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**Hydrocarbon Investigation
GTE McGrath Central Office
McGrath, Alaska**

July 21, 1999

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Prepared For:

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AGI Project No. 15,169.268



1.0 INTRODUCTION

This report presents results of an investigation into the nature, extent, and source of recently discovered contamination at GTE's Central Office site in McGrath, Alaska. McGrath is a small town located on the Kuskokwim River in central Alaska (Figure 1).

BACKGROUND

On June 22, 1999, a GTE crew and subcontractor with a backhoe were engaged at the site installing a new subsurface grounding system. The backhoe was utilized to excavate, trench, and backfill for the grounding system installation. During this work, contaminated soil, evidenced by strong petroleum vapors, was encountered at a depth of about 6 inches below ground surface (bgs). The work was stopped to allow the vapors to dissipate. The work resumed later in the day when conditions appeared safe. The grounding system was installed but the excavated area was not backfilled pending further investigation into the nature of the contamination.

PURPOSE AND SCOPE

The purpose of this investigation was to evaluate the extent and source of suspected petroleum hydrocarbon contamination. AGI's scope of services to complete this investigation included the following:

- Observing conditions and activities on the site and in the vicinity.
- Exploring subsurface and near surface soil conditions using backhoe and hand dug test pits.
- Field screening select soil samples for volatile organic compounds (VOCs).
- Analyzing select soil samples for gasoline, diesel, and motor oil-range petroleum hydrocarbons; benzene, ethylbenzene, toluene, and xylene (BETX); and priority pollutant VOCs.
- Researching well log data for the site vicinity.
- Researching known contaminated sites in McGrath that could have contributed to the discovered contamination.
- Preparing this report documenting our findings.



SITE FEATURES AND ENVIRONMENTAL SETTING

SITE DESCRIPTION

The GTE facility is located on the south side of a gravel frontage road that parallels the east-west runway at the McGrath airport. The parcel is 100 by 100 feet, or approximately 0.23 acre. The site is level and mostly covered by gravel that is utilized for parking. GTE maintains two structures on site: a 20-foot long trailer with communication equipment (Central Office), and a 20-foot by 18-foot wood-framed building with a dirt floor that is used to store communication equipment. Site features are shown on Figure 2 and site photographs are included in Appendix A. GTE has owned the property since July 1977 and does not, and reportedly has never, stored fuel or performed vehicle maintenance on site.

SITE VICINITY

The GTE site is bordered on the east by a pole barn owned by BJ Fuel (Appendix A, Photo 2). BJ Fuel maintains an 11,000-gallon aboveground unleaded gasoline fuel tank immediately off the southeast corner of the site. A radio station is south of the site. West of the site are an office and hangar for Redline Air Charter Service. To the north is the frontage road followed by the airport runway.

Three fuel lines, owned and operated by BJ Fuels, extend from the airport runway, beneath the frontage road, and then daylight just off the northeast corner of the GTE property (Appendix A, Photo 5). From that point, one aboveground fuel line extends south along the east edge of the property to the gasoline fuel storage tank south of the site. A tee-connection and valve on this line enables the above ground tank to be fueled directly from the runway and fuel from the tank to flow to the BJ Fuel gasoline pump approximately 250 feet east of the property. The second fuel line that extends from the runway terminates to a quick-connect at the northeast corner of the GTE property, and the third line leads east directly toward the BJ Fuel pump.

ENVIRONMENT

McGrath lies within a meander loop of the Kuskokwim River. The site is underlain by the river's flood deposits consisting of silt and silty gravel. The Kuskokwim River is used to barge supplies to McGrath, which serves as a distribution point to remote settlements.

Well log information for the area was obtained from the State of Alaska Department of Natural Resources and the U.S. Geological Survey, Water Resources Division. The information provided by these two agencies is included in Appendix B. Review of public well log information in the area indicates there are eight privately-owned domestic wells within the McGrath community. The city of McGrath owns three wells; two are listed as "unused" and one is listed as the public supply well. The FAA and local school have wells listed for "institutional" use. The FAA also has one well listed for public supply. The US Bureau of Land Management also has two wells for domestic and institutional use.

The well summary data indicates that drinking water wells tap the first encountered groundwater and that the depth to groundwater generally ranges from 5 to 20 feet below ground surface. The mean water level is about 12 feet bgs.



FIELD INVESTIGATION

AGI Technologies (AGI) arrived in McGrath June 26, 1999 to evaluate the contaminated area. At the time of our arrival the grounding system was installed and in service. The approximately 1-foot deep trench between the GTE storage building and the BJ Fuel Pole Barn was still open (Appendix A, Photos 4, 9, and 10). The apparent odor of petroleum fuel vapors could be detected in the area. Dead vegetation surrounded the fill port of the above ground tank located on the BJ Fuel property (Appendix A, Photos 7 and 8). Vegetation between the GTE storage building and BJ Fuel Pole Barn (Appendix A, Photo 9) was also dead. Containers with fuel absorbent materials and oil were situated at the north end of the BJ Fuel tank. These observations suggest fuel releases have occurred at the BJ Fuel property in these two areas.

Our field investigation included test pitting, collecting samples for laboratory analyses, and conducting field headspace screening for VOCs. Investigation methods are described below.

METHODS

Soil Sampling

A backhoe, owned and operated by Joel Collins of McGrath, was used to excavate three test pits surrounding the contaminated trench to observe soil conditions and collect soil samples for laboratory analysis. Test Pit 1 (TP1) was located at the northeast corner of the property, close to the contamination discovery. This test pit was terminated at 4.5-feet bgs, due to restrictions imposed by adjacent underground utilities. TP2, approximately 26 feet west of TP1, was terminated at 2.5-feet bgs. TP3, located 30 feet south of TP1, was terminated at 4.5-feet bgs. Samples were collected from each of the test pits. Additional samples were collected from hand dug holes inside the GTE storage building, the bottom of the trench, and of the trench soil stockpile. The following table identifies sample numbers, locations, and depths. Sample locations are shown on Figure 2.

Sample Number	Sample Location	Sample Depth (feet bgs)
S1	TP1	4.5
S2	TP1	1.0
S3	Trench floor, east side of storage building	0.5
S4	TP 2	2.5
S5	TP 3	4.5
S6	TP 3	1.0
S7	Floor of GTE storage building	0.5
S8	Floor of GTE storage building	0.5
S9	Floor of GTE storage building	0.5
S10	Trench soil stockpile	0.5



Soil Vapor Screening

Soil conditions along the east side of the GTE property, south of the Central Office building near the BJ Fuel piping and aboveground tank were explored using field screening methods. Eight soil samples were collected at a depth of 6 inches bgs using a decontaminated shovel. The samples were then field screened for VOCs as follows. Soil samples were placed in a plastic resealable bag and disaggregated; after approximately 5 minutes, the probe of an organic vapor meter equipped with a photoionization detector (OVM-PID) was inserted through the bag into the headspace above the soil and the maximum reading of headspace vapors was recorded. This is not a compound-specific analysis and is affected by, among other influences, climate (e.g., temperature and humidity), soil type and conditions, instrument calibration and operation, and type of petroleum hydrocarbon compounds present. The headspace samples, designated HS1 through HS8, were collected from a depth of 6 inches bgs. Sample locations are shown on Figure 2.

VOCs, at 213 parts per million (ppm), were detected in the headspace sample collected just north of the BJ Fuel aboveground gasoline tank (HS 5). VOCs were not detected in any of the other field-screened samples.



LABORATORY ANALYSIS

METHODS

The samples were submitted under chain-of-custody protocol to MultiChem Analytical Services (MAS) in Anchorage, Alaska and Renton, Washington for analysis. Samples S1 through S10 were analyzed for total petroleum hydrocarbons quantified as gasoline by Alaska Department of Environmental Conservation (ADEC) method AK-101 and for benzene, ethylbenzene, toluene, and total xylenes (BETX) by EPA method 8021M. Five samples (S1 through S3, S8, S9) were also analyzed for diesel-range petroleum hydrocarbons by ADEC method AK-102, and for oil-range petroleum hydrocarbons by ADEC method AK 103. One sample, S3, also was analyzed for priority pollutant VOCs by EPA method 8260B.

ANALYTICAL RESULTS

The laboratory reports are included in Appendix C and the analytical results are summarized in Tables 1 and 2. Gasoline-range petroleum hydrocarbons were detected in seven of the ten samples, ranging from 11 to 10,000 milligrams per kilogram (mg/kg). Diesel and motor oil-range petroleum hydrocarbons were detected in all five samples analyzed. Diesel concentrations ranged from 44 to 560 mg/kg. Motor oil concentrations ranged from 160 to 830 mg/kg. Benzene was detected in eight of the samples, ranging from 1.3 to 140 mg/kg. Ethylbenzene was detected in seven of the samples ranging from 0.33 to 250 mg/kg. Toluene was detected in nine of the samples, ranging from 0.021 to 1,100 mg/kg. Xylenes were detected in nine of the samples, ranging from 0.020 to 1,500 mg/kg. BETX concentrations were correspondingly high in samples that contained high concentrations of gasoline-range petroleum hydrocarbons.

The VOC analyses quantified BETX in S3 at similar concentrations as were quantified by EPA method 8021M. Several other benzene and toluene compounds were also quantified by this method including isopropylbenzene, *n*-propylbenzene, 1,2,4-trimethylbenzene, and *p*-isopropyltoluene. Detected concentrations ranged from 19 to 370 mg/kg. Some of these compounds (i.e. the 1,2,4-trimethylbenzene) are typical components of gasoline. Others may be present as additives in a fresh oxygenated gasoline product or have resulted as degradation products of gasoline. The VOC analysis does not indicate the presence of chlorinated solvents.



KNOWN CONTAMINATED SITES

ADEC provided a list of known contaminated sites in McGrath as identified in their Contaminated Sites Remediation Program, a copy of which is included in Appendix D. The list contains eight sites in McGrath as summarized below.

- Alaska Commercial Co. Store – 10,000 gallon spill of regular gas between a fuel storage tank and a pump at a joint just north of a boardwalk that passes in front of the store. Site adequately cleaned up per ADEC.
- FAA McGrath Air Sp. Building 406 – Diesel contaminated soil was encountered during a site assessment following removal of two underground storage tanks (USTs).
- Federal Aviation Administration RCAG Site – Contaminated soils were encountered during removal of two USTs.
- McGrath Airport – Approximately 50 gallons of jet fuel spilled on the asphalt when the hose came out of a tank. The incident is considered closed due to minimal impact from the spill.
- Water Treatment Plant – Approximately 5,000 gallons of diesel fuel was released from an above ground storage tank due to a broken pipe fitting. Approximately 900 gallons of product were recovered.
- McGrath Airport Fueling Pad – AvGas and MoGas contaminated soil identified in vicinity of fuel storage tanks. Groundwater is contaminated but drinking water supplies apparently are not affected.
- McGrath Airport Building 206 – DDT found in soil at the building during reclamation project. Soil was excavated and disposed.
- Alaska Commercial Properties Office, Warehouse, and Hangar – Approximately 80 cubic yards of diesel contaminated soil was identified. Drums and abandoned equipment were removed.

Based on our site reconnaissance and available information on the locations of these listed contaminated sites, none appear to be within close proximity to the GTE Central Office property. Therefore, potential impact to the GTE site from these known contaminated sites is low.



CONCLUSIONS AND RECOMMENDATIONS

The sample analytical results document that multiple releases of gasoline have migrated from the BJ Fuel property, onto GTE property. GTE has no history of, and does not currently store fuel, or perform vehicle maintenance on their property, and there is no reason to suspect that GTE is the source of the contamination. Gasoline was detected in samples of the dirt floor of the GTE storage building. Site workers have been instructed to properly vent the building before entering, and to not smoke in the storage building or near the fuel pipeline.

Two areas of the BJ fuel property appear impacted by gasoline spills: the area of the fuel pipeline quick connect and pipeline tee near the northeast corner of the GTE property and the area around the fill port at the north end of the BJ Fuel aboveground tank. Review of the analytical chromatograms and BETX concentrations indicates the gasoline sampled near the pipeline quick connect and tee is from a recent release, or from recent and long-term ongoing releases. Dead vegetation, field screening for VOCs, and the presence of spill cleanup materials at the north end of the BJ Fuel aboveground tank indicates gasoline was also recently released in that area. There are no secondary containment or other spill prevention devices surrounding this tank, and the fuel pipeline and pipeline couplings have no safety devices to prevent accidental discharges to the environment.

The highest concentrations of gasoline were detected in S3, which was collected within the trench near the BJ Fuel piping connections near the northwest corner of the GTE property, and S10, which was collected from the grounding trench spoils. Laboratory analyses also identified diesel and motor oil-range petroleum hydrocarbons in soils, although at lesser concentrations than were detected for gasoline. In most instances, detections of diesel-range petroleum hydrocarbons may be due to the gasoline peaks overlapping into the diesel range. However, motor oil appears to be a separate detected compound at this site. The types of products transferred through the fuel lines have not been established, and may have included petroleum products other than gasoline.

Following receipt of the preliminary analytical results, the contamination discovery was reported to ADEC on July 12, 1999. We recommend that a copy of this report be forwarded to the ADEC.

LIMITATIONS

This report has been prepared exclusively for GTE for this project only. The analyses, conclusions, and recommendations in this report are based on data described herein and on our experience and professional judgement. The data were either made available to AGI or reasonably obtained within the practical constraints of our scope of services. AGI cannot be responsible for the interpretation by others of the data contained herein.

We must presume the conditions encountered are representative as interpreted within this report. However, you should be aware that subsurface conditions may vary between exploration locations and with time, and unanticipated conditions can and do often occur.

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.



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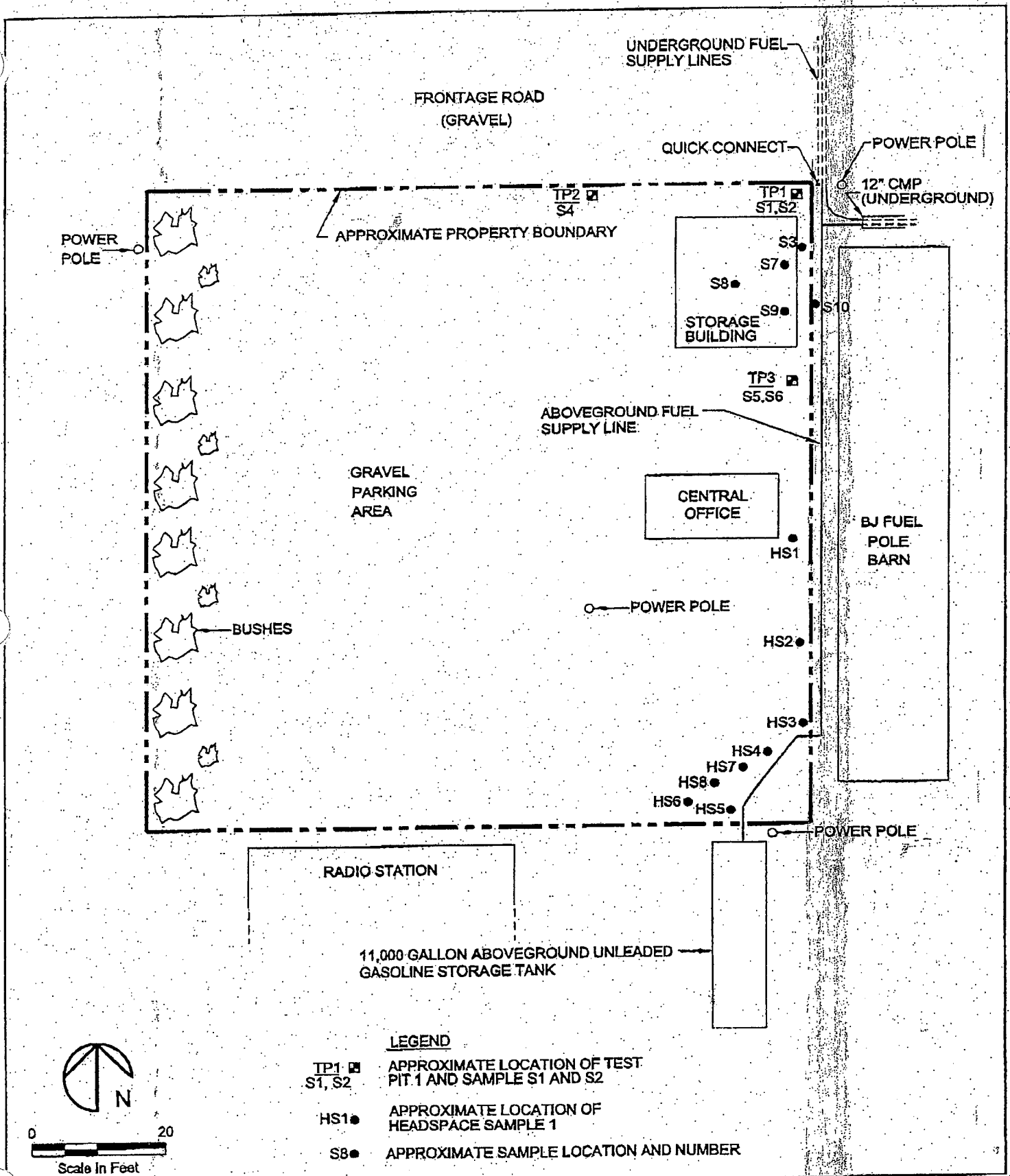
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Site Plan
GTE McGrath Central Office
McGrath, Alaska

FIGURE

2



Table 1
Analytical Results
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Sample I.D.	Date Sampled	EPA Test Method				Alaska Test Method		
		BETX 8021M				Total Petroleum Hydrocarbons		
		Benzene	Ethylbenzene	Toluene	Xylenes, Total	AK101 Gasoline	AK102 Diesel	AK103 Motor Oil
		mg/kg				mg/kg	mg/kg	mg/kg
4.5 S1	06/26/99	5.0	6.4	39	48	310	61	410
1.0 S2	06/26/99	1.8	0.33	11	14	75	61	830
0.5 S3	06/26/99	140	250	1,100	1,500	10,000	550	160
2.5 S4	06/26/99	<0.014	<0.017	0.021	0.020	<3.5	NA	NA
4.5 S5	06/26/99	<0.015	<0.019	<0.019	<0.019	<3.8	NA	NA
1.0 S6	06/26/99	1.6	<0.023	1.5	0.21	11	NA	NA
0.5 S7	06/26/99	0.068	0.020	0.098	0.24	<3.7	NA	NA
0.5 S8	06/26/99	2.6	4.1	28	34	220	130	570
0.5 S9	06/26/99	11	17	99	120	730	44	340
0.5 S10	06/26/99	12	110	360	820	3,800	NA	NA

Notes:

J - estimated value.

mg/kg - milligram per kilogram.

NA - sample not analyzed for this compound.

< - analyte not detected at concentrations equal to or greater than the stated concentration.

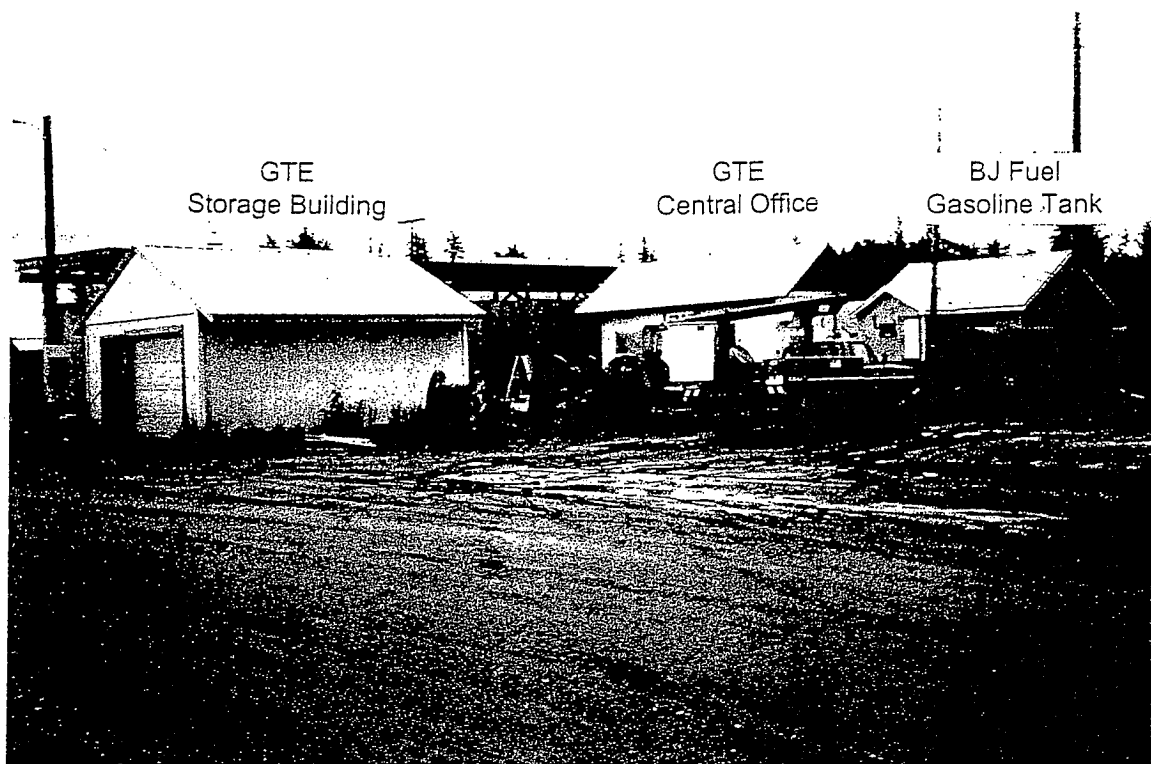


PHOTO-1: Site View Looking Southeast



PHOTO-2: Fuel Pole Barn and GTE Storage Building, Looking West

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PHOTOGRAPHS 1 and 2

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PHOTO-3: Site View Looking Northeast

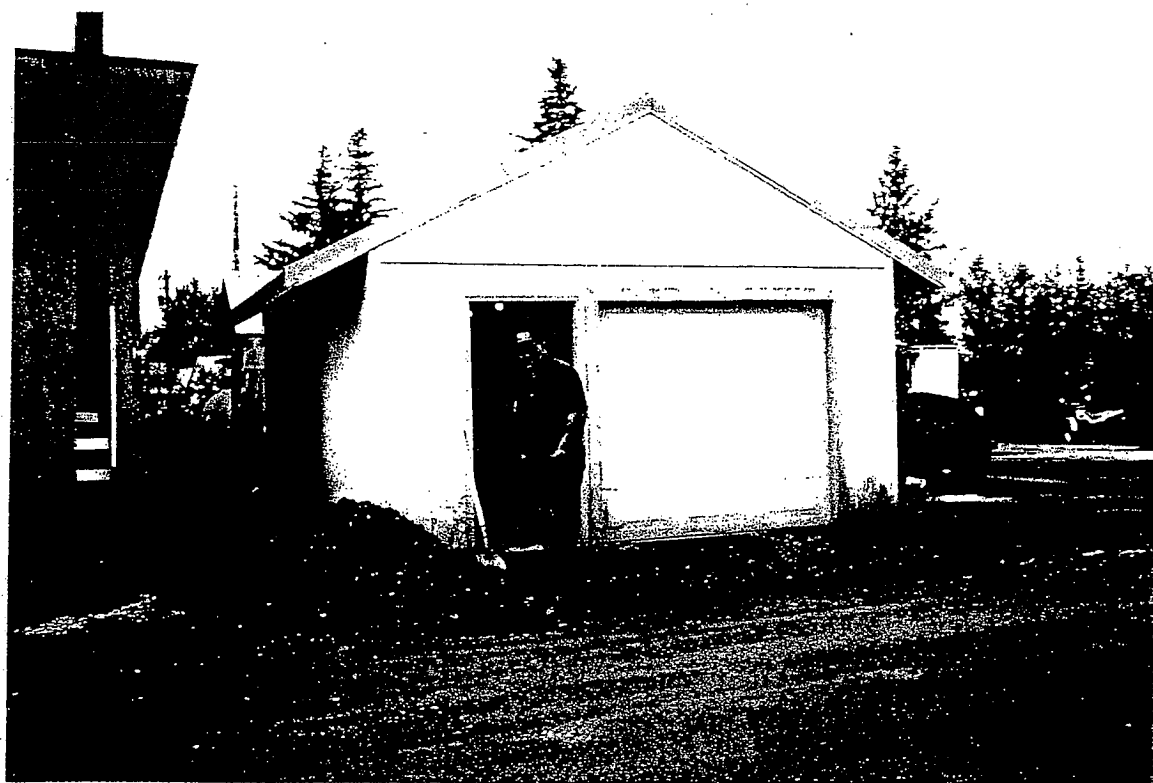


PHOTO-4: Contaminated Grounding Trench Between Storage Building And Pole Barn

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PHOTOGRAPHS 3 and 4

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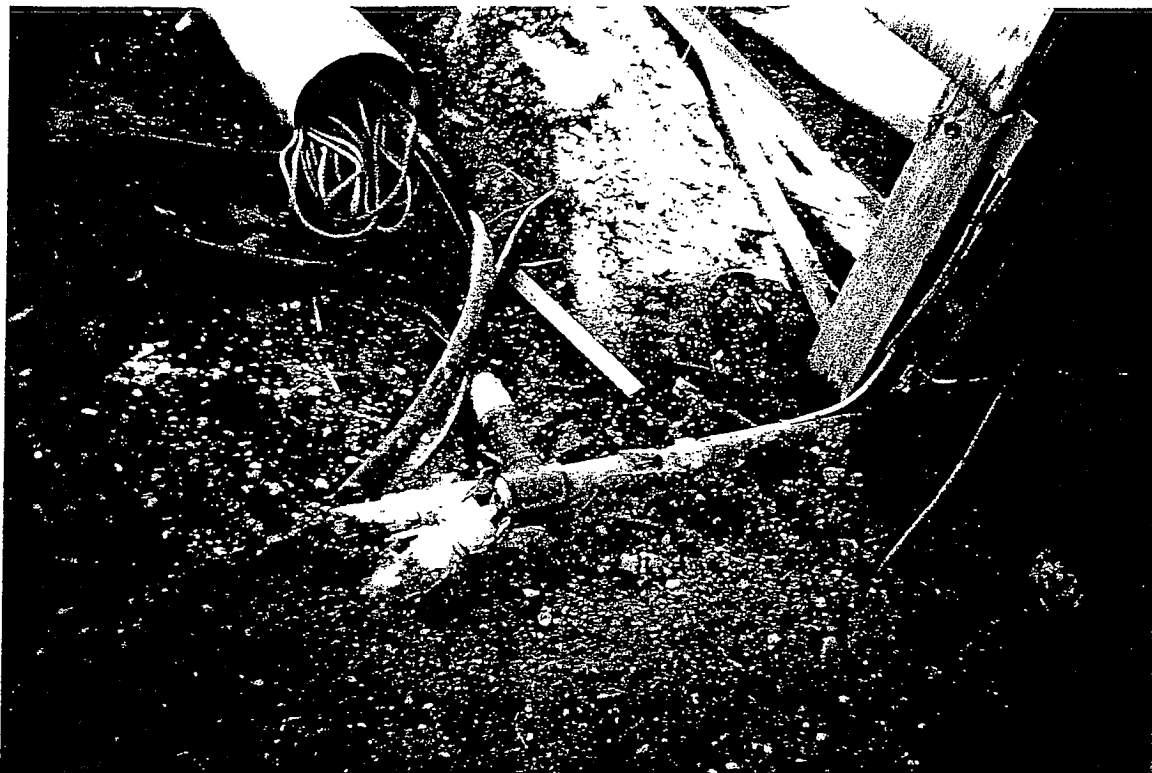


PHOTO-5: BJ Fuel Piping at Northeast Corner of GTE Storage Building



PHOTO-6: BJ Fuel Gasoline Storage Tank Located at Southeast Corner of GTE Site

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PHOTOGRAPHS 5 and 6

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PHOTO-7: Dead Vegetation at South End of BJ Fuel Tank



PHOTO-8: Dead Vegetation at North End of BJ Fuel Tank. Containers are Partially Filled with Fuel, Absorbent Pads and Water

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PHOTOGRAPHS 7 and 8

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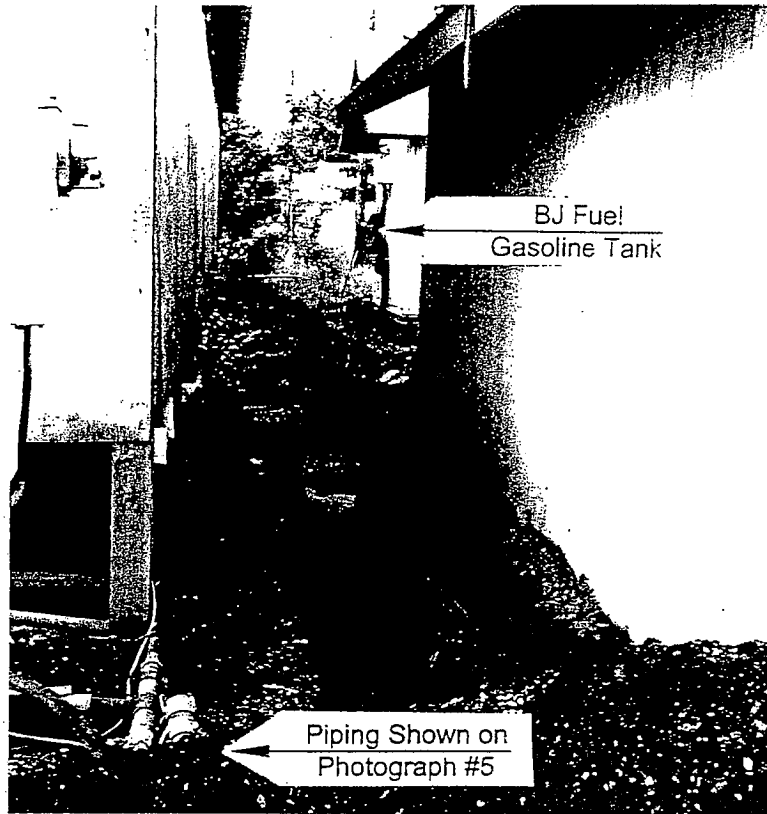


PHOTO- 9: Contaminated Grounding Trench Along East Side of GTE Storage Building
View Looking South

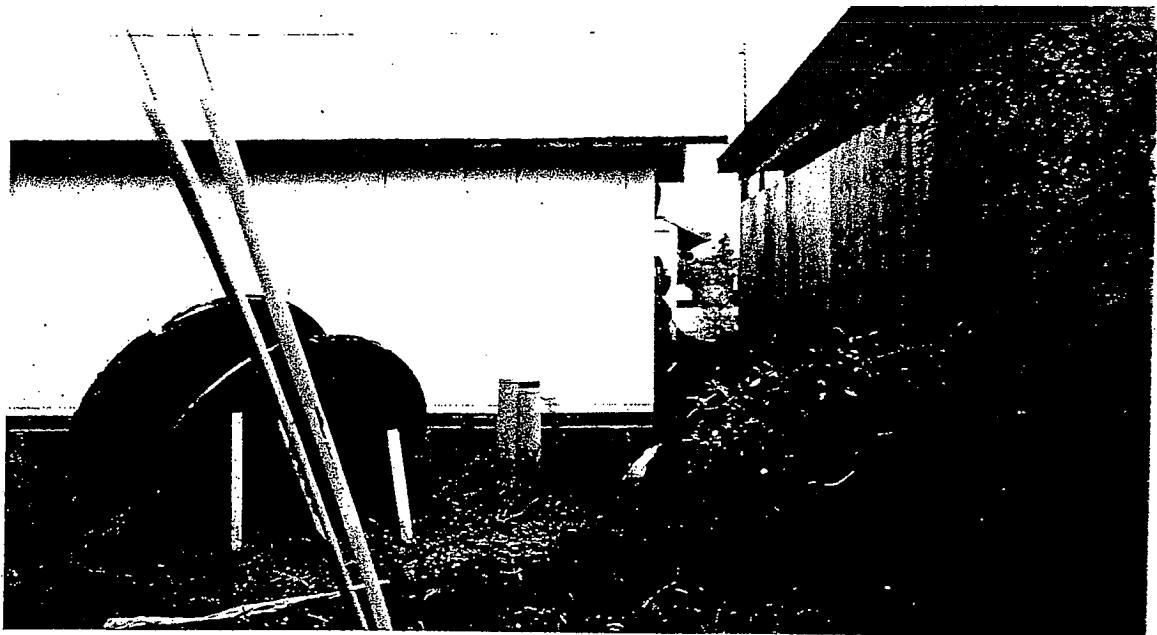


PHOTO-10: Contaminated Trench Area Between GTE Storage Building and BJ Fuel Pole Barn
View Looking North

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PHOTOGRAPHS 9 and 10

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