Work Plan
Site Investigation
Atlantic Public Water Supply
Atlantic, Iowa
F-07-8701-15/FIA0194SI
Site #Z34 Project #001
July 30, 1987
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AUG 4 1987

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SECTION 1: INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked the Ecology and Environment, Inc. Field Investigation Team (E&E/FIT) on October 31, 1986 to prepare a work plan and to assist the Iowa Department of Natural Resources (IDNR) in the evaluation of the source of groundwater contamination of the Atlantic Public Water Supply (PWS) in Atlantic, Iowa. The work plan, accomplished under Technical Directive Document (TDD) #F-07-8704-15 is presented in this report.

A soil-gas study, as proposed in this work plan, should define the approximate geographic extent of the groundwater plume associated with the tetrachloroethene (PCE) detected in the City of Atlantic's water supply. Several other organic contaminants were also detected in trace amounts in the city's water. These organic contaminants are listed later in this report (Table 1).

Presently the exact origin of the PCE is not known. Several possible source areas have been identified and will be investigated using soil-gas investigative methods. It is the objective of this investigation to locate the source(s) and extent of contamination.

SECTION 2: SITE DESCRIPTION

The City of Atlantic (population 8,000+) is located in southwest Iowa approximately 75 miles west of Des Moines, the state capital, and 45 miles northeast of Council Bluffs (Figure 1). Atlantic's drinking water is supplied by a field of 12 water wells, 9 of which are presently on line. The well field is located in the N 1/2, SW 1/4, Section 4 and the SW 1/4, NE 1/4, Section 4, T76N, R36W of the Atlantic and Wiota Quadrangle, Cass County, Iowa (Figure 1, Ref. 1 & 2).

Atlantic's water well field is located in the wide, deep, pre-glacial valley of the Nishnabotna River which flows southwestward across Cass County. The water well field is adjacent to Troublesome Creek, a tributary of the Nishnabotna River. The average elevation of the study area is approximately 1160 feet above mean sea level.

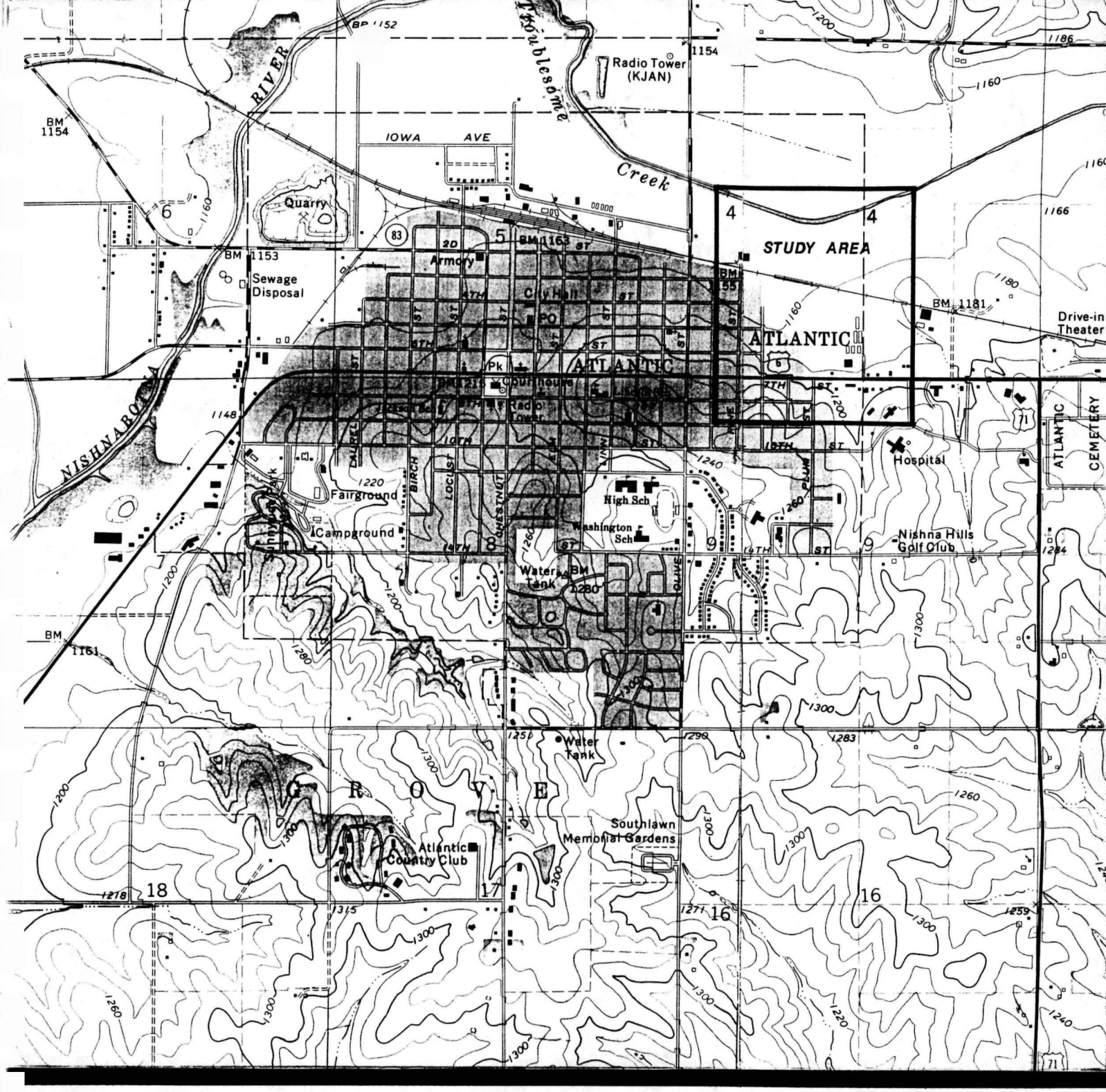


FIGURE 1 Site Location Atlantic, Iowa

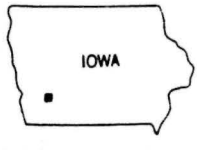
SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL



SITE LOCATION

(REF.1&2)

SECTION 3: GROUNDWATER CONTAMINATION

3.1 General History

Tetrachloroethene (PCE) was first observed in well #7 on August 26, 1982 with concentrations of PCE measured at 170 ppb. The periodic sampling of well #7 through June 10, 1987 has consistently shown concentrations ranging from of 150 ppb to 260 ppb of PCE. Additional contaminants observed in well #7 and several of the other municipal wells are trichloroethene, trans-1,2-dichloroethene, chloroform, and atrazine. Table 1 illustrates the sampling results chronologically from August, 1982 through June, 1987. The most recent sampling of the city's water wells was conducted on June 10, 1987 by the Iowa Department of Natural Resources (IDNR), and was observed by E&E/FIT. Eleven of the city's twelve wells were sampled. Well #5 is permanently capped and abandoned. This is due to the existence of an electric substation which now exists at this well location. Well #12 was installed to replace Well #5.

Organic contaminants have been detected in trace amounts in wells #2, #3, #8, #9, and #12. Wells #3 and #7 have been taken off the water system due to their elevated levels of contamination. From August, 1982 to January, 1986 well #7 was pumped at a rate of approximately 80 gallons per minutes (GPM) for 8 to 12 hours per day to Buttermilk Creek which serves as a drainage ditch for the surrounding area (Figure 2).

Well #7 was shut in for a period of three months from January, 1986 to April, 1986 during which time a solution for the contaminated well was sought. It was decided in March, 1986 that well #7 should be pumped to waste for 24 hours per day to Buttermilk Creek. It is anticipated that this procedure will halt or retard the further encroachment of the contamination plume from the southeast. Currently, well #7 is continually pumped to waste.

Table 1
Sample Results 8/82 - 6/87
Atlantic Public Water Supply

Well #	Trichloroethene							Tetrachloroethene							Chlorofrom							1-2 Dichloroethane							Atrazine					
	8-82	5-83	8-84	1-86	3-86	6-86	6-87	8-82	5-83	8-84	1-86	3-86	6-86	6-87	8-82	5-83	8-84	1-86	3-86	6-86	6-87	8-82	5-83	8-84	1-86	3-86	6-86	6-87	8-82	5-83	8-84	1-86	3-86	6-86
#1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NR	NR	NR	NR	NR	NR	<1	NR	NR	NR	NR	NR	NR	<1	*	*	*	*	*	*
#2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	NR	NR	<1	NR	NR	NR	<1	NR	NR	<1	NR	NR	NR	<1	*	*	*	*	*	*
#3	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	4	<1	<1	1	NR	NR	<1	NR	NR	NR	1	NR	NR	<1	NR	NR	NR	<1	*	*	*	*	*	*
#4	*	*	*	*	*	*	1	*	*	*	*	*	*	3	*	*	*	*	*	*	<1	*	*	*	*	*	*	<1	*	*	*	*	*	*
#5	WELL IS CAPPED AND ABANDONED																																	
#6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NR	NR	NR	NR	NR	NR	<1	NR	NR	NR	NR	NR	NR	<1	*	*	*	*	*	*
#7	<1	<1	2	1.1	<1	1	1	170	223	260	190	160	200	150	NR	NR	<1	NR	NR	NR	<1	NR	NR	<1	NR	NR	NR	1	*	*	1.7	*	*	*
#8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	NR	NR	<1	NR	NR	NR	<1	NR	NR	<1	NR	NR	NR	<1	*	*	*	*	*	*
#9	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	NR	NR	<1	NR	NR	NR	<1	NR	NR	<1	NR	NR	NR	<1	*	*	*	*	*	*
#10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NR	NR	NR	NR	NR	NR	<1	NR	NR	NR	NR	NR	NR	<1	*	*	*	*	*	*
#11	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NR	NR	NR	NR	NR	NR	<1	NR	NR	NR	NR	NR	NR	<1	*	*	*	*	*	*
#12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NR	NR	<1	NR	NR	NR	<1	NR	NR	<1	NR	NR	NR	<1	*	*	*	*	*	*

* = Not Tested
NR = Not Recorded

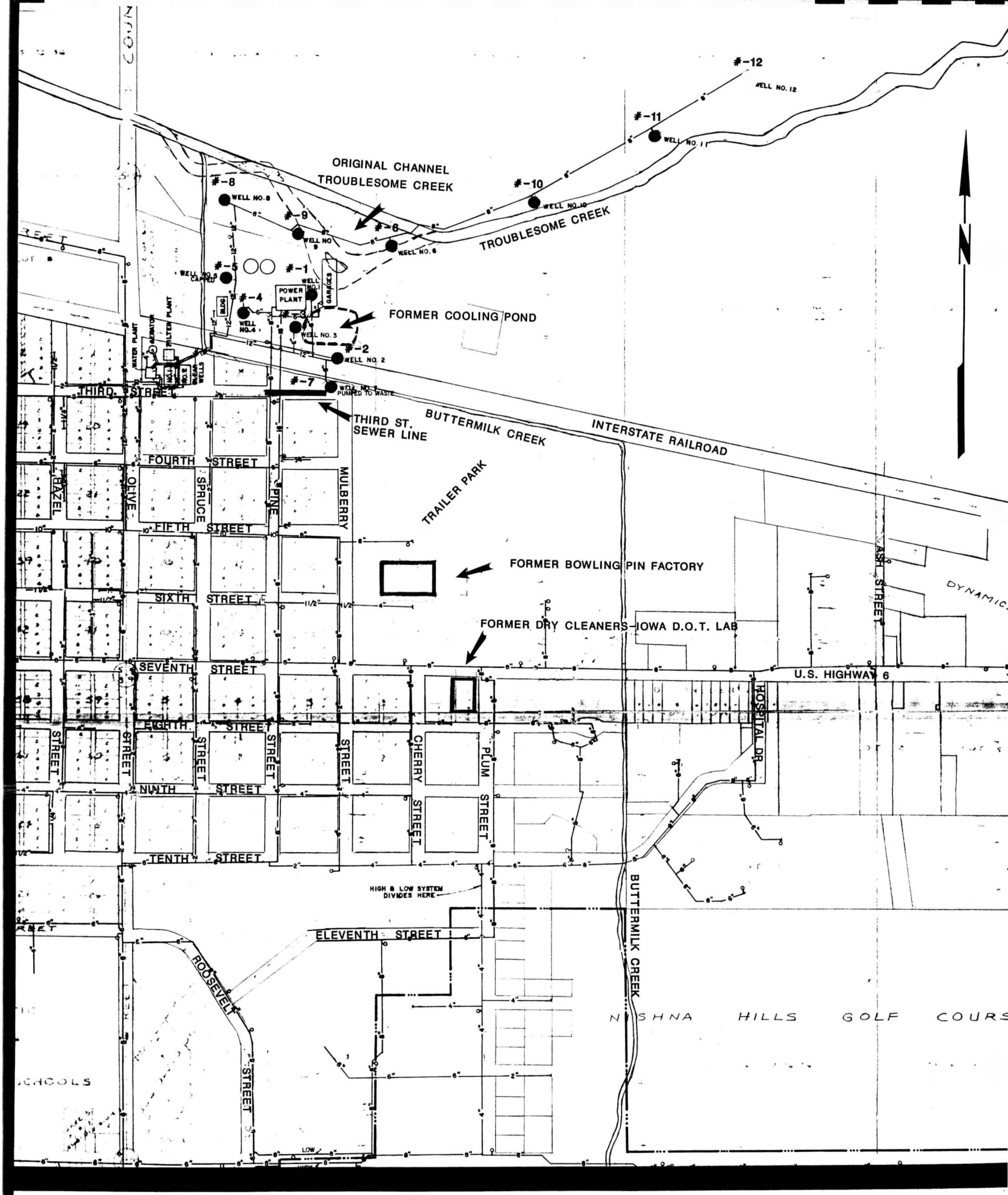


FIGURE 2
ATLANTIC, IOWA PUBLIC WATER SUPPLY WELLS

0 440 880 1760 3520 7040

SCALE 1"=440'

WELL LOCATIONS

— 6" — 8" — WATER MAINS

WATER SYSTEM MAP DRAWN BY KERN MILLER A.M.U.

REVISED P.C.DULA 7-20-87

3.2 Potential Sources of Contamination

Several sources of contamination have been suggested by Jean Carlton of IDNR - Des Moines (Ref. 3) and by Mr. Richard Stevens, Superintendent of the Atlantic Municipal Utilities (AMU) (Ref. 4). The source(s) of contamination is presently unknown. Possible sources (Figure 2) are:

- Power Plant - It is possible that the Atlantic Power Plant had, at some time in the past, a disposal area on-site. Well logs from wells #3 and #5 indicate fill material in the upper ten feet. Solvents may have been disposed of in the past on the property. The power plant also utilized a cooling pond on their property prior to 1960. Solvents may have been introduced to the pond and leached to the aquifer (Figure 2). Mr. Richard Stevens, Superintendent of AMU and Mr. William Hoeck, Water Manager, firmly believe that no chemical or solid wastes have ever been disposed of on the power company grounds (Ref. 4).

- Commercial Sites - Several gas stations, auto service and repair facilities are located within the drainage basin area of the site. Three former commercial sites are of special interest as they are located hydrologically upgradient and in close proximity to the contaminated wells. These sites are: the former dry cleaning facility which operated in Atlantic approximately 20 years ago. This facility was subsequently utilized by the Iowa Department of Transportation (IDOT) as a testing laboratory. The IDOT relocated their testing operations sometime in 1986 to a site east of Atlantic. It is suspected that solvents were routinely used in the dry cleaning business operations and in the daily functions of the IDOT test lab (Figure 2).

A bowling pin refinishing factory operated in Atlantic for several years in the area now occupied principally by a trailer park. This factory was consumed by fire several years ago. The exact dates of operation and ultimate destruction of the factory are presently unknown. It is suspected that solvents were utilized in the factory's operation (Figure 2).

° Sewer Line - A sewer line is located south of well #7 and is oriented east-west paralleling Third Street (Figure 2). This sewer line may serve as a conduit for contaminants from other areas of Atlantic.

° Railroad - The Iowa Interstate Railroad operates a line of the railroad north of Atlantic. The railroad line crosses the southern end of the water well field with well #7 juxtaposed to the south of the tracks. The remaining eleven wells are located north of the tracks (Figure 2).
This railroad line was formerly operated by the Chicago, Rock Island, and Pacific Railway (CRI&P). Mr. Richard Stevens, AMU Superintendent, has learned of three spills which occurred along this railroad line while the CRI&P were the owners. Presently records of these spills, if they exist, are being sought. It is believed that these spills occurred prior to 1969. Two of these spill involved a lost load of automobiles and a spill of molasses (Ref. 4).

SECTION 4: NATURE OF HAZARDOUS MATERIAL

Tetrachloroethene (syns.: PCE, perchloroethylene, perk, PERC, tetrachloroethylene, and 1,1,2,2,-tetrachloroethylene) is used as a dry cleaning solvent; textile scouring solvent; dried vegetable fumigant; rug and upholstery cleaner; stain, spot, and rust remover; printing ink ingredient; heat transfer media ingredient; metal degresser, and as a chemical intermediate in the production of other organic compounds.

PCE vaporizes easily and when carried by surface water, a large percentage of the PCE is lost through evaporation. It will generally leach through soils of low (<0.1%) organic carbon content. Prolonged exposure of PCE to light accelerates decomposition.

PCE can be carried up the food chain, it does not however, appear to biomagnify or concentrate as it moves up the food chain. It is generally eliminated rapidly from aquatic organisms and does not appear to affect aquatic plants. The following limits apply to fresh water aquatic life:

Acute toxicity - 5280 mg/l

Chronic toxicity - 840 mg/l

Limits to human life are for a lifetime advisory level in drinking water of 608 mg/l; cancer risk at 10^{-5} is 6.6 mg/l (Ref. 5).

SECTION 5: GEOLOGY

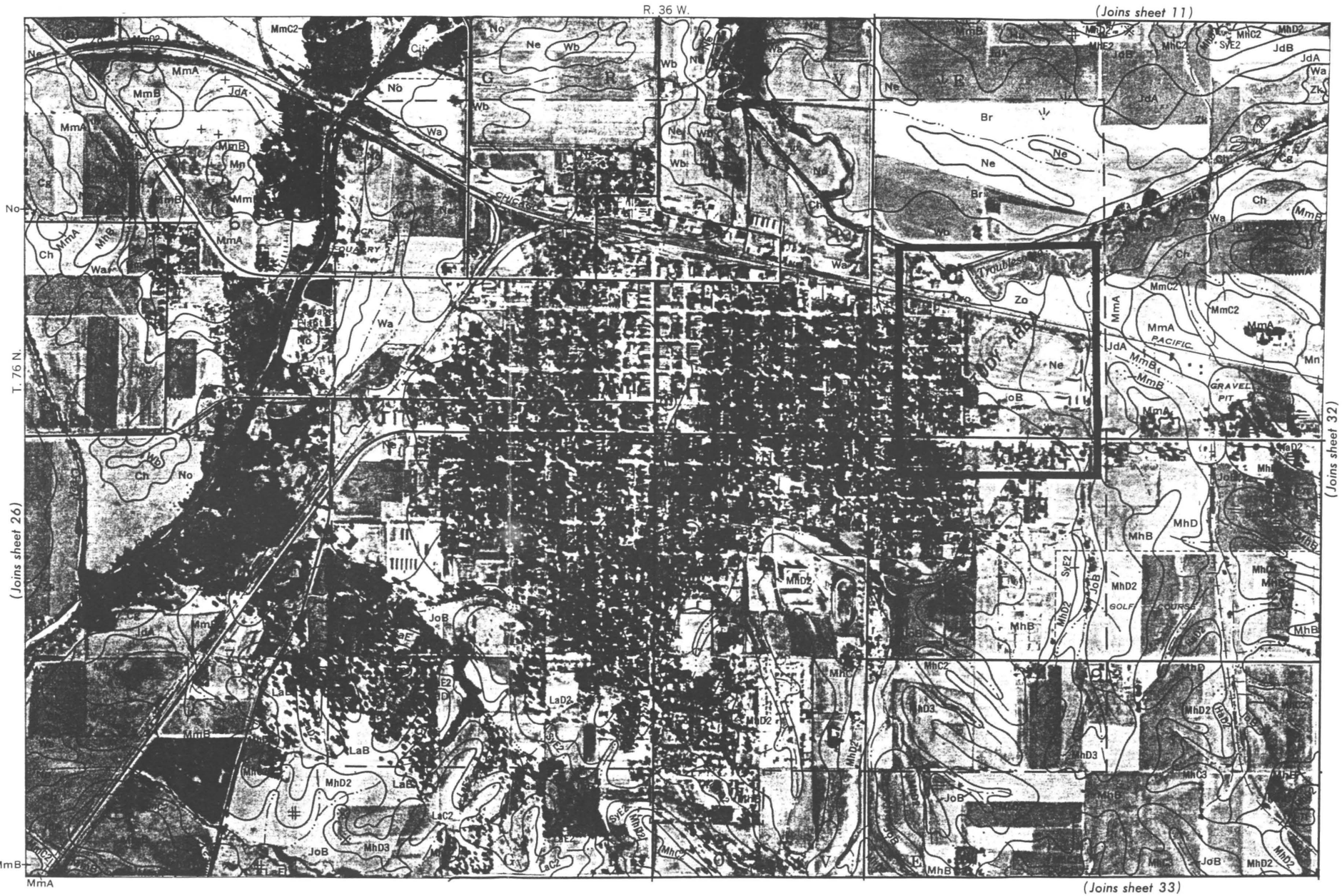
5.1 Topography and Drainage

The City of Atlantic, Iowa is located in northwest Cass County (Figure 1). Physiographically Atlantic lies in an extensive glacial drift plain, mantled with loess. The plain slopes gently toward the southwest and is cut by streams that flow south and southwest. All of the valleys of the larger streams have a well developed flood plain that is bordered by an older flood plain. The East Nishnabotna River borders the City of Atlantic to the west and northwest. Troublesome Creek, a tributary to the East Nishnabotna, borders the city to the north (Ref. 6).

The Atlantic PWS water well field is situated in the well developed flood plain of Troublesome Creek. The flow path of Troublesome Creek and several of it's tributaries (drainage ditches) have been artificially altered in the study area. Troublesome Creek was rerouted in 1945 by straightening its southern meander which was adjacent to the AMU cooling pond. The banks of Troublesome Creek are now located approximately 500 feet north of it's original location (Figure 2). Buttermilk Creek's natural flow has been altered by the railroad embankment of the Iowa Interstate R.R. which forces the creek's flow to the west. Buttermilk Creek resumes its northward flow to Troublesome Creek through the AMU grounds (Figure 2). The average elevation in the study area is 1160 feet above mean sea level.

5.2 Stratigraphy

Ten soil types have been mapped in the immediate and surrounding area of the Atlantic PWS. The units are: The Bener silty clay loam; the Colo silty clay loam; the Judson silt loam; the Marshall silty clay loam, with 9 to 14% slopes; the bench forming Marshall silty clay loam; the Nevin silty clay loam; the Nodaway silt loam; the Zook silt loam; the Zook silty clay loam; and the Wabash silty clay loam (Figure 3, Ref. 7).



LEGEND

Marshall-Bremer-Nevin
Nodaway-Zook-Colo

- Br - Bremer silty clay loam
- Cg - Colo silty clay loam
- JdA - Judson silt loam 0-2% slopes
- MhDz - Marshall silty clay loam 9-14% slopes, moderately eroded
- MmA - Marshall silty clay loam, benches, 0-2% slopes
- Ne - Nevin silty clay loam
- Nw - Nodaway silt loam, channeled
- Zk - Zook silt loam, overwash
- Zo - Zook silty clay loam
- Wb - Wabash silty clay loam

FIGURE 3 SOIL MAP ATLANTIC, IOWA

0 ½ Mile Scale 1:15840 0 3 000 Feet

(REF.7)

The soil types mapped here are classified in specific soil associations. The Marshall-Bener-Nevin Association is composed of nearly level, well drained to poorly drained soils on benches. The Wabash soil is also associated with this group. These soils are formed from loess and/or alluvium. The Nodaway-Zook-Colo Association is composed of nearly level moderatley well drained to poorly drained soils on bottom lands. The Wabash soil is also found in minor amounts with this group. The Judson silt loam mentioned earlier has 0 to 2% slopes and generally makes up alluvial fans below upland drainageways. The permeability range within these soils is 0.8 to 2.5 inches/hr (0.6×10^{-6} to 1.8×10^{-3} cm/sec) (Ref. 7).

In the valley of the East Nishnabotna River and Troublesome Creek the Pleistocene glacial drift generally lies unconformably on Pennsylvanian strata. Well logs from wells #8, 9, 10, 11, and 12 also indicate however, the presence of the Cretaceous Dakota Sandstone within the study area. This Cretaceous sandstone is discontinuous and lies unconformably below the Pleistocene glacial deposits and rests unconformably on the Pennsylvanian strata; here the later is chiefly a series of shales alternating with thinner beds of hard limestone (Missourian Stage [Figure 4]).

5.3 Hydrogeology

The water bearing beds utilized in Cass County are the alluvial sands and gravels, loessal sands, drift sands, the Dakota Sandstone and the limestone of the Missourian Stage. The Atlantic PWS receives it supply of water from the sands and gravels that fill the valley bottoms of the East Nishnabotna River and Troublesome Creek, to depths of 50 to 100 feet, and from the Dakota Sandstone. These sands and gravels afford an inexhaustable water supply at depths of 20 to 100 feet. The water-bearing bed is an angular grained white sand with some gravel and lies 50 to 86 feet below the surface. Above it are many layers of clayey silt alternating with beds of sand and gravel, some of which are water bearing. The aquifers of concern in the study area, the Pleistocene glacial drift and the Dakata Sandstone, are hydrologically connected and have a ground water flow direction to the northwest. Pump rates from wells in this shallow aquifer are from 300 to 500 gallons per minutes (gpm).

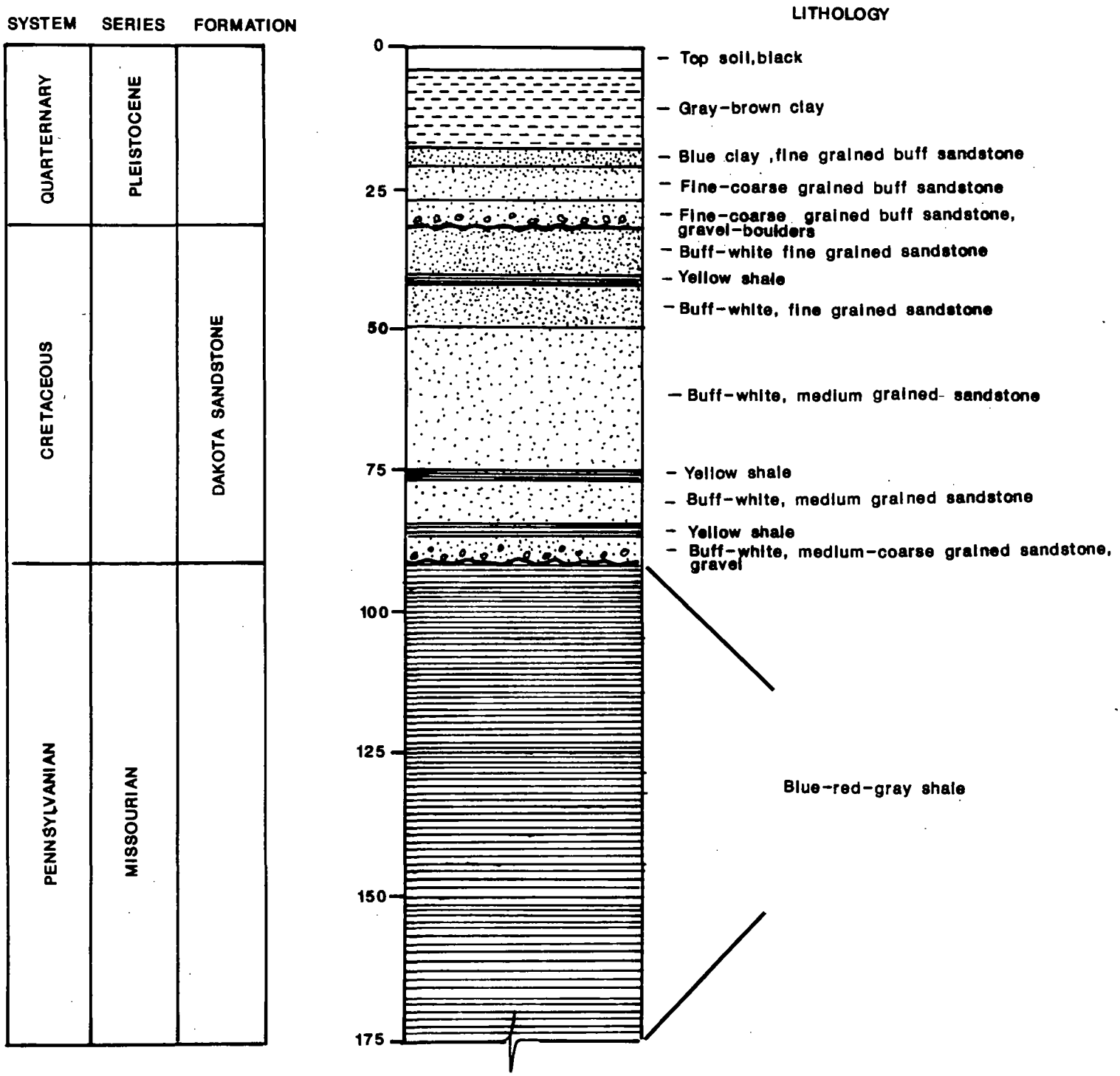


FIGURE-4 GENERALIZED STRATIGRAPHIC SECTION -ATLANTIC,IOWA

KEY

SHALE GRAVEL

CLAY SANDSTONE

VERTICAL SCALE 1"=25'

(REF.6)

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When not pumped, the water in the wells ordinarily stands 13 feet below the surface (Potentiometric Surface). This level varies with weather and rainfall. The wells respond within 24 hours to heavy rainfall and the rise of the river nearby, but the water level lowers much more slowly than it rises (Ref. 6).

SECTION 6: HRS CONSIDERATIONS

A draft HRS with no known source was prepared for the Atlantic PWS. Since no present data exists to prove a source of contamination, the HRS score is considered a draft score. The site investigative work will target all potential sources.

A groundwater release has been detected in the wells of the Atlantic PWS. PCE (tetrachloroethene) has been detected in elevated concentrations in wells #3 and #7.

Surface water in the vicinity of the well field has not been sampled and is not used for recreational purposes. Considering the detected concentrations the potential for a detectible release is very low.

The possibility of an air route is not known. The potential release from the groundwater (the only known source) to the air is nil considering the approximately 15 feet of cover material over the water table.

The draft HRS score for the Atlantic PWS is 22.32. This score is not high enough to warrant consideration for the NPL with the present documentation. This investigation will determine if there are additional factors to be considered.

SECTION 7: PROPOSED SITE INVESTIGATION

The main emphasis of the Atlantic Soil-Gas Survey will be to create a map of the tetrachloroethene (PCE) plume and to locate the source or sources of the contamination.

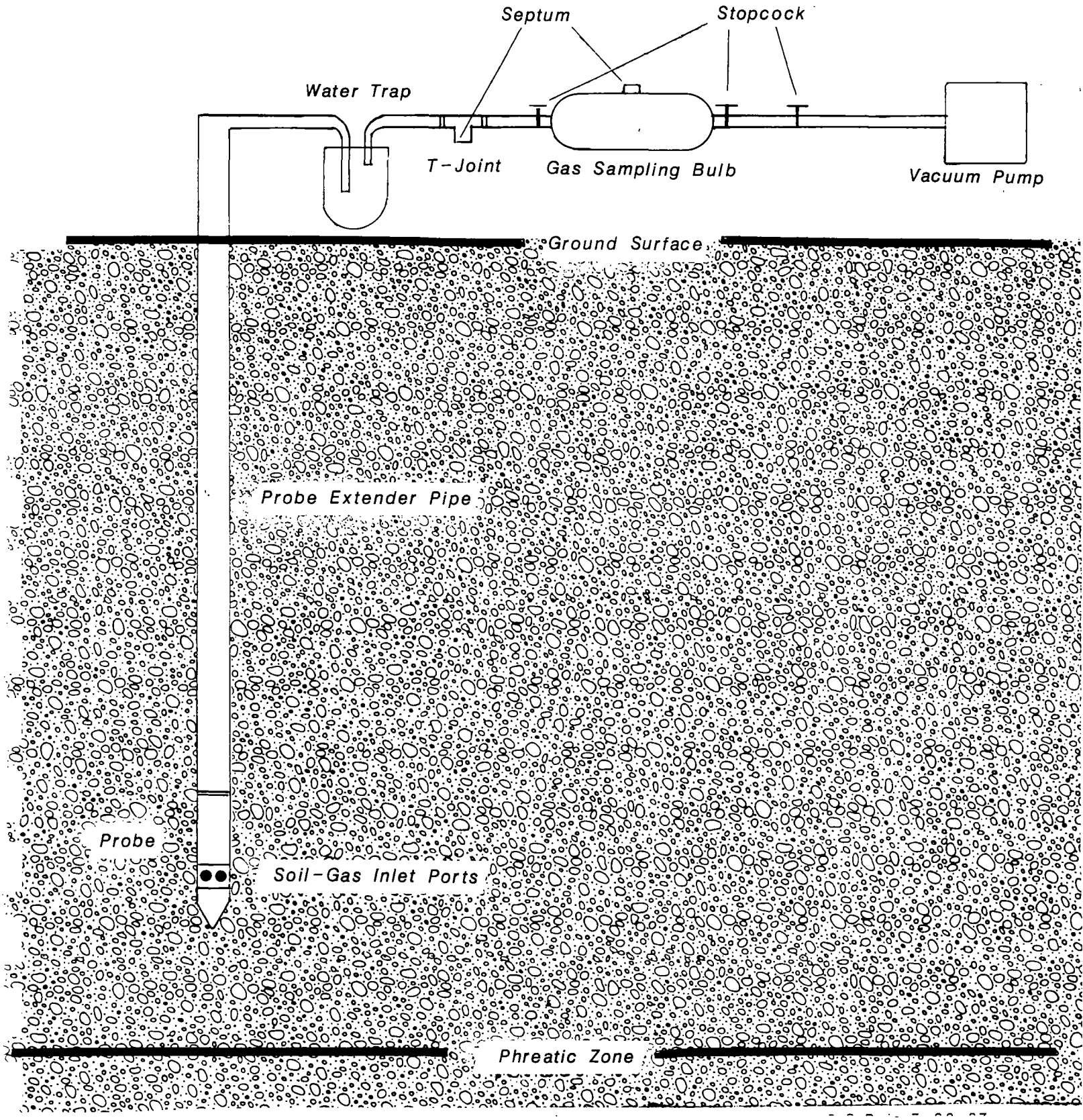
7.1 Soil-Gas Survey

Soil-gas samples will be collected by driving a hollow probe and pipe extenders to a depth of 5 to 10 feet, approximately 3 to 5 feet above the saturated (phreatic) zone. A small amount of air (10 to 20 liters) will be evacuated from the soil. A sample (1 ul to 2 ml) of the soil-gas will be collected in a syringe from the gas sampling bulb and immediately analyzed in a mobile laboratory (Figure 5). The complete operation of sampling, soil-gas analysis, and probe removal requires 20-30 minutes of time per sample. Typically 10-15 locations can be measured in a 10 hour day. Probes can be driven by hand and soil- gas extracted with a portable battery operated pump if vehicular access is not possible. The Region VII EPA CME-45 drill rig will be used to assist with probe insertion and removal. The black iron probes and extender pipe will be steam cleaned between probe locations Region VII soil-gas analyses and quality assurance procedures (QAP) for the AID-GC (Ref. 8) will generally be followed. Tetrachloroethene (PCE) will be the target compound of this soil-gas study. Any divergence from the QAP will be noted in the project logbook.

7.2 Soil-Gas Sampling Plan

The Atlantic Soil-Gas Survey will be divided into a series of three zones, Zones A, B, and C encompassing a total area of approximately 960,000 square feet. Each of these zones will undergo two phases of drilling, phases 1 and 2; with an optional third phase, phase 3, which will extend the study area if needed. E&E/FIT will commence the analysis in Zone A at the site of the former dry former

FIGURE 5 SOIL-GAS ANALYSIS SET-UP



dry cleaning business and the Iowa DOT Lab (Figure 6). Phase 1 drilling (open triangles) will concentrate in these possible source areas. If the analytic results are favorable, E&E/FIT will proceed to phase 2 (solid squares) which is designed to delineate the geographic extent of the PCE plume in Zone A. Phase 3 (solid triangles) will be utilized if necessary. If analytical results are inconclusive in phase I of Zone A than E&E/FIT will proceed to Zone B.

Upon completion of drilling activities in Zone A, E&E/FIT will commence drilling in Zone B. This zone covers the area formerly occupied by the bowling pin factory. Two phases of drilling, phase 1 and 2 will be used in Zone B with an optional third phase, phase 3, utilized if necessary. Phase 1 will concentrate on locating a possible source area. Phase 2 will try to establish the PCE plume boundaries in Zone B.

Zone C encompasses the area occupied by the Atlantic Power Plant and will be investigated last. The principal targets in Zone C are the former cooling pond site and the Third Street sewer line. The study sequence of phases 1, 2 and 3 utilized in Zones A and B will be followed in Zone C as well (Figure 6).

Probe locations in Zone A, B, and C are spaced approximately 200 feet apart. Adjustments in probe locations will be made as necessary. Data will be plotted in the field to determine completeness of coverage. An estimated 72 probe locations will be utilized in Phase 1 and 2. A choice of 92 optional probe sites have been located for the optional phase 3. If phase 3 of the study is needed it will require at least one additional week to complete the study. The study is anticipated to be completed utilizing phases 1 and 2.

7.3 Soil Samples

A maximum of ten subsurface samples will be collected if source area(s) can be located by the soil-gas survey. The Region VII EPA drill rig will be used to collect these samples to a maximum depth of 15 feet, via either split spoon samples or shelby tubes.

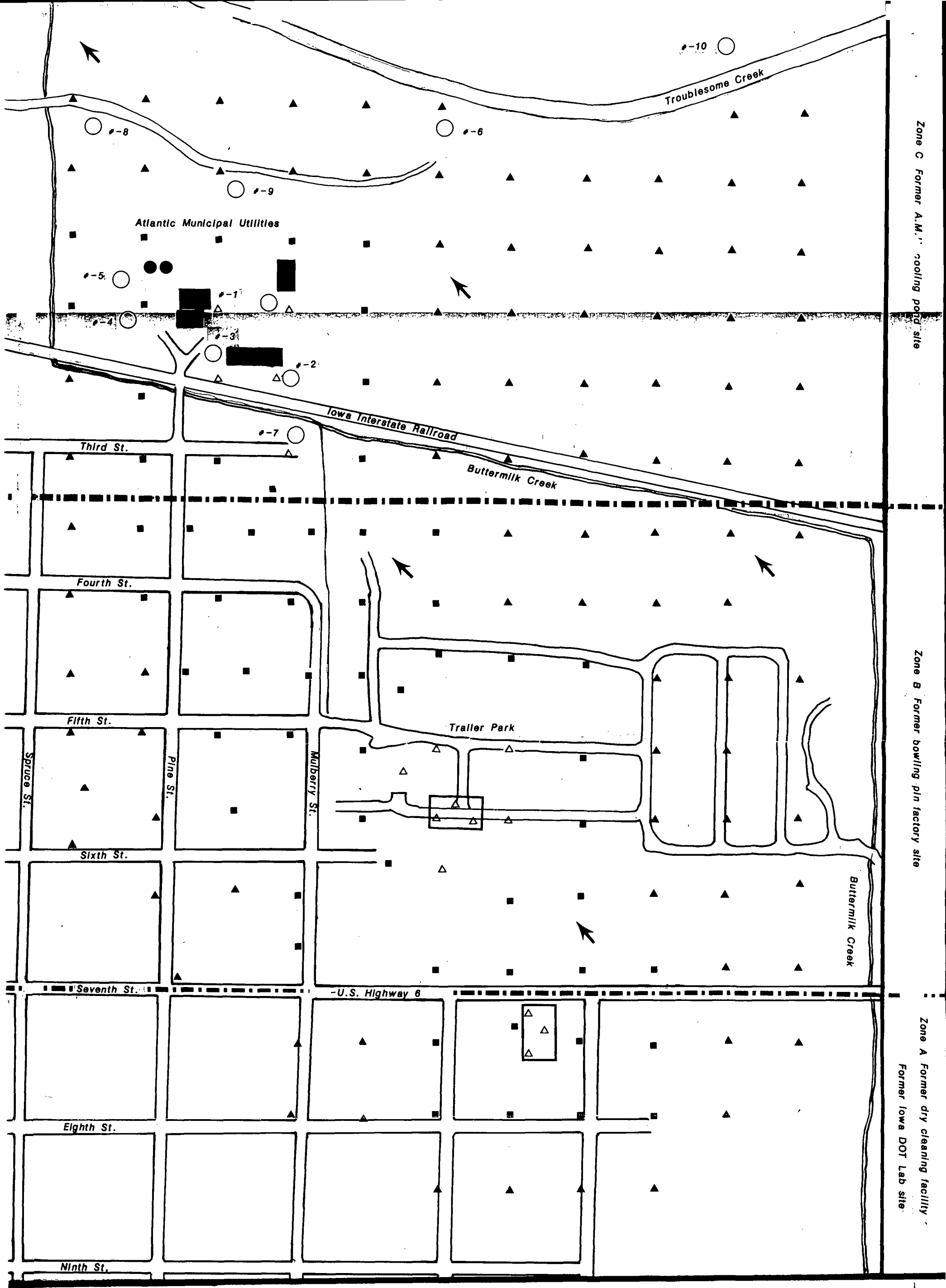
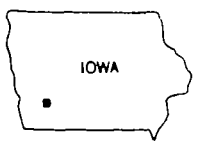


FIGURE 6 Soil-Gas Survey Sampling Plan Atlantic, Iowa



Site Location

△ Probe location Phase 1

■ Probe location Phase 2

▲ Probe location Phase 3 (optional)

○ Municipal water well

□ Former commercial site

← Ground-water flow

0 230 460 920

Scale; 1" = 230'

N

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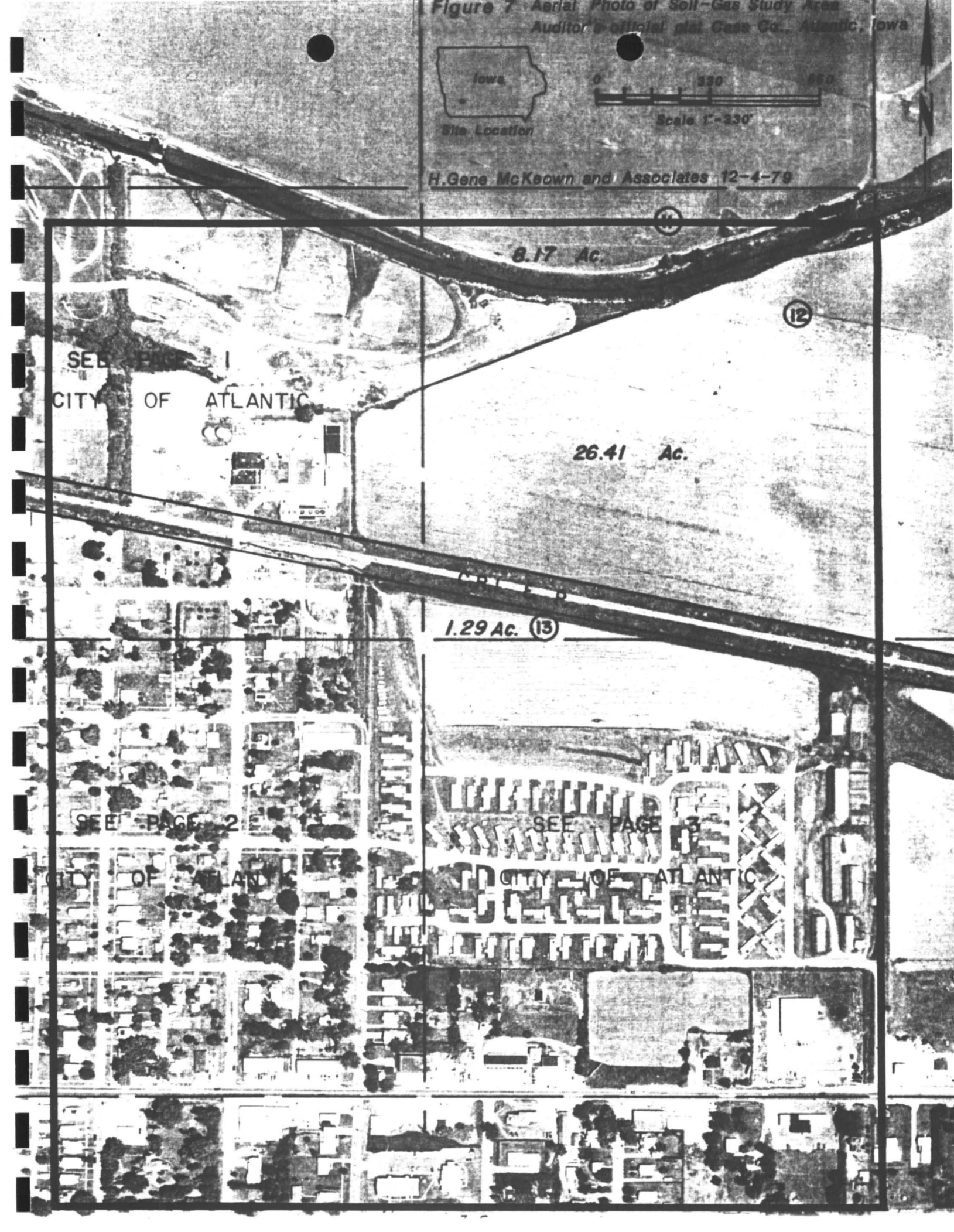
Figure 7 Aerial Photo of Soil-Gas Study Area
Auditor's official plat Cass Co., Atlantic, Iowa
Iowa
Site Location
0
330
660
Scale 1"=330'
N
H.Gene McKeown and Associates 12-4-79
8.17 Ac.
12
SEE PAGE 1
CITY OF ATLANTIC
26.41 Ac.
1.29 Ac.
13
SEE PAGE 2
CITY OF ATLANTIC
SEE PAGE 3
CITY OF ATLANTIC

A steam cleaner will be used for decontamination between samples. Requested analyses will be for volatile organics. A GC/MS scan is also requested.

7.4 Sample Summary

Soil: = 10 samples (VOA, 2-40 ml vials each
BNA, 10 8 oz. jars, Pesticides 10
8 oz. jars).
1 duplicate (VOA, 2-40 ml vials each)
1 field blank (VOA)

Expected delivery date : 8/31/87
Anticipated Concentration: Low
Priority : 2
Sample Series Number : IK994

Standard EPA sample preparation, packaging, and delivery procedures will be followed.

7.5 FIT Resources

It is anticipated that a minimum of seven (7) field days will be required to complete the Atlantic Soil-Gas Survey. A five-person team will be needed to conduct the investigation. Field work is tentatively scheduled to begin August 24, 1987. Level of Effort (LOE) hours are dedicated as follows:

° Travel (5 persons)	80 hours
° Access - utility lines, etc.	60 hours
° Equipment maintenance and calibration	80 hours
° Field work (5 persons)	320 hours
° Site Safety Plan	12 hours
° Trip report	25 hours
° Data plotting and interpretation	95 hours
° Field report	100 hours
TOTAL	767 hours

7.6 Site-Safety

Level D protection will be employed while performing the soil-gas survey and will also be utilized if soil sampling activities are conducted. Level C protection will be available, if such protection is warranted, as indicated by HNU readings (action level = 1 ppm) or if obvious hazards are presented. Standard safety procedures for drill-rig operations such as the donning of steel-toed shoes and hard hats shall be strictly observed.

SECTION 8: SUMMARY

A soil-gas survey is proposed to determine and document the source or sources of tetrachloroethene (PCE) contamination observed in several water wells of the public water supply of Atlantic, Iowa. Presently an exact source or sources of the PCE is unknown. There are several possible sources which will be investigated.

The proposed SI field work is tentatively scheduled to commence on August 24, 1987 and will consist of approximately 72 probe locations covering an area of approximately 960,000 square feet. It is hypothesized that the results from this study will confirm the presence, location and source(s) of the PCE plume.

SECTION 9: REFERENCES

1. U.S. Geological Survey, 1966, Topographic Map, 7 1/2 minute series Atlantic Quadrangle, Cass County, Iowa. Scale 1:24,000.

2. U.S. Geological Survey, 1966, Topographic Map, 7 1/2 minute series Wiota Quadrangle, Cass County, Iowa. Scale 1:24,000.

3. Carlton, Jean Preliminary Assessment Report of the Atlantic Public Water Supply, Atlantic, Iowa. Iowa Department of Natural Resources, October 15, 1986.

4. Personal Conversation: 10 June, 1987 Mr. Philip C. Dula, E&E/FIT, with Mr. Richard Stevens Superintendent Atlantic Municipal Utilities, 15 West Third St., Atlantic, Iowa 50022 (712) 243-1395.

5. Sitting, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens (Park Ridge: Nores Publ., 1985, 2nd Edition.

6. Simpon, Howard E. and Norton, W.H., Underground Waters of the Southwest District, Cass County. Iowa Geological Survey Volume XXI Annual Reports 1910 and 1911, pg. 1117-1124, 1912.

7. Soil Conservation Service, 1969, Soil Survey of Cass County, Iowa U.S Department of Agriculture in cooperation with Iowa Agricultural Experiment Station.

8. Ecology and Environment, Inc. 1986. Field Operation Manual for AID-511 portable gas chromatograph, Overland Park, KS (R-07-8405-12).

APPENDIX A

Request for Analytical Services

REGION VII ANALYTICAL SERVICES REQUEST FORM

Activity Number IK944 Date 7-29-87
Activity Description ATLANTIC P.W.S. ATLANTIC, IOWA
Originator PAUL DOHERTY Division/Branch E&E/FIT
Projected Sample Delivery Date 8-24-87
TDD# F-07-8701-15 PAN# FIA0194SI

REQUEST SUMMARY

No. of Samples	Matrix	Analyses Type
11	SOIL	VOA, PESTICIDES, & BNA *

SPECIAL REQUIREMENTS OR COMMENTS

* GC/MS SCAN.

APPROVALS

Originator (Date)

Philip C. Dula 7-29-87
TEAM LEADER

Division Director or Branch Chief (Date)

TO BE COMPLETED BY REGION VII LABORATORY
Lab Branch Approval:

Lab Assignment		Due Date	
_____	Region VII	_____	CLP	_____	Routine
_____	TAT	_____	Other	_____	Other
_____	ESAT				

Distribution

Originator	_____ ANLT
Data Coordinator	_____ TAT Team Leader
CLQA	_____ ESAT Team Leader
RSCC	_____ Other

APPENDIX B

Well Log - Well #10 Atlantic Public Water Supply

Layne-Western Company Omaha, Nebraska

Well Information

1. Contract City of Atlantic Date May 2, 1966

City and State Atlantic, Iowa Driller Dick Farrell

3. Well No. 10 at test hole No. 66-2 Well location (attach map) 680' east of well # 6 in city well field

4. Work completed May 2, 1966 No of man hours as charged to job on time sheet

5. MATERIAL:

	LENGTH	DIA.	GAUGE OR WALL THICKNESS	MATERIAL	TYPE	NO. OF OPENINGS
6. Screen	25'	12"	7 ga.	Stainless steel	Shutter	5
7. Inner Casing	57' 6"	12"	.6	Cast Iron	T & C	
8. Outer Casing						

9. 20 yds ~~xxx~~ of gravel used in the well. Size Road & cement mix

10. Test of well. Did you use test or permanent pump? test 8" Size of Bowl 9 Stages

11. Size of orifice 6 inch by 4 inch. Orifice tube reading 25 inches.

12. Pumping test — measurements from ground level:

TIME	G.P.M.	STATIC	DRAWDOWN	PUMPING LEVEL
8:00	317	14'	15'	29'
8:30	317	14'	15'	29'
9:00	317	14'	17'	31'
11:00	317	14'	17'	31'
2:00	317	14'	17'	31'
3:00	317	14'	17'	31'
4:30	492	14'	26'	40'

13. Recovery in 5 minutes, in 30 minutes

14. Did you seal bottom of well? yes Thickness inches, material stainless 7 ga. plate

15. Well underreamed? From feet to feet, feet to feet.

16. If all screen was not placed at bottom, state how it was spaced.

From feet to feet; from feet to feet; from feet to feet.

17. Depth of well from ground level to top of plug 76' 6" Size of drilled hole 42"

18. Was cement placed around or between any of the casings? No

19. If so, state where, how much and method used.