MEMORANDUM

STATE OF ALASKA

TO: John Sandor
Commissioner

DATE: December 11, 1990

FILE NO: Correspondence

THRU: Larry Dietrick

TELEPHONE NO: 452-1714

THRU: Pete McGee
RES

THRU: Doug Dasher
IDO Manager

FROM: Daniel Basketfield DKB
Environmental Engineer
NRO

SUBJECT: Illinois & Minnie Street Connector

On December 3, 1990, the Northern Regional Office received copies of a Shannon & Wilson, Inc., "Final Report, Illinois Street and Minnie Street Connector Hazardous Waste Field Investigation, Phase II," concerning the results of soil and groundwater investigations during 1990 undertaken on behalf of the Alaska Department of Transportation and Public Facilities. The report discusses the results of the second phase of an environmental sampling effort in the vicinity of the proposed right-of-way for DOT's Illinois Street Widening and Minnie Street Connector projects in Fairbanks. The preliminary phase of study for this project was reported earlier in the May, 1989, "Preliminary Hazardous Waste Site Evaluation, Proposed Minnie Street Connector," report by Shannon & Wilson, Inc.

The area under consideration consisted of portions of Illinois Street near Kelly's Firestone and the Alaska Chevron Service Station, and several properties between the Eielson Branch of the Alaska Railroad and Illinois Street at the Minnie Street intersection. The parcels under study were:

1. Petroleum Sales
2. Saupe Enterprises (Chevron Bulk Plant)
3. Willner's Texaco
4. Nerland's/Alaska Feed Company
5. VanGas (Suburban Propane)
6. Alaska Gold
7. Sourdough Express
8. Alaska RR right-of-way
9. Fairbanks city streets (Driveway St., Charles St., Oil Ave)
10. Alaska Chevron
11. Kelly's Firestone

Significant contamination of both soils and groundwater were observed throughout the study area. The following is a brief

summary of the problems noted based on 348 separate analyses of soil and water samples:

1. Free-floating petroleum product was observed on the water table at the Van Gas (Suburban Propane) site in thicknesses varying from 0.02 to 0.35 feet on September 14, 1990, and from 0.06 to 0.57 feet on October 22, 1990. The average depths to groundwater over the entire study area were 13.6 feet and 16 feet, respectively, during these periods of observation. The earlier 1989 preliminary report indicated free-product was observed in apparent thicknesses of over one foot at the Saupe Enterprises (Chevron Bulk Plant) site during the 1980's. Free-product approximately 0.22 feet thick was observed at the Saupe Enterprises site on October 22, 1990.

2. Only five test holes out of a total of 30 had soil and groundwater contamination below guideline levels and the MCL's. However, in these five test holes VOC's, HVOC's and TPH-levels were detected in varying concentrations.

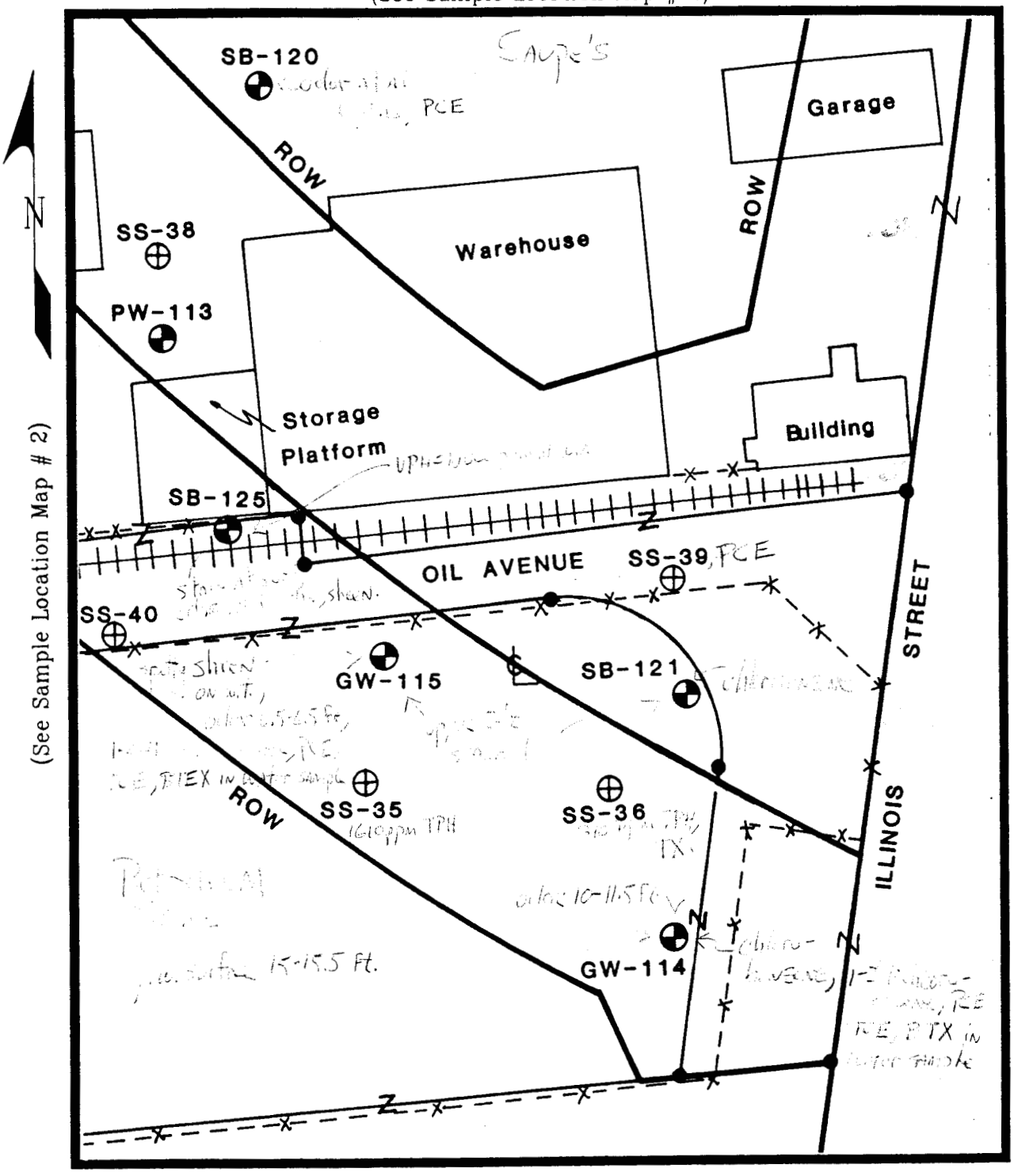
3. Fourteen of 21 surface samples had either TPH or VPH results above guideline levels. Surface TPH levels at the VanGas site were reported as high as 120,000 ppm.

4. Four groundwater wells exhibited concentrations of 1,2,-dichloroethane above MCL's, with the highest value of 27 ppb over five times the MCL of 5 ppb. Tetrachloroethylene (1.1 ppb), and trichloroethylene (0.9 ppb) were also detected.

5. Nine of ten water samples showed benzene concentrations greater than the MCL of 5 ppb, with maximum concentrations at approximately 8200 ppb. Two water samples showed ethylbenzene (5000 and 1600 ppb) exceeding the MCL of 700 ppb, and toluene (20,000 and 8100 ppb) exceeding the MCL of 2000 ppb. One water sample showed xylenes at 59,000 ppb, nearly six times the MCL of 10,000 ppb.

6. PCB's (Aroclor 1260) were detected at a maximum of 0.6 ppm at the Alaska Gold site. Arsenic (183 ppm, Sourdough Express), chromium (44 ppm, city street), mercury (20 ppm, Sourdough Express), and lead (520 ppm, Kelly's Firestone) were maximum values detected in soil analyses for metals.

(See Sample Location Map # 2)



(See Sample Location Map # 2)

LEGEND:

- Soil Boring
- Surface Sample
- Proposed ROW & Centerline
- Property/Lease Boundary & Corners
- Fence
- Railroad Tracks
- Power/Telephone Poles

Approximate Scale: 1 inch = 50 feet

Note: Map based upon Alaska DOT & PF Proposed ROW Map dated 8/1/88.

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& Public Facilities
Hazardous Waste Field Investigation, Phase II
Proposed Minnie Street Connector &
Illinois Street Widening Projects
Fairbanks, Alaska

SAMPLE LOCATION MAP # 1

OCTOBER, 1990 X-0308

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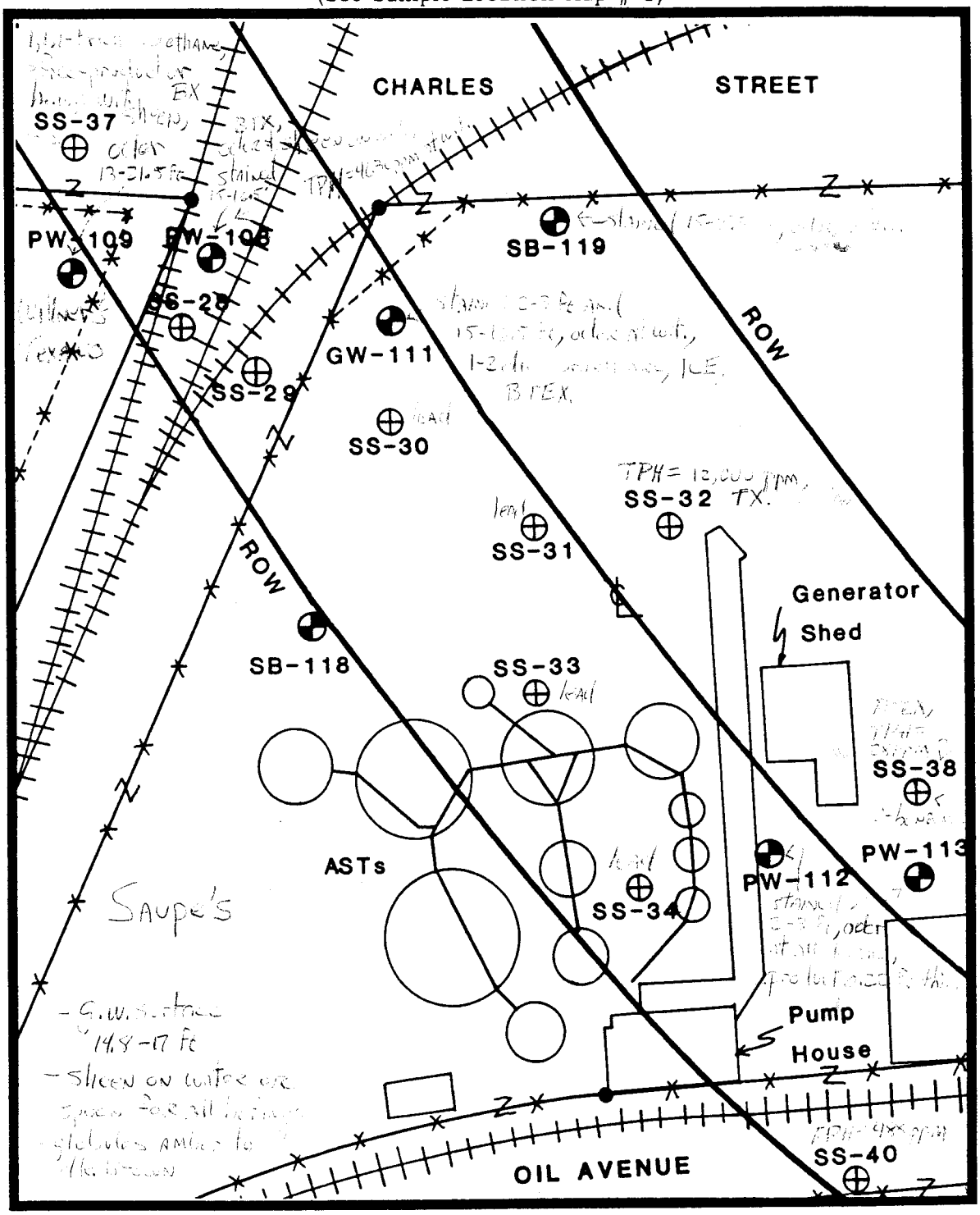
Fig. 4

(See Sample Location Map # 3)



(See Sample Location Map # 1)

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SAMPLE LOCATION MAP # 2

OCTOBER, 1990 X-0308

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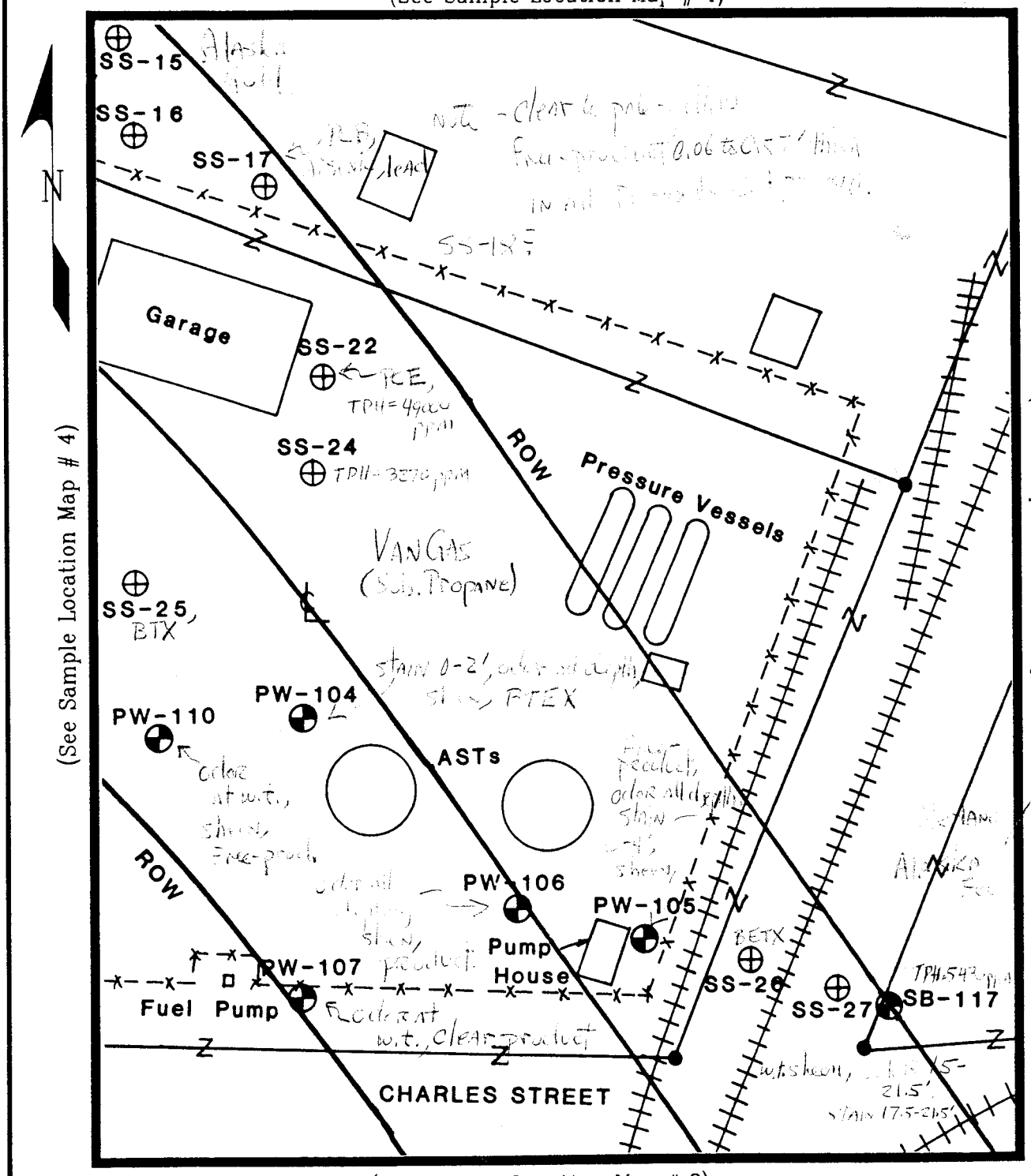
Fig. 5

(See Sample Location Map # 4)



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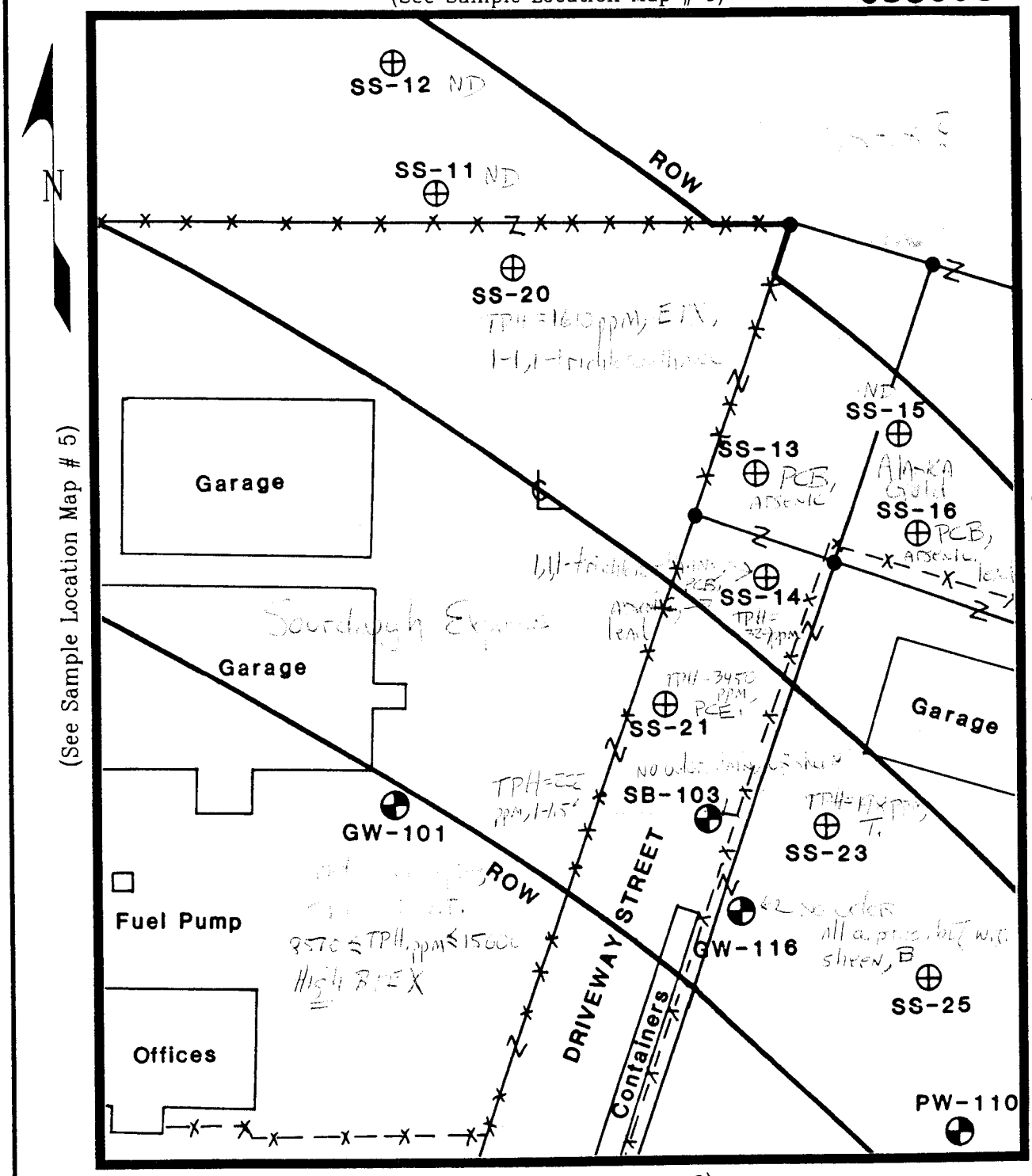
SAMPLE LOCATION MAP # 3

OCTOBER, 1990 X-0308

SHANNON & WILSON, INC. Geotechnical Consultants | Fig. 6

(See Sample Location Map # 5)



(See Sample Location Map # 5)

(See Sample Location Map # 3)

(See Sample Location Map # 3)

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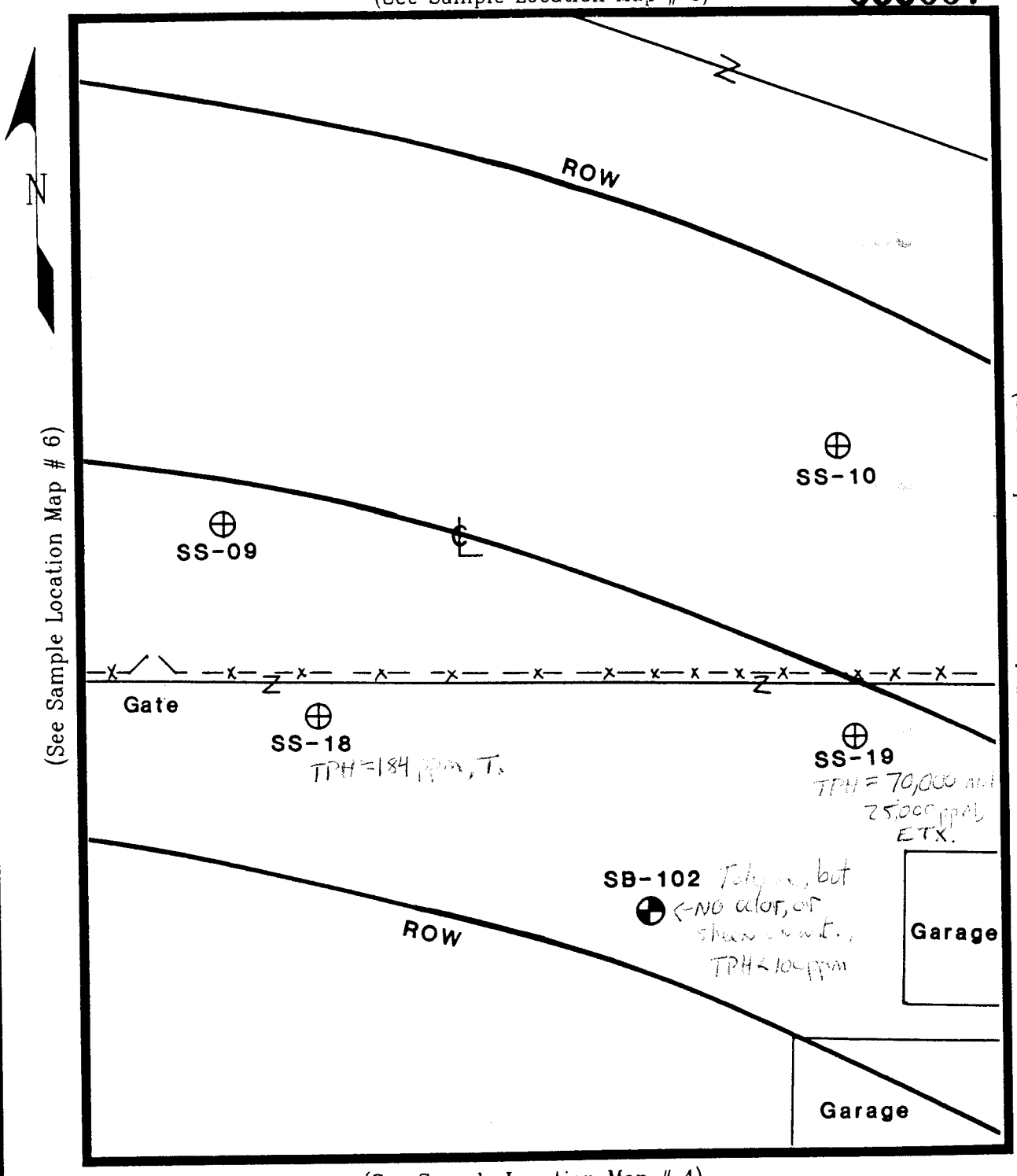
SAMPLE LOCATION MAP # 4

OCTOBER, 1990 X-0308

SHANNON & WILSON, INC. Geotechnical Consultants | Fig. 7

(See Sample Location Map # 6)



(See Sample Location Map # 4)

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Note: Map based upon Alaska DOT & PF Proposed ROW Map dated 8/1/88.

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Fairbanks, Alaska

SAMPLE LOCATION MAP # 5

OCTOBER, 1990 X-0308

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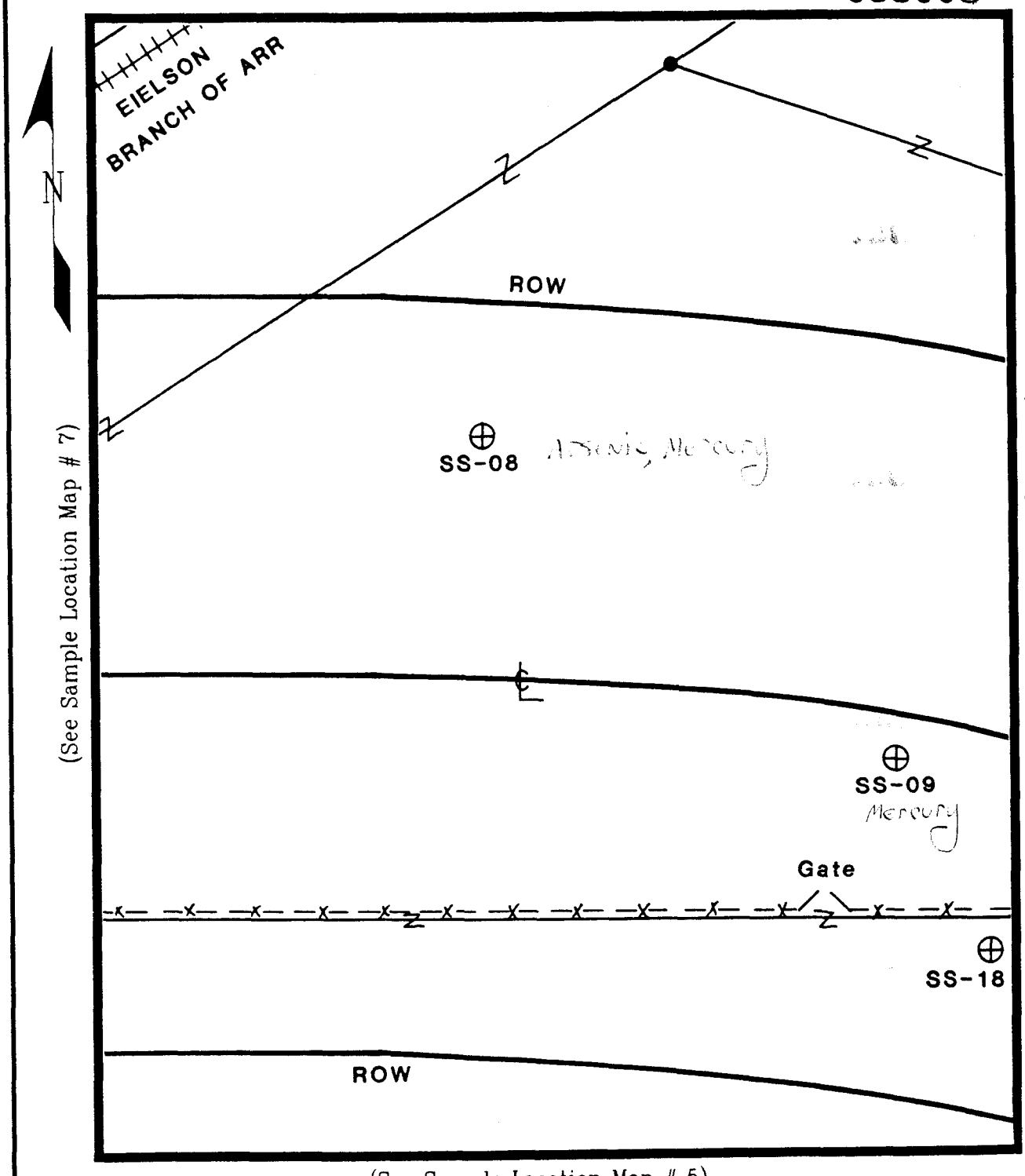
Fig. 8



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SAMPLE LOCATION MAP # 6

OCTOBER, 1990 X-0308

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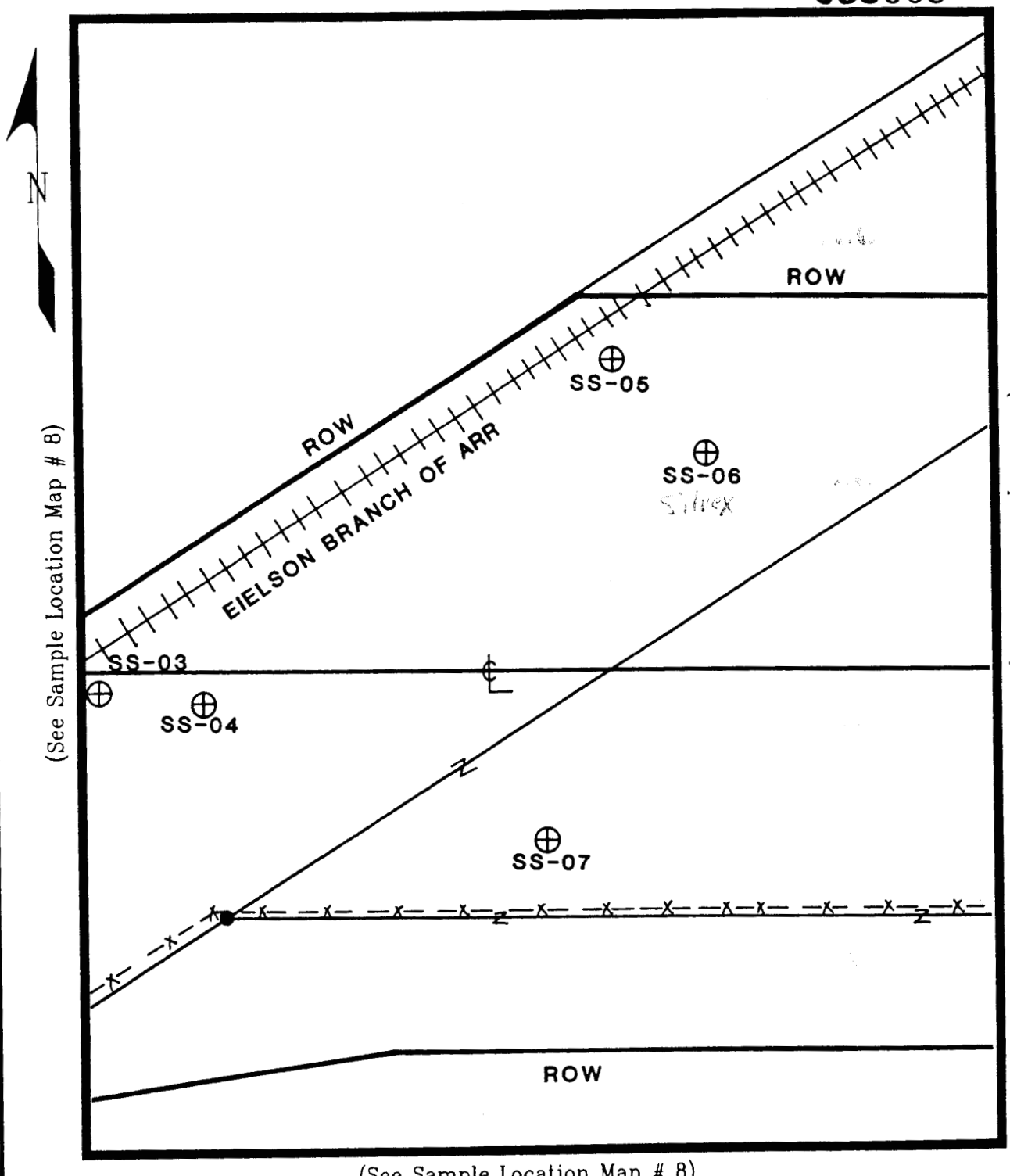
Fig. 9



LEGEND:

- Soil Boring
- Surface Sample
- Proposed ROW & Centerline
- Property/Lease Boundary & Corners
- Fence
- Railroad Tracks
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Approximate Scale: 1 inch = 50 feet

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SAMPLE LOCATION MAP # 7

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Fig. 10

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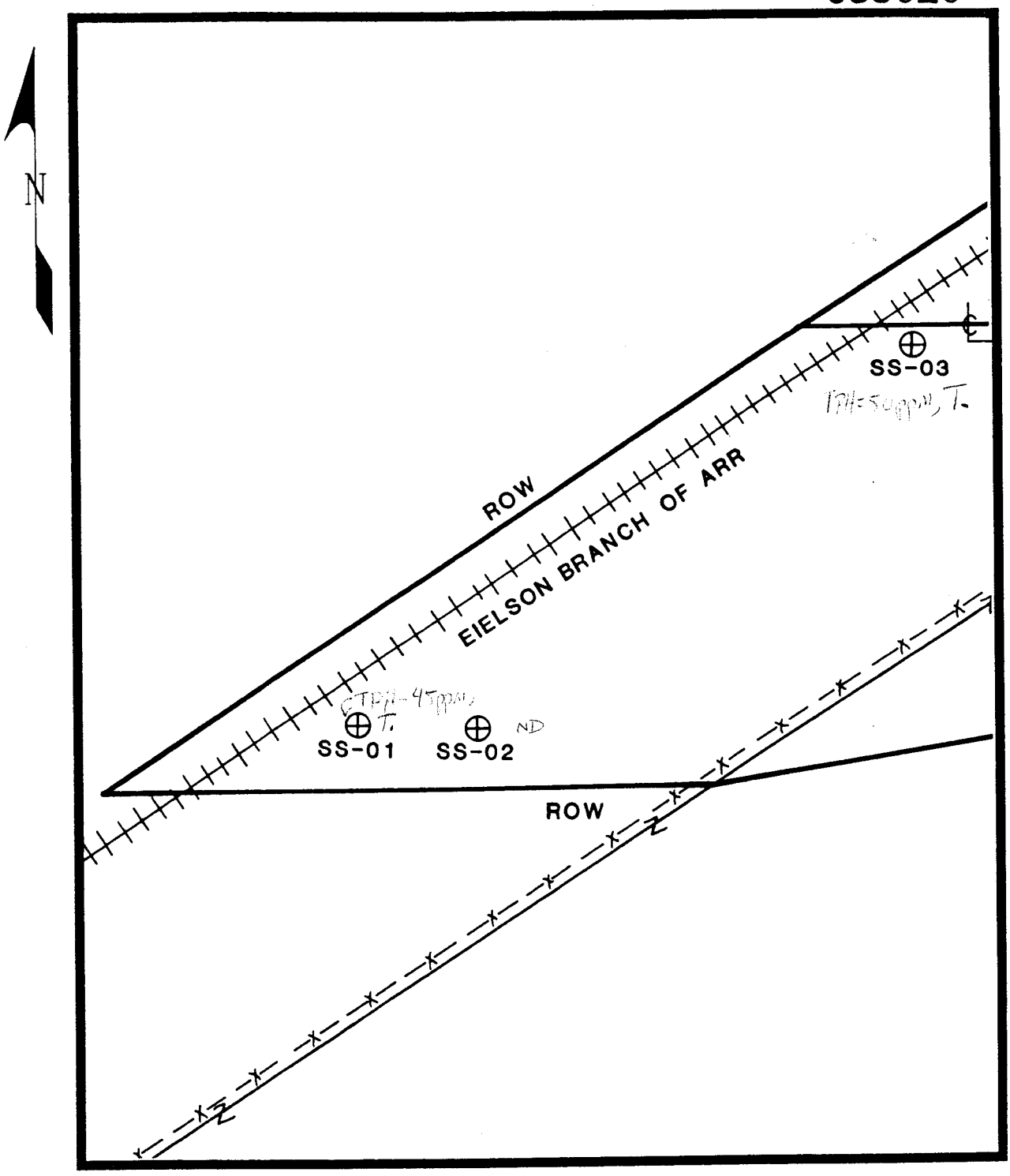

(See Sample Location Map # 7)

LEGEND:

- Soil Boring
- Surface Sample
- Proposed ROW & Centerline
- Property/Lease Boundary & Corners
- Fence
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SAMPLE LOCATION MAP # 8

OCTOBER, 1990 X-0308

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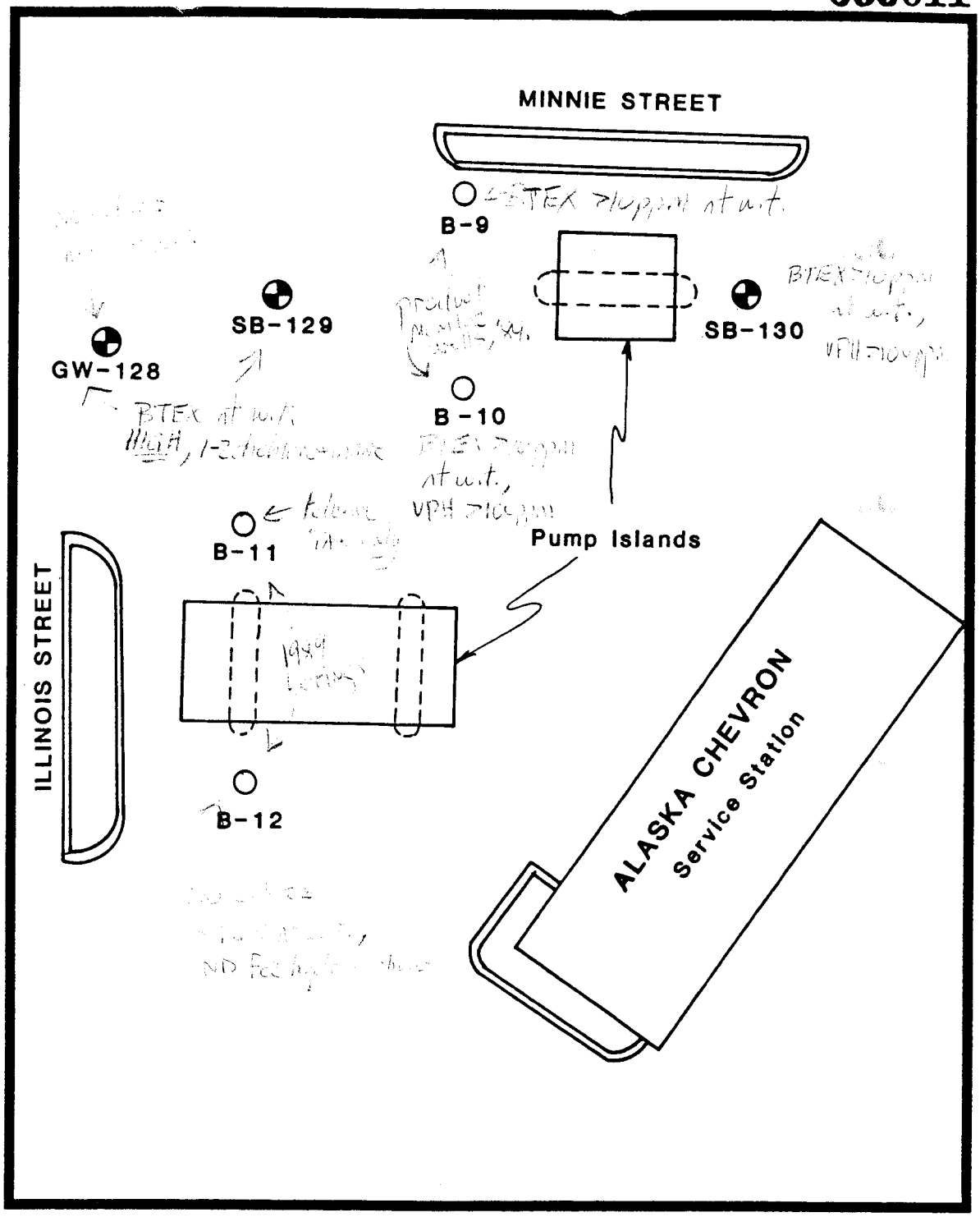
Fig. 11



LEGEND:

- Soil Boring
- Previous Boring
- Property/Lease Boundary & Corners
- Fence
- Power/Telephone Poles

Approximate Scale: 1 inch = 30 feet

Note: Map base 1984 City of Fairbanks Planimetric Map.

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SAMPLE LOCATION MAP # 9

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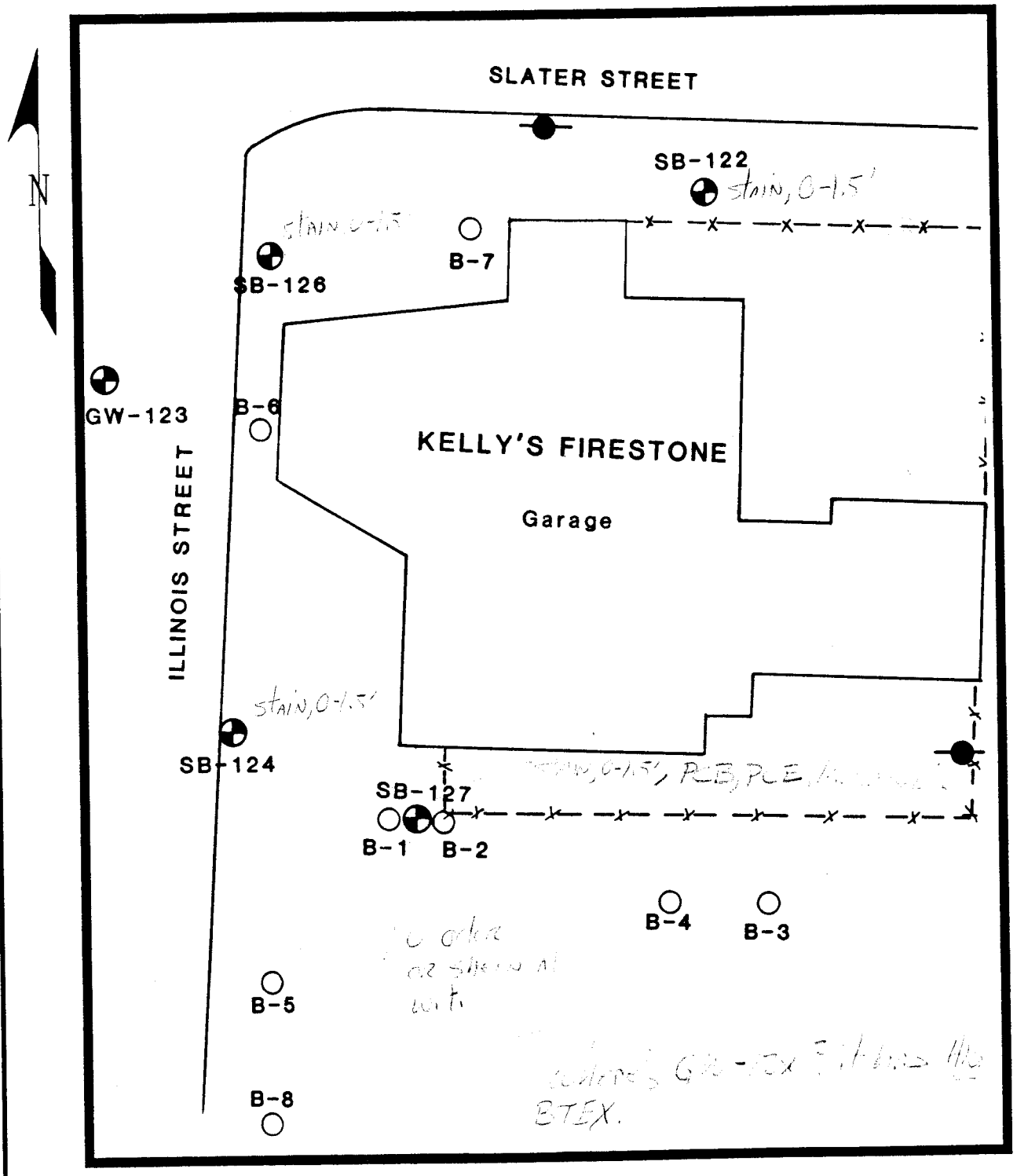
Fig. 12



LEGEND:

- Soil Boring
- Previous Boring
- Property/Lease Boundary & Corners
- Fence
- Power/Telephone Poles

Approximate Scale: 1 inch = 30 feet

Note: Map base 1984 City of Fairbanks Planimetric Map.

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Fairbanks, Alaska

SAMPLE LOCATION MAP # 10

OCTOBER, 1990 X-0308

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Fig. 13

observations regarding hydrocarbon contamination made during drilling. Also included are the types of samples collected and the different analyses performed. The analytical results are summarized on a parcel by parcel basis.

6.2.1 Petroleum Sales

Soil and groundwater investigations within the proposed right-of-way at Petroleum Sales consisted of one soil boring (SB-121) and two groundwater monitoring wells (GW-114 and GW-115). All three test holes were also analyzed for Halogenated Volatile Organics (EPA Method 8010). In addition, two surface samples (SS-35 and SS-36) were collected and analyzed for the presence of petroleum contamination (EPA Methods 418.1 and 8020). Figure 4 shows the locations of the soil boring, groundwater monitoring wells, and the surface samples.

In general, the soils encountered in the three test holes consisted of a loose to dense, brown to gray, trace silty to silty, sandy gravel. In soil boring SB-121, the gravel was overlain by a 2-foot thick layer of brown, slightly gravelly, silty sand. Petroleum hydrocarbon staining was observed in the upper 2 feet of each test hole. A hydrocarbon odor was detected in the soils from the two groundwater monitoring wells at depths ranging from 10 to 11.5 feet and 0.5 to 6.5 feet in GW-114 and GW-115, respectively. The depth to groundwater, measured following well installation, was 15.08 and 15.51 feet, respectively. A spotty hydrocarbon sheen was observed on excess water contained in the split-spoon while drilling GW-115.

The analytical results of the soil and groundwater samples obtained within the proposed right-of-way at Petroleum Sales are summarized below:

- All soil samples submitted for analysis from the soil boring and groundwater monitoring wells had TPH (EPA Method 418.1) concentrations less than 100 ppm, ranging from 20 to 35 ppm.

- Three of the six soil samples from GW-114 and SB-121 exhibited low levels of chlorobenzene ranging from 0.07 to 0.16 ppm.

- The water sample from GW-114 had 5.4 ppb 1,2-dichloroethane, 0.5 ppb tetrachlorethylene (PCE), 0.6 ppb trichloroethylene (TCE), 10 ppb benzene, 0.9 ppb toluene, and 1.3 ppb xylenes.

- The water sample from GW-115 had concentrations of 0.7 ppb 1,2 - dichloroethane, 1.1 ppb PCE, 0.3 ppb TCE, 33 ppb benzene, 12 ppb toluene, 4.5 ppb ethylbenzene and 33 ppb xylenes.

- Surface samples SS-35 & SS-36 had TPH (EPA Method 418.1) concentrations of 1610 and 310 ppm, respectively. Trace concentrations of toluene (0.02 ppm) and xylenes (0.04 ppm) were detected in SS-36.

6.2.2 Saupe Enterprises

Soil and groundwater investigations within and adjacent to the proposed right-of-way at Saupe Enterprises consisted of one groundwater monitoring well (GW-111), three soil borings (SB-118 through SB-120), two product monitoring wells (PW-112 and PW-113), and six surface samples (SS-30 through SS-34 and SS-38). The three soil borings were also analyzed for Halogenated Volatile Organics. Four of the surface samples were analyzed for lead, while the other two (SS-32 and SS-38) were analyzed for the presence of petroleum contamination. Figures 4 and 5 show the locations of the test holes and surface samples.

In general, the soils consisted of a loose to dense, brown to gray, trace silty to silty, sandy gravel, often interbedded with a medium dense to dense, brown to gray, silty to gravelly sand. This was overlain by approximately 3 feet of black, slightly gravelly, sandy silt in GW-111 and approximately 2.5 feet of brown, slightly gravelly, sandy silt in SB-118. Two test holes (PW-

113 and SB-120) were drilled through a 3-inch thick asphalt pavement overlay. The depth to groundwater was measured in the three monitoring wells following installation and ranged from 14.79 to 17.06 feet.

Three test holes (GW-111, PW-112, and PW-113) had hydrocarbon-stained soils at the surface which extended to depths of between approximately 2 and 3 feet. Two adjacent test holes, GW-111 and SB-119, exhibited hydrocarbon-stained soils between depths of approximately 15 and 16.5 feet. In general, three test holes (PW-112, PW-113, and SB-120) had soils which exhibited a hydrocarbon odor throughout the depth drilled while the other three test holes only had soils at or near the water table which yielded an odor. A hydrocarbon sheen on either excess sample water or the sampling spoon was observed in each test hole. Four of the six test holes had samples at the water table which contained globules of hydrocarbon product ranging in color from amber to dark brown.

The results of product monitoring well measurements and analytical test results of the soil and groundwater samples collected from within and alongside of the proposed right-of-way at Saupe Enterprises are summarized as follows:

- Fourteen of the eighteen soil samples from the soil borings and monitoring wells exceeded 100 ppm TPH or VPH. TPH and VPH concentrations ranged from:
  - -20 to 1760 ppm TPH (EPA 418.1);
  - -1,600 to 20,500 ppm VPH quantified as diesel (EPA 5030/8015); and
  - -7,500 to 12,500 ppm VPH quantified as gasoline (EPA 5030/8015).

- Eleven of the eighteen soil samples from the test holes had total BTEX (summation of benzene, toluene, ethylbenzene, and xylene concentrations) greater than 10.0 ppm.

- Tetrachloroethene (PCE) was detected in two of the three soil samples from SB-120 (0.20 and 0.01 ppm).

- In the test holes, the greatest contamination generally occurred at or near the water table (12.5 to 19.0 feet). This would be consistent with hydrocarbons having been spread through the range of water table fluctuation.

- A floating layer of dark brown product was measured in PW-112 and PW-113 on October 22, 1990 and had thicknesses of 0.22 and 0.23 feet, respectively.

- The water sample from GW-111 contained 6.7 ppb 1,2-dichloroethane, 0.5 ppb trichloroethylene (TCE), 425 ppb benzene, 37.5 ppb toluene, 60 ppb ethylbenzene and 140 ppb xylenes.

- Surface samples SS-32 and SS-38 exhibited TPH concentrations (EPA 418.1) of 12,000 and 28 ppm, respectively and trace concentrations of BTEX.

- Surface samples SS-30, SS-31, SS-33, and SS-34 yielded total lead concentrations ranging from 43.9 to 198.4 ppm.

6.2.3 Willner's Texaco

One product monitoring well (PW-109) was installed adjacent to the proposed right-of-way at Willner's Texaco. A total of five samples were submitted for analysis which also included analyses for Halogenated Volatile Organics. The location of PW-109 is shown in Figure 5.

In general, soil conditions consisted of a 2-foot thick layer of brown, slightly gravelly to gravelly, sandy silt, underlain by approximately 11 feet of medium dense to dense, gray, gravelly sand and sandy gravel. The depth to the water table was 14.60 feet, measured following well installation.

A hydrocarbon odor was detected in all soil samples from approximately 13 feet to the bottom of the boring. A heavy sheen or thin product layer was observed in samples collected at or below the water table.

The results of product monitoring well measurements and analytical test results of the soil and groundwater samples collected adjacent to the proposed right-of-way at Willner's Texaco are summarized as follows:

- Two of the five soil samples exceed 100 ppm TPH (EPA 418.1). The TPH concentrations ranged from 22 to 13,000 ppm with the highest concentrations occurring at or near the water table.

- Two of the five soil samples exhibited trace concentrations of 1,1,1-trichloroethane (0.03 and 0.06 ppm).

- Product monitoring well measurements on September 14 and October 22, 1990 yielded only a hydrocarbon odor and sheen at the water surface.

- The water sample from PW-109 contained 76 ppb benzene and 44 ppb xylenes.

6.2.4 Nerland's/Alaska Feed Company

One soil boring, SB-117, was drilled within the proposed right-of-way at the Nerland's parcel (subleased to Alaska Feed Company). A total of five samples were submitted to NTL which also included analyses for Halogenated Volatile Organics (EPA Method 8010). The location of SB-117 is shown in Figure 6.

In general, soil conditions consisted of 2 feet of dark brown, slightly gravelly silt containing organics underlain by approximately a ½-foot thick layer of black coal dust and/or fly ash. This

was underlain by approximately 5 feet of very loose, brown, sandy silt containing coal chunks. At approximately 7.5 feet, a medium dense, gray-brown, sandy gravel was encountered which extended to the bottom of the boring. The depth to water was observed during drilling as 16.5 feet.

A hydrocarbon odor was detected in soil samples from approximately 15 feet to the bottom of the boring. Soil samples from between 17.5 and 21.5 feet exhibited hydrocarbon staining similar to those encountered in GW-111 and SB-119 (Saupe Enterprises) at approximately the same depth. A hydrocarbon sheen was observed in samples obtained at or below the water table. The results of the analytical soil tests for SB-117 are summarized below:

- Three of the five soil samples had TPH concentrations exceeding 100 ppm. TPH concentrations ranged from 21 to 5,430 ppm with the highest concentrations occurring at or near the water table.

- No Halogenated Volatile Organics were detected in any of the five samples.

6.2.5 VanGas (Suburban Propane)

Soil and groundwater investigations within the proposed right-of-way at the VanGas property consisted of five product monitoring wells (PW-104 through PW-107 and PW-110), one groundwater monitoring well (GW-116), and four surface samples (SS-22 through SS-25). The soil samples from GW-116 were also analyzed for Halogenated Volatile Organics (EPA Method 8010). Surface sample SS-22 was analyzed for waste oil contamination while the remaining surface samples were analyzed for the presence of petroleum contamination. The locations of the monitoring wells and surface samples are shown in Figures 6 and 7.

In general, subsurface conditions encountered consisted of a brown to black, trace silty to silty, sandy gravel fill ranging in thickness from approximately 0.5 to 2.5 feet. In two test holes, PW-

104 and GW-116, the gravel fill was underlain by medium dense, brown to gray, trace silty to silty, sandy gravel which extended to the depth of the test hole. In the other four test holes, the gravel fill was underlain by either a brown, gravelly, silty sand (PW-107) or a brown to black, trace to slightly gravelly, sandy silt. This layer extended to an approximate depth between 3.5 and 4 feet and was underlain by medium dense to dense, gray-brown to gray, trace to slightly silty, sandy gravel. Depths to the water table were measured following well installation and ranged from 15.89 to 16.67 feet below the ground surface.

Product monitoring wells PW-104 and PW-105 exhibited hydrocarbon-stained soils in the upper 2 to 4 feet of soil, respectively. A hydrocarbon odor was detected in test holes PW-104 through PW-106 generally throughout the depth drilled. In test holes PW-107 and PW-110, a hydrocarbon odor was detected in samples obtained at or near the water table. No odor was detected in soil samples obtained from GW-116. A sheen on excess water from samples collected at or below the water table was observed in each test hole. Relatively clear product was observed in samples from PW-107 taken near the water table.

The results of product monitoring well measurements and analytical test results of the soil and groundwater samples obtained from within the proposed right-of-way at the VanGas parcel are summarized below:

- Fourteen of the eighteen soil samples from the monitoring wells exceeded 100 ppm TPH. TPH concentrations ranged from 21 to 120,000 ppm with the higher concentrations occurring at or near the water table. This would be consistent with hydrocarbons having been spread throughout the range of water table fluctuation.

- A water sample collected from PW-104 had 100 ppb benzene, 120 ppb toluene, 530 ppb ethylbenzene and 5,600 ppb xylenes.

- A floating product layer consisting of relatively clear to pale yellow product was observed in each of the five product monitoring wells on October 22, 1990. Product thicknesses ranged from 0.06 to 0.57 feet.

- The water sample obtained from GW-116 contained 43 ppb benzene. No Purgeable Halocarbon constituents were detected.

- Three of the four surface samples exceeded 100 ppm TPH. TPH concentrations ranged from 46 to 49,000 ppm.

- Surface sample SS-22 contained 1.7 ppm of PCE.

6.2.6 Alaska Gold

Three surface samples, SS-15 through SS-17, were obtained from the Alaska Gold property within the proposed right-of-way. One sample (SS-15) was analyzed for the presence of herbicides (EPA Method 8150) and the two other samples were analyzed for the presence of PCB's (EPA Method 8080) and metals (As, Hg, and Pb). The locations of the surface samples are shown in Figures 6 and 7.

The analytical results of the soil samples collected from the Alaska Gold parcel are summarized as follows:

- Aroclor 1260 (PCB) was detected at concentrations of 0.6 and 0.3 ppm in surface samples SS-16 and SS-17, respectively.

- Elevated (relative to observed background levels) concentrations of arsenic (124.1 and 161.0 ppm) and moderate levels of lead (82.3 and 95.4 ppm) were measured in samples SS-16 and SS-17, respectively.

- Surface sample SS-15 did not exhibit herbicide concentrations above the detection limits.

6.2.7 Sourdough Express

Soil and groundwater investigations within the proposed right-of-way at Sourdough Express properties consisted of one groundwater monitoring well (GW-101), one soil boring (SB-102), and nine surface samples. Soil samples from both test holes were also analyzed for Halogenated Volatile Organics (EPA Method 8010). Surface samples SS-7 through SS-11 were analyzed for PCB's and metals (As, Hg, Pb). Surface sample SS-12 was analyzed for the presence of herbicides. Samples SS-18 through SS-20 were analyzed for the presence of petroleum contamination. The sample and test hole locations are shown in Figures 7 through 10.

In general, the subsurface soil conditions consisted of 7.5 feet of loose to medium dense, brown to gray-brown, trace silty to silty, sandy gravel underlain by medium dense, gray-brown to gray, gravelly sand. The depth to groundwater was 15.76 feet as measured in GW-101 following well installation.

A hydrocarbon odor was detected in all the soil samples obtained throughout the test hole in GW-101. A sheen was observed on the water of samples collected at or below the water table. Neither an odor nor a sheen were observed in soil samples from SB-102.

The results of the soil and groundwater samples collected from Sourdough Express properties within the proposed right-of-way are summarized as follows:

- All three soil samples from GW-101 had TPH (EPA 418.1) concentrations greater than 100 ppm, which ranged from 8,570 to 15,600 ppm.

- All three soil samples from SB-102 had TPH (EPA 418.1) levels below 100 ppm,

ranging from 26 to 49 ppm.

- Trace concentrations of toluene were detected in all three soil samples from SB-102 and ranged from 0.04 to 0.06 ppm.

- No Halogenated Volatile Organics (EPA 8010) were detected in the samples from either GW-101 or SB-102.

- The water sample from GW-101 contained BTEX concentrations of 880 ppb benzene, 8,100 ppb toluene, 5,000 ppb ethylbenzene, and 59,000 ppb xylene, respectively.

- No PCB's (EPA 8080) were detected in surface samples SS-7 through SS-11.

- No herbicides (EPA 8150) were detected in surface sample SS-12.

- Surface sample SS-8 exhibited elevated (relative to apparent background levels) concentrations of arsenic (182.5 ppm) and mercury (20.2 ppm); surface sample SS-9 had a mercury concentration of 4.6 ppm.

- Surface samples SS-18 through SS-20 had TPH (EPA 418.1) concentrations greater than 100 ppm, which ranged from 184 to 70,000 ppm.

- Surface samples SS-18 and SS-20 had trace concentrations of 1,1,1-trichloroethane, 0.05 and 0.21 ppm respectively.

6.2.8 Alaska Railroad Right-Of-Way

Soil and groundwater investigations conducted within Alaska Railroad right-of-way for the proposed Minnie Street Connector right-of-way consisted of one product monitoring well

(PW-108), one soil boring (SB-125), and ten surface samples (SS-1 through SS-6 and SS-26 through SS-29). PW-108 is located south of Charles Street (Figure 5). PW-108 had five soil samples submitted to NTL for analyses which included Halogenated Volatile Organics. Soil boring SB-125, also analyzed for Halogenated Volatile Organics, is located on the Saupe Enterprises spur north of Oil Avenue (Figure 4). Five surface samples, SS-2, SS-4, SS-6, SS-7, and SS-29, were analyzed for the presence of herbicides (EPA 8150). The other five surface samples, SS-1, SS-3, SS-5, SS-26, and SS-28 were analyzed for the presence of petroleum contamination. The locations of the surface samples are shown on Figures 5, 6, 10, and 11.

In general, the soils encountered during drilling consisted of loose to dense, gray-brown to gray, slightly silty to silty, sandy gravel. In PW-108, this gravel layer was overlain by 1.5 feet of black, railroad ballast with pieces of coal and fly ash. In SB-125, the gravel layer was overlain by 2.5 feet of brown, slightly gravelly, silty sand. The depth to water was 14.39 feet as measured in PW-108. In soil boring SB-125 the depth to the water table was observed at approximately 16 feet.

Hydrocarbon stained soils from PW-108 at a depth of between 15 and 16.5 feet were similar to those in SB-117 (Nerland's) and SB-119 and GW-111 (Saupe Enterprises) which occur at approximately the same depth. In PW-108, a hydrocarbon odor and sheen were observed in soils obtained at or below the water table. In SB-125, hydrocarbon stained soil was noted at the surface. A hydrocarbon odor was detected in all the samples from SB-125. A sheen was observed in soil samples collected at or below the water table.

The results of the soil and groundwater samples obtained from within the Alaska Railroad right-of-way are summarized as follows:

- Only one of the five soil samples collected from PW-108 had TPH (EPA 418.1) greater than 100 ppm. The TPH values ranged from 24 to 4,630 ppm, of which the highest

value occurred at the water table.

- The three soil samples from SB-125 had VPH (EPA Method 5030/8015) concentrations quantified as diesel greater than 100 ppm. The VPH concentrations ranged from 610 ppm to 10,000 ppm and highest concentrations generally occurred at the water table. This would be consistent with hydrocarbons having been spread through the range of water table fluctuation.

- The water sample from PW-108 contained 0.7 ppb benzene, 1.8 ppb toluene, and 1.6 ppb xylenes.

- One of the five surface samples (SS-6) tested for herbicides (EPA Method 8150) had a trace concentration of Silvex, 0.02 ppb.

- All surface samples tested for TPH (EPA 418.1) had concentrations less than 100 ppm and ranged from 23 to 50 ppm.

6.2.9 City Streets

Soil investigations of the streets included within the proposed right-of-way consisted of one soil boring, SB-103, on Driveway Street, one surface sample, SS-13, for metals and PCB's on Driveway Street, two surface samples, SS-14 and SS-21, for waste oil analyses from Driveway Street, one surface sample, SS-37, for waste oils, and two surface samples, SS-39 and SS-40, on Oil Avenue for the presence of waste oil. Soil samples from SB-103 were also analyzed for Halogenated Volatile Organics. The locations of the soil boring and the surface samples are shown in Figures 4, 5, and 7.

In general, the subsurface conditions encountered in SB-103 consisted of a 2.5-foot thick surficial layer of brown, sandy silt with organics underlain by medium dense, brown to gray,

sandy gravel and gravelly sand. The depth to the water table observed during drilling was approximately 15.5 feet. No hydrocarbon odor, staining, or sheen was observed during drilling.

The analytical results of the soil samples collected from Driveway Street, Charles Street, and Oil Avenue are summarized as follows:

- One of the three soil samples from SB-103 exceeded 100 ppm TPH (EPA 418.1). TPH concentrations ranged from 20 to 222 ppm. The highest concentration occurred near the ground surface (1.0 - 1.5 feet).

- All surface samples had TPH (EPA 418.1) greater than 100 ppm and ranged from 178 to 3,450 ppm.

- Trace concentrations of 1,1,1 - trichloroethane were detected in SS-14 (0.05 ppm) and SS-37 (0.28 ppm).

- PCE was detected in SS-21 (0.80 ppm), SS-37 (0.03 ppm), and SS-39 (0.06 ppm).

- Aroclor 1260 (PCB) was detected in S-13 (0.065 ppm) and SS-14 (0.5 ppm).

- Surface samples SS-13 and SS-14 exhibited elevated levels, relative to other arsenic concentrations, of 145.1 and 155.5 ppm, respectively. In addition, surface sample SS-14 had 144.5 ppm lead.

6.2.10 Alaska Chevron

Two soil borings (SB-129 and SB-130) and one groundwater monitoring well (GW-128) were drilled at Alaska Chevron during this phase of the hazardous waste field explorations. In April of 1989, two soil borings, B-11 and B-12, were drilled and two product monitoring wells,

B-9 and B-10, were installed under the first phase of the investigation. Samples from the four test holes drilled in April, 1989 were analyzed for Aromatic Volatile Organics (EPA 8020) and Total Petroleum Hydrocarbons (EPA 418.1). Samples from the three recent test holes were submitted and analyzed for Aromatic Volatile Organics and Volatile Petroleum Hydrocarbons (VPH, EPA Method 5030/8015). A water sample from GW-128 was analyzed for Purgeable Aromatics and Purgeable Halocarbons. The locations of the previous and recent test holes are shown in Figure 12. The boring logs for test holes B-9 through B-12 are not included with this report.

In general, the subsurface conditions consisted of medium dense to very dense, brown to gray, trace silty to silty, sandy gravel. In test holes SB-130 and B-9, a medium dense to dense, gray-brown, trace gravelly, sandy layer varying in thickness from 3 to 5 feet was encountered at a depth of 4.5 and 8 feet, respectively. The depth to the water table was measured in GW-128 to be 17.57 feet below the ground surface.

A hydrocarbon odor and sheen were observed at the water table in each test hole except B-12 and GW-128. Groundwater monitoring well GW-128 was installed downgradient from the other test holes to determine the amount of dissolved hydrocarbon contamination present in the groundwater.

The analytical results of the recent investigation and past work are summarized below:

- Six of the 20 soil samples tested for TPH or VPH had concentrations above detection limits. The VPH analyses were quantified as gasoline by Method 5030/8015 and ranged from 2 to 360 ppm (only 1 was greater than 100 ppm). The single TPH concentration was 3,200 ppm.

- Test holes B-9, B-10, and SB-130 had samples at the water table which had total BTEX

greater than 10 ppm, and B-10 and SB-130 had TPH or VPH greater than 100 ppm.

- SB-129 and GW-128 had measurable BTEX levels at or near the water table. The concentrations in GW-128 were lower than in SB-129.

- B-11 had trace levels of toluene at the water table only and hydrocarbons were not detected in B-12.

- The water sample from GW-128 had 27 ppb 1,2-dichloroethane, 8,200 ppb benzene, 20,000 ppb toluene, 1,600 ppb ethylbenzene, and 7,600 ppb xylenes.

6.2.11 Kelly's Firestone

Four soil borings (SB-122, SB-124, SB-126, and SB-127) and one groundwater monitoring well (GW-123) were drilled at Kelly's Firestone during this phase of the hazardous waste field investigations. In April of 1989, six soil borings, B-1 through B-5 and B-8, and two product monitoring wells, B-6 and B-7, were installed during the initial phase. Samples from the six test holes drilled in April, 1989 were analyzed for Aromatic Volatile Organics (EPA 8020) and Total Petroleum Hydrocarbons (EPA 418.1). In addition, Total Organic Halogens (TOX) were analyzed on soil samples from B-1 and B-2. Samples from the five recent test holes were analyzed for Aromatic Volatile Organics, Volatile Petroleum Hydrocarbons (EPA 5030/8015), and one soil sample was analyzed for Total Petroleum Hydrocarbons (EPA 418.1). Three samples from SB-127 were analyzed for Halogenated Volatile Organics and two samples were analyzed for the presence of PCB's and metals (As, Cd, Cr, and Pb). A water sample from GW-123 was analyzed for Purgeable Aromatics and Purgeable Halocarbons. The locations of the previous and recent test holes are shown in Figure 13. The boring logs for test holes B-1 through B-8 are not included with this report.

In general, the soil conditions encountered consisted of sandy gravel (fill) or gravelly sand

underlain by silty fine sand or fine sandy silt overlying sandy gravel with occasional gravelly sand interbeds. The depth to the water table was measured in GW-123 to be 18.10 feet below ground surface.

A hydrocarbon odor or sheen at or near the water table was observed in each of the test holes except B-3, B-4, B-5, and B-8, all to the south of Kelly's. Four test holes, SB-122, SB-124, SB-126, and SB-127 exhibited hydrocarbon staining and/or odor at or near the ground surface, and extending approximately 1.5 feet deep.

The results of the recent phase of subsurface investigations and the initial phase, during April, 1989, are summarized below:

- Ten of the 31 soil samples tested for TPH or VPH had concentrations exceeding 100 ppm. Only 14 of the 31 samples had values above the detection limits. Reported TPH and VPH concentrations ranged from:
  1 sample at 130 ppm TPH (EPA Method 418.1)
  2 samples at 2 ppm each quantified as diesel (EPA Method 5030/8015)
  2 to 8900 ppm quantified as gasoline (EPA Method 5030/8015)

- Ten of the 31 soil samples analyzed by EPA Method 8020 had total BTEX (summation of BTEX compounds) concentrations greater than 10 ppm. Eleven of the 31 samples did not have detectable levels of BTEX. Total BTEX measured ranged from 0.10 to 2079 ppm.

- Two of the three soil samples from SB-127 analyzed by EPA 8010 exhibited 0.04 ppm of tetrachloroethylene (PCE).

- 0.09 ppm of Aroclor 1262 (PCB) was detected in SB-127 near the ground surface.

- Elevated levels of lead (520.2 ppm) and possibly of arsenic (relative to observed background levels) were measured in near-surface samples from SB-127.

- The water sample from GW-128 had concentrations of 8,200 ppb benzene, 20,000 ppb toluene, 1,600 ppb ethylbenzene, and 7,600 ppb xylenes. No Purgeable Halocarbon (EPA 601) constituents were detected.