2320.38.057

Received 09-25-1992
from S&W

Additional Field Explorations
Quonset Hut Apartments
7825 Kenai Spur Highway
Soldotna, Alaska

June, 1992

USKH
2515 A Street
Anchorage, Alaska 99503

Attn: Mr. Edwin H. Riggs

SHANNON & WILSON, INC.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ADDITIONAL FIELD EXPLORATIONS
QUONSET HUT APARTMENTS
SOLDOTNA, ALASKA

1.0 INTRODUCTION

This report presents the results of our additional field explorations for the Quonset Hut Apartments located at 7825 Kenai Spur Highway, Soldotna, Alaska. This site is being considered by the Department of Transportation and Public Facilities as a right-of-way (R.O.W.) take for the proposed upgrade and realignment of the Kenai Spur Highway and is located within the Kenai Rural and Urban, MP 2.8 to 10.0 section of the realignment project.

An environmental site assessment was completed in December, 1991, on the property in order to determine if petroleum hydrocarbons and/or hazardous substances have impacted the site's soils and groundwater. Results of the assessment were presented in our January, 1992 Environmental Site Assessment report. The assessment included reviewing historical documents and high altitude aerial photographs, performing a visual assessment of the site and interviews with the property owner and tenants, drilling and sampling three monitoring wells on the site and performing laboratory analyses on select samples. Results of the assessment indicated that elevated levels of polychlorinated biphenyls (PCBs) are present in the surface soils and slightly elevated levels of total petroleum hydrocarbons (TPH) and halogenated volatile organics (HVOs) are present in the groundwater. In addition, several known sources of petroleum hydrocarbons were identified. These sources included an abandoned underground heating oil storage tank, four 55-gallon drums, six batteries and stained surface soils.

Additional field explorations were recommended such that the lateral extent of PCBs in the surface soils could be better defined and a groundwater monitoring program established. This field exploration work included reviewing four low altitude aerial photographs of the site, collecting and sampling surface soils across the site on a grid pattern for PCBs and sampling the three existing groundwater monitoring wells. Recommendations were also developed in our March 16, 1992, proposal letter for removing and disposing of the UST and associated impacted soils, the 55-gallon drums, the six batteries and the stained surface soils. Authorization to proceed with the field exploration portion of the work was received on April 30, 1992, from Mr. Ed Riggs of USKH.

2.0 SITE AND PROJECT DESCRIPTION

The project site is located in a residential/commercial area at 7825 Kenai Spur Highway in the NE1/4 of Section 34, T 6 N, R 11 W, Kenai Quadrangle (C-4). The site has two buildings on it including the Quonset Hut Apartments building with a workshop attached to the north end and a storage building. The general site features in the immediate vicinity as well as the proposed R.O.W. take area are shown in Figure 1.

The additional field explorations included reviewing aerial photographs of the site in order to better determine the potential locations of PCB impacted soils, collecting surface soil samples across the site for PCBs and sampling the three existing groundwater monitoring wells. The field explorations were also to include collecting soil samples from beneath the shop floor. This sampling would have involved cutting a hole through the wood section of the shop floor. On May 6, 1992, Mr. Tommy Thompson, the owner of the property, was contacted for permission to conduct this sampling. Mr. Thompson did not grant us permission, thus, no soil samples were collected from beneath the shop floor. All sampling work performed in the additional field explorations was conducted in accordance with our Quality Assurance Project Plan (QAPP) approved by the ADEC on April 24, 1991, and our Site Specific Health and Safety Plan dated December 13, 1991.

3.0 AERIAL PHOTOGRAPH REVIEW

Two aerial photographs taken in 1963 and 1986 were available for review from the ADOT/PF for the initial environmental assessment activities discussed in our January, 1992 report. Due to the large scale of 1 inch equals 500 feet, details in the photographs were difficult to identify. Four additional photographs were selected for print at a scale of 1 inch equal to 100 feet from Aeromap USA, Inc. These photos from 1967, 1970, 1978 and 1981 are included as Figures 2 through 5, respectively. The information obtained from these photographs, in addition to the two photos supplied by the ADOT/PF, were used to attempt to determine the source of the PCBs present in the on-site soils and to establish a surface sampling grid in areas throughout the site that would most likely contain PCB impacted soils.

In the 1963 photo supplied by the ADOT/PF, the Quonset Hut property had been cleared of it's vegetation but contained no structures. The property to the south of the site had been cleared and appeared to be farmed. The residential home that is currently located south of the property had been constructed.

In the 1967 photograph, included as Figure 2, the quonset hut has been moved onto the property in the position in which it is currently located. (According to the property owner, the quonset hut was brought to the site in 1964.) Also located on the completely cleared lot are two vehicles, one large trailer or mobile home and five smaller trailers or portable storage units. Numerous objects are stored along the south border of the site in a cluttered manner. Several other miscellaneous objects are stored near the trailers and along the east side of the quonset hut. The row of objects stored along the east side of the quonset hut may be 55-gallon drums. Several small dark colored areas are visible in the center of the property and along the south border. These dark areas appear to be wet surface soils and/or shadows from adjacent objects. The properties to the north, west, south and southeast of the site have been cleared of vegetation and partially developed.

The 1970 photograph, included as Figure 3, shows the property in a similar condition as the 1967 photograph with the quonset hut and several trailers located on the site. The large trailer/mobile home has been moved slightly to the south. The four small trailers that were located to the east and west of the quonset hut have been removed. A small shed or another trailer has been located adjacent to the south side of the only remaining small trailer on the site. Two vehicles and one large boat are parked on the site. The surface soils appear to have been disturbed in the southwest corner of the site where the storage building is currently located. This might be the initiation of the construction of the storage building. (According to the property owner, the storage building was constructed in 1971 or 1972.) The majority of the objects that were located around the site in the 1967 photo have been removed. Some long slender objects that appear to be lumber, piping or other similarly shaped material are located on the southeast corner of the site. The darker colored surface soils in the photo appear to be wet soils. With the exception of the construction of the large warehouse type structure currently located on the property to the east of the subject site, little development has taken place on the surrounding properties.

The 1978 photograph, included as Figure 4, shows the property with the storage building completed and the shop building added onto the north end of the quonset hut. The large trailer/mobile home has been removed from the site. The smaller trailer that has been located on the property since the 1967 photo has been moved to the west side of the quonset hut. The small shed that was placed adjacent to the trailer has been removed from the site. An area about 15 feet by 15 feet that appears to be bermed, is located in the former location of the small shed. The large boat visible in the 1970 photo has been parked along the east side of the storage building. Numerous objects have been stored along the west border of the property including what appears to be a boat

trailer. Several small objects lining the eastern edge of the property appear to be 55-gallon drums. A 35-foot long slender object located within the right-of-way area is possibly an antennae or boom. Increased activity is present on the properties surrounding the subject site. The property to the southeast has numerous objects stored throughout in a disorganized manner giving it an appearance of a junk yard. The property to the north of the site, has five large connex trailers parked in the unpaved yard area.

The 1981 photograph is included as Figure 5. In addition to the quonset hut and storage building, three small sheds or trailers are located along the south border of the site. The large boat and trailer have been removed in addition to the objects that appeared to be 55-gallon drums along the east edge of the property. Several objects located along the west side of the quonset hut appear to be the 55-gallon drums that are currently located on the property. Most of the materials formerly stored along the west edge of the site have been removed. A long shadow extending off of the small white colored shed appears to be the boom or antennae formerly located within the right-of-way take area in the 1978 photo. A long white object just south of the quonset hut appears to be a canoe or small boat. The darker colored surface areas are most likely either ponded surface water or wet surface soils resulting from a recent precipitation event. Notable changes to the surrounding properties includes the removal of the large connexes from the property to the north. The property to the north is partially fenced in and numerous boats are being stored on the lot. Numerous stained surface soils are present throughout the junk yard area on the property to the southeast of the subject site.

In the 1986 photo supplied by the ADOT/PF, both the Quonset Hut apartment building and the storage building were present. A total of six vehicles were parked around the apartment building. To the south of the apartments, in the vicinity of the leachfield, the grass was prominently green and healthy. About 50 feet further south of the very green growth, the vegetation appeared brown. To the north of the storage building along the tree line, numerous small objects were being stored. Dark patches visible in the parking area may represent wet soils or surface staining.

4.0 FIELD EXPLORATIONS

Field exploration activities included surface soil sampling for PCBs in a predetermined grid type pattern and sampling the three existing groundwater monitoring wells located on site. As discussed in Section 2.0, the field explorations were also to include sampling the soils located beneath the wooden portion of the shop floor attached to the north end of the quonset hut structure.

This sampling was not completed because the owner of the structure would not grant us permission to complete the sampling. Brief explanations of surface soils and groundwater sampling activities are presented in the following sections.

4.1 Surface Soil Sampling

A total of fifteen (15) surface soil samples were collected on May 14, 1992, as part of the field exploration program to determine the aerial extent of PCBs across the property. The samples were collected from a predetermined grid area consisting of twenty-five 30 by 30-foot blocks that covered the majority of the property as shown in Figure 1. The blocks covered several suspect locations including the area around the shop entrance, the southern portion of the property where PCBs had been found during the December, 1991 sampling activities and along the east, south and west boundaries of the property where numerous objects including potential 55-gallon drums were located in the aerial photographs reviewed. Samples were collected generally from the center of each block at a depth of 6 inches below the existing ground surface. The samples were designated by the appropriate row letter, A through E, followed by a consecutive number for each row, 1 through 4. For example, the second sample collected from the third row from the south was designated Sample C2.

The samples were placed into laboratory supplied sample jars using a decontaminated stainless steel spoon. The sampling spoon was scrubbed with a dilute Alconox wash solution, followed by a sequence of tap water and deionized water rinses prior to sampling. After filling the sample bottles, the samples were placed in a chilled cooler for delivery to the laboratory. The samples locations and descriptions are summarized in Table 2. In addition, the sample locations are shown on the site plan, Figure 1.

4.2 Monitoring Well Sampling

Water samples from each of the three existing monitoring wells were recovered to complete the first round of a groundwater monitoring program. The monitoring program was initiated in order to demonstrate whether the levels of total petroleum hydrocarbons and trace levels of halogenated volatile organics are decreasing with time and whether there are any other toxic or carcinogenic petroleum hydrocarbon related compounds in the water. Before sampling of the wells, water level measurements were obtained by using an electrical water level indicator device, measuring down from the rim of the PVC well casings. Next, the wells were purged with a plastic disposable bailer such that a minimum of three well volumes of water were removed from each

monitoring well. The water produced from the well purging is being stored on-site in 55-gallon drums. After completing the development of the wells, a water sample was obtained from each monitor well using a VOSS disposable bailer. Temperature (°C), pH and conductivity (μmhos/cm) values of the water samples were measured in the field at the time of sampling. Each sample was placed in laboratory supplied bottles and then in a chilled cooler for delivery to the laboratory.

The sampling equipment was cleaned prior to purging and sampling with a dilute Alconox wash solution and rinsed with tap water followed by methanol and deionized water. The results of the purging, water level, pH, conductivity and temperature measurements for the monitoring wells are presented on the Water Sampling Log in Table 3.

The vertical positions of the wells were determined by a Registered Land Surveyor, Mr. Roy Whitford of Soldotna, Alaska, during the December, 1991 field study. An arbitrary vertical elevation of 100.00 feet was assigned to the temporary bench mark (TBM) located on top of the spike in a utility pole, as shown on Figure 1. The monitoring well measuring point elevations, the rim of the PVC pipe, are referenced to the TBM and are summarized in Table 3. The groundwater elevation is also referenced to the TBM.

5.0 LABORATORY ANALYSES

Soil and water samples were sent under chain-of-custody procedures to Northern Testing Laboratories of Alaska for analysis. The results of the analyses have been summarized in Table 2. Individual laboratory reports are included in Appendix A.

Fifteen (15) soil samples obtained from the grid sampling were analyzed for polychlorinated biphenyls, PCBs, using EPA Test Method 8080.

Three (3) water samples taken from the monitoring wells were analyzed for total petroleum hydrocarbons, TPH, using EPA Test Method 418.1; halogenated volatile organics, HVO, using EPA Test Method 601; and polynuclear aromatics, PNAs, using EPA Test Method 610. A duplicate of the water sample B2MWW2, designated B2MWW2D, was also analyzed for total petroleum hydrocarbons,TPH, by EPA Test Method 418.1.

6.0 SUBSURFACE CONDITIONS

6.1 Soils

The surface soils encountered during the grid sampling consist generally of brown, silty sand. The silty sand contained organics throughout the southern portion of the site and gradually became gravelly towards the northern portion of the site.

6.2 Groundwater

Three monitoring wells were installed at the 7825 Kenai Spur Highway site in December, 1991, to facilitate sampling of groundwater for analytical testing and to monitor the depth of groundwater beneath the site. The static groundwater level was measured in the monitoring wells at a depth of about 4 to 5 feet below the surface on May 12, 1992. These static water level readings were used to develop the water level (potentiometric surface) contour map shown on Figure 1. The gradient of the potentiometric surface is relatively flat at approximately 0.34 %, and the dip of the gradient is generally toward the southeast. The gradient and dip calculated from the December, 1991, sampling were similar, however, the water table appears to be about 1 to 1-1/2 feet higher in elevation in the May, 1992, sampling compared to the December, 1991 sampling.

7.0 DISCUSSION OF ANALYTICAL RESULTS

7.1 Soils

A total of fifteen surface soil samples collected from the locations shown on the site plan in Figure 1 were analyzed by the laboratory for polychlorinated biphenyls, PCBs. Six of the fifteen samples analyzed contained detectable levels of Aroclor 1254, the same type of PCB detected from the surface sample collected from Boring B2MW in the December, 1991, explorations. The detected levels of PCBs ranged from 0.04 ppm to 22.0 ppm. Three of these samples, however, contained detectable levels below the practical quantitation limit or method detection limit of 0.1 ppm. The laboratory could detect approximately 0.04 ppm to 0.06 ppm PCBs in these samples, however, these levels are below the calibration range of the test equipment and are therefore considered approximate. The remaining three samples, A1, B1 and B3, contained 22.0 ppm, 0.4 ppm and 0.2 ppm PCBs, respectively. Samples A1 and B1 were located in the general area as Sample B2S1 collected in December, 1991. Sample B2S1 contained 15.2 ppm PCBs. Sample B3 was located off of the southeast corner of the quonset hut building as shown in Figure 1.

Detectable PCBs in the surface soil samples are located across the southern portion of the property and adjacent to the shop building adjacent to the north end of the quonset hut. The highly elevated levels of PCBs, appear to be confined to the southwestern portion of the property adjacent to the storage building. These results, however, may be misleading. Soil with PCB levels greater than the cleanup level of 10 ppm may be located adjacent to soils that tested less than the recommended cleanup level as seen in Samples B1S1 and B1, collected during the December, 1991, and May, 1992, explorations, respectively. Sample B1, collected about 5 feet away from the location of Sample B1S1, contained only 0.4 ppm PCBs compared to B1S1's 15.2 ppm. These results may indicate discrete release points of PCBs throughout the impacted area.

7.2 Groundwater

All of the groundwater samples analyzed had non-detectable polynuclear aromatics. The samples, however, contained similar levels of the same contaminants detected in the December, 1991, sampling. Sample B1MWW2, obtained from the monitoring well located near the 55-gallon storage drums, had 0.0004 ppm of tetrachloroethylene and non-detectable levels of TPH and all other HVOs. Sample B2MWW2 had 0.5 ppm of TPH and non-detectable levels of HVOs. Sample B3MWW2, collected from the monitoring well near the underground storage tank, had 0.0002 ppm of 1,1,1-trichloroethane and non-detectable concentrations of TPH and all other HVOs. Sample B2MWW2D, a duplicate sample of B2MWW2, had 0.6 ppm TPH.

The levels of tetrachloroethylene and 1,1,1-trichloroethane detected in the water samples were below the most stringent ADEC cleanup levels (0.005 ppm tetrachloroethylene and 0.2 ppm 1,1,1-trichloroethane). The 0.5 to 0.6 ppm concentration of TPH found in the sample and duplicate collected from Monitoring Well B2MW ~~is above the ADEC cleanup level of non-detectable TPH (0.4 ppm).~~ 2015 Update ADEC PDA

7.3 Quality Control Samples

The soil and groundwater sample results for this project were presented by the laboratory in a Data Deliverables report. This data package includes the analytical method used, uncorrected quantitative results, date and times of analyses, chromatograms of the gas chromatograph analysis, calibration documents for instruments used, surrogate compound recovery data, narrative statements explaining any corrective action taken on reported data and laboratory quality control sample recovery data to document the precision and accuracy of the results. The information

included in this Data Deliverables package was used to calculate whether the precision, accuracy and completeness of the analysis were performed within the boundaries of the data quality objectives. The data quality objectives for this project, are shown in our April 20, 1991 Quality Assurance Project Plan (QAPP) for UST Site Assessments which has been approved by the ADEC.

The precision, accuracy and completeness for the total petroleum hydrocarbons (TPH), halogenated volatile organics (HVO), polychlorinated biphenyls (PCBs), and polynuclear aromatics (PNAs) and the data quality objectives (DQO) for this project are as follows:

Parameter	Precision (DQO)%	Accuracy (DQO)%	Completeness (DQO)%
TPH	+/-21 (+/-40)	98-130 (60-130)	100 (95)
HVO-Water	+/-29 (+/-30)	76-136 (60-140)	100 (95)
PCBs-Soil	+/-28 (+/-40)	75-80 (60-130)	100 (95)
PNAs-Water	+/-10 (+/-30)	58-111 (60-130)	98 (95)

As shown above, the data quality objectives for this project have been met.

7.4 Drill Cuttings and Purged Groundwater Disposal

Three (3) 55-gallon drums of drill cuttings and three (3) drums of purged groundwater were generated during the December, 1991 assessment. The soil cuttings and the purged groundwater are being stored in 55-gallon drums on-site near each of the monitoring well locations. The storage drums were not disposed of as suggested in our January, 1992, Environmental Site Assessment report. Large snow falls following the field explorations hampered access to the drums, therefore, disposal was delayed. The storage drums are marked with the appropriate boring/monitoring well number.

Analytical soil samples from Boring B-3 were clean, therefore, the disposal of the drill cuttings from this boring can be performed by spreading onto the ground surface. Disposal of the drill cuttings from Boring B-1 will be accomplished at Alaska Pollution Control in Anchorage due to the presence of TPH concentrations above the ADEC cleanup guidelines. Disposal of the drill cuttings from Boring B-2 containing PCB concentrations above the ADEC cleanup guidelines will be accomplished at Alaska Pollution Control depending on the total quantity of PCB impacted soils that will need processing. The disposal, therefore, will be postponed until a decision for addressing the PCB impacted surface soils is made and any excavation activities that are required

are completed. APC will only process a large quantity of PCB impacted soil at their incinerator. If less than 20 yards of impacted soil need processing, the soils will have to either be disposed of at an out of state facility or temporarily stored until APC has a large enough quantity of PCB impacted soils to cost effectively process.

The analytical groundwater samples from Monitoring Wells B1MW, B2MW and B3MW had levels of contaminants above ADEC guidelines. Disposal of the groundwater purged from these wells will be accomplished at Alaska Pollution Control in Anchorage.

8.0 CONCLUSIONS AND RECOMMENDATIONS

PCB impacted soils were found primarily along the southern portion of the site and by the shop building. The levels ranged from 0.04 ppm which is less than the practical quantitation limit for PCBs to 22.0 ppm which is greater than the probable cleanup level of 10 ppm. Based on the locations of detectable PCBs, it appears that possibly transformers or some other PCB oil containing equipment were worked on at the shop then stored in the yard along the southern portion of the property.

It appears that the greatest quantity of PCBs are located in the southwest corner of the site adjacent to the storage building. Both Samples A1 and B1S1, collected from Boring B1MW, contained levels of PCBs exceeding 10 ppm. Based on the result of 0.4 ppm PCB for Sample B1, located about 5 feet from the location of Sample B1S1 containing 15.2 ppm, it appears that the high levels of PCBs are not continuous across the entire southwest corner of the site. On the other hand, samples that contained levels of PCBs below the cleanup level of 10 ppm may be located adjacent to soil which contains higher levels.

Mr. Max Schwenne of the Alaska Department of Environment Conservation, ADEC, was contacted on June 15, 1992, for information regarding sites with PCB impacted soils. According to Mr. Schwenne, 10 ppm has been used as the cleanup guideline for sites around the Anchorage area. He is currently checking with the EPA for alternatives to excavating and processing soils impacted with PCBs. Proposed alternatives such as paving over an impacted area, however, have not been accepted by the EPA in the past.

We recommend that additional surface soil sampling be conducted prior to beginning any excavation of PCB impacted soils. Based on the results of the grid sampling, it appears that PCB impacted soils are present across a larger area of the property than initially anticipated. Additional

sampling will further delineate those areas of detectable PCBs and confirm whether the areas not previously sampled do not have PCB impacted soils. In our opinion, by better defining the areas with PCBs greater than the cleanup level of 10 ppm, the total quantity of excavated soils that will have to be disposed of will be decreased.

We recommend that a minimum of twenty five additional surface soil samples be collected and analyzed for PCBs. As shown on Figure 6, the samples should be collected from grid blocks that were not sampled during the May, 1992 field explorations, from the two grid blocks around the shop building and from the four quarters of each of the grid blocks in which the recovered sample contained levels of PCBs higher than the practical quantitation limit (0.1 ppm). This sampling should more completely define lateral extent of PCB impacted soil greater than the cleanup level of 10 ppm and adequately cover the entire site for confirmation that PCB impacted soils are not located in the surface soils within these areas. It is imperative to define the extent of PCB impacted soils prior to beginning field work, as PCBs are typically not visible and no field detection method for PCBs is available.

The water sample collected from Monitoring Wells B1MW and B3MW contained 0.0004 ppm tetrachloroethylene and 0.0002 ppm 1,1,1-trichloroethane, respectively. These levels are below the most stringent cleanup level set by ADEC of 0.005 ppm tetrachloroethylene and 0.2 ppm 1,1,1-trichloroethane. The water sample B2MWW2 and duplicate sample B2MWW2, collected from Monitoring Well B2MW, had 0.5 ppm and 0.6 ppm of TPH. This level is close to the method detection limit of 0.4 ppm and, therefore, is just above the cleanup level of non-detectable set by ADEC. Based on our observations of visually stained soils in this area and the fact that PCBs were detected in the soil sample from Boring B2MW, the TPH contamination in the groundwater is most likely a result of a release from mishandling of waste oil at the site. We recommend, as in our January, 1992 report, that the stained soils in the vicinity of Boring B2MW be removed to the depth of visible penetration and disposed of at an approved facility.

Similar levels of the same contaminants were found in each of the monitoring wells during the May, 1992 sampling as in the December, 1991 sampling. The levels do not appear to be decreasing at this time.

All three water samples analyzed had non-detectable PNAs by EPA Test Method 610. These results indicate that the other common toxic or carcinogenic compounds associated with petroleum hydrocarbon contaminants are not present in the site's groundwater.

9.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives, in the study of this site. The findings we have presented within this report are based on limited research and on the sampling analysis that we conducted at this site. They should not be construed as a definite conclusion regarding the soils and groundwater quality at this site. It is possible that our subsurface tests may have missed some higher levels of petroleum hydrocarbon or hazardous substance constituents, although our intention was to sample areas likely to be impacted. As a result, the analysis and sampling performed can only provide you with our best judgement as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in the conditions of this site can occur with passage of time, whether they be due to natural processes or the works of man on this site. In addition, changes in Government Codes, regulations, or laws may occur. Due to such changes, our observations and recommendations applicable to this site may need to be revised wholly or in part, due to changes beyond our control.

The results of our surface soil and groundwater evaluation indicate that soils and groundwater impacted by low levels of petroleum hydrocarbon and hazardous substance constituents remain at the Quonset Hut site. You are therefore advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore, has not, and will not, disclose the results of this study.

We appreciate this opportunity to be of service. Please call the undersigned with any questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Prepared By:

LeeAnne Osgood
Geotechnical Engineer

Approved By:

Fred R. Brown, P.E.
Vice President

TABLE 1 - SOIL AND WATER SAMPLE LOCATIONS AND DESCRIPTIONS

SOIL SAMPLES

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (ft.)	Sample Classification
A1	5/14/92	Center of sampling grid A1	0.5-1.0	Brown, silty SAND with organics
A2	5/14/92	Center of sampling grid A2	0.5-1.0	Brown, silty SAND with organics
A3	5/14/92	Center of sampling grid A3	0.5-1.0	Brown, silty SAND with organics
A4	5/14/92	Center of sampling grid A4	0.5-1.0	Brown, silty SAND with organics
B1	5/14/92	Center of sampling grid B1	0.5-1.0	Brown, silty SAND with organics
B2	5/14/92	Center of sampling grid B2	0.5-1.0	Brown, silty SAND with organics
B3	5/14/92	Center of sampling grid B3	0.5-1.0	Brown, silty SAND with organics
C1	5/14/92	Center of sampling grid C1	0.5-1.0	Brown, silty SAND with a trace of gravel
C2	5/14/92	Center of sampling grid C2	0.5-1.0	Brown, silty SAND with a trace of gravel
C3	5/14/92	Center of sampling grid C3	0.5-1.0	Brown, silty SAND with a trace of gravel
D1	5/14/92	Center of sampling grid D1	0.5-1.0	Brown, silty SAND with a trace of gravel
D2	5/14/92	Center of sampling grid D2	0.5-1.0	Brown, silty SAND with a trace of gravel
D3	5/14/92	Center of sampling grid D3	0.5-1.0	Brown, silty SAND with a trace of gravel
E1	5/14/92	Center of sampling grid E1	0.5-1.0	Brown, silty, gravelly SAND
E2	5/14/92	Northeast section of sampling grid E2	0.5-1.0	Brown, silty, gravelly SAND

WATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (ft.)	Sample Classification
B1MWW2	5/12/92	Monitoring Well No. B1MW, Water Sample No. 2	7	Groundwater
B2MWW2	5/12/92	Monitoring Well No. B2MW, Water Sample No. 2	7	Groundwater
B3MWW2	5/12/92	Monitoring Well No. B3MW, Water Sample No. 2	7	Groundwater
B2MWW2D	5/12/92	Monitoring Well No. B2MW, Water Sample No. 2 (duplicate)	7	Groundwater

TABLE 2 - SUMMARY OF SOIL AND WATER SAMPLE ANALYTICAL RESULTS

SOIL SAMPLES

Parameter Tested	Method*	Analytical Sample Number (See Table 1 and Appendix A)														
		A1	A2	A3	A4	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2
Polychlorinated Biphenyls	EPA 8080															
Aroclor 1254 - ppm	EPA 8080	22.0	0.06	0.05	ND	0.4	ND	0.2	ND	ND	ND	ND	ND	ND	ND	0.04
All Others - ppm	EPA 8080	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

WATER SAMPLES

Parameter Tested	Method*	Analytical Sample Number (See Table 1 and Appendix A)			
		B1MWW2	B2MWW2	B2MWW2D	B3MWW2
Petroleum Hydrocarbons - ppm	EPA 418.1	ND	0.5	0.6	ND
Halogenated Volatile Organics	EPA 601				
Tetrchloroethylene - ppm	EPA 601	0.0004	ND	NA	ND
1,1,1-Trichloroethane - ppm	EPA 601	ND	ND	NA	0.0002
All others - ppm	EPA 601	ND	ND	NA	ND
Polynuclear Aromatics - ppm	EPA 610	ND	ND	NA	ND

KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR COMPOUNDS TESTED AND LIMITS OF DETECTION

TABLE 3 - WATER SAMPLING LOG

POTENTIOMETRIC SURFACE DETERMINATION

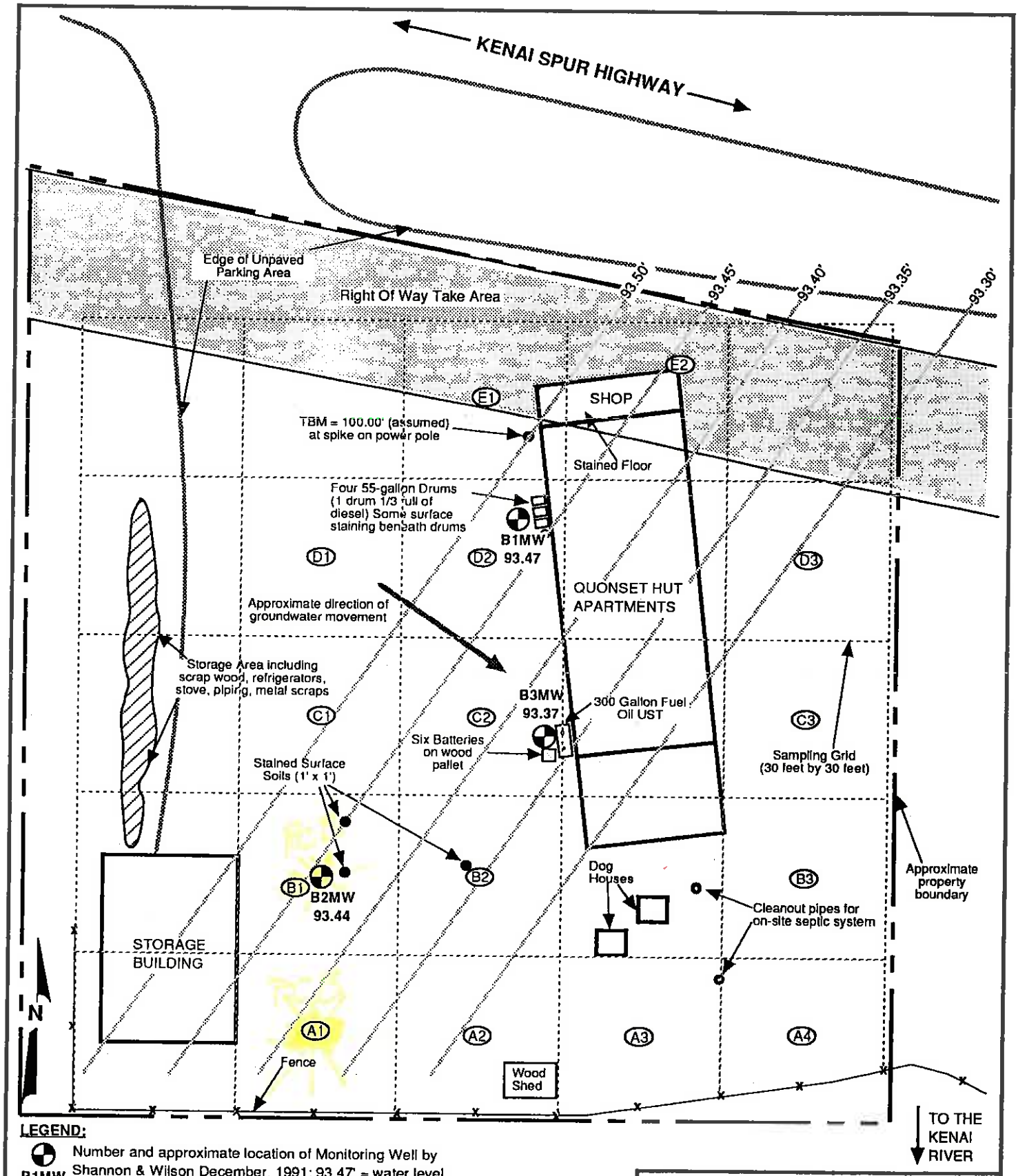
WELL NUMBER	B1MW	B2MW	B3MW
DATE WATER LEVEL MEASURED	5/12/92	5/12/92	5/12/92
TIME WATER LEVEL MEASURED	11:37	11:35	11:39
MP ELEVATION, FT	97.78	96.95	97.80
DEPTH TO WATER BELOW MP, FT	4.31	3.51	4.43
WATER LEVEL ELEVATION, FT	93.47	93.44	93.37

SAMPLING/DEVELOPING DATA

WELL NUMBER	B1MW	B2MW	B3MW
DATE SAMPLED	5/12/92	5/12/92	5/12/92
TIME SAMPLED	1:30	12:10	12:45
DEPTH TO WATER BELOW MP, FT	4.31	3.51	4.43
TOTAL DEPTH OF WELL BELOW MP, FT	11.96	9.32	11.68
WATER COLUMN IN WELL, FT	7.65	5.81	4.43
GALLONS PER FOOT	0.16	0.16	0.16
GALLONS IN WELL	1.25	1	1.2
TOTAL GALLONS PUMPED/BAILED	5	5	5
TEMPERATURE, C	2.9	3.1	3.0
SPECIFIC CONDUCTANCE, UMHOS/CM	137	60	90
pH	5.61	5.44	5.82
REMARKS			

Diameter of Casing: 2 inch
Development Method: Brainard-Kilman Pump
Purging & Sampling Method: Voss Disposable Bailer
Sampling Personnel: Curt Conner

KEY
MP=Measuring Point
NM=Not Measured



LEGEND:

- B1MW 93.47' — Number and approximate location of Monitoring Well by Shannon & Wilson December, 1991; 93.47' = water level elevation in well
- 95.00' — Groundwater potentiometric surface contour and approximate elevation (ft); based on TBM at 100.00 ft (12/21/91 Survey)
- A1 — Grid number and approximate location of surface soil sample by Shannon & Wilson, May, 1992

0 25 50

Approximate scale in feet

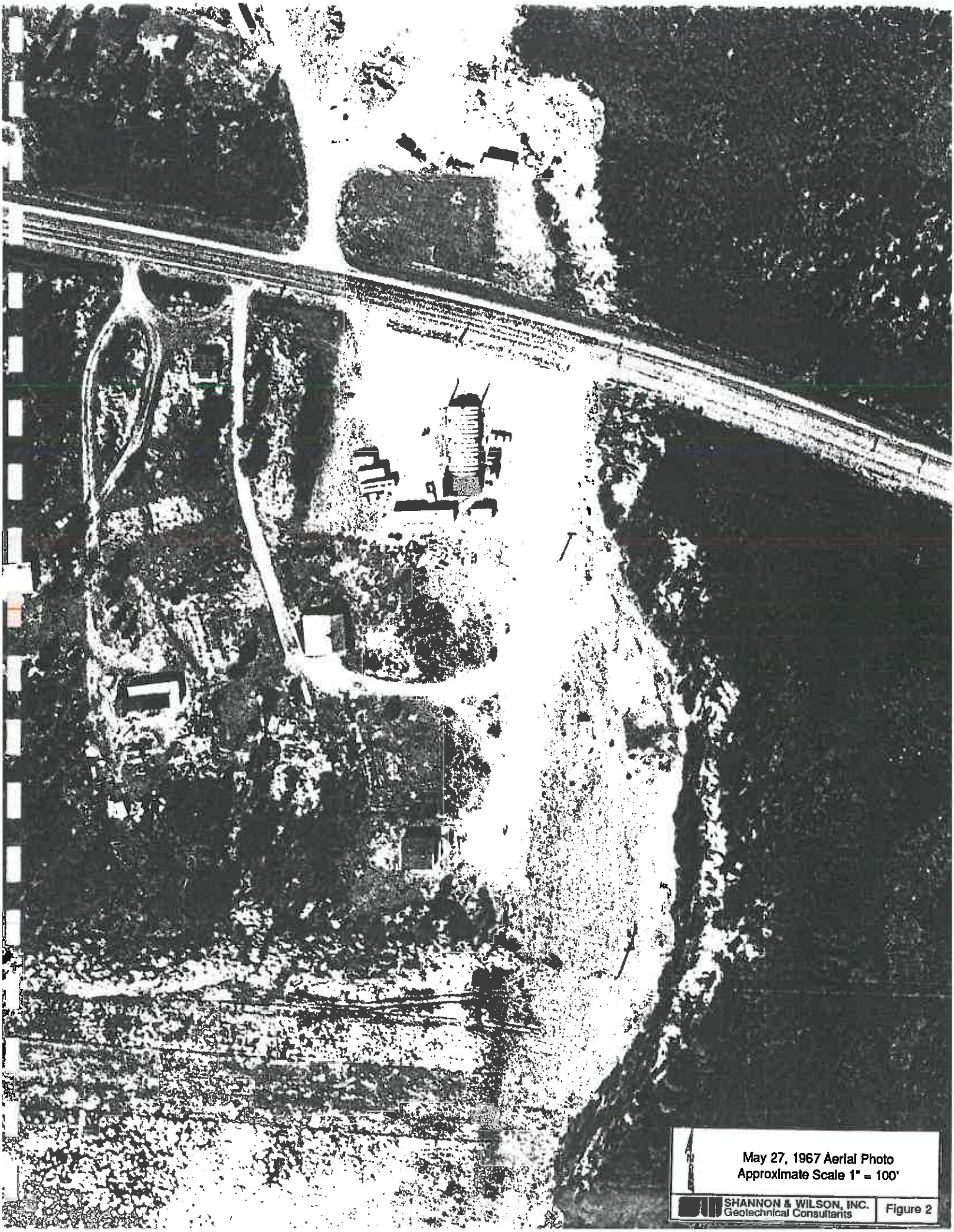
Quonset Hut Apartments
Kenai, Alaska

SITE PLAN

June, 1992 X-5069-3

SHANNON & WILSON, INC.
Geotechnical Consultants

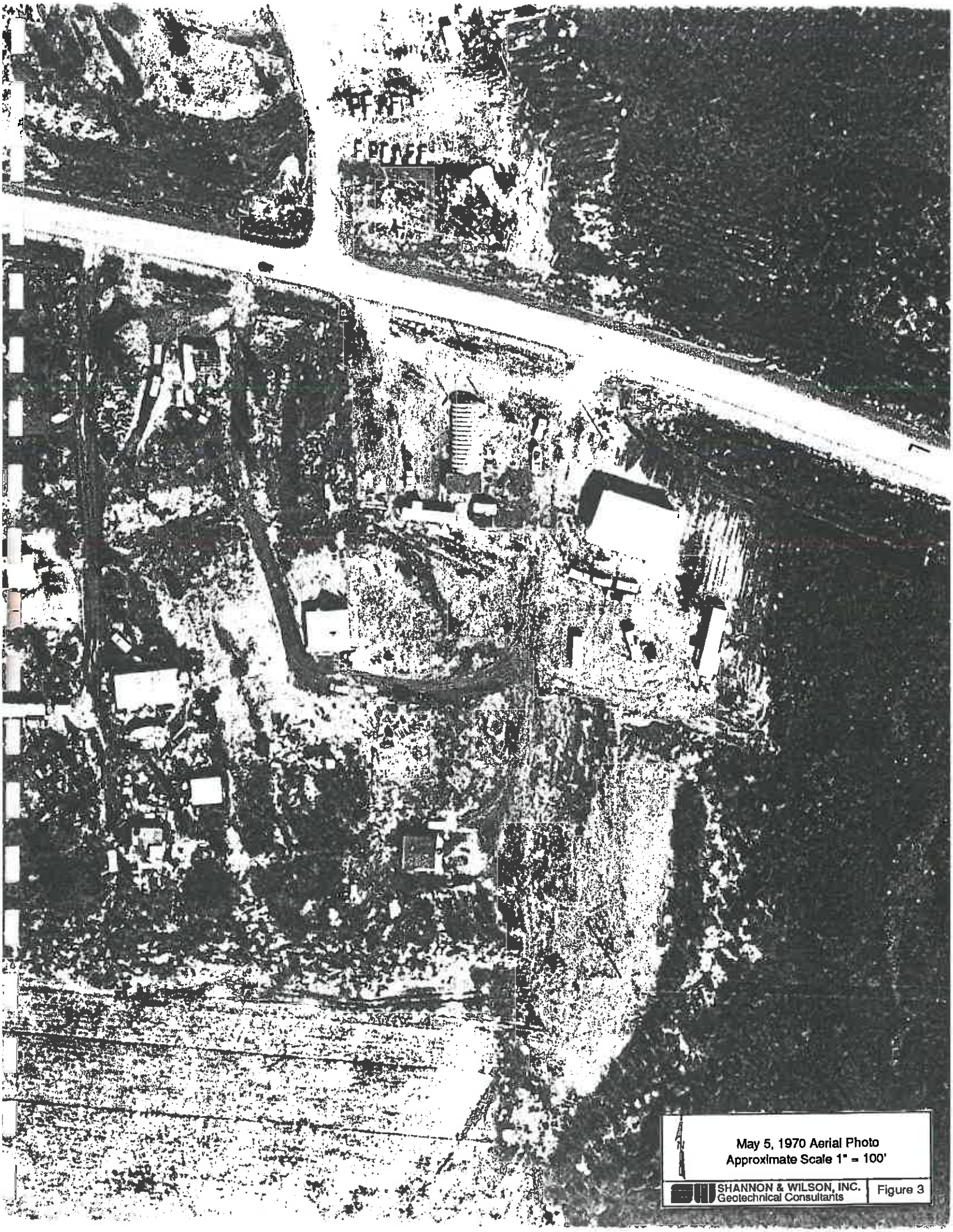
Fig. 1



May 27, 1967 Aerial Photo
Approximate Scale 1" = 100'

SHANNON & WILSON, INC.
Geotechnical Consultants

Figure 2



May 5, 1970 Aerial Photo
Approximate Scale 1" = 100'

SHANNON & WILSON, INC.
Geotechnical Consultants

Figure 3

September 29, 1978 Aerial Photo
Approximate Scale 1" = 100'

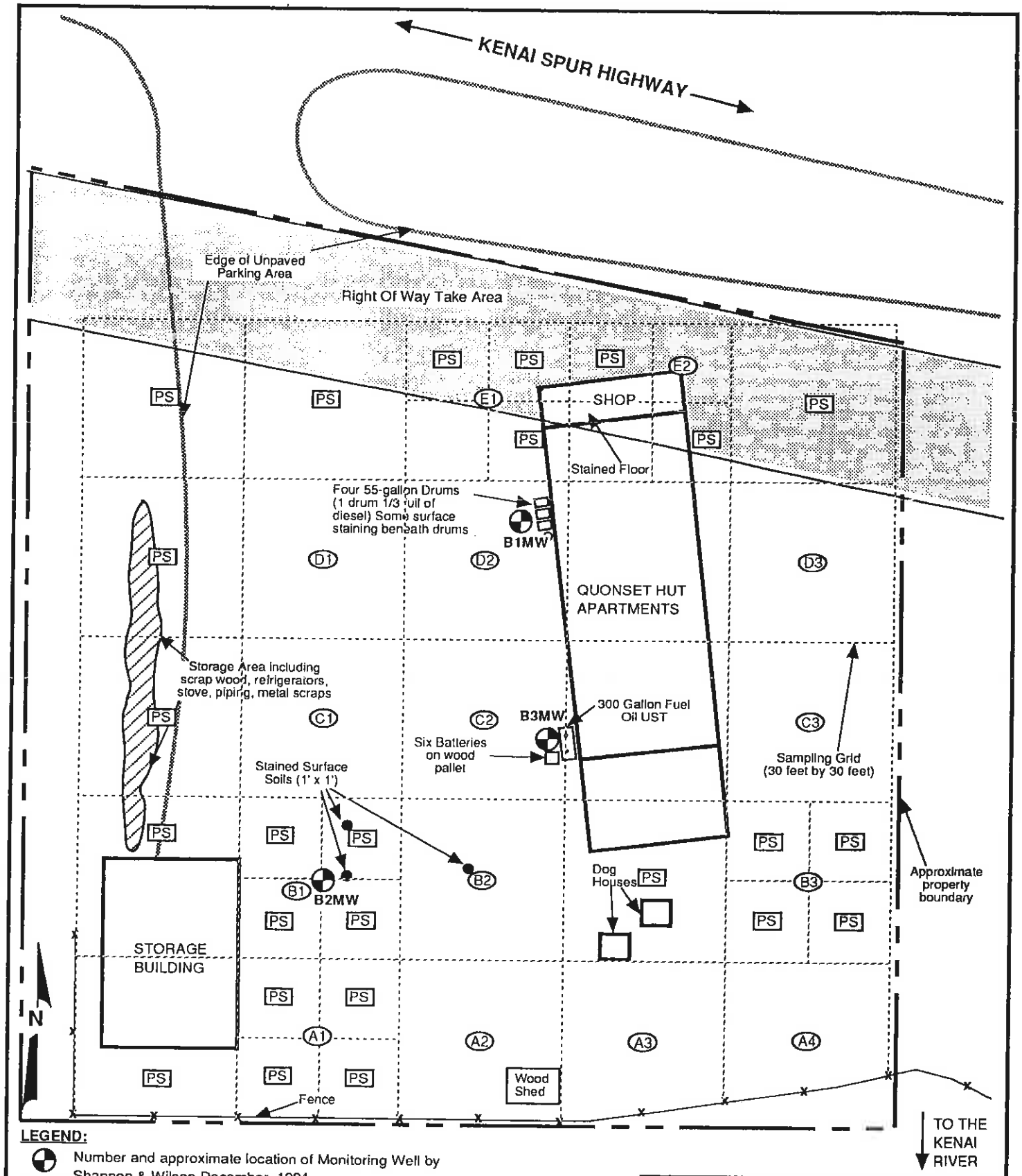
SHANNON & WILSON, INC.
Geotechnical Consultants

Figure 4

September 25, 1981 Aerial Photo
Approximate Scale 1" = 100'

SHANNON & WILSON, INC.
Geotechnical Consultants

Figure 5



LEGEND:

B1MW — Number and approximate location of Monitoring Well by Shannon & Wilson December, 1991

A1 — Grid number and approximate location of surface soil sample by Shannon & Wilson, May, 1992

PS — Location of proposed additional surface samples

0 25 50

Approximate scale in feet

Quonset Hut Apartments
Kenai, Alaska

PROPOSED ADDITIONAL SAMPLE LOCATIONS PLAN

June, 1992 X-5069-3

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 6