Limited Site Assessment

Prepared For:

Dan Aalfs
305 East Pioneer Avenue, "Old Homer Tesoro"
Homer, Alaska
ADEC File #2314.26.031

Prepared By:

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Preparation Date:

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
BTEX	Benzene, Toluene, Ethyl benzene, Xylenes
bgs	Below Ground Surface
COC	Chain of Custody
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
GRO	Gasoline Range Organics
PID	Photoionization Detector
ppm	Parts Per Million
LOQ	Limit of Quantification (formerly PQL: Practical Quantitative Limit)
MDL	Method Detection Limit
QA/QC	Quality Assurance/Quality Control
RRO	Residual Range Organics
sf	Square Feet
SM	Silty Sand
SP	Poorly Graded Sand
SW	Well Graded Sand
SGS	Societe Generale de Surveillance
USCS	Unified Soil Classification System
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

Restoration Science & Engineering, LLC (RSE) is providing this Underground Storage Tank (UST) closure site assessment report to describe site conditions encountered during site characterization activities in accordance with our workplan, approved by the ADEC's Paul Horwath on September 13, 2011. RSE implemented this workplan and, in conjunction with an excavation contractor (Property Improvements), excavated six test pits on the subject property to assess subsurface hydrocarbon impacts. Field activities took place from September 20-21, 2011.

1.0 SITE DESCRIPTION AND HISTORY

The subject property is located at 305 East Pioneer Avenue, Lot 3A1 of Nils O. Svedlund Subdivision No. 8 Plat 90-20, located near the intersection of East Pioneer and Svedlund Street in downtown Homer, Alaska (Attachment A, Figure 1). The site operated as a retail fuel and service station from at least as early as 1973 until 1991. The subject property is irregular in shape with the approximate dimensions of 200 ft by 80-100 ft in width. Homer is located in the Southern Kenai Peninsula on the north side of Kachemak Bay. This property is situated on the south side of East Pioneer Avenue. The property is primarily comprised of a flat gravel fill pad sloping gently to the south before reaching a steep vegetated embankment on the southern edge of the property. The property is bounded by developed commercial properties to the east and west, an embankment descending to an alley to the south, and Pioneer Avenue to the north.

Based on our review of ADEC records, one 3,000-gallon and one 4,000-gallon gasoline USTs, one 8,000-gallon diesel UST, as well as the associated piping and dispensers were removed from the site in 1991 without proper UST closure documentation. In addition to retail fuel sales the site was used for automotive maintenance activities. Maintenance activities occurred in two structures, known as the "Old Garage" and the "New Garage" and are located on the property. Two other structures, known as the "Old Wood Frame Shop" and the "Old Gas Station Office", as well as a gas station canopy have been removed from the site. The Old Wood Frame Shop is also a suspected location of historic automotive maintenance activities.

2.0 AREA HYDROGEOLOGY AND CLIMATE

Homer is located in the Southern Kenai Peninsula on the north side of Kachemak Bay. The Homer area lies on the southern end of the Kenai Peninsula between Cook Inlet and the Kenai Mountains. Significant geologic features in Homer include the escarpment and adjacent upland (Diamond Ridge and Lookout Mountain), the bench area at the foot of the escarpment (Homer Bench area) and the Homer Spit extending into Kachemak Bay. The city of Homer and the subject property lay on an irregular terrace and alluvial fan complex between the bluff and Kachemak Bay referred to as the "Homer Bench".

Lot 3A1 is located on the upper portion of the lower homer bench, and had a moderately steep grade to the south, prior to being filled. The topography of the Homer bench is a result of Pleistocene glaciations and resultant surficial deposits of glacial drift or pro-glacial lake-bottom and deltaic sediments overlain by fan alluvium and colluvium. The depth to groundwater at the site is not known, but is greater than 13 feet below grade based recent test pit observations.

3.0 SITE CHARACTERIZATION ACTIVITIES

RSE supervised the excavation of six test pits throughout the subject property. Test pits were excavated to between 8 ft below ground surface (bgs) and 13 ft bgs. The locations of test pits were chosen using a combination of historic aerial photographs, on-site interviews, and a workplan prepared by International Consulting and Engineering, dated April 2003, that included a diagram indicating the probable locations of USTs and dispenser islands. A scaled Site Diagram indicating the locations of site features and test pits is provided as Figure 2. Field screening results are provided in Table 1. Soil encountered has been described using Unified Soil Classification System (USCS) conventions and symbols.

Test pit TP1 was excavated to a depth of 8 feet bgs in the probable location of the former dispenser islands. A wooden box approximately 8ft x 3ft x 4ft was encountered approximately 3 ft bgs (Photograph 4 in Appendix A). This box may have acted as the foundation for the dispenser island (previously removed). The top of the box was open, and the bottom of this crib was located approximately 7 ft bgs. Material above 7 ft bgs, including within the box, consisted of well graded sand (SW) with silt (SM). The excavator bucket was used to break through the bottom of the crib. A relatively dense layer of silt with poorly graded fine sand (ML-SP) was encountered below the crib at a depth of approximately 7 ft bgs. Impacted soil was encountered heterogeneously throughout the excavation. Two analytical samples were collected from this excavation, one at the depth of 3ft bgs (TP1-3), which exhibited the greatest field screening result, and the other from the ML-SP layer beneath the wooden crib at a depth of approximately 8 ft bgs (TP1-8).

Test pit TP2 was excavated in the reported vicinity of the former tanks. The initial test pit was excavated to a depth of 7.5 ft bgs. No staining or olfactory evidence of hydrocarbons was encountered until 7.5 ft bgs, where impacted soil was encountered. A trench was advanced from TP2 to the south and impacted soil was again encountered at 6.5 ft bgs. A flexible pipe coupled to a copper pipe was encountered within the zone of impacted soil at approximately 7 ft bgs. This line was tentatively identified as the water service to the building. A portion of this line was removed, and a remaining portion was crimped and left in place. The location was marked above grade using an “I” beam and timber. TP2 was completed to a depth of 11 ft bgs. Material above 10 ft bgs appeared to consist of relatively unconsolidated fill materials consisting of a heterogeneous mixture of well graded sand with silt (SW-SM). Occasional large cobbles and debris was encountered. Apparent native material was encountered at 10 ft bgs and consisted of ML-SP. Two analytical samples were collected from this excavation, one at the depth which returned the greatest field screening result at a depth of 6 ft bgs (TP2-6), and the other from native material at a depth of approximately 11 ft bgs (TP2-11).

Because hydrocarbon impacts were encountered at the former locations of the dispenser island and the USTs, RSE initiated an effort to evaluate the horizontal and vertical extent of hydrocarbon impacts at the subject property. Test pit TP3 was excavated to the north of the former UST location and TP2. Material encountered in TP3 was an unconsolidated and consisted of SW-SM. Some large cobbles were encountered in this area. Perched (non-recharging) water was encountered at approximately 9 ft bgs and impacted soil was encountered at the soil-water interface. One analytical sample (TP3-9) was collected from the just above the soil water interface.

Test pit TP4 was excavated to the west of the former USTs, near the boundary of the adjoining property to the west. TP4 contained mixed debris (wiring, bricks, concrete and building materials) and fill material consisting of SW-SM. Heterogeneous areas within the excavation were impacted by hydrocarbons. The excavation was completed to a depth of approximately 13 ft bgs, where apparent native soil consisting of brown organic silt (OL) with poorly graded fine sand (SP). Two analytical samples were collected from this excavation, one from the fill material overlying the native soil at 11 ft bgs (TP4-12), and the other from the native soil at a depth of 13 ft bgs (TP4-13). The sample from 13 ft bgs exhibited a relatively high PID result for the site and was chosen to characterize VOCs at the subject property.

Test pit TP5 was excavated to the south of the former USTs. TP5 contained fill material consisting of SW-SM. Mixed debris and heterogeneous regions of hydrocarbon impacted fill material were present throughout the excavation. TP5 was completed to a depth of approximately 13 ft bgs, where apparent native soil consisting of brown OL-SP was encountered. One analytical sample was collected from the completed depth of 13 ft bgs (TP5-13).

Test pit TP6 was excavated to the south of the “New Garage” in the vicinity of the former “Wood Shop” building, which is no longer present on site. TP6 contained mixed debris (including a truck bumper) and fill material consisting of SW-SM. Heterogeneous regions of hydrocarbon impacted fill material were present throughout the excavation. TP6 was completed to a depth of 12 ft bgs, where native material consisting of ML was encountered. One analytical (TP6-12) and one duplicate sample (TP6-XI) were collected from native material at the completed depth in this excavation.

4.0 FIELD AND ANALYTICAL SAMPLING METHODOLOGY

During the site characterization effort the test pits were subjected to field screening and analytical sampling. The primary objective of field screening is to qualitatively test for the presence of contamination on site. The primary objective of analytical sampling is to quantitatively identify contaminants that are present on site, and to ensure accurate enough results that samples can be compared to relevant cleanup criteria, and prudent cleanup or disposal decisions can be determined. The following sections provide details on terminology, methodology, and specific data QA/QC requirements that insure these objectives are met.

4.1 FIELD SCREENING METHODS

A photoionization detector (PID) was used during soil screening. The PID was calibrated prior to use in accordance with the manufacturer's calibration specifications. For this project the PID was a MiniRAE Lite Model PGM 7300, and it was calibrated using 100 part per million isobutylene gas.

The following general headspace screening procedure was used to obtain and analyze field screening samples using the PID:

1. A clean ziplock bag was partially filled (one-third to one-half) with the sample to be analyzed;

2. Headspace vapors were allowed to develop in the bag for at least 10 minutes but no longer than one hour and bags were agitated for 15 seconds at the beginning and end of the headspace development period to assist volatilization;

3. The instrument sampling probe was inserted to a point about one-half the headspace depth;

4. After probe insertion the highest meter reading was taken and recorded, typically between two and five seconds after probe insertion.

4.2 ANALYTICAL SAMPLE COLLECTION

Samples were placed in method specific containers, tightly closed, and maintained at temperatures between 2˚ and 6˚ Celsius during transport to the analytical laboratory. Analytical samples were transported under chain of custody (COC) protocol and submitted to SGS Environmental Services (SGS) in Anchorage for analyses. All volatile samples were accompanied by a trip blank, to be analyzed by the same method.

5.0 SOIL SAMPLE RESULTS

Soil samples were taken of representative soils remaining in place within the test pits. All samples were analyzed for gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO); and benzene, toluene, ethyl benzene, and total xylenes (collectively referred to as BTEX) by Alaska Methods (AK) 101, 102, 103, EPA method SW8021B, respectively. One sample (TP4-13) from a depth exhibiting a relatively high field screening result and that was representative of impacted soil at the site was analyzed for volatile organic compounds (VOCs) by Environmental Protection Agency (EPA) method 8260.

Soil sample results are compared to ADEC 18 AAC 75 Method 2 cleanup levels for migration to groundwater (Table 2). ADEC Method 2 cleanup levels for migration to groundwater are 250 milligrams per kilogram (mg/Kg) for DRO, 11,000 mg/Kg for RRO, 300 mg/Kg for GRO, 25 micrograms per kilogram (µg/Kg) for benzene, 6,500 µg/Kg for toluene, 6,900 µg/Kg for ethylbenzene and 63,000 µg/Kg for total xylenes.

All soil samples exceeded the ADEC cleanup criteria for at least one constituent, with the exception of the sample TP3-9, which exhibited low concentrations of hydrocarbons, less than the ADEC cleanup criteria. Results from sample TP5-13 were less than the ADEC cleanup criteria for every parameter analyzed, with the exception of benzene, which was present at a concentration of 859 µg/Kg.

All other samples exhibited concentrations of at DRO that were greater than the ADEC cleanup criteria. Many samples exhibited concentrations of other analytes that were greater than the ADEC cleanup criteria. Details regarding the particular hydrocarbons above the ADEC cleanup criteria in each test pit are provided below:

Samples collected from TP1 exhibited concentrations of DRO greater than the ADEC cleanup criteria. The sample collected from 3 ft bgs (TP1-3) exhibited a concentration of DRO of 5,160 mg/Kg, while the sample collected from the underlying native soil at a depth of 8 ft bgs (TP3-8) exhibited a concentration of DRO of 892 mg/Kg. Neither of these samples exhibited concentrations of RRO, GRO, or BTEX constituents that were greater than the ADEC cleanup criteria, though results associated with sample TP1-3 had a method detection limit (MDL) that was greater than the ADEC cleanup criteria of 25 µg/Kg for benzene and does not eliminate benzene as a contaminant of concern at this depth. The MDL for benzene associated with TP3-8 was less than the ADEC cleanup criteria and benzene was not detected in this sample (MDL = 6.67 µg/Kg for benzene in this sample).

Samples were collected from depths of 6 ft bgs and 11 ft bgs from TP2 (TP2-6 and TP2-11, respectively). Both samples contained concentrations of DRO, GRO, and all BTEX constituents that were significantly greater than the ADEC cleanup criteria.

The sample collected from the TP3 (TP3-9) did not exhibit concentrations of any analyte that were greater than the applicable ADEC cleanup criteria. This test pit was impacted by hydrocarbons, but at concentrations less than the ADEC cleanup criteria.

Samples were collected from depths of 12 ft bgs and 13 ft bgs from TP-4 (TP4-12 and TP4-13, respectively). Both of these samples exhibited concentrations of DRO, GRO, and BTEX constituents that were greater than the ADEC cleanup criteria. Sample TP4-13 was submitted for VOC analysis by EPA method 8260. VOC results confirmed that BTEX constituents are present at concentrations exceeding ADEC cleanup criteria. One other constituent, 1,2,4-trimethylbenzene, was present at a concentration of 61,700 µg/Kg, a concentration greater than the ADEC cleanup criteria of 23,000 µg/Kg. No halogenated hydrocarbons were detected in the VOC analysis of this sample. Several other VOC constituents were detected, but at concentrations that were less than their respective ADEC cleanup criteria (See Table 3).

The sample collected from TP-5 contained benzene at a concentration of 859 µg/Kg, exceeding the ADEC cleanup criteria of 25 µg/Kg. All other analytes were detected in this sample, but at concentrations that are less than the applicable ADEC cleanup criteria.

Two analytical samples were collected from the same sample location from excavation TP-6 (TP6-12 and TP6-XI). TP6-XI was submitted to the lab as a blind duplicate. Both samples exhibited concentrations of DRO and benzene that were greater than their respective ADEC cleanup levels.

6.0 ANALYTICAL METHODOLOGY QA/QC

Specific data quality objectives include the measurement of several parameters to establish target analyte detection limits, data precision, data bias, and method comparability.

MDLs are determined in order to insure that contaminants of concern can be quantified at concentrations less than the applicable ADEC cleanup levels. Target MDLs are set below the applicable cleanup criteria, in accordance with 40 CFR part 36, Appendix B.

Laboratory reports were reviewed for QA/QC sample and performance deviations as outlined in our workplan. Data was flagged appropriately according to EPA 540/R-99/008 National Functional Guidelines. Many of these performance criteria are also included in the ADEC laboratory data review checklist, which was completed for this project. No major QC failures affecting sample usability were recorded for this project. The laboratory did not meet the target MDL for benzene for sample TP1-3, which was not detected in the sample. This "non-detect" result can not be used to establish the absence of benzene as a contaminant of concern at this location and has been "R" flagged as a result of this QC failure. Additional minor QA/QC deviations are detailed in the ADEC Laboratory Data Review Checklist, provided in Appendix C.

Several samples are "J" flagged as estimates because the result was greater than the MDL, but below the LOQ. While the analyte has been positively identified in these samples, the error associated with the measurement is sufficiently that the result should be considered an estimate. LOQs associated with "J" flagged results are less than the ADEC cleanup levels and are sufficient to establish that these contaminants are not present at the site at concentrations greater than the ADEC cleanup criteria.

Sample TP6-XI was submitted to the lab as a blind duplicate sample and was collocated with sample TP6-12. While both samples indicated the presence of the same constituents at concentrations that exceeded the ADEC cleanup criteria, the relative percent difference (RPD) between the sample and the field duplicate exceeded the ADEC guidance of 50% for DRO, RRO, GRO, and xylenes, which exhibited RPDs of 92%, 99%, 76%, and 63%, respectively. The RPD for benzene in the two samples was 42%, which met the ADEC RPD criteria. RPDs greater than 50% indicate a high degree of heterogeneity of impacted soil at the subject property, an observation that is consistent with the heterogeneity of the mixed fill materials observed on site.

7.0 INVESTIGATIVE DERIVED WASTE

Test pits were completed and back filled one at a time. All excavated material was placed back into the test pit from which it came at the approximate depth from which it originated. Small quantities of perched groundwater were encountered in some excavations, especially near the building foundation, where drain tile was also observed. Consistently recharging groundwater was not observed in any test pit and test pits were dry at the time they were backfilled.

8.0 DISCUSSION AND CONCLUSIONS

Limitations

This report was prepared for the exclusive use of our client, Dan Aalfs. Conclusions and statements of site conditions are based upon information provided from observations during RSE's field investigation and conversations with onsite personnel. Based upon this, the data and interpretation presented in this report provide our best engineering judgment regarding the environmental characteristics of the site and do not guarantee that additional pollution is absent from the subject property.

Hydrocarbon Impacts

Hydrocarbon impacts are present throughout the site. Hydrocarbon impacted soil was distributed heterogeneously throughout test pits, and many also contained debris such as concrete and wiring. Fill material in test pits was inconsistent and relatively unconsolidated.

TP3 was located to the north of the former tank area and was relatively clean with the exception of a small lens of impacted soil just above a layer of perched groundwater. This impacted soil contained concentrations of hydrocarbons below the applicable ADEC cleanup criteria. TP3 likely represents the northern boundary of contaminated soil present on site.

TP5 was located to the south of the former tank area and contained soil that was impacted by hydrocarbons, but only exceeded the ADEC cleanup criteria for benzene. Notably, some of the lowest levels of GRO observed at the site were present in TP5, perhaps indicating that benzene was migrating into this location from a source location near TP2, which contained GRO concentrations greater than the ADEC cleanup criteria and concentrations of benzene one-to-two orders of magnitude greater than that observed in TP5.

TP1 was located in the former dispenser area and exhibited concentrations of DRO and benzene at concentrations greater than the ADEC cleanup criteria.

TP2 and TP4 were located in the probable location of the former USTs and to the west of the former USTs, respectively. TP2 contained relatively clean soil down to a depth of 6 ft bgs to 7.5 ft bgs, at which point hydrocarbon impacted soil was encountered. TP4 contained mixed fill materials, debris and impacted soil throughout the excavation. Concentrations of DRO, GRO, and BTEX constituents greater than the ADEC cleanup criteria were present in these locations. It should be noted that only TP2 and TP4

contained concentrations of GRO greater than the ADEC cleanup criteria, implicating this region as a unique source area.

TP6 was located to the south of the new garage, in the vicinity of a wood shed that was previously removed from the subject property. TP6 contained mixed fill, debris, including a truck bumper, and impacted soil throughout the excavation. It should be noted that DRO was present at concentrations not only exceeding the ADEC cleanup criteria, but also exceeding DRO concentrations encountered in other test pits on site. This test pit also exceeded the ADEC cleanup criteria for benzene. The presence of large quantities of DRO and benzene in the relative absence of GRO, toluene, ethylbenzene, and xylenes in this area may indicate a unique source.

Garage Building Floor Drains

In addition to test pits excavated on the subject property, the garage drain system was checked using tracer dye to confirm that the garage drain system discharged to the public sanitary sewer. Tracer dye and large quantities of water were introduced into the drains. The sanitary sewer was observed at a sanitary sewer manhole located at the top of the bluff near the properties southwest boundary. Observation of tracer dye and dramatic changes in flow rate associated with the introduction of tracer dye and water confirm that the buildings drain system is connected to the City of Homer municipal sanitary sewer system.

Conceptual Site Model

Significant hydrocarbon impacts to subsurface soil are present at the subject property. Media impacts and potential transport mechanism were evaluated using the ADEC Human Health Conceptual Site Model Graphic Form. This form identified potential site works, visitors, and construction workers as potential receptors via incidental soil ingestion, dermal absorption, and inhalation of fugitive dust and organic vapors in outdoor area. The building present on site is currently unused and secured. A copy of the completed Human Health Conceptual Site Model Graphic Form is provided in Appendix B.

Water Supply Well Search

Because of hydrocarbon impacts to subsurface soil and the potential for these hydrocarbons to migrate to groundwater a drinking water well search was performed using the State of Alaska Division of Mining, Land and Water Alaska Hydrologic Survey Well Log Tracking System (WELTS). This search was performed for Township 6 south, Range 13 west, section 20. Results from the WELTS search indicated that no drinking water wells were present in this section. The absence of drinking water wells in the area is consistent with fact that water in the area surrounding the subject property is supplied by the City of Homer from the Bridge Creek Reservoir. The reservoir is located approximately 2.3 miles to the north and at a considerably higher elevation than the subject property. The Bridge Creek Reservoir is not considered a potential receptor for contamination originating at the subject property.

Estimate Quantity of Impacted Soil

Based on field observations and laboratory results several areas within subject property are impacted by hydrocarbon contamination at concentrations exceeding ADEC cleanup levels. These areas include the former dispenser island, which is impacted by DRO, but not by benzene; The vicinity of the former USTs located to the west of the New Garage building, which is impacted by DRO, GRO and BTEX constituents; and the area south of the New Garage building which is impacted by DRO and benzene. Test pit TP5 was advanced to the southeast of the New Garage building and was only impacted by benzene at concentrations greater than the ADEC cleanup criteria. The total quantity of soil at the subject property that is impacted by hydrocarbons at a concentration greater than the ADEC cleanup criteria is estimated to be approximately 1,600 cubic yards.

Restoration Science & Engineering, LLC

David Nyman, PE
Nick Braman, Environmental Scientist/Chemist

References

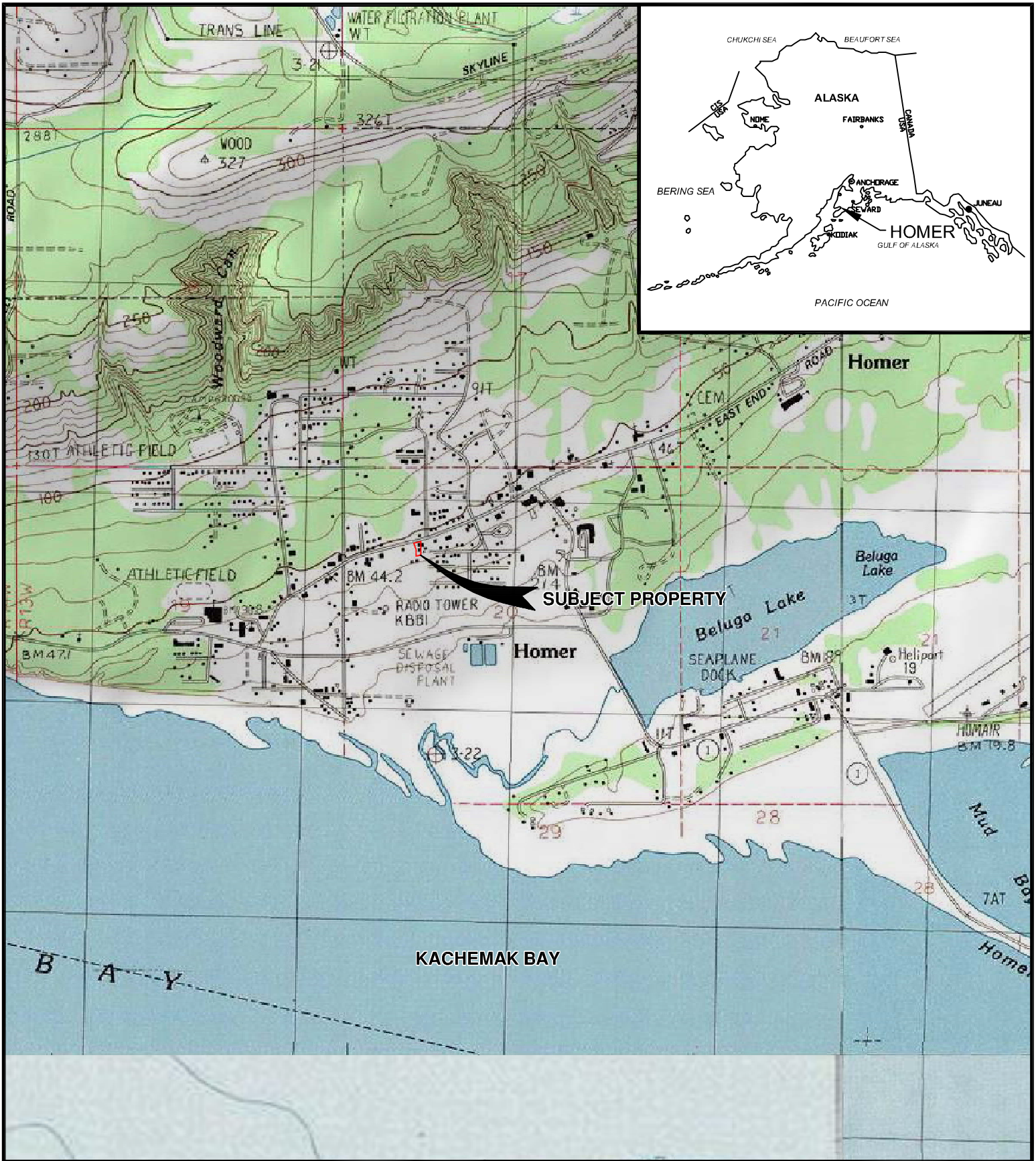
Waller, R.M., Feulner, A.J., Morris, D.A. "Water Resources and Surficial Geology of the Homer Area, South-Central Alaska" USGS Hydrologic Investigations Atlas HA-187. 1968.

May 18, 1970 Aerial Photograph, Aeromap.

Restoration Science and Engineering, "Revised Workplan for Underground Storage Tank Closure and Property Assessment", September 13, 2011.

International Consulting and Engineering, "Underground Storage Closure Report and Site Assessment", April 9, 2003.

Appendix A:
Figures



REFERENCE: NATIONAL GEOGRAPHIC TOPO! 2003

0 1000 2000 4000

SCALE IN FEET

N

305 E. PIONEER WORKPLAN
LOT 3A1 NILS O. SVEDLUND SUBDIVISION

VICINITY MAP

HOMER, ALASKA

JOB NO: 09-659	DRAWN: JRH
DATE: 10-21-2011	FILE: 305 E Pioneer TP Locations.DWG

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FIGURE 1

N

0 15 30 60

SCALE IN FEET

305 E. PIONEER WORKPLAN
LOT 3A1 NILS O. SVEDLUND SUBDIVISION

SITE LOCATION WITH AERIAL PHOTO

HOMER, ALASKA

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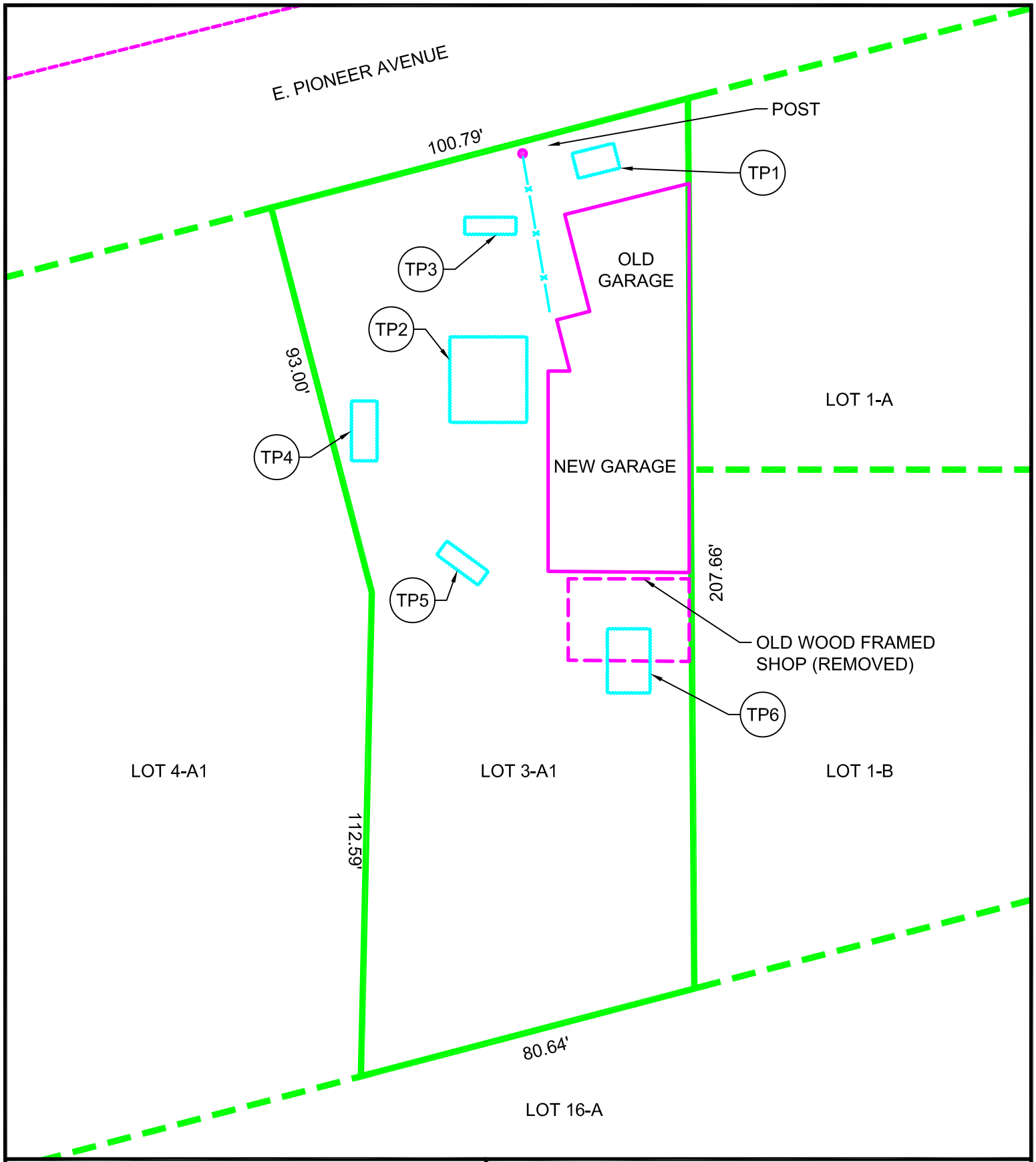
JOB NO: 09-659	DRAWN: JRH
DATE: 10-21-2011	FILE: 305 E Pioneer TP Locations.DWG

FIGURE 2



LEGEND:

TP1 APPROXIMATE TEST PIT LOCATION

0 15 30 60

SCALE IN FEET

N

305 E. PIONEER WORKPLAN
LOT 3A1 NILS O. SVEDLUND SUBDIVISION

SITE DIAGRAM

HOMER, ALASKA

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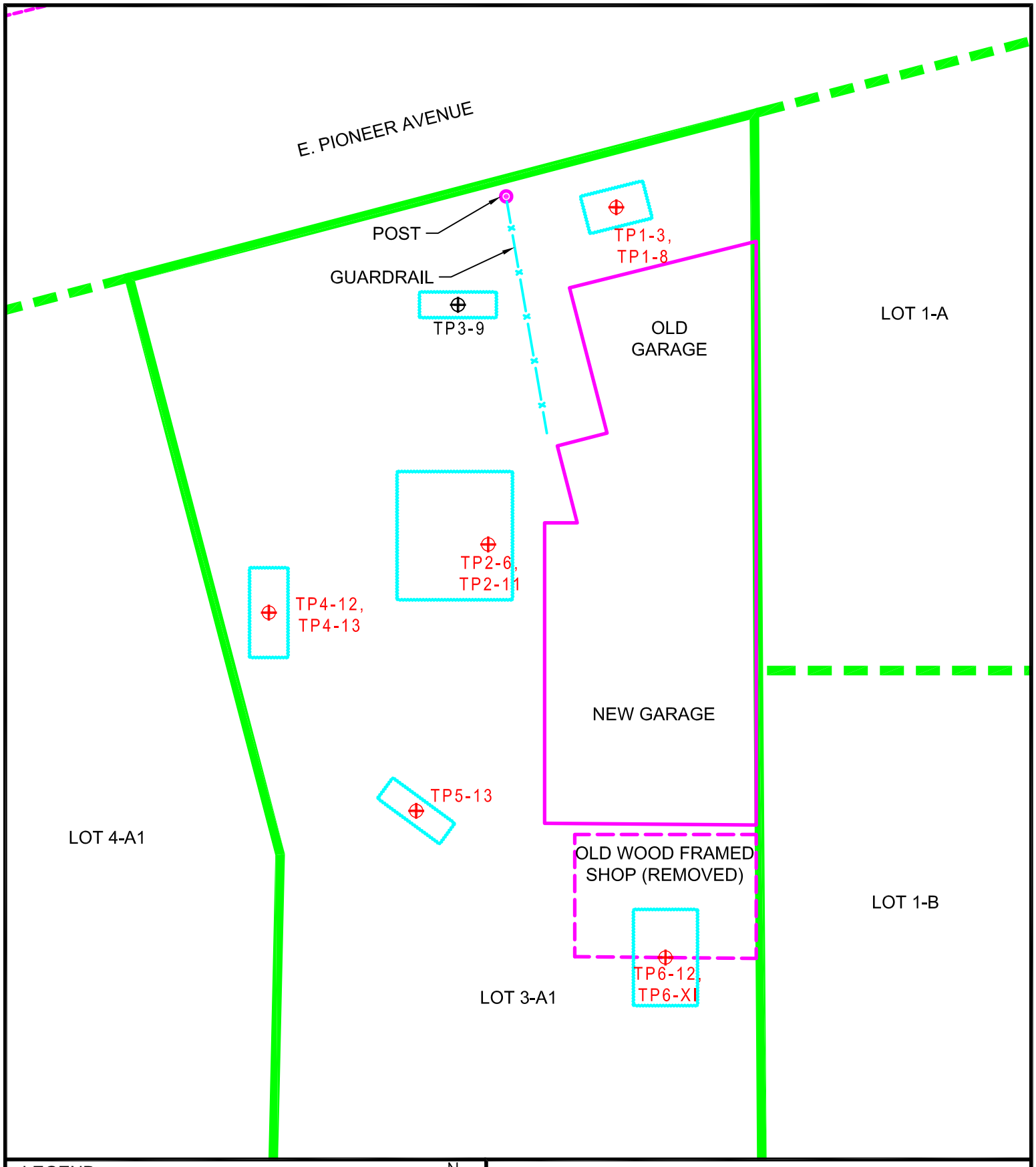
JOB NO: 09-659	DRAWN: JRH
DATE: 10-21-2011	FILE: 305 E Pioneer TP Locations.DWG

FIGURE 3



LEGEND:

RSE-1 **SOIL SAMPLE LOCATION**

RSE-1 **SOIL SAMPLE EXCEEDS ADEC CLEANUP CRITERIA**

0 10 20 40

SCALE IN FEET

N

305 E. PIONEER WORKPLAN
LOT 3A1 NILS O. SVEDLUND SUBDIVISION

SAMPLE LOCATIONS

HOMER, ALASKA

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JOB NO: 09-659	DRAWN: JRH
DATE: 10-21-2011	FILE: 305 E Pioneer TP Locations.DWG

FIGURE 4

Appendix B:
Tables

TABLE 1
LIMITED SITE ASSESSMENT, 305 EAST PIONEER
HEADSPACE CONCENTRATIONS IN SOIL
NOVEMBER 2011 REPORT DATE

HEADSPACE CONCENTRATIONS IN SOIL				
Screening Sample ID	**Date**	**PID Headspace Concentration (10.2 eV)**	**Depth Below Ground Surface**	**NOTES**
		(ppmv)	**(feet)**	
TP1-3	9/20/2011	606	3	(apparent fill) SW-SM
TP1-5	9/20/2011	0.0	5	(apparent fill) SW-SM
TP1-7	9/20/2011	1.2	7	(apparent fill) SW-SM
TP1-8	9/20/2011	44.1	8	(apparent fill) SW-SM
TP1-8	9/20/2011	66	8	(apparent fill) SW-SM
TP1-8	9/20/2011	5.8	8	(native materials) ML-SP
TP2-7.5	9/20/2011	2345	7.5	(apparent fill) SW-SM
TP2-6	9/20/2011	502	6	(apparent fill) SW-SM
TP2-11	9/20/2011	365	11	(native materials) ML-SP
TP3-9	9/20/2011	3.9	9	(apparent fill) SW-SM
TP4-11	9/20/2011	210	11	(apparent fill) SW-SM
TP4-13	9/20/2011	899	13	(native materials) ML-SP
TP5-11	9/20/2011	240	11	(apparent fill) SW-SM
TP5-13	9/20/2011	215	13	(native materials) ML-SP
TP6-6	9/21/2011	396	6	(apparent fill) SW-SM
TP6-10	9/21/2011	1005	10	(apparent fill) SW-SM
TP6-12	9/21/2011	713	12	(native materials) ML-SP

NOTES:
1) All field screening performed using a MiniRae Lite, Model PGM 7300 photoionization detector calibrated to 100 ppmv isobutylene.
2) Screening samples were warmed to approximately 60 °F before reading.
3) PID = photoionization detector, ppmv = parts per million by volume
4) Bold samples are associated with laboratory samples of the same name.
5) USCS symbols: SW = Well Graded Sand, SP = Poorly Graded Sand, SM = Silty Sand, ML = Silt

TABLE 2
LIMITED SITE ASSESSMENT, 305 EAST PIONEER
HYDROCARBON CONCENTRATIONS IN SOIL
NOVEMBER 2011 REPORT DATE

HYDROCARBON CONCENTRATIONS IN SOIL									
SAMPLE ID	**DATE**	**PID RESULTS**	**DIESEL RANGE ORGANICS**	**RESIDUAL RANGE ORGANICS**	**GASOLINE RANGE ORGANICS**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**TOTAL XYLENES**
		(ppmv)	**(mg/Kg)**	**(mg/Kg)**	**(mg/Kg)**	**(µg/Kg)**	**(µg/Kg)**	**(µg/Kg)**	**(µg/Kg)**
TP1-3	9/19/2011	606	***5160***	*1340*	*110*	***ND (34.1) R***	*67.7 J*	*704*	*991*
TP1-8	9/19/2011	5.8	***892***	*1460*	*1.71 J*	*ND (6.67)*	*ND (13.0)*	*ND (13.0)*	*ND (83.4)*
TP2-6	9/19/2011	502	***3680***	*130*	***789***	***8470***	***1350***	***38700***	***131905***
TP2-11	9/19/2011	365	***6570***	*612*	***2050***	***28000***	***64000***	***103000***	***511000***
TP3-9	9/19/2011	3.9	*76.5*	*156*	*ND (0.634)*	*5.07 J*	*ND (6.59)*	*ND (6.59)*	*ND (42.3)*
TP4-12	9/19/2011	210	***1270***	*81.0*	***1370***	***13400***	***141000***	***60800***	***276100***
TP5-13	9/19/2011	215	*193*	*764*	*7.90 J*	***859***	*36.2 J*	*77.0 J*	*1818*
TP6-12	9/19/2011	215	***39700***	*6800*	*40.0*	***428***	*ND (80.4)*	*91.5 J*	*4000*
TP6-XI	9/19/2011		***14700***	*2290*	*89.2*	***653***	*334*	*98.1 J*	*7760*
TP4-13[2]	9/19/2011	713	***1850***	*415*	***720***				
ADEC Method 2 soil cleanup levels for migration to groundwater			**250**	**11000**	**300**	**25**	**6500**	**6900**	**63000**

NOTES:

1) Gasoline Range Organics by Method AK 101**,** Diesel range organics analyses by Method AK 102, Residual Range Organics by Method AK103, BTEX (benzene, toluene, ethylbenzene and total xylenes) analyses by Method EPA 8021B.

2) Sample TP4-13 was analyzed for Volatile Organic Compounds by EPA 8260, VOC results are provided in Table 3.

3) The J flag indicates that the result is an estimated value.

4) ND indicates that the analyte was not detected. The limit of detection is given in parantheses.

5) **Bold Text** indicates that a sample result is greater than the ADEC cleanup levels.

6) The **R** flag indicates that the this data point has been rejected. The limit of detection associated with the non-detection of benzene in this sample is greater than the ADEC cleanup criteria: benzene may be present at concentrations greater than the ADEC cleanup criteria at this location.

7) ppmv= parts per million by volume, mg/Kg = milligrams per kilogram, µg/Kg = micrograms per kilogram

TABLE 3

LIMITED SITE ASSESSMENT, 305 EAST PIONEER
VOC CONCENTRATIONS IN SOIL
NOVEMBER 2011 REPORT DATE

HYDROCARBON CONCENTRATIONS IN SOIL					
SAMPLE ID	**VOLATILE ORGANIC COMPOUNDS BY METHOD 8260 ANALYTES**	**RESULT**	**LIMIT OF QUANTITATION**	**LIMIT OF DETECTION**	**ADEC CLEANUP CRITERIA**
		(µg/Kg)		**(µg/Kg)**	**(µg/Kg)**
TP4-13	1,1,1,2-Tetrachloroethane	ND	272	*84.9*	*NA*
	1,1,1-Trichloroethane	ND	272	*84.9*	*18*
	1,1,2,2-Tetrachloroethane	ND	544	*163*	*17*
	1,1,2-Trichloroethane	ND	272	*84.9*	*18*
	1,1-Dichloroethane	ND	272	*84.9*	*NA*
	1,1-Dichloroethene	ND	272	*84.9*	*NA*
	1,1-Dichloropropene	ND	272	*84.9*	*NA*
	1,2,3-Trichlorobenzene	ND	544	*163*	*NA*
	1,2,3-Trichloropropane	ND	272	*84.9*	*0.53*
	1,2,4-Trichlorobenzene	ND	272	*84.9*	*850*
	1,2,4-Trimethylbenzene	**61700**	5440	*1630*	***23000***
	1,2-Dibromo-3-chloropropane	ND	1090	*338*	*NA*
	1,2-Dibromoethane	ND	272	*84.9*	*NA*
	1,2-Dichlorobenzene	ND	272	*84.9*	5100
	1,2-Dichloroethane	ND	272	*84.9*	2500
	1,2-Dichloropropane	ND	272	*84.9*	18
	1,3,5-Trimethylbenzene	14000	272	*84.9*	23000
	1,3-Dichlorobenzene	ND	272	*84.9*	33
	1,3-Dichloropropane	ND	272	*84.9*	*NA*
	1,4-Dichlorobenzene	ND	272	*84.9*	640
	2,2-Dichloropropane	ND	272	*84.9*	*NA*
	2-Butanone (MEK)	ND	2720	849	59000
	2-Chlorotoluene	ND	272	*84.9*	*NA*
	2-Hexanone	ND	2720	849	*NA*
	4-Chlorotoluene	ND	272	*84.9*	*NA*
	4-Isopropyltoluene	694	272	849	*NA*
	4-Methyl-2-pentanone (MIBK)	ND	2720	849	8100
	Benzene	**14300**	136	42.5	**25**
	Bromobenzene	ND	272	84.9	*NA*
	Bromochloromethane	ND	272	84.9	*NA*
	Bromodichloromethane	ND	272	84.9	44
	Bromoform	ND	272	84.9	340
	Bromomethane	ND	2180	675	*NA*

NOTES:

1) The J flag indicates that the result is an estimated value.
2) ND indicates that the analyte was not detected. The limit of detection is given in parantheses.
3) **Bold Text** indicates that a sample result is greater than the ADEC cleanup levels.
4) µg/Kg = micrograms per kilogram

TABLE 3
LIMITED SITE ASSESSMENT, 305 EAST PIONEER
VOC CONCENTRATIONS IN SOIL
NOVEMBER 2011 REPORT DATE

HYDROCARBON CONCENTRATIONS IN SOIL					
SAMPLE ID	**VOLATILE ORGANIC COMPOUNDS BY METHOD 8260 ANALYTES**	**RESULT**	**LIMIT OF QUANTITATION**	**LIMIT OF DETECTION**	**ADEC CLEANUP CRITERIA**
		(µg/Kg)		**(µg/Kg)**	**(µg/Kg)**
TP4-13	Carbon disulfide	ND	1090	338	12000
	Carbon tetrachloride	ND	272	84.9	23
	Chlorobenzene	ND	272	84.9	630
	Chloroethane	ND	2180	675	32
	Chloroform	ND	272	84.9	460
	Chloromethane	ND	272	84.9	*NA*
	cis-1,2-Dichloroethene	ND	272	84.9	16
	cis-1,3-Dichloropropene	ND	272	84.9	33
	Dibromochloromethane	ND	272	84.9	*NA*
	Dibromomethane	ND	272	84.9	*NA*
	Dichlorodifluoromethane	ND	544	163	140000
	Ethylbenzene	**39200**	2720	849	**6900**
	Hexachlorobutadiene	ND	544	163	120
	Isopropylbenzene (Cumene)	4360	272	84.9	5100
	Methylene chloride	ND	1090	338	210
	Methyl-t-butyl ether	ND	1090	338	1300
	Naphthalene	9810	544	163	20000
	n-Butylbenzene	3240	272	84.9	15000
	n-Propylbenzene	11200	272	84.9	15000
	o-Xylene	58000	2720	849	63000
	P & M -Xylene	**134000**	5440	1630	**63000**
	sec-Butylbenzene	1120	272	84.9	12000
	Styrene	ND	272	84.9	960
	tert-Butylbenzene	ND	272	84.9	12000
	Tetrachloroethene	ND	136	42.5	24
	Toluene	**122000**	2720	849	**6500**
	trans-1,2-Dichloroethene	ND	272	84.9	370
	trans-1,3-Dichloropropene	ND	272	84.9	33
	Trichloroethene	ND	136	42.5	*NA*
	Trichlorofluoromethane	ND	544	163	86000
	Vinyl chloride	ND	272	84.9	8.5
	Xylenes (total)	**192000**	10900	3380	**63000**

NOTES:

1) The J flag indicates that the result is an estimated value.
2) ND indicates that the analyte was not detected. The limit of detection is given in parantheses.
3) **Bold Text** indicates that a sample result is greater than the ADEC cleanup levels.
4) µg/Kg = micrograms per kilogram

Appendix C:
Selected Site Photographs

Photo 1. Subject Property (Looking South)

Photo 2. Subject Property (Looking Northeast)

Photo 3. Breaking Ground at Test Pit One (Looking South)

Photo 4. Wooden Crib in Test Pit One

Photo 5. Test Pit Two (Looking Southwest).

Photo 6. Typical Test Pit containing debris, including wiring, concrete, building materials and bricks.

Photo 7. Breaking Ground at Test Pit Six located to the South of the Garage (Looking North)

Photo 8. Debris and impacted soil encountered in Test Pit Six.

Appendix D:
Human Health Conceptual Site Model Graphic Form

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: 305 East Pioneer Avenue, Homer, Alaska
ADEC file # 2314.26.031

Completed By: Nick Braman
Date Completed: 10/20/11

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Current & Future Receptors: Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☐ Surface Soil (0-2 ft bgs)	☐ Direct release to surface soil — check soil									
	☐ Migration to subsurface — check soil									
	☐ Migration to groundwater — check groundwater									
	☐ Volatilization — check air									
	☐ Runoff or erosion — check surface water									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Subsurface Soil (2-15 ft bgs)	☐ Direct release to subsurface soil — check soil									
	☑ Migration to groundwater — check groundwater									
	☑ Volatilization — check air									
	☑ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Ground-water	☐ Direct release to groundwater — check groundwater									
	☑ Volatilization — check air	☑ soil	☑ Incidental Soil Ingestion		X	X	X			
	☐ Flow to surface water body — check surface water		☑ Dermal Absorption of Contaminants from Soil		X	X	X			
	☐ Flow to sediment — check sediment		☑ Inhalation of Fugitive Dust		X	X	X			
	☑ Uptake by plants or animals — check biota	☑ groundwater	☐ Ingestion of Groundwater							
	☐ Other (list):		☐ Dermal Absorption of Contaminants in Groundwater							
			☐ Inhalation of Volatile Compounds in Tap Water							
		☑ air	☑ Inhalation of Outdoor Air		X	X	X			
			☐ Inhalation of Indoor Air							
			☑ Inhalation of Fugitive Dust		X	X	X			
☐ Surface Water	☐ Direct release to surface water — check surface water	☐ surface water	☐ Ingestion of Surface Water							
	☐ Volatilization — check air		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Sedimentation — check sediment		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Sediment	☐ Direct release to sediment — check sediment	☐ sediment	☐ Direct Contact with Sediment							
	☐ Resuspension, runoff, or erosion — check surface water									
	☐ Uptake by plants or animals — check biota	☐ biota	☐ Ingestion of Wild or Farmed Foods							
	☐ Other (list):									

Revised, 10/01/2010

Appendix E:
ADEC Laboratory Data Review Checklist
And Laboratory Data

Laboratory Data Review Checklist

Completed by:	Nick Braman		
Title:	Environmental Scientist/Chemist	Date:	Oct 19, 2011
CS Report Name:	UST Closure Assessment, 305 E. Pioneer, Homer	Report Date:	
Consultant Firm:	Restoration Science and Engineering		
Laboratory Name:	SGS	Laboratory Report Number:	1114619
ADEC File Number:	2314.26.031	ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

(•) Yes ( ) No ( ) NA (Please explain.) Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

( ) Yes ( ) No (•) NA (Please explain) Comments:

Samples were not transferred.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Correct analyses requested?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

( ) Yes ( ) No (●) NA (Please explain) Comments:

All sample conditions were adequate for the analyses ordered.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Samples were erroneously labeled as being collected one day later than they actually were, sample dates provided on the laboratory report are one day ahead of the actual collection date.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality is not affected by erroneous sample dates.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

c. Were all corrective actions documented?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

See details on QC failures presented in later sections.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

b. All applicable holding times met?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

c. All soils reported on a dry weight basis?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

( ) Yes (•) No ( ) NA (Please explain) Comments:

SGS presents both a limit of quantification (LOQ) and a method detection limit (MDL). Sample results greater than the MDL but less than the LOQ are presented, but J flagged.

e. Data quality or usability affected? (Please explain)

Comments:

TP1-3 exhibited a non-detectable concentration of benzene with a MDL greater than the ADEC cleanup criteria. This result does not establish that benzene is not present at concentrations that may require remedial actions.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

ii. All method blank results less than PQL?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

iii. If above PQL, what samples are affected? Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain) Comments:

Sample met method blank criteria.

v. Data quality or usability affected? (Please explain) Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

○ Yes ○ No ◉ NA (Please explain) Comments:

No metals or inorganic analysis was performed on these samples.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

○ Yes ◉ No ○ NA (Please explain) Comments:

LCS/LCSD was not properly quantified due to a lack of surrogate caused by and instrument error. Several analyte recoveries were biased high in LCS/LCSD samples associated with the 8260 VOC analysis. The case narrative states that MIBK recovery was biased low, but this LCS was corrected.

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

vii. Data quality or usability affected? (Please explain) Comments:

LCS results were biased high, but the analyte was not detected in the affected samples, therefore data usability is unaffected.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

○ Yes ◉ No ○ NA (Please explain) Comments:

Many samples contained high concentrations of target analytes. Surrogate recoveries are affected both by co-elution of surrogate with target compounds (biased high) and due to sample dilutions necessary to analyze samples with high concentrations of target analytes.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain) Comments:

samples were not flagged due to failed surrogate recoveries because the concentrations of target analytes associated with failed surrogate recoveries were often significantly greater than the applicable ADEC cleanup criteria.

iv. Data quality or usability affected? (Use the comment box to explain.). Comments:

The data is considered useful for establishing that hydrocarbons at concentrations greater than the ADEC cleanup criteria is present at the respective sample locations.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

○ Yes ○ No ◉ NA (Please explain.) Comments:

One cooler was used for all samples.

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ○ NA (Please explain) Comments:

The large RPD is a result of the heterogeneous soil conditions observed on site.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ◉ No ○ NA (Please explain) Comments:

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

No decon blank was perfomed for this project.

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

○ Yes ○ No ○ NA (Please explain) Comments:

SGS presents both a limit of quantification (LOQ) and a method detection limit (MDL). Samples greater than the MDL but less than the LOQ are presented with "J" flags, indicating the quantity is an estimate detected below the LOQ. In all of these cases the MDL is less than the applicable cleanup standards, except as explained in 5(e), above. Many samples containing large quantities of BTEX constituents had MDLs or LOQs that were greater than the ADEC cleanup levels due to sample dilution [illegible] samples with high quantities of analytes. These samples are not affected by PQLs greater than the ADEC cleanup criteria, becuase the results themselves are greater than the ADEC cleanup criteria.

Reset Form

Appendix F:
Field Notes

CONTENTS

PAGE	REFERENCE	DATE

9/18/11 [struck through] dates are +1 day on sample labels due to bad wrist watch

9/19/11 ~~9/19/11~~ – 45°F & Rushing lightly

9/20/11

Arrived on site @ 7:30 met Eric soon after. Utility locates performed by Electric, Water/sewer, comm met w/ all locators on site

Talked w/ Scott Connolly (235-6183), Dan Aalfs agent @ Bay Realty next door gave us keys & mentioned Phase II's performed on his property & Kachemak Trust property @ the bottom of the hill

Sisters meeting @ 10:00, Broke ground @ dispenser island @ 10:10

Wood crib? discovered @ ~3ft bg – forms box about 8x3x4 w/ bottom around 7' bg Punched the bottom out & sampled below.

Scale: 1 square = ______

Location	PID
TP1-5	0.0
TP1-7	1.2
TP1-8	44.1

encountered relatively clean "confining" layer just under c/b

Location	PID
~~TP1~~-8 (wet)	66
TP~~1~~-3 (wet)	606! → 10:47
TP~~1~~-8 (confining)	5.8 → 10:49

Sheen formed when wood are exposed to precipitation

hot lens of impacted material just above c/b (6" thick layer)

Scale: 1 square = ______

TP2 - looks like sand clean fill ~~for first~~ some wood & large cobbles & sand. To 7.0 feet

Encountered french drain @ ~7.5' bg. & some water from foundation heavy staining just above water @ 7.5 ft. Native soil?

Location	PID
~~TP2-7.5~~	
TP2-7.5 →	2345 → ~~[illegible]~~

begin second section trench @ 50° to initial TP2 to achieve target depth. encountered positive impacted soil @ 6.5 ft. bg

we appear to have severed the building's water supply. we are pinching off both ends & marking the location

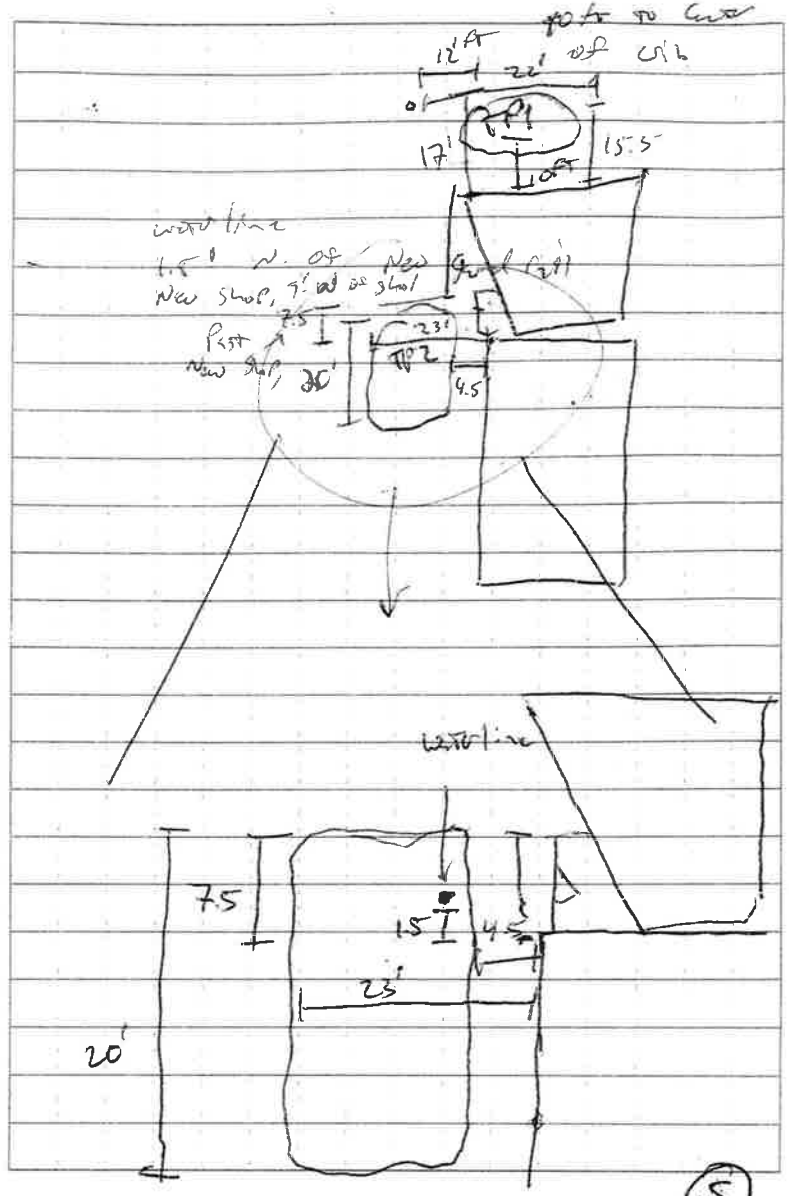
Scale: 1 square = ______

Location	PID	
TP2-6 (bot)	~~503~~ 502	→ 12:27
TP2-11	365	→ 12:30

marked the East end of the Broken water line w/ a metal T Bar & stick o' wood

native material below 10ft composed of mixed silt/clay/sand may serve as confining layer.

Scale: 1 square = _____



Scale: 1 square = _____

TP3 - fill w/ bis cobbles
uncompacted, unconsolidated backfill
water intrusion & unstable soil
looked clean, impacted soil right
on water

Location	PID
TP3-9	3.9 → 13:05

~~TP~~

TP2 was more consolidated
& had distinct layers, ~~[illegible]~~ wires,
concrete,

concrete metal tubing ~~TP4~~ ~~[illegible]~~ contained mixed
debris & materials, & piping. Impacted
material looks like it might be cast
in from neighboring historical excavation
consolidated, native soil @ ~13 ft bg
, ~~[illegible]~~ color

Scale: 1 square = ______

Location PID

	Location	PID
fill	TP4 - ~~12~~ 11	210 → 13:47
Native Soil	TP4 - 13	829 → 1400

Reached native soil (brown, [illegible])
@ ~13' bg; Sampled

Location	PID
~~TP5-11~~	~~340~~
TP5-13	215 → 14:37

Packed up site, filled in excavations
& smoothed w/ Excavator

Went back to lodge, finished field
notes, unpacked gear & samples, end
of day @ 17:30

MMB

Scale: 1 square = ______

9/21/11

~~9/20/11~~ Arrived onsite @ 9:15

Excavated TP6 20ft south of new sewer. TP6 contained mixed fill materials w/ hose, rocks & debris (car bumpers, etc.) & impacted soil

	Location	PID
dry	← TP6-~~8~~6	396
sand	← TP6-10	~~713~~ 1005
native	← TP6-12	713 → 9:48
organic	Duplicate TP6-X1	10:00

Located floor drain & used flourescent dye ~~to~~ in lifted manhole in the [illegible] End of factory & confirmed discharge to sewer. The process took longer than expected because the dye was difficult to see. Eventually drain discharge to sewer was verified by delivery ~35 through the clean out.

Left site @ ~ 15:00

End of Day

MB

8

Scale: 1 square = ____________

9/22/11

~~9/21/11~~

Drove locals to Airport @ 9:00 & left Home @9:30. Got back to Anchorage @ ~ 14:00, relabeled samples & put on fresh ice. End of Day @ 15:30

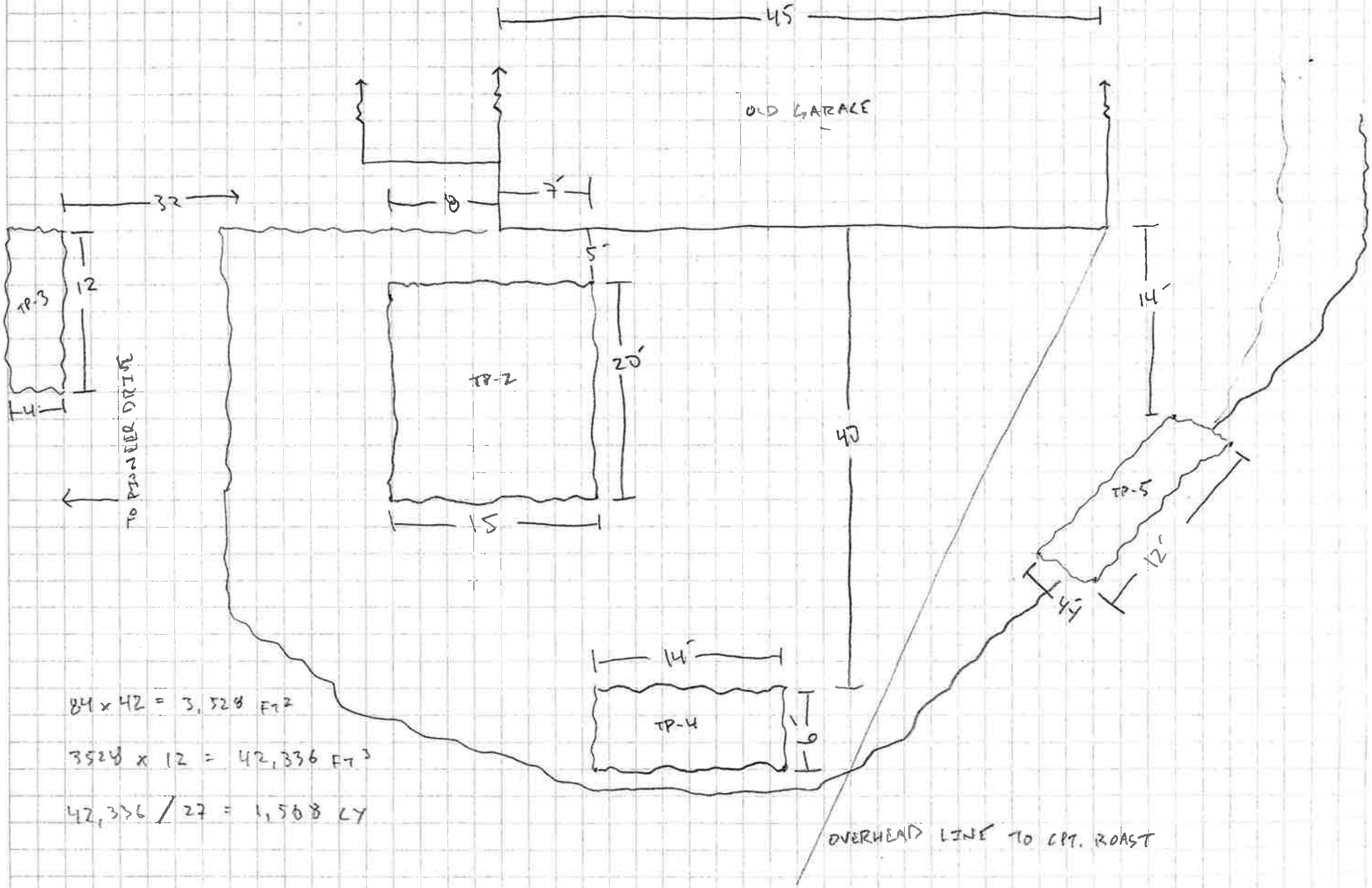
End of Day

MRS

Scale: 1 square = ____________

9

Rite in the Rain



84 x 42 = 3,528 FT²

3528 x 12 = 42,336 FT³

42,336 / 27 = 1,568 CY