55	25	24	-	42	54	FT 25
FT 26	2781	365	144	70	60	206	247	FT 26
FT 27	25864	3466	1029	187	331	1441	1442	FT 27
FT 28	5791	622	190	30	59	304	270	FT 28
FT 29	990	98	35	20	-	56	59	FT 29
FT 30	2575	327	136	123	58	248	293	FT 30
FT 31	4916	153	53	84	27	137	148	FT 31
FT 32	1419	60	21	39	-	45	48	FT 32
FT 33	2030	116	43	39	-	93	97	FT 33
FT 34	4471	259	103	118	51	194	204	FT 34
FT 35	2741	209	72	68	27	159	175	FT 35
FT 36	10158	698	245	433	101	666	643	FT 36
FT 37	8561	356	105	150	40	190	207	FT 37
FT 38	1096	53	16	22	-	31	34	FT 38
FT 39	1652	64	21	33	-	42	45	FT 39
FT 40	14301	199	43	20	-	55	61	FT 40
FT 41	514	37	14	-	-	28	29	FT 41
FT 42	1877	83	25	22	-	53	53	FT 42
FT 43	731	48	17	-	-	32	36	FT 43
FT 44	5517	162	45	43	-	89	96	FT 44
FT 45	6673	391	128	170	49	288	311	FT 45
FT 46	306540	1358	398	130	137	2267	1778	FT 46
FT 47	6131601	1190	234	449	569	3994	3841	FT 47

TABLE 18 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- FIRE TRAINING AREA -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS CONCENTRATIONS ----

SAMPLE #	METHANE PPB	ETHANE PPB	PROPANE PPB	I-BUTANE PPB	N-BUTANE PPB	ETHYLENE PPB	PROPYLENE PPB	SAMPLE #
FT 48	887	43	17	-	-	33	31	FT 48
FT 49	14427	290	57	51	-	127	94	FT 49
FT 50	1025400	1096	290	192	322	1821	1687	FT 50
FT 51	228500	396	113	87	81	658	608	FT 51

NOTE:
FT XX - 3 FT. SAMPLE
FT XX-1 - 1 FT. SAMPLE
FT XX-2 - 2 FT. SAMPLE

TABLE 19

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- FIRE TRAINING AREA -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
FT 1	21959	94.3	3.2	1.0	1.5	22829	1.9	1.9	FT 1
FT 2	6621	90.7	4.7	1.5	3.2	7053	3.0	3.1	FT 2
FT 3	4553	89.6	4.9	1.7	3.8	4888	3.3	3.6	FT 3
FT 4	2686	91.5	4.4	1.5	2.6	2851	2.9	2.9	FT 4
FT 5	1932	95.4	2.3	0.8	1.5	1989	1.4	1.5	FT 5
FT 6	1536	88.9	5.1	1.9	4.0	1677	3.8	4.6	FT 6
FT 7	979	94.4	2.3	0.9	2.3	1021	2.0	2.2	FT 7
FT 8	1185	93.9	2.5	0.9	2.6	1233	1.9	2.0	FT 8
FT 9	1530	80.6	10.9	4.1	4.4	1768	6.4	7.0	FT 9
FT 10	4509	89.2	5.0	1.6	4.2	4854	3.5	3.6	FT 10
FT 11	1873	87.7	4.6	2.3	3.4	2071	4.4	5.2	FT 11
FT 12	17133	95.7	2.1	0.5	1.6	17585	1.3	1.2	FT 12
FT 13	3534	82.3	8.5	3.1	6.1	3989	5.4	6.0	FT 13
FT 14	10649	87.8	6.7	2.3	3.2	11740	4.5	4.7	FT 14
FT 15	48261	98.4	1.0	0.3	0.3	49114	0.9	0.9	FT 15
FT 15-1	3585	94.8	2.6	0.9	1.7	3833	3.9	2.6	FT 15-1
FT 15-2	15855	97.9	1.4	0.4	0.3	16181	1.1	0.9	FT 15-2
FT 16	1835	86.8	6.7	2.3	4.1	2032	4.7	5.0	FT 16
FT 17	758	92.1	3.6	1.3	3.0	804	2.7	3.0	FT 17
FT 18	1433	91.8	4.0	1.5	2.7	1519	2.7	3.0	FT 18
FT 19	2997	89.3	5.3	1.8	3.6	3225	3.3	3.8	FT 19
FT 20	928	93.6	3.2	1.2	1.9	975	2.3	2.6	FT 20
FT 21	6393	85.7	7.8	2.7	3.9	7072	4.7	4.9	FT 21
FT 22	303480	99.7	0.2	0.0	0.1	304769	0.2	0.2	FT 22
FT 23	1406	83.2	10.1	4.1	2.6	1574	5.1	5.5	FT 23
FT 24	8629	82.3	10.6	3.5	3.6	9682	5.3	5.6	FT 24
FT 25	2153	95.2	2.6	1.2	1.1	2249	1.9	2.4	FT 25
FT 26	3420	81.3	10.7	4.2	3.8	3873	5.3	6.4	FT 26
FT 27	30877	83.8	11.2	3.3	1.7	33760	4.3	4.3	FT 27
FT 28	6692	86.5	9.3	2.8	1.3	7266	4.2	3.7	FT 28
FT 29	1143	86.6	8.6	3.1	1.7	1258	4.5	4.7	FT 29
FT 30	3219	80.0	10.2	4.2	5.6	3760	6.6	7.8	FT 30
FT 31	5233	93.9	2.9	1.0	2.1	5518	2.5	2.7	FT 31
FT 32	1539	92.2	3.9	1.4	2.5	1632	2.8	2.9	FT 32
FT 33	2228	91.1	5.2	1.9	1.8	2418	3.8	4.0	FT 33
FT 34	5002	89.4	5.2	2.1	3.4	5400	3.6	3.8	FT 34
FT 35	3117	87.9	6.7	2.3	3.0	3451	4.6	5.1	FT 35
FT 36	11635	87.3	6.0	2.1	4.6	12944	5.1	5.0	FT 36
FT 37	9212	92.9	3.9	1.1	2.1	9609	2.0	2.2	FT 37
FT 38	1187	92.3	4.5	1.3	1.9	1252	2.5	2.7	FT 38
FT 39	1770	93.3	3.6	1.2	1.9	1857	2.3	2.4	FT 39
FT 40	14563	98.2	1.4	0.3	0.1	14679	0.4	0.4	FT 40
FT 41	565	91.0	6.5	2.5	0.0	622	4.5	4.7	FT 41
FT 42	2007	93.5	4.1	1.2	1.1	2113	2.5	2.5	FT 42
FT 43	796	91.8	6.0	2.1	0.0	864	3.7	4.2	FT 43
FT 44	5767	95.7	2.8	0.8	0.7	5952	1.5	1.6	FT 44
FT 45	7411	90.0	5.3	1.7	3.0	8010	3.6	3.9	FT 45
FT 46	308563	99.3	0.4	0.1	0.1	312608	0.7	0.6	FT 46
FT 47	6134043	100.0	0.0	0.0	0.0	6141878	0.1	0.1	FT 47

TABLE 19 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, S.C. ----
---- FIRE TRAINING AREA -- PROBE SURVEY, OCT. 1986 ----
---- SOIL GAS PERCENTAGES ----

SAMPLE #	TOTAL C1-C4	METHANE %C1	ETHANE %C2	PROPANE %C3	BUTANE %C4	TOTAL HYDCARB	ETHYLENE %	PROPYLENE %	SAMPLE #
FT 48	947	93.7	4.5	1.8	0.0	1011	3.3	3.1	FT 48
FT 49	14825	97.3	2.0	0.4	0.3	15046	0.8	0.6	FT 49
FT 50	1027300	99.8	0.1	0.0	0.1	1030808	0.2	0.2	FT 50
FT 51	229177	99.7	0.2	0.0	0.1	230443	0.3	0.3	FT 51

NOTE:
FT XX - 3 FT. SAMPLE
FT XX-1 - 1 FT. SAMPLE
FT XX-2 - 2 FT. SAMPLE

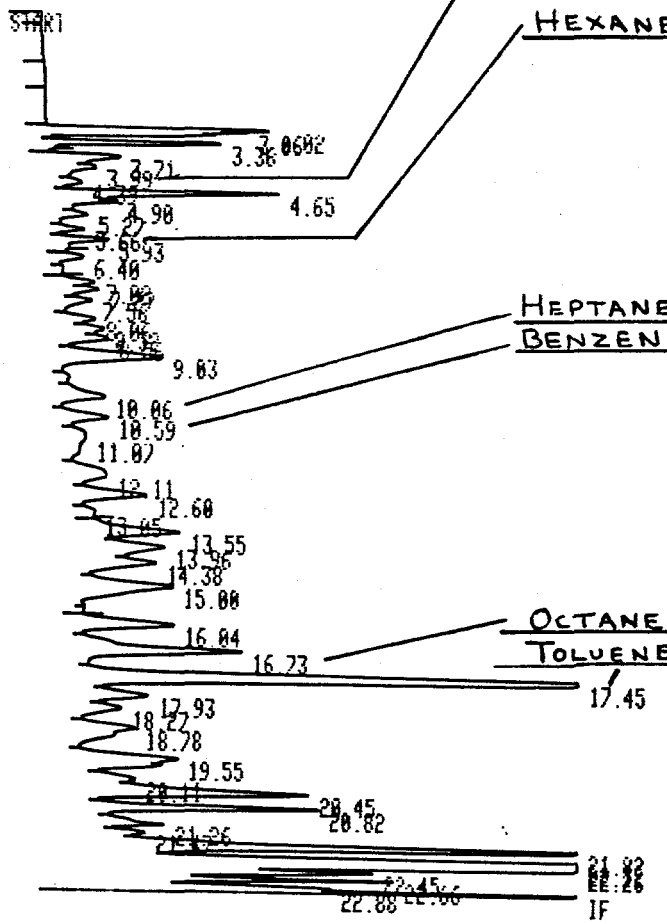
TABLE 20

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN S.C. ----
---- FIRE TRAINING AREA -- SOIL SAMPLES -- OCT. 1986 ----
---- SOIL CONCENTRATIONS BY WEIGHT ----

SAMPLE NUMBER	DEPTH	PENTANE PPB	HEXANE PPB	HEPTANE PPB	BENZENE PPB	OCTANE PPB	TOLUENE PPB	TOTAL AREA	SAMPLE NUMBER	DEPTH
FT 1	1.0	-	-	-	-	-	-	5985	FT 1	1.0
FT 1	2.0	-	-	-	-	-	-	6102	FT 1	2.0
FT 1R	2.0	-	-	-	-	-	-	11205	FT 1R	2.0
FT 1	3.0	-	-	-	-	-	-	10155	FT 1	3.0
FT 1	4.0	-	-	-	-	-	-	6246	FT 1	4.0
FT 1	5.0	-	-	-	-	-	-	14291	FT 1	5.0
FT 12	2.0	-	-	-	-	-	-	10737	FT 12	2.0
FT 14	2.0	-	-	-	-	-	-	13275	FT 14	2.0
FT 15	2.0	-	-	-	-	-	-	29982	FT 15	2.0
FT 16	2.0	-	-	-	-	-	-	11268	FT 16	2.0
FT 17	2.0	-	-	-	-	-	-	17002	FT 17	2.0
FT 20	2.0	-	-	-	-	-	-	17223	FT 20	2.0
FT 21	2.0	-	-	-	-	-	-	20730	FT 21	2.0
FT 22	2.0	2.4	-	-	-	7.5	9.5	681970	FT 22	2.0
FT 23	2.0	-	-	-	-	-	-	26617	FT 23	2.0
FT 26	2.0	-	-	-	-	-	-	34288	FT 26	2.0
FT 27	2.0	-	-	-	-	-	-	14678	FT 27	2.0
FT 28	2.0	-	-	-	-	-	-	16043	FT 28	2.0
FT 29	2.0	-	-	-	-	-	-	44576	FT 29	2.0
FT 41	1.0	-	-	-	-	-	-	7201	FT 41	1.0
FT 41	2.0	-	-	-	-	-	-	6982	FT 41	2.0
FT 41	3.0	-	-	-	-	-	-	9416	FT 41	3.0
FT 41	4.0	-	-	-	-	-	-	7822	FT 41	4.0
FT 41	5.0	-	-	-	-	-	-	7688	FT 41	5.0
FT 47	1.0	-	-	2.3	2.3	6.4	6.6	959610	FT 47	1.0
FT 47	2.0	-	-	3.3	3.7	10.1	59.5	1303900	FT 47	2.0
FT 47	3.0	-	-	-	1.9	6.0	19.5	497400	FT 47	3.0
FT 47	4.0	-	-	-	2.3	3.7	3.9	398220	FT 47	4.0
FT 47	5.0	-	-	-	-	-	-	88959	FT 47	5.0
FT 51	1.0	-	-	-	-	-	-	97940	FT 51	1.0
FT 51	2.0	-	-	-	-	2.5	5.4	438260	FT 51	2.0
FT 51	3.0	-	-	-	-	-	2.6	173130	FT 51	3.0
FT 51	4.0	-	-	-	-	-	2.5	138830	FT 51	4.0
FT 51	5.0	-	-	-	-	-	-	21501	FT 51	5.0

FIGURE 43

FIRE TRAINING AREA GASOLINE RANGE
HYDROCARBON CHROMATOGRAM FOR SITE FT-47



RUN # 84 OCT/14/86 16:28:07
WORKFILE ID: B
WORKFILE NAME:

AREA%

RT	AREA	TYPE	AR/HT	AREA%
3.02	17943	PV	0.090	1.376
3.06	7245 D	VV	0.041	0.556
3.36	15417	VB	0.103	1.182
3.71	13208	BV	0.207	1.013
3.99	10067	VV	0.244	0.772
4.39	5875	VV	0.218	0.451
4.65	26210	VV	0.130	2.010
4.90	10019	VV	0.178	0.768
5.27	6157	VV	0.216	0.472
5.66	3478	VP	0.144	0.267
5.93	5695	PB	0.134	0.437
6.40	3044	BP	0.167	0.234
7.08	4639	BV	0.158	0.356
7.27	5884	VV	0.180	0.451
7.56	5333	VV	0.204	0.409
8.06	5681	VV	0.191	0.436
8.32	7781	VV	0.207	0.597
8.56	9078	VV	0.222	0.696
9.03	23734	VP	0.266	1.820
10.06	10643	VP	0.273	0.816
10.59	9178	PV	0.230	0.704
11.07	9555	VP	0.547	0.733
12.11	10870	PV	0.387	0.834
12.60	13912	VP	0.235	1.067
13.05	961	PB	0.176	0.074
13.55	18915	BV	0.243	1.451
13.96	21379	VV	0.322	1.640
14.38	16201	VV	0.268	1.243
15.00	26348	VP	0.333	2.021
16.04	18962	BV	0.232	1.454
16.23	34887	VV	0.243	2.676
17.45	120180	VV	0.183	9.217
17.93	15024	VV	0.249	1.152
18.27	8841	VV	0.238	0.678
18.78	17158	VP	0.347	1.316
19.55	18358	PV	0.208	1.408
20.11	11123	VV	0.222	0.853
20.45	43820	VV	0.213	3.361
20.82	33623	VV	0.157	2.579
21.26	15191	VV	0.203	1.165
21.47	10194	VV	0.175	0.782
21.82	92762	VV	0.148	7.114
22.12	97401	VV	0.090	7.470
22.26	344730	VV	0.088	26.437
22.45	39535	VV	0.151	3.032
22.66	31958	VV	0.114	2.451
22.88	25748	VV	0.115	1.975

TOTAL AREA= 1303900
MUL FACTOR= 1.0000E+00

The Miscellaneous Chemicals Basin

At the Miscellaneous Chemicals Basin a total of 120 soil samples were taken for analysis of the halocarbons listed in Table 1. Of this total, seven sites were repeats of sites sampled in our prior survey conducted in the spring of 1986 under RFP85-43. In the earlier survey thirty-two sites were sampled. We have included those data in the statistics, maps and tables of this report. (Sites 1-32 are the earlier survey; Jan., 86 Sites 38-145 are the present survey.) Oct, 86 In the case of repeat sites, only the data from the most recent survey was plotted on the maps, although both sets of data are listed in Table 22.

Locations of all sites are shown on the Site Location Map in Figure 44. For the most part, the sites are located on 20 ft centers and soil samples were taken from a depth of 18-24 inches.

The data (both sets) are shown in Table 21, and are plotted in Figures 45-49. No data above minimum detection levels were found for vinyl chloride, 1,1-dichloroethane or 1,2-dichlorethane and only three sites were found which contained 1,1-dichloroethylene or methylene chloride. No maps were prepared for these compounds.

As may be determined from Table 22 and Figures 45 and 46, tetrachloroethylene and trichloroethylene have by far the largest magnitudes and are more widely distributed than the other halocarbons surveyed. Trichloromethane (chloroform), shown in

Figure 47, has considerably smaller magnitude, however, the higher samples cluster in the central portion of the basin. Only three sites had cis 1,2-dichloroethylene above minimum detection levels. These data are plotted in Figure 48. A number of sites, as shown in Figure 49, exhibited apparent trans 1,2-dichlorethylene levels above the minimum detection level. In both the earlier and present survey, we noticed that although the chromatographic peak for this compound had the proper retention time, the shape of the sample peak was different from that of the standard. We have also noticed that the range of the measurements, particularly for the present survey, is restricted. We therefore suggest caution in the interpretation of the data for this compound.

TABLE 21

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, SC. ----
---- MISCELLANEOUS CHEMICAL BASIN -- 1.5 FT. SOIL SAMPLES, OCTOBER 1986 ----
---- SOIL CONCENTRATION BY WEIGHT IN PPB ----
(samples 1 - 32 from Jan. 86')

SAMPLE NUMBER	VINYL CHLORIDE	1,1-DiCl ETHYLENE	DiCl METHANE	T1,2-DiCl ETHYLENE	1,1-DiCl ETHANE	C1,2-DiCl ETHYLENE	TriCl METHANE	1,2-DiCl ETHANE	TriCl ETHYLENE	TetraCl ETHYLENE
P 1	*	-	-	24.0	-	*	0.3	*	3.8	1.02
P 2	*	-	-	21.0	-	*	1.9	*	8.3	20.00
P 2R	-	-	-	-	-	-	0.5	-	6.2	6.40
P 3	*	-	-	24.0	-	*	2.1	*	6.8	296.00
P 3R	-	-	-	-	-	4.2	1.7	-	5.9	1200.00
P 4	*	-	-	18.0	-	*	-	*	0.1	13.00
P 4R	-	-	-	-	-	-	-	-	-	0.10
P 5	*	-	-	18.0	-	*	-	*	-	3.16
P 6	*	-	-	24.0	-	*	-	*	-	1.96
P 7	*	-	-	21.0	-	*	-	*	-	0.34
P 8	*	-	-	24.0	-	*	-	*	-	0.13
P 9	*	-	-	24.0	-	*	-	*	-	-
P 10	*	-	-	33.0	-	*	-	*	-	0.04
P 11	*	-	-	30.0	-	*	-	*	-	-
P 12	*	-	-	48.0	-	*	-	*	0.1	-
P 13	*	-	-	24.0	-	*	0.6	*	7.8	2.66
P 13R	-	-	-	-	-	-	-	-	0.1	0.10
P 14	*	-	-	42.0	-	*	-	*	0.2	0.05
P 15	*	-	-	39.0	-	*	0.1	*	2.6	0.29
P 16	*	-	-	24.0	-	*	0.3	*	1.7	1.24
P 17	*	-	-	42.0	-	*	0.3	*	7.5	99.60
P 17R	-	-	-	3.6	-	-	-	-	0.1	4.40
P 18	*	-	-	48.0	-	*	-	*	0.2	0.07
P 19	*	-	-	36.0	-	*	-	*	-	-
P 20	*	-	-	36.0	-	*	-	*	1.2	-
P 21	*	-	-	33.0	-	*	-	*	0.2	-
P 22	*	-	-	27.0	-	*	-	*	0.1	-
P 23	*	-	-	24.0	-	*	-	*	-	-
P 24	*	-	-	24.0	-	*	0.1	*	-	-
P 25	*	-	-	21.0	-	*	-	*	-	-
P 26	*	-	-	2.0	-	*	0.1	*	-	0.09
P 27	*	-	-	4.0	-	*	0.1	*	0.1	0.12
P 28	*	-	-	4.0	-	*	0.1	*	35.2	216.00
P 28R	-	-	0.6	7.5	-	15.9	0.3	-	660.0	44800.00
P 29	*	-	-	4.0	-	*	-	*	0.1	3.22
P 29R	-	-	-	3.3	-	-	-	-	-	4.30
P 30	*	-	-	4.0	-	*	-	*	0.1	1.24
P 31	*	-	-	3.0	-	*	0.1	*	0.2	0.83
P 32	*	-	-	4.0	-	*	-	*	-	0.41
P 33	-	-	-	-	-	-	-	-	-	-
P 34	-	-	-	-	-	-	-	-	-	-
P 35	-	-	-	-	-	-	-	-	-	-
P 36	-	-	-	-	-	-	-	-	0.1	560.00
P 37	-	-	-	7.2	-	-	-	-	-	-
P 38	-	-	-	-	-	-	-	-	-	-
P 39	-	-	-	-	-	-	-	-	-	0.12
P 40	-	-	-	-	-	-	0.1	-	11.0	24.50
P 41	-	-	-	-	-	-	-	-	-	-

TABLE 21 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, SC. ----
---- MISCELLANEOUS CHEMICAL BASIN -- 1.5 FT. SOIL SAMPLES, OCTOBER 1986 ----
---- SOIL CONCENTRATION BY WEIGHT IN PPB ----
(samples 1 - 32 from Jan. 86')

SAMPLE NUMBER	VINYL CHLORIDE	1,1-DiCl ETHYLENE	DiCl METHANE	T1,2-DiCl ETHYLENE	1,1-DiCl ETHANE	C1,2-DiCl ETHYLENE	TriCl METHANE	1,2-DiCl ETHANE	TriCl ETHYLENE	TetraCl ETHYLENE
P 42	-	-	-	-	-	-	-	-	-	-
P 43	-	-	-	-	-	-	-	-	-	-
P 44	-	-	-	-	-	-	-	-	-	-
P 45	-	-	-	-	-	-	-	-	-	-
P 46	-	-	-	-	-	-	-	-	-	-
P 47	-	-	-	-	-	-	-	-	1.9	1.60
P 48	-	-	-	-	-	-	0.1	-	0.1	0.80
P 49	-	-	-	3.0	-	-	-	-	-	-
P 50	-	-	-	3.7	-	-	-	-	-	-
P 51	-	-	-	-	-	-	-	-	-	-
P 52	-	-	-	-	-	-	-	-	0.1	-
P 53	-	-	-	-	-	-	-	-	1.8	0.20
P 54	-	0.7	-	3.9	-	295.0	13.2	-	5520.0	96.00
P 55	-	-	-	-	-	-	0.4	-	23.0	9.50
P 56	-	-	-	3.0	-	-	-	-	0.1	-
P 57	-	-	-	-	-	-	1.4	-	7.8	44.00
P 58	-	0.3	-	-	-	-	18.2	-	640.0	9333.00
P 59	-	-	-	-	-	-	-	-	-	18.50
P 60	-	-	-	-	-	-	0.2	-	5.9	40.00
P 61	-	-	-	-	-	-	-	-	-	-
P 62	-	-	-	-	-	-	-	-	-	0.40
P 63	-	-	-	-	-	-	-	-	-	-
P 64	-	-	-	-	-	-	-	-	-	-
P 65	-	-	-	-	-	-	-	-	-	-
P 66	-	-	-	-	-	-	-	-	-	-
P 67	-	-	-	-	-	-	-	-	-	-
P 68	-	-	-	-	-	-	0.3	-	0.3	15.30
P 69	-	-	-	-	-	-	-	-	0.1	0.80
P 70	-	-	-	-	-	-	-	-	0.2	0.09
P 71	-	-	-	-	-	-	0.7	-	1.4	0.60
P 72	-	-	-	-	-	-	-	-	-	-
P 73	-	-	-	-	-	-	-	-	0.1	-
P 74	-	-	-	-	-	-	-	-	0.3	0.10
P 75	-	-	-	3.6	-	-	-	-	0.1	0.10
P 76	-	-	-	4.4	-	-	-	-	-	-
P 77	-	-	-	4.8	-	-	-	-	-	0.03
P 78	-	-	-	8.0	-	-	-	-	-	-
P 79	-	-	-	-	-	-	-	-	-	0.04
P 80	-	-	-	-	-	-	-	-	-	-
P 81	-	-	-	4.1	-	-	-	-	-	0.04
P 82	-	-	-	5.5	-	-	-	-	-	-
P 83	-	-	-	6.5	-	-	0.1	-	5.6	1640.00
P 84	-	-	-	-	-	-	3.2	-	13.5	4800.00
P 85	-	-	-	2.9	-	-	-	-	-	0.10
P 86	-	-	-	-	-	-	-	-	-	-
P 87	-	-	-	-	-	-	-	-	-	-
P 88	-	-	-	-	-	-	-	-	-	-
P 89	-	-	-	-	-	-	-	-	-	-

TABLE 21 (cont)

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, SC. ----
---- MISCELLANEOUS CHEMICAL BASIN -- 1.5 FT. SOIL SAMPLES, OCTOBER 1986 ----
---- SOIL CONCENTRATION BY WEIGHT IN PPB ----
(samples 1 - 32 from Jan. 86')

SAMPLE NUMBER	VINYL CHLORIDE	1,1-DiCl ETHYLENE	DiCl METHANE	T1,2-DiCl ETHYLENE	1,1-DiCl ETHANE	C1,2-DiCl ETHYLENE	TriCl METHANE	1,2-DiCl ETHANE	TriCl ETHYLENE	TetraCl ETHYLENE
P 90	-	-	-	-	-	-	-	-	-	-
P 91	-	-	1.4	-	-	-	-	-	-	-
P 92	-	-	-	5.1	-	-	-	-	-	-
P 93	-	-	-	-	-	-	-	-	-	-
P 94	-	-	-	-	-	-	-	-	0.8	2144.00
P 95	-	-	-	7.5	-	-	-	-	-	49.00
P 96	-	-	-	5.4	-	-	-	-	-	46.00
P 97	-	-	-	3.0	-	-	-	-	-	-
P 98	-	-	-	-	-	-	-	-	-	-
P 99	-	-	-	-	-	-	-	-	-	-
P 100	-	-	-	-	-	-	-	-	-	-
P 101	-	-	-	-	-	-	-	-	0.1	3.40
P 102	-	-	-	-	-	-	-	-	-	0.10
P 103	-	-	-	-	-	-	-	-	-	0.20
P 104	-	-	-	-	-	-	-	-	-	0.30
P 105	-	-	-	-	-	-	-	-	-	-
P 106	-	-	-	-	-	-	-	-	-	-
P 107	-	-	-	-	-	-	-	-	-	0.03
P 108	-	-	-	-	-	-	-	-	-	2.70
P 109	-	-	-	-	-	-	-	-	-	-
P 110	-	-	-	-	-	-	-	-	0.2	1.90
P 111	-	-	-	3.4	-	-	-	-	-	-
P 112	-	-	-	4.8	-	-	-	-	-	-
P 113	-	-	-	-	-	-	-	-	-	-
P 114	-	-	-	-	-	-	-	-	-	-
P 115	-	-	-	-	-	-	-	-	-	0.05
P 116	-	-	-	-	-	-	-	-	-	0.03
P 117	-	-	-	-	-	-	-	-	-	-
P 118	-	-	-	-	-	-	-	-	-	-
P 119	-	-	-	-	-	-	-	-	0.1	0.03
P 120	-	-	-	-	-	-	-	-	-	-
P 121	-	-	-	-	-	-	-	-	-	-
P 122	-	-	-	-	-	-	-	-	0.1	-
P 123	-	-	-	-	-	-	-	-	-	-
P 124	-	-	-	-	-	-	-	-	-	-
P 125	-	-	-	-	-	-	-	-	-	-
P 126	-	-	-	-	-	-	-	-	-	-
P 127	-	-	-	-	-	-	-	-	-	2.10
P 128	-	-	-	-	-	-	-	-	-	-
P 129	-	-	-	3.3	-	-	-	-	-	-
P 130	-	-	-	-	-	-	-	-	-	0.03
P 131	-	-	-	-	-	-	-	-	-	2.30
P 132	-	-	-	-	-	-	-	-	-	-
P 133	-	-	-	-	-	-	-	-	-	44.00
P 134	-	-	-	-	-	-	-	-	-	-
P 135	-	-	-	-	-	-	-	-	-	-
P 136	-	-	-	-	-	-	-	-	-	-
P 137	-	-	-	-	-	-	-	-	-	-

TABLE 21 (cont)

**12-Dec-86 **

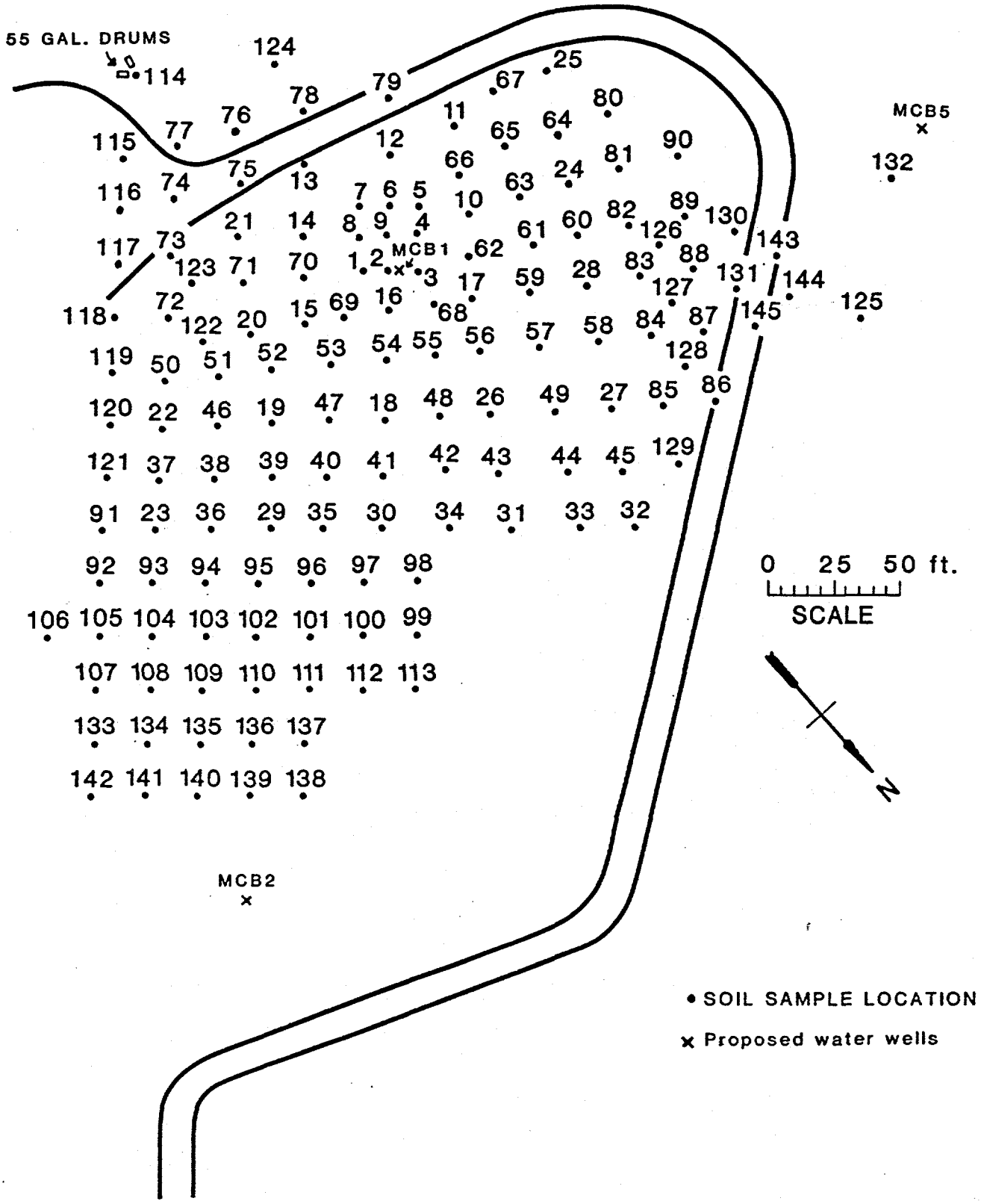
MICROSEEPS LTD

---- E. I. DUPONT DE NEMOURS CO. INC., S.R.P., AIKEN, SC. ----
---- MISCELLANEOUS CHEMICAL BASIN -- 1.5 FT. SOIL SAMPLES, OCTOBER 1986 ----
---- SOIL CONCENTRATION BY WEIGHT IN PPB ----
(samples 1 - 32 from Jan. 86')

SAMPLE NUMBER	VINYL CHLORIDE	1,1-DiCl ETHYLENE	DiCl METHANE	Tl,2-DiCl ETHYLENE	1,1-DiCl ETHANE	Cl,2-DiCl ETHYLENE	TriCl METHANE	1,2-DiCl ETHANE	TriCl ETHYLENE	TetraCl ETHYLENE
P 138	-	-	-	-	-	-	-	-	-	-
P 139	-	-	-	-	-	-	-	-	-	5.90
P 140	-	-	-	-	-	-	-	-	-	0.90
P 141	-	-	-	-	-	-	-	-	-	-
P 142	-	-	-	-	-	-	-	-	-	0.03
P 143	-	-	-	-	-	-	-	-	-	0.05
P 144	-	-	-	-	-	-	-	-	-	-
P 145	-	-	-	-	-	-	-	-	-	-
MDL	3.0	~~1~~ 0.3	0.5	2.0	5	4	0.03	5	0.04	0.03
ppb										

NOTE:
- BELOW MINIMUM DETECTION LIMIT
* NOT ANALYZED FOR COMPOUND
R REPEAT SAMPLE

FIGURE 44

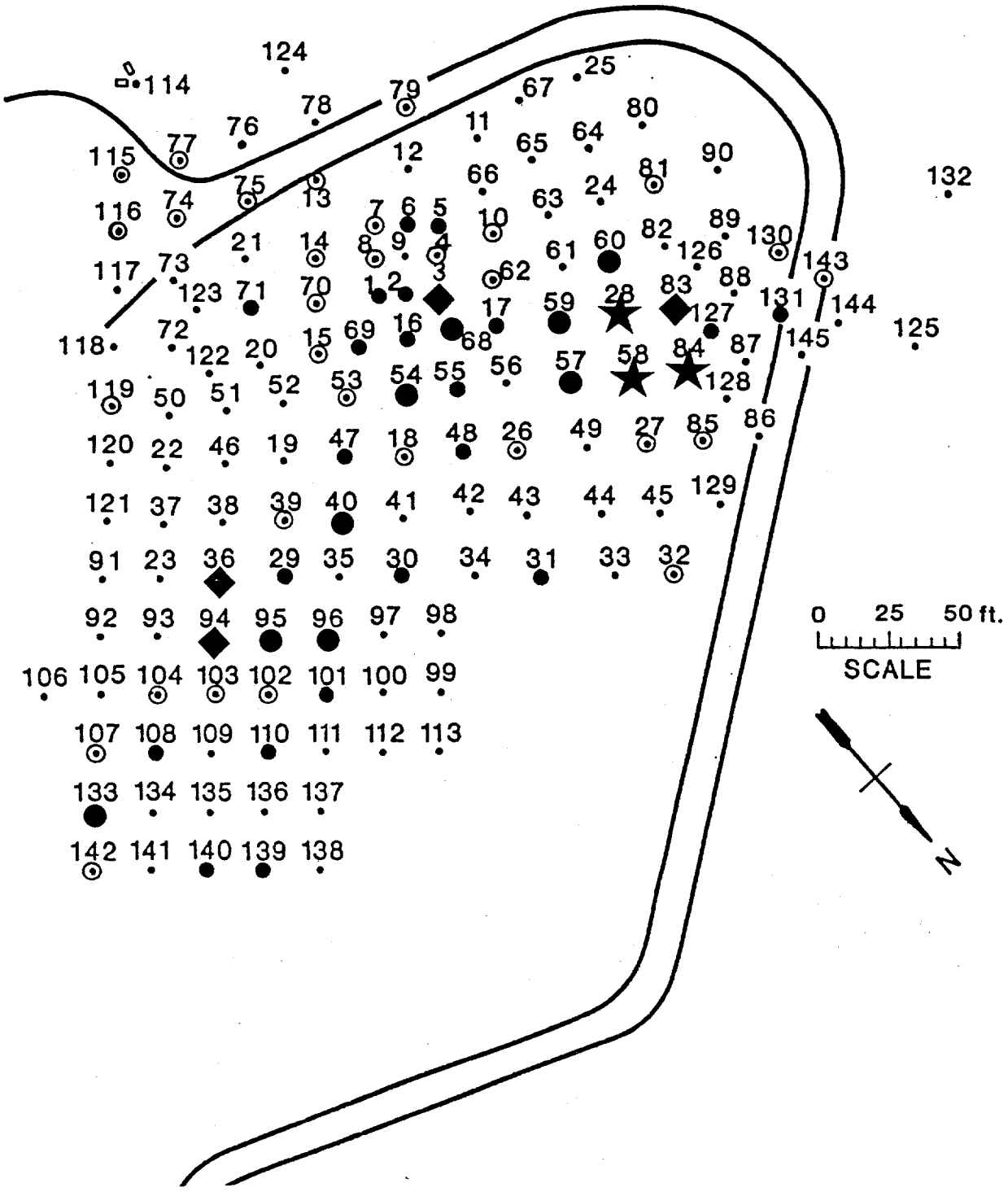


MISCELLANEOUS CHEMICAL BASIN

SITE LOCATION MAP

S.R.P. NOVEMBER, 1986

FIGURE 45



LEGEND

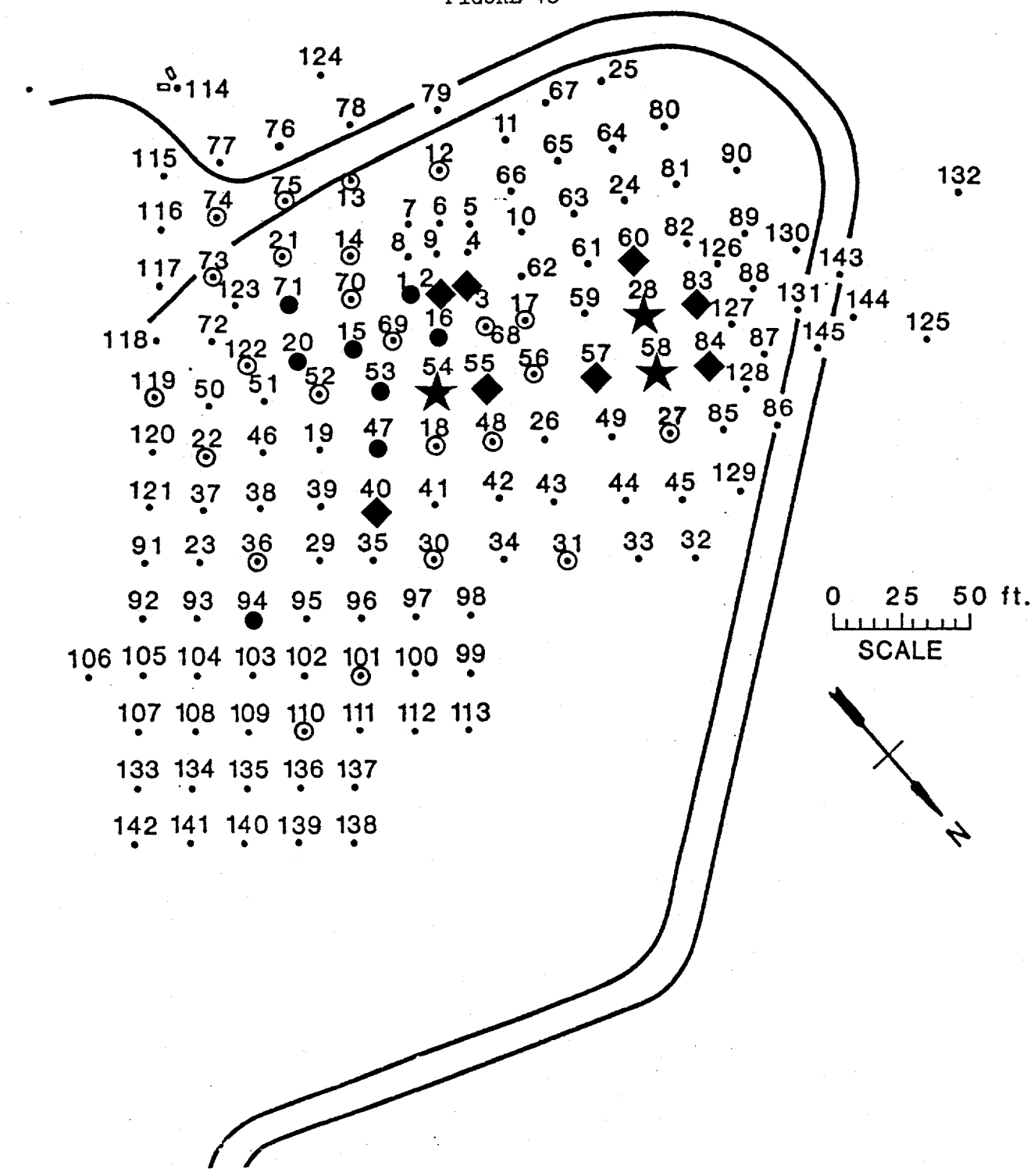
SYMBOL	RANGE (ppb)
★	> 4700
◆	500 – 4600
●	11 – 100
•	.6 – 10
⊙	.03 – .5
·	*BELOW M.D.L.*

MISCELLANEOUS
CHEMICAL BASIN

TETRACHLOROETHYLENE

S.R.P. NOVEMBER, 1986

FIGURE 46



LEGEND

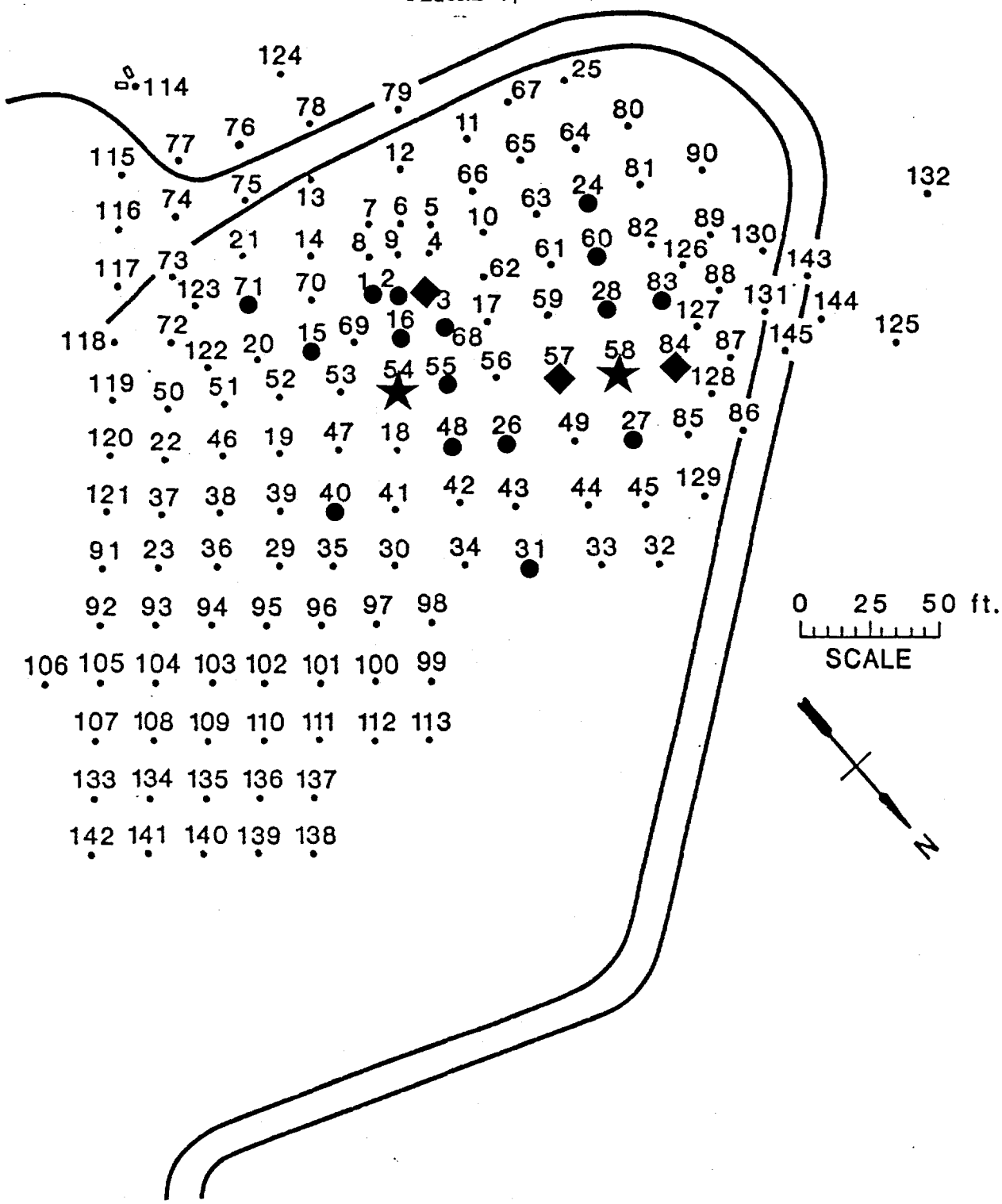
SYMBOL	RANGE (ppb)
★	600 – 6000
◆	5 – 25
●	.5 – 4
⊙	.1 – .4
·	*BELOW M.D.L.*

MISCELLANEOUS
CHEMICAL BASIN

TRICHLOROETHYLENE

S.R.P. NOVEMBER, 1986

FIGURE 47



LEGEND

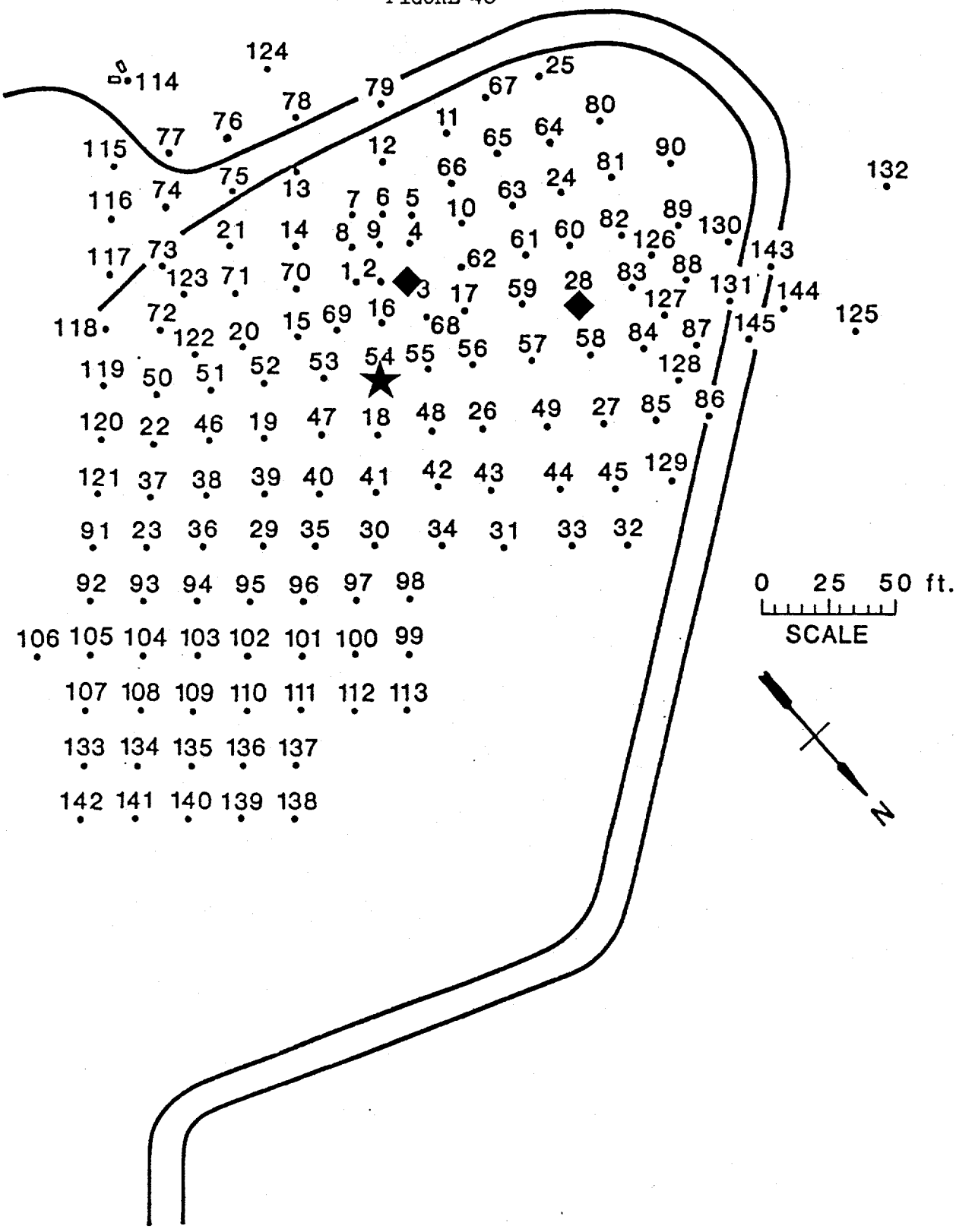
SYMBOL	RANGE (ppb)
★	13 – 19
◆	1 – 4
●	.1 – .9
·	*BELOW M.D.L.*

MISCELLANEOUS
CHEMICAL BASIN

TRICHLOROMETHANE

S.R.P. NOVEMBER, 1986

FIGURE 48



LEGEND

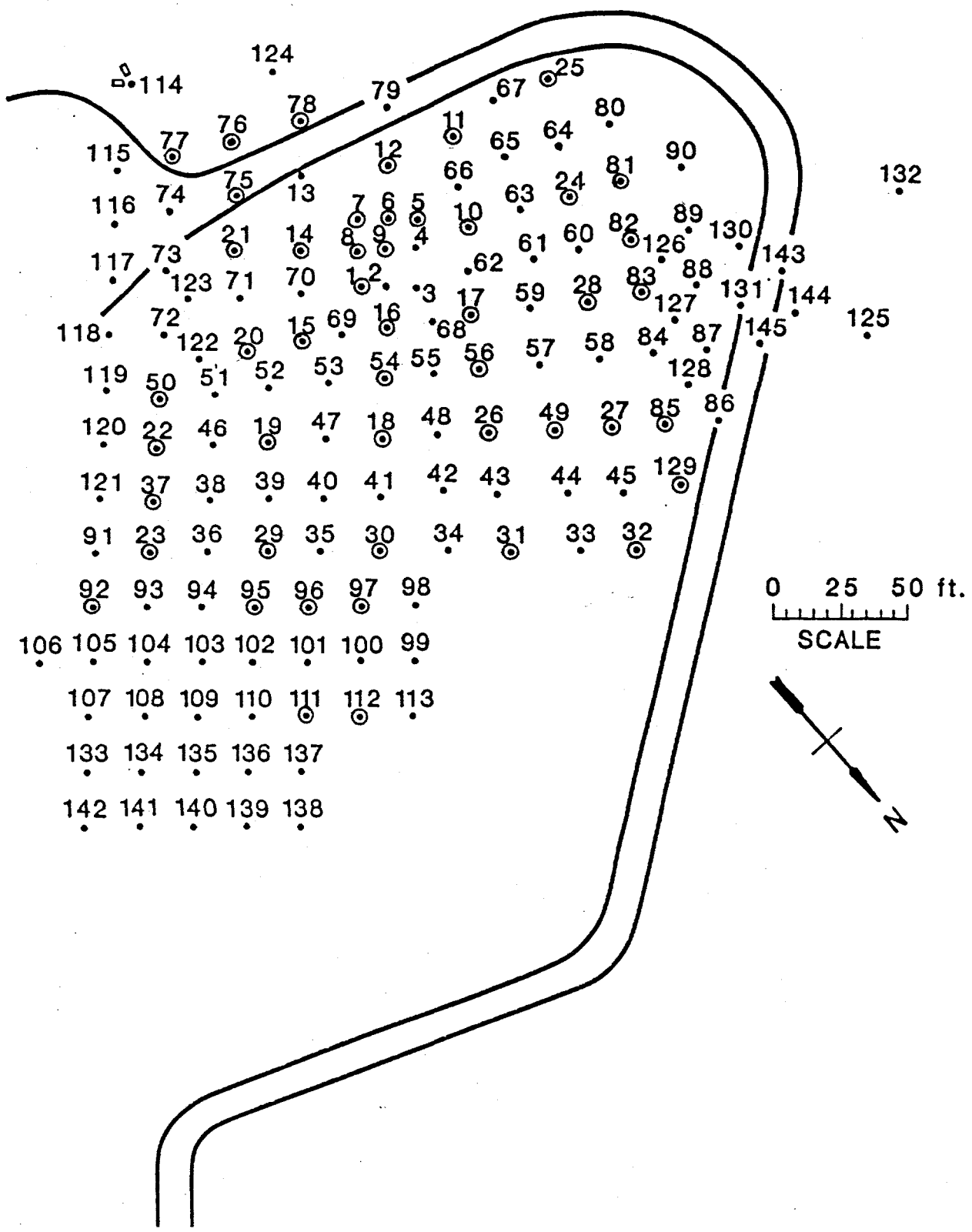
SYMBOL	RANGE (ppb)
★	295
◆	4 – 16
•	*BELOW M.D.L.*

MISCELLANEOUS
CHEMICAL BASIN

CIS 1, 2
DICHLOROETHYLENE

S.R.P. NOVEMBER, 1986

FIGURE 49



LEGEND

SYMBOL	RANGE (ppb)
⊙	2 – 48
·	*BELOW M.D.L.*

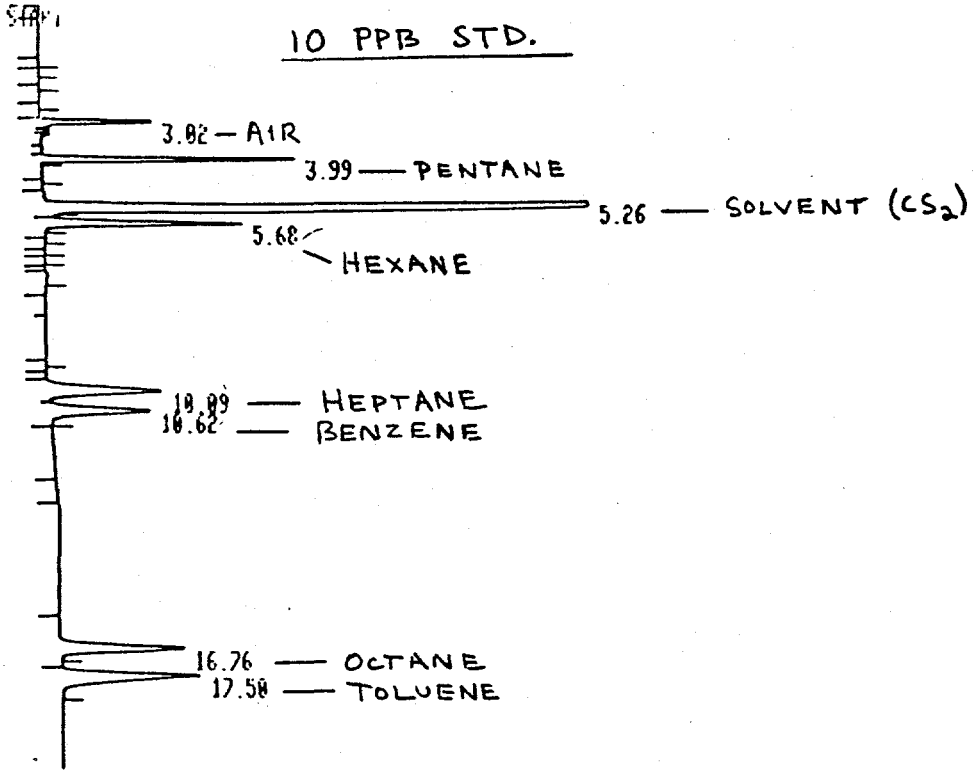
MISCELLANEOUS
CHEMICAL BASIN

TRANS 1, 2
DICHLOROETHYLENE

S.R.P. NOVEMBER, 1986

FIGURE 50

GASOLINE RANGE HYDROCARBONS
10ppb STANDARD CHROMATOGRAM



RUN # 89 OCT/14/86 22:48:40
WORKFILE ID: B
WORKFILE NAME:

AREA%

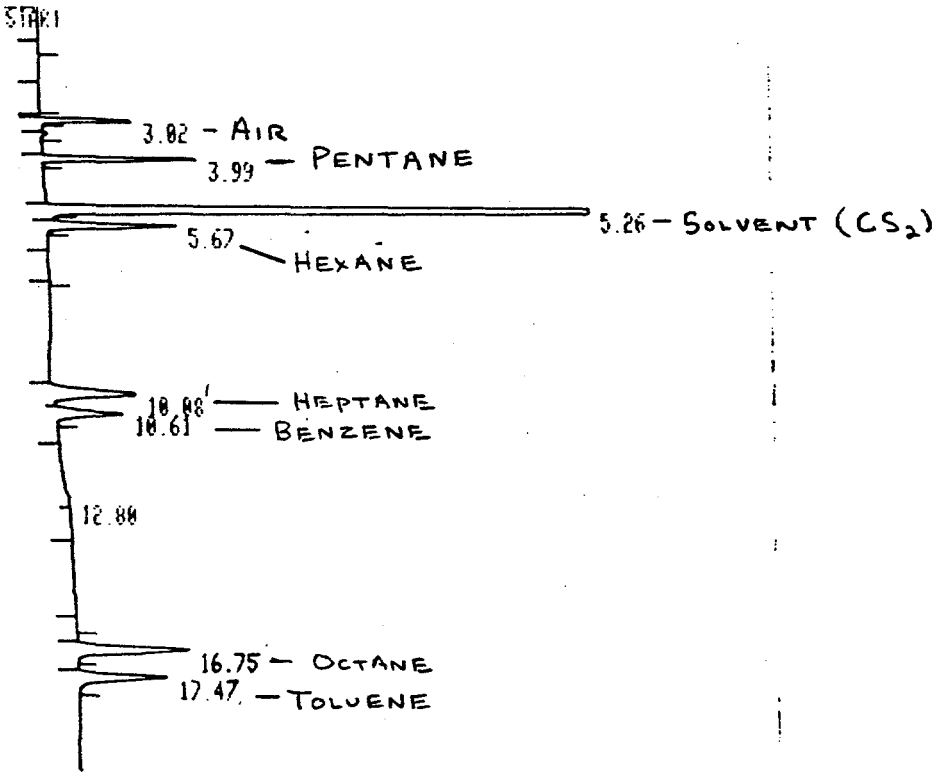
	RT	AREA	TYPE	AR/HT	AREA%
	3.02	10963	PV	0.112	1.940
PENTANE	3.99	22619	PB	0.101	4.003
	5.26	422840	PB	0.115	74.823
HEXANE	5.68	21494	BB	0.128	3.803
HEPTANE	10.09	22003	PV	0.219	3.894
BENZENE	10.62	17559	VB	0.197	3.107
OCTANE	16.76	19598	PB	0.181	3.468
TOLUENE	17.50	28045	BB	0.232	4.963

TOTAL AREA= 565120
MUL FACTOR= 1.0000E+00

FIGURE 51

GASOLINE RANGE HYDROCARBONS
5ppb STANDARD CHROMATOGRAM

5 PPB STD.



RUN # 91 OCT/14/86 23:40:51
WORKFILE ID: B
WORKFILE NAME:

	RT	AREA	TYPE	AR/HT	AREA%
	3.02	8102	PB	0.102	2.044
PENTANE	3.99	13980	PB	0.103	3.526
	5.26	298200	PB	0.114	75.216
HEXANE	5.67	14248	BB	0.128	3.594
HEPTANE	10.08	16683	PV	0.220	4.208
BENZENE	10.61	12155	VB	0.199	3.066
	12.80	0	PB	0.000	0.000
OCTANE	16.75	18591	BB	0.186	4.689
TOLUENE	17.47	14501	BB	0.182	3.658

TOTAL AREA= 396460
MUL FACTOR= 1.0000E+00