RECEIVED
JUN 13 1995
IOWA SECTION

RCRA Facility Investigation Report
Sauer-Sundstrand Facility
2800 East 13th Street, Ames, Iowa 50010
USEPA Docket No. VII-91-H-0009

Volume II of III

HLA Project No. 23088,1.16

June 9, 1995

Harding Lawson Associates
Engineering and Environmental Services
Oakbrook Terrace Tower, One Tower Lane, Suite 1300
Oakbrook Terrace, IL 60181 – (708) 571-2162

APPENDIX A

TANK CLOSURE REPORT

gss GROUNDWATER SERVICE & SUPPLY, INC.

TANK CLOSURE REPORT
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA

LUST NO. 7LTD58

REGISTRATION NO. 8605539

PROJECT NO. 92591

SEPTEMBER 1992

PREPARED FOR:
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA 50010

PREPARED BY:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 SE CONVENIENCE BOULEVARD
SUITE 6
ANKENY, IOWA 50021

gss GROUNDWATER SERVICE & SUPPLY, INC.

October 13, 1992

Project No. 92591
Tank Registration No. 8605539
LUST NO. 7LTD58

Sauer-Sundstrand Company
2800 East 13th Street
Ames, Iowa 50010
Attn: Mr. George Charbonneau

RE: Tank Closure Report - Sauer-Sundstrand Company - Ames, Iowa.

Dear Mr. Charbonneau:

Enclosed please find two (2) copies of the Tank Closure Report performed on your property located in Ames, Iowa. The report includes location and site maps, laboratory results and chain of custody documentation. Per your request, on 10/13/92, one copy of the report was submitted via overnight mail to Mr. Ray Milejczak, Harding Lawson Associates, One Tower Lane, Suite 1300, Oakbrook Terrace, IL 60181.

Yours truly,
GROUNDWATER SERVICE & SUPPLY, INC.

Eugene J. Blazenko
President/Geologist

encl:
EJB/els

2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

SUMMARY

This closure report is for Sauer-Sundstrand located in the NW 1/4 of Section 6, Township 83 North, Range 23 West in Story County, Iowa (Figure 1). This facility is a manufacturing plant for hydraulic pumps and transmissions. Eight tanks were removed from the site and a total of approximately 1,100 cubic yards of backfill and soil were removed for bioremediation on-site. Soil remaining in place has exhibited either non-detectable or very low levels of hydrocarbons.

While GSS was working at the site, Sauer-Sundstrand identified a release from an inside, above ground unit that recovers non-hazardous, petroleum based solvent for reuse by the plant. At Sauer-Sundstrand's request, GSS excavated soils that Sauer-Sundstrand identified. These soils were stockpiled separately for on-site bioremediation. Sauer-Sundstrand plans further excavation of this area.

SITE DESCRIPTION

The facility is located at the intersection of 13th Street and Interstate 35 in Ames, Iowa. Several manufacturing facilities and commercial businesses surround the site. The surface drainage in the area is generally to the south-southwest. Subsurface flow is probably in the same direction.

Ground water elevations measured in existing monitoring wells on-site varied between 3.5 to 9.8 feet below grade. The average ground water depth based on seven separate well locations was 7.2 feet below surface grade.

LOCATIONS OF UNDERGROUND STORAGE TANKS

Area "A" shown on Figure 2 contains one 8200 gallon tank for storage of waste oil. The base of this tank was 21.0 feet below surface grade. Area "B" contains seven underground storage tanks (USTs),

namely: four - 8200 gallon; two - 10,000 gallon and one - 1000 gallon. The bottom of the 10,000 and 8200 gallon USTs averaged 12.0 feet below grade. The location and contents (per Sauer-Sundstrand), for USTs in area "B", is shown on Figure 3.

UST REMOVAL

UST removal commenced on July 15, 1992. Groundwater Service and Supply, Inc. (GSS) was retained to monitor and collect necessary samples for a closure report.

An area along the east property boundary was designated for storage of any soil that would be removed during the tank closure process. This area was covered with 6 mil plastic sheeting for the soil to be placed on, with a water retention berm added to contain runoff. No soil was to be moved off-site during the closure process. Future plans included above ground bio-remediation of impacted soil.

USTs in area "B" were removed first. Several of the tanks in this area were not ready for removal because they contained liquid. The non-hazardous liquid, consisting of used hydraulic oil, water, and sediment from the used oil, was removed from the tank. The hydraulic oil and water was processed through the waste water treatment facility. The sediment was placed in drums and disposed of as waste water treatment sludge. After the USTs were cleaned, they were removed from the tank pit. All USTs had been back-filled in medium grain sand and appeared in good condition with no visible holes.

Ground water was immediately visible seeping into the tank pits along the north and east sidewalls of the open excavations. Within two hours after tank removal, the bottom of each tank pit was covered with water. Therefore, with the exception of the 1,000 gallon UST, no soil samples were collected below the base of each UST. The base of the 1000 gallon UST was 5.5 feet below grade, and above water. A soil

sample was collected beneath the UST. The laboratory results are as follows:

LABORATORY RESULTS - SOIL

LOCATION	DEPTH(FT)	OA-1 TOTAL HYDROCARBONS(PPM)	OA-2 TOTAL EXTRACTABLE HYDROCARBONS(PPM)
PB-1	6.0	<10.	<10.

The removal of the UST in area "A" required the use of sheet piling to support the side walls. This UST had been placed deep, 21 feet below grade, to allow gravity assisted flow of waste oil from all points within the Sauer-Sundstrand engineering test laboratory. All original fill material around this UST was removed prior to filling the excavation with clean fill.

OVEREXCAVATION

A soil gas survey was conducted on the sidewalls of Area ~~A~~ B with a Photoionization Detector (PID). Area ~~B~~ A sidewalls were not sampled because of the requirement for sheet piling at the site. However, boreholes 1 BH and 2 BH were both drilled immediately adjacent to the UST pit area (Ref. Figure 2A - Audit Report). 1 BH indicated elevated PID readings in the interval at and below ground water level, measured at 3.8 feet. 2 BH did not record any detectable PID readings. Areas with readings over 10 parts per million (ppm) were marked with spray paint for removal. The progression of overexcavation is shown on Figure 3. Approximately 1,100 cubic yards of backfill material and soil were removed during the tank closure process for later bio-remediation.

Sixteen soil samples were collected from the sidewalls after overexcavation; one for every 100 square feet of exposed pit sidewall. The laboratory results are as follows:

LABORATORY RESULTS - SOIL REMAINING IN PLACE

LOCATION	DEPTH (FT.)	TOTAL HYDROCARBONS (PPM)	TOTAL EXTRACTABLE HYDROCARBONS (PPM)
SS - 1	6.0	<10.	<10.
SS - 2	6.0	<10.	11.
SS - 3	6.0	<10.	<10.
SS - 4	6.0	<10.	26.
SS - 5	3.0	<10.	<10.
SS - 6	3.0	<10.	<10.
SS - 7	6.0	<10	20.
SS - 8	6.0	<10.	160.
SS - 9	4.0	<10.	<10.
SS -10	4.0	<10.	<10.
SS -11	4.0	<10.	<10.
SS -12	4.0	<10.	<10.
SS -13	4.0	<10.	<10.
SS -14	5.0	<10.	<10.
SS -15	5.0	<10.	<10.
SS -16	5.0	<10.	<10.

Seven soil samples from the overexcavated soil and back fill material were collected for baseline data for the bio-remediation project. The laboratory results are as follows:

LABORATORY RESULTS - EXCAVATED SOIL

LOCATION	TOTAL HYDROCARBONS (PPM)	TOTAL EXTRACTABLE HYDROCARBONS (PPM)
NT-1	190.	2000.
SP-1	290.	1100.
SP-2	100.	650.
SP-3	97.	2100.
SP-4	160.	1100.
SP-5	160.	2100.
SP-6	320.	1400.

All samples were chilled with ice immediately after collection and during shipment to the National Environmental Testing, Inc. (NET) laboratory. Both University Hygienic Laboratory procedures OA-1 and OA-2 were used in sample handling, preparation and analyses.

Site photographs, detailed laboratory results and chain of custody documentation are included in the Appendix.

SOLVENT RECOVERY SPILL EXCAVATION

At the request of Sauer-Sundstrand, an additional area was over-excavated that was not included in the original scope of work. Sauer-Sundstrand discovered conditions indicating a recent release of solvent 140 had occurred within the building. It appeared that some of the solvent leaked outside of the building onto the ground. Sauer-Sundstrand employees began to clean up the spill be digging out the dirt with hand shovels and placing the excavated soil in 55 gallon drums. Sauer-Sundstrand asked GSS to perform additional excavation when results of hand excavation indicated the release might be larger than originally believed.

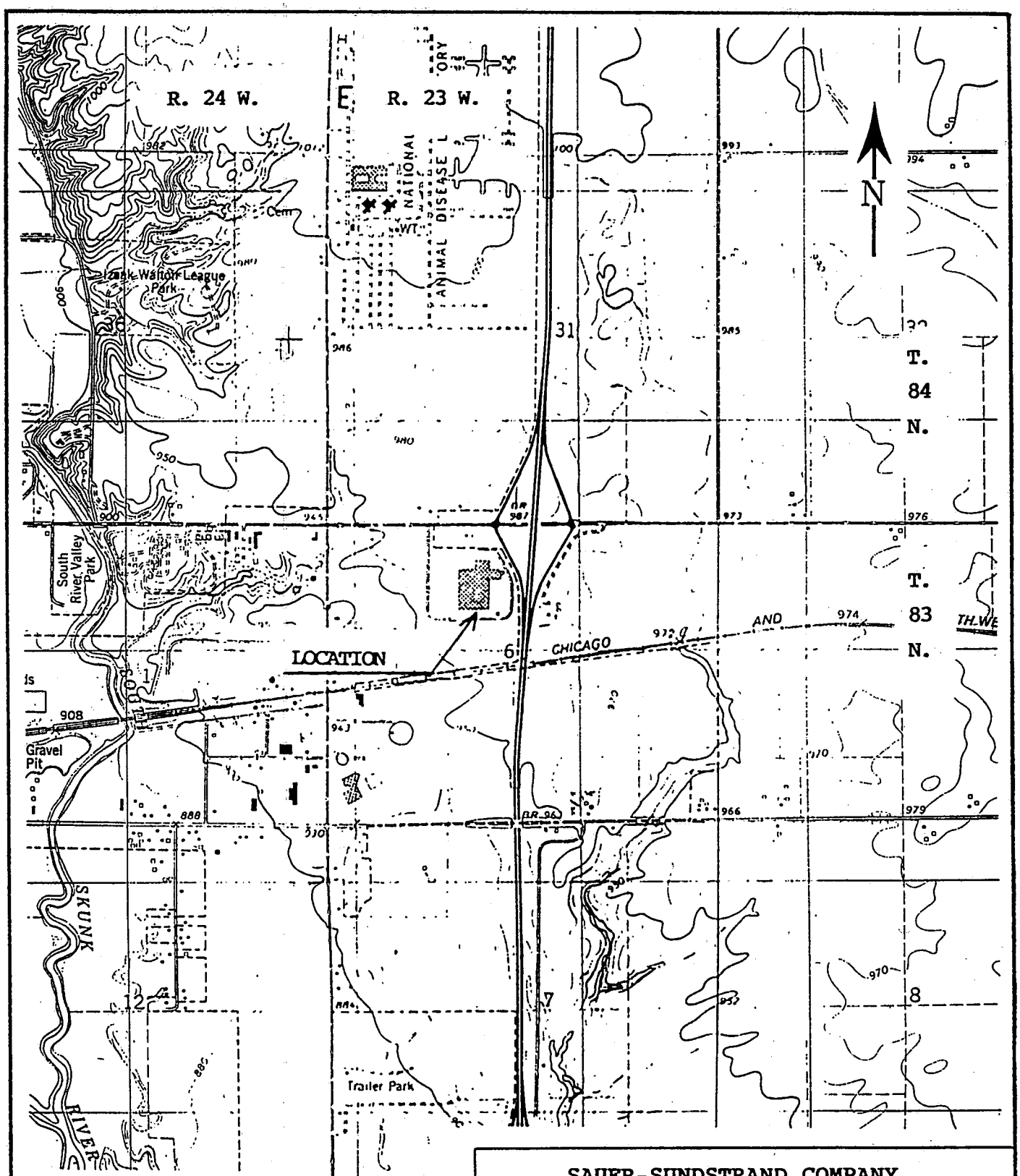
The overexcavated area of the solvent 140 spill is shown on Figure 3. PID readings along the sidewalls ranged up to 1500-2000 ppm. The reading decreased to zero ppm at the south limit of the excavation. The impacted soil appears to follow the building foundation to the west and continue under the asphalt parking lot.

Complete removal of all soil with elevated PID readings was not undertaken. The existence of buried utilities, which was not known until they were struck and broken with the hydraulic excavator, interfered with the excavation. Also, the asphalt parking area must be kept undisturbed for truck deliveries for the time being. As a result, not all soil was removed. Approximately 100 cubic yards of soil were removed from this area.

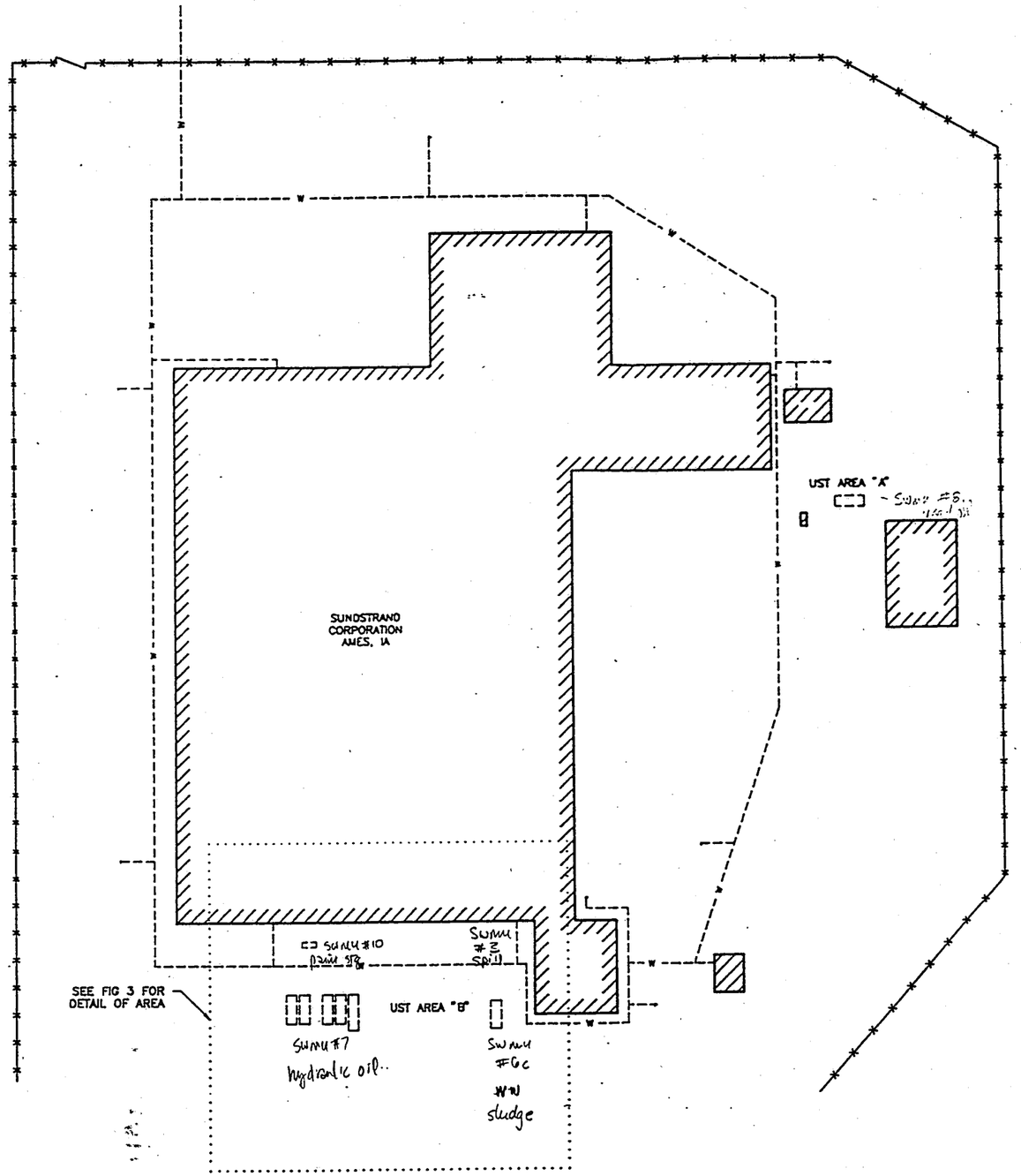
Sauer-Sundstrand intends to complete the excavation of impacted soils from the solvent recovery unit area promptly when conditions allow.

GROUND WATER

Ground water samples were not collected during the overexcavation of the site. Previous work done by GSS in June 1992 identified areas of very low levels of ground water impact around some of the USTs. All results were either not detectable or below Maximum Containment Levels for BTEX. Petroleum hydrocarbon levels were below any applicable cleanup standard. However, the detection limit for 1 BH does show benzene to be <400 ug/l. This detection limit used is high because of the dilution factors used (Sauer-Sundstrand - National Environmental Testing). Based on the Material Safety Data Sheet (MSDS) of the material in the tank, it is probable that the levels of benzene are actually below Maximum Contaminent Levels (Sauer Sundstrand). A complete copy of this Drilling Audit Report with ground water laboratory results is included in the Appendix.



SAUER-SUNDSTRAND COMPANY			
TOPOGRAPHICAL SITE MAP			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 07/92	DWN. BY	CHKD. BY	
SCALE 1"=2000'	NOTES STORY COUNTY		
gss GROUNDWATER SERVICE & SUPPLY, INC.		FIG. 1	



N

LEGEND

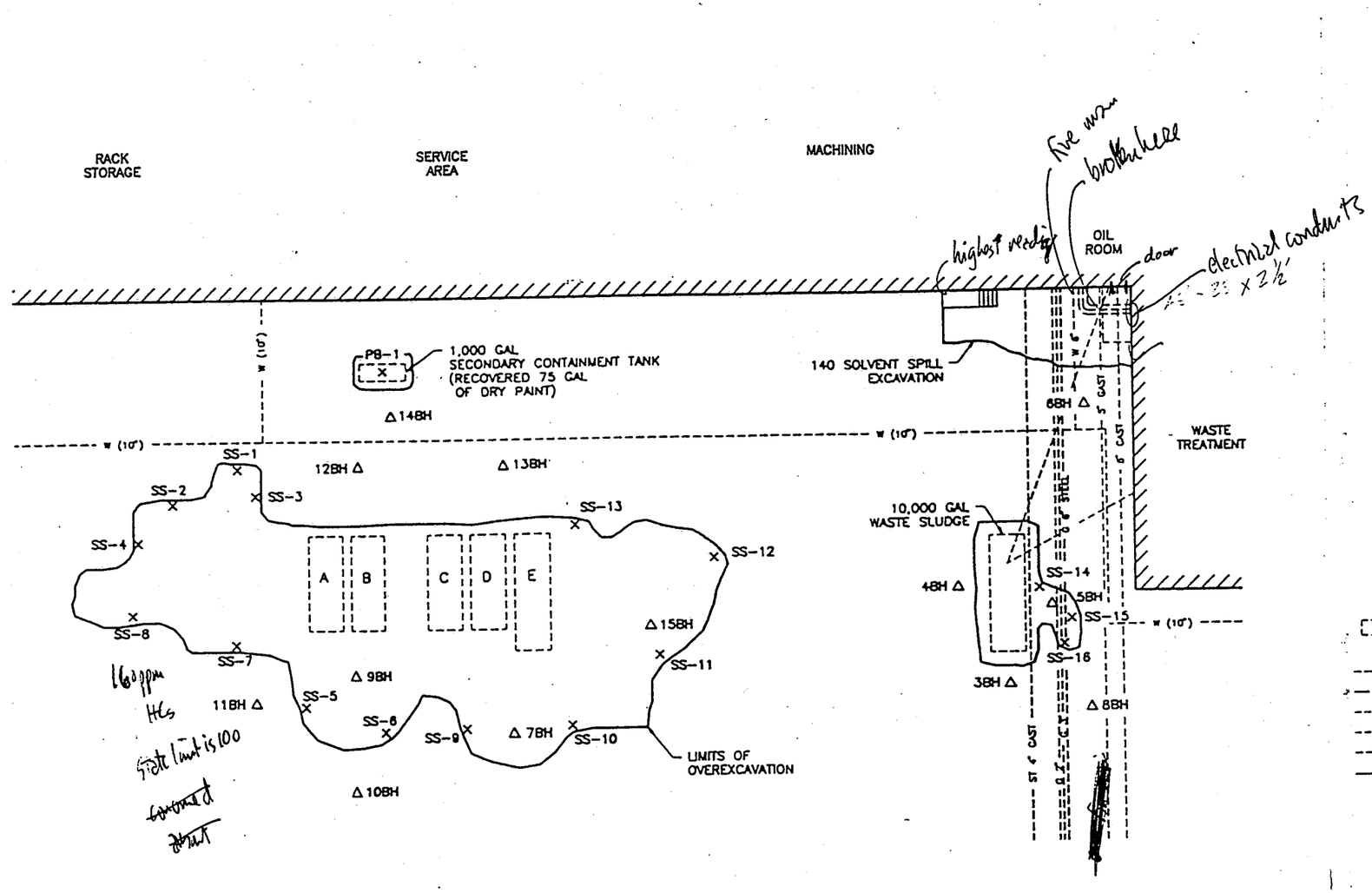
- UNDERGROUND TANKS
- GAS LINE LOCATION (APPROX.)
- OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

SAUER–SUNDSTRAND COMPANY

SCALED SITE PLAN

LOCATION	AMES, IA	PROJ. NO.	92591
DATE	09/92	DWN. BY WAP	CHKD. BY JE
SCALE	1"=100'	NOTES	

GSS GROUNDWATER SERVICE & SUPPLY, INC. FIG. 2



TANK	CONTENTS
A	8,200 AUTOMOTIVE TYPE F
B	8,200 HYTRAN
C	8,200 10W 30 OIL
D	8,200 HYTRAN
E	10,000 WASTE OIL

(3) 30,000 GAL LP GAS TANKS

LEGEND

- UNDERGROUND TANKS
- BOREHOLE (BH)
- GAS LINE LOCATION (APPROX.)
- OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

SAUER-SUNDSTRAND COMPANY

OVEREXCAVATION MAP
(UST AREA "B")

LOCATION	AMES, IA		PROJ. NO. 92591
DATE	09/92	DWN. BY WAP	CHKD. BY JE
SCALE	1"=30'	NOTES	

GSS GROUNDWATER SERVICE & SUPPLY, INC. FIG. 3

APPENDIX

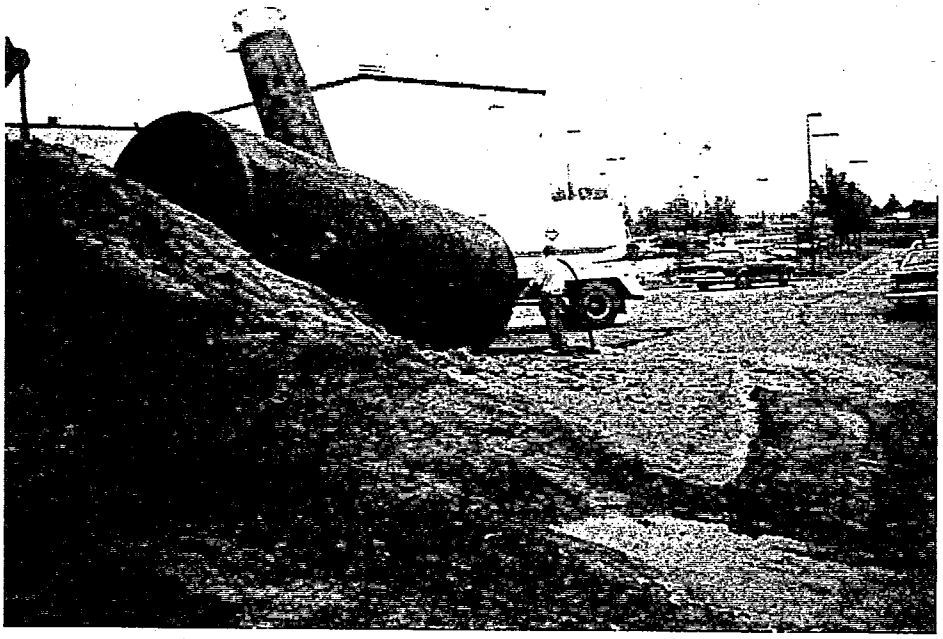
SITE PHOTOGRAPHS

LABORATORY RESULTS

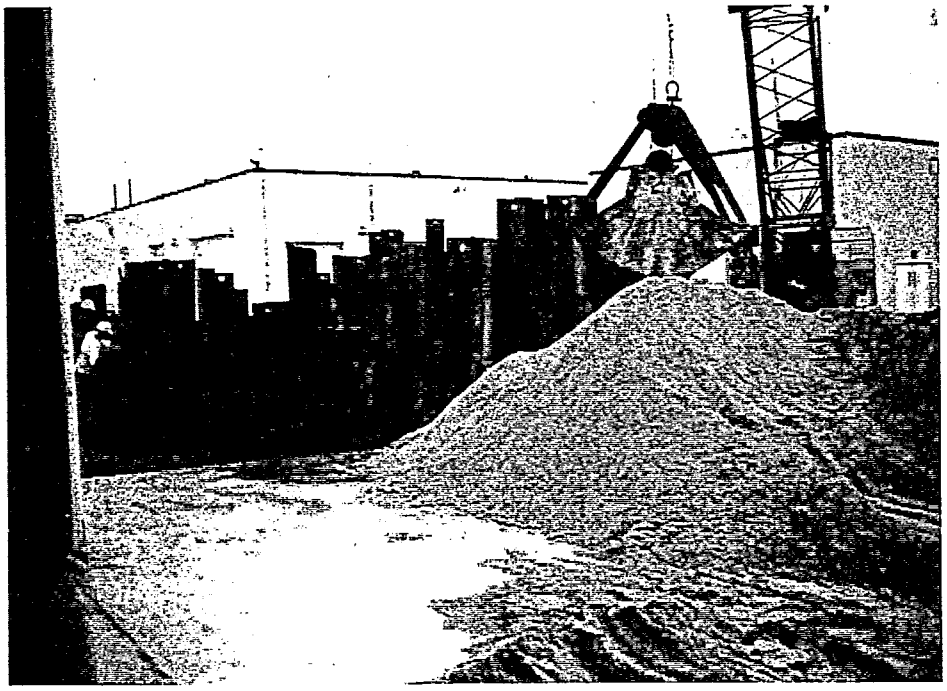
CHAIN OF CUSTODY

TANK DISPOSAL AGREEMENT

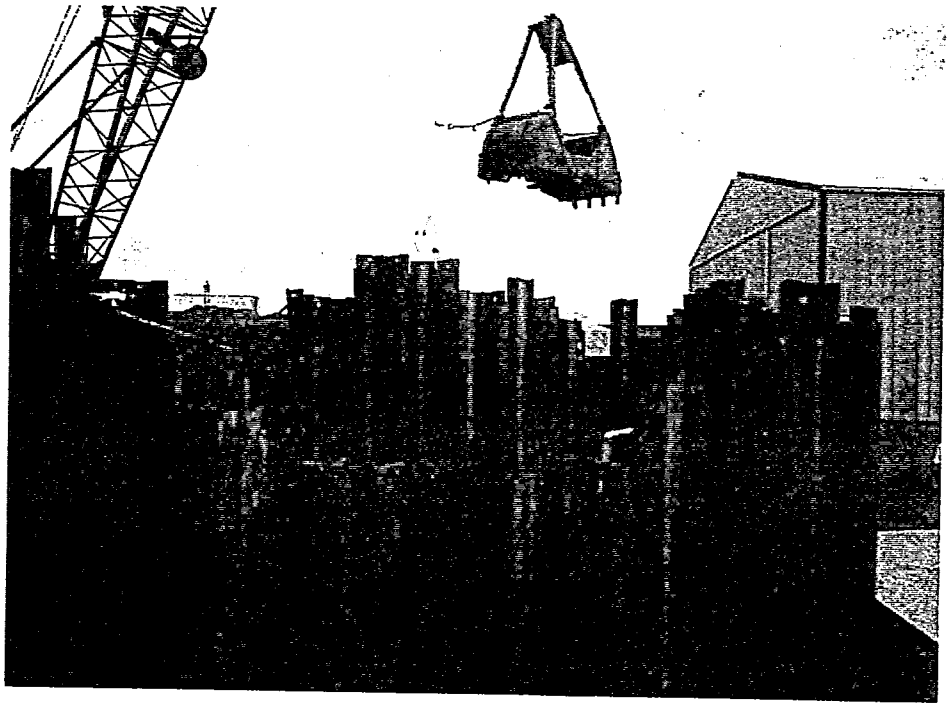
GSS DRILL AUDIT REPORT



8200 GALLON TANK BEING CLEANED AFTER REMOVAL FROM HOLE LINED WITH SHEET PILING.



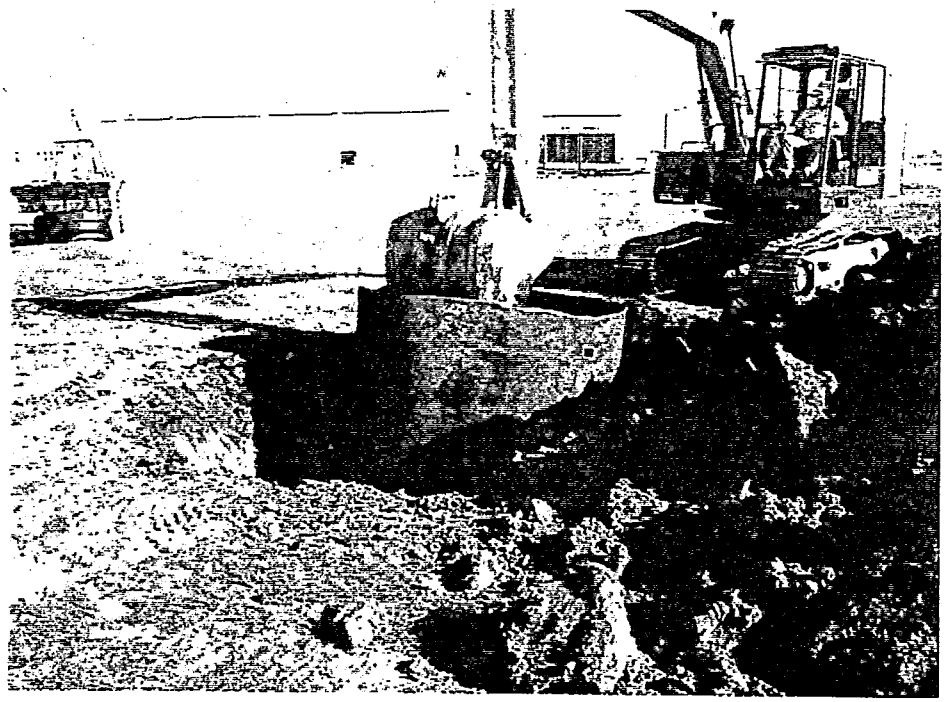
BACKFILLING TANK PIT.



SHEET PILING AROUND 8200 GALLON UST ON EAST SIDE OF SITE

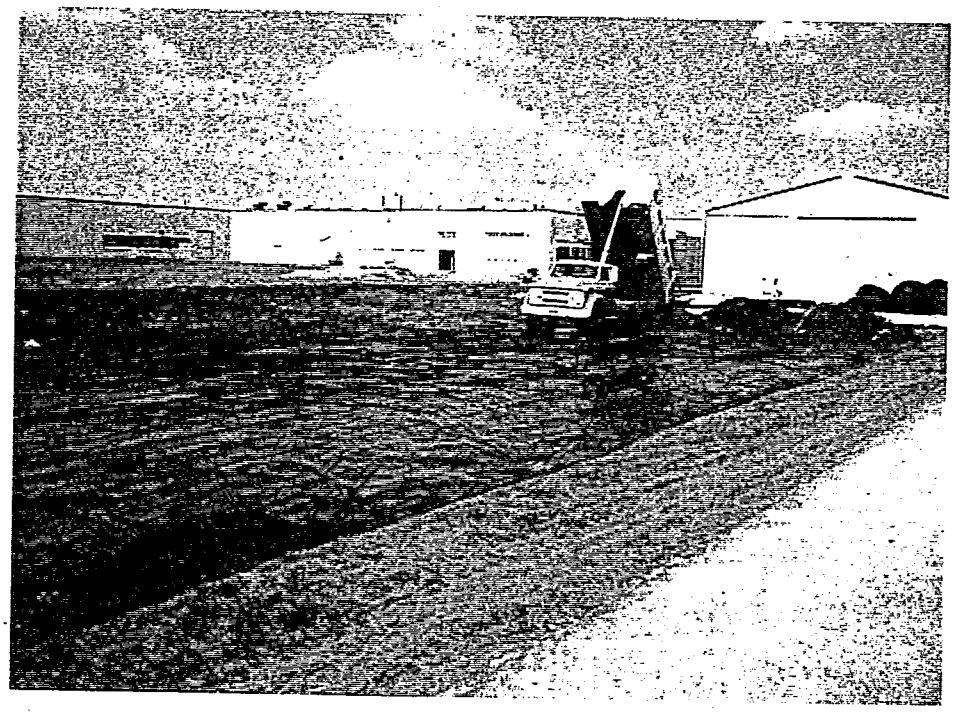
EXCAVATING TANK INSIDE OF SHEET PILING. BASE OF TANK WAS 20 FEET BELOW GRADE.

gss

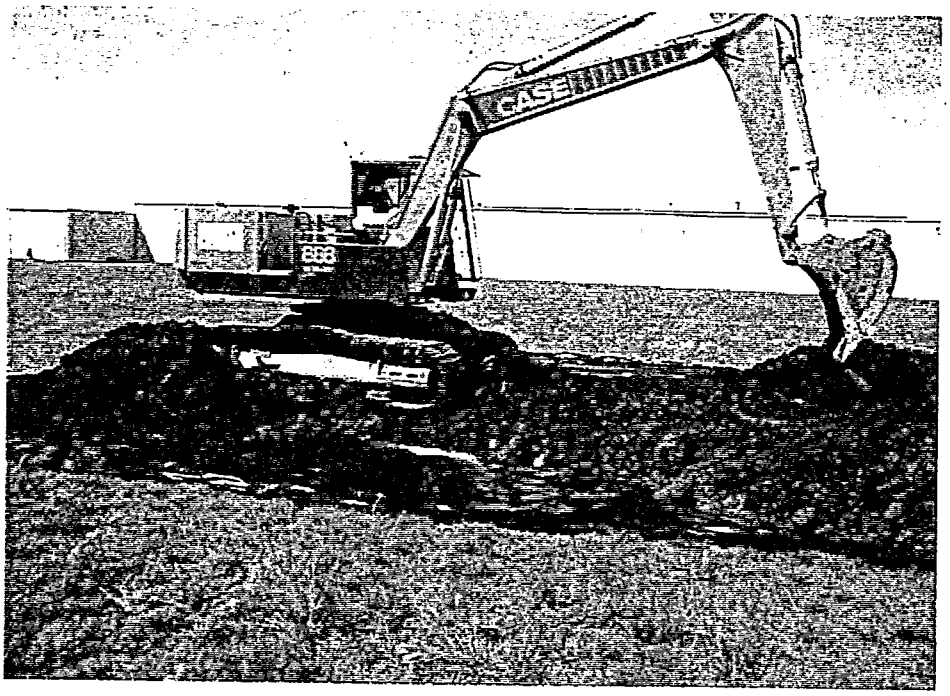


SOIL MIXING TUB.

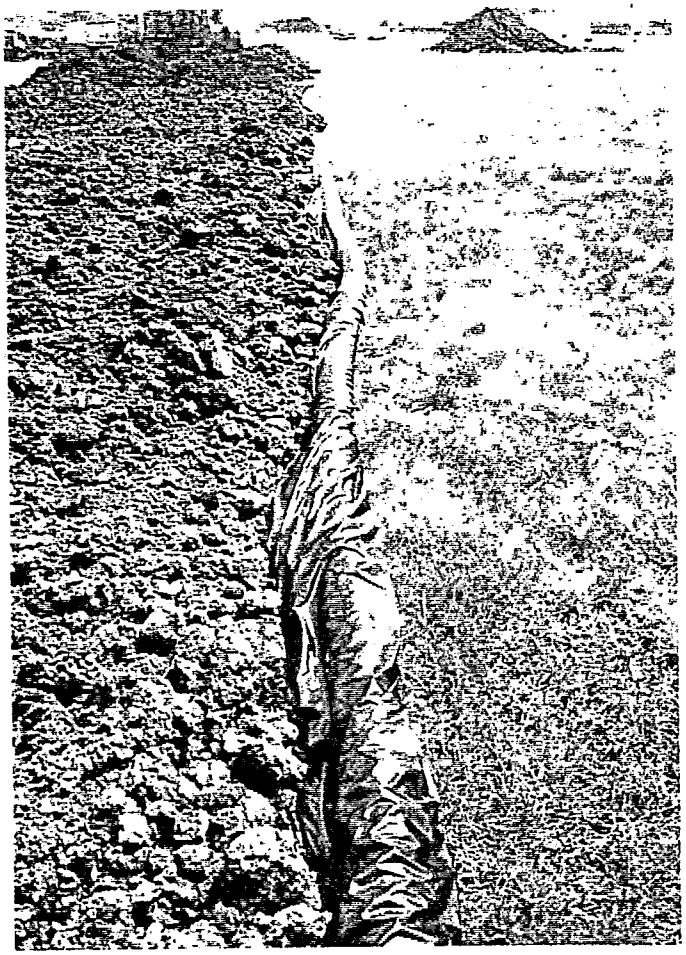
TRACK LOADER PLACES EXCAVATED SOIL INTO TUB. RUBBER TIRE LOADER PLACES SOLV-II INTO TUBE. HYDRAULIC BACKHOE MIXES BOTH TOGETHER.



SOLV-II AND EXCAVATED SOIL IS PLACED ON PLASTIC.

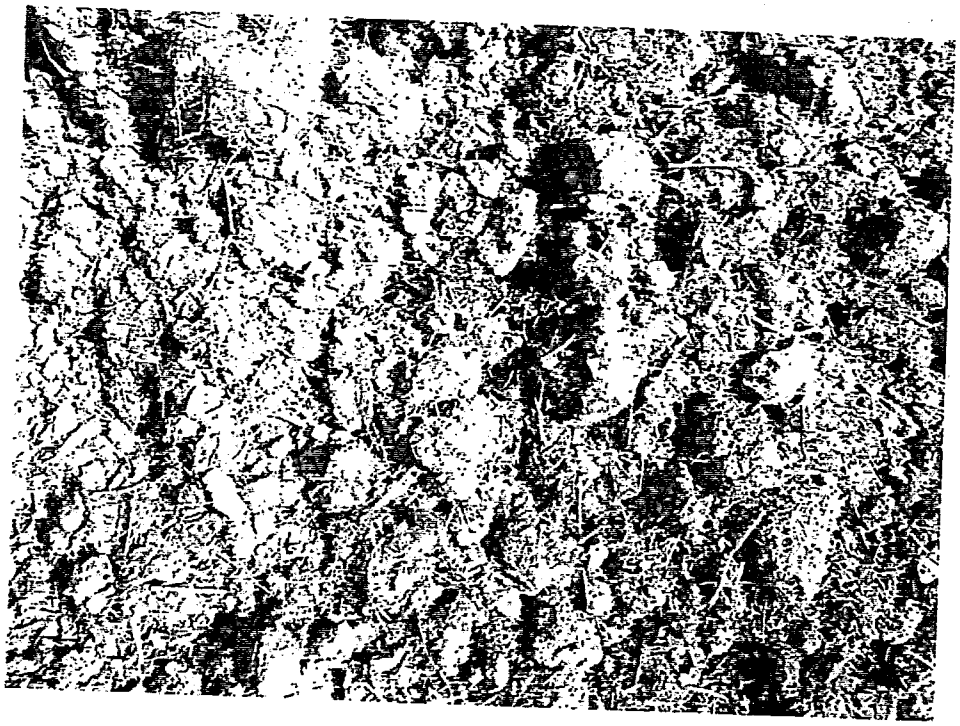


HYDRAULIC BACKHOE LEVELS SOIL TO 12 INCH LIFT.



RUN-OFF BERM PLACED AROUND TREATMENT CELL.

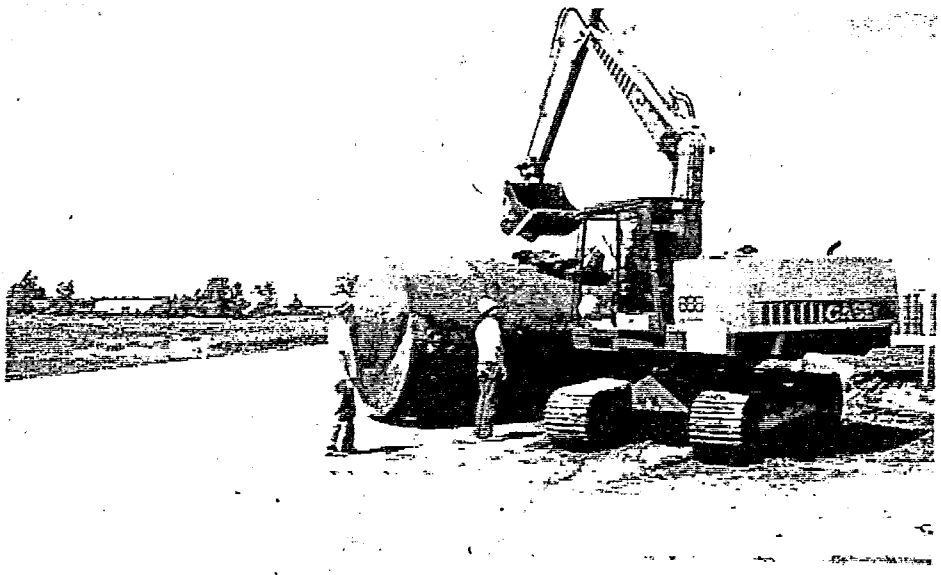
gss



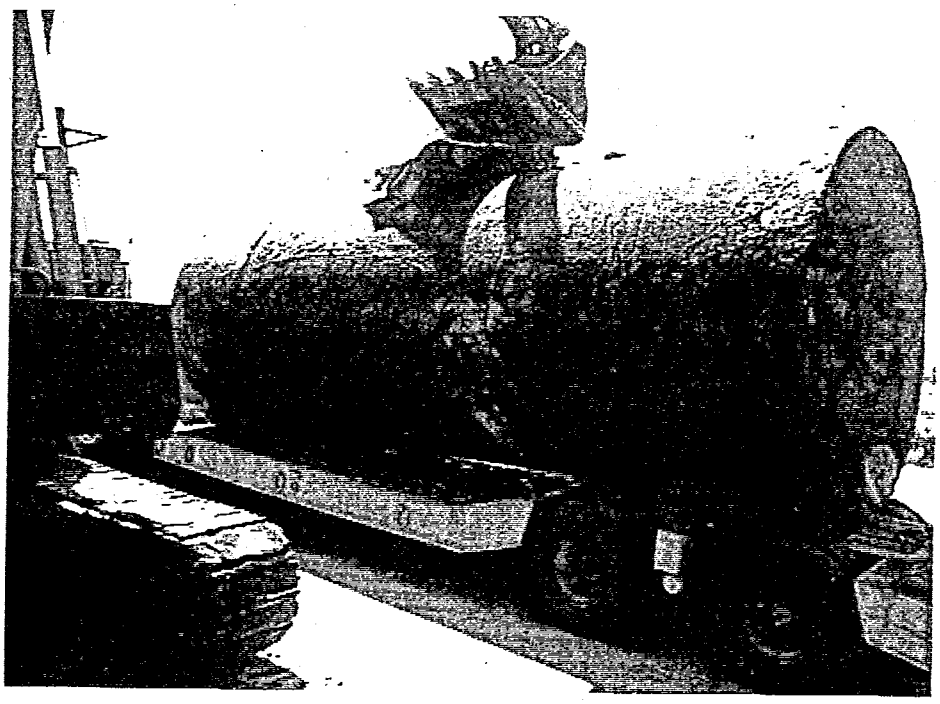
SOLV-II AND EXCAVATED SOIL MIXTURES.

WOOD STAKES HOLD RUN-OFF BERM IN PLACE.

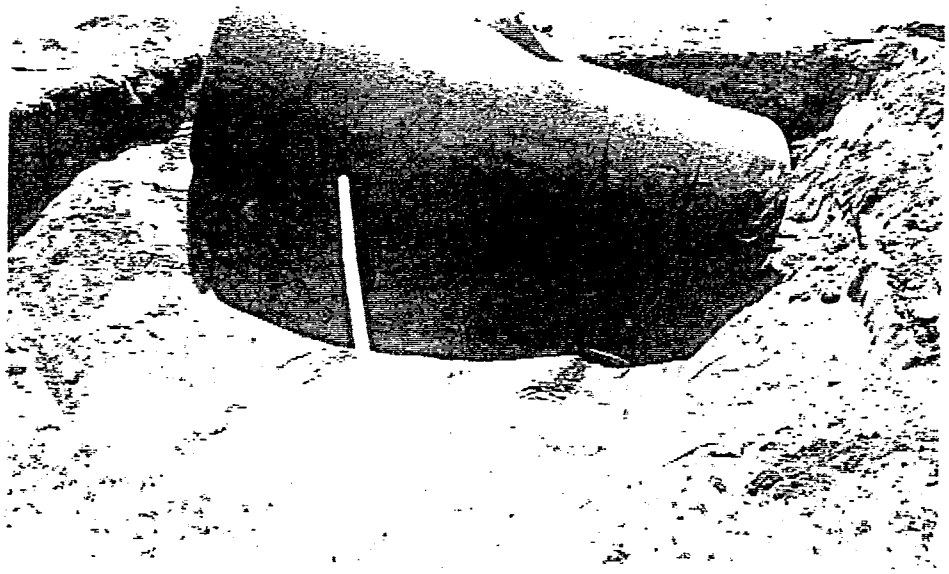
gss



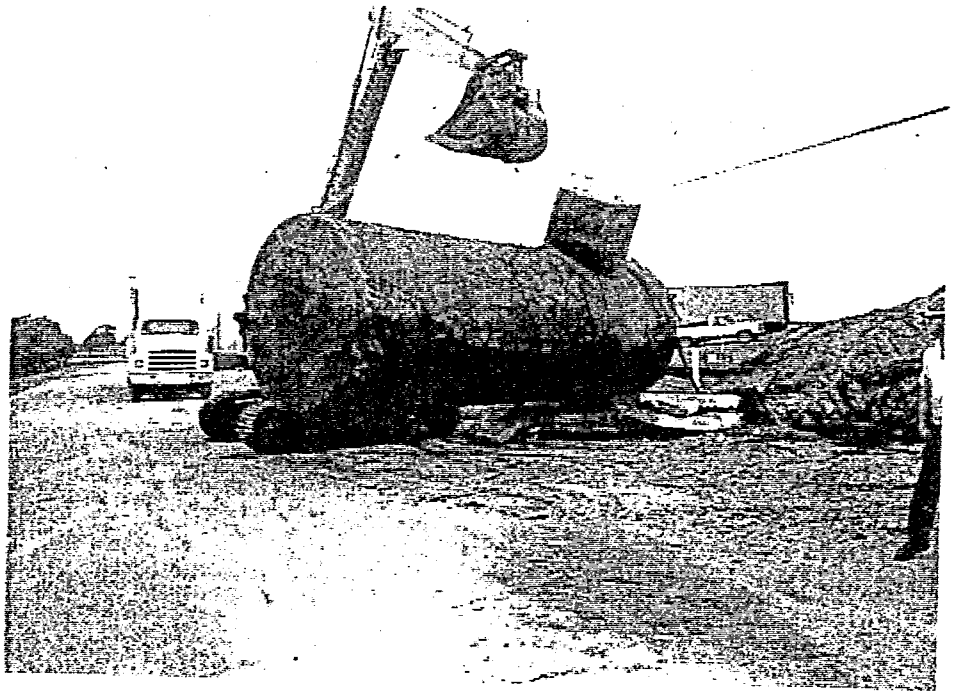
8,200 GALLON AUTOMOTIVE TYPE F OIL TANK



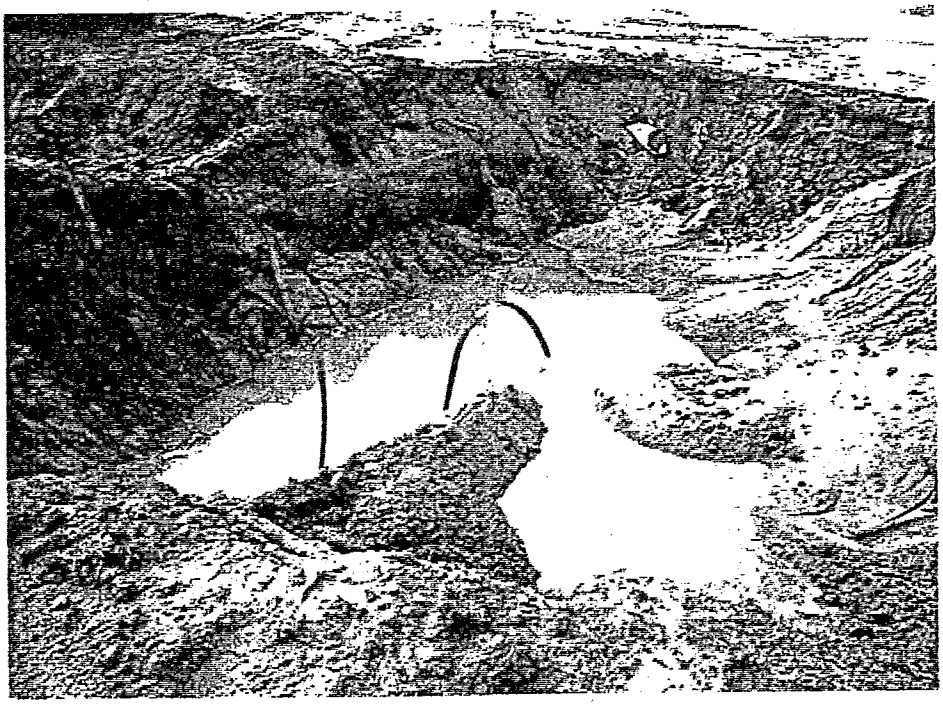
8,200 GALLON HYTRAN OIL TANK



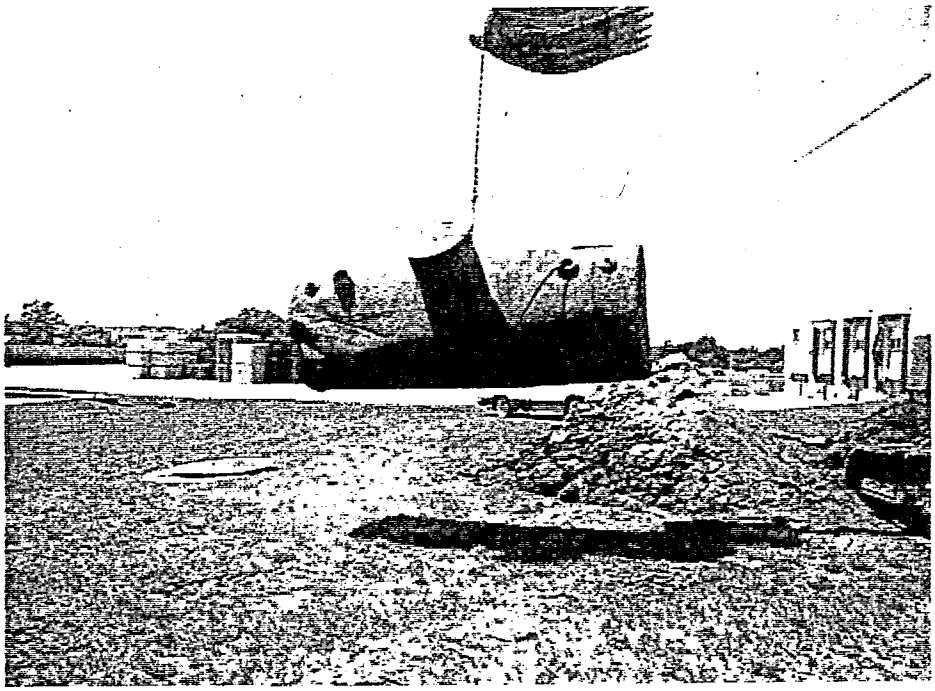
8,200 GALLON 10W 30 OIL TANK



SECOND 8,200 GALLON HYTRAN OIL TANK

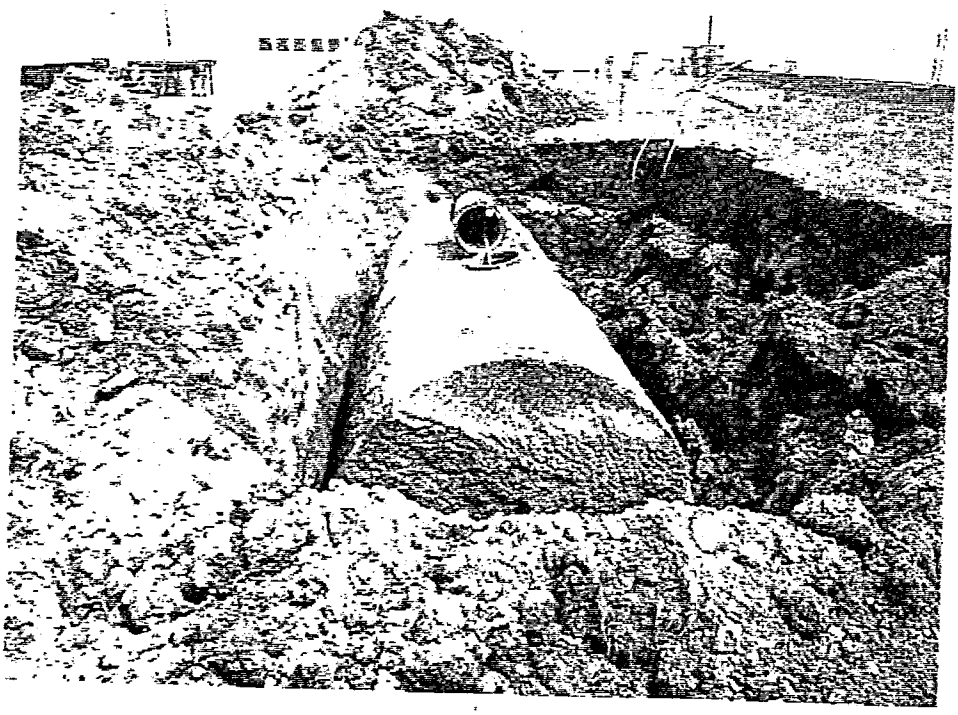


10,000 GALLON WASTE OIL TANK



1,000 GALLON DUMP TANK

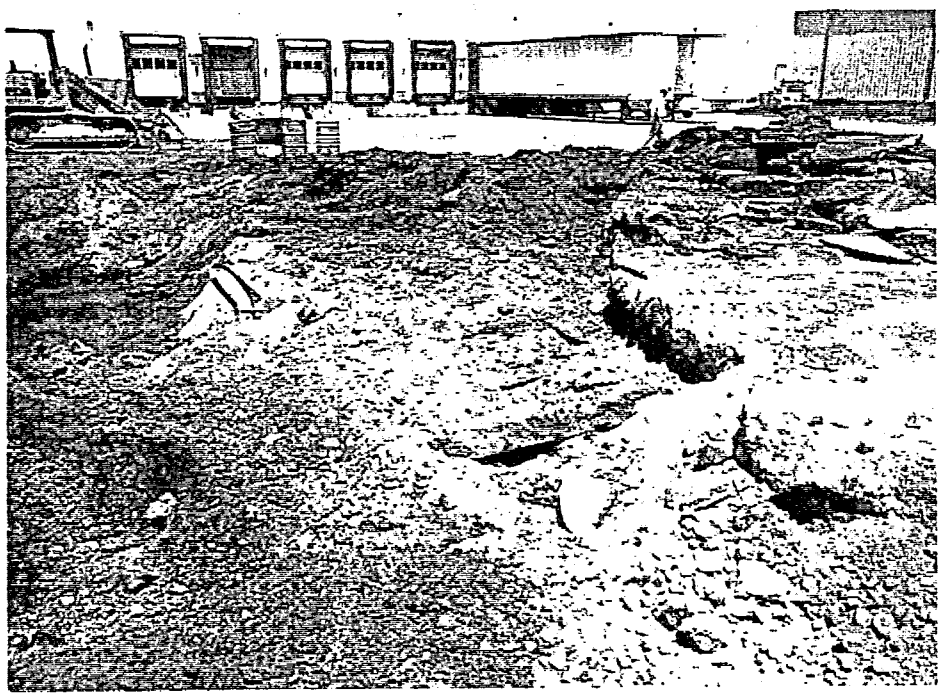
gss



10,000 GALLON WASTE SLUDGE TANK

DRY PAINT REMOVED FROM 1,000 GALLON DUMP TANK

gss



OVEREXCAVATION OF UST PITS

gss

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 1992

ANALYTICAL REPORT

08/07/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5718

NET Sample Number: 177122

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 07/15/1992

Date Received: 07/17/1992

Sample ID: PB-1 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/28/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

4 1992

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

08/13/1992

NET Job Number: 92.5801

NET Sample Number: 177431

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-1 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177432

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-2 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	11.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	11.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177433

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Sample ID: SS-3 6' Sauer-Sundstrand

Date Received: 07/21/1992

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177434

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-4 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	26.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	26.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel. (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177435

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-5 3' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177436

Collectors Phone No.: 515/964-0304

Collected by: Brad Wade

Date Taken: 07/17/1992

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Received: 07/21/1992

Sample ID: SS-6 3' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
								Soil
EXTRACTABLE HYDROCARBONS-SOIL								
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
								Soil
VOLATILES - BTEX (NONAQUEOUS)								
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

08/13/1992

NET Job Number: 92.5801

NET Sample Number: 177437

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Sample ID: SS-7 6' Sauer-Sundstrand

Date Received: 07/21/1992

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	20.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	20.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177438

Collectors Phone No.: 515/964-0304

Collected by: Brad Wade

Date Taken: 07/17/1992

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Received: 07/21/1992

Sample ID: SS-8 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	160.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	160.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

08/04/1992

NET Job Number: 92.5829

NET Sample Number: 177515

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Sample ID: SS-9 4' Sauer-Sundstrand

Date Received: 07/22/1992

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177516

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-10 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177517

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-11 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177518

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-12 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177519

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-13 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

RECEIVED

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177665

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-14 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	08/05/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177666

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-15 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	08/05/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177667

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-16 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		ake	08/04/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: Sawer - Sundstrand

UST ADDRESS: 13th St AMES

SAMPLERS: (SIGNATURE) [signature]

LAB: Net

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SS-1	6ft	4oz		✓		Pit		✓	7-17	1655					✓			
SS-2	6ft	✓		✓		✓		✓	✓	1656					✓			
SS-3	6ft	✓		✓		✓		✓	✓	1657					✓			
SS-4	6ft	✓		✓		✓		✓	✓	1700					✓			
SS-5	3ft	✓		✓		✓		✓	✓	1730					✓			
SS-6	3ft	✓		✓		✓		✓	✓	1730					✓			
SS-7	1ft	✓		✓		✓		✓	✓	1800					✓			
SS-8	1ft	✓		✓		✓		✓	✓	1800					✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	7/17/92	8:10 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/21/92	9:10	Melanie Saccioni

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B Wade

PROJECT NAME: Sauer - Sundstrand

UST ADDRESS: 13th Street Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SS-9 4ft		1/4 oz		✓		Pit		✓	7/20	1501		✓			✓			
SS-10 4ft		✓		✓		✓		✓	✓	1503		✓			✓			
SS-11 4ft		✓		✓		✓		✓	✓	1505		✓			✓			
SS-12 4ft		✓		✓		✓		✓	✓	1507		✓			✓			
SS-13 4ft		✓		✓		✓		✓	✓	1509		✓			✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Susan Hagenke	7/21/92	10:00 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/22/92	800	Melene Vaccaro

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

RECEIVED AUG 6 1992

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B Wade

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: 13th St Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTANINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SS-14 5ft		1/4 oz		—		Pit		—	7/21	1330		—			—			
SS-15 5ft		—		—		—		—	—	1352		—			—			
SS-16 5ft		—		—		—		—	—	1334		—			—			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Bill Puette	7/22/92	0830A	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/23/92	800	Melene Saccian

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

AUG 3 1992

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) [signature]

PROJECT NAME: Sawver-Sundstrand

UST ADDRESS: Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2		UST CONTENTS	REMARKS
PB-1 6ft		4oz		–		Pit		✓	7/15	1800		–			✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	7/16/92	9:05 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/17/92	800	Melene Saccam

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

RECEIVED
AUG 10 1992

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED SEP 16 1992

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

09/15/1992

NET Job Number: 92.67730

NET Sample Number: 181234

Collected by: David Easley

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 08/21/1992

Date Received: 08/25/1992

Sample ID: NT1 6" Sauer/Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	2000.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Diesel	2000.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	4.3	ug/g		kjt	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	190.	ug/g	d	kjt	09/03/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
701 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.66970

NET Sample Number: 180898

Collected by: Brad Waler

Collectors Phone No.: 515-964-0304

Job Description: Sauer Sundstrand
Ames, IA

Date Taken: 08/19/1992

Date Received: 08/21/1992

Sample ID: SP-1 Proj. No. 92591

Analyte	Result	Units	Result flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	1100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Motor Oil	1100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	08/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	08/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	08/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	6.5	ug/g		kjt	08/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	290.	ug/g	d	kjt	08/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.66970

NET Sample Number: 180899

Collected by: Brad Waler

Collectors Phone No.: 515-964-0304

Job Description: Sauer Sundstrand
Ames, IA

Date Taken: 08/19/1992

Date Received: 08/21/1992

Sample ID: SP-2 Proj. No. 92591

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	650.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
Diesel	<200.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
Motor Oil	650.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	2.4	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	100.	ug/g	d	djl	08/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
7104 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.66970

NET Sample Number: 180900

Collected by: Brad Waler

Collectors Phone No.: 515-964-0304

Job Description: Sauer Sundstrand
Ames, IA

Date Taken: 08/19/1992

Date Received: 08/21/1992

Sample ID: SP-3 Proj. No. 92591

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	2100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Motor Oil	2100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	2.8	ug/g		djl	08/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	97.	ug/g	d	djl	08/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
700 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.67460

NET Sample Number: 181094

Collected by: David Easley

Collectors Phone No.: 515-964-0304

Job Description: Sauer/Sundstrand
Ames, IA

Date Taken: 08/20/1992

Date Received: 08/22/1992

Sample ID: SP-4 Proj. No. 92591

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	1100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
Motor Oil	1100.	ug/g		tms	09/10/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	09/01/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	0.5	ug/g		djl	09/01/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	09/01/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	3.2	ug/g		djl	09/01/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	160.	ug/g	d	djl	09/01/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.67460

NET Sample Number: 181095

Collected by: David Easley

Collectors Phone No.: 515-964-0304

Job Description: Sauer/Sundstrand
Ames, IA

Date Taken: 08/20/1992

Date Received: 08/22/1992

Sample ID: SP-5 Proj. No. 92591

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	2100.	ug/g		rlb	09/03/1992	IA-OA2	10. ug/g	Soil
Diesel	<200.	ug/g		rlb	09/03/1992	IA-OA2	10. ug/g	Soil
Motor Oil	2100.	ug/g		rlb	09/03/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	5.4	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	160.	ug/g	d	djl	09/03/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
104 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
SEP 16 1992

ANALYTICAL REPORT

09/15/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.67730

NET Sample Number: 181235

Collected by: David Easley

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 08/21/1992

Date Received: 08/25/1992

Sample ID: SP6 8" Sauer/Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	1400.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
Diesel	200.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
Motor Oil	1200.	ug/g		tms	09/11/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	7.5	ug/g		djl	09/03/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	320.	ug/g	d	djl	09/03/1992	S-8015/IA-OA1	10 ug/g	Soil

NOTE: CCU out of control for BTEX on this sample. Results may be biased.

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: Sauer/Sundstrand

UST ADDRESS: Ames IA

LAB: NET

SAMPLERS: (SIGNATURE) [signature]

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	UST CONTENTS	REMARKS
SP-1	8 inches	402	✓		Pile		✓		8/19	1600	✓				✓		
SP-2	✓	—		✓	—		✓		—	1601	✓				—		
SP-3	✓	—		✓	—		✓		—	1602	—				—		

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	8/20/92	4:35 pm	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	8/20/92	8:00	Norma Johnson

CLIENT NAME/OFFICE LOCATION:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-984-0304 • 1-800-373-6761 • FAX 515-984-1226

RECEIVED
SEP 16 1992

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: Sauer/Sundstrand

UST ADDRESS: Ames IA

SAMPLERS: (SIGNATURE) David Easley

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SP4	8"	1-4oz		✓		Pile		✓	8-20	17:05		✓			✓			
SP5	8"	1-4oz jar		✓		Pile		✓	8-20	17:07		✓			✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[illegible]	8/21/92	10:20 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	8/22/92	8:00	Norma Johnson

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: David Easley PHONE: (515) 964-0304

gss
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-0761 • FAX 515-964-1226

RECEIVED
SEP 16 1992
GROUNDWATER SERVICE & SUPPLY, INC.

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) David Easley

PROJECT NAME: Saver / Sundstrand

UST ADDRESS: Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
NT1	6"	1-4 oz. gar		✓		Pile		✓	8/21	12:30		✓			✓			
SP6	8"	1-4 oz. gar		✓		Pile		✓	8/21	12:32		✓			✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jeff Harding	8/24/92	9:15 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	8/25/92	800	Melene Saccani

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

David W Easley

PROJECT MANAGER:

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

RECEIVED SEP 16 1992

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x22' 8,200 gal. underground storage tank was removed from Sauer Sundstrand Ames Ia. and sold to Handsaker Salvage - Radcliffe Ia for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Paul D. Handsaker
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x22' 8,200 gal underground storage tank was removed from Sauer Sundstrand Ames Ia. and sold to Handsaker Salvage - Radcliffe Ia for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Paul D. Handsaker
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x22' 8,200 gal. underground storage tank was removed from Sauer Sundstrand and sold to Bell Salvage - Ames Ia. for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Buyer: Chad R Bell

Seller: Bob Lepper

Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x22' 8,200 gal. underground storage tank was removed from Sauer Sundstrand Ames IA. and sold to Gary Carlson Salvage - Jewell IA for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Gary Carlson

Buyer:

Bob Lepper

Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x22' 8,200 gal. underground storage tank was removed from Sauer Sundstrand Ames Ia. and sold to Gary Carlson Salvage - Jewell Ia. for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Gary Carlson
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x27' 10,000 gal. underground storage tank was removed from Sauer Sundstrand Ames Ia and sold to Gary Carlson Salvage - Jewell Ia. for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Gary Carlson
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 8'x27' 10,000 gal. underground storage tank was removed from Sauer Sundstrand Ames Io. and sold to Gary Carlson Salvage - Jewell Ia. for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Gary Carlson
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

TANK DISPOSAL AGREEMENT

This statement is to verify that a 4'x11' 1,000 gal. underground storage tank was removed from Sauer Sundstrand - Ames Ia. and sold to Gary Carlson Salvage - Jewell Ia. for the sum of $1.00. This is also to verify that the purchaser's intent is to destroy said underground storage tank for the purchase of scrap metal.

Gary Carlson
Buyer:

Bob Lepper
Seller: Bob Lepper Excavating
P.O. Box 268
Hubbard, IA 50122
515/864-2472

DATED: 8-23-92

DRILLING AUDIT REPORT
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA

PROJECT NO. 92591

JULY 1992

PREPARED FOR:
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA 50010

PREPARED BY:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 SE CONVENIENCE BOULEVARD
SUITE 6
ANKENY, IOWA 50021

July 6, 1992

Project No. 92591

Sauer-Sundstrand Company
2800 East 13th Street
Ames, Iowa 50010
Attn: Mr. George Charbonneau

RE: Drilling Audit Report - Sauer-Sundstrand Company - Ames, Iowa.

Dear Mr. Charbonneau:

Enclosed, please find two (2) copies of the Drilling Audit Report performed on your property located in Ames, Iowa. The report includes location and site maps, well and soil gas logs, laboratory results and chain of custody documentation.

On your behalf, we are forwarding copies of the report to both the Iowa Department of Natural Resources and to GAB-Business Services.

Yours truly,
GROUNDWATER SERVICE & SUPPLY, INC.

Eugene J. Blazenko
President/Geologist

encl:
cc: IDNR - Attn: Keith Bridson
GAB - Attn: Mr. Neil Searcy

EJB/sgb

OBJECTIVE

To drill test boreholes (BHs) to determine the presence or absence of soil and ground water contamination that may be related to on-site storage of hydrocarbon products at the plant located in Ames, Iowa (Figures 1 & 2).

WORK PERFORMED

On June 8 and 9, 1992, Groundwater Service & Supply, Inc. (GSS) drilled 15 BHs on various portions of the site (Figures 2A - 2B). The BHs were drilled to depths ranging from 10 to 20 feet. Soil cuttings were screened for soil gas content with a Photoionization Detector (PID).

After drilling each hole, all drilling equipment was decontaminated with a high pressure, hot water cleaning unit.

Water samples were collected from all wells encountering ground water. All water sampling equipment was decontaminated with an Alconox detergent solution and distilled water after each sampling procedure.

All samples were chilled with ice immediately after collection and during shipment to the National Environmental Testing, Inc. (NET) laboratory. Both University Hygienic Laboratory procedures OA-1 and OA-2 were used in sample handling and preparation and analyses.

SOIL

BHs 3 through 15 encountered clays with varying amounts of sand and gravel. BHs 1 and 2 contained fine grained sand that may represent backfill material from oversized pit areas. Split barrel cuttings were screened at approximately 1 foot intervals for soil gas content with a PID. Samples were also examined for discoloration and checked for odor. Soil samples were collected from 5, 9 and 15 BH for labora-

tory analyses. Soil gas readings are shown on the well and soil gas logs that are included in the Appendix. Laboratory results of soil samples (shown on Figure 2B) are as follows:

LABORATORY RESULTS - SOIL

WELL	DEPTH (FT.)	TOTAL HYDROCARBONS (PPM)	TOTAL EXTRACTABLE HYDROCARBONS (PPM)
5 BH	5.0	230.	520.
9 BH	2.0	350.	500.
15 BH	2.0	290.	1600.

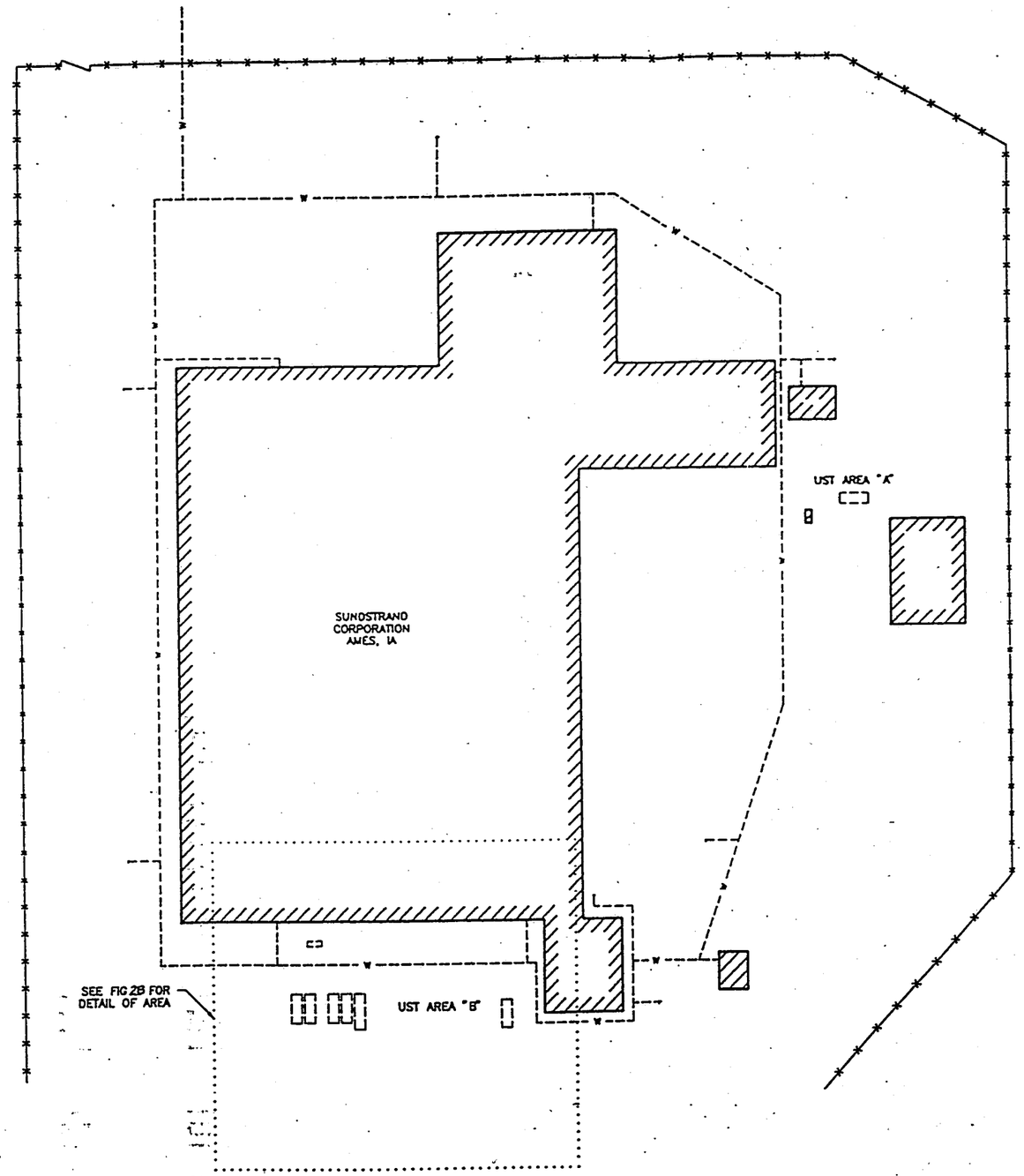
GROUND WATER

After drilling was complete, GSS collected ground water samples from all BHs. Three (3) 40 ml. vials and one (1) quart jar of water were collected from each of the BHs. Ground water from BHs 1, 2, 8, 11 and 12 were the only samples that analyzed above method detection levels. Total xylenes are the highest constituents (Ref. lab results). Ground water was encountered at depths ranging from 3 to 10 feet with an average of 7 to 8 feet.

Detailed well and soil gas logs, laboratory results and chain of custody documentation are included in the Appendix of this submittal.

CONCLUSION

Soil contamination in the multiple UST area (Figure 2B) appears to be limited to the south and southwest sides of the UST pit area. Soil contamination at the single UST (Figure 2A) may be limited to the UST pit area.

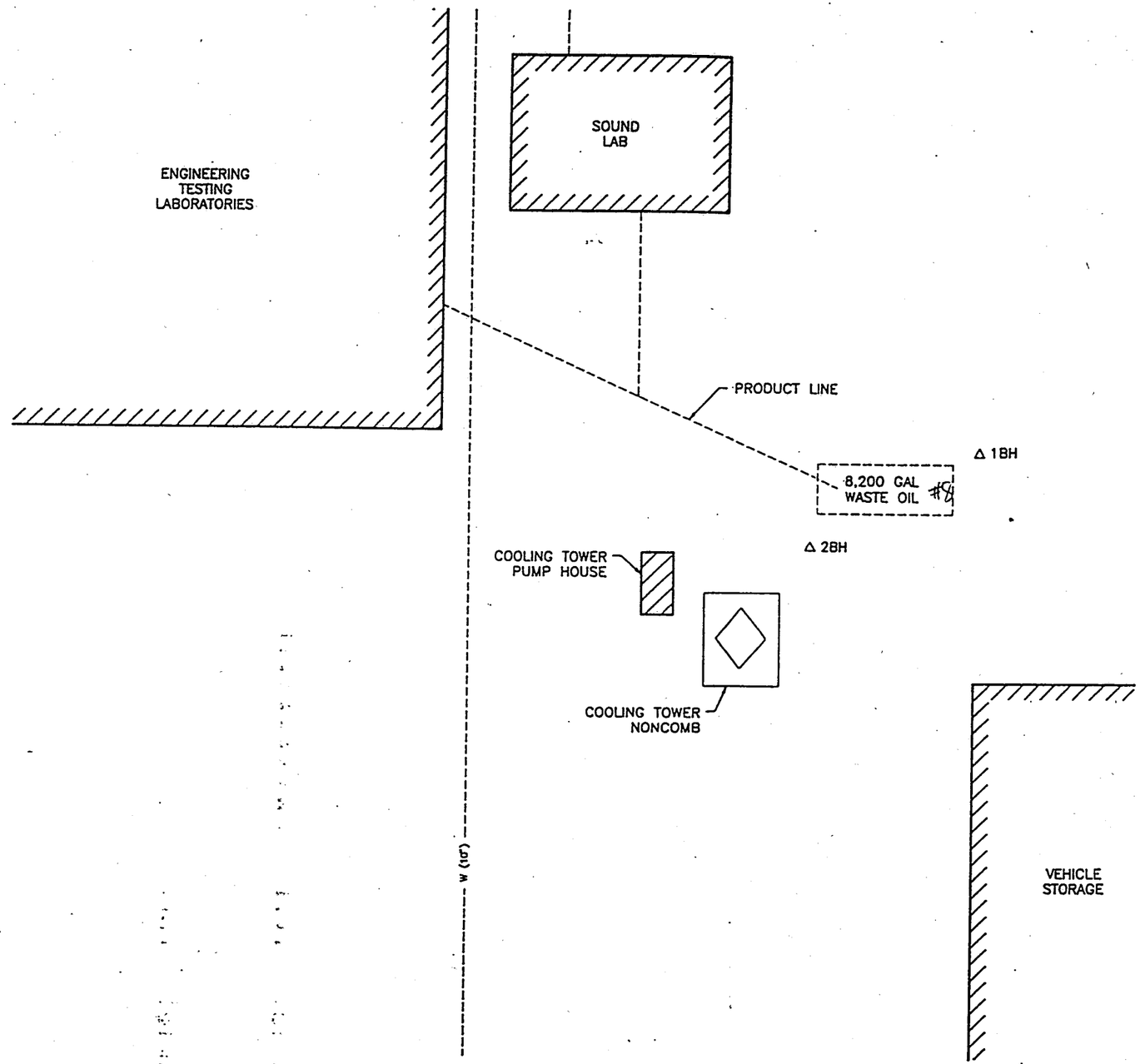


N

LEGEND

- UNDERGROUND TANKS
- GAS LINE LOCATION (APPROX.)
- OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

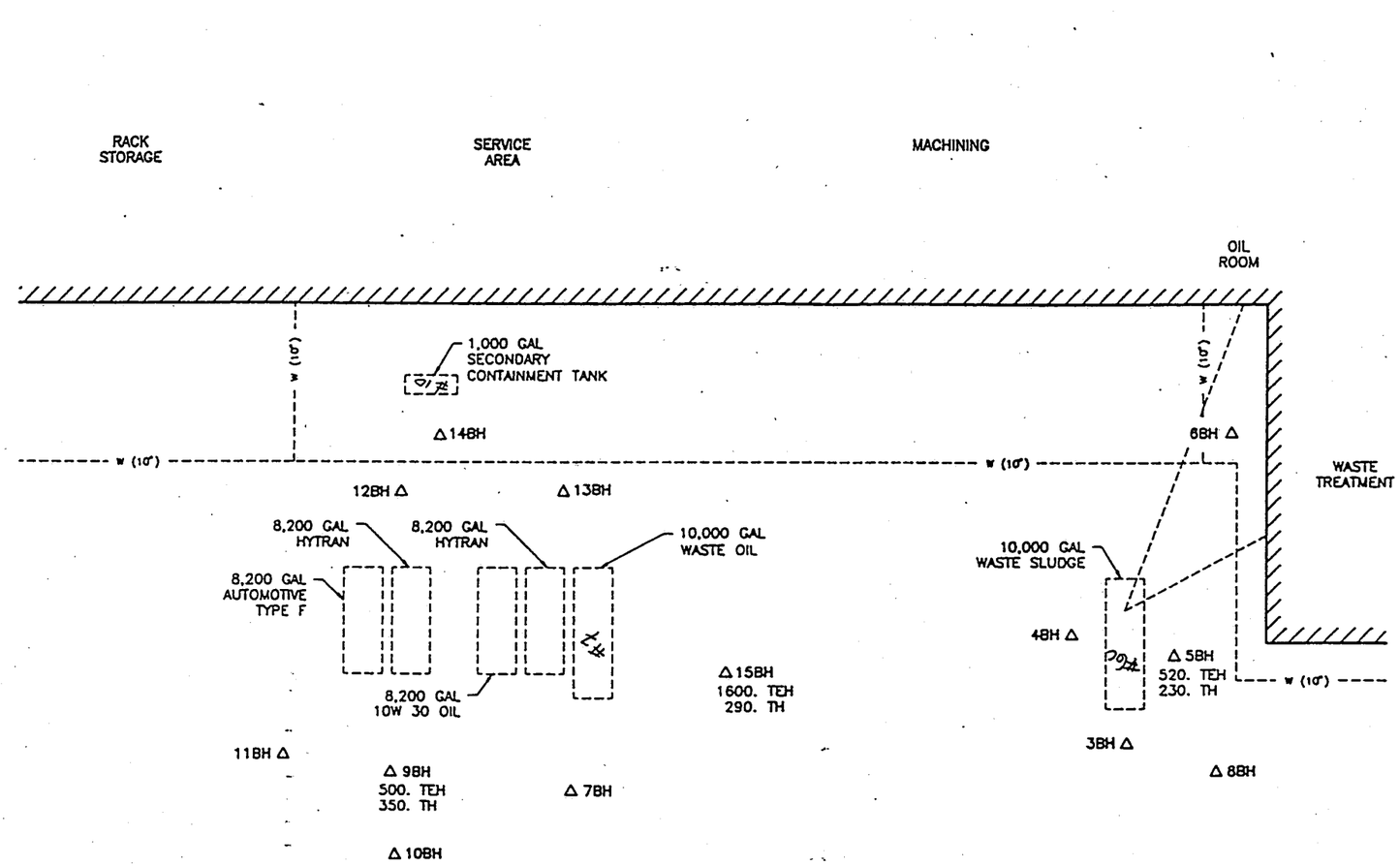
SAUER–SUNDSTRAND COMPANY			
SCALED SITE PLAN			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 07/92	DWN. BY WAP	CHKD. BY JE	
SCALE 1"=100'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 2



LEGEND

- UNDERGROUND TANKS
- Δ BOREHOLE (BH)
- --G-- GAS LINE LOCATION (APPROX.)
- —OE— OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- --SS-- SANITARY SEWER LINE LOCATION (APPROX.)
- --ST-- STORM SEWER LINE LOCATION (APPROX.)
- --W-- WATER LINE LOCATION (APPROX.)
- —OT— OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- ⊠ DISPENSING PUMP
- ø POWER POLE

SAUER–SUNDSTRAND COMPANY			
DETAILED SITE AREA MAP (UST AREA "A")			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 07/92	DWN. BY WAP	CHKD. BY JE	
SCALE 1"=20'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 2A



N

LEGEND

- UNDERGROUND TANKS
- Δ BOREHOLE (BH)
- --G-- GAS LINE LOCATION (APPROX.)
- —OE— OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- --SS-- SANITARY SEWER LINE LOCATION (APPROX.)
- --ST-- STORM SEWER LINE LOCATION (APPROX.)
- --W-- WATER LINE LOCATION (APPROX.)
- —OT— OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

SOIL SAMPLE RESULTS

- TEH TOTAL EXTRACTABLE HYDROCARBONS
- TH TOTAL HYDROCARBONS

SAUER-SUNDSTRAND COMPANY

DETAILED SITE AREA MAP (UST AREA "B")

LOCATION	AMES, IA	PROJ. NO.	92591
DATE	07/92	DWN. BY WAP	CHKD. BY JE
SCALE	1"=30'	NOTES	

GSS GROUNDWATER SERVICE & SUPPLY, INC. FIG. 2B

APPENDIX

WELL AND SOIL GAS LOGS

LABORATORY RESULTS

CHAIN OF CUSTODY DOCUMENTATION

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 1 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE
Date & Time Start 6/8/92 1015	Date & Time End 6/8/92 1042	Ground Surface Elevation (ASL) 977.09 / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area north-east of northern most tank.
					7	
					307	(0-1.0') CL - Clay, brown, dry, hard.
					188	
5					301	(1.0-3.0') SM - Sand, brown, fine grained, silty, fine grained, slightly moist.
					293	
					187	
					60	
					173	(3.0-13.4') SM - Sand, dark gray, fine grained, silty, wet with FAIR ODOR of waste oil from 3.0' - 13.4'.
10					307	
					198	
					245	
					167	(13.4-15.0') CL - Clay, tan, with iron-rust staining, moist, firm.
					0	
15					0	
20						
25						
30						

WEATHER: CLoudy, mild (70°); occassional drizzle.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
Date :	6/8/92	6/9/92					
Level:	3.60'	3.80'					
Time :	1142	0745					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 2 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE
Date & Time Start 6/8/92 1102	Date & Time End 6/8/92 1130	Ground Surface Elevation (ASL) 976.29 / Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area off southwest corner of north-most tank.
					0	
					0	
					0	(0-4.0') CL - Clay, brown, dry to slightly moist, firm to semi-soft.
5					0	
					0	
					0	(4.0-10.0') SM - Sand, gray, fine grained, silty, wet.
					0	
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (70°); occassional drizzle.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS							
WATER LEVELS	Date :	6/8/92	6/9/92				
Static Water Level Symbol v	Level:	3.30'	3.05'				
	Time :	1145	0750				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 3 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE	
Date & Time Start 6/8/92 1330	Date & Time End 6/8/92 1400	Ground Surface Elevation (ASL) 972.26	Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area 25.0' south of single southeast tank.
					0	
					0	
					0	(0-4.0') CL - Clay, brown-tan, slightly moist, firm.
5					0	
					0	(4.0-6.0') CL - Clay, black, massive, very slightly moist, firm with thin lens of fine, silty sand at 4.0'.
					0	
					0	
					0	
					13	
10					0	(6.0-10.0') CL - Clay, gray-tan, with iron-rust staining and scattered black, carbonaceous material, slightly moist to moist at 9.5', firm to soft at 9.5'.
15						
20						
25						
30						

WEATHER: Cloudy, mild (72!).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	6/8/92	6/9/92				
	Level:	6.50'	6.45'				
	Time :	1440	1213				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 4 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE
Date & Time Start 6/8/92 1410	Date & Time End 6/8/92 1430	Ground Surface Elevation (ASL) 972.36 / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt loading dock area to the southwest of the southeast tank.
					0	
					0	
					0	(0-6.0') CL - Asphalt, gravel, clay, dark brown to black, dry, hard.
5					0	
					0	
					0	(6.0-10.0') CL - Clay, gray-tan with iron-rust staining and scattered black carbonaceous material, slightly moist to moist at 8.0'.
					0	
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	6.75'					
Time :	1210					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 5 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5'		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE	
Date & Time Start 6/8/92 1435	Date & Time End 6/8/92 1505	Ground Surface Elevation (ASL) 973.76	Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area south-east of southeast most tank.
					13	
					40	(0-5.2') CL - Clay, black, with fine gravels, slightly moist, semi-soft, poor recovery.
					60	
			HS	HS	73	
5					113	
					7	(5.2-10.0' - CL - Clay, gray with iron-rust staining and scattered black carbonaceous material, slightly moist, semi-firm.
					0	
					0	
					0	
10					0	
15						
20						
25						
30						

NOTES: Soil sample collected at 5.0' at 1455. Sunstrand representative reported pump on top tank as being hit by vehicle sometime in the past.

WEATHER: Cloudy with slight drizzle, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
	Date :	6/9/92				
	Level:	7.70'				
	Time :	1225				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 7 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by JE	
Date & Time Start 6/8/92 1630	Date & Time End 6/8/92 1708	Ground Surface Elevation (ASL) 972.06	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in middle of asphalt driveway 24.0' south and in the middle of the 3-tank area.
					0	
					0	
					0	
5					0	(0-3.0') CL - Clay, black, with gravels, slightly moist, poor recovery.
					0	
					0	
					0	(3.0-8.0') CL - Clay, gray-green, slightly moist, semi-firm.
					0	
10					0	
						(8.0-9.8') CL - Clay, black, moist, firm with thin lens of fine grained silty sand at 8.5', moist; firm..
15						(9.8-10.0') CL - Clay, gray, moist, firm.
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) HS (hollow stem auger)

OBSERVATIONS							
WATER LEVELS	Date :	6/8/92	6/9/92				
Static Water Level Symbol v	Level:	8.0'	7.95'				
	Time :	1855	1245				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 8 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE
Date & Time Start 6/9/92 0840	Date & Time End 6/9/92 0900	Ground Surface Elevation (ASL) 973.46 / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area off-setting #5 BH to the south-east.
					0	
					0	
					0	(0-5.0') CL - Clay, black, slightly moist, semi-firm.
5					0	
					0	(5.0-10.0') CL - Clay, gray-green, slightly moist, semi-firm.
					0	
					0	
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (68°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS						
WATER LEVELS	Date :	6/9/92				
Static Water Level Symbol v	Level:	2.00'				
	Time :	1238				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 9 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by JE	
Date & Time Start 6/9/92 0930	Date & Time End 6/9/92 0955	Ground Surface Elevation (ASL) 971.66	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					220	Begin in asphalt of driveway south of 2-tank area.
			#1S	HS	113	
					67	(0-4.0') CL - Clay, black, with gravels, slightly moist, semi-soft with SLIGHT ODOR.
					0	
					0	
5					0	
					0	(4.0-7.5') CL - Clay, black-green, slightly moist, semi-firm.
					0	
					0	
					0	
10						(7.5-9.5') CL - Clay, black, massive, scattered green mottling.
						(9.5-10.0') CL - Clay, tan-green, with scattered iron-rust staining, moist, firm.
15						
20						
25						
30						

NOTES: Soil sample collected at 2.0' at 0935 (6/9/92).
WEATHER: Cloudy, mild (68°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽						
Date :	6/9/92					
Level:	8.10'					
Time :	1500					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 10 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE	
Date & Time Start 6/9/92 1008	Date & Time End 6/9/92 1030	Ground Surface Elevation (ASL) 971.56	Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin on south edge of pavement opposite #9 BH.
					0	
					0	(0-4.0') CL - Clay, black, with gravel, slightly moist, semi-firm.
					0	
5					0	
					0	(4.0-9.9') CL - Clay, black, with green mottling and scattered clastics, slightly moist to moist at 9.0', firm.
					0	
					0	
					0	
10					0	
						(9.9-10.0') CL - Clay, gray, sandy with iron-rust staining, moist, soft.
15						
20						
25						
30						

WEATHER: Cloudy, mild (70°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS						
WATER LEVELS	Date :	6/9/92				
Static Water Level Symbol v	Level:	7.80'				
	Time :	1545				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 11 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by JE
Date & Time Start 6/9/92 1040	Date & Time End 6/9/92 1110	Ground Surface Elevation (ASL) 971.56 / Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt west of #9 BH.
					0	
					0	(0-3.0') CL - Clay, brown, with gravels, firm.
					0	
5					0	(3.0-10.0') CL - Clay, black-green, slightly moist, semi-firm.
					0	
					0	
					0	
					~~111~~ 53	(10.0-15.0') CL - Clay, tan with gray mottling and iron rust staining; wet, semi-firm.
10					~~13~~	
					0	
					0	
					0	
					0	
15					0	
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS						
WATER LEVELS	Date :	6/9/92				
Static Water Level Symbol v	Level:	9.10'				
	Time :	1552				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 12 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5'		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by JE	
Date & Time Start 6/9/92 1245	Date & Time End 6/9/92 1310	Ground Surface Elevation (ASL) 972.46	Lust Number

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin grass area immediately to the north of the west 2-tank area.
					0	
					0	
					0	(0-3.0') CL - Clay-brown, sandy, dry.
					0	
5					0	
					0	(3.0-8.0') CL - Clay, black, slightly moist, firm.
					0	
					0	(8.0-9.0') CL - Clay, tan with numerous clastics, slightly moist, firm.
10					93	
						(9.0-9.9') CL - Clay, black, dense, moist, firm.
15						(9.9-10.0') CL - Clay, gray-green, slightly sandy, moist, soft with SLIGHT ODOR.
20						
25						
30						

WEATHER: Cloudy-sunny, windy, mild (75°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	8.80'					
Time :	1600					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 13 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 20' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE	
Date & Time Start 6/9/92 1313	Date & Time End 6/9/92 1350	Ground Surface Elevation (ASL) 973.56	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area immediately north of 3-tank area.
					0	
					0	
					0	(0-5.0') CL - Clay, brown with considerable gravels, dry, firm.
5					0	
					0	
					0	(5.0-11.0') CL - Clay, brown, very sandy with variable sized clastics, moist at 9.0'.
					0	
					0	
10					0	
					0	(11.0-19.8') CL - Clay, brown with fine clastics, semi-soft.
					0	
					0	
					0	(19.8-20.0') CL - Clay, dark gray-blue, massive with fine clastics, slightly moist, firm.
15					0	
					0	
					0	
					0	
					0	
20					0	
25						
30						

NOTES: BH carried to 20.0' to establish depth of impermeable (barrier) blue clay.
WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS							
WATER LEVELS	Date :	6/9/92					
Static Water Level Symbol v	Level:	10.60'					
	Time :	~~1615~~					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 14 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE
Date & Time Start 6/9/92 1400	Date & Time End 6/9/92 1435	Ground Surface Elevation (ASL) 973.56 / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	(0-1.0') CL - Clay, dark brown, dry, firm.
					0	
					0	(1.0-8.5') CL - Clay, black, massive, slightly moist, semi-firm.
					0	
5					0	
					0	(8.5-10.0') CL - Clay, gray, with fine clastics, slightly moist, firm.
					0	
					0	
					0	(10.0-15.0') CL - Clay, tan with gray mottling and iron-rust staining, moist, firm.
10					0	
					0	
					0	
					0	
15					0	
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	10.90'					
Time :	~~1675~~					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 15 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by JE	
Date & Time Start 6/9/92 1440	Date & Time End 6/9/92 1500	Ground Surface Elevation (ASL) 972.16	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt receiving dock area immediately to the east of the 3-tank area.
					80	
			#1S	HS	~~140~~ 66	
					~~33~~	
					0	(0-2.5') CL - Clay, black in upper half and tan in lower half, clay, firm, VERY SLIGHT ODOR from 1.5 - 3.0'.
5					0	
					0	
					0	
					0	
					0	(2.5-4.5') CL - Clay, black, slightly moist, firm.
10					0	
						(4.5 - 9.0') CL - Clay, tan, slightly moist, firm.
						(9.0-10.0') CL - Clay, black with gray mottling and iron-rust staining, moist, firm.
15						
20						
25						
30						

NOTES: Soil sample collected at 2.0' at 1500.
WEATHER: Cloudy, mild (75°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	8.40'					
Time :	1634					

DNR FORM 542-1392

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUL - 2 1992

ANALYTICAL REPORT

07/01/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4655

NET Sample Number: 172964

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #1-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
* Total Extractable Hydrocarbons	14000.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
Diesel	2700.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
Motor oil	11000.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<400.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	520.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<400.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	9600.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<4000.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	270.	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

* Estimated concentration. Sample over calibration curve.

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUL - 2 1992

ANALYTICAL REPORT

07/01/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4655

NET Sample Number: 172965

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #2-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	2.7	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
Diesel	2.7	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	8.1	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172966

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #3-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172967

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #4-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/17/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172968

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #5-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.16	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172969

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #6-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172970

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #7-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.37	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172971

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #8-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
								Water
EXTRACTABLE HYDROCARBONS-WATER								
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
								Water
VOLATILES - BTEX (WATER)								
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	3.3	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	44.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.36-	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172972

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #9-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172973

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #10-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.20	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172974

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #11-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	32.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.31	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172975

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #12-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	15.	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	3.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	12.	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<4.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	7.5	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<4.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	52.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<40.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	1.5	mg/L		bqb	06/17/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172976

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #13-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172977

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #14-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

Copy

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: SAUER SUNSTRAND

UST ADDRESS: 2800 13th Street Ames, IA

LAB: NET

SAMPLERS: (SIGNATURE) JOHN TIDT

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2		UST CONTENTS	REMARKS
#1 BH		[illegible]	✓			well		✓	6/9	1145	✓			✓			Used Oil	
#2 BH		"	✓			"		✓	"	1150	✓			✓			"	
#3 BH		"	✓			"		✓	"	1213	✓			✓			Oil Waste Sludge	
#4 BH		"	✓			"		✓	"	1218	✓			✓			"	
#5 BH		"	✓			"		✓	"	1225	✓			✓			"	Expedite Water Samples #3BH thru #15BH including soil samples
#6 BH		"	✓			"		✓	"	1230	✓			✓			"	
#7 BH		"	✓			"		✓	"	1245	✓			✓			HyTRAN	
#8 BH		"	✓			"		✓	"	1238	✓			✓			Waste Sludge	
#9 BH		"	✓			"		✓	"	1540	✓			✓			Type F	
#10 BH		"	✓			"		✓	"	1545	✓			✓			HyTran	
#11 BH		"	✓			"		✓	"	1552	✓			✓			Type F	
#12 BH		"	✓			"		✓	"	1600	✓			✓			HyTran	
#13 BH		"	✓			"		✓	"	1615	✓			✓			10W-30	
#14 BH		"	✓			"		✓	"	1625	✓			✓			Paint	
#15 BH		1G+	✓			"		✓	"	1625	✓						Paint	Check For Lead

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	6/10/92	8:20 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	6/10/92	1400	Melissa Saccom

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: JOHN TIDT

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-5781 • FAX 515-964-1226

RECEIVED JUL - 2 1992

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 22 1992

ANALYTICAL REPORT

06/19/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021

Sample No.: 172983
Job Number: 92.4657

Sample Description: #14-BH
PROJECT #92591

Date Taken: 06/09/1992

Date Received: 06/10/1992

	Result	Units	Date Analyzed
Lead, GFAA	<0.0050	mg/L	06/18/1992

NOTE: Reporting limits may vary due to matrix effects.

Cheryl L. Wilson
Project Manager

OCEAN GROUP

Copy

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) John Tidt

PROJECT NAME: SAUER SUNSTRAND

UST ADDRESS: 2800 13th Street Ames, IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE '92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2		UST CONTENTS	REMARKS
#1 BH		3-40ml 1Qt	✓			Well		✓	6/9	0145		✓		✓			Used	
#2 BH		"	✓			"		✓	"	1230		✓		✓			[illegible]	
#3 BH		"	✓			"		✓	"	1213		✓		✓				
#4 BH		"	✓			"		✓	"	1218		✓		✓				
#5 BH		"	✓			"		✓	"	1225		✓		✓				
#6 BH		"	✓			"		✓	"	1230		✓		✓			Hy Trim	
#7 BH		"	✓			"		✓	"	1245		✓		✓			[illegible]	
#8 BH		"	✓			"		✓	"	1235		✓		✓			Type F	
#9 BH		"	✓			"		✓	"	1540		✓		✓			[illegible]	
#10 BH		"	✓			"		✓	"	1545		✓		✓			Type F	
#11 BH		"	✓			"		✓	"	1552		✓		✓			Hy Trim	
#12 BH		"	✓			"		✓	"	1600		✓		✓			10W-30	
#13 BH		"	✓			"		✓	"	1615		✓		✓			Paint	
#14 BH		"	✓			"		✓	"	1625		✓		✓			Paint	Check For Lead
#15 BH		1Qt	✓			"		✓	"	1625		✓						

Expedite Water Samples #3 BH thru #15 BH including Soil samples

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	6/10/92	8:30 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	6/10/92	1400	Melene Saccian

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: John Tidt

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172978

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #15-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172979

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: Blanks/Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172980

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/08/1992

Date Received: 06/10/1992

Sample ID: #5-BH 5' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	520.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
Diesel	180.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
Motor Oil	340.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	8.4	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	230.	ug/g	d	djl	06/18/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172981

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #9-BH 2' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	500.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Diesel	500.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<100.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	40.	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	350.	ug/g	d	djl	06/19/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/24/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172982

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #15-BH 2' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	1600.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Diesel	610.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Motor Oil	1000.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	21.	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	290.	ug/g	d	djl	06/19/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591 #7

SAMPLERS: (SIGNATURE)

PROJECT NAME: SAUER SUNSTRAND

UST ADDRESS: 2800 13th Street Ames, IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE '92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2	UST CONTENTS	REMARKS
#15BH		3-40ml + 1 Qt	✓			Well		✓	6/9	1634	✓			✓		Waste Oil	
Blanks		3-40ml vials						✓		1645			✓				
																	Expedite
																Waste Sludge	
#5BH	5.0'	1-4oz Jar		✓		Boring		✓	6/8	1455	✓			✓		Hy Tech	
#9BH	2.0'	"		✓		"		✓	6/9	0935	✓			✓		Waste Oil	
#15BH	2.0'	"		✓		"		✓	6/9	1500							

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	6/10/92	8:20 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: John Tiot

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite G, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

DISCLAIMER

The author of this report, GROUNDWATER SERVICE & SUPPLY, INC. - GSS, of Ankeny, County of Polk, State of Iowa, hereby gives notice that any statement or opinion contained in the following report prepared by GSS shall not be construed to create any warranty or representation that the real property on which the investigation was conducted is free of pollution or complies with all applicable regulatory and statutory requirements; or that the property is fit for any particular purpose. Statement, descriptions or opinions are informational only and are not made or given as a warranty of the property in any way. Any purchaser of the property shall be solely responsible for determining the adequacy of the property for any and all uses for which the purchaser shall use the property. Any purchaser of the property which is the subject of this report should enter into any purchase on sole reliance of his own judgement and upon his own personal investigation of the property he is to receive, and not in reliance upon any representation by GSS regarding such property, the character, quality or value thereof.

APPENDIX B

SITE CLEANUP REPORT

DRAFT

SITE CLEANUP REPORT
FOR
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA

DRAFT

LUST NO. 7LTD58

Tank Registration No. 8605539

PROJECT NO. 92591

JUNE 1993

PREPARED FOR:
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA 50010

PREPARED BY:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 SE CONVENIENCE BOULEVARD
SUITE 6
ANKENY, IOWA 50021

Iowa

Department of Natural

Resources

DRAFT

LEAKING UNDERGROUND STORAGE TANK SITE CLEANUP REPORT (SCR)

PROJECT NO. 92591

Iowa Department of Natural Resources
Underground Storage Tank Section
Wallace State Office Building
900 East Grand Avenue
Des Moines, IA 50319-0034

515/281-8693

DRAFT

IOWA DEPARTMENT OF NATURAL RESOURCES

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

Leaking Underground Storage Tank Site Cleanup Report (SCR)

SITE IDENTIFICATION

LUST No.	7LTD58	UST Registration No.	8605539

Site Name:	Sauer Sundstrand Company
Site Address:	2800 East 13th Street
City:	Ames, IA 50010

RESPONSIBLE PARTY IDENTIFICATION

Name: George Charbonneau		
Street: 2800 East 13th Street		
City: Ames,	State: IA	Zip Code: 50010

Submittal Date: June 1993

SITE RISK CLASSIFICATION (circle one) HIGH RISK LOW RISK NO RISK

STATEMENT OF CERTIFICATION

The below named certify that this document, appendices and attachments satisfy the Site Cleanup Report requirements of Chapter 567-135(455b) of the Iowa Administrative Code and all other applicable state, federal and local requirements.

GROUNDWATER SERVICE & SUPPLY, INC.
Eugene J. Blazenko
App
Print Name of Registered Groundwater Professional

George Charbonneau
Print Name of Responsible Party

Signature - Registered Groundwater Professional

Signature - Responsible Party

Official DNR Use Only

Date Received:		Comment Date:	
Reviewer:		Comment Date:	
Date Reviewed:		Approved Date:	

APPENDICES CHECK-OFF SHEET

Check the box to indicate the appendix is attached. Attach the appendices to the end of the SCR in the order listed.

☐ Appendix 1 "II(C) - Tank & Line Tightness Testing Results"

Copies of all results, supporting field data, and the third party evaluation of the leak detection system. Explain the cause of testing anomalies and discuss any corrective action or repairs made to the system. Label as II(C) - Tank & Line Tightness Testing Results.

Appendix 2 "II(D) - Topographical Site Map"

Topographic map of the site and surrounding area. Label as II(D) - Topographical Site Map.

Appendix 3 "II(E) - Scaled Site Plan"

Map showing the site and immediate surrounding area. Label as II(E) - Scaled Site Plan.

Appendix 4 "II(F) - Scaled Site Vicinity Map"

Map showing the site in relation to general area features and the locations of properties adjacent to the site affected by the petroleum contamination or with potential to be affected as a result of contamination movement. Label as II(F) - Scaled Site Vicinity Map.

Appendix 5 "III(B) - DNR Form 542-1392, Soil Boring Logs"

Completed DNR form 542-1392 for each soil boring at the site. Label as III(B) - Soil Boring Log.

Appendix 6 "III(H) - Soil Contamination Plume Map"

Soil contamination plume map depicting the full extent of vadose zone soils exceeding the soil contamination corrective action levels. Label as III(H) - Soil Contamination Plume Map.

Appendix 7 "IV(B) - DNR Form 542-1392, Monitoring Well Construction Diagram"

Completed DNR form 542-1392 for each monitoring well at the site. Label as IV(B) - Monitoring Well Construction Diagram.

Appendix 8 "IV(G) - Groundwater Contour Map"

Groundwater contour map based on work done at the site. Label as IV(G) - Groundwater Contour Map.

Appendix 9 "IV(I) - Groundwater Contamination Plume Maps"

Groundwater contamination plume maps depicting the full extent of free phase product and dissolved phase contamination exceeding the groundwater corrective action levels under 135.7(9) and the levels of groundwater contamination within the plume. Label as IV(I) - Groundwater Contamination Plume Map.

Appendix 10 "VI - Hydrogeological Cross-Section Diagram"

Stratigraphically correlated hydrogeologic cross-section or three- dimensional diagram which adequately defines the spatial relationships of subsurface materials at the site. Label as VI - Hydrogeological Cross-Section Diagram.

Appendix 11 "VIII - Receptor Survey Map"

Site area map with the results of the following receptor surveys illustrated:

1) Surface Water Body Survey. Location of surface water bodies (i.e. lakes, ponds, rivers, streams, etc) within 1,000 feet of the petroleum contamination and evaluation of the potential for there to be a hydrogeological connection between the contamination and surface water.

2) Conduit Survey. Location of utility and natural conduits and confined spaces within 200 feet of the petroleum contamination and the results of investigations to determine the potential for the conduits to act as a pathway for vapors and product.

3) Groundwater Well Survey. Location of active, abandoned and plugged groundwater wells within 1,000 feet of the petroleum release.

4) Groundwater Barriers Survey. Locations of barriers and an explanation of their significance to contamination movement.

Label as VIII - Receptor Survey . Title survey narratives with the headings above.

Appendix 12 "X - Laboratory Data Sheets"

Copies of laboratory data sheets. Label as X - Laboratory Data Sheets.

Appendix 13 "XII(B) - Off-Site Contamination Source Support Data"

Data to support allegations of off-site contamination sources impacting the site. Label as XII(B) - Off-site Contamination Source Support Data.

Appendix 14 "XIII - Site Risk Classification Justification"

Justification of risk classification. Label as XIII - Site Risk Classification Justification.

Appendix 15 "XIV(A3) - Treatment Technology Evaluation" (High Risk Sites Only)

Evaluation of treatment technologies. Label as XIV(A3) - Treatment Technology Evaluation.

Appendix 16 "XIV(A4) - Best Available Technology (BAT)" (High Risk Sites Only)

Identification of the best available treatment technology. Label as XIV(A4) - Best Available Technology (BAT).

Appendix 17 "XIV(B2) - Best Management Practice" (Low Risk Sites Only)

Detailed best management practices plan. Label as XV(B2) - Best Management Practice.

Appendix 18 "XIV(B3) - Monitoring Plan" (Low Risk Sites Only)

Monitoring plan that will ensure any significant increase in contamination concentration or movement is detected. Label as XIV(B3) - Monitoring Plan.

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered: 05/24/89

B. Date the petroleum release was reported to DNR: 05/24/89

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	All parcels - 3/89 to PRESENT		
LAND OWNER NAME AND ADDRESS	SUSA Holding Company of Story County, Inc. 2800 E. 13th Ames, IA 50010		
REAL ESTATE OWNER NAME AND ADDRESS	SAME		
OPERATOR NAME AND ADDRESS	Sauer-Sundstrand Co. 2800 E. 13th Ames, IA 50010		
CONTRACT AGREEMENTS	Lease contract between Sauer-Sundstrand & SUSA Holding Co. of Story County, Inc.		
SITE ACTIVITIES	5/89 - GTI removed UST #3 and found released materials. 10/89 - Excavation begins. Free product found in recovery well 2. 12/89 - GTI conducted a limited site investigation. 7/92 - GSS removed remaining 7 USTs in "Area B" (#1, 2, 4, 5, 6, 7 and 1000 gal secondary containment tank); removed 8200 gal waste oil tank (#10) from "Area A."		

Is this page reproduced with additional history? Yes [X] No [ ]

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered: 05/24/89

B. Date the petroleum release was reported to DNR: 05/24/89

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	(Parcel 210) 8/70 to 3/89	(Parcel 210) TO 8/70	
LAND OWNER NAME AND ADDRESS	Sundstrand Corporation 2800 E. 13th Street Ames, IA 50010	Warren & Mary Israel & J.B. & Lois B. Walker	
REAL ESTATE OWNER NAME AND ADDRESS	SAME	UNKNOWN	
OPERATOR NAME AND ADDRESS	SAME	UNKNOWN	
CONTRACT AGREEMENTS	UNKNOWN	UNKNOWN	
SITE ACTIVITIES	1971 - Sundstrand installed 2-10000 gal. USTs (#3 diesel & #6 waste oil); 3 - 8200 gal. USTs (#4 solvent, #5 Hytran Oil & #10 waste oil). 1977 - Installed 2 - 8200 USTs (#1 type F oil & #2 Hytran). 1981 - Installed 1000 gal. UST for lacquer. 1982 - Installed 1-10,000 UST (#7 for waste oil). 11/87 - GTI conducted tightness tests. Converted 8200 gal - solvent UST (#4) to 10W-30 motor oil.		

Is this page reproduced with additional history? Yes [X] No [ ]

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered:

B. Date the petroleum release was reported to DNR:

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	(Parcel 70) 1/71 - 3/89	(Parcel 70) to 1/71	
LAND OWNER NAME AND ADDRESS	Sundstrand Corporation 2800 E. 13th Ames, IA 50010	Bleeker's, Inc.	
REAL ESTATE OWNER NAME AND ADDRESS	SAME	UNKNOWN	
OPERATOR NAME AND ADDRESS	SAME	UNKNOWN	
CONTRACT AGREEMENTS	UNKNOWN	UNKNOWN	
SITE ACTIVITIES			

Is this page reproduced with additional history? Yes [X] No [ ]

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered:

B. Date the petroleum release was reported to DNR:

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	(NE Parcel of 210) 3/71 to 3/89	(NE Parcel) 10/64 to 3/71	(NE Parcel) TO 3/71
LAND OWNER NAME AND ADDRESS	Sundstrand Corporation 2800 E. 13th Ames, IA 50010	Gulf Oil Co.	Lucy Banks (Unknown)
REAL ESTATE OWNER NAME AND ADDRESS	SAME	UNKNOWN	UNKNOWN
OPERATOR NAME AND ADDRESS	SAME	UNKNOWN	UNKNOWN
CONTRACT AGREEMENTS	UNKNOWN	UNKNOWN	UNKNOWN
SITE ACTIVITIES			

Is this page reproduced with additional history? Yes [X] No [ ]

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered:

B. Date the petroleum release was reported to DNR:

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	(Parcel 120) 9/79 to 3/89	to 9/79	
LAND OWNER NAME AND ADDRESS	Sundstrand Corporation 2800 E. 13th Ames, IA 50010	Bleeker's, Inc.	
REAL ESTATE OWNER NAME AND ADDRESS	SAME	UNKNOWN	
OPERATOR NAME AND ADDRESS	SAME	UNKNOWN	
CONTRACT AGREEMENTS	UNKNOWN	UNKNOWN	
SITE ACTIVITIES			

Is this page reproduced with additional history? Yes [X] No [ ]

*** IMPORTANT: READ ALL INSTRUCTIONS BEFORE COMPLETING ***

(CONFINE YOUR ANSWERS TO THE SPACE PROVIDED UNLESS OTHERWISE NOTED)

I. Site History

A. Date the petroleum release was discovered:

B. Date the petroleum release was reported to DNR:

C. Site Owner Chronology **This Page May Be Photocopied for Additional Site History**

Provide a chronological summary of past and present site and tank owners and operational history. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold on site. List the current mailing addresses of all previous owners and tank operators. List written contracts or agreements between land owners, real estate owners and tank operators. In the SITE ACTIVITY row, list number, capacity, and contents of past and present tanks, previous releases and tank closures.

DATE	(Parcel 030) 12/79 to 3/89	7/68 to 12/79	To 7/68
LAND OWNER NAME AND ADDRESS	Sundstrand Corporation 2800 East 13th Ames, IA 50010	Iowa Realty, Inc. & Dan J., Peter C., & David R. Woltz	Urban Co., LTD (Unknown)
REAL ESTATE OWNER NAME AND ADDRESS	SAME	SAME	UNKNOWN
OPERATOR NAME AND ADDRESS	SAME	Woltz Studios, Inc. (photographers) (SAME)	UNKNOWN
CONTRACT AGREEMENTS	UNKNOWN	UNKNOWN	UNKNOWN
SITE ACTIVITIES			

Is this page reproduced with additional history? Yes [ ] No [X]

>> E. Attach Appendix "II(E) - Scaled Site Plan"

Provide a scaled map (scale 1 inch = 20 to 50 feet) of the site and the immediate surrounding area. It must show the following, but is not limited to:

1) Location and content of existing and removed USTs, product lines and dispensers.
2) Pertinent site features (i.e., buildings, roads, wells, waterways, sinkhole, etc.).

>> F. Attach Appendix "II(F) - Scaled Site Vicinity Map"

Provide a scaled (scale 1 inch = 200 to 500 feet) vicinity map showing the site in relation to surrounding general features. It must show the following, but is not limited to:

1) Pertinent general features (i.e., buildings, roads, waterways, sinkhole, etc.).
2) Location of properties adjacent to the site affected or potentially affected by the contamination.

List below the names of owners of property affected or potentially affected by the contamination. Ensure the names correspond to the data provided on appendix "II(F) Scaled Site Vicinity Map."

Property Owner Name	Property Address	Owner Mailing Address
1 3M Company	900 Dayton Avenue Ames, IA 50010	Minnesota Mining & Manufacturing Company 3M Center Building St. Paul, MN 55100
2 Ackerman Investment Co.	Best Western Starlight Village 2601 E. 13th Street Ames, IA 50010	Ackerman Investment Co. 1625 5th Ave. South Ft. Dodge, IA 50501
3 A & A Enterprises, Inc.	2801 E. 13th Ames, IA 50010	1625 5th Avenue South Ft. Dodge, IA 50501
4 River Valley Credit Union	2811 E. 13th Ames, IA 50010	SAME
5 Robert D. & Norma J. Bunce	KEZT-FM 2825 E. 13th Ames, IA 50010	13649 Bay Hill Drive Clive, IA 50325
6 Sandra Allen, Sharon Brown & Sue Nelson c/o Edward P. Allen	Farmland NE No property address	Route 1, Box 707 Fort Calhoun, NE 68023
7 Webster City Custom Meats, Inc.	Farmland SE No property address	Highway 20 E. Webster City, IA 50595
8 Doolittle Oil Co.	AMOCO Station (Doc's Stop) 2902 E. 13th Ames, IA 50010	P.O. Box 151 Webster City, IA 50595
9		
10		
11		

D. Describe the circumstances of the discovery of the release:

On May 24, 1989, Groundwater Technology, Inc. (GTI) discovered contamination during the removal of a 10,000 diesel UST (#3).

E. Describe the initial actions taken to abate the petroleum release:

The suspected release was reported to IDNR on 5/24/89. A boring on 7/25/89 found released materials of an unknown source. IDNR field office #5 investigated on 8/16/89 and concluded released materials were of hydraulic fluid with traces of "Stoddard Solvent," spilled during transfer of solvent from tanker truck to UST (#4), 1971-1987. GTI drilled one soil boring (11/29/89).

II. Current Site Conditions (CONFINE YOUR ANSWER TO THE SPACE PROVIDED)

A. Provide a general description of the site geology:

The site is 0.86 miles east of the South Skunk River. An intermittent stream and tributary is about one-half mile from the site. Areas "A" and "B" are lithologically similar. Both are predominantly clay overlain with sandy clay and gravel, sand, or fine clastics.

B. Description of the existing UST system: This page may be photocopied if more than 6 tanks exist at this site.

Tank Number	1	2	3	4	5	6
Capacity (gallons)						
Product Stored						
Construction Material						
Operational Status	CHECK ONE BOX ONLY FOR EACH TANK					
Contains product	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Contains NO product and is out of use	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
C. Tank and line tightness tests required by DNR (yes or no)						
Tank Leak Rate (g/h)						
Line Leak Rate (g/h)						

>> Attach Appendix "II(C) - Tank and Line Tightness Testing Results"

If tanks or lines were tightness tested, attach copies of all results, supporting field data and the third party evaluation of the leak detection system. Explain the cause of testing anomalies and discuss any corrective actions or repairs made to the system.

>> D. Attach Appendix "II(D) - Topographical Site Map"

Provide a topographical map of the site and surrounding area developed from work done at the site, city surveys where available or USGS maps. Legible contour elevation differentials no greater than ten feet must be provided. Two foot contour intervals are preferred.

III. Soil Sampling Methods & Findings

(CONFINE YOUR ANSWER TO THE SPACE PROVIDED)

A. Boring number and placement.

Explain and justify the rationale used to determine the number and placement of soil borings. Factors that should be taken into consideration when developing the rationale include site stratigraphy, media conductivity, mobility of contaminants and duration of the release. The number and placement of borings must be sufficient to allow the:

1) determination of the lateral and vertical extents of soil contamination,
2) accurate description of site stratigraphy, and
3) identification of the transition zone between those areas that do and do not exceed the soil contamination cleanup level.

The identification of the transition zone will require the construction of contours developed through the interpolation of data. Additional information will be required to substantiate the location of contour lines if it is determined that the lines are not consistent with the rationale or data provided, or the interpolation techniques appear to be questionable.

PREVIOUS WORK: On 5/24/89 GTI removed UST #3 and found impacted soils. On 11/10/89 GTI hand augered a borehole (BH-1 or SB-1) as part of the removal of UST #3 and found released materials in the soil sample.

CURRENT WORK: Groundwater Service & Supply, Inc. (GSS) was retained in 6/92 to perform internal, on-site audit of conditions. Drilled 2 BHs in area "A" and 13 BHs in Area "B."

In July 1992, the 8200 gallon UST in Area A was removed. This UST was 21 feet below grade, requiring sheet piling to support the side walls. Therefore, pit wall soil samples were not collected.

The remaining 7 USTs in Area B were also removed and the impacted soil was overexcavated. Soil samples (SS-1 through SS-16) were collected from the side walls. A soil sample was collected beneath the 1000 gallon secondary containment tank (PB-1).

In March 1993, a total of 9 borings were drilled in Areas A & B to further delineate the extent of impacted soil at this site. Borings were drilled in all directions around the UST in Area A to detect any released material still remaining after the tank was removed. 25 BH and 26 BH were drilled adjacent to SS-8 (the only sample collected during overexcavation that exceeded IDNR CAL).

>> B. Attach Appendix "III(B) - Soil Boring Logs"

Complete and attach a DNR form 542-1392 for each soil boring at site.

C. Explain the actions taken to prevent cross-contamination between boreholes during installation and sampling.

Drilling equipment included a high pressure, hot water cleaning unit. This cleaning equipment was used to decontaminate the augers and other drilling equipment after drilling each hole. All sampling equipment was cleaned between samples with an Alconox solution and distilled water rinse.

Clean latex gloves were worn when collecting soil samples.

The temporary casings placed in BHs to assist in ground water sampling were not reused.

D. List the vapor equipment used.

Describe its use and evaluate conclusions drawn from vapor results and calibration procedures. Equipment must be calibrated at the beginning and end of each day at the site, at a minimum.

GSS used the following:

Thermo-Environmental Instruments, Inc. OVM (Model B)

1. To screen split barrel cores for soil gas over each 1.0 foot interval.
2. To screen head space of ground water samples.

The OVM model B was calibrated prior to drilling using a 250 ppm isobutylene standard. The calibration procedure showed that the analyzer was operating properly and generated reliable data. Vapor readings were used as a guide for the collection of soil samples; generally, the sample with the highest reading was collected for laboratory analysis. The OVM was calibrated each day at the initiation and completion of field activities with an isobutylene standard. Records from July 1992 and early March 1993 were not kept.

Tabulate Daily Calibration Data In The Chart Below

CALIBRATION (PPM)

Date	Standard	Start	During	End	Date	Standard	Start	During	End
3/23/93	250	248	257	244					

E. Describe soil sample collection methods and explain why the methods provide a representative sample. Split spoon and hollow stem augers producing a continuous core are acceptable soil sampling devices. At a minimum, soil samples must be collected at five foot intervals and when changes in the formation occur for soil observations, vapor screening and other indicated analyses.

Samples were collected and examined continuously by using a split barrel sampling technique during drilling operations. This technique provides minimally disturbed soil samples and provides detailed information on subsurface stratigraphy. The samples were visually examined, described and continuously screened for volatile organic compounds (VOCs) during drilling operations. A Photoionization Detector (PID) was used for this procedure. If soil contamination was found in concentrations greater than 10 ppm above ground water, samples were collected for laboratory analyses at intervals of approximately 5 feet through the contaminated zone or at the discretion of the site geologist/engineer.

F. Attach Appendix "III(H) - Soil Contamination Plume Maps"

Provide soil contamination plume maps depicting the full extent of vadose zone soils exceeding the soil contamination corrective action level under 135.7(9) and the levels of contamination within the plume. The extent of off-site soil contamination must be investigated. Label boring locations with the petroleum hydrocarbon concentrations used to determine the extent of the plume. The map must contain a sufficient number of data points to adequately justify the construction of plume contour lines. Identify borings used to determine hydraulic conductivity.

IV. Groundwater Sampling Methods & Findings (CONFINE YOUR ANSWER TO SPACE PROVIDED)

A. Boring number and placement.

Explain and justify the rationale used to determine the number and placement of groundwater monitoring wells. Factors that should be taken into consideration when developing the rationale include site stratigraphy, media conductivity, mobility of contaminants and duration of the release. The number and placement of wells must be sufficient to allow the 1) determination of the lateral and vertical extent of groundwater contamination, 2) accurate description of site stratigraphy, and 3) identification of the transition zone between those areas that do and do not exceed the contamination cleanup level. The identification of the transition zone will require the construction of contours developed through the interpolation of data. Additional information will be required to substantiate the location of contour lines if it is determined that the lines are not consistent with the rationale or data provided, or the interpolation techniques appear to be questionable.

AREA "A": Analytical data from the water sample from 1 BH led to the drilling of 6 MWs and another BH. All samples analyzed below laboratory detection limits. 19 MW and 22 MW were located near the water lines but these were not impacted.

AREA "B": As pre-assessment (3 BH through 15 BH) water samples all analyzed below laboratory method detection limits (MDL), SCR borings were placed downgradient from the overexcavation. 16 MW and 17 MW were completed for long-term monitoring.

>> B. Attach Appendix "IV(B) - Monitoring Well Construction Diagram"

Complete and attach a DNR form 542-1392 for each monitoring well constructed at the site.

C. Explain permanent monitoring well construction.

If the following well construction material or dimensions vary, indicate the variations on DNR Form 542-1392.

1) method of cleaning well components prior to installation.
   All tubular goods and backfill were factory packaged. Prior to use, they were respectively wrapped in plastic or bagged.
2) casing and screen material.
   2" Schedule 40 PVC
3) screen slot size.
   .020 slotted screen.
4) how the sections of casings and screens are connected.
   The sections were joined by threaded flush joints. No glues or cements were used on the joints.
5) method used to install filter pack and seals.
   Screened sections were backfilled with 20 - 40 silica sand to about 1 foot above the top of the screen; sand backfills were then capped with bentonite seals to about 2 - 3 inches below the top of the pipe. Both the sand and the bentonite were poured into the hole from their containment bags and the materials tamped down selectively to ensure complete backfilling.
6) actions taken to prevent cross-contamination of wells during construction and sampling.
   All sampling equipment was decontaminated with an Alconox detergent solution and distilled water after each sampling procedure. All equipment was washed between advancements of each borehole. Clean latex gloves were worn during sample collection.
7) monitoring well development procedures.
   All monitor wells were developed by removing at least 3-4 well volumes of ground water.

D. For samples collected from boreholes:

(Temporary casing and screen are required prior to sample collection.)

1) Describe the type and use of temporary casing and screen.

   The temporary BH consisted of a 2" Schedule 40 PVC, 10 foot screen with a 5 foot Schedule 40 PVC blank casing. The temporary casing was used to reduce suspended sediments in the ground water.

2) Explain and justify the adequacy of well development procedures to ensure a representative sample.

   Wells were bailed at least 3 - 4 volumes to ensure the removal of construction debris and excess sediment resulting from the drilling and also to provide a sample at the proper stable reservoir temperature and pH.

E. Explain and justify the adequacy of groundwater sampling and well purging methods.

Prior to sampling for water, wells were bailed until 3-4 volumes were displaced to extract any water introduced by the drilling process, to dewater the sand pack and to remove suspended sediments. Dewatering the sand pack allows fresh water from the surrounding sediments to infiltrate the well, resulting in a representative ground water sample. Thereafter, 3 - 40 ml. vials were collected from each well for BTEX analyses and a quart jar for the analysis of extractables.

In order to utilize the most data points for the construction of reliable ground water contour maps, separate maps for Areas "A" and "B" were constructed.

F. Groundwater Data for Contour Map Development **AREA "A"** SURVEY DATA FROM ADJACENT SITES MAY BE UTILIZED

Well/ Boring Number	Date Measured	Static Water Level (ASL) (to 0.01 ft.)	Water Level Corrected due to Free Product * (Yes/No)	Product Depth	Ground Surface Elevation (ASL) to 0.1 ft.
18 MW	5/17/93	975.24	NO	inches	976.2
19 MW	"	973.50	"	inches	975.8
20 MW	"	975.02	"	inches	977.6
21 MW	"	975.61	"	inches	977.5
22 MW	"	973.93	"	inches	975.9
24 MW	"	975.11	"	inches	977.1
				inches	
				inches	
				inches	
				inches	
				inches	
				inches	

* Describe below the correction method used to determine the static water level.

Describe the benchmark used to survey for groundwater surface elevations.

Fire hydrant #3 with an ASL elevation of 975.00' was used to survey groundwater surface elevations.

>> G. Attach Appendix "IV(G)- Groundwater Contour Map"

Provide a groundwater contour map based on work done at the site and the adjacent area. All wells at the site must be shown on the map. Wells constructed in different aquifers must be identified. Indicate the groundwater flow direction with an arrow. Groundwater contours and elevations at each data point used for contouring must be labeled on the map. Contours must be consistent with observed water level elevations. Measurements of static water level and depth to the bottom of the wells must be taken. An adequate number of water levels must be measured in each well to determine the static water level. Static water levels must be measured to the nearest 0.01 foot. Identify wells used to determine hydraulic conductivity.

E. Explain and justify the adequacy of groundwater sampling and well purging methods.

F. Groundwater Data for Contour Map Development **AREA "B"** SURVEY DATA FROM ADJACENT SITES MAY BE UTILIZED

Well/ Boring Number	Date Measured	Static Water Level (ASL) (to 0.01 ft.)	Water Level Corrected due to Free Product * (Yes/No)	Product Depth	Ground Surface Elevation (ASL) to 0.1 ft.
3 BH	6/9/92	965.81	NO	inches	972.26
4 BH	"	965.61	"	inches	972.36
5 BH	"	966.06	"	inches	973.76
6 BH	"	966.16	"	inches	974.96
7 BH	"	964.11	"	inches	972.06
8 BH	"	966.46	"	inches	973.46
9 BH	"	963.56	"	inches	971.66
10 BH	"	963.76	"	inches	971.56
11 BH	"	962.46	"	inches	971.56
13 BH	"	962.96	"	inches	973.56
14 BH	"	962.66	"	inches	973.56
15 BH	"	963.76	"	inches	972.16

* Describe below the correction method used to determine the static water level.

Describe the benchmark used to survey for groundwater surface elevations.

>> G. Attach Appendix "IV(G)- Groundwater Contour Map"

Provide a groundwater contour map based on work done at the site and the adjacent area. All wells at the site must be shown on the map. Wells constructed in different aquifers must be identified. Indicate the groundwater flow direction with an arrow. Groundwater contours and elevations at each data point used for contouring must be labeled on the map. Contours must be consistent with observed water level elevations. Measurements of static water level and depth to the bottom of the wells must be taken. An adequate number of water levels must be measured in each well to determine the static water level. Static water levels must be measured to the nearest 0.01 foot. Identify wells used to determine hydraulic conductivity.

H. Describe and explain the following:

1) identify the methodology and device used to determine static groundwater levels.
   The depth to static ground water and the total depth of the well bore were measured respectively with a decontaminated Interface Probe (IP) and weighted tape.

2) provide confirmation that the methodology used will provide the required levels of accuracy.
   Several water levels were measured with the IP in each well to an accuracy of .01 inch to ensure static water levels.

3) groundwater flows and any anomalous water levels.
   Groundwater flow is to the south and southwest.

4) fluctuations in water levels with special emphasis on those which may alter general groundwater gradient or flow direction.
   No fluctuations were noted during this investigation.

>> I. Attach Appendix "IV(I) - Groundwater Contamination Plume Maps"

Provide groundwater contamination plume maps depicting the full extent of free phase product and dissolved phase contamination exceeding the groundwater corrective action levels under 135.7(9) and the levels of groundwater contamination within the plume. The extent of off-site groundwater contamination must be investigated. Label each data point with the contaminant concentrations used to determine the extent of the plume. The map must contain a sufficient number of data points to adequately justify the construction of plume contours. Identify free product thickness.

V. Sampling Quality Control

(Confine Your Answer to the Space Provided)

Provide a statement that indicates the quality control/quality assurance (QC/QA) procedures used during the site investigation were at least as stringent as those contained in IDNR's Leaking Underground Storage Tank Quality Assurance Plan.

QC/QA procedures as outlined in the IDNR's LUST Tank Quality Assurance Plan were followed by GSS and associated services including drilling contractors and commercial laboratories.

VI. Hydrogeological Cross-Sections

>>Attach Appendix "VI - Hydrogeological Cross-Section Diagram"

Develop, from the borings that were required to identify the extent of contamination, stratigraphically correlated hydrogeologic cross-sections or three-dimensional diagrams which adequately define the spatial relationships of subsurface materials at the site. The cross-sections should illustrate the materials in the contamination zone. The sections or diagrams must include the following information:

1) Identification of types and characteristics of the geological materials present.
2) Identification of contact zones between different geological materials, noting zones of high permeability or fracture.
3) Detailed borehole information including location, depth of termination and zone of saturation.

VII. Hydraulic Conductivity

(Confine Your Answer To The Space Provided)

A. Determine and record here the hydraulic conductivity of subsurface materials at the site. Identify borings and wells used to determine hydraulic conductivity. Include calculations and data used to obtain the values.

K = 0.05 m/day (19 MW)
K = 0.21 m/day (20 MW)

See Appendix 10 for calculations.

B. Indicate the method used.

The Bouwer-Rice method was used.

C. If an equivalent method was used to determine conductivity, evaluate its accuracy.

The Bouwer-Rice method was used.

D. Explain why the location/number of data points where hydraulic conductivity was determined adequately provides a representative indication of conductivity at the site.

Because of the similarity in lithology between areas A and B and since area B had been extensively overexcavated, only hydraulic conductivities in area A were measured and these are believed to be representative of both areas.

VIII. Receptor Survey

>> Attach Appendix "VIII - Receptor Survey Map"

Provide a site area map that identifies the following:

A. Surface Water Body Survey. Location of surface water bodies (i.e., lakes, ponds, rivers, streams, etc.) within 1000 feet of the petroleum contaminated area. Include an evaluation of the potential for hydrogeological connections between the contamination and surface water. Justify the decision to conduct or not to conduct monitoring to determine the impact of contamination on surface water quality. Grab samples are typically collected to determine the impact of contamination on surface water quality. Samples taken upstream of the release can help establish the background levels for the compounds of concern. Subsequent samples taken downstream will provide information regarding contamination concentration versus travel time. If surface water sampling is conducted, provide a discussion of the sampling methodology and evaluate the adequacy of the sampling program. Tabulate the analytical results. Also record visual observations (i.e., sheen, sludge, scum, etc.). Label the narrative and analytical results in Appendix VIII pertaining to the above with the heading "Surface Body Receptor Survey"

B. Conduit Survey. Location of utility (i.e., power lines, storm and sanitary sewers, tile lines, etc.), natural (i.e., sinkhole, caves, etc.) conduits and confined spaces (i.e., basements, crawl spaces, etc.) within 200 feet of the area of petroleum contamination. Include a description of the investigation conducted to determine the potential for the conduits to act as pathways for vapors and product. The investigation must include soil sample collections for laboratory analysis and vapor monitoring. The focus of the investigation should be influenced by soil types, product type, phases and concentrations, location and depth of the utilities and confined spaces and groundwater elevations. In tabulation form, define the type of conduit or confined space, conduit backfill material, slope of conduit and trench, and relationship to groundwater levels. Tabulate the analytical results. Indicate if contamination has resulted in the presence of explosive vapors or caused physical damage to conduits or confined spaces. Label the narrative and analytical results in Appendix VIII pertaining to the above with the heading "Conduit Survey."

The following are recommended when conducting a vapor survey in an accessible utility conduit:

The vapor survey is required if there are reports of vapors or if the conduit has been impacted by the contamination or if there is the potential for vapors based on the type of substance release.

1) Use an explosimeter and photoionization detector (PID) to take vapor readings. Start at the manway closest to the site. Work upstream and downstream to determine if and where the product or vapors are entering, and the extent of the impacted area. "Crack" each manway cover and take readings of oxygen, explosimeter and PID. Repeat measurements at mid-depth and water level or bottom of the conduit.

2) Check air flow directions from the manway to determine if dilution of vapors is occurring.

3) Collect water or sewage samples. Observe for sheen and odors. If there is odor but no product, consider using the PID to obtain a head space analysis.

4) Check all incoming conduit branches. If odors are detected, continue the investigation upstream and downstream even if no product is present.

5) Check lift stations near the site.

The following are recommended when conducting a confined space survey:

1) Check confined spaces using an explosimeter and PID. Record names and addresses of building residents/owners.
2) Check for vapors near basements, sewer drains and near any foundation cracks.

C. Groundwater Survey. Identifying active, inactive, abandoned and plugged groundwater wells within 1,000 feet of the petroleum contaminated area. Groundwater professionals only need to report well information readily available from public entities (i.e., county health or zoning departments, IDNR, Water Supply Section (515/242-6128), Geological Survey Bureau (319/335-1575), etc., and water well owners. An onsite survey will be necessary to identify all the wells in a 300-foot radius of the petroleum contaminated area. Include in the appendix:

1) Copies of available well logs.
2) Name and address of each well owner. Correlate with well number.
3) Description of the plugging method for those wells not sealed according to chapter 567-39 IAC.
4) Complete the following table:

Photocopy if additional space is needed

Well # as identified on Receptor Survey Map	Amoco Station #1										
Well Status											
Active	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Inactive	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Abandoned	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Plugged - According to Ch. 39	[x]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
- Not according to Ch. 39*	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

* Describe in the appendix the plugging process used for each well marked.

Well Use	For Each well, Mark All That Apply										
Public Well	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Private Drinking Well	[x]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Static Water Level Elevation	Not known										
Well Depth Elevation	Not known										
Well Diameter	5"										
Casing Material	Steel										
Well Log Provided - NO	[x]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
YES	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Label the narrative and information in appendix VIII pertaining to the above with the heading "Groundwater Well Survey."

D. Groundwater Barrier Survey. Identify the location of barriers, (i.e., foundations, structures, parking lots, roads, natural, etc.) that could have an impact on the movement of the contamination. Explain the significance of the barriers by relating their presence to the hydrogeological conditions at the site. Label the narrative in Appendix VIII pertaining to the above information with the heading "Groundwater Barrier Survey."

IX. Certification of Site Health & Safety

REQUIRED

Statement of Verification of On-Site Health & Safety Procedures

The On-Site Health & Safety Procedures and Conditions conform with applicable OSHA requirements.

Yes [x] No [ ]

X. Tabulation of Analytical Data

Photocopy this form if additional space is needed.

Soil Analytical Data Information

Provide a tabulation of analytical data for each soil boring or monitoring well. List each sampling event chronologically with the oldest data first. If borings were sampled on a particular day at different elevations, list the results for the samples closest to the ground surface first. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	SB-1	SB-1	SB-1	5 BH *	9 BH *	15 BH *	16 MW	17 MW	18 MW
Date Sampled	11/10/89	11/10/89	11/10/89	6/8/92	6/9/92	6/9/92	3/3/93	3/3/93	3/3/93
Elevations (ft ASL) - Ground Surface				973.76	971.66	972.16	970.83	971.76	976.19
- Soil Sample	2'	7'	9'	968.76	969.66	970.16	965.83	966.76	974.19
- Static Groundwater				966.06	963.56	963.76	964.63	965.45	975.24
Total Petroleum Hydrocarbons (ppm)	84	150	4900	230.	350.	290.	<10.	<10.	<10.
Extractable Hydrocarbons (ppm)	-	-	-	520.	500.	1600.	<10.	<10.	<10.

*NOTE: REMOVED DURING O/E

Groundwater Analytical Data Information

Provide a tabulation of groundwater sampling analytical data. List the sampling events starting with the first well in the well identification scheme. If the well was sampled more than once, list each result chronologically. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	1 BH	2 BH	3 BH	4 BH	5 BH	6 BH	7 BH	8 BH	9 BH
Date	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92
Elevation (ft ASL) - Ground Elevation	977.09	976.29	972.26	972.36	973.76	974.96	972.06	973.46	971.66
- Top of Screen	-	-	-	-	-	-	-	-	-
- Static Water Level	973.29	973.24	965.81	965.61	966.06	966.16	964.11	966.46	963.56
Benzene (ppb)	<400.	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene (ppb)	520.	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.3	<2.0
Toluene(ppb)	<400.	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylene (ppb)	9600.	8.1	<2.0	<2.0	<2.0	<2.0	<2.0	44.	<2.0

>> Attach Appendix X "Laboratory Data Sheets"
Provide copies of all laboratory data sheets.

XI. Free Product

CONFINE YOUR ANSWER TO THE SPACE PROVIDED

A. Is free product present at the site ? YES [ ] NO [X]
B. If yes, indicate the date the "Free Product Removal Report" was submitted: 6/4/90 TO 10/3/91
C. Discuss the status and evaluate the effectiveness of the free product removal system in relation to the hydrogeological conditions at the site.
D. Provide monthly reports to DNR on the attached DNR forms 542-1424 and 542-1425

Monthly reports from Groundwater Technology, Inc. attached (Appendix 19). No evidence of free product after initial reading in 1989.

X. Tabulation of Analytical Data

Photocopy this form if additional space is needed.

Soil Analytical Data Information

Provide a tabulation of analytical data for each soil boring or monitoring well. List each sampling event chronologically with the oldest data first. If borings were sampled on a particular day at different elevations, list the results for the samples closest to the ground surface first. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	19 MW	20 MW	21 MW	22 MW	23 BH	24 MW	25 BH	26 BH	
Date Sampled	3/3/93	3/3/93	3/4/93	3/4/93	3/4/93	3/23/93	3/23/93	3/23/93	
Elevations (ft ASL) - Ground Surface	975.80	977.57	977.51	975.89	977.47	977.06	972.15	972.23	
- Soil Sample	973.80	974.57	975.51	973.89	975.47	974.06	968.15	969.23	
- Static Groundwater	973.50	975.02	975.61	973.93	974.74	975.11	965.05	964.92	
Total Petroleum Hydrocarbons (ppm)	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.	
Extractable Hydrocarbons (ppm)	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.	

Groundwater Analytical Data Information

Provide a tabulation of groundwater sampling analytical data. List the sampling events starting with the first well in the well identification scheme. If the well was sampled more than once, list each result chronologically. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	10 BH	11 BH	12 BH	13 BH	14 BH	15 BH	TERR.#4	16 MW	17 MW
Date	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	6/9/92	3/3/93	3/3/93	3/3/93
Elevation (ft ASL) - Ground Elevation	971.56	971.56	972.46	973.56	973.56	972.16	976.28	970.83	971.76
Top of Screen	-	-	-	-	-	-	-	965.83	966.76
Static Water Level	963.76	962.46	963.66	962.96	962.66	963.76	973.86	964.63	965.45
Benzene (ppb)	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene (ppb)	<2.0	<2.0	7.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene(ppb)	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylene (ppb)	<2.0	32.	52.	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

>> Attach Appendix X "Laboratory Data Sheets"
Provide copies of all laboratory data sheets.

XI. Free Product

CONFINE YOUR ANSWER TO THE SPACE PROVIDED

A. Is free product present at the site ? YES [ ] NO [X]
B. If yes, indicate the date the "Free Product Removal Report" was submitted:
C. Discuss the status and evaluate the effectiveness of the free product removal system in relation to the hydrogeological conditions at the site.
D. Provide monthly reports to DNR on the attached DNR forms 542-1424 and 542-1425

X. Tabulation of Analytical Data

Photocopy this form if additional space is needed.

Soil Analytical Data Information

Provide a tabulation of analytical data for each soil boring or monitoring well. List each sampling event chronologically with the oldest data first. If borings were sampled on a particular day at different elevations, list the results for the samples closest to the ground surface first. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9
Date Sampled	7/17/92	7/17/92	7/17/92	7/17/92	7/17/92	7/17/92	7/17/92	7/17/92	7/20/92
Elevations (ft ASL) - Ground Surface									
- Soil Sample	6'	6'	6'	6'	3'	3'	6'	6'	4'
- Static Groundwater									
Total Petroleum Hydrocarbons (ppm)	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.
Extractable Hydrocarbons (ppm)	<10.	11.	<10.	26.	<10.	<10.	20.	160.	<10.

Groundwater Analytical Data Information

Provide a tabulation of groundwater sampling analytical data. List the sampling events starting with the first well in the well identification scheme. If the well was sampled more than once, list each result chronologically. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	18 MW	19 MW	20 MW	21 MW	22 MW	23 BH	24 MW	25 BH	26 BH
Date	3/3/93	3/3/93	3/3/93	3/4/93	3/4/93	3/4/93	3/23/93	3/23/93	3/23/93
Elevation (ft ASL) - Ground Elevation	976.19	975.80	977.57	977.51	975.89	977.47	977.06	972.15	972.23
- Top of Screen	973.69	973.30	975.07	975.01	973.39	-	974.56	-	-
- Static Water Level	975.24	973.50	975.02	975.61	973.93	974.74	975.11	965.05	964.92
Benzene (ppb)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene (ppb)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Toluene(ppb)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Xylene (ppb)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.7	8.7

>> Attach Appendix X "Laboratory Data Sheets"
Provide copies of all laboratory data sheets.

XI. Free Product

CONFINE YOUR ANSWER TO THE SPACE PROVIDED

A. Is free product present at the site ? YES [ ] NO [X]
B. If yes, indicate the date the "Free Product Removal Report" was submitted:
C. Discuss the status and evaluate the effectiveness of the free product removal system in relation to the hydrogeological conditions at the site.
D. Provide monthly reports to DNR on the attached DNR forms 542-1424 and 542-1425

X. Tabulation of Analytical Data

Photocopy this form if additional space is needed.

Soil Analytical Data Information

Provide a tabulation of analytical data for each soil boring or monitoring well. List each sampling event chronologically with the oldest data first. If borings were sampled on a particular day at different elevations, list the results for the samples closest to the ground surface first. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16	PB-1	
Date Sampled	7/20/92	7/20/92	7/20/92	7/20/93	7/21/92	7/21/92	7/21/92	7/15/92	
Elevations (ft ASL) - Ground Surface									
- Soil Sample	4'	4'	4'	4'	5'	5'	5'	6'	
- Static Groundwater									
Total Petroleum Hydrocarbons (ppm)	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.	
Extractable Hydrocarbons (ppm)	<10.	<10.	<10.	<10.	<10.	<10.	<10.	<10.	

Groundwater Analytical Data Information

Provide a tabulation of groundwater sampling analytical data. List the sampling events starting with the first well in the well identification scheme. If the well was sampled more than once, list each result chronologically. Record all elevations as feet Above Sea Level (ASL).

Boring/Well Number									
Date									
Elevation (ft ASL) - Ground Elevation									
- Top of Screen									
- Static Water Level									
Benzene (ppb)									
Ethylbenzene (ppb)									
Toluene(ppb)									
Xylene (ppb)									

>> Attach Appendix X "Laboratory Data Sheets"
Provide copies of all laboratory data sheets.

XI. Free Product

CONFINE YOUR ANSWER TO THE SPACE PROVIDED

A. Is free product present at the site ? YES [ ] NO [X]
B. If yes, indicate the date the "Free Product Removal Report" was submitted:
C. Discuss the status and evaluate the effectiveness of the free product removal system in relation to the hydrogeological conditions at the site.
D. Provide monthly reports to DNR on the attached DNR forms 542-1424 and 542-1425

XII. Contamination Source

A. Identify the source of contamination at the site.

Any impacted soil was most likely the result of isolated spills and/or overfills associated with the heavy traffic and underground tanks.

>>B. Attach Appendix "XII(B) - Off-Site Contamination Source Support Data"

If the contamination source identified in XII(A) is an off-site source, justify your conclusion with analytical data and maps showing the site under investigation and potential off-site sources and groundwater flow direction.

XIII. Site Risk Classification

A. HIGH RISK SITE CONDITIONS

The following describe high risk site conditions. Conditions numbered 7, 9, 13, and 14 include a means, based on specific site factors, for proposing a low risk classification. Check the appropriate box if documentation has been provided to substantiate the existence of specific site conditions that will result in a low risk classification. A site is classified as high risk if any of the following conditions exist and documentation is not provided to confirm a low risk classification. All responses must be justified with technical and hydrogeological data obtained during the site assessment and the application of recognized engineering, geological and hydrogeological principles. Give your justification for each answer on appendix "XIII - Site Risk Classification Justification." Number the responses to correspond with the condition description (i.e., A1, A2, etc.).

CONDITION DESCRIPTION	
1) The Threshold Limit Value-Time Weighted Average (TLV-TWA) for benzene in occupied structures exceeds or is likely to exceed 10 parts per million for more than 8 hours per day.	[ ] YES, HIGH RISK [■] NO
2) The concentration of combustible gases in structures, basements, crawl spaces, utility conduits, storm or sanitary sewers, vaults or any other confined space exceeds or is likely to exceed 10% of the Lower Explosive Limit (LEL).	[ ] YES, HIGH RISK [■] NO
3) Surface water quality criteria standards contained in subrule 567-61.3(455B) of the Iowa Administrative Code are exceeded or are likely to be exceeded due to a hydrogeologic connection between the surface water and the contamination zone.	[ ] YES, HIGH RISK [■] NO
4) Petroleum contaminated soil exceeding 100 mg/kg total organic hydrocarbons is in contact with a utility trench containing a PVC drinking water transmission line.	[ ] YES, HIGH RISK [■] NO
5) The petroleum contamination in utility trenches exceeds the corrective action levels in 135.8(8) of the Iowa Administrative Code.	[ ] YES, HIGH RISK [■] NO
6) Petroleum contamination is present at concentrations or concentrations are likely to occur, to cause physical damage to a utility conduit or a structure.	[ ] YES, HIGH RISK [■] NO
7) Soil with a total organic hydrocarbon level greater than 100 mg/kg is located within 1,000 feet of an active well used as a public or private water source. A site may be classified as low risk if a groundwater professional can demonstrate the water source will not be impacted by the soil contamination to the extent that an MCL is exceeded or in the absence of an MCL an Action Level is exceeded. Factors that must be considered in evaluating the impact of the remaining soil contamination include well depth, construction, radius of influence and use; area hydrogeological characteristics; soil permeability; transmissivity, and contamination concentrations and persistence; chemical characteristics, and migration potential of the released substance.	[ ] YES, HIGH RISK [■] NO Documentation is provided to support a LOW RISK CLASSIFICATION [ ] YES, LOW RISK [ ] NO
8) Soil with a total organic hydrocarbon level greater than 100 mg/kg is located within the seasonal high groundwater level of a protected groundwater source or groundwater serving a public or private water source.	[ ] YES, HIGH RISK [■] NO
9) The petroleum release occurred in an area of fractured limestone or karst topography (i.e., topography formed on limestone, gypsum, and other rocks by dissolution, characterized by sinkholes, caves and underground drainage). A site may be classified low risk if a groundwater professional can demonstrate that the protected groundwater sources in the area of the petroleum release will not be impacted by the contamination to the extent that an MCL is exceeded or in the absence of an MCL an Action Level is exceeded. Factors that must be considered in evaluating the impact of the petroleum contamination include area hydrogeological characteristics; separation distance between the contaminated zone and protected groundwater sources; soil permeability and transmissivity; overburden thickness and contamination concentrations; and the persistence, chemical characteristics and migration potential of the released substance.	[ ] YES, HIGH RISK [■] NO Documentation is provided to support a LOW RISK CLASSIFICATION [ ] YES, LOW RISK [ ] NO
10) A public or private water supply is or is likely to be contaminated to the extent that an MCL is exceeded; or in the absence of an MCL, an Action Level is exceeded.	[ ] YES, HIGH RISK [■] NO
11) A protected groundwater source is contaminated to the extent that an MCL is exceeded; or in the absence of an MCL, an Action Level is exceeded.	[ ] YES, HIGH RISK [■] NO

12) The contaminated groundwater plume is within 100 feet of natural or man-made structures or conduits that could allow the vertical or horizontal migration of contaminants to a protected groundwater source that is used as a public or private water source.	[ ] YES, HIGH RISK [■] NO
13) The contaminated groundwater plume is within 1,000 feet of an active public or private water source. A site may be classified low risk if a groundwater professional can demonstrate that the protected groundwater source will not be impacted by the groundwater contamination to the extent that an MCL is exceeded or in the absence of an MCL an Action Level is exceeded. Factors that must be considered in evaluating the impact of the remaining groundwater contamination include well depth, construction, radius of influence and use, area hydrogeological characteristics; soil permeability and transmissivity; contamination concentrations and persistence, chemical characteristics and migration potential of the released substance.	[ ] YES, HIGH RISK [■] NO Documentation is provided to support a LOW RISK CLASSIFICATION. [ ] YES, LOW RISK [ ] NO
14) The material separating groundwater serving as a public or private water source, or which is a protected groundwater source, from soil with a total organic hydrocarbon level greater than 100 mg/kg which has a hydraulic conductivity greater than 10^{-4} meters per day. The separating material must have a hydraulic conductivity less than or equal to 10^{-4} meters per day, a minimum thickness of three meters and be free of subsurface discontinuities between the contamination zone and the groundwater for the site to be classified low risk. A site can be classified low risk if a groundwater professional can demonstrate with hydrogeological and risk assessment data that the separating material will prevent or inhibit the migration of contaminants to the groundwater to the extent that an MCL or in the absence of an MCL, an Action Level will not be exceeded. A sufficient number of measurements of the hydraulic conductivity shall be made to accurately identify the hydrogeologic conditions of the separating material under the full area extent of the contamination zone. Measurements shall be made at a minimum of two locations. The distance between adjacent measurement locations shall not exceed 100 feet. The department may require additional measurements based on the hydrogeological complexity of the site.	[ ] YES, HIGH RISK [■] NO Documentation is provided to support a LOW RISK CLASSIFICATION [ ] YES, LOW RISK [ ] NO

B: LOW RISK SITE CONDITIONS

The following describe low risk site conditions. Check the boxes that describe the site conditions.

Conditions Description	
1) The soil total organic hydrocarbon concentration exceeds 100 mg/kg or the groundwater concentration exceeds an MCL or in the absence of an MCL, an Action Level is exceeded, but high risk conditions do not exist and are not likely to occur.	[■] YES, LOW RISK [ ] NO
2) High risk conditions numbered 7, 9, 13 and 14 exist, but documentation is provided to substantiate the claim that specific site conditions are present that will result in a low risk classification.*	[ ] YES, LOW RISK [■] NO

C. NO ACTION REQUIRED SITE CONDITIONS

The following describe no action required site conditions. Check the boxes that describe the site conditions.

Condition Description	
1) The soil total organic hydrocarbon concentration is equal to or less than 100 mg/kg and the groundwater contamination is equal or less than an MCL or in the absence of an MCL, is equal to or less than an Action Level and high risk or low risk conditions do not exist and are not likely to occur.	[ ] YES, NO ACTION [■] NO
>> Attach Appendix "XIII - Site Risk Classification Justification"	

* Maximum Contaminant Level as defined in subrule 567-41.3(455B) of the Iowa Administrative Code
** Action Level as defined in 567-133.2(455B, 455E) of the Iowa Administrative Code

XIV. Corrective Action Response

The corrective action response involves the identification of the best available treatment technology or best available management practices to address the contamination at the site. The corrective action response must be consistent with the site risk classification.

Contaminated sites classified as high risk can be reclassified to low risk if the condition causing the classification is abated. For example, if the only reason a site was classified high risk is because the soil around a PVC water line is contaminated, the site could be reclassified to low risk if the water line was replaced. For such sites identified as high risk, propose a corrective action response that will result in the reclassification of the site to low risk.

Please proceed to part "A" if the site has been classified as high risk. Sites classified as low risk are subject to best management practices which will include contamination monitoring. Please proceed to part "B" if the site has been classified as low risk. Sites classified as no risk are not required to remediate or monitor.

A. High Risk Site Corrective Action Recommendations

1. Identify below the contamination phases and estimated phase volumes at the site:

Vadose zone soil contamination present ?	YES [ ]	NO [ ]
If yes, approximate volume of contaminated soil present	_____	Cubic Yards
Dissolved phase petroleum product present in the groundwater ?	YES [ ]	NO [ ]
If yes, approximate volume of contaminated groundwater present	_____	Gallons
Free phase petroleum product present?	YES [ ]	NO [ ]
If yes, approximate volume of free phase product present	_____	Gallons

2. List at least two treatment technologies available to address the contamination at the site.

1. _____
2. _____
3. _____
4. _____

>>3. Attach Appendix "XIV(A3) - Treatment Technology Evaluation"

Provide an evaluation of each treatment technology listed in XV(A3) organized as follows:

1) TREATMENT TECHNOLOGY. Identify the treatment technology.

2) TREATMENT METHOD EFFECTIVENESS. Evaluate the treatment method's capability to reduce the compounds of concern to acceptable levels and estimate the length of time it will take to reduce the compounds to these levels.

3) RELIABILITY. Evaluate factors that may have an impact on the reliability of the treatment system. Consider such factors as groundwater quality, biological growths, design complexity, weather, operational maintenance and monitoring requirements, etc.

4) SITE CHARACTERISTICS. Evaluate the factors that may have an impact on the practicality of using the treatment method. Consider such factors as site geology, hydraulic conductivity, groundwater quality, site location and ability to maintain and monitor hydraulic control of the groundwater plume.

5) COST ESTIMATES. Evaluate start-up, operational and maintenance costs.

6) ENVIRONMENTAL, PUBLIC HEALTH and SAFETY BENEFITS and DISADVANTAGES. Evaluate the environmental and public health and safety benefits and disadvantages of the treatment system. Consider such factors as air emissions, wastewater discharges, groundwater injection systems, permits required, vandalism, access, etc.

>> 4. Attach Appendix "XIV(A4) - Best Available Technology"

List your selection of the best available treatment technology to address the contamination phases at this site. Provide a detailed justification and explanation for selection of this technology. Base the justification narrative on professional judgment considering actual cost, actual equipment or techniques currently in use, published technical articles, site hydrogeology and research results, engineering and groundwater professional reference materials, consultation with experts in the field, capital and operation costs, and guidelines or rules of other regulatory agencies. Innovative treatment technology design selections are encouraged but must be accompanied by system operational and technical data that will support the best available treatment technology selection. Do not initiate treatment system design work until the proposed best available treatment technology concept has been accepted by IDNR.

5. Report Submittal

Please send one copy of the completed SCR and appendices to the Iowa Department of Natural Resources, Lust Coordinator, Wallace Building, Des Moines, IA 50319 and one copy of the completed SCR and appendices to GAB Business Services, Inc. POB 3837, Des Moines, IA 50322. Additional information or clarification may be requested.

Following approval of the SCR, IDNR will require the submission of a Corrective Action Design Report (CADR). The CADR will contain technical information specific to the treatment system chosen to remediate the site and a monitoring proposal designed to determine the effectiveness of the system.

B. Low Risk Site Corrective Action Recommendations

1. Identify below the contamination phases and estimated phase volumes at the site:

Vadose zone soil contamination present ?	YES [■]	NO [ ]
If yes, approximate volume of contaminated soil present	20	Cubic Yards
Dissolved phase petroleum product present in the groundwater ?	YES [ ]	NO [■]
If yes, approximate volume of contaminated groundwater present	_____	Gallons
Free phase petroleum product present?	YES [ ]	NO [■]
If yes, approximate volume of free phase product present	_____	Gallons

>>2. Attach Appendix "XIV(B2) - Best Management Practice"

Provide a detailed best management practice plan. At a minimum, the plan must contain:

1) Description of leak detection activities that will be implemented at the site.

2) Schedule of activities and description of any prohibited practices, and other management practices, or a combination thereof, which will be implemented to prevent additional contamination.

3) Assurances the analytical and investigatory technical requirements discussed and referenced in this SCR will be followed. Vapor analysis results will be accepted provided that:

a) It can be demonstrated that the media being sampled and sampling points are conducive to the detection of contamination movement and increases in concentration (i.e., the sampling radius must be determined).

b) Gas chromatography or similar method of analysis is used for analysis of samples.

c) Samples for laboratory analysis must be obtained if the following screening levels are exceeded.

0.1 mg/l TPHC (near diesel facilities) for soil gas (in situ, partial vacuum extraction)
1.0 mg/l TPHC (near gasoline facilities) for soil gas (in situ, partial vacuum extraction)
0.5 mg/l TPHC for groundwater (head space analysis)
1.0 mg/kg TPHC (near diesel facilities) for soil (head space analysis)
10.0 mg/kg TPHC (near gasoline facilities) for soil (head space analysis)

>> 3. Attach Appendix "XIV(B3) - Monitoring Plan"

Provide a monitoring plan that will ensure any significant increase in contamination concentration or movement is detected. The number and locations of monitoring sites must be consistent with contamination plume definition, soil permeabilities, hydraulic conductivities and groundwater flow direction. Include site maps to show monitoring locations. The following frequency is recommended. Any proposed reduction in the recommended sampling must be justified. Factors that must be considered in the justification include the migration potential of the released substance, potential impact on the environment and public health if migration of the soil or groundwater contamination occurs, area hydrogeologic characteristics, soil permeability, transmissivity, and contamination concentrations and persistence.

YEARS AFTER APPROVAL OF THE MONITORING PLAN	SAMPLE IN
1) one through three	calendar quarters 2, 3 and 4.
2) four through six	calendar quarters 2 and 4
3) seven through nine	calendar quarter 2
4) twelve	calendar quarter 2

4. Report Submittal

Please send one copy of the completed SCR and appendices to the Iowa Department of Natural Resources, Lust Coordinator, Wallace Building, Des Moines, IA 50319 and one copy of the completed SCR and appendices to GAB Business Services, Inc. POB 3837, Des Moines, IA 50322. Additional information or clarification may be requested.

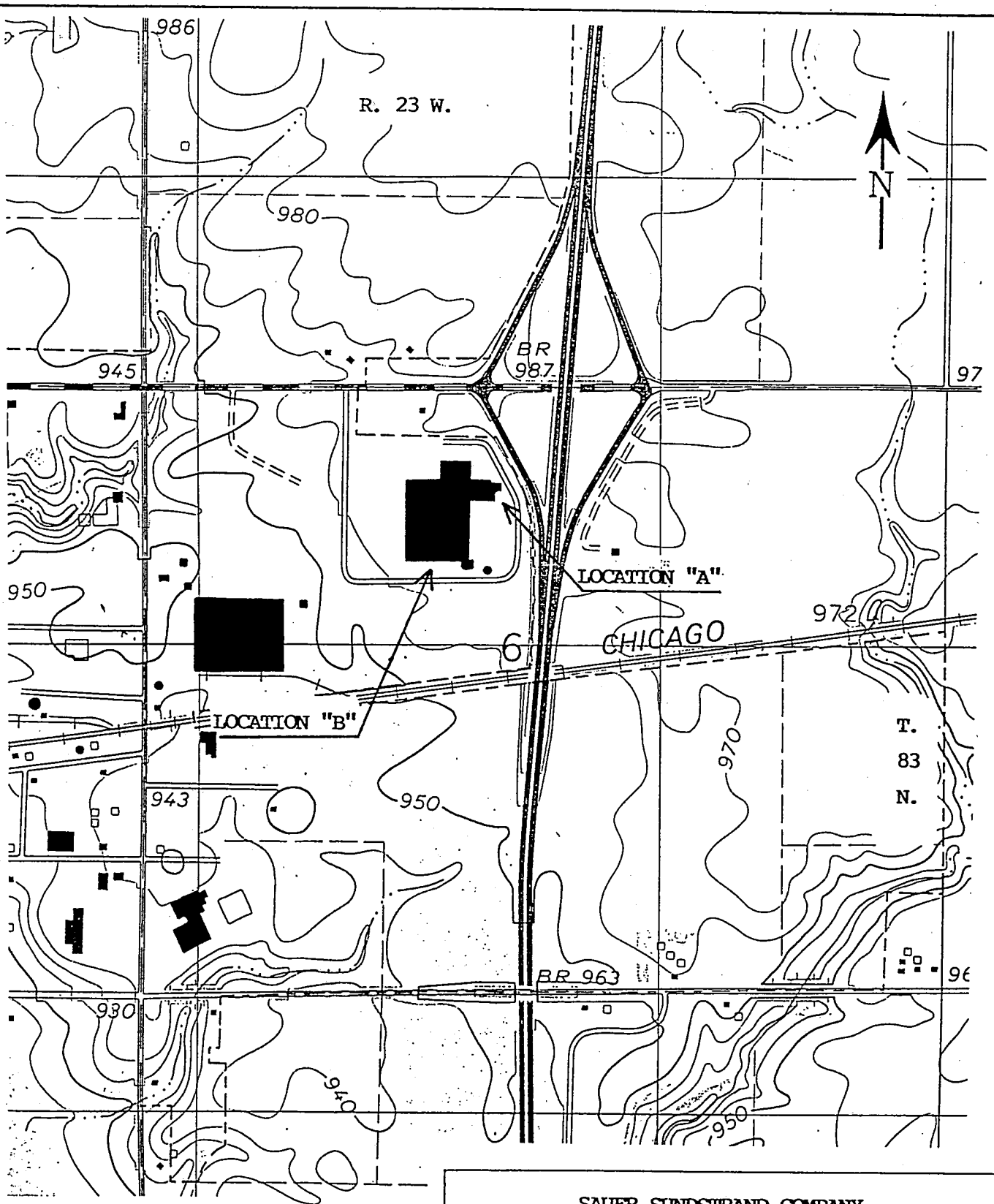
Monitoring results must be submitted in the format required by IDNR's Site Monitoring Report (SMR). A copy of the Site Monitoring Report will be provided after the SCR is approved.

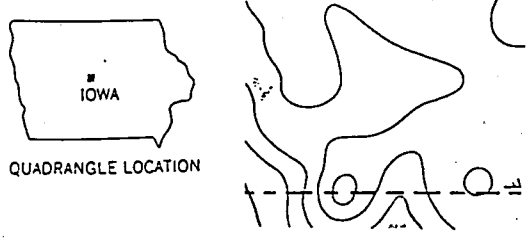
APPENDIX 1

"II(C) TANK AND LINE TIGHTNESS TESTING RESULTS"

APPENDIX 2

"II(D) - TOPOGRAPHICAL SITE MAP"

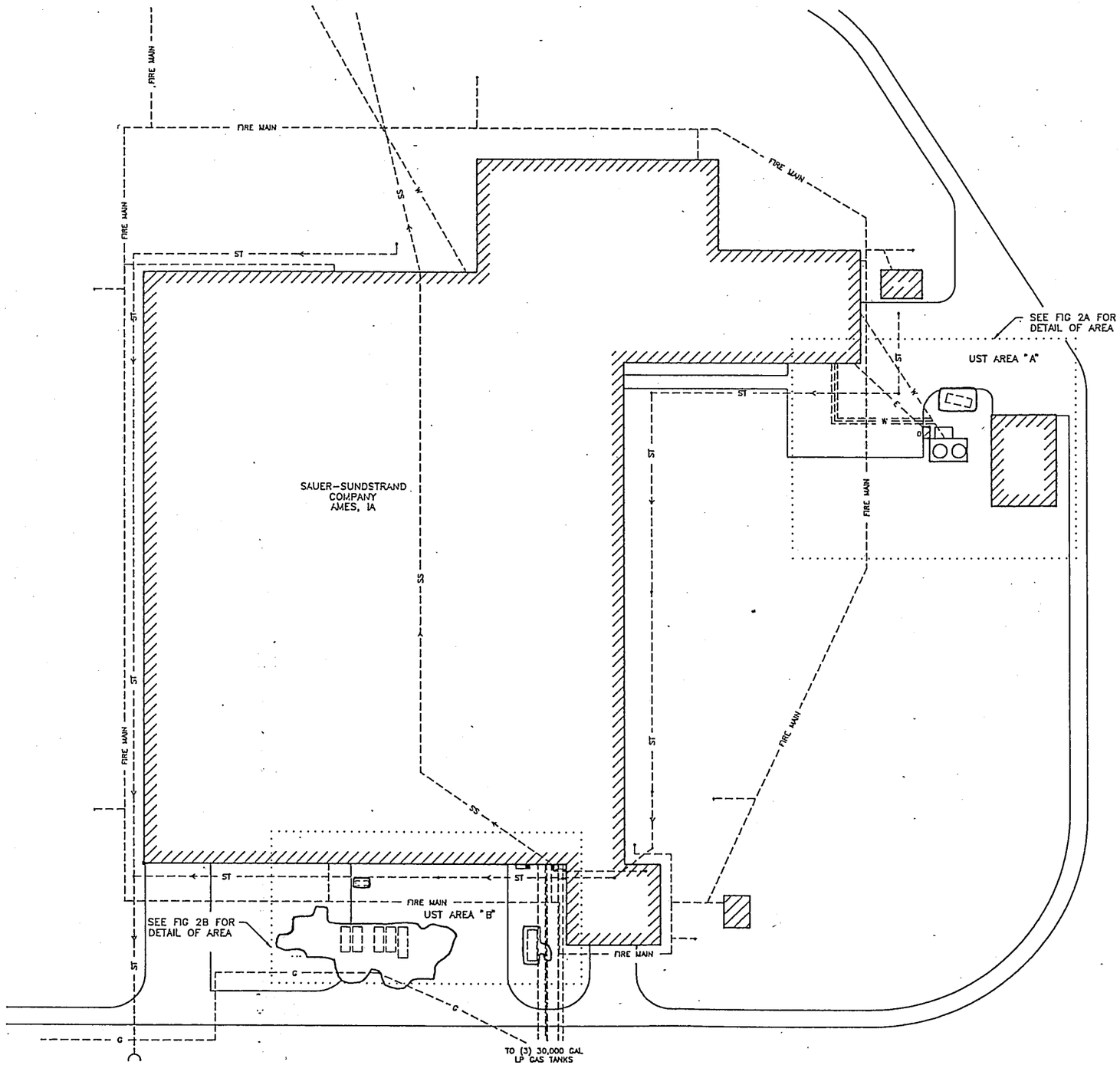




SAUER SUNDSTRAND COMPANY			
II(D)-TOPOGRAPHICAL SITE MAP			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 06/93	DWN. BY	CHKD. BY EJB/JB	
SCALE 1"=1000'	NOTES STORY COUNTY		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 1

APPENDIX 3

"II(E) - SCALED SITE PLAN"

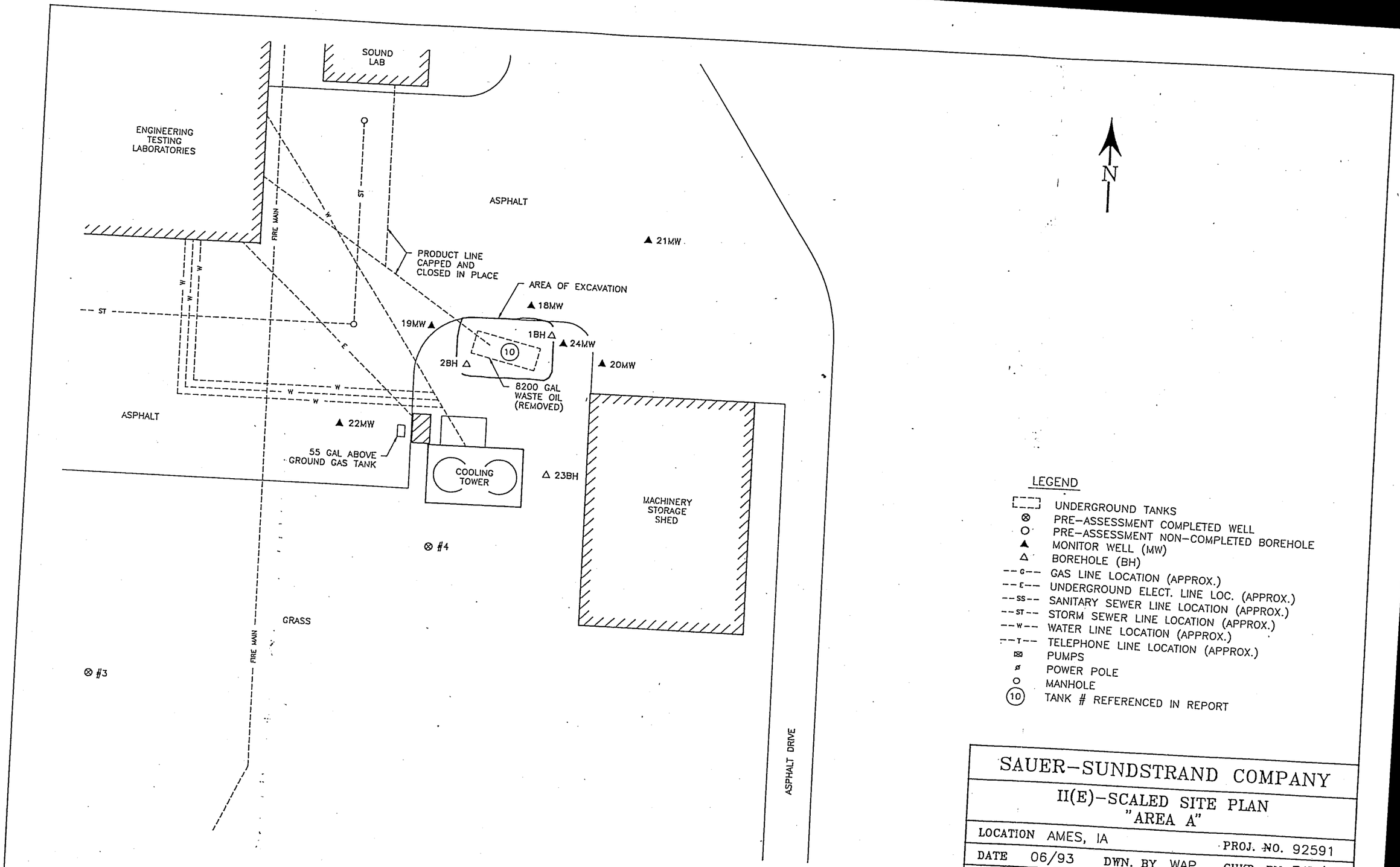


N

LEGEND

- UNDERGROUND TANKS
- GAS LINE LOCATION (APPROX.)
- OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

SAUER-SUNDSTRAND COMPANY			
II(E)-SCALED SITE PLAN			
LOCATION AMES, IA			PROJ. NO. 92591
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
SCALE 1"=100'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 2



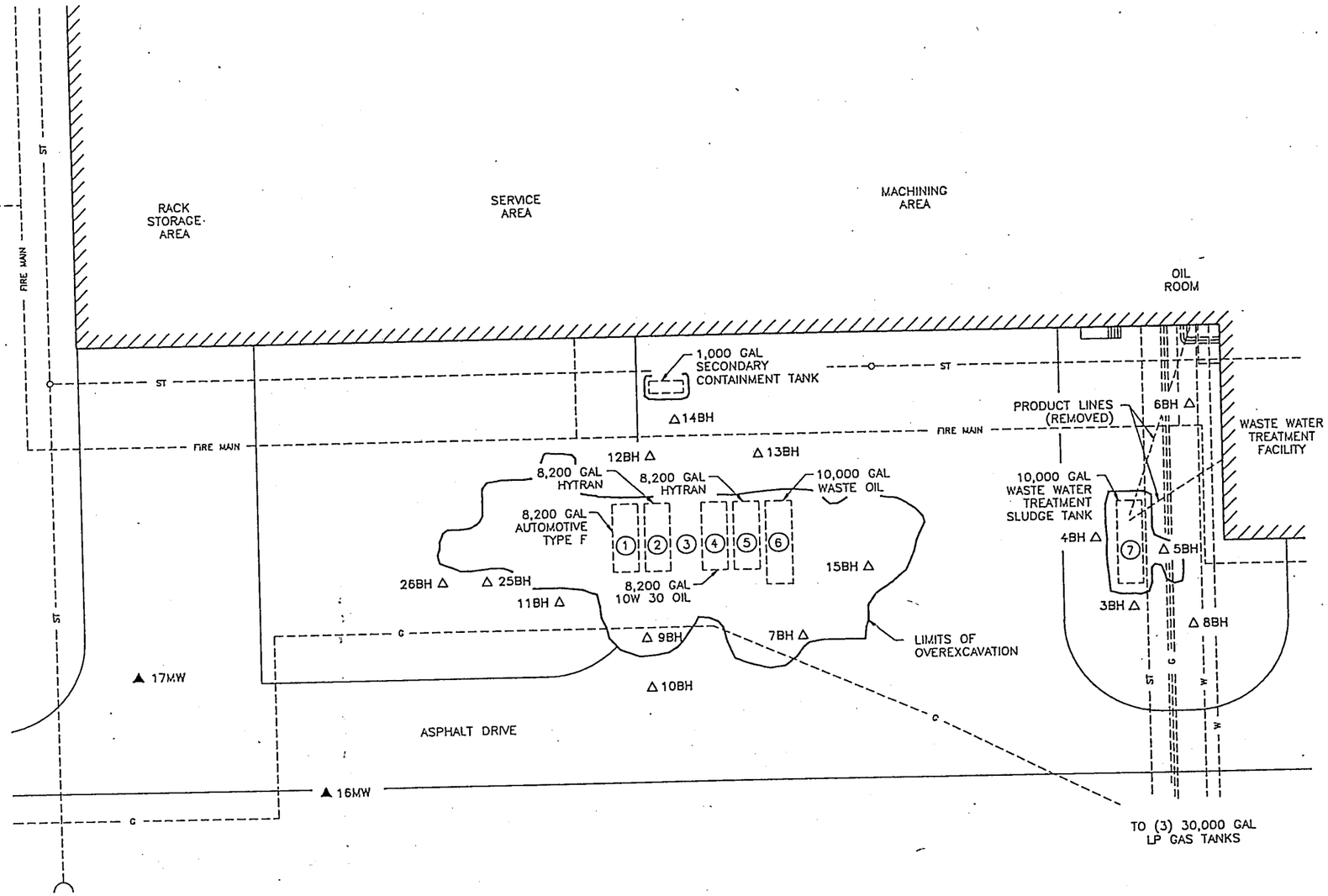
SAUER-SUNDSTRAND COMPANY

II(E)-SCALED SITE PLAN
"AREA A"

LOCATION	AMES, IA		PROJ. NO. 92591
DATE	06/93	DWN. BY WAP	CHKD. BY EJB/JB
SCALE	1"=30'	NOTES	

gss GROUNDWATER SERVICE & SUPPLY, INC.

FIG. 2A



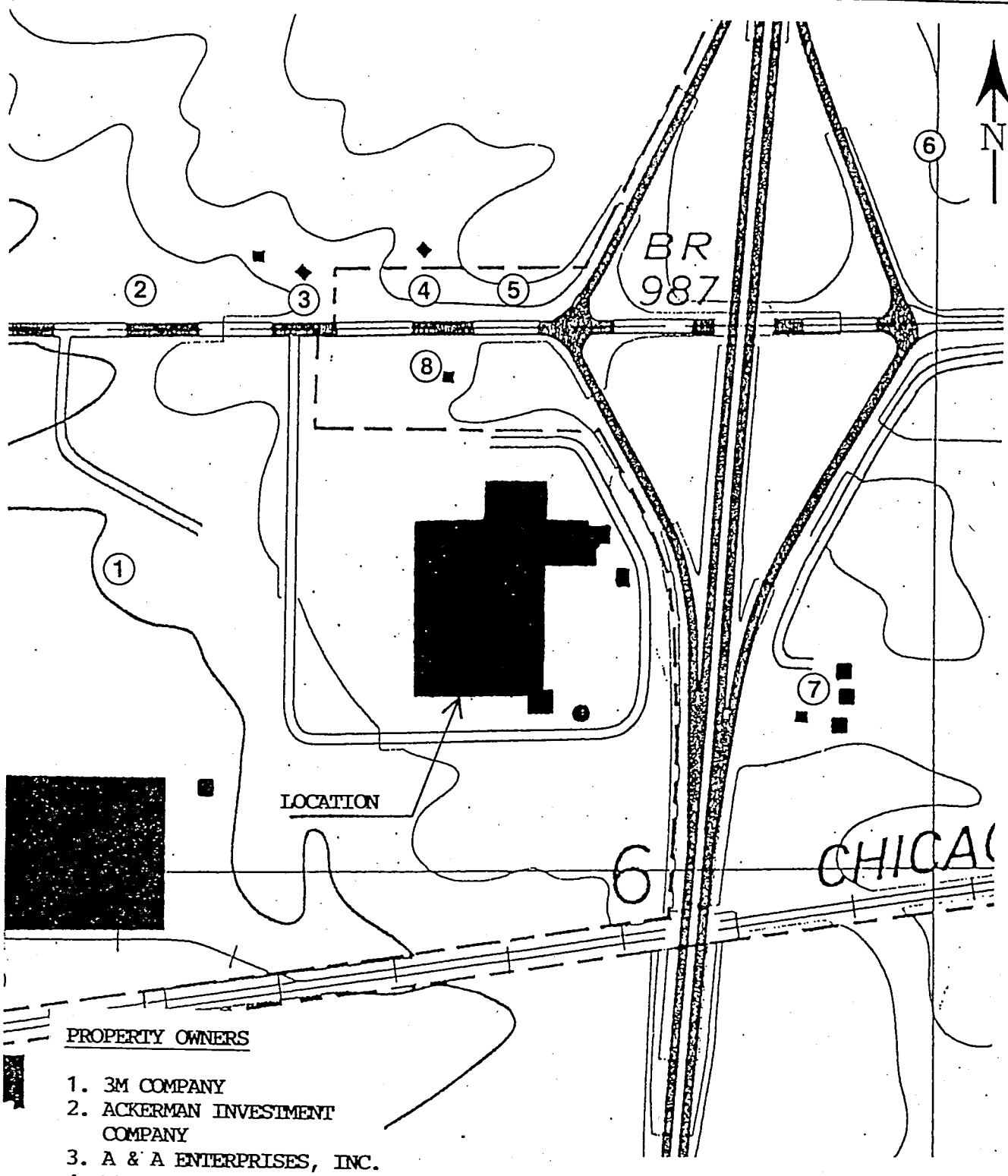
LEGEND

- UNDERGROUND TANKS
- PRE-ASSESSMENT COMPLETED WELL
- PRE-ASSESSMENT NON-COMPLETED BOREHOLE
- MONITOR WELL (MW)
- BOREHOLE (BH)
- GAS LINE LOCATION (APPROX.)
- UNDERGROUND ELECT. LINE LOC. (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- TELEPHONE LINE LOCATION (APPROX.)
- PUMPS
- POWER POLE
- MANHOLE
- TANK # REFERENCED IN REPORT

SAUER-SUNDSTRAND COMPANY			
II(E)-SCALED SITE PLAN "AREA B"			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
SCALE 1"=40'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 2B

APPENDIX 4

"II(F) - SCALED SITE VICINITY MAP



PROPERTY OWNERS

1. 3M COMPANY
2. ACKERMAN INVESTMENT COMPANY
3. A & A ENTERPRISES, INC.
4. RIVER VALLEY CREDIT UNION
5. ROBERT D. & NORMA J. BUNCE
6. SANDRA ALLEN, SHARON BROWN & SUE NELSON %EDWARD P. ALLEN
7. WEBSTER CITY CUSTOM MEATS, INC.
8. DOOLITTLE OIL CO.

SAUER-SUNDSTRAND COMPANY			
II (F)-SCALED SITE VICINITY MAP			
LOCATION	AMES, IA	PROJ. NO.	92591
DATE	06/93	DWN. BY	CHKD. BY EJB/JB
SCALE	1"=500'	NOTES	
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 3

APPENDIX 5

"III(B) - DNR FORM 542-1392, SOIL BORING LOGS"

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Drilling Log

Well Number BH-1

Project Sundstrand Tank #3 Owner Sundstrand Sauer

Location Ames, Iowa Project Number 421-839-9651(01)

Date Drilled 11-10-89 Total Depth of Hole 10' Diameter 3"

Surface Elevation _____ Water Level Initial 9' 24-hrs. _____

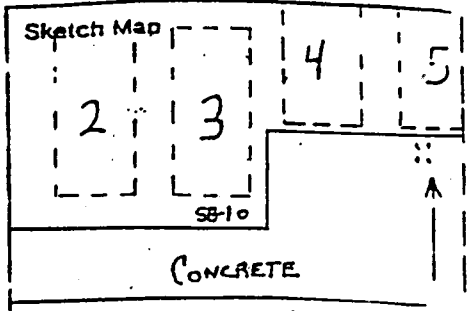
Screen Dia. _____ Length _____ Slot Size _____

Casing: Dia. _____ Length _____ Type _____

Drilling Company Groundwater Tech Drilling Method Hand Auger

Driller Gordon R. Log by James Marek

Sketch Map



Notes See generalized site map for area location.

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					
1					Brown, loose, damp Sand, gravel, and silt (fill)
2		*			
3					Greenish-gray, damp, plastic Clay, some silt, little sand (fill).
4					
5					Brown loose, damp Sand (fill)
6					Dark grayish-brown moist, Sand, Silt and Clay (fill)
7		*			Black, moist, plastic Silt, some clay.
8					Dark gray, wet, plastic Silt and Clay.
9		* ▽			Gray saturated, plastic Silt, little clay.
10					

* Hydrocarbon Odor indicated between the 1' and 4' depths.

* Hydrocarbon Odor indicated between the 6' and 10' depths.

* Water found at 9' below grade.

02100144

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 1 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"	Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01	Logged by J. Eidt	
Date & Time Start 6/8/92 1015	Date & Time End 6/8/92 1042	Ground Surface Elevation (ASL) 977.09
Lust Number 7LTD58		

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area north-east of northern most tank.
					7	
					307	(0-1.0') CL - Clay, brown, dry, hard.
					188	
5					301	
					293	(1.0-3.0') SM - Sand, brown, fine grained, silty, fine grained, slightly moist.
					187	
					60	
					173	(3.0-13.4') SM - Sand, dark gray, fine grained, silty, wet with FAIR ODOR of waste oil from 3.0' - 13.4'.
10					307	
					198	
					245	
					167	(13.4-15.0') CL - Clay, tan, with iron-rust staining, moist, firm.
					0	
15					0	
20						
25						
30						

WEATHER: Cloudy, mild (70°); occasional drizzle.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS							
WATER LEVELS	Date :	6/8/92	6/9/92				
Static Water Level Symbol v	Level:	3.60'	3.80'				
	Time :	1142	0745				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 2 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt
Date & Time Start 6/8/92 1102	Date & Time End 6/8/92 1130	Ground Surface Elevation (ASL) 976.29 / Lust Number 7LTD58

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area off southwest corner of north-most tank.
					0	
					0	
					0	(0-4.0') CL - Clay, brown, dry to slightly moist, firm to semi-soft.
5					0	
					0	
					0	(4.0-10.0') SM - Sand, gray, fine-grained, silty, wet.
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (70°); occasional drizzle.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	6/8/92	6/9/92				
	Level:	3.30'	3.05'				
	Time :	1145	0750				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 3 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/8/92 1330	Date & Time End 6/8/92 1400	Ground Surface Elevation (ASL) 972.26	Lust Number 7LTD58

Depth in Feet 972.26	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area 25.0' south of single southeast tank.
					0	
					0	
					0	(0-4.0') CL - Clay, brown-tan, slightly moist, firm.
5					0	
					0	(4.0-6.0') CL - Clay, black, massive, very slightly moist, firm with thin lens of fine, silty sand at 4.0'.
965.81 V					0	
					0	
					0	
					13	
10					0	(6.0-10.0') CL - Clay, gray-tan, with iron-rust staining and scattered black, carbonaceous material, slightly moist to moist at 9.5', firm to soft at 9.5'.
15						
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	6/8/92	6/9/92				
	Level:	6.50'	6.45'				
	Time :	1440	1213				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 4 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt
Date & Time Start 6/8/92 1410	Date & Time End 6/8/92 1430	Ground Surface Elevation (ASL) 972.36 / Lust Number 7LTD58

Depth in Feet 972.36	Well Construction Details	Blow Count if Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt loading dock area to the southwest of the southeast tank.
					0	
					0	
					0	(0-6.0') CL - Asphalt, gravel, clay, dark brown to black, dry, hard.
5					0	
					0	
965.61 ▽					0	(6.0-10.0') CL - Clay, gray-tan with iron-rust staining and scattered black carbonaceous material, slightly moist to moist at 8.0'.
					0	
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
	Date :	6/9/92				
	Level:	6.75'				
	Time :	~~1310~~				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 6 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by J. Eidt	
Date & Time Start 6/8/92 1525	Date & Time End 6/8/92 1605	Ground Surface Elevation (ASL) 974.96	Lust Number 7LTD58

Depth in Feet 974.96	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area to the northeast of the southeast tank.
					0	
					0	
					0	(0-8.5') CL - Clay, black with small gravel, slightly moist, semi-soft, poor core recovery.
5					0	
					0	
					0	
					0	(8.5-15.0') CL - Clay, tan with scattered iron-rust staining and variable sized clastics, moist, firm.
966.16 V					0	
10					0	
					0	
					0	
					0	
					0	
15						
20						
25						
30						

NOTES: Location is halfway between tank and contamination found at product line depth adjacent to building and within 2.5' east of product line.

WEATHER: Cloudy, mild (75°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
	Date :	6/9/92				
	Level:	8.80'				
	Time :	1230				

DNR FORM 542-1392

PROJECT NO. 92391

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 7 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"	Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01	Logged by J. Eidt	
Date & Time Start 6/8/92 1630	Date & Time End 6/8/92 1708	Ground Surface Elevation (ASL) 972.06	Lust Number 7LTD58

Depth in Feet 972.06	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in middle of asphalt driveway 24.0' south and in the middle of the 3-tank area.
					0	
					0	
					0	
5					0	(0-3.0') CL - Clay, black, with gravels, slightly moist, poor recovery.
					0	
					0	
964.11 V					0	(3.0-8.0') CL - Clay, gray-green, slightly moist, semi-firm.
					0	
10					0	
						(8.0-9.8') CL - Clay, black, moist, firm with thin lens of fine grained silty sand at 8.5', moist; firm..
15						(9.8-10.0') CL - Clay, gray, moist, firm.
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	6/8/92	6/9/92				
	Level:	8.0'	7.95'				
	Time :	1855	1245				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 8 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 0840	Date & Time End 6/9/92 0900	Ground Surface Elevation (ASL) 973.46	Lust Number 7LTD58

Depth in Feet 973.46	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area off-setting #5 BH to the south-east.
					0	
					0	
					0	(0-5.0') CL - Clay, black, slightly moist, semi-firm.
5					0	
					0	
966.46 V					0	(5.0-10.0') CL - Clay, gray-green, slightly moist, semi-firm.
					0	
					0	
10					0	
15						
20						
25						
30						

WEATHER: Cloudy, mild (68°).

* SS (split spoon) HS (hollow stem auger)

STATIC

OBSERVATIONS						
WATER LEVELS	Date :	6/9/92				
Static Water Level Symbol v	Level:	7.00'				
	Time :	1238				

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 9 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 0930	Date & Time End 6/9/92 0955	Ground Surface Elevation (ASL) 971.66	Lust Number 7LTD58

Depth in Feet 971.66	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					220	Begin in asphalt of driveway south of 2-tank area.
			#1S	HS	113	
					67	(0-4.0') CL - Clay, black, with gravels, slightly moist, semi-soft with SLIGHT ODOR.
					0	
5					0	
					0	
					0	(4.0-7.5') CL - Clay, black-green, slightly moist, semi-firm.
963.56 V					0	
					0	
10					0	(7.5-9.5') CL - Clay, black, massive, scattered green mottling.
						(9.5-10.0') CL - Clay, tan-green, with scattered iron-rust staining, moist, firm.
15						
20						
25						
30						

NOTES: Soil sample collected at 2.0' at 0935 (6/9/92).
WEATHER: Cloudy, mild (68°).

* SS (split spoon) *HS (hollow stem auger) STATIC

OBSERVATIONS	Date :	6/9/92					
WATER LEVELS	Level:	8.10'					
Static Water Level Symbol v	Time :	1500					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 10 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 1008	Date & Time End 6/9/92 1030	Ground Surface Elevation (ASL) 971.56	Lust Number 7LTD58

Depth in Feet 971.56	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin on south edge of pavement opposite #9 BH.
					0	
					0	(0-4.0') CL - Clay, black, with gravel, slightly moist, semi-firm.
					0	
5					0	
					0	(4.0-9.9') CL - Clay, black, with green mottling and scattered clastics, slightly moist to moist at 9.0', firm.
					0	
963.76 ▽					0	
					0	
10					0	
						(9.9-10.0') CL - Clay, gray, sandy with iron-rust staining, moist, soft.
15						
20						
25						
30						

WEATHER: Cloudy, mild (70°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
	Date :	6/9/92				
	Level:	7.80'				
	Time :	1545				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 11 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt
Date & Time Start 6/9/92 1040	Date & Time End 6/9/92 1110	Ground Surface Elevation (ASL) 971.56 / Lust Number 7LTD58

Depth in Feet 971.56	Well Construction Details	Blow Count N Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt west of #9 BH.
					0	
					0	(0-3.0') CL - Clay, brown, with gravels, firm.
					0	
5					0	(3.0-10.0') CL - Clay, black-green, slightly moist, semi-firm.
					0	
					0	
~~962.46~~ V					~~111~~ 53	(10.0-15.0') CL - Clay, tan with gray mottling and iron rust staining; wet, semi-firm.
10					~~13~~ 0	
					0	
					0	
					0	
15					0	
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	9.10'					
Time :	1552					

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 12 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5'		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt
Date & Time Start 6/9/92 1245	Date & Time End 6/9/92 1310	Ground Surface Elevation (ASL) 972.46 / Lust Number 7LTD58

Depth in Feet	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin grass area immediately to the north of the west 2-tank area.
					0	
					0	
					0	(0-3.0') CL - Clay-brown, sandy, dry.
5					0	
					0	(3.0-8.0') CL - Clay, black, slightly moist, firm.
					0	
					0	
10					93	(8.0-9.0') CL - Clay, tan with numerous clastics, slightly moist, firm.
						(9.0-9.9') CL - Clay, black, dense, moist, firm.
15						(9.9-10.0') CL - Clay, gray-green, slightly sandy, moist, soft with SLIGHT ODOR.
20						
25						
30						

WEATHER: Cloudy-sunny, windy, mild (75°).

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS						
WATER LEVELS	Date :	6/9/92				
Static Water Level Symbol v	Level:	8.80'				
	Time :	1600				

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 13 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 20' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 1313	Date & Time End 6/9/92 1350	Ground Surface Elevation (ASL) 973.56	Lust Number 7LTD58

Depth in Feet 973.56	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in grass area immediately north of 3-tank area.
					0	
					0	
					0	(0-5.0') CL - Clay, brown with considerable gravels, dry, firm.
5					0	
					0	(5.0-11.0') CL - Clay, brown, very sandy with variable-sized clastics, moist at 9.0'.
					0	
					0	
10 ▽ 962.96					0	(11.0-19.8') CL - Clay, brown with fine clastics, semi-soft.
					0	
					0	
					0	(19.8-20.0') CL - Clay, dark gray-blue, massive with fine clastics, slightly moist, firm.
15					0	
					0	
					0	
					0	
20						
25						
30						

NOTES: BH carried to 20.0' to establish depth of impermeable (barrier) blue clay.
WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger) STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽						
Date :	6/9/92					
Level:	10.60'					
Time :	~~1615~~					

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 14 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 15' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 1400	Date & Time End 6/9/92 1435	Ground Surface Elevation (ASL) 973.56	Lust Number 7LTD58

Depth in Feet 973.56	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	(0-1.0') CL - Clay, dark brown, dry, firm.
					0	
					0	(1.0-8.5') CL - Clay, black, massive, slightly moist, semi-firm.
					0	
5					0	
					0	(8.5-10.0') CL - Clay, gray, with fine clastics, slightly moist, firm.
					0	
					0	
					0	
10 962.66 ▽					0	(10.0-15.0') CL - Clay, tan with gray mottling and iron-rust staining, moist, firm.
					0	
					0	
					0	
15					0	
20						
25						
30						

WEATHER: Cloudy, mild (72°).

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽						
Date :	6/9/92					
Level:	10.90'					
Time :	1625					

DNR FORM 542-1392

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 15 BH	Facility Name SAUER SUNDSTRAND	Facility Address 2800 13TH STREET AMES, IOWA	
Boring Depth (Feet) x Diameter (Inches) 10' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Eidt	
Date & Time Start 6/9/92 1440	Date & Time End 6/9/92 1500	Ground Surface Elevation (ASL) 972.16	Lust Number 7LTD58

Depth in Feet 972.16	Well Construction Details	Blow Count (if Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Begin in asphalt receiving dock area immediately to the east of the 3-tank area.
					80	
			#1S	HS	140	
					66	
					33	
					0	(0-2.5') CL - Clay, black in upper half and tan in lower half, clay, firm, VERY SLIGHT ODOR from 1.5 - 3.0'.
					0	
5					0	
					0	
					0	
963.76 ✓					0	(2.5-4.5') CL - Clay, black, slightly moist, firm.
10					0	
						(4.5 - 9.0') CL - Clay, tan, slightly moist, firm.
						(9.0-10.0') CL - Clay, black with gray mottling and iron-rust staining, moist, firm.
15						
20						
25						
30						

NOTES: Soil sample collected at 2.0' at 1500.
WEATHER: Cloudy, mild (75°).

* SS (split spoon) HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	6/9/92					
Level:	8.40'					
Time :	1634					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 23 BH	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa	
Boring Depth (Feet) x Diameter (Inches) 6.0' x 6.5"		Drilling Method HAND AUGER	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Boudouris	
Date & Time Start 3/4/93 1345	Date & Time End 3/4/93 1415	Ground Surface Elevation (ASL) 977.47	Lust Number 7LTD58

Depth in Feet 977.47	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Grass and gravel.
			S	SS	0	(0-1') OL - Topsoil, black.
974.74 ▽					0	
					0	(1-2') SL - Sandy and gravel, light brown.
5					0	
					0	(2-3') CL -Sandy clay, black, compact.
						(3-4') CL - Sandy clay, green-gray, compact.
10						
						(4-5') CL - Sandy clay, light yellow-brown, compact.
						(5-6') SC - Clayey sand, light brown, compact, moist, rust mottling.
15						
20						
25						
30						

NOTES: Total depth = 6.0'.
WEATHER: Sunny and cold.

* SS (split spoon) *HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽						
Date :	3/4/93					
Level:	2.73'					
Time :	~~1500~~					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 25 BH	Facility Name Sauer Sundstrand Co.	Facility Address 2800 E. 13th Street Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 10.0' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by B. Wade
Date & Time Start 3/23/93 1445	Date & Time End 3/23/93 1510	Ground Surface Elevation (ASL) 972.15 / Lust Number 7LTD58

Depth in Feet 972.15	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	(0-3') CL - Clay, black to blackish-gray, frost first 2.0 feet, some fill material rock, wood, asphalt, etc.
					0	
					0	
			(S)	HS	0	
5					0	(3-10') CL - Clay, black, firm, dry to 9.1 then moist.
965.05 V					0	
					0	
					0	
10					0	
					0	
15						
20						
25						
30						

* SS (split spoon) HS (hollow stem auger)

STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	3/23/93	3/23/93	3/23/93			
	Level:	9.81'	7.09'	7.10'			
	Time :	1503	1537	1550			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 26 BH	Facility Name Sauer Sundstrand Co.	Facility Address 2800 E. 13th Street Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 10.0' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by B. Wade
Date & Time Start 3/23/93 1520	Date & Time End 3/23/93 1540	Ground Surface Elevation (ASL) 972.23 / Lust Number 7LTD58

Depth in Feet 972.23	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	(0-5') CL - Clay, black with 1" limestone rock at 2.5' to 2.8' then back to black clay with light gray banding.
					0	
			(S)	HS	0	
					0	
5					0	
					0	(5-8') CL - Black, uniform in color and texture.
964.92 ✓					0	
					0	(8-10') CL - Clay, gray, sandy, sharp contact.
					0	
10					0	
15						
20						
25						
30						

* SS (split spoon) *HS (hollow stem auger)

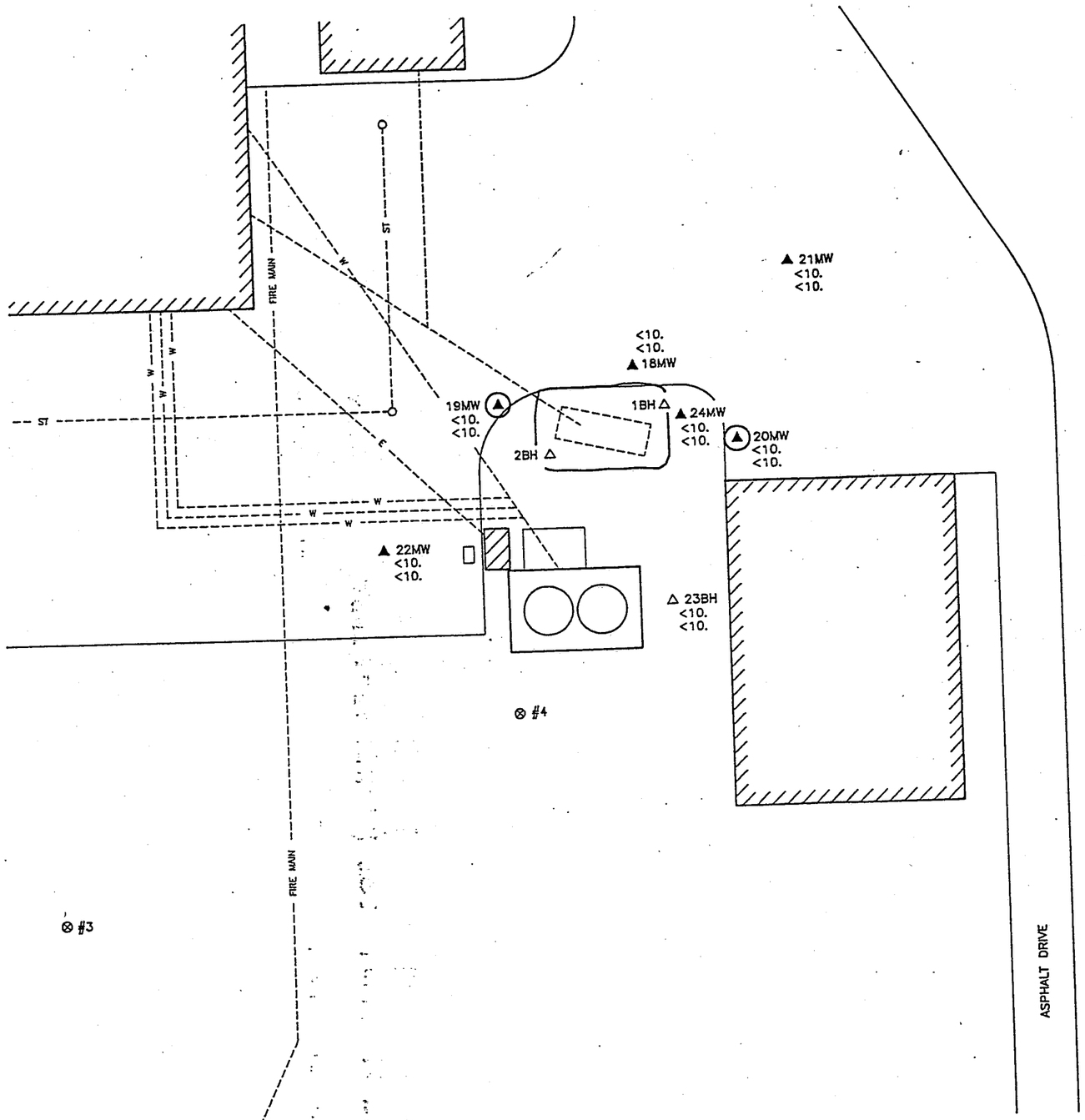
STATIC

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	3/23/93	3/23/93				
Level:	7.31'	7.31'				
Time :	1538	1551				

DNR FORM 542-1392

APPENDIX 6

"III(H) - SOIL CONTAMINATION PLUME MAP"

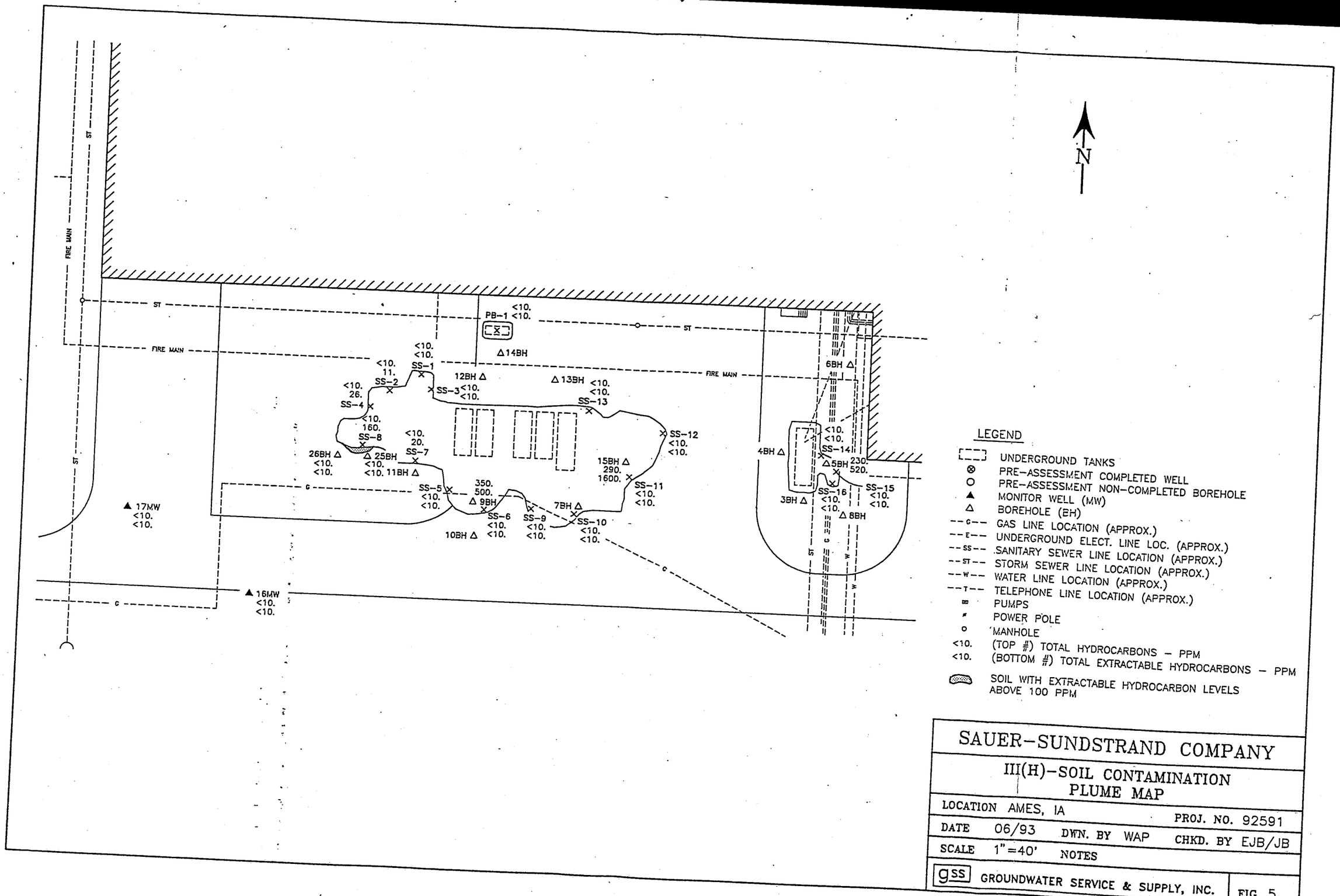


NOTE: AS ALL SOIL SAMPLES ANALYZED BELOW LABORATORY METHOD DETECTION LIMITS, NO CONTAMINATION PLUME WAS CONTOURED.

LEGEND

- UNDERGROUND TANKS
- ⊗ PRE-ASSESSMENT COMPLETED WELL
- O PRE-ASSESSMENT NON-COMPLETED BOREHOLE
- ▲ MONITOR WELL (MW)
- △ BOREHOLE (BH)
- --G-- GAS LINE LOCATION (APPROX.)
- --E-- UNDERGROUND ELECT. LINE LOC. (APPROX.)
- --SS-- SANITARY SEWER LINE LOCATION (APPROX.)
- --ST-- STORM SEWER LINE LOCATION (APPROX.)
- --W-- WATER LINE LOCATION (APPROX.)
- --T-- TELEPHONE LINE LOCATION (APPROX.)
- PUMPS
- POWER POLE
- O MANHOLE
- ◯ WELL USED TO DETERMINE HYDRAULIC CONDUCTIVITY
- <10. (TOP #) TOTAL HYDROCARBONS – PPM
- <10. (BOTTOM #) TOTAL EXTRACTABLE HYDROCARBONS – PPM

SAUER–SUNDSTRAND COMPANY			
III(H)–SOIL CONTAMINATION PLUME MAP			
LOCATION AMES, IA			PROJ. NO. 92591
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
SCALE 1"=30'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 4



SAUER-SUNDSTRAND COMPANY

III(H)-SOIL CONTAMINATION PLUME MAP

LOCATION	AMES, IA		PROJ. NO. 92591
DATE	06/93	DWN. BY WAP	CHKD. BY EJB/JB
SCALE	1"=40'	NOTES	

GSS GROUNDWATER SERVICE & SUPPLY, INC.

FIG. 5

APPENDIX 7

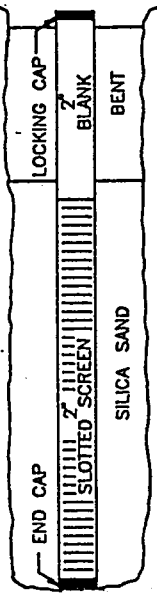
"IV(B) - DNR FORM 542-1392, MONITORING WELL CONSTRUCTION DIAGRAM"

No boring logs of earlier monitoring wells #3 and #4 installed south of "Area A" were available.

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 16 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by J. Boudouris
Date & Time Start 3/3/93 1000	Date & Time End 3/3/93 1045	Ground Surface Elevation (ASL) 970.83 / Lust Number 7LTD58

Depth in Feet 970.83	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Asphalt (5")
					0	(0-3') CL - Topsoil, black, sandy.
					0	
					0	
5			S	SS	0	(3-5') CL - Clay, sandy and pebbles, green-gray.
					0	
					0	(5-10') CL -Clay, sandy, rock fragments, dark gray, green mottling.
962.49					0	
10					0	(10-12') CL - Silty clay, yellow-brown, compact.
					0	
					0	(12-15') CL - Silty clay, green-gray, compact.
					0	
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'.
WEATHER: Cold and raining.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS							
WATER LEVELS	Date :	3/3/93	3/3/93	5/17/93			
Static Water Level Symbol v	Level:	8.50'	8.34'	6.20'			
	Time :	1140	1615	1325			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 17 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street, Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Boudouris
Date & Time Start 3/3/93 1045	Date & Time End 3/3/93 1120	Ground Surface Elevation (ASL) 971.76 / Lust Number 7LTD58

Depth in Feet 971.76	Well Construction Details	Blow Count (If Applicable)	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
	LOCKING CAP; 2" BLANK; BENT				0	Asphalt (5")
					0	(0-2') CL - Sandy clay, black.
					0	
					0	
5			S	SS	0	(2-4') CL - Silty clay, gray, compact.
					0	
					0	(4-5') CL - Clay, green and black bands, compact.
963.74					0	
	2" SLOTTED SCREEN; SILICA SAND				0	(5-8') CL - Clay, black, roots/wood fragments.
10					0	
	END CAP				0	(8-10') SL - Clayey sand, light green, soft.
					0	
					0	(10-15') SC - Clayey sand, light yellow-brown, wet.
15						
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'.
WEATHER: Overcast and cold.

* SS (split spoon) *HS (hollow stem auger)

OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	3/3/93	3/3/93	5/17/93			
Level:	8.18'	8.02'	6.31'			
Time :	1135	1620	1330			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 18 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Boudouris
Date & Time Start 3/3/93 1245	Date & Time End 3/3/93 1320	Ground Surface Elevation (ASL) 976.19 / Lust Number 7LTD58

Depth in Feet 976.19	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
975.03	LOCKING CAP; 2" BLANK; BENT				0	Asphalt.
			S	SS	0	
					0	(0-2') SC -Sand and gravel, light brown.
					0	
5	2" SLOTTED SCREEN; SILICA SAND				0	(2-5') SC - Clayey sand, light brown, rock fragments, compact, rust mottling.
					0	
					0	
					0	
10					0	(5-11') SC - Clayey sand, fine grained, well sorted, compact.
					0	
	END CAP				0	(11-15') CL - Sandy clay, gray, compact, pebbles and rock fragments.
					0	
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'.
WEATHER: Cold and overcast.

* SS (split spoon) *HS (hollow stem auger)

STATIC

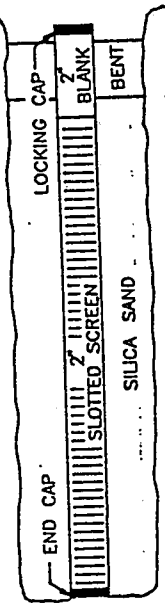
OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	3/3/93	3/4.93	5/17/93			
Level:	1.44'	1.16'	0.95'			
Time :	1625	1216	1305			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 19 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street, Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by J. Boudouris
Date & Time Start 3/3/93 1330	Date & Time End 3/3/93 1400	Ground Surface Elevation (ASL) 975.80 / Lust Number 7LTD58

Depth in Feet 975.80	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Asphalt.
973.96			S	SS	0	(0-10') CL - Sandy clay, light brown, compact.
5					0	
10					0	(10-15') CL - Silty clay, gray, compact.
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'. PID = No functioning/much drifting.
WEATHER: Cold and drizzling.

* SS (split spoon) *HS (hollow stem auger)

STATIC

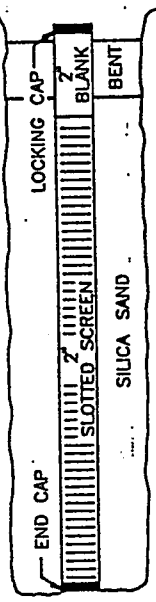
OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
	Date :	3/3/93	3/4/93	5/17/93			
	Level:	5.04'	1.84'	2.30'			
	Time :	1635	1045	1310			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 20 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa	
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Boudouris	
Date & Time Start 3/3/93 1415	Date & Time End 3/3/93 1600	Ground Surface Elevation (ASL) 977.57	Lust Number 7LTD58

Depth in Feet 977.57	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Concrete (6").
974.91 ▽			S	SS	0	(0-2') CL -Sandy clay, black.
					0	
					0	(2-5') CL - Sandy clay, light brown, compact.
5					0	
					0	(5-10') CL - Sandy clay, light brown, rust mottling, soft.
					0	
					0	
10					0	(10-14') CL - Sandy clay, light brown, rust mottling.
					0	
					0	(14-15') CL - Sandy clay, gray, compact.
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'. PID not functioning; steady drifting

WEATHER: Cold and drizzling.

* SS (split spoon) *HS (hollow stem auger)

STATIC

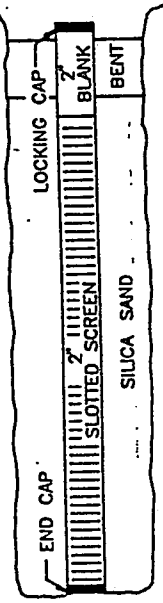
OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽	Date :	3/3/93	3/4/93	5/17/93			
	Level:	2.96'	2.66'	2.55'			
	Time :	~~1640~~	~~1120~~	1250			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 21 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa	
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA	
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by J. Boudouris	
Date & Time Start 3/4/93 1045	Date & Time End 3/4/93 1130	Ground Surface Elevation (ASL) 977.51	Lust Number 7LTD58

Depth in Feet 977.51	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	Asphalt (5").
975.25					0	(0-1') OL - Topsoil, black.
					0	
					0	(1-3') CL - Sandy clay, green, compact.
5					0	
					0	(3-5') CL - Sandy clay light brown, rust mottling, compact rock fragments,
					0	
					0	
10					0	(5-11) CL - Sandy clay, light brown, rust mottling.
					0	
					0	(11-15) CL - Silty clay, dark green-gray rock fragments, compact.
					0	
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total depth = 15.0'.
WEATHER: Sunny and cold.

* SS (split spoon) HS (hollow stem auger)

STATIC

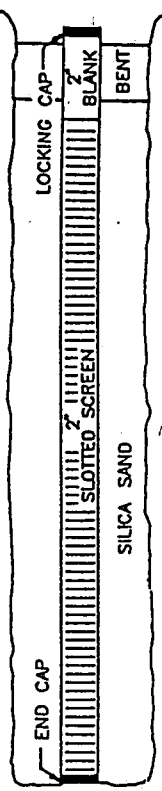
OBSERVATIONS WATER LEVELS Static Water Level Symbol v							
Date :	3/4/93	5/17/93					
Level:	2.26'	1.90'					
Time :	1329	1255					

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 22 MW	Facility Name Sauer Sundstrand	Facility Address 2800 E. 13th Street Ames, Iowa	
Boring Depth (Feet) x Diameter (Inches) 20.0' x 6.5"		Drilling Method HSA	
Well Contractor Registration # Rewerts Drilling Co. 0236-01		Logged by J. Boudouris	
Date & Time Start 3/4/93 1140	Date & Time End 3/4/93 1230	Ground Surface Elevation (ASL) 975.89	Lust Number 7LTD58

Depth in Feet 975.89	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
974.23 ▽					0	Asphalt.
			S	SS	0	
					0	(0-1') OL - Topsoil, black.
					0	
5					0	(1-3') SC -Clayey sand, light brown, pebbles.
					0	
					0	(3-10') CL - Sandy clay, light brown, compact, rock fragments, rust mottling.
					0	
10					0	(10-20') CL - Silty clay, dark gray, compact, rock fragments.
					0	
					0	
15					0	
					0	
					0	
20					0	
25	Inner casing & screen diameter = 2"					
30						

NOTES: Total Depth = 20.0'.
WEATHER: Sunny and cold.

* SS (split spoon) *HS (hollow stem auger)

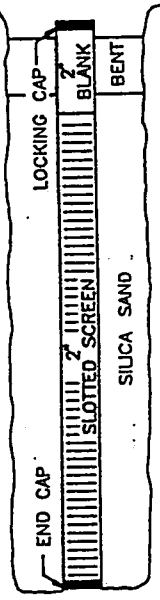
OBSERVATIONS WATER LEVELS Static Water Level Symbol ▽						
Date :	3/4/93	3/4/93	5/17/93			
Level:	8.96'	1.66'	1.96'			
Time :	1331	1502	1315			

DNR FORM 542-1392

PROJECT NO. 92591

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 24 MW	Facility Name Sauer Sundstrand Co.	Facility Address 2800 E. 13th Street Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 15.0' x 6.5"		Drilling Method HSA
Well Contractor Rewerts Drilling Co. Registration # 0236-01		Logged by B. Wade
Date & Time Start 3/23/93 1330	Date & Time End 3/23/93 1430	Ground Surface Elevation (ASL) 977.06 — Lust Number 7LTD58

Depth in Feet 977.06	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type*	PID/FID Reading (PPM)	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
					0	(0-2.3') Topsoil, grass roots, moist, frost first 2.0 feet.
					0	
993.79			(S)	HS	0	
					0	(2.3-7.5') CL - Clay, brown wet at 4.0', sandy clay at 5.5'.
5					0	
					0	
					0	(7.5-12.5') CL - Clay, brown, silty with some sand.
					0	
					0	
10					0	
					0	(12.5-15') - Clay, gray, sharp contact between brown and gray. Gray clay is soft, some pebble size rocks.
					0	
					0	
15					0	
20						
25	Inner casing & screen diameter = 2"					
30						

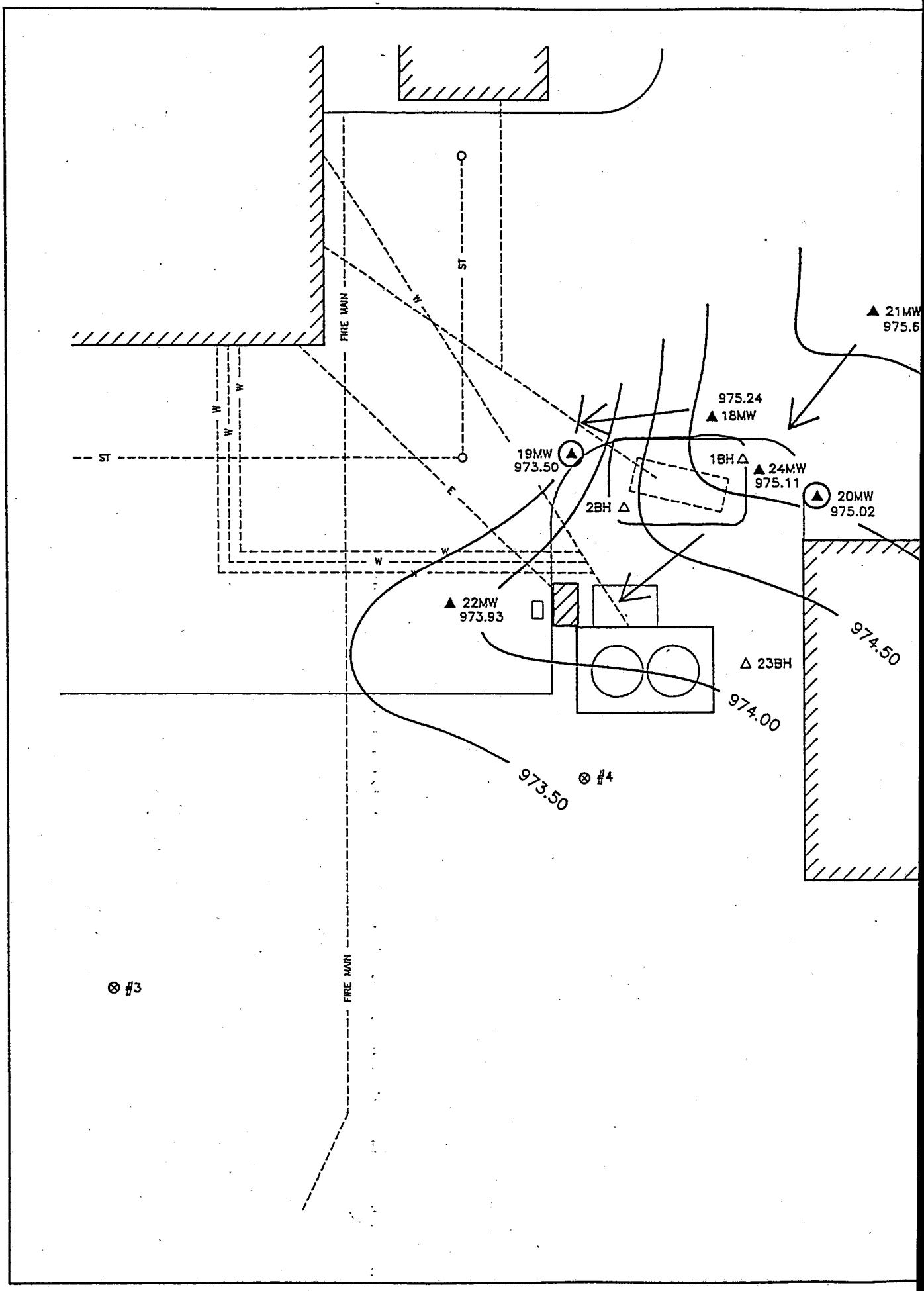
* SS (split spoon) *HS (hollow stem auger)

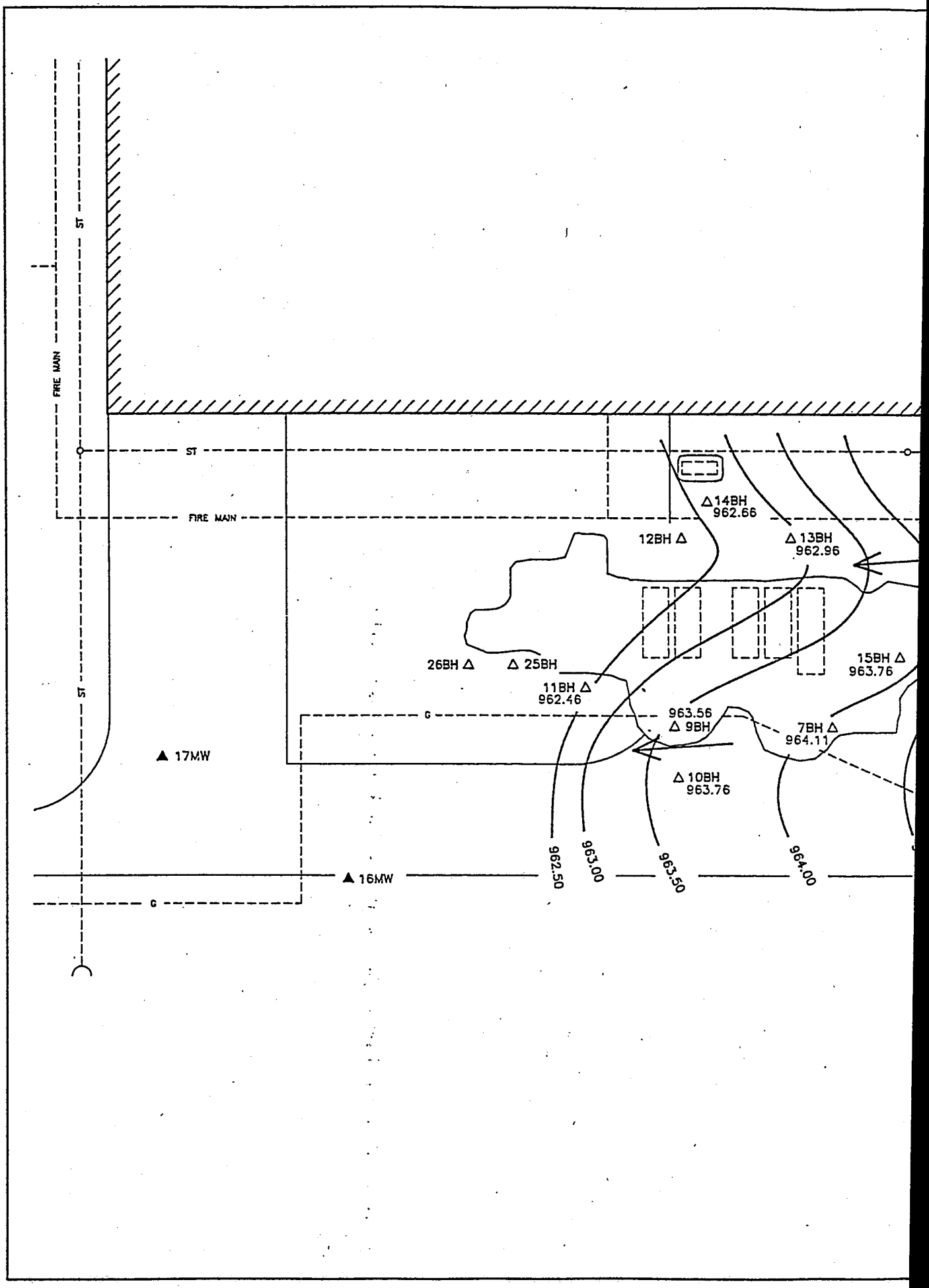
OBSERVATIONS WATER LEVELS Static Water Level Symbol v						
Date :	3/23/93	3/23/93	3/23/93	3/23/93	5/17/93	
Level:	8.78'	3.51'	3.51'	3.27'	1.95'	
Time :	1435	1532	1600	1700	1300	

DNR FORM 542-1392

APPENDIX 8

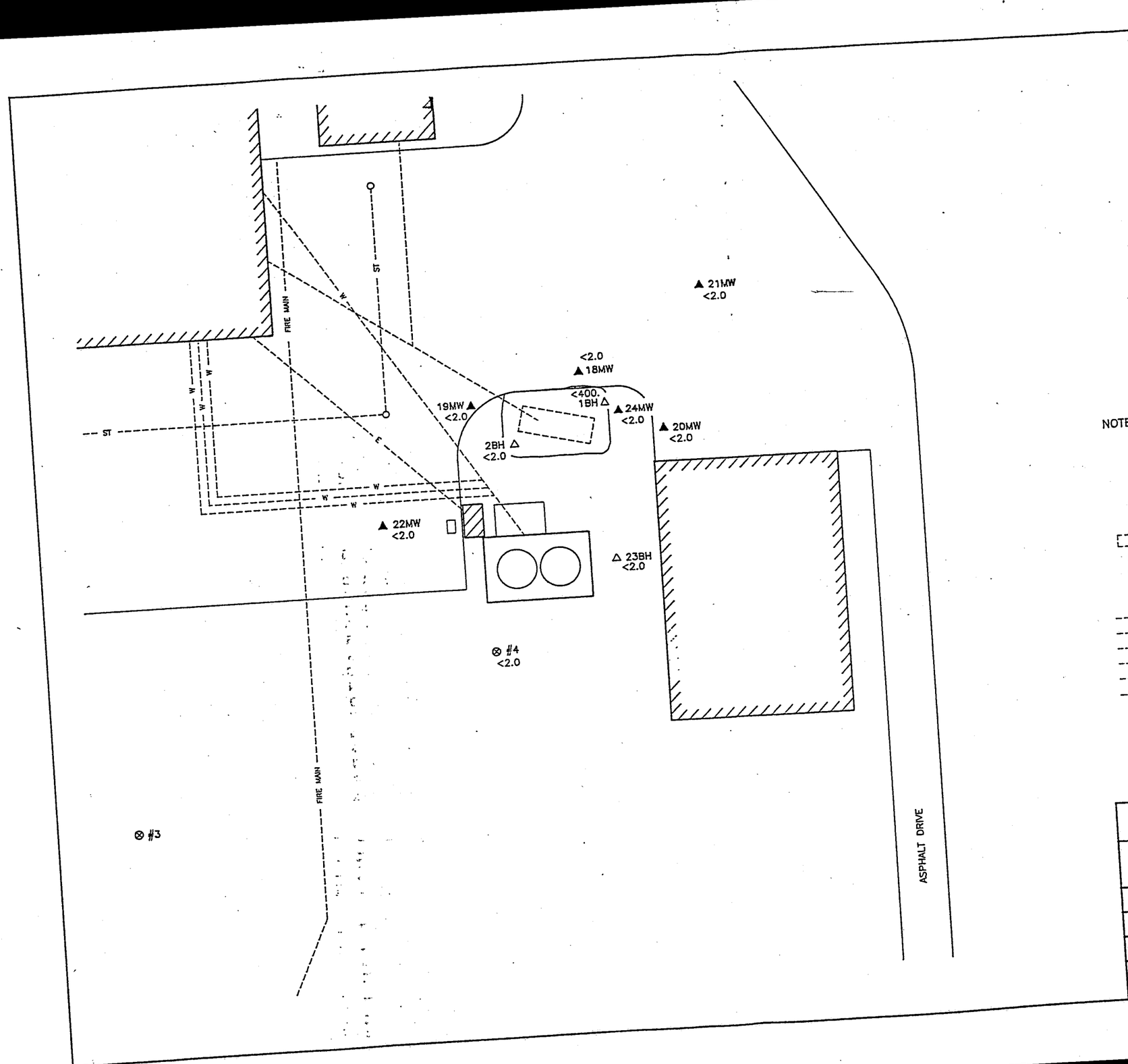
"IV(G) - GROUNDWATER CONTOUR MAP"


FIRE MAIN
ST
W
E
21MW
975.6
975.24
18MW
19MW
973.50
1BH
24MW
975.11
20MW
975.02
2BH
22MW
973.93
23BH
974.50
974.00
973.50
#4
#3
FIRE MAIN


FIRE MAIN
ST
ST
ST
FIRE MAIN
Δ14BH
962.66
12BH Δ
Δ13BH
962.96
26BH Δ
Δ 25BH
15BH Δ
963.76
11BH Δ
962.46
963.56
Δ 9BH
7BH Δ
964.11
▲ 17MW
Δ10BH
963.76
962.50
963.00
963.50
964.00
▲ 16MW

APPENDIX 9

"IV(I) - GROUNDWATER CONTAMINATION PLUME MAPS"



NOTE: AS ALL GROUND WATER SAMPLES ANALYZED BELOW LABORATORY METHOD DETECTION LIMITS, NO CONTAMINATION PLUME WAS CONTOURED.

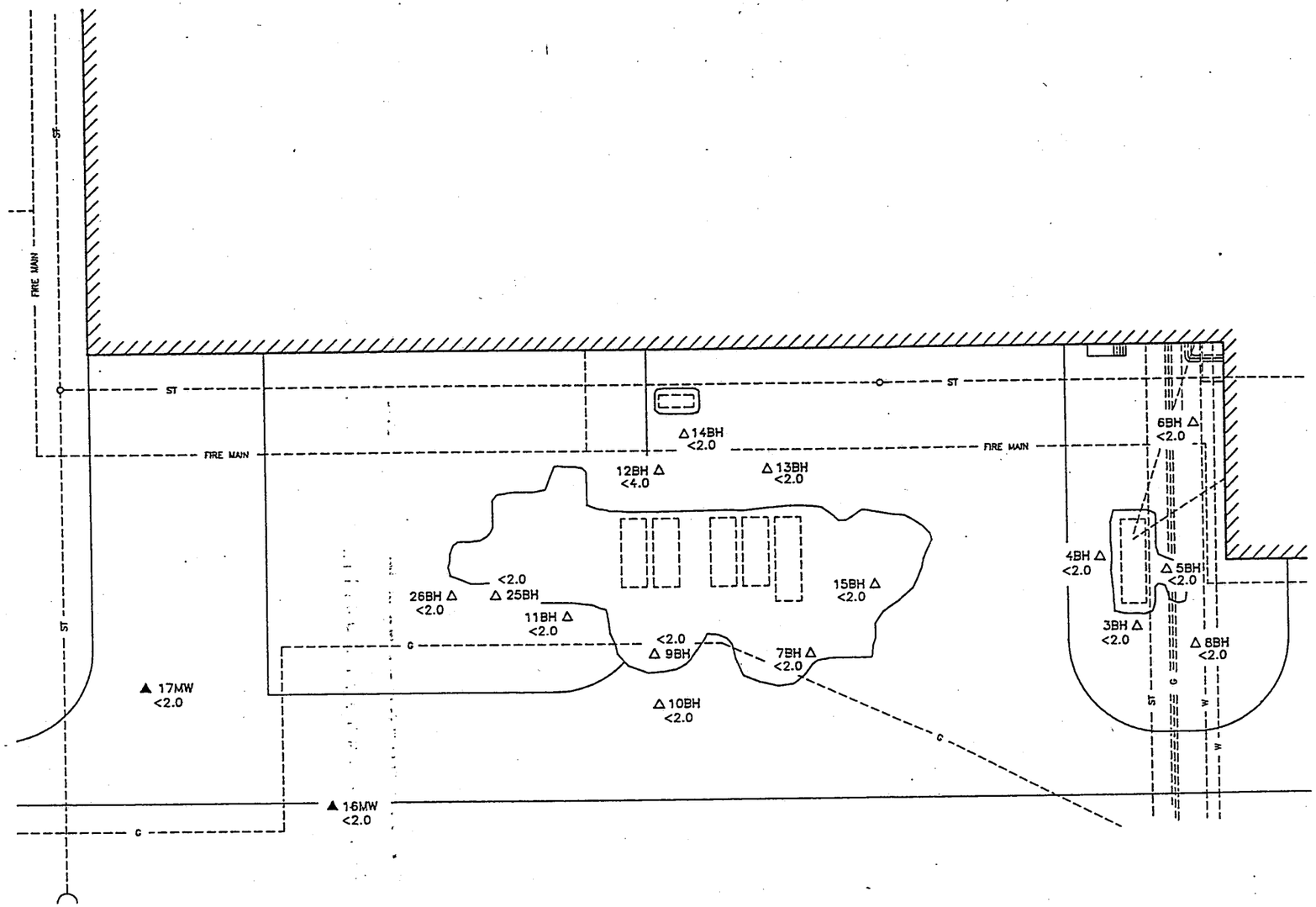
LEGEND

- UNDERGROUND TANKS
- ⊗ PRE-ASSESSMENT COMPLETED WELL
- ○ PRE-ASSESSMENT NON-COMPLETED BOREHOLE
- ▲ MONITOR WELL (MW)
- △ BOREHOLE (BH)
- --G-- GAS LINE LOCATION (APPROX.)
- --E-- UNDERGROUND ELECT. LINE LOC. (APPROX.)
- --SS-- SANITARY SEWER LINE LOCATION (APPROX.)
- --ST-- STORM SEWER LINE LOCATION (APPROX.)
- --W-- WATER LINE LOCATION (APPROX.)
- --T-- TELEPHONE LINE LOCATION (APPROX.)
- PUMPS
- POWER POLE
- MANHOLE
- <2.0 BENZENE CONCENTRATION (PPB)

SAUER-SUNDSTRAND COMPANY

IV(I)-GROUND WATER CONTAMINATION PLUME MAP (BENZENE)

LOCATION	AMES, IA		PROJ. NO. 92591
DATE	06/93	DWN. BY WAP	CHKD. BY EJB/JB
SCALE	1"=30'	NOTES	
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 8



NOTE: AS ALL GROUND WATER SAMPLES ANALYZED BELOW LABORATORY METHOD DETECTION LIMITS, NO CONTAMINATION PLUME WAS CONTOURED.

LEGEND

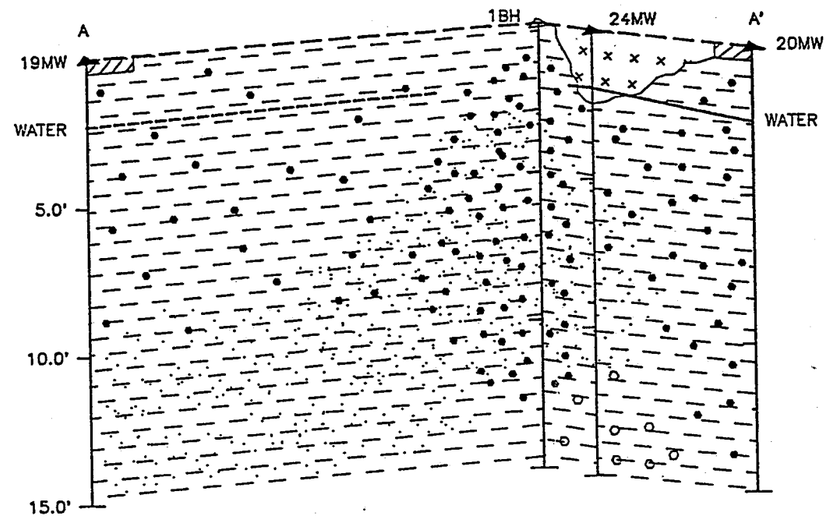
- UNDERGROUND TANKS
- PRE-ASSESSMENT COMPLETED WELL
- PRE-ASSESSMENT NON-COMPLETED BOREHOLE
- MONITOR WELL (MW)
- BOREHOLE (BH)
- --G-- GAS LINE LOCATION (APPROX.)
- --E-- UNDERGROUND ELECT. LINE LOC. (APPROX.)
- --SS-- SANITARY SEWER LINE LOCATION (APPROX.)
- --ST-- STORM SEWER LINE LOCATION (APPROX.)
- --W-- WATER LINE LOCATION (APPROX.)
- --T-- TELEPHONE LINE LOCATION (APPROX.)
- PUMPS
- POWER POLE
- MANHOLE
- <2.0 BENZENE CONCENTRATION (PPB)

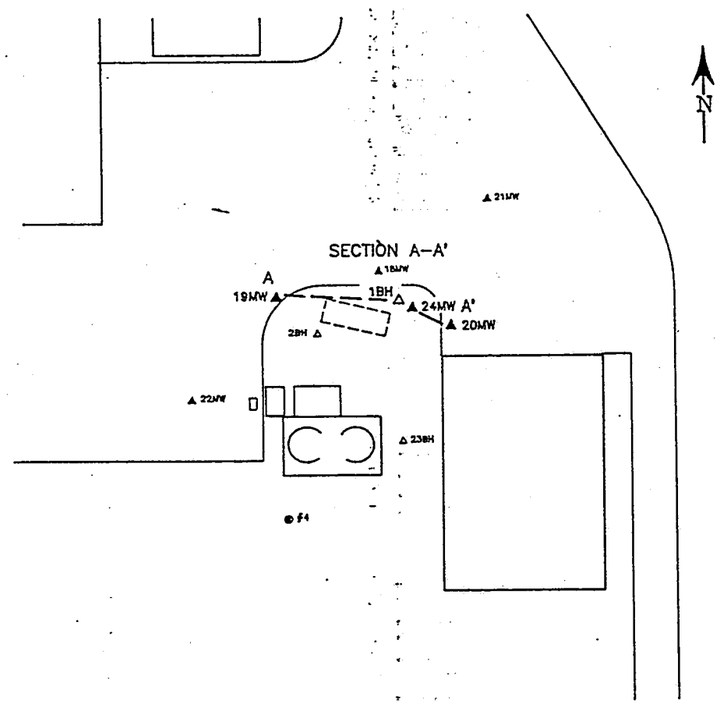
SAUER-SUNDSTRAND COMPANY			
IV(I)-GROUND WATER CONTAMINATION PLUME MAP (BENZENE)			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
SCALE 1"=40'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 9

APPENDIX 10

"VI - HYDROGEOLOGICAL CROSS-SECTION DIAGRAM"

SECTION A–A'



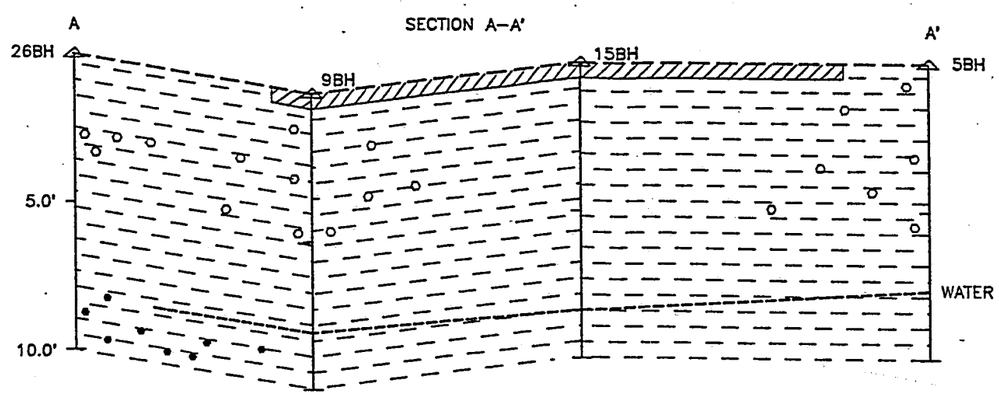


LEGEND

- PAVEMENT
- TOPSOIL
- CLAY
- SAND
- GRAVEL/PEBBLES
- TILL
- SILT

FOR A MORE DETAILED DESCRIPTION OF GEOLOGICAL DATA – SEE WELL LOG

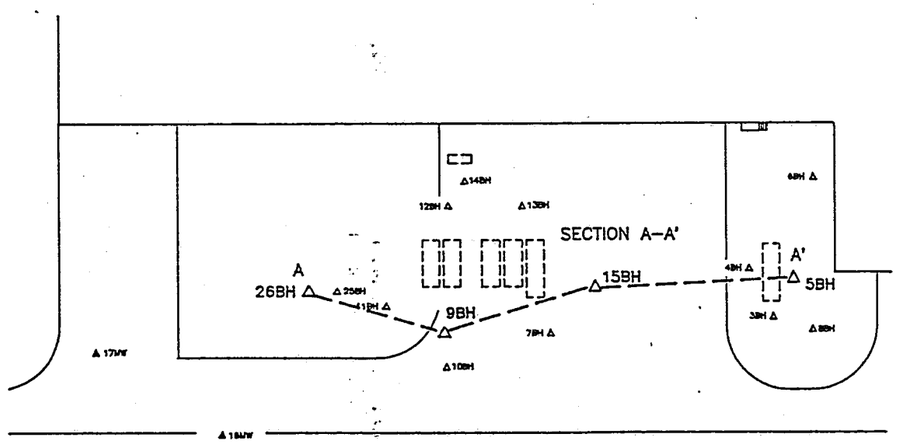
SAUER–SUNDSTRAND COMPANY			
VI–HYDROGEOLOGICAL CROSS SECTION DIAGRAM			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
VERTICAL SCALE 1"=5'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 10



LEGEND

- PAVEMENT
- TOPSOIL
- CLAY
- SAND
- GRAVEL/PEBBLES
- TILL
- SILT

FOR A MORE DETAILED DESCRIPTION OF GEOLOGICAL DATA – SEE WELL LOG



SAUER–SUNDSTRAND COMPANY			
VI–HYDROGEOLOGICAL CROSS SECTION DIAGRAM			
LOCATION AMES, IA		PROJ. NO. 92591	
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
VERTICAL SCALE 1"=5'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 11

APPENDIX 11 - VIII - RECEPTOR SURVEY MAP

A. Surface Water Body Survey. There are no surface water bodies within 1000 feet of the site. (See Figure 13 in this Appendix). The South Skunk River and tributaries are over a half mile to the west.

B. Conduit Survey. All utility conduits are shown on the Receptor Survey Map (Figure 12) and on the table labelled "Conduit Survey".

A confined space survey was conducted in the basement under the north portion of the building. The results are included in this Appendix.

Although there are water lines, storm sewers, and gas and electric utility lines on the property, the very locally impacted soil, and the lack of impact on the ground water indicate no off-site migration. Impacted soil that was present, has been removed through overexcavation. The only possible impacted soil remaining on-site is a very small and localized area noted by soil sample SS-8 during overexcavation.

C. Water Well Survey. An area with a radius of 300 feet around the two areas was scouted on foot for water wells. None was found.

The only water well within 1000 feet of the Sauer-Sundstrand property was at the Amoco Station (Doc's Stop) on E. 13th Street next to the entrance to Sauer-Sundstrand (Figure 13). This well was plugged in 1992 when the property was connected to the city of Ames water supply.

The following sources of information were utilized:

> The USGS List of Water Wells in Iowa; the Iowa Geological Survey in Iowa City; the Story County Engineer's office; the City of Ames, Director of Water and Pollution Control (and his retired predecessor); the owner of the Amoco Station property; and the Rewert's Drilling Company.

D. Ground Water Barrier Survey. There is probably considerable compaction in this area in connection with the construction of I-35 and the Sauer-Sundstrand plant.

PROJECT NO.	92591	CLIENT	SAUER/SUNDSTRAN	DATE	03/04/93
LUST NO.	7LTD58	LOCATION	AMES	WELL NO.	19MW
DEPTH OF WELL(FT)	16	STATIC WATER LEVEL(FT)	1.38	HOLE DIA(IN)	6.5
CASING DIA.(IN)	2	SCREEN DIA.(IN)	2	SCREEN LENGTH(FT)	12.5
SLOT SIZE	0.020	CASING TYPE	PVC	TEST BY	D EASLEY

POROSITY	ADJUSTED CASING RADIUS(FT) (rc) *
0.3	0.16

Water level below top of screen

Lw<H

Le(ft)	13.62
rw(ft)	0.27
Le/rw	50.29
A	3
B	0.4
H	25
ln(Re/rw)	2.70
K(ft/sec)	1.93E-06
K(m/day)	0.05

Le=Lw

Le=bottom of well-static water level

rw=radius of boring

rc=adjusted casing radius

A, B & C=coefficient of L/rw from chart

H=depth of aquifer

K=hydraulic conductivity

When Lw < H:

$\ln(Re/rw) = 1/((1.1/(\ln(Lw/rw)) + (A+B\ln((h-Lw)/rw))/(Le/rw))$

When Lw = H:

$\ln(Re/rw) = 1/((1.1/(\ln(Lw/rw)) + C/(Le/rw))$

* The casing radius (rc) was adjusted to compensate for the sand pack and well diameter. The formula used to determine rc is as follows:

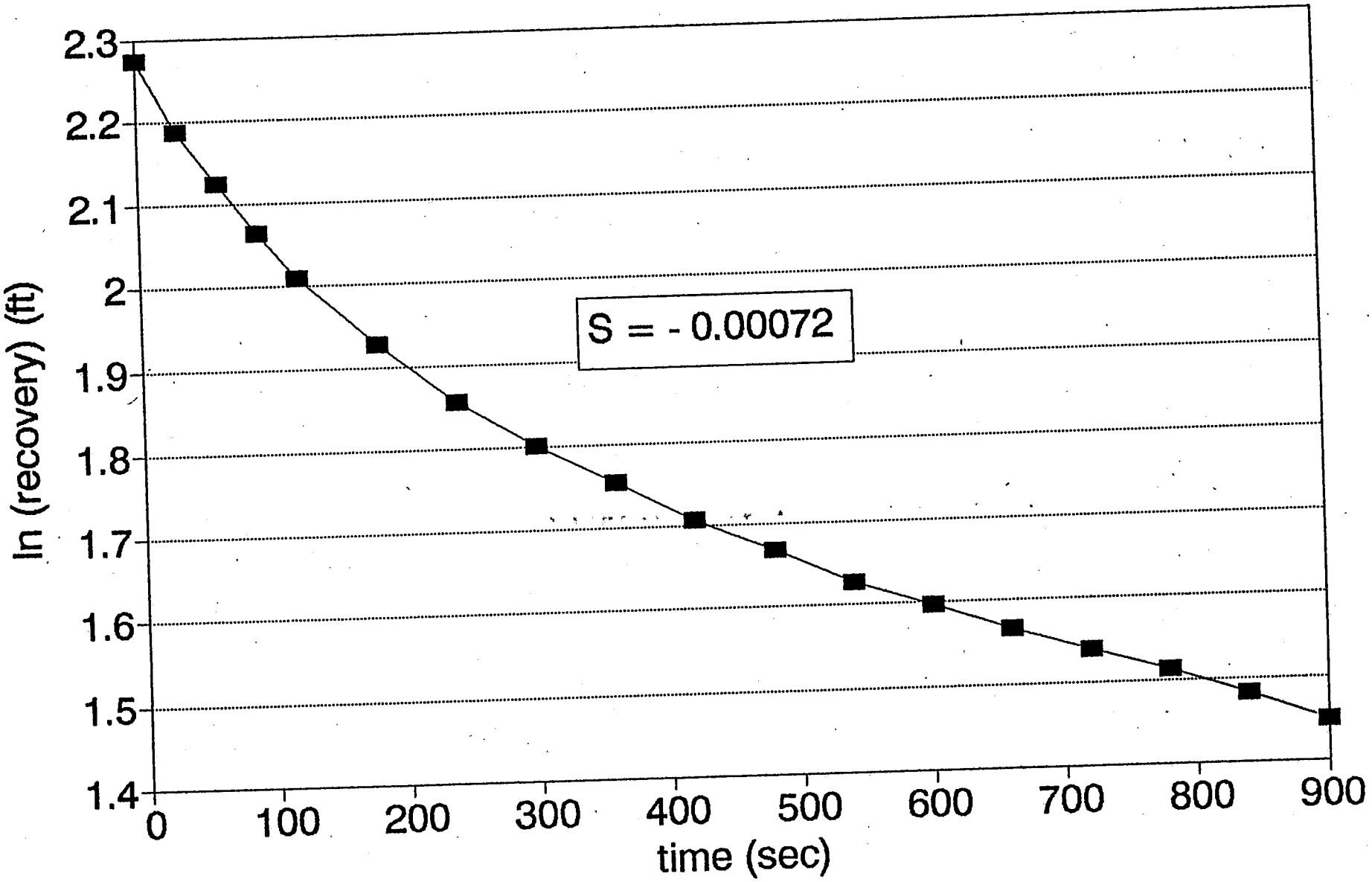
$\sqrt{(\text{casing diam}/2)^2 + (((\text{well diam}/2)^2 - (\text{casing diam}/2)^2) \times \text{Porosity})}$

12

time(sec)	depth to water (ft)	recovery(ft)	ln(recovery)
0	11.1	9.72	2.27
30	10.3	8.92	2.19
60	9.75	8.37	2.12
90	9.26	7.88	2.06
120	8.84	7.46	2.01
180	8.25	6.87	1.93
240	7.78	6.4	1.86
300	7.44	6.06	1.80
360	7.16	5.78	1.75
420	6.9	5.52	1.71
480	6.68	5.3	1.67
540	6.47	5.09	1.63
600	6.32	4.94	1.60
660	6.17	4.79	1.57
720	6.04	4.66	1.54
780	5.92	4.54	1.51
840	5.78	4.4	1.48
900	5.64	4.26	1.45

Regression Output:

Constant		2.0399471
Std Err of Y Est		0.029015
R Squared		0.9697672
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	-0.000724	
Std Err of Coef.	4.044E-05	



92591 19 MW

SAUER-SUNDSTRAND - AMES

PROJECT NO.	92591	CLIENT	SAUER/SUNDSTRAN	DATE	03/04/93
LUST NO.	7LTD58	LOCATION	AMES	WELL NO.	20MW
DEPTH OF WELL(FT)	16	STATIC WATER LEVEL(FT)	2.46	HOLE DIA(IN)	6.5
CASING DIA.(IN)	2	SCREEN DIA.(IN)	2	SCREEN LENGTH(FT)	12.5
SLOT SIZE	0.020	CASING TYPE	PVC	TEST BY	D EASLEY

POROSITY	ADJUSTED CASING RADIUS(FT) (rc)
0.3	0.16

Le=Lw

Le=bottom of well-static water level

rw=radius of boring

rc=adjusted casing radius

A, B & C=coefficient of L/rw from chart

H=depth of aquifer

K=hydraulic conductivity

When Lw < H:

$\ln(Re/rw) = 1/((1.1/(\ln(Lw/rw)) + (A+B\ln((h-Lw)/rw))/(Le/rw))$

When Lw = H:

$\ln(Re/rw) = 1/((1.1/(\ln(Lw/rw)) + C/(Le/rw))$

The casing radius (rc) was adjusted to compensate for the sand pack and well diameter. The formula used to determine rc is as follows:

$$\sqrt{\frac{(\text{casing diam}/2)^2 + (((\text{well diam}/2)^2 - (\text{casing diam}/2)^2) \times \text{Porosity})}{12}}$$

Water level below top of screen

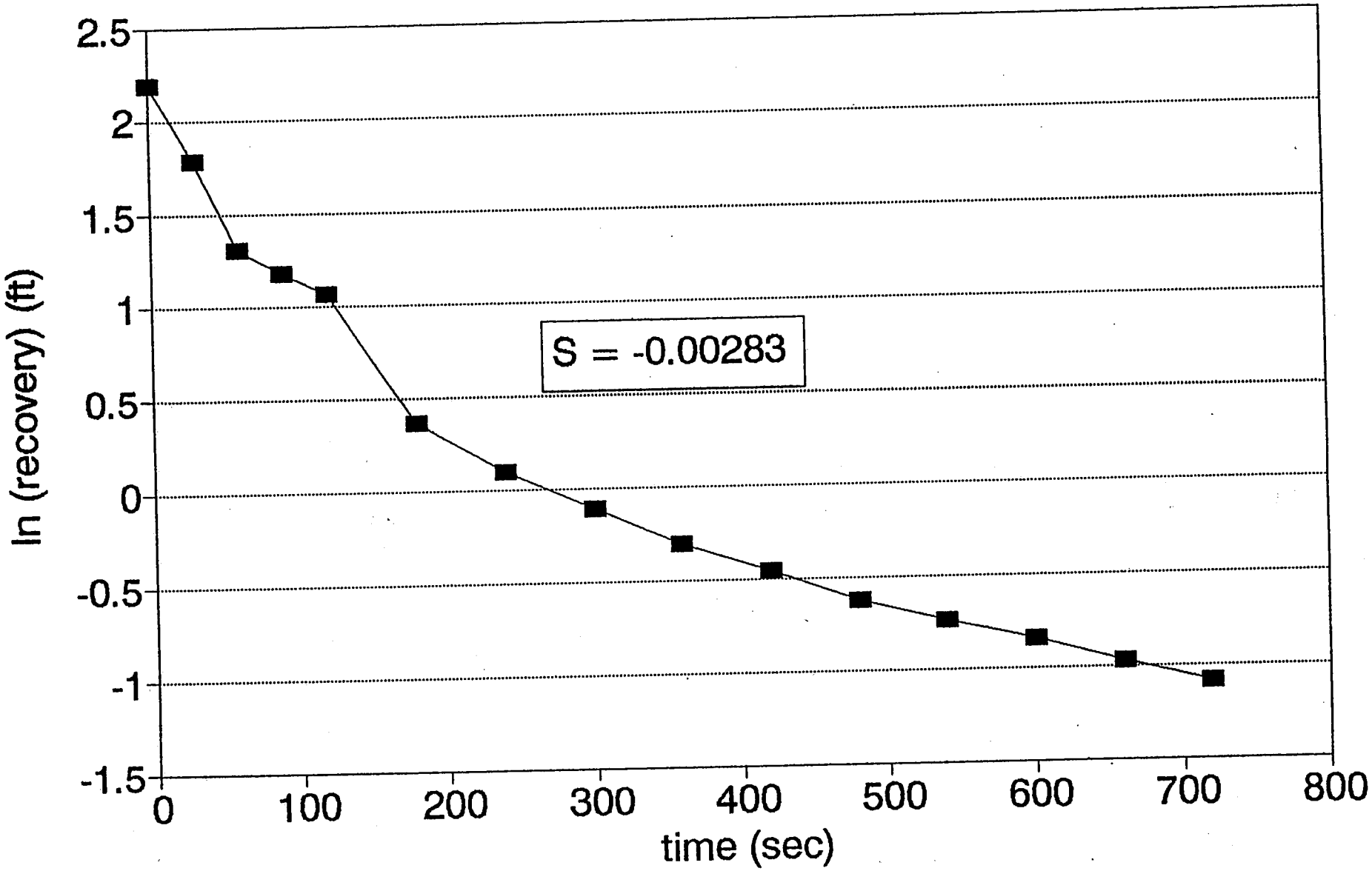
Lw<H
Le(ft)
12.54
rw(ft)
0.27
Le/rw
46.30
A
2.9
B
0.4
H
25
ln(Re/rw)
2.61
K(ft/sec)
7.94E-06

K(m/day)
0.21

time(sec)	depth to water (ft)	recovery(ft)	ln(recovery)
0	11.4	8.94	2.19
30	8.4	5.94	1.78
60	6.14	3.68	1.30
90	5.7	3.24	1.18
120	5.36	2.9	1.06
180	3.9	1.44	0.36
240	3.66	1.1	0.10
300	3.36	0.9	-0.11
360	3.2	0.74	-0.30
420	3.1	0.64	-0.45
480	3	0.54	-0.62
540	2.94	0.48	-0.73
600	2.89	0.43	-0.84
660	2.84	0.38	-0.97
720	2.8	0.34	-1.08

Regression Output:

Constant		0.7819708
Std Err of Y Est		0.061381
R Squared		0.9817275
No. of Observations		8
Degrees of Freedom		6
X Coefficient(s)	-0.002834	
Std Err of Coef.	0.0001579	



92591 20 MW

SAUER-SUNDSTRAND - AMES

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

03/13/1993

NET Job Number: 93.01469

NET Sample Number: 201592

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Sample ID: #18-MW Sauer-Sundstrand

Date Received: 03/05/1993

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Solids, Dissolved	660.	mg/L		jcf	03/08/1993	E-160.1	10.	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only). B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201703

Collectors Phone No.: 515/964-0304

Collected by: GSS

Date Taken: 03/04/1993

Job Description: PROJECT #92591 - AMES, IOWA

Date Received: 03/05/1993

Sample ID: #21-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Solids, Dissolved	700.	mg/L		jcf	03/08/1993	E-160.1	10.	mg/L	GROUND

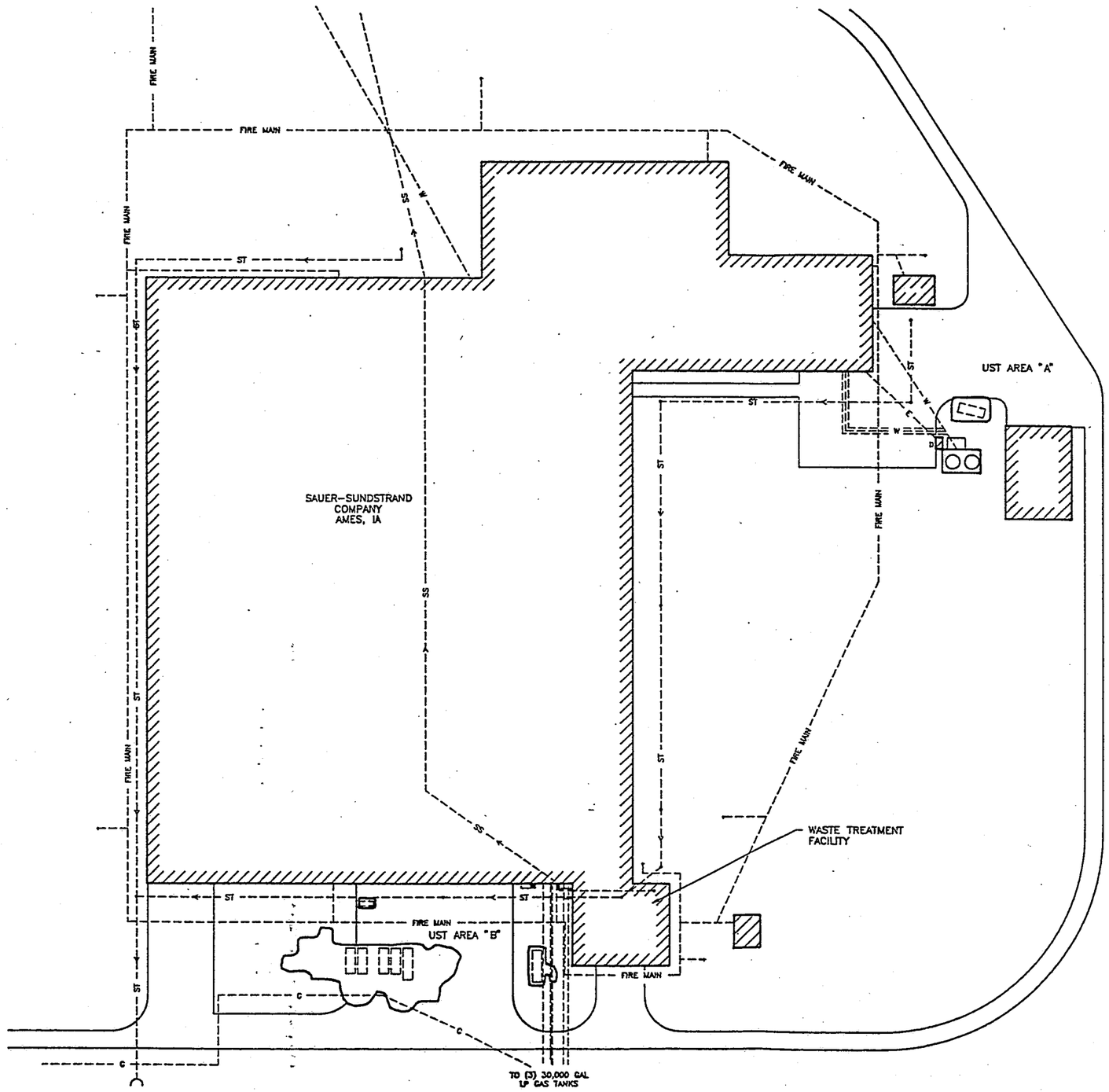
All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

APPENDIX 11

"VIII - RECEPTOR SURVEY MAP"



N

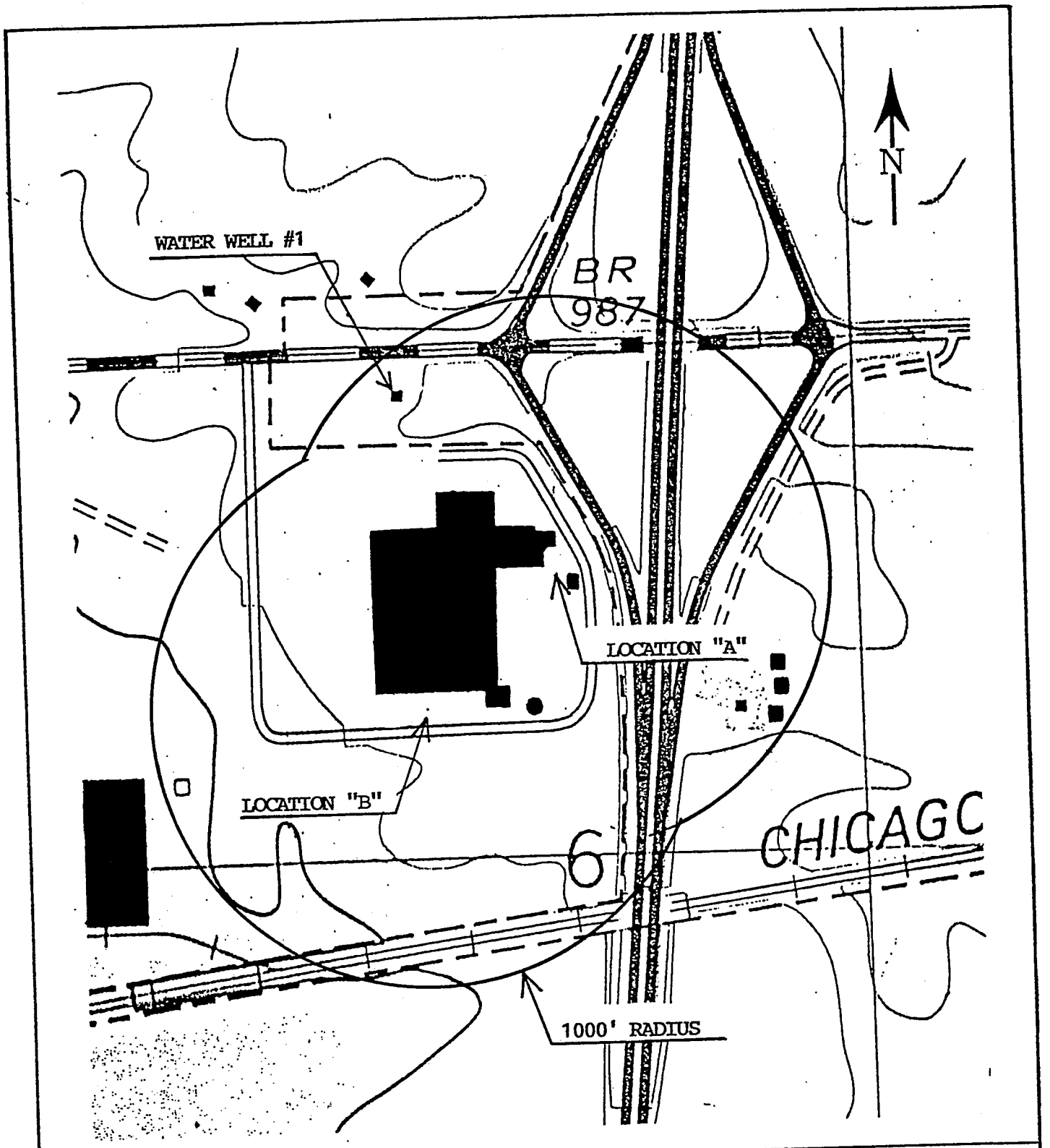
LEGEND

- UNDERGROUND TANKS
- GAS LINE LOCATION (APPROX.)
- OVERHEAD ELECTRIC LINE LOCATION (APPROX.)
- SANITARY SEWER LINE LOCATION (APPROX.)
- STORM SEWER LINE LOCATION (APPROX.)
- WATER LINE LOCATION (APPROX.)
- OVERHEAD TELEPHONE LINE LOCATION (APPROX.)
- DISPENSING PUMP
- POWER POLE

SAUER-SUNDSTRAND COMPANY			
VIII-RECEPTOR SURVEY MAP			
LOCATION AMES, IA		PROJ.-NO. 92591	
DATE 06/93	DWN. BY WAP	CHKD. BY EJB/JB	
SCALE 1"=100'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 12

CONDUIT SURVEY

TYPE OF CONDUIT/ CONFINED SPACE	BACKFILL MATERIAL	SLOPE OF CONDUIT & TRENCH	RELATIONSHIP TO GROUNDWATER LEVELS	PRESENCE OF EXPLOSIVE VAPORS OR PHYSICAL DAMAGE CAUSED BY CONTAMINATION
SANITARY SEWER Clay tile	Unknown	N-S in building to waste treatment facility in southeast corner of plant.	10' (below)	None
STORM SEWER Clay pipe	Unknown	N-S & E-W to southwest corner of building.	4' (below)	None
WATER 12" Cast iron	Unknown	None	4' - 5' (below)	None
NATURAL GAS 4" Steel	Native	None	30" L&P (above)	None
BURIED ELECTRIC			3-4' (below)	None
BURIED TELEPHONE None				
OTHER				



SAUER SUNDSTRAND COMPANY			
VIII-SURFACE WATER BODIES/ WATER WELL SURVEY			
LOCATION	AMES, IA	PROJ. NO.	92591
DATE 06/93	DWN. BY	CHKD. BY	EJB/JB
SCALE 1"=500'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 13

CONFINED SPACE SURVEY

DATE: 6/9/93
RECORDED BY: Scott Lee

LUST NO. 7LTD58
UST REG NO. 8605539
PROJECT NO. 92591

FACILITY NAME: Sauer-Sundstrand Company
FACILITY ADDRESS: 2800 E. 13th St. Ames, IA
DESCRIPTION: Basement, north side of building.

	EXPLOSIMETER READING (%) LEL	02	PID READING	X .56	= BENZENE (PPM)
START TIME	0.00%	20.8%			
1/2					
1					
1 1/2					
2					
2 1/2					
3					
3 1/2					
4					
4 1/2					
5					
5 1/2					
6					
6 1/2					
7					
7 1/2					
8					

NOTES: MSA Minigard II

APPENDIX 12

"X - LABORATORY DATA SHEETS"

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Midwest Region
4211 May Avenue
Wichita, KS 67209
(316) 945-2624
(800) 633-7936

CLIENT: Groundwater Technology, Inc.
5158 [illegible] Avenue
Des Moines, IA 5[illegible]1

ATTN: James M[illegible]ek
DATE RCVD: 11-11-89
DATE RPTD: 11-29-[illegible]
LAB NUMBER: W[illegible]-11-221
ANALYZED BY: J. Sattler

SAMPLE SUBMITTED: Three voc bottles of soil for each sample
Sundstrand/Saver Tank #3
(#4210-9651)(01)

SAMPLE I.D.	TOTAL PETROLEUM HYDROCARBONS CONCENTRATION & UNITS		METHOD
SB-1 2'	84	mg/Kg	*
SB-1 7'	150	mg/Kg	*
SB-1 9'	4,900	mg/Kg	*

*Modified EPA 3550, Std. Mtds. 15th Ed., 503 B&E

Respectfully submitted,

GTEL ENVIRONMENTAL LABORATORIES, INC.
MIDWEST REGION

Terry R. Loucks
LABORATORY DIRECTOR

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172980

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/08/1992

Date Received: 06/10/1992

Sample ID: #5-BH 5' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	520.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
Diesel	180.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
Motor Oil	340.	ug/g		tms	06/19/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<1.0	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	8.4	ug/g		djl	06/18/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	230.	ug/g	d	djl	06/18/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172981

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #9-BH 2' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	500.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Diesel	500.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<100.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	40.	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	350.	ug/g	d	djl	06/19/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/24/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172982

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #15-BH 2' Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
								Soil
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	1600.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Diesel	610.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
Motor Oil	1000.	ug/g		tms	06/17/1992	IA-OA2	10. ug/g	Soil
								Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<2.0	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	21.	ug/g		djl	06/19/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	290.	ug/g	d	djl	06/19/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201593

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #16-MW 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/05/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201594

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #17-MW 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/05/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201595

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #18-MW 2' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/05/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201596

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #19-MW 2' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/05/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201597

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #20-MW 3' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/05/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201708

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #21-MW 2' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/11/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/11/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/11/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/11/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/08/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201709

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #22-MW 2' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/08/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel (319) 277-2401
Fax (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201710

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #23-BH 2' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/08/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/09/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/08/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/08/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel (319) 277-2401
FAX (319) 277-2425

RECEIVED APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203459

Collectors Phone No.: 515/964-0304

Collected by: GSS

Date Taken: 03/23/1993

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Received: 03/25/1993

Sample ID: #24-MW 3' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/31/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/26/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203460

Collectors Phone No.: 515/964-0304

Collected by: GSS

Date Taken: 03/23/1993

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Received: 03/25/1993

Sample ID: #25-BH 4' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/31/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/26/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203461

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Taken: 03/23/1993

Date Received: 03/25/1993

Sample ID: #26-BH 3' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			mmk	03/31/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Diesel	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
Motor Oil	<10.	ug/g		jab	03/29/1993	IA-OA2	10.	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	03/26/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10.	ug/g		smh	03/26/1993	S-8015/IA-OA1	10.	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177431

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-1 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/11/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177432

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-2 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	11.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	11.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177433

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-3 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

08/13/1992

NET Job Number: 92.5801

NET Sample Number: 177434

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Sample ID: SS-4 6' Sauer-Sundstrand

Date Received: 07/21/1992

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	26.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	26.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177435

Collectors Phone No.: 515/964-0304

Collected by: Brad Wade

Date Taken: 07/17/1992

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Received: 07/21/1992

Sample ID: SS-5 3' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/30/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/30/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.®

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177436

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-6 3' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.®

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177437

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-7 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	20.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
Motor Oil	20.	ug/g		ake	08/12/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 14 1992

ANALYTICAL REPORT

08/13/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5801

NET Sample Number: 177438

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/17/1992

Date Received: 07/21/1992

Sample ID: SS-8 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	160.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	160.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177515

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-9 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177516

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-10 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177517

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-11 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177518

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-12 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/28/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG - 6 1992

ANALYTICAL REPORT

08/04/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5829

NET Sample Number: 177519

Collected by: B. Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
13TH STREET/AMES, IOWA

Date Taken: 07/20/1992

Date Received: 07/22/1992

Sample ID: SS-13 4' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		hlk	07/29/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		kjt	07/31/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		kjt	07/31/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177665

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-14 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	08/05/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177666

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-15 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	08/05/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	08/05/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED AUG 13 1992

ANALYTICAL REPORT

08/12/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5874

NET Sample Number: 177667

Collected by: Bill Priestly

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - 13TH STREET/AMES, IOWA

Date Taken: 07/21/1992

Date Received: 07/23/1992

Sample ID: SS-16 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		tms	08/02/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		ake	08/04/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		ake	08/04/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

AUG 10 1992

ANALYTICAL REPORT

08/07/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.5718

NET Sample Number: 177122

Collected by: Brad Wade

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 07/15/1992

Date Received: 07/17/1992

Sample ID: PB-1 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-SOIL								Soil
Total Extractable Hydrocarbons	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
Diesel	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
Motor Oil	<10.	ug/g		ake	08/04/1992	IA-OA2	10. ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)								Soil
Benzene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Ethylbenzene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Toluene	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Xylenes, Total	<0.5	ug/g		djl	07/28/1992	S-8015/IA-OA1	0.5 ug/g	Soil
Total Hydrocarbons	<10.	ug/g		djl	07/28/1992	S-8015/IA-OA1	10 ug/g	Soil

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)
B = Blank hit for this compound
All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: Sawer - Sundstrand

UST ADDRESS: 13th St AMES

SAMPLERS: (SIGNATURE) [signature]

LAB: Net

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SS-1 6ft		4oz		✓		Pit		–	7-17	1655					✓			
SS-2 6ft		✓		–		–		–	–	1656					✓			
SS-3 6ft		✓		✓		–		✓	–	1657					✓			
SS-4 6ft		✓		✓		–		–	–	1700					✓			
SS-5 3ft		✓		✓		–		–	–	1730					✓			
SS-6 3ft		✓		✓		–		–	–	1730					✓			
SS-7 6ft		✓		✓		–		–	–	1800					✓			
SS-8 6ft		✓		✓		–		–	✓	1800								

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	7/17/92	8:10 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/21/92	9:10	Melanie Jacobson

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B Wade

PROJECT NAME: Sauer - Sundstrand

UST ADDRESS: 13th Street Ames IA

LAB: NCT

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2		UST CONTENTS	REMARKS
SS-9 4ft		4 07		✓		Pit		✓	7/20	1501		✓			✓			
SS-10 4ft		✓		✓		✓		✓	✓	1503		✓			✓			
SS-11 4ft		✓		✓		✓		✓	✓	1505		✓			✓			
SS-12 4ft		✓		✓		✓		✓	✓	1507		✓			✓			
SS-13 4ft		✓		✓		✓		✓	✓	1509		✓						

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Susan Hoguke	7/21/92	10:00 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/22/92	800	Helene Saccoman

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304
1-800-373-6761 • FAX 515-964-1226

RECEIVED AUG 03 1992

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B Wade

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: 13th St Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
SS-14 5ft		1/4 oz		—		Pit		—	7/21	1330		—			—			
SS-15 5ft		—		—		—		—	—	1332		—			—			
SS-16 5ft		—		—		—		—	—	1334		—			—			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Bill Pratt	7/22/92	0830A	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/23/92	800	Melane Saccian

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

AUG 13 1992

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B Wirth

PROJECT NAME: Sawer-Sundstrand

UST ADDRESS: Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1992	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
PB-1 6ft		1/4 oz		–		Pit		✓	7/15	1800		–			✓			

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	7/16/92	9:05 AM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	7/17/92	800	Malene Saccam

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

AUG 0 1992

NET
NATIONAL ENVIRONMENTAL TESTING, INC.
NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUL - 2 1992

ANALYTICAL REPORT

07/01/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4655

NET Sample Number: 172964

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #1-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
* Total Extractable Hydrocarbons	14000.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
Diesel	2700.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
Motor oil	11000.	mg/L		ake	07/01/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<400.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	520.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<400.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	9600.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<4000.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	270.	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

* Estimated concentration. Sample over calibration curve.

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUL - 2 1992

ANALYTICAL REPORT

07/01/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4655

NET Sample Number: 172965

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #2-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	2.7	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
Diesel	2.7	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		ake	06/28/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	8.1	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

GB Copy

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172966

Collectors Phone No.: 515/964-0304

Date Taken: 06/09/1992

Date Received: 06/10/1992

Collected by: John Eidt

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Sample ID: #3-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
								Water
EXTRACTABLE HYDROCARBONS-WATER								
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
								Water
VOLATILES - BTEX (WATER)								
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCLAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172967

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #4-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/17/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172968

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #5-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.16	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172969

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #6-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172970

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #7-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.37	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

RECEIVED
JUN 25 1992

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172971

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #8-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	3.3	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	44.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.36	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172972

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #9-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172973

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #10-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.20	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172974

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #11-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	32.	ug/L		djl	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		djl	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	0.31	mg/L		djl	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCLAN GROUP

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172975

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #12-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	15.	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	3.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	12.	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<4.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	7.5	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<4.0	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	52.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<40.	ug/L		bqb	06/17/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	1.5	mg/L		bqb	06/17/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172976

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: #13-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

RECEIVED JUN 25 1992

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172977

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #14-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172978

Collected by: John Eidt

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Taken: 06/09/1992

Date Received: 06/10/1992

Sample ID: #15-BH Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
EXTRACTABLE HYDROCARBONS-WATER								Water
Total Extractable Hydrocarbons	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Diesel	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
Motor oil	<2.0	mg/L		tms	06/12/1992	IA-OA2	2.0 mg/L	Water
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201590

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: Terr. #4 Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/06/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/06/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201585

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #16-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/05/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	0.19	mg/L		smh	03/05/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201586

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #17-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/05/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/05/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	0.27	mg/L		smh	03/05/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201587

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #18-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/06/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/06/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201588

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #19-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/06/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/06/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201589

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: #20-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/06/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/06/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201704

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #21-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/08/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/08/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201705

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #22-MW Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/08/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/08/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201706

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: #23-BH Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/08/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/08/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203462

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Taken: 03/23/1993

Date Received: 03/25/1993

Sample ID: #24-MW Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/26/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/26/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/26/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/26/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/26/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/26/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203463

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Taken: 03/23/1993

Date Received: 03/25/1993

Sample ID: #25-BH Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	3.7	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/31/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/31/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED APR - 7 1993

ANALYTICAL REPORT

04/06/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01961

NET Sample Number: 203464

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591
2800 EAST 13TH STREET/AMES, IOWA

Date Taken: 03/23/1993

Date Received: 03/25/1993

Sample ID: #26-BH Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	8.7	ug/L		smh	03/31/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/31/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/31/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Cedar Falls Division
704 Enterprise Drive
P.O. Box 625
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

JUN 25 1992

ANALYTICAL REPORT

06/23/1992

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 92.4656

NET Sample Number: 172979

Collectors Phone No.: 515/964-0304

Collected by: John Eidt

Date Taken: 06/09/1992

Job Description: PROJECT #92591
2800 13TH STREET/AMES, IOWA

Date Received: 06/10/1992

Sample ID: Blanks/Sauer Sunstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
VOLATILES - BTEX (WATER)								Water
Benzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Ethylbenzene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Toluene	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
Xylenes, Total	<2.0	ug/L		bqb	06/11/1992	S-8015/IA-OA1	2.0 ug/L	Water
MTBE	<20.	ug/L		bqb	06/11/1992	S-8015/IA-OA1	20. ug/L	Water
Total Hydrocarbons	<0.10	mg/L		bqb	06/11/1992	S-8015/IA-OA1	0.10 mg/L	Water

Key to Flags: D = Chromatogram does not match gasoline (OA-1 only)

All Results are calculated on a wet weight basis.
Reporting Limts are extremely matrix dependent and may not always be achievable
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/13/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01469

NET Sample Number: 201591

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/03/1993

Date Received: 03/05/1993

Sample ID: Blanks Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/06/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/06/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/06/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAR 16 1993

ANALYTICAL REPORT

03/15/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 93.01496

NET Sample Number: 201707

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #92591 - AMES, IOWA

Date Taken: 03/04/1993

Date Received: 03/05/1993

Sample ID: Blanks Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
VOLATILES - BTEX (WATER)									Water
Benzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Ethylbenzene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Toluene	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
Xylenes, Total	<2.0	ug/L		smh	03/08/1993	S-8015/IA-OA1	2.0	ug/L	Water
MTBE	<20.	ug/L		smh	03/08/1993	S-8015/IA-OA1	20.	ug/L	Water
Total Hydrocarbons	<0.10	mg/L		smh	03/08/1993	S-8015/IA-OA1	0.10	mg/L	Water

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Project Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 42591 #7

SAMPLERS: (SIGNATURE)

PROJECT NAME: SAUER SUNSTRAND
UST ADDRESS: 2800 13th Street Ames, IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE '92	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL QA-1	DIESEL BY UHL QA-1 & QA-2	WASTE OIL BY UHL QA-1 & QA-2		UST CONTENTS	REMARKS
#15BH		3-40ml + 1 Qt	✓			Well		✓	6/9	1634		✓		✓			Waste Oil	
Blanks		3-40ml vials						✓		1645			✓					
																		Expedite
																	Waste Sludge	
#5BH	5.0'	1-4oz Jar		✓		Boring		✓	6/8	1455		✓		✓			Hy Tran	
#9BH	2.0'	"		✓		"		✓	6/9	0935		✓		✓			Waste Oil	
#15BH	2.0'	"		✓		"		✓	6/9	1500				✓				

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	6/10/92	8:20 Am	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

CLIENT NAME/OFFICE LOCATION:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: John Tiot

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: Ames, IA

LAB: NET

SAMPLERS: (SIGNATURE) James Boudouris

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	Tot. Diss. Sol.	UST CONTENTS	REMARKS
16MW	-	3-40ml	X			MW		X	3/3	1045	X	X	X					
17MW	-	"	X			"		X	"	1140	X	X	X					
18MW	-	"	X			"		X	"	1330	X	X	X					
19MW	-	"	X			"		X	"	1455	X	X	X					
20MW	-	4-40ml	X			"		X	"	1600	X	X	X					Heavy sediment
Terr. #4		3-40ml	X			"		X	"	1655	X	X	X					
Blanks	-	"	X			Dist. W.		X	"	1500	X	X	X					
18MW	-	1 pt	X			MW		X	"	1315		X				X		
16MW	5	1-4oz		X		MW		X	"	1030		X		X				
17MW	5	"		X		"		X	"	1115		X		X				
18MW	2	"		X		"		X	"	1300		X		X				
19MW	2	"		X		"		X	"	1345		X		X				
20MW	3	"		X		"		X	"	1520		X		X				

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Ron Prestley	3/4/93	930	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	3/5/93	800	Melene Staccioni

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: James BOUDOURIS

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

MAR 16 1993

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS (SIGNATURE). James Boudouris

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: Ames, IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	Tot. Diss. Sol.	UST CONTENTS	REMARKS
21 MW	—	1 ft	X			MW		X	3/4	1145		X				X		
21 MW	—	3-40ml	X			"		X	"	1150	X	X	X					
22 MW	—	"	X			"		X	"	1340	X	X	X					
23 BH	—	"	X			BH		X	"	1510	X	X	X					
Blanks	—	"	X			Dist. W.		X	"	1515	X	X	X					
21 MW	2	1-4oz		X		MW		X	"	1100		X		X				
22 MW	2	"		X		"		X	"	1200		X		X				
23 BH	2	"		X		BH		X	"	1350		X		X				

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jeffrey A. Harding	3/5/93	8:00 A.m.	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	3/5/93	12:50	Melene Saccian

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER: James Boudouris

PHONE: (515) 964-0304

gss GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

RECEIVED MAR 16 1993

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 92591

SAMPLERS: (SIGNATURE) B. Wade

PROJECT NAME: Sauer Sundstrand

UST ADDRESS: 2800 E 13th St Ames IA 50010

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1993	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2		UST CONTENTS	REMARKS
24 mw 3 ft	3	1/4 oz		✓		Well		/	3/23	1340		✓		✓			Hyd Oil	Waste Oil Gas Diesel
25 BH 4 ft	4	✓		✓		/		/	✓	1459		/		✓			"	" " " "
26 BH 3 ft	3	✓		✓		/		/	✓	1532		/		✓			"	" " " "
24 mw		3 vials	/			/		/	/	1627		/		/			"	" "
25 BH		✓	/			/		/	/	1708		/		/			"	" "
26 BH		✓	/			/		/	/	1720		/		/			"	" "

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Ben Priestley	3/24/93	1430	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	3/25/93	800	Melanie Stacian

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6701 • FAX 515-964-1226

RECEIVED
APR - 7 1993

APPENDIX 13

"XII(B) - OFF-SITE CONTAMINATION SOURCE SUPPORT DATA"

APPENDIX 14

"XIII - SITE RISK CLASSIFICATION JUSTIFICATION"

APPENDIX 14
XIII - SITE RISK CLASSIFICATION JUSTIFICATION

A1 NO. There are no confined spaces that might be impacted by the localized areas of contamination that were subsequently overexcavated.

A2 NO. No structures, basements, crawl spaces, utility conduits, storm or sanitary sewers, or confined spaces have been impacted by combustible gases associated with the hydrocarbons and hydraulic fluids held in underground storage tanks (USTs).

A3 NO. There are no surface water bodies within 1000 feet.

A4 NO. There is no contaminated soil in contact with a utility trench containing a PVC drinking water transmission line. All known water lines are cast iron.

A5 NO. No utility trenches are impacted. The area around 5 BH was overexcavated in 1992.

A6 NO. There is currently no known damage to any utilities, and it is unlikely to happen.

A7 NO. There are no active water wells within 1000 feet of this site. The water well at the Amoco Station was plugged in 1992.

A8 NO. Hydraulic conductivities calculated from slug test data in 19 MW and 20 MW were below 0.44 meters per day. Therefore, the ground water at this site is not protected.

A9 NO. According to the Groundwater Vulnerability Regions of Iowa map and the Story County Soil Survey, there is no known fractured limestone or karst topography in the area.

A10 NO. There are no active water wells in the area, and the ground water is not protected.

A11 NO. The ground water at this site is not protected.

A12 NO. No ground water contamination was found during this investigation.

A13 NO. No ground water contamination was found during this investigation.

A14 N/A The ground water at this site is not protected.

APPENDIX 15

"XIV(A3) - TREATMENT TECHNOLOGY EVALUATION: (HIGH RISK SITES ONLY)

APPENDIX 16

"XIV(A4) - BEST AVAILABLE TECHNOLOGY (BAT)"

(HIGH RISK SITES ONLY)

APPENDIX 17

"XIV(B2) - BEST MANAGEMENT PRACTICE (LOW RISK SITES ONLY)

APPENDIX 17

"XIV(B2) - BEST MANAGEMENT PRACTICE"

All USTs have been removed from this site.

PROPOSED ACTION PLAN

The site is classified as "Low Risk". As such, it is necessary for Sauer-Sundstrand to monitor the site to verify that the spilled material is not migrating downgradient. This monitoring program could continue for a total of twelve years.

It is Sauer-Sundstrand's policy to remain an environmentally responsible citizen. The proposed action is to clean up any spill or suspected spill rather than on-going monitoring for an extended period, provided such clean up is economically feasible and results are environmentally sound. To this end, it is proposed that the following be approved by IDNR:

1. SS-8 is the only soil sample showing analytical results greater than 100 ppm total extractable hydrocarbons (160 ppm). Boreholes BH 25 and BH 26 were added to determine the extent, if any, of the impacted soil at SS-8. Analysis of both samples was non-detect. An additional borehole or boreholes closer to SS-8 will be added to determine the presence or absence of hydrocarbons. If analytical results do not exceed 100 ppm, the site will be classified "No Risk."

2. If analytical results indicate impacted soil exists, the extent of the plume will be determined by additional boreholes and analyses. Once the plume limits are determined, the site will be overexcavated in accordance with IDNR UST procedures to remove all impacted soils. When soil samples taken in accordance with UST procedures show total hydrocarbons <100 ppm, the site will be classified "No Risk".

3. When the site is classified "No Risk", an appropriate addendum will be prepared and submitted to IDNR for approval.

APPENDIX 18

"XIV(B3) - MONITORING PLAN"
(LOW RISK SITES ONLY)

APPENDIX 18

"XIV(B3) - MONITORING PLAN"

See Appendix 17.

APPENDIX 19

FREE PRODUCT RECOVERY

MONTHLY REPORTS FROM GTI

GROUNDWATER TECHNOLOGY

Groundwater Technology, Inc.
5158 Park Avenue, Des Moines, IA 50321 USA
Tel: (515) 282-9132

October 3, 1991

Mr. George Charbonneau
Sauer-Sundstrand
2800 East 13th Street
Ames, Iowa 50010

7LTD58

#04210-0298-02

RE: Monthly Product Removal/Well Bailing (August)

Dear Mr. Charbonneau:

Please find attached the final updated compilation of liquid level data collected during the six monthly inspections of the Sauer-Sundstrand facility petroleum recovery wells. Also attached are product/water recovery forms for the most recent visit (not previously transmitted).

The separate phase hydrocarbon layer in RW-2 (west well) had essentially disappeared at the time of the August visit. This is a substantial decrease in the layer thickness since the peak thickness of 0.70 feet was measured in May.

The August site inspection and product recovery represented the final field activity covered by the current contract. If continued activity is desired by Sauer-Sundstrand, a change order must be processed.

It has been a pleasure for Groundwater Technology to provide environmental services to Sauer-Sundstrand. If you have any questions, please contact me or Jim Marek at 515-282-9132.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

David Wonder
Hydrogeologist

cc: ~~Paul Waters, IDNR~~ LUST AUG '91

ELEVATION CALCULATIONS
WELL LOCATION AND ELEVATION

Date: Various

Benchmark: N.A.

Site: Sauer Sundstrand

Reference Elevation: N.A.

Project No: 04210-0298-02

Date	Well #	TOC Elevation	DTW (feet)	Corrected DTW (feet)	DTP (feet)	Product Thickness (feet)
03/13/91	RW-1 (S)	N.A.	9.49	9.49		
03/13/91	RW-2 (W)	N.A.	6.93	6.78	6.73	0.20
04/08/91	RW-1 (S)	N.A.	9.96	9.96		
04/08/91	RW-2 (W)	N.A.	6.25	5.88	5.75	0.50
05/06/91	RW-1 (S)	N.A.	8.90	8.90		
05/06/91	RW-2 (W)	N.A.	5.16	4.64	4.46	0.70
06/13/91	RW-1 (S)	N.A.	9.71	9.71		
06/13/91	RW-2 (W)	N.A.	5.78	5.71	5.68	0.10
07/22/91	RW-1 (S)	N.A.	11.44	11.44		
07/22/91	RW-2 (W)	N.A.	7.52	7.39	7.34	0.18
08/13/91	RW-1 (S)	N.A.	11.17	11.17		
08/13/91	RW-2 (W)	N.A.	8.00	7.99	7.99	0.01

sauer.813

GROUNDWATER TECHNOLOGY

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 08/23/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa Well RW-1, South Well

VOLUME OF RECOVERED PRODUCT: 4 Gallons Water

FOR MONTH OF: August, 1991

GROUNDWATER TECHNOLOGY

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 07/22/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa Well RW-2, West Well

VOLUME OF RECOVERED PRODUCT: ½ Gallons Oil & Water

FOR MONTH OF: August, 1991

GROUNDWATER TECHNOLOGY

GROUNDWATER TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

July 31, 1991

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

#04210-0298-02

RE: Monthly Product Removal/Well Bailing (June and July)

Dear Mr. Charbonneau:

Please find attached a compilation of liquid level data collected during the last two monthly inspections of the Sauer Sundstrand facility petroleum recovery wells. Also attached are product/water recovery forms for the two most recent visits (not previously transmitted).

The thickness of the product layer in RW-2 (western well) has shown a progressive increase since March. Well RW-1 (southern well) continued to show no free product layer. Recovered product was placed in a 55-gallon drum on site, and purged water was disposed into Sauer's waste water treatment facility.

If you have any questions, please contact me or Jim Marek at 515-282-9132.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

David Wonder
Hydrogeologist

cc: Paul Waters, IDNR

dw\sauer.731

ELEVATION CALCULATIONS
WELL LOCATION AND ELEVATION

Date: Various

Site: Sauer Sundstrand

Benchmark: N.A.

Reference Elevation: N.A.

Project No: 04210-0298-02

Date	Well #	TOC Elevation	DTW (feet)	Corrected DTW (feet)	DTP (feet)	Measured Product Thickness (feet)
03/13/91	RW-1 (S)	N.A.	9.49	9.49		
03/13/91	RW-2 (W)	N.A.	6.93	6.78	6.73	0.20
04/08/91	RW-1 (S)	N.A.	9.96	9.96		
04/08/91	RW-2 (W)	N.A.	6.25	5.88	5.75	0.50
05/06/91	RW-1 (S)	N.A.	8.90	8.90		
05/06/91	RW-2 (W)	N.A.	5.16	4.64	4.46	0.70
06/13/91	RW-1 (S)	N.A.	9.71	9.71		
06/13/91	RW-2 (W)	N.A.	5.78	5.71	5.68	0.10
07/22/91	RW-1 (S)	N.A.	11.44	11.44		
07/22/91	RW-2 (W)	N.A.	7.52	7.39	7.34	0.18

sauer.528

GROUNDWATER TECHNOLOGY

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 06/13/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa - South Well

VOLUME OF RECOVERED PRODUCT: 5 Gallons Water

FOR MONTH OF: June 1991

GROUNDWATER TECHNOLOGY

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 06/13/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa - West Well

VOLUME OF RECOVERED PRODUCT: ¼ Gallon

FOR MONTH OF: June 1991

GROUNDWATER TECHNOLOGY

ELEVATION CALCULATIONS
WELL LOCATION AND ELEVATION

Date: 06/13/91

Name: Dave O'Brien

Site: Sauer Sundstrand
04210-0298-02

Benchmark: N.A.

Reference Elevation: N.A.

Well #	Corrected Elevation (TOC)	DTW	Corrected Water Elevation	DTP	Corrected Product Elevation	Product Thickness
West		5.78		5.68		
South		9.71				

GROUNDWATER TECHNOLOGY

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 07/22/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa Well # South Well

VOLUME OF RECOVERED PRODUCT: 5 Gallons Water

FOR MONTH OF: July, 1991

sauer2.725

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 07/22/91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION: Ames, Iowa Well # South Well

VOLUME OF RECOVERED PRODUCT: ½ Gallons Oil & Water

FOR MONTH OF: July, 1991

sauer3.725

ELEVATION CALCULATIONS
WELL GAUGE

Date: 07/22/91

Name: Dave O'Brien/
Troy Stuedemann

Site: Sauer Sundstrand

Benchmark:

Reference Elevation:

Well #	Corrected Elevation (TOC)	DTW	Corrected Elevation (TOC)	DTP	Corrected DTP Elevation (TOC)	Thickness
South		11.44				
West		7.52		7.34		

sauer.725

GROUNDWATER TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

March 15, 1991

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells (March)

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on March 13, 1991. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of 0.20 feet (by inspection with an interface probe). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. We will continue the monthly operations for five more months (April through August, 1991) or until activities begin at the site, at your request.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI
Jim Horn - IDNR
Paul Water - IDNR

jm\char.314

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 3-13-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: None

VOLUME OF WATER REMOVED: 5 gallons

FOR MONTH OF: March, 1991

WELL #: RW-1 (South)

GROUNDWATER TECHNOLOGY, INC.

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 3-13-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 1 pint

VOLUME OF WATER REMOVED: 1 gallons

FOR MONTH OF: March, 1991

WELL #: RW-2 (West)

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER
TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

March 14, 1991

Mr. Paul Waters
Iowa Department of Natural Resources
Wallace State Office Building
900 E. Grand Avenue
Des Moines, Iowa 50319-0034

RE: Monthly Fluid Recovery Reports, Sauer-Sundstrand

Dear Mr. Waters:

At the request of Sauer-Sundstrand (Sauer), enclosed are copies of the monthly product recovery forms that have been recorded since September of 1990. Mr. Jim Horn of the IDNR has been copied with the correspondence and forms. I hope this information fulfills your request to Sauer.

Sauer has contracted Groundwater Technology to continue monthly manual removal of fluids from the two wells of concern. We will include you on the distribution list.

Should you have any questions regarding these matters please contact me at 515/282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: George Charbonneau - Sauer
Jim Horn - IDNR
Deanne Geile - GTI

jm\waters.314

GROUNDWATER TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

September 17, 1990

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on September 14, 1990. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of approximately one inch (by visual inspection with a transparent bailer). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore 10 gallons of water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Groundwater Technology will visit the site during the middle of each subsequent month for five more months as contracted.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely

GROUNDWATER TECHNOLOGY, INC.,

James Marek

James Marek
Hydrogeologist
Territory Manager

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 9-14-90

RW#1

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 0 gallons product / 10 gallons water

FOR MONTH OF: September 14, 1990

GROUNDWATER TECHNOLOGY, INC.

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 9-14-90

RW#2

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 1/2 gallon

FOR MONTH OF: September 14, 1990

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY, INC.
5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

March 13, 1991

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells (February)

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on February 1, 1991. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of 0.20 feet (by inspection with and interface probe). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Per your request on March 12, 1991, we will continue the monthly operations for six more months (March through August, 1991) or until activities begin at the site.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI
Jim Horn - IDNR
Paul Water - IDNR

jm\charb.314

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 2-1-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: None

VOLUME OF WATER REMOVED: 2 gallons

FOR MONTH OF: February, 1991

WELL #: RW-1 (South)

GROUNDWATER TECHNOLOGY, INC.

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 2-1-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 1 gallon

VOLUME OF WATER REMOVED: 3 gallons

FOR MONTH OF: February, 1991

WELL #: RW-2 (West)

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

February 14, 1991

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on January 7, 1991. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of 0.33 feet (by inspection with an interface probe). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore 5 gallons of water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Groundwater Technology will visit the site during the middle of each subsequent month for one more month as contracted. Final month will be for February 1991.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI
Jim Horn - IDNR

jm\charb.107

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 1-7-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-01

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: MW-1 (south side)

VOLUME OF RECOVERED PRODUCT: 0 gallon

VOLUME OF RECOVERED WATER: 5 gallons

FOR WEEK OF: 1-7-91 to 1-11-91

GROUNDWATER TECHNOLOGY, INC.

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 1-7-91

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-01

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: MW-2 (west side)

VOLUME OF RECOVERED PRODUCT: ½ gallon

VOLUME OF RECOVERED WATER: ½ gallon

FOR WEEK OF: 1-7-91 to 1-11-91

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER
TECHNOLOGY, INC.

5158 Park Avenue, Des Moines. IA 50321 U.S.A. (515) 282-9132

January 7, 1991

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on December 19, 1990. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of approximately one inch (by visual inspection with a transparent bailer). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore 3.5 gallons of water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Groundwater Technology will visit the site during the middle of each subsequent month for two more months as contracted.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI
Jim Horn - IDNR

jm\charb.107

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 12-19-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-01

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 3-1/2 Gallon water bailed out MW #1 (South well)

FOR MONTH OF: December 1990

GROUNDWATER TECHNOLOGY, INC.

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 12-19-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-01

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 1 Gallon Mixed Water & Product Mostly Water

FOR MONTH OF: December 1990

NOTE: Tracks in the snow looks like someone was here within the last day or so.

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY, INC.
5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

November 29, 1990

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on November 12, 1990. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of approximately two inches (by visual inspection with a transparent bailer). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore 5 gallons of water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Groundwater Technology will visit the site during the middle of each subsequent month for three more months as contracted.

I forwarded the September and October monthly reports to Mr. Jim Horn of the Iowa Department of Natural Resources per your request.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI
Jim Horn - IDNR

jm\char917.90

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 11-12-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: RW-1

VOLUME OF RECOVERED PRODUCT: None

VOLUME OF RECOVERED WATER: Approximately 5 gallons

FOR WEEK OF: 11-18-90

GROUNDWATER TECHNOLOGY, INC.

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 11-12-90

D. O'Brien

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298-02

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: RW-2

VOLUME OF RECOVERED PRODUCT: 1 gallon

VOLUME OF RECOVERED WATER: none

FOR WEEK OF: 11-18-90

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY, INC.

5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

October 28, 1990

Mr. George Charbonneau
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Monthly Product Removal/Well Bailing of Recovery Wells

Dear Mr. Charbonneau:

Enclosed are the monthly product/bailing volumes recovered manually at the Sauer facility Ames, Iowa. Groundwater Technology traveled to the site and performed the work on October 15, 1990. Separate phase hydrocarbons were exhibited in recovery well RW-2 (western well), with a thickness of approximately three inches (by visual inspection with a transparent bailer). Recovery well RW-1 (southern well) did not exhibit separate phase hydrocarbons and therefore 5 gallons of water was purged from the well.

The removed product was containerized on site in a 55 gallon drum. The purge water was disposed into Sauer's waste water treatment facility. Groundwater Technology will visit the site during the middle of each subsequent month for four more months as contracted.

If you should have questions concerning these matters, please contact me at 515-282-9132.

Sincerely
GROUNDWATER TECHNOLOGY, INC.,

James Marek
Hydrogeologist
Territory Manager

cc: Deanne Geile - GTI

jm\char1028.90

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 10-15-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 1 gallon oil and 1 gallon water (RW #2 West)

FOR MONTH OF: October

GROUNDWATER TECHNOLOGY, INC.

MONTHLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 10-15-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 4210-0298-02

LOCATION OF PROJECT: Ames, Iowa

VOLUME OF RECOVERED PRODUCT: 5 gallons water bailed out of RW #1 (South)

FOR MONTH OF: October, 1990

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY, INC.
5158 Park Avenue, Des Moines, IA 50321 U.S.A. (515) 282-9132

July 23, 1990

Iowa Department of Natural Resources
Emergency Response Section
902 East 9th
Des Moines, Iowa 50309
Attn: Mr. Paul Waters

RE: Separate Phase Hydrocarbon Removal at a Sauer-Sundstrand Facility, Ames, Iowa - LUST #7LTD58

Dear Mr. Waters:

This correspondence is to update the Iowa Department of Natural Resources (IDNR) on the progress of the separate phase hydrocarbon removal initiated by Groundwater Technology at the above referenced facility.

On November 10, 1989, Groundwater Technology initiated a limited subsurface investigation at the Sauer-Sundstrand facility. This limited investigation included the advancement of one soil boring in the vicinity of a recently removed underground storage tank (tank #3). The boring was advanced into the water table to a total depth of 10 feet. The attached site map presents the former location of tank #3, the soil boring location and other pertinent locations.

During the performance of the soil boring (SB-1) separate phase hydrocarbons were detected on the top of the water table located at approximately nine (9) feet below grade.

Subsequently, on June 4, 1990, Groundwater Technology installed a four (4) inch recovery well within the backfill of the former tank number 3 excavation. The purpose of the recovery well was to facilitate the removal of separate phase hydrocarbons from the subsurface in the vicinity of tank number 3. The well is installed to a total depth of 10.11 feet (the former tank concrete anchor pad was encountered at this depth). The well was completed with nine (9) feet of .010 inch machine slotted, four (4) inch diameter, schedule 40 PVC well screen, and four (4) feet of schedule 40 PVC riser for above ground completion. The well annulus was completed with a graded sand/gravel pack to one (1) foot below grade, six (6) inches of bentonite, and six (6) inches of neat cement grout to grade. Separate phase hydrocarbons were not encountered during the installation of the recovery well.

Subsequent to recovery well installation, and once a week for the following six (6) weeks, 50 gallons of groundwater was manually removed from the recovery well via a 3.5 inch PVC bailer. The bail water was containerized and disposed of through Sauer-Sundstrand's on-site waste water treatment facility. Free floating separate phase hydrocarbons were not encountered on the water table surface during any of the subsequent six (6) weekly site visits. However, the bailed groundwater was observed to exhibit a sheen on each visit. Included with this document are the seven (7) weekly product volume recovery reports beginning with the week of June 4, 1990 and ending with the week of July 16, 1990.

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 7-17-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0298

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: South well

VOLUME OF RECOVERED PRODUCT: 0 gallon

VOLUME OF RECOVERED WATER: 50 gallon

FOR WEEK OF: 7-16-90 to 7-20-90

GROUNDWATER TECHNOLOGY, INC.

WEEKLY PRODUCT VOLUME RECOVERY FORM

REPORT DATE: 6-4-90

PROJECT NAME: Sauer Sundstrand

PROJECT NUMBER: 04210-0291

LOCATION OF PROJECT: Ames, Iowa

WELL NUMBER: South Well

VOLUME OF RECOVERED PRODUCT: 0

VOLUME OF RECOVERED WATER: 50 gallons

FOR WEEK OF: 6-4-90

GROUNDWATER TECHNOLOGY, INC.

DISCLAIMER

The author of this report, GROUNDWATER SERVICE & SUPPLY, INC. - GSS, of Ankeny, County of Polk, State of Iowa, hereby gives notice that any statement or opinion contained in the following report prepared by GSS shall not be construed to create any warranty or representation that the real property on which the investigation was conducted is free of pollution or complies with all applicable regulatory and statutory requirements; or that the property is fit for any particular purpose. Statement, descriptions or opinions are informational only and are not made or given as a warranty of the property in any way. Any purchaser of the property shall be solely responsible for determining the adequacy of the property for any and all uses for which the purchaser shall use the property. Any purchaser of the property which is the subject of this report should enter into any purchase on sole reliance of his own judgement and upon his own personal investigation of the property he is to receive, and not in reliance upon any representation by GSS regarding such property, the character, quality or value thereof.

APPENDIX C

POTENTIAL 140 SOLVENT RELEASE INVESTIGATION REPORT AND IDNR CORRESPONDENCE

gss GROUNDWATER SERVICE & SUPPLY, INC.

POTENTIAL 140 SOLVENT RELEASE INVESTIGATION FOR SAUER-SUNDSTRAND COMPANY 2800 EAST 13TH STREET AMES, IOWA

PROJECT NO. 93655

JUNE 1994

PREPARED FOR:
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA 50010

PREPARED BY:
GROUNDWATER SERVICE & SUPPLY, INC.
2701 SE CONVENIENCE BOULEVARD
SUITE 6
ANKENY, IOWA 50021

gss GROUNDWATER SERVICE & SUPPLY, INC.

June 8, 1994

Project No. 93655

Sauer-Sundstrand Company
2800 East 13th Street
Ames, Iowa 50010
Attn: Mr. George Charbonneau

RE: Potential 140 Solvent Release Investigation - Sauer-Sundstrand Company - Ames, Iowa.

Dear Mr. Charbonneau:

Enclosed please find six (6) copies of the Potential 140 Solvent Release Investigation performed on your property located in Ames, Iowa. The report includes site maps, well and soil gas logs, laboratory results and chain of custody documentation. If you have any questions please contact me at (515) 964-0304.

Yours truly,
GROUNDWATER SERVICE & SUPPLY, INC.

Brad Wade
APP. B.

encl.
BW:els

2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

OBJECTIVE

To drill 6 - 9 boreholes (BHs) to determine the presence or absence of impacted soil and/or ground water that may be related to use or storage of 140 solvent.

PREVIOUS WORK

In September 1993, Harding Lawson Associates as part of their RCRA Facility Investigation, drilled two borings to investigate a potential release of 140 solvent. Their borings identified as SWMU3-101 and SWMU3-102 were advanced to 16 feet using a split spoon sampler. Soil samples only, were collected from each boring and were shared with Groundwater Service & Supply, Inc. (GSS) for analysis.

GSS samples were analyzed for total organic hydrocarbons at National Environmental Testing, Inc. (NET) laboratory. Detectable organic hydrocarbons were noted in both borings between 5 and 10 feet with analytical results indicating more concentrated levels in SWMU3-101 at 5.5 feet. Laboratory results are tabulated below:

LABORATORY RESULTS - SOIL

LOCATION	DEPTH (FT)	TOTAL EXTRACTABLE HYDROCARBONS	TOTAL HYDROCARBONS
SWMU3-101	5.5	17	200
SWMU3-101	15.0	<10	<10
SWMU3-102	7.0	14	28
SWMU3-102	15.0	<10	<10

WORK PERFORMED

On May 19, 1994 GSS advanced 7 borings from 6 to 15 feet deep. To define the lateral and vertical extent of any potential release, borings were placed outside the area previously overexcavated. Actual boring placement was coordinated with utility maps provided by Sauer-Sundstrand and previous mapping done by GSS.

Borings were drilled with hollow stem augers and a continuous core barrel which retrieved cores over the full length of the boring. Each foot of core was screened for soil gas with a Photoionization Detector (PID) to help identify if a release had occurred. Soil core sections with the highest PID readings were sampled for further analysis at NET laboratory. Each soil and water sample were chilled in ice immediately after collection and during shipment.

SOIL

The soil is characterized by 1 to 7 feet of coarse sand with some gravel, which overlies a slightly sandy clay that becomes more firm with less sand as depth increases. Boring 3 BH-140 encountered auger refusal at 6 feet, likely due to contact with the clay storm drain, which runs in an east-west direction by this boring. To confirm zero PID readings, additional samples were collected for laboratory confirmation. The laboratory results are as follows:

LABORATORY RESULTS - SOIL (PPM)

LOCATION	DEPTH (FT.)	TOTAL EXTRACTABLE HYDROCARBONS
1 BH-140	7.0	6100
1 BH-140	10.0	<10
2 BH-140	7.0	<10
2 BH-140	14.5	<10
3 BH-140	6.0	2700
4 BH-140	5.0	230
4 BH-140	10.0	<10
5 BH-140	5.5	<10
5 BH-140	10.0	<10
6 BH-140	5.5	<10
7 BH-140	5.0	<10
7 BH-140	11.5	<10

WATER

A shallow ground water aquifer was encountered in all borings at 6.5 - 9.9 feet except 3 BH-140 which remained dry. The water samples were

collected and sent to NET for analysis. The results are as follows:

LABORATORY RESULTS - WATER (PPM)

LOCATION	TOTAL EXTRACTABLE HYDROCARBONS
1 BH-140	7.8
2 BH-140	<2.0
4 BH-140	<2.0
5 BH-140	<2.0
6 BH-140	<2.0
7 BH-140	<2.0

CONCLUSIONS

Based on analytical results of soil and water, a release of 140 solvent did occur. The State of Iowa has established a corrective action limit of 100 ppm for total organic hydrocarbons in soil and no guidelines for total organic hydrocarbons in ground water.

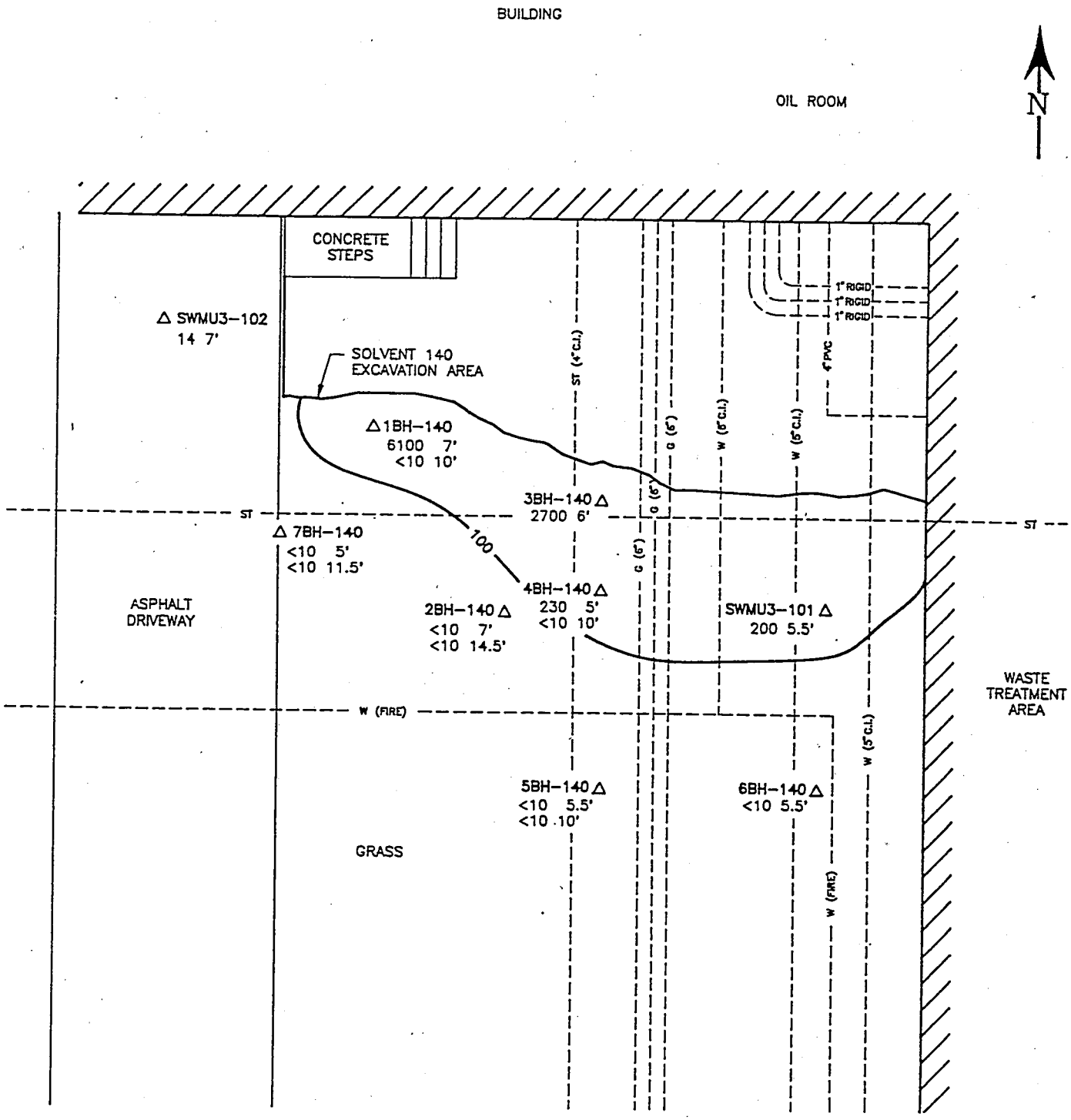
1. State enforcement of the 100 ppm corrective action limit in soil depends on many factors. Factors that are generally considered in evaluating the impact include area hydrogeological characteristics; separation distance between the impacted zone and protected ground water sources; soil permeability and transmissivity; overburden thickness; constituent concentrations and persistence; chemical characteristics and migration potential of the released substance.

As earlier stated, there is no guideline for total organic hydrocarbons in ground water. In general, the State of Iowa would request a broader scan of volatile organic compounds such as EPA test method 8240. Then, a review of individual analytes would be compared to published EPA drinking water standards. If some of the analytes were detected above the standard, then possible corrective action would be recommended.

RECOMMENDATIONS

The impacted soil remaining beyond the original overexcavation limit is between 70 to 90 cubic yards. Overexcavating the soil combined with on-site remediation through biological stimulation would lower the total organic hydrocarbon content. This has already been successful on other soils treated at this facility.

Additional analytical testing may be required to determine if corrective action is appropriate for ground water.



LEGEND

△	BOREHOLE
--W--	WATER LINE
--ST--	STORM SEWER LINE
--G--	GAS LINE

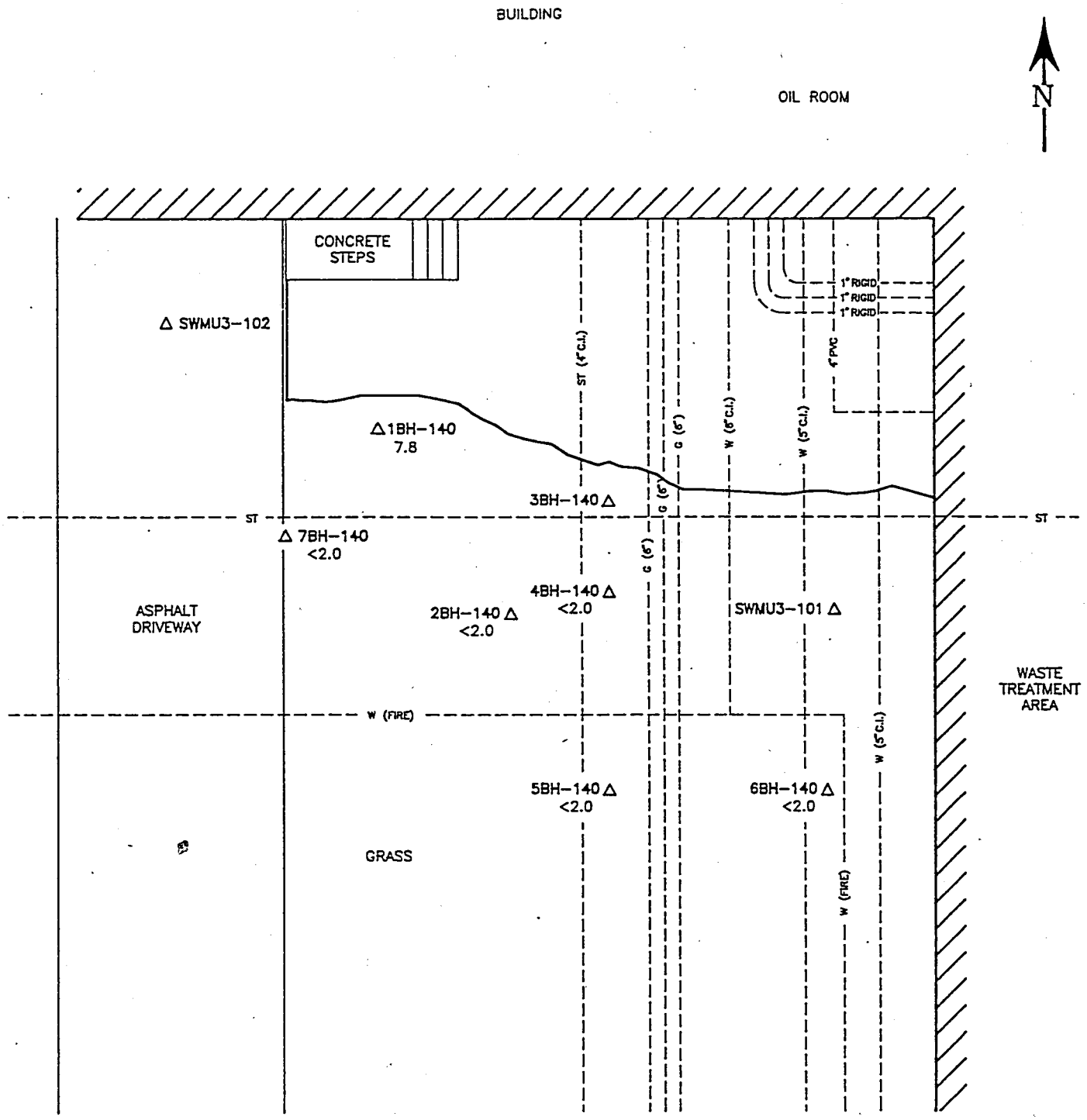
SAUER-SUNDSTRAND COMPANY

SOLVENT 140 EXCAVATION SOIL ANALYTICAL RESULTS

LOCATION	AMES, IA		PROJ. NO. 93655
DATE	06/94	DWN. BY BP	CHKD. BY BW
SCALE	1"=10'	NOTES	

GSS GROUNDWATER SERVICE & SUPPLY, INC.

FIG. 1



LEGEND

Δ	BOREHOLE
--W--	WATER LINE
--ST--	STORM SEWER LINE
--G--	GAS LINE

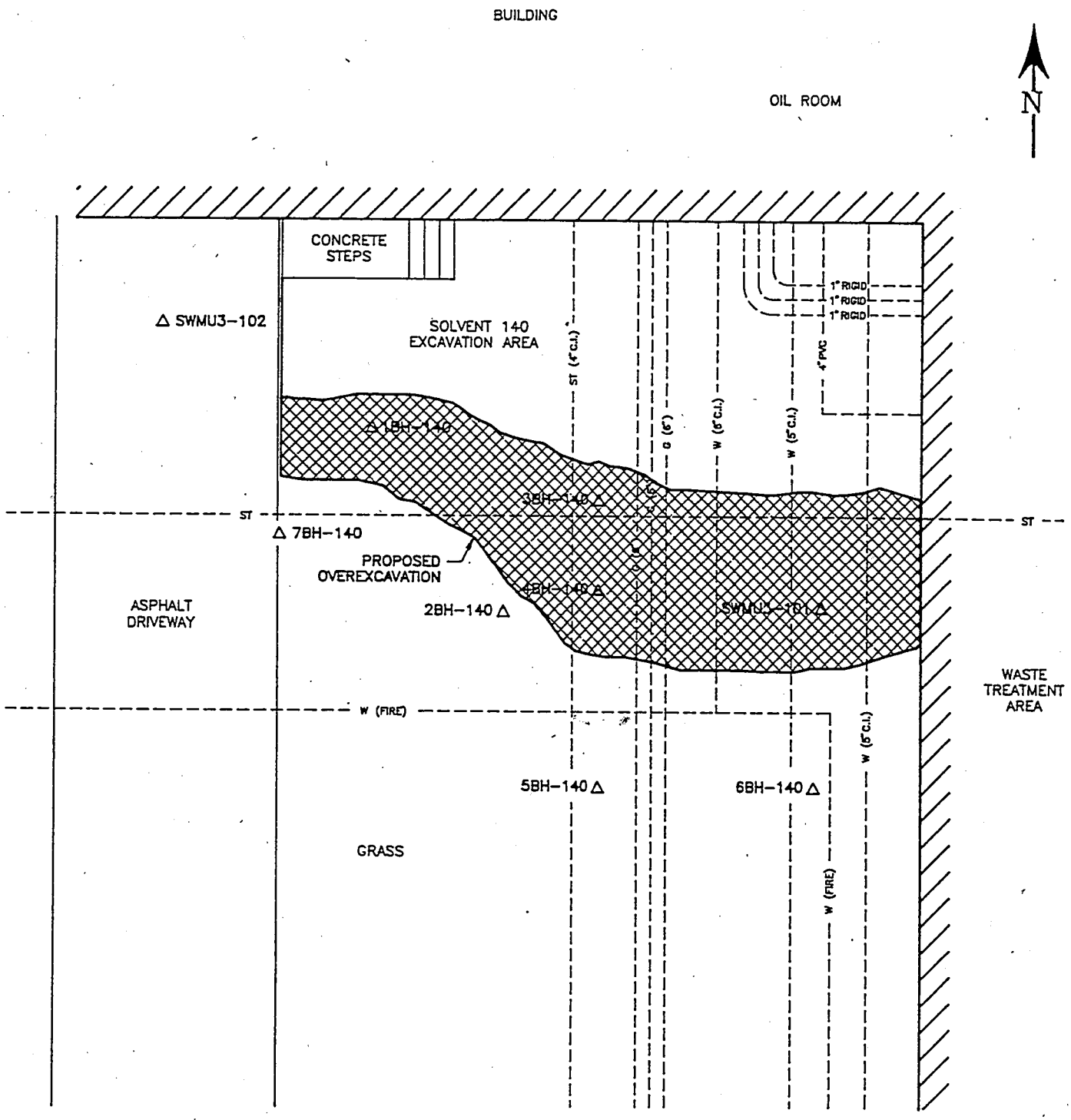
SAUER-SUNDSTRAND COMPANY

SOLVENT 140 EXCAVATION/ GROUND WATER ANALYTICAL RESULTS

LOCATION	AMES, IA	PROJ. NO.	93655
DATE	06/94	DWN. BY BP	CHKD. BY BW
SCALE	1"=10'	NOTES	

gss GROUNDWATER SERVICE & SUPPLY, INC.

FIG. 2



LEGEND

△	BOREHOLE
--W--	WATER LINE
--ST--	STORM SEWER LINE
--G--	GAS LINE

SAUER-SUNDSTRAND COMPANY			
SOLVENT 140 PROPOSED OVEREXCAVATION AREA			
LOCATION AMES, IA		PROJ. NO. 93655	
DATE 06/94	DWN. BY BP	CHKD. BY BW	
SCALE 1"=10'	NOTES		
gss GROUNDWATER SERVICE & SUPPLY, INC.			FIG. 3

APPENDIX

WELL & SOIL GAS LOGS

LABORATORY RESULTS

CHAIN OF CUSTODY DOCUMENTATION

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # SWMV3-102	Facility Name Sauer-Sundstrand (93655)	Facility Address Ames, Iowa	
Boring Depth (Feet) x Diameter (Inches) 16.0 x 6.5"		Drilling Method Split Spoon	
Well Contractor Registration # Layne-Western1904593		Logged by B. Priestley	
Date & Time Start 9/29/93 0945	Date & Time End 9/29/93 1105	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-6.0") Asphalt. (6.0"-6.0') Fill, road bed material loose and granular, rocky.
					0	
					0	
5					0	
					0	(6.0-9.0') Till, gravel, tan turning gray in color, becoming sandy and moist at 7.0'.
			7.0'	SS	346	
					863	
					120	(9.0-12.0') Clay-till, tan with rust streakes, moist with scattered gravels, silty.
10					163	
					0	
					3	(12.0-16.0') Silt-clay, light tan in color, scattered pebbles, sandy at 14.0'.
					0	
					0	
15			15.0'	SS	0	
					0	
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
	Date :						
	Level :						
	Time :						

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # SWMV3-101	Facility Name Sauer-Sundstrand (93655)	Facility Address Ames, Iowa
Boring Depth (Feet) x Diameter (Inches) 16.0 x 6.5"		Drilling Method Split Spoon
Well Contractor Registration # Layne-Western1904593		Logged by B. Priestley
Date & Time Start 9/29/93 1115	Date & Time End 9/29/93 1220	Ground Surface Elevation (ASL) / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-4.5') Grass/topsoil, poor recovery.
5			5.5'	SS	37	(4.5-16.0') Clay, tan, moist 16.0' with gray streaking, very silty.
					185	
					0	
					0	
					0	
10					0	
					0	
					0	
					0	
					0	
15			15.0'	SS	0	
					0	
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS						
Date :						
Level :						
Time :						

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 1BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA	
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5"		Drilling Method Hollow Stem Auger	
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade	
Date & Time Start 5/19/94 0810	Date & Time End 5/19/94 0845	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-1.0') 3/8 minus crushed limestone.
					0	(1.0-7.0') Course sand and gravel, pebbles to 1/2 inch, SLIGHT ODOR.
					0	
					0	
					0	
5					9	
					0	
			7.0'	SS	37	(7.0-12.0') Clay, brown, sandy, moist, semi-firm.
					48	
					325	
10			10.0'	SS	240	
					0	
					0	(12.0-15.0') CL - Clay, hard, light brown, less sandy than above.
					5	
					4	
15					0	
						NOTE: Located: 10'S of the SW corner of the steps and than 6'E.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
	Date :	05/19/94	05/19/94				
	Level :	6.91'	6.53'				
	Time :	0950	1230				

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 2BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA	
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5'		Drilling Method Hollow Stem Auger	
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade	
Date & Time Start 5/19/94 0850	Date & Time End 5/19/94 0925	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0					0	(0.0-0.5') Topsoil. (0.5-7.0') Coarse gravel and sand.
					0	
					0	
					0	
5					0	
					0	
			7.0'	SS	0	(7.0-12.0') CL - Clay, light brown, some sand, moist medium firm.
					0	
					0	
10					0	
					0	
					0	(12.0-15.0') CL - Clay, hard light brown, some coarse grained sand.
					0	
					0	
15			14.5'	SS	0	
					0	
						NOTE: Located: 15'E of the SW corner of the steps than 26'S of the building wall.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
Date :	05/19/94	05/19/94					
Level :	7.85'	7.41'					
Time :	1015	1238					

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 3BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA
Boring Depth (Feet) x Diameter (Inches) 6.0 x 6.5"		Drilling Method Hollow Stem Auger
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade

Date & Time Start 5/19/94 0935	Date & Time End 5/19/94 0945	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-0.4') 3/8 minus crushed limestone.
					0	(0.4-6.0') Sand and gravel STRONG ODOR.
					0	
					0	
					0	
5					205	
			6.0'	SS	642	(6.0') Auger refusal. Saw red clay tile at base of boring looks ok but scratched. Possible storm sewer.
10						
15						NOTE: Located: 10'E of the SE corner of the steps and 20'S of building wall.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
	Date :	05/19/94					
	Level :	None					
	Time :	1244					

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 4BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5"		Drilling Method Hollow Stem Auger
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade
Date & Time Start 5/19/94 0950	Date & Time End 5/19/94 1020	Ground Surface Elevation (ASL) / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-0.5') Topsoil. (0.5-7.0') Sand and gravel SLIGHT ODOR at 5.0'.
					0	
					0	
					0	
					0	
5			5.0'	SS	321	
						(7.0-10.0') No recovery. CL - Brown, moist, some sand.
10			10.0'	SS	0	(10.0-15.0') CL - Clay, moist brown, some sand.
					0	
					0	
					0	
					0	
15					0	
						NOTE: Located: 6'S of 3BH-140 straight in line. Found 1 1/4 to 1 1/2 pebble in core tube in 5-10' section. I think it blocked core recovery.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
Date :	05/19/94	05/19/94					
Level :	10.53'	7.77'					
Time :	1037	1245					

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 5BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA	
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5"		Drilling Method Hollow Stem Auger	
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade	
Date & Time Start 5/19/94 1025	Date & Time End 5/19/94 1051	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0					0	(0.0-0.5') Topsoil. (0.5-4.5') Sand and gravel coarse.
					0	
					0	
					0	
5					0	(4.5-5.0') CL - Brown, hard with large pebble at 5.0'.
			5.5'	SS	0	(5.0-6.5') Coarse sand.
					0	
					0	(6.5-15.0') CL - Clay, brown some sand, moist, soft.
					0	
					0	
10			10.0'	SS	0	
					0	
					0	
					0	
15					0	
					0	NOTE: Located: in line with 3BH-140 and 4BH-140 and 38'S from building wall.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
Date :	05/19/94	05/19/94					
Level :	9.07'	7.71'					
Time :	1123	1254					

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 6BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5"		Drilling Method Hollow Stem Auger
Well Contractor Registration # Rewerts/023601		Logged by B. Wade
Date & Time Start 5/19/94 1125	Date & Time End 5/19/94 1150	Ground Surface Elevation (ASL) / Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-0.5') Topsoil. (0.5-4.0') CL - Clay grayish brown, firm, dry, some pebbles up to 1 1/4" in size.
					0	
					0	
					0	
					0	(4.0-8.0') As above more brown.
5					0	
			5.5'	SS	0	
					0	
					0	
					0	(8.0-15.0') CL - Clay brown/sandy, soft to 12', from 12-15' clay has less sand and is hard.
					0	
10					0	
					0	
					0	
					0	
					0	
15					0	
						NOTE: Start in grass. Located: 38'S of building wall and 7'W of other building wall that sits east.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
	Date :	05/19/94	05/19/94				
	Level :	9.65'	8.72'				
	Time :	1230	1302				

SOIL BORING LOG & MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well # 7BH-140	Facility Name Sauer-Sundstrand (93655)	Facility Address 2800 13th Street, Ames, IA	
Boring Depth (Feet) x Diameter (Inches) 15.0 x 6.5"		Drilling Method Hollow Stem Auger	
Well Contractor Registration # Rewerts/0236-01		Logged by B. Wade	
Date & Time Start 5/19/94 1205	Date & Time End 5/19/94 1225	Ground Surface Elevation (ASL)	Lust Number

Depth in Feet	Well Construction Details	Blow Count If Applicable	Sample No.	Sample Type *	PID/FID Reading	Rock Formations, Soil, Color and Classifications, Observations (moisture, etc.)
0						(0.0-1.0') 3/8 minus crushed limestone.
					0	(1.0-7.0') Sand and gravel coarse.
					0	
					0	
					0	
5			5.0'		0	
					0	
					0	(7.0-10.0') CL - Clay, brown with gray streaks, firm.
					0	
					0	
10					0	(10.0-15.0') CL - Clay, brown soft to 13' than hard, some sand in upper 3'.
					0	
			11.5'	SS	0	
					0	
					0	
					0	
15					0	
						NOTE: Located: 17'S of the SW corner of the steps right on edge of asphalt.
20						

*SS (split spoon) HS (hollow stem auger)

OBSERVATIONS WATER LEVELS							
	Date :	05/19/94					
	Level :	9.91'					
	Time :	1308					

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED OCT 11 1993

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

10/08/1993

NET Job Number: 93.07788

NET Sample Number: 225757

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - SAUER SUNDSTRAND/AMES, IOWA

Date Taken: 09/29/1993

Date Received: 10/01/1993

Sample ID: SWMU3-101 5.5' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	10/05/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	17	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Mineral Spirits	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Motor Oil	17	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	1.3	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	19	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	200	ug/g	d	smh	10/05/1993	S-8015/IA-OA1	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED OCT 11 1993

ANALYTICAL REPORT

10/08/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 93.07788

NET Sample Number: 225758

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - SAUER SUNDSTRAND/AMES, IOWA

Date Taken: 09/29/1993

Date Received: 10/01/1993

Sample ID: SWMU3-101 15' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	10/05/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Mineral Spirits	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10	ug/g		smh	10/05/1993	S-8015/IA-OA1	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
OCT 11 1993

ANALYTICAL REPORT

10/08/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 93.07788

NET Sample Number: 225759

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - SAUER SUNDSTRAND/AMES, IOWA

Date Taken: 09/29/1993

Date Received: 10/01/1993

Sample ID: SWMU3-102 7' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	10/05/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	14	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Mineral Spirits	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Motor Oil	14	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	1.4	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	28	ug/g	d	smh	10/05/1993	S-8015/IA-OA1	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED OCT 11 1993

ANALYTICAL REPORT

10/08/1993

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 93.07788

NET Sample Number: 225760

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - SAUER SUNDSTRAND/AMES, IOWA

Date Taken: 09/29/1993

Date Received: 10/01/1993

Sample ID: SWMU3-102 15' Sauer Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	10/05/1993	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									Soil
Total Extractable Hydrocarbons	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Mineral Spirits	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		ake	10/07/1993	IA-OA2	10	ug/g	Soil
VOLATILES - BTEX (NONAQUEOUS)									Soil
Benzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Ethylbenzene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Toluene	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Xylenes, Total	<0.5	ug/g		smh	10/05/1993	S-8015/IA-OA1	0.5	ug/g	Soil
Total Hydrocarbons	<10	ug/g		smh	10/05/1993	S-8015/IA-OA1	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 93655

SAMPLERS: (SIGNATURE) Bill Kunetty

PROJECT NAME: SAUER SUNDSTRAND

UST ADDRESS: AMES, IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	OA-1 & OA-2 FOR STODDARD SOLVENT	UST CONTENTS	REMARKS
SWMU3-101	5.5'	1-4 oz.		X		borehole		X	9/29/93	1140		X				X		
SWMU3-101	15.'	"		X		"		X	"	1210		X				X		
SWMU3-102	7.'	"		X		"		X	"	1015		X				X		
SWMU3-102	15.'	"		X		"		X	"	1055		X				X		

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Bill Kunetty	9/29/93	2:00 PM	Jeff Hardy
Jeff Hardy	9/30/93	1:15P	
	10/01/93	800	Melanie Saccione

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

RECEIVED OCT 1993

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250685

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #1 BH-140 7' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	6100	ug/g		ccb	05/24/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250686

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #1 BH-140 10' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250687

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #2 BH-140 7' Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250688

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #2 BH-140 14.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250689

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #3 BH-140 6' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	05/24/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	2,700	ug/g		djl	05/25/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250690

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #4 BH-140 5' Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	230	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250691

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #4 BH-140 10' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	05/24/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/24/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250692

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #5 BH-140 5.5' Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	05/24/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/24/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250693

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #5 BH-140 10' Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250694

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #6 BH-140 5.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/24/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250695

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #7 BH-140 5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			smh	05/23/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/23/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET NATIONAL ENVIRONMENTAL TESTING, INC.®

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250696

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #7 BH-140 11.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			kak	05/24/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		ccb	05/24/1994	IA-OA2	10	ug/g	Soil
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250697

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #1 BH-140 Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2			Water
EXTRACTABLE HYDROCARBONS-WATER									
Total Extractable Hydrocarbons	7.8	mg/L		djl	05/25/1994	IA-OA2	2.0	mg/L	Water
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250698

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #2 BH-140 Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2			Water
EXTRACTABLE HYDROCARBONS-WATER									
Total Extractable Hydrocarbons	<2.0	mg/L		djl	05/25/1994	IA-OA2	2.0	mg/L	Water
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250699

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #4 BH-140 Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2			Water
EXTRACTABLE HYDROCARBONS-WATER									
Total Extractable Hydrocarbons	<2.0	mg/L		djl	05/25/1994	IA-OA2	2.0	mg/L	Water
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250700

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #5 BH-140 Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit	Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2		Water
EXTRACTABLE HYDROCARBONS-WATER								
Total Extractable Hydrocarbons	<2.0	mg/L		djl	05/25/1994	IA-OA2	2.0 mg/L	Water
Quantified as D-140 solvent								

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED MAY 27 1994

ANALYTICAL REPORT

05/26/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

NET Job Number: 94.03993

NET Sample Number: 250701

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Date Received: 05/21/1994

Sample ID: #6 BH-140 Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2			Water
EXTRACTABLE HYDROCARBONS-WATER									
Total Extractable Hydrocarbons	<2.0	mg/L		djl	05/25/1994	IA-OA2	2.0	mg/L	Water

Quantified as D-140 solvent

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

RECEIVED
MAY 27 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(800)373-6761

05/26/1994

NET Job Number: 94.03993

NET Sample Number: 250702

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IA

Date Taken: 05/19/1994

Sample ID: #7 BH-140 Sauer-Sundstrand

Date Received: 05/21/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep	complete			kak	05/25/1994	IOWA-OA2			Water
EXTRACTABLE HYDROCARBONS-WATER									
Total Extractable Hydrocarbons	<2.0	mg/L		djl	05/25/1994	IA-OA2	2.0	mg/L	Water
Quantified as D-140 solvent									

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

CHAIN–OF–CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 1 of 2

PROJECT NO. 93655

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: Ames IA

SAMPLERS: (SIGNATURE) B Wade

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1994	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	Mineral Spirits Solvent 140	UST CONTENTS	REMARKS
1BH-140	7	1		X		Well		X	5/19	0830		X				X		Solvent 140
1BH-140	10	1		X		X		X	X	0835		X				X		
2BH-140	7	1		X		X		X	X	0900		X				X		
2BH-140	14½	1		X		X		X	X	0915		X				X		
3BH-140	6	1		X		X		X	X	0947		X				X		
4BH-140	5	1		X		X		X	X	1000		X				X		
4BH-140	10	1		X		X		X	X	1010		X				X		
5BH-140	5½	1		X		X		X	X	1037		X				X		
5BH-140	10	1		X		X		X	X	1039		X				X		
6BH-140	5½	1		X		X		X	X	1245		X				X		
7BH-140	5	1		X		X		X	X	1210		X				X		
7BH-140	11½	1		X		X		X	X	1211		X				X		

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN–OF–CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	5/20/94	3:15 pm	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	5/21/94	800	NET
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	5/23/94	800	Melene Saccani

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964–0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-5761 • FAX 515-964-1226

RECEIVED 2 7 1994

Page 2 of 2

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 93655

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: Ame IA

LAB: NET

SAMPLERS: (SIGNATURE) B Wade

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE '94	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	Mineral Spirits Solvent 140	UST CONTENTS	REMARKS
1BH-140		1Qt	X			Well		X	5/19	1236		X				X		Solvent 140
2BH-140		"	X			X		X	X	1242		X				X		
4BH-140		"	X			X		X	X	1250		X				X		
5BH-140		"	X			X		X	X	1301		X				X		
6BH-140		"	X			X		X	X	1307		X				X		
7BH-140		"	X			X		X	X	1313		X				X		

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	8/10/94	5:15 PM	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	5/21/94	800	NET
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	5/23/94	800	Melanie Sorensen

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • FAX 515-964-1226

RECEIVED
MAY 27 1994

DISCLAIMER

The author of this report, GROUNDWATER SERVICE & SUPPLY, INC. - GSS, of Ankeny, County of Polk, State of Iowa, hereby gives notice that any statement or opinion contained in the following report prepared by GSS shall not be construed to create any warranty or representation that the real property on which the investigation was conducted is free of pollution or complies with all applicable regulatory and statutory requirements; or that the property is fit for any particular purpose. Statement, descriptions or opinions are informational only and are not made or given as a warranty of the property in any way. Any purchaser of the property shall be solely responsible for determining the adequacy of the property for any and all uses for which the purchaser shall use the property. Any purchaser of the property which is the subject of this report should enter into any purchase on sole reliance of his own judgement and upon his own personal investigation of the property he is to receive, and not in reliance upon any representation by GSS regarding such property, the character, quality or value thereof. This report has been prepared for the exclusive use of our client. No warranties, either expressed or implied, are intended or made. The conclusions and opinions expressed are based on information gathered and field work preformed at the time of the preparation of this report and are subject to any changes in nature of conditions or new information.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

January 21, 1994

George Charbonneau
Plant Engineer
Sauer Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Solvent 140 spill
HSI# 12223-KL-1400; Story County

Dear Mr. Charbonneau:

This letter serves as a follow-up to our conversation regarding the specific actions required of Sauer Sundstrand by the IDNR. Based on the information presented in your report dated October 18, 1993, no further action is required at this time. I may be contacted at 515/281-8793 if you have any questions.

Sincerely,

Kathleen A. Lee

Kathleen A. Lee
Environmental Specialist
Emergency Response Unit

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145 / TDD 515-242-5967 / FAX 515-281-8895

APPENDIX D

OVEREXCAVATION OF 140 SOLVENT RELEASE AREA REPORT AND IDNR CORRESPONDENCE

GROUNDWATER SERVICE & SUPPLY, INC.

OVEREXCAVATION OF 140 SOLVENT RELEASE AREA
FOR
SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
OCTOBER 1994

PROJECT NO. 93655

OCTOBER 1994

PREPARED FOR:

SAUER-SUNDSTRAND COMPANY
2800 EAST 13TH STREET
AMES, IOWA 50010

PREPARED BY:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 SE CONVENIENCE BOULEVARD
SUITE 6
ANKENY, IOWA 50021

gss GROUNDWATER SERVICE & SUPPLY, INC.

October 20, 1994

Project No. 93655

Sauer-Sundstrand Company
2800 East 13th Street
Ames, Iowa 50010
Attn: Mr. George Charbonneau

RE: Overexcavation of 140 Solvent Release Area - Sauer-Sundstrand Company - Ames, Iowa.

Dear Mr. Charbonneau:

Enclosed please find six (6) copies of our report documenting overexcavating activities in the 140 Solvent release area performed on your property located in Ames, Iowa. The report includes site maps, photographs, laboratory results and chain of custody documenta-tion. If you have any questions please contact me at (515) 964-0304.

Yours truly,
GROUNDWATER SERVICE & SUPPLY, INC.

Brad Wade

Brad Wade
Rev 3.

encl.
BW:els

2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-6761 • FAX 515-964-1226

WORK PERFORMED

On September 28, 1994 Groundwater Service & Supply, Inc. (GSS) documented the removal of 85 cubic yards of soil from the 140 Solvent release area. To define the limits of the excavation a Photoionization Detector (PID) was used to take soil gas reading in the soil. When soil gas PID readings reached below 10 ppm the advancement of the excavation was stopped.

To confirm PID readings, soil samples from both sidewalls (OE-1 through OE-6) and pit bottom (PB-1 and PB-2) were collected for analysis. Sample locations are shown on Figure 1. The laboratory results are as follows:

LABORATORY RESULTS - SOIL (PPM)

LOCATION	DEPTH (FT)	TOTAL EXTRACTABLE HYDROCARBONS
OE-1	7.0	<10
OE-2	7.0	<10
OE-3	5.5	<10
OE-4	7.0	34
OE-5	5.5	92
OE-6	6.5	<10
PB-1	9.0	<10
PB-2	8.0	<10

Soil from the overexcavation area has been stock piled on-site. Plans are in progress to bio-remediate the soil in bio cells located on the east portion of the Sauer-Sundstrand Company property. All remediation activities will be documented in separate reports.

CONCLUSION

Laboratory results show remaining soil in the 140 Solvent release area is below the State of Iowa corrective action limit of 100 ppm for organic hydrocarbons.

APPENDIX

SITE PHOTOGRAPHS

LABORATORY RESULTS

CHAIN OF CUSTODY DOCUMENTATION

LOOKING WEST AT THE EXCAVATION SITE.

LOOKING EAST AT THE EXCAVATION SITE.

gss

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2426

RECEIVED OCT - 5 1994

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

10/04/1994

NET Job Number: 94.08920

NET Sample Number: 269413

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Sample ID: OE-1 7' Sauer-Sundstrand

Date Received: 09/30/1994

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

CLEAN GROUP

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269414

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: OE-2 7' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269415

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: OE-3 5.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/01/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269416

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: OE-4 7' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	34	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Motor Oil	34	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

10/04/1994

NET Job Number: 94.08920

NET Sample Number: 269417

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: OE-5 5.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	92	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Motor Oil	92	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NET® NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269418

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AHES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: OE-6 6.5' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

OCEAN GROUP

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269419

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: PB-1 9' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

NATIONAL ENVIRONMENTAL TESTING, INC.

Cedar Falls Division
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319) 277-2401
Fax: (319) 277-2425

ANALYTICAL REPORT

10/04/1994

GROUNDWATER SERVICE SUPPLY
2701 S.E. Convenience Blvd
Suite 6
Ankeny, IA 50021
(515)964-0304

NET Job Number: 94.08920

NET Sample Number: 269420

Collected by: GSS

Collectors Phone No.: 515/964-0304

Job Description: PROJECT #93655 - AMES, IOWA

Date Taken: 09/28/1994

Date Received: 09/30/1994

Sample ID: PB-2 8' Sauer-Sundstrand

Analyte	Result	Units	Result Flag	Analyst	Date Analyzed	Method	Reporting Limit		Matrix
Extraction Prep, soil	complete			klm	10/01/1994	IOWA-OA2			Soil
EXTRACTABLE HYDROCARBONS-SOIL									
Total Extractable Hydrocarbons	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Diesel	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Mineral Spirits (D-140)	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil
Motor Oil	<10	ug/g		djl	10/02/1994	IA-OA2	10	ug/g	Soil

All results are calculated on a wet weight basis.
Reporting Limits are extremely matrix dependent and may not always be achievable.
Key to Flags: D = Chromatogram does not match gasoline (OA-1 only) B = Blank hit for this compound
Units: mg/L = ppm ug/g = mg/kg = ppm ug/L = ppb

R. L. Bindert
Operations Manager

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO. 93655

SAMPLERS: (SIGNATURE) B Wade

PROJECT NAME: Sauer-Sundstrand

UST ADDRESS: Ames IA

LAB: NET

CHECK ANALYSIS TYPE REQUESTED

SAMPLE I.D. NUMBER	DEPTH (FT.)	# OF CONTAINERS	WATER	SOIL	SED.	SOURCE OF SAMPLE	COMP.	GRAB	DATE 1994	TIME	ACIDIFIED	ICED	GASOLINE HYDROCARBONS BY UHL OA-1	DIESEL BY UHL OA-1 & OA-2	WASTE OIL BY UHL OA-1 & OA-2	Mineral Spirits Solvent 140	UST CONTENTS	REMARKS
OE-1	7'	1		X		Pit		X	9/28	1500		X				X		
OE-2	7'	1		X		X		X	X	1505		X				X		
OE-3	5.5	1		X		X		X	X	1510		X				X		
OE-4	7	1		X		X		X	X	1515		X				X		
OE-5	5.5	1		X		X		X	X	1520		X				X		
OE-6	6.5	1		X		X		X	X	1530		X				X		
PB-1	9	1		X		X		X	X	1647		X				X		
PB-2	8	1		X		X		X	X	1621		X						

PLEASE RETURN AN EXECUTED COPY OF THE CHAIN-OF-CUSTODY AND CHROMATOGRAMS

WATER ANALYSIS REPORT IS TO INCLUDE MTBE

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	9/29/94	3:16 pm	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
	9/30/94	8:00	[signature]

CLIENT NAME/OFFICE LOCATION:

GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. CONVENIENCE BLVD., STE. 6
ANKENY, IOWA 50021

PROJECT MANAGER:

PHONE: (515) 964-0304

GSS
GROUNDWATER SERVICE & SUPPLY, INC.
2701 S.E. Convenience Boulevard, Suite 6, Ankeny, Iowa 50021 • 515-964-0304 • 1-800-373-5761 • FAX 515-964-1226

DISCLAIMER

The author of this report, GROUNDWATER SERVICE & SUPPLY, INC. - GSS, of Ankeny, County of Polk, State of Iowa, hereby gives notice that any statement or opinion contained in the following report prepared by GSS shall not be construed to create any warranty or representation that the real property on which the investigation was conducted is free of pollution or complies with all applicable regulatory and statutory requirements; or that the property is fit for any particular purpose. Statement, descriptions or opinions are informational only and are not made or given as a warranty of the property in any way. Any purchaser of the property shall be solely responsible for determining the adequacy of the property for any and all uses for which the purchaser shall use the property. Any purchaser of the property which is the subject of this report should enter into any purchase on sole reliance of his own judgement and upon his own personal investigation of the property he is to receive, and not in reliance upon any representation by GSS regarding such property, the character, quality or value thereof. This report has been prepared for the exclusive use of our client. No warranties, either expressed or implied, are intended or made. The conclusions and opinions expressed are based on information gathered and field work preformed at the time of the preparation of this report and are subject to any changes in nature of conditions or new information.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

Certified Mail

December 22, 1993

George Charbonneau
Plant Engineer
Saur Sundstrand
2800 East 13th Street
Ames, Iowa 50010

RE: Solvent 140 spill
HSI# 12223-KL-1400; Story County

Dear Mr. Charbonneau:

This letter is in regard to your correspondence dated October 18, 1993, concerning the spill of 10 gallons of Solvent 140. The incident detailed in your letter does not appear to require a verbal and written report according to Department rules described at IAC Chapter 131 "Spills and Hazardous Conditions". The actions taken to remediate the spill appear to have been appropriate for the situation. Please note that if the spilled material had been classified as a listed RCRA waste, on-site treatment in the aboveground bioremediation cell may have required a permit from EPA Region VII. The volume of soil excavated seems excessive as compared to the volume of solvent spilled. Two documents are enclosed for your information: IAC Chapter 131 and Guidelines for Reporting Hazardous Conditions. I may be contacted at 515/281-8793 if you have any questions.

Sincerely,

Kathleen A. Lee

Kathleen A. Lee
Environmental Specialist
Emergency Response Unit

copies: FO 5

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145 / TDD 515-242-5967 / FAX 515-281-8895

APPENDIX E

SWMU DESCRIPTIONS

4.0 DESCRIPTION OF SWMUS

Fifteen SWMUs that have been identified at the plant are described below. The location of all units and associated piping both used currently and in the past are shown on Plate 3. The description and location of SWMUs at the Plant will be used to develop the field activities described in Section 5.0 to complete the RFI.

SWMU #1 Former Designated Drum Storage Area (DDSA)

Location:	South of the Plant along the southern edge of south access road.
Type of Unit or Disposal Area:	Container Storage Area.
Design Features:	The drums were kept on wooden pallets in the DDSA which was approximately 6 by 30 feet in size and was neither paved nor constructed with spill containment provisions. The surface of the DDSA was paved with asphalt in July 1978.
Size or Capacity:	Approximately 180 square feet.
Operation Practices:	According to plant staff, waste materials such as spent PCE and TCA historically were stored in 55-gallon drums at the plant for less than 90 days. The total quantity of drums formerly stored in the DDSA is unknown. Sundstrand records indicate however, that approximately 275 gallons of PCE were stored in the DDSA during a six month period in 1977. Dates of storage for any other waste materials are not available.
Period of Operation:	From February 1972 to September 1982, these drums were stored in the DDSA which is the primary SWMU of concern. Sundstrand ceased using the DDSA in September 1982 and removed all drums at that time.
Age of Unit:	Approximately 15 years old.
General Physical Condition:	The area which was once used as the DDSA has now been paved.
Method of Closure:	In accordance with the closure plan approved by EPA, soil aeration is in progress to remediate VOC impacts at this SWMU. Closure activities began in August, 1992 and are expected to be completed in 1993.

SWMU #2 Current Hazardous Waste Storage Area

Location:	Southeast Corner of Main Building.
Type of Unit or Disposal Area:	Container Storage Area.
Design Features:	Steel building with a ceiling, surrounded by masonry block walls and has a concrete floor with dikes.
Size or Capacity:	Approximately 400 square feet.
Operation Practices:	One hazardous waste storage area is located at the plant. In September 1982, all hazardous waste drum storage was transferred to this enclosed steel and concrete unit located on the south end of the manufacturing facility. Spent materials including liquid paint wastes and spent freon are stored in 55-gallon drums for less than 90 days prior to final disposal.
Period of Operation:	1982 until present.
Age of Unit:	9 years.
General Physical Condition:	Good.
Method of Closure:	Not Applicable.

SWMU #3 Solvent 140 Recovery Still

Location:	Southeast corner of main building.
Type of Unit or Disposal Area:	
Design Features:	The still consists of an electronically powered boiler which produces steam that is used to heat the solvent to its boiling point. The solvent boils off, leaving hydraulic oil behind. Process water is used to cool and condense the solvent vapors back into a liquid. The clean solvent is stored in a tank to allow separation from any water that may have condensed. The still bottoms (hydraulic oil) are piped to the Used Oil Storage tank, SWMU # 13. Prior to the installation of the above ground storage tank for wastewater treatment sludge, SWMU #6b, in 1991, the still bottoms were transferred by underground piping to the underground storage tank, SWMU #6c, used to store the wastewater treatment sludge.
Size or Capacity:	Operational capacity is 50 gallons per hour. Practical capacity is 175 gallons per 8 hour shift.

Operation Practices:	Sauer-Sundstrand uses a still to recycle solvent 140, which has a flash point greater than 140 degrees Fahrenheit. Solvent 140 is delivered to the plant by tanker and stored in an above ground storage tank until needed. The solvent is distributed throughout the plant via a centralized distribution system. The solvent is used in indoor wash tanks throughout the plant. Each tank is connected to a central, above ground distribution system. The solvent is considered spent when it becomes so loaded with hydraulic oil that the parts retain a film of oil after washing. This spent solvent is brought to the solvent still from the wash tanks in portable steel tanks. The spent solvent is poured through strainers and filters to remove solids. It is then poured into holding tanks until distilled.
Period of Operation:	1973 until present.
Age of Unit:	Approximately 20 years.
General Physical Condition:	Good.
Method of Closure:	Not Applicable.

SWMU #4

SWMU #4 contains two components, the Acid Neutralization Sump (4a) and the Cyanide Holding Basin (4b). SWMU #4 was part of an experimental process constructed in the early 70's. In an attempt to eliminate a costly step in the assembly process, the plant experimented with bronze plating of certain transmission components. The plating operation was used intermittently for about 10 years before it was discontinued.

Since the plating process was experimental in nature and infrequently used, very little information and documentation about the facility is available. The only documentation available is a details design drawing provided in Appendix C which shows SWMU #4a, the Acid Neutralizing Sump, and SWMU #4b, the Cyanide Holding Basin.

SWMU #4a Acid Neutralizing Sump

Location:	East Side of Plant.
Type of Unit or Disposal Area:	Underground Acid Neutralizing Sump.
Design Features:	The Underground Acid Neutralizing Sump consists of an underground concrete vault.
Size or Capacity:	Approximately 300 gallons.
Operation Practices:	According to the design drawing provided in Appendix C the Acid Neutralizing Sump contained an initial fill of 13,500 lbs of limestone. Spent solutions of 10% phosphoric acid used to clean metal parts prior to the bronze plating operation were discarded into the sump through a 6 inch underground pipe from the test lab. The neutralized fluid product then flowed through underground piping and was discharged to the POTW through the sanitary sewer. The preconstruction diagrams of the Acid Neutralizing Sump do not depict the location of the associated underground piping beneath the plant. The plant has expanded 50 feet toward the east and the piping layout has been estimated for the new boundary of the building (Plate 3).
Period of Operation:	The date that the plating waste tank was placed into service is estimated to be in the early 70's. The tank was last used in 1982 and closed in 1987.
Age of Unit:	Unknown.
General Physical Condition:	Closed.
Method of Closure:	The vault was neutralized and flushed and the fluids discharged to the POTW. The limestone was left in place and clean sand used to fill the sump. Clean soil was used to fill the excavation above the vault.

SWMU #4b Cyanide Holding Basin

Location:	East Side of Plant.
Type of Unit or Disposal Area:	Underground Holding Basin
Design Features:	According to the only document available, for SWMU #4b, this unit is a reinforced concrete holding basin designed to hold cyanide plating waste.
Size or Capacity:	Approximately 5000 gallons.

Operation Practices:	According to the design drawing provided in Appendix C, cyanide plating waste was discharged from the production area into the Cyanide Holding Basin. Presently available information does not explain how the waste was discharged or removed from the basin.
Period of Operation:	The date the Cyanide Holding Basin was placed into service is estimated to be in the early 70's. It is estimated that the tank was last used in 1982 and closed in 1987.
Age of Unit:	Unknown
General Physical Condition:	Closed.
Method of Closure:	Unknown.

SWMU #5 Test Stand Hydraulic Oil Spill Area

Location:	West side of manufacturing building.
Type of Unit or Disposal Area:	Spill Area
Size or Capacity:	Approximately 86 cubic yards
Design Features:	Concrete catch basin constructed below test stand to catch hydraulic oil lost during testing.
Operation Practices:	Hydraulic oil collects in the catch basin and is sucked out with a vacuum when the basin is half full. The oil is transferred to the used oil storage tank, SWMU#13, for disposition by re-refining. In 1989, it was discovered that a design flaw in the basin caused a leak of hydraulic oil into the ground. See Appendix D for details. Stoddard solvent was used in the past in small amounts as part of the testing process. Excess Stoddard solvent dripped into each catch basin and mixed with spent hydraulic oil.
Period of Operation:	Not applicable.
Age of Unit:	Not applicable.
General Physical Condition:	Not applicable.
Method of Closure:	Not Applicable.

SWMU #6 Wastewater Treatment Facility

SWMU #6 has been separated into three components to provide a detailed description of the Plant's wastewater treatment process. These three components are the Wastewater Treatment System (SWMU #6a), the Above Ground Wastewater Sludge Tank (SWMU #6b), and the Former Wastewater Sludge UST (SWMU #6c). EPA commented twice in their February 11, 1992 response regarding the SWMU #6 system: 1) how sludge is handled from the system and; 2) how the sludge became hazardous.

The sludge has, on two occasions, been disposed of as a hazardous material. The material was manifested and disposed of by fuel blending. This material is normally non-hazardous and is used as raw material in the manufacture of roofing shingles.

To understand how the material became hazardous, it is necessary to realize that spent hydraulic oil is the waste product from the solvent recovery still, SWMU # 3. The spent oil was transferred to an underground storage tank, SWMU #6c, that was used at the time to collect sludge from the Wastewater Treatment System, SWMU#6a. This UST (SWMU #6c) was temporarily closed in place in 1991 and was removed by Sauer during July of 1992. When the tank contained enough material to fill a tank truck, it was transferred off-site for use, either as raw material or fuel blending. On two occasions, the solvent still failed, causing solvent to be transferred with the waste oil in amounts large enough to depress the flash point of the sludge in the storage tank below 140°F.

To eliminate this problem, three steps were taken:

1. Closer monitoring of the solvent still during processing by maintenance personnel.
2. The Plant now uses Solvent 140 which has a flash point greater than 140°F.
3. A closed cup flash point tester was purchased and is used to monitor flash point of sludge and the solvent.

Since the implementation of these procedures, waste treatment sludge has always been non-hazardous.

SWMU #6a Wastewater Treatment System

Location:	Southeast corner of main building.
Type of Unit or Disposal Area:	Above ground wastewater treatment tanks.
Design Features:	Four (4) above ground wastewater tanks are used, one for processing wastewater and three for storage of wastewater prior to processing.
Size or Capacity:	Each tank has a 3,000 gallon maximum capacity and a 2,500 gallon working capacity.
Operation Practices:	The wastewater treatment system includes collected hydraulic oils from the test lab area and spent cleaning solutions from parts washers and floor scrubbers. The test lab hydraulic oil is collected in a 1,000 gallon vaulted sump and then pumped to the wastewater treatment system through above ground piping. The spent cleaning solutions are fed directly to the wastewater treatment system through above ground piping located in the production area. This mixture of water, detergent and oil is collected in the three above ground tanks awaiting processing. The mixture is then transferred to the process tank, the pH is lowered to less than 4.0 using sulfuric acid to cause the oil to break away from the water. Alum and flocculent are added and air passed through the tank to aid in floating the oil to the top of the tank for skimming. Oil skimmed from the top of the tank is transferred by gravity feed piping to the Above Ground Wastewater Sludge Tank, SWMU #6b. The water remaining in the process tank is neutralized using caustic soda and is discharged into the sanitary sewer.
Period of Operation:	The tanks were installed in 1981 at the time of plant expansion and are currently in use.
Age of Unit:	9 years.
General Physical Condition:	Good.
Method of Closure:	Not Applicable.

SWMU #6b Above Ground Wastewater Sludge Tank

Location:	Southeast corner of building.
Type of Unit or Disposal Area:	Above ground storage tank.
Design Features:	A 10,000-gallon storage tank used to store non-hazardous sludge generated by the wastewater treatment system, SWMU #6a.

Size or Capacity: 10,000 gallons.

Operation Practices: Oily sludge from the wastewater treatment process tank is transferred by gravity feed through above ground piping to this tank for storage until the quantity is great enough to fill a tanker. The sludge is transferred off-site for re-refining or used as a raw material.

Period of Operation: 1991 until present.

Age of Unit: 1 year.

General Physical Condition: Good.

Method of Closure: Not Applicable.

SWMU #6c Former Wastewater Treatment Sludge UST

Location: South of main building, west of garage.

Type of Unit or Disposal Area: Underground Storage Tank (UST).

Design Features: 10,000 gallon steel UST.

Size or Capacity: 10,000 gallons.

Operating Practices: Prior to installation of Above Ground Wastewater Sludge Tank, SWMU #6b, in December, 1991, this tank was used to store sludge from the Wastewater Treatment System, SWMU #6a. Sludge from SWMU #6a was transported to this tank via underground piping. Still bottoms from the Solvent 140 Recovery Still, SWMU #3, consisting of water and hydraulic oil, were transported to this tank via underground piping until December, 1991. This UST was closed in place in December, 1991, and removed by Sauer, in July 1992.

Period of Operation: Installed in 1982 and closed in place in December 1991. Removed in July 1992.

General Physical Condition: Good.

Method of Closure: The former Wastewater Treatment Sludge UST was temporarily closed in place in 1991 and was removed in July of 1992 under the Iowa UST program. Appendix E contains the UST Removal Report.

SWMU #7 Spent Hydraulic Oil Storage Tank

Location: South of building.

Type of Unit or Disposal Area:	Underground Storage Tank (UST).
Design Features:	10,000-gallon steel UST.
Operation Practices:	Used hydraulic oil is generated as a result of testing hydraulic transmissions. Used oil is placed into sump inside building, then piped into UST.
Period of Operation:	1971 through 1991.
Age of Unit:	Approximately 20 years.
General Physical Condition:	Good.
Method of Closure:	The spent hydraulic oil tank was temporarily closed in place in 1991 and was removed by Sauer in July of 1992 under the Iowa UST program. Appendix E contains the UST Removal Report.

SWMU #8 Test Lab Used Oil Tank

Location:	East of Test Lab garage, north of cooling tower.
Type of Unit or Disposal Area:	Underground Storage Tank (UST).
Design Features:	8,200-gallon steel UST.
Size or Capacity:	8,200 Gallons
Operation Practices:	Used hydraulic oil is generated as a result of testing hydraulic transmissions. Oil from testing operations is collected in floor trenches, then transferred by underground piping into UST. This UST was temporarily closed in place in 1991 and was removed in July of 1992 under the Iowa UST program. Appendix E contains the UST Removal Report.
Period of Operation:	1971 through 1991.
Age of Unit:	Approximately 20 years.
General Physical Condition:	Good.
Method of Closure:	The spent hydraulic oil tank was temporarily closed in place in 1991 and was removed by Sauer in July of 1992 under the Iowa UST program. Appendix E contains the UST Removal Report.

SWMU #9 Interim Status Container Storage Area (ISCSA)

Location:	This temporary drum storage area is located south of the main building on a grassy knoll.
Type of Unit or Disposal Area:	Container storage area.
Design Features:	Not Applicable.
Size or Capacity:	Not Applicable.
Operation Practices:	Spent PCE and TCA solvents were stored in 55 gallon drums on skids west and southwest of the propane tank access road.
Period of Operation:	Unknown.
Age of Unit:	Unknown.
General Physical Condition:	Not Applicable.
Method of Closure:	Pursuant to the closure plan approved by EPA, soil aeration/bioremediation is in progress to remediate VOC impacts at this SWMU. Closure activities began in August 1992 and are expected to be completed in 1993.

SWMU #10 Paint Storage Secondary Containment Tank

Location:	South of main building.
Type of Unit or Disposal Area:	Underground Storage Tank (UST).
Size or Capacity:	1,000 Gallons.
Design Features:	One 1,000-gallon holding tank was installed to capture the spillage of paint from the paint storage room inside of the main building.
Operation Practices:	The tank is fed by two trenches in the floor which feed to underground piping from the room. On one occasion, approximately 5 to 10 gallons of red lacquer paint were discharged to this tank. This paint dried on the bottom of the tank. During recent investigation of the tank, it was found that the tank contained approximately 75 gallons of gray, black, and red lacquer paint, primarily gray. Employee interviews revealed no knowledge of any accidental or intentional spill other than that cited above. This was an unauthorized and unreported dumping of paint into the tank.

Period of Operation:	The tank was last used in the late 1980's.
Age of Unit:	Unknown.
General Physical Condition:	Good.
Method of Closure:	The UST and auxiliary piping were temporarily closed in place in 1991 and were removed by Sauer in July of 1992 under the Iowa UST program. Appendix E contains the UST removal report.

SWMU #11 Waste Paint Drum Storage Area

Location:	East side of propane tank access road.
Type of Unit or Disposal Area:	Temporary storage of drums of spent lacquer paint waste.
Design Features:	Not Applicable.
Size or Capacity:	Not Applicable.
Operation Practices:	Liquid paint was poured into steel pan to evaporate liquid fraction. The dry paint solids were then placed in dumpster for disposal.
Period of Operation:	Was used in the early 1970's.
Age of Unit:	Approximately one year.
General Physical Condition:	Not Applicable.
Method of Closure:	Use of site discontinued.

SWMU #12 Sound Lab Used Oil Sump

Location:	The sound lab outside of the northeastern corner of the main building.
Type of Unit or Disposal Area:	Used hydraulic oil collection trenches.
Design Features:	An in-floor trench around the transmission test stand is used to collect spilled oil.
Size or Capacity:	Approximately 80 gallons.
Operation Practices:	Used oil collects in the trench. The oil is pumped out using a portable vacuum system on a mobile cart. Contents are transferred to the test lab area sump and then pumped above ground to the wastewater treatment facility, SWMU#6a.

Period of Operation:	1971 to present.
Age of Unit:	21 years.
General Physical Condition:	Good.
Method of Closure:	Not applicable, unit is in use.

SWMU #13 Used Oil Storage Tank

Location:	Southeast corner of building.
Type of Unit or Disposal Area:	Interior above ground steel storage tank.
Design Features:	The aboveground steel storage tank is located in a block room and is diked.
Size or Capacity:	8,200 gallons.
Operation Practices:	Used oil is collected from the Test Stand Catch Basins, SWMU# 15, using an air operated vacuum system and a 200 gallon mobile tank. The mobile tank is pulled to the Used Oil Storage Tank where the oil is pumped into the storage tank. Motor oil from fork lifts is collected and transferred to the tank. Still bottoms (hydraulic oil) from the Solvent 140 Recovery Still, SWMU#3, is transferred to the tank via overhead piping. When sufficient oil has been collected, it is hauled off-site periodically for re-refining.
Period of Operation:	Installed in 1991.
Age of Unit:	Approximately 1 year.
General Physical Condition:	Good.
Method of Closure:	Not applicable, unit is in use.

SWMU #14 Used Oil Filtration System

Location:	Inside southeast corner of building.
Type of Unit or Disposal Area:	Oil filtration system.
Design Features:	A series of filters for removing particulate material from used hydraulic oil and four 300 gallon steel tanks in which the oil is stored during processing.
Size or Capacity:	A maximum operational capacity of approximately 600 gallons per 8 hour shift.

Operation Practices:	Used oil is poured through a strainer and pumped through a filter into a holding tank, then pumped repeatedly through a bank of filters until clean, transferred to a holding tank for analysis, then transferred to the new oil storage tank.
Period of Operation:	Installed prior to 1980.
Age of Unit:	Unknown.
General Physical Condition:	Good.
Method of Closure:	Not Applicable.

SWMU #15 Oil Collection Pans and Catch Basins

SWMU #15 consists of 16 hydraulic oil collection pans and two (2) hydraulic oil catch basins all located inside the Test Stand Production Area (see Plate # 3). The "test stands" are large operating machines which serve as quality assurance checks on assembled hydraulic transmissions.

The 16 oil collection pans and two (2) catch basins sit underneath individual test stands for the purpose of collecting spent hydraulic oil during normal testing operations. The deep pans and catch basins vary in size and can hold between approximately 50 gallons to 200 gallons depending on the size of the test stand and nature of operation. Appendix F provides photographs of typical test stands with oil collection pans and catch basins.

Each test stand is identified by a unique asset number (see Plate 3). The oil collection pans and catch basins may be located in the production area by reference to an associated test stand asset number. The following

is a list of all asset numbers associated with an oil collection pan or catch basin:

Oil Collection Pan I.D.	Catch Basin I.D.
Test Stand Asset #6213	Test Stand Asset #6476
Test Stand Asset #1108	Test Stand Asset #6475
Test Stand Asset #0109	
Test Stand Asset #6150	
Test Stand Asset #6206	
Test Stand Asset #1107	
Test Stand Asset #1106	
Test Stand Asset #6755	
Test Stand Asset #1010	
Test Stand Asset #1011	
Test Stand Asset #1128	
Test Stand Asset #6045	
Test Stand Asset #7025	
Test Stand Asset #6320	
Test Stand Asset #4896	
Test Stand Asset #1138	

Location:	Installed under each test stand, 16 collection pans and 2 catch basins.
Type of Unit or Disposal Area:	Welded steel pan or concrete reinforced catch basin.
Design Features:	Two and one half to five inch deep pans, free of holes, somewhat larger than the machine which sits in them.
Size or Capacity:	Approximately between 50 to 200 gallons depending on size and type of test stand.
Operation Practices:	Oil collects in the pans or catch basins from the testing process. When the level of oil reaches about one inch from the top of the pan, the oil is removed using a vacuum system and transferred to the used oil filtration system, SWMU #14. Oil which collects in the two (2) catch basins is removed about once a week.
Period of Operation:	Installed prior to 1980.
Age of Unit:	Unknown.
General Physical Condition:	Good.
Method of Closure:	Not Applicable.

APPENDIX F

CONCRETE FLOOR INSPECTION LETTER

COPY

Harding Lawson Associates

September 15, 1993

23088.1.3

Mr. Scott Moyer
Sundstrand Corporation
4949 Harrison Avenue
Rockford, Illinois 61125

Inspection Of Secondary Containment Systems
Sauer-Sundstrand RCRA Facility Investigation
Ames, Iowa

Dear Mr. Moyer:

Harding Lawson Associates has prepared this letter to summarize and discuss the results of the inspection of the secondary containment systems at the Sauer-Sundstrand Facility in Ames, Iowa. The inspection was performed to identify those solid waste management units (SWMU) requiring soil borings and soil sampling as part of the RCRA Facility Investigation (RFI) for the facility. Figure 1 shows the layout of the site and the location of the SWMUs that were inspected.

INSPECTION METHODS

The following paragraph was included in the Supplemental Investigation Work Plan for the RFI and explains the objectives of the inspection.

> "HLA also will perform visual inspections at all indoor SWMU which have, at a minimum, a concrete floor barrier separating them from subsurface soils. HLA will inspect the floor and exterior of the building for cracks to evaluate whether a release has occurred and if analytical sampling is necessary. The SWMU with concrete containment features are #2, #3, #6, #12, #13, #14, and #15. The inspection will consist of PID readings, where appropriate, in conjunction with observations of surficial soils outside of the building for discoloration." *page 25, Supplemental Investigation Work Plan, Harding Lawson Associates, October 14, 1992.*

Bill Renner, Tim Bryan, and Steve Anderson of HLA and George Charbonneau and Gary McConnell of Sauer-Sundstrand inspected the following SWMU in the afternoon of August 17, 1993.

- Number 2, Current Hazardous Waste Storage Unit
- Number 3, Solvent 140 Recovery Still
- Number 6, Waste Water Treatment Facility which includes 6a, the Waste Water Treatment System, 6b, the Above-Ground Waste Water Sludge Tank, and 6c, the Former Waste Water Sludge Underground Storage Tank which has been removed.
- Number 12, Sound Lab Used Oil Sump
- Number 13, Used Oil Storage Tank
- Number 14, Used Oil Filtration System
- Number 15, Oil Collection Pans and Catch Basins

Each SWMU was inspected to identify potential contaminant migration pathways through the secondary containment of the SWMU. Once a contaminant migration pathway was identified, HLA looked for evidence of a release. Visual staining was the primary means of identifying the evidence of a release. Where it was possible to look at the soils outside of a SWMU secondary containment system, these soils were inspected for visual contamination and if found, were analyzed using a photo-ionization detector. Photographs of each SWMU, especially the areas of potential migration were taken and are enclosed as separate figures.

For SWMU that relied upon concrete slabs or formed concrete for secondary containment, the concrete was inspected for containment related conditions and any flaws or construction features that could reduce the containment capability. Cracks, perforations through the concrete, and expansion joints were of primary concern followed by the surface condition of the concrete and any protective coating on the surface.

For SWMU that had other types of secondary containment such as catch basins, sumps or catch pans, the condition of the structure was inspected to see if there were any leaks. The concrete surrounding or beneath these features was also examined for competency and evidence of leakage through the secondary containment that could cause subsequent leakage through the concrete.

Observation notes taken at each SWMU are summarized below following a brief description of each SWMU. A recommendation is then made whether the containment appears adequate or whether the analytical sampling program must be performed.

SWMU NUMBER 2, CURRENT HAZARDOUS WASTE STORAGE UNIT

The hazardous waste storage unit is a concrete, masonry unit, and metal-panel siding enclosed room with locked door access. The concrete floor has recessed sections where hazardous waste containers are stored. The recessed areas provide the secondary containment capacity. The lower approximately two feet of the walls is concrete with masonry units above on the interior partition walls and metal panel siding on the exterior walls. The concrete forming the walls and the floor slab are free of joints that could be potential migration pathways. The floor slab is sound; free of cracks, spalling, scaling or other damage.

A portion of the wall of the hazardous waste storage area is constructed of concrete because it is located below grade. The exterior of the building was not inspected because if a leak occurred, no staining or other indications would be evident at the surface.

Based on the soundness of the floor, no additional borings are necessary in the vicinity of SWMU Number 2, the Current Hazardous Waste Storage Area.

SWMU NUMBER 3, SOLVENT 140 RECOVERY STILL

The Solvent 140 Still is electrically powered and used to distill spent Solvent 140 by reclaiming the solvent and separating used hydraulic oil. The still is elevated above the concrete floor on a frame which is bolted to the floor. The still is located near the exterior wall and near a joint between the floor slab and a column footing. This joint is filled with a preformed expansion joint filler.

The exterior wall is metal panel siding that extends to the floor. In the vicinity of the still, this floor-wall connection is protected by a section of angle-iron that is bolted to the floor to prevent potential spills from passing beneath the exterior wall. The angle iron has been caulked with a silicone caulk to prevent seepage beneath the angle-iron. The expansion joint at a column footing is located immediately adjacent to the still. The expansion joint is not covered with epoxy resin nor is it evident that a water-stop was included in the expansion joint.

The room in which the still is located is also used for the storage of hydraulic oil and is where SWMU Number 14, the used oil filtration system, is located. The floor has an epoxy coating. Evidence of hydraulic oil spills can be seen on the floor. It would be impossible to identify whether these stains are due to the new hydraulic oil, used hydraulic oil, or from the Solvent 140 Still.

The analytical sampling program in the vicinity of SWMU Number 3, the Solvent 140 Recovery Still needs to be performed because of visual staining and the proximity of the expansion joint.

SWMU NUMBER 6, WASTE WATER TREATMENT FACILITY

SWMU Number 6, the waste water treatment facility includes 6a, the waste water treatment system, 6b, the above-ground waste water sludge tank, and 6c, the former waste water sludge underground storage tank which has been removed. The waste water treatment system consists of four 3,000-gallon, above-ground waste water tanks, one for processing waste water and the remaining three for storing waste water prior to treatment. The above-ground waste water sludge tank is a 10,000-gallon storage tank used to store non-hazardous sludge generated by the waste water treatment system. The former waste water treatment sludge underground storage tank was removed in 1992 and was not part of this inspection.

The room containing the waste water treatment system and the above-ground waste water sludge tank has a concrete floor and masonry unit walls. The room is below grade so the exterior walls are constructed of concrete until they are above grade where the masonry units begin. The room consists of a section of original construction supplemented by a room expansion which caused a joint in the floor. The joint is tight and does not contain any expansion joint filler material. The joints between the footings for the exterior walls and columns and the floor slab have a preformed expansion joint filler.

The area outside of the waste water treatment room was inspected for visual staining, but none was evident. The partial below-grade construction of the waste water treatment room would make it highly unlikely that staining would be evident.

Because of the proximity of the expansion joint to the tank locations, HLA recommends that the analytical sampling program in the vicinity of SWMU Number 6 needs to be implemented.

SWMU NUMBER 12, SOUND LAB USED OIL SUMP

The sound lab is a semi-detached building where transmissions are tested. The building has a concrete foundation and floor slab and metal panel siding walls. Concrete trenches within the floor slab collect used oil from the transmission test stands. A metal lined catch basin also is located beneath a test stand to collect used oil. Used oil flows to a collection sump for subsequent removal and treatment.

According to George Charbonneau, the site plant manager, the floor slab at the sound lab is approximately 36 inches thick. The surface of the slab is sound with no evidence of deterioration that could lead to potential migration pathways. The joints between the metal catch basin and sump and the concrete around them are tight and do not appear to be a potential migration pathway. The floor and wall intersections have been caulked to prevent migration between the floor and wall interface.

Based on the soundness of the concrete, the lack of expansion joints or cracks, and the absence of visual staining, HLA recommends that the analytical sampling program in the vicinity if SWMU Number 12 not be implemented.

SWMU NUMBER 13, USED OIL STORAGE TANK

The used oil storage tank, SWMU Number 13, is a 8,200 gallon steel storage tank used to store used oil from the test stands. The tank is located in the same room as the waste water treatment facilities, therefore it has the same containment features. The section on SWMU Number 6, the waste water treatment facility has a description of the room and a discussion of the condition of the concrete.

Because of the proximity of the expansion joint at the exterior wall and floor slap intersection, the analytical sampling program for this SWMU should be implemented. This is the same recommendation that HLA made for SWMU Number 6 which is in the same room as SWMU Number 13.

SWMU NUMBER 14, USED OIL FILTRATION SYSTEM

SWMU Number 14, the used oil filtration system is located in the same room as SWMU Number 3, the Solvent 140 recovery still, therefore it has the same containment features. The used oil filtration system is a series of filters for removing solids from used hydraulic oil and four, 300-gallon steel tanks for storing the used oil. A metal pan is located beneath the filtration system to catch oil drips.

The concrete in the vicinity of the used oil filtration system is sound. There are expansion joints with preformed expansion joint fillers. It is unknown whether there are water-stops within the expansion joints. The floor in the vicinity of the used oil filtration system has an epoxy coating and is stained with hydraulic oil. It is unknown whether this staining is due to used oil or new hydraulic oil.

Based on the evidence of visual staining and the location of expansion joints near the used oil filtration system, HLA recommends that the analytical sampling plan in the vicinity of SWMU Number 14 be implemented.

SWMU NUMBER 15, OIL COLLECTION PANS AND CATCH BASINS

SWMU Number 15 consist of hydraulic oil collection pans or catch basins that are below test stands within the Test Stand Production Area. The size of the collection pans and catch basins vary. Each test stand and it's collection pan or catch basin is identified by a unique asset number. In the *Supplemental Investigation Work Plan*, (HLA 1992) the following test stand assets were identified to be included within this investigation.

- Oil Collection Pans for Asset Numbers 0109, 1010, 1011, 1106, 1107, 1108, 1128, 1138, 4896, 6045, 6150, 6206, 6213, 6320, 6755, and 7025 (16 assets)

- Catch Basins for Asset Numbers 6475 and 6476

At the time of the inspection, it was apparent the Assets 1010 an 1011 were incorrectly identified and should have been listed as 1110 and 1111. Assets 6150 and 6213 had the oil collection pans removed and were not included with the inspection. Additional Assets Numbers 6318 and 6319 were identified and inspected.

Many of the Test Stand Assets are designed to be moveable to allow for a modular layout of the testing facility This allows Sauer-Sundstrand the ability to improve productivity as necessary. However, inspecting the current location of a oil collection pan only gives an indication of the current collection performance. If current collection performance is adequate, this gives reason to infer that past performance at a different location within the test stand area was similar, however, past collection performance and associated contaminate migration potential can not be ascertained. The overall capability of the floor within the test stand area to provide containment is discussed since some of the test stand assets have been moved.

The floor of the Test Stand Production Area is reinforced concrete with an epoxy coating. In general, the production area is well maintained and clean for an industrial facility. Due to the nature of the testing process, hydraulic oil is spilled on the floor or drips from parts waiting to be assembled or tested. The epoxy coating on the floor is black. Since the floor is routinely exposed to oil, it is impossible to identify a potential release from staining on the floor. A release must therefore be evaluated based on potential release pathways to the soil beneath the floor. The floor is sound and the epoxy coating covers the entire production area except for localized damaged areas. In the areas identified and inspected where the epoxy coating was missing, the concrete surface beneath was sound and smooth; adequate to provide a barrier to a release. There were no potential releases identified through inspection of the interior of the Test Stand Production Area.

An inspection of the exterior of the building identified visual staining along the concrete beneath the walls on the west side of the building. This is the area where the two catch basin assets, 6475 and 6476, are located. A previous release from 6475 was identified and remediated in 1989. It is not clear whether the existing staining is due to the previous spill or any current contaminant migration.

Due to the presence of visual staining on the floor slab on the exterior of the building, HLA recommends implementing the analytical sampling plan for SWMU Number 15.

CONCLUSION

HLA recommends performing analytical sampling at SWMU Numbers 3, 6, 13, 14 and 15. Sampling at SWMU Numbers 2 and 12 is not necessary.

If you have any questions please call either of the undersigned at (708) 571-2162.

Yours very truly,

HARDING LAWSON ASSOCIATES

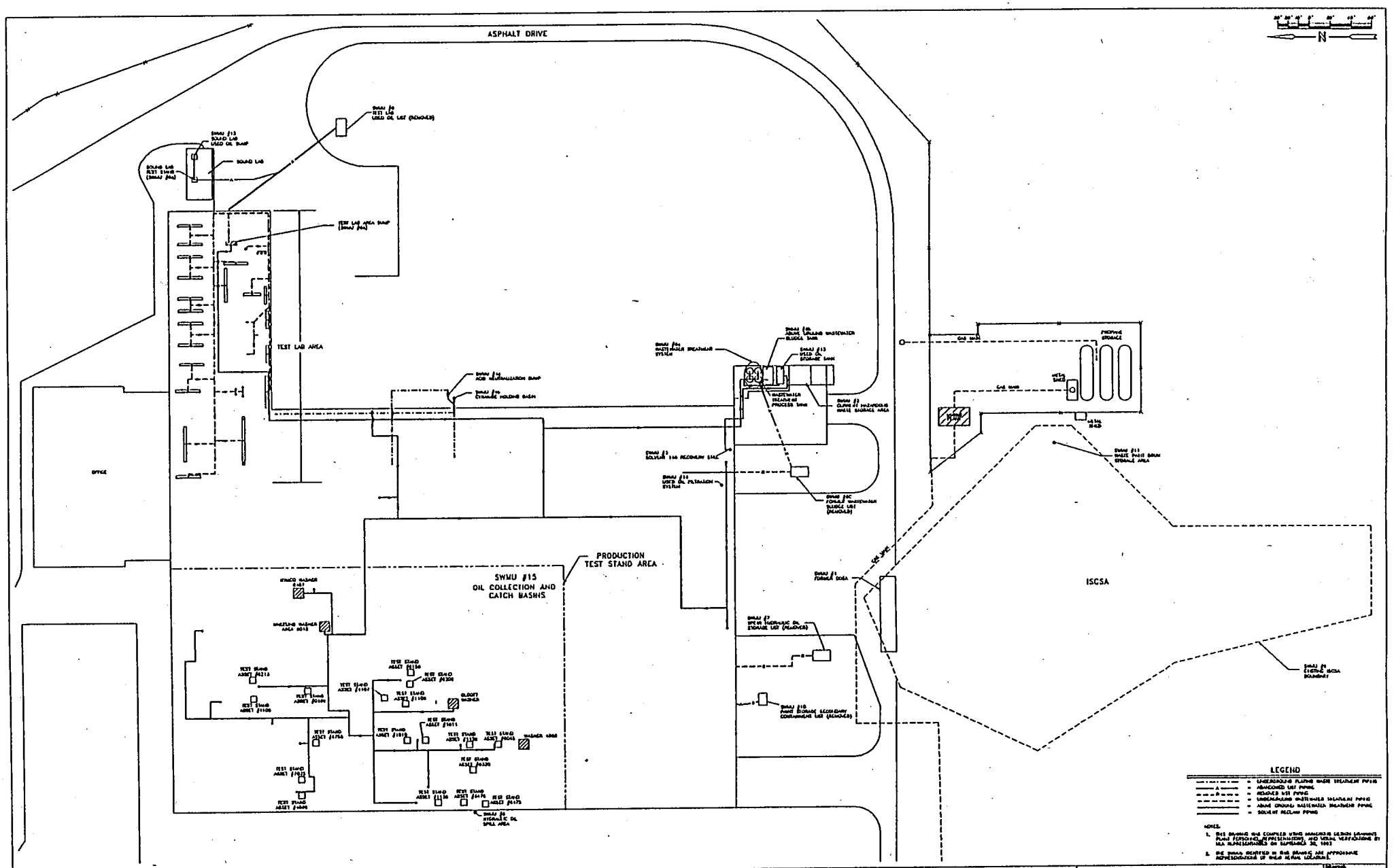
William G. Renner, PE
Senior Engineer

Timothy M. Bryan, PG
Senior Hydrogeologist

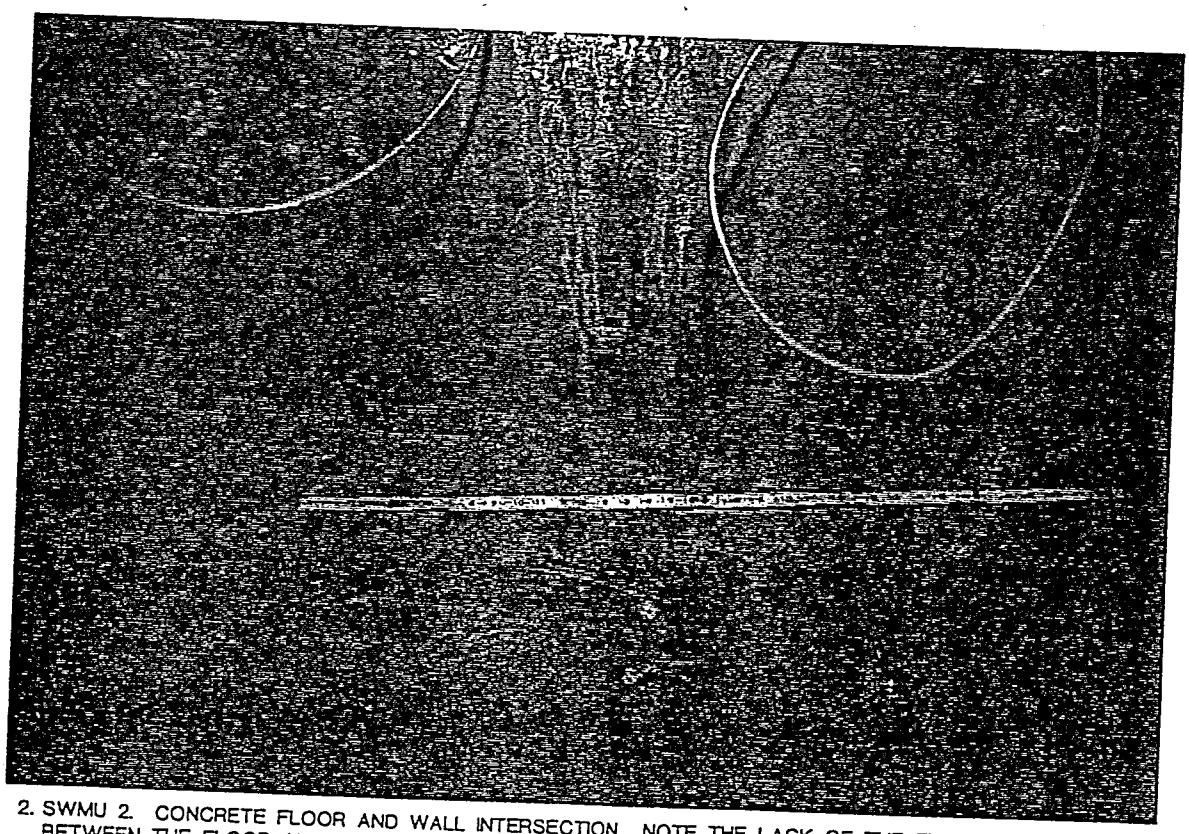
Enclosures

WGR/km
0914933V.02

cc: George Charbonneau – Sauer-Sundstrand Company (w/enclosures)
Robert Parsons – HLA (w/o enclosures)


ASPHALT DRIVE
N
TEST LAB AREA
OFFICE
PRODUCTION TEST STAND AREA
SWMU #15
OIL COLLECTION AND CATCH BASINS
ISCSA
LEGEND
NOTES:
1. THIS DRAWING WAS COMPILED USING HANDHOLD DESIGN DRAWINGS PLANT PERSONNEL REPRESENTATIONS, AND VISUAL VERIFICATIONS BY HLA REPRESENTATIVES ON SEPTEMBER 30, 1992
2. THE SWMU IDENTIFIED IN THIS DRAWING ARE APPROXIMATE REPRESENTATIONS OF THEIR ACTUAL LOCATIONS.
Harding Lawson Associates
Engineering and Environmental Services
One Tower Lane, Suite 1300
Oakbrook Terrace, IL 60181
(708) 571-2162
FAX (708) 571-0436
ONE INCH AT FULL SIZE
AMES RFI NOD REVISIONS
SAUER-SUNDSTRAND FACILITY
2800 EAST 13TH STREET
AMES, IOWA 50010
SOLID WASTE MANAGEMENT UNITS
DRAWING 3
SHEET 1 OF 1
REVISION NUMBER
DATE 10/11/93

1. SWMU 2. THE CONCRETE CONTAINMENT WITHIN THE ROOM CAN BE SEEN BELOW THE METAL AND CMU WALLS.



2. SWMU 2. CONCRETE FLOOR AND WALL INTERSECTION. NOTE THE LACK OF THE EXPANSION JOINT BETWEEN THE FLOOR AND THE WALL.

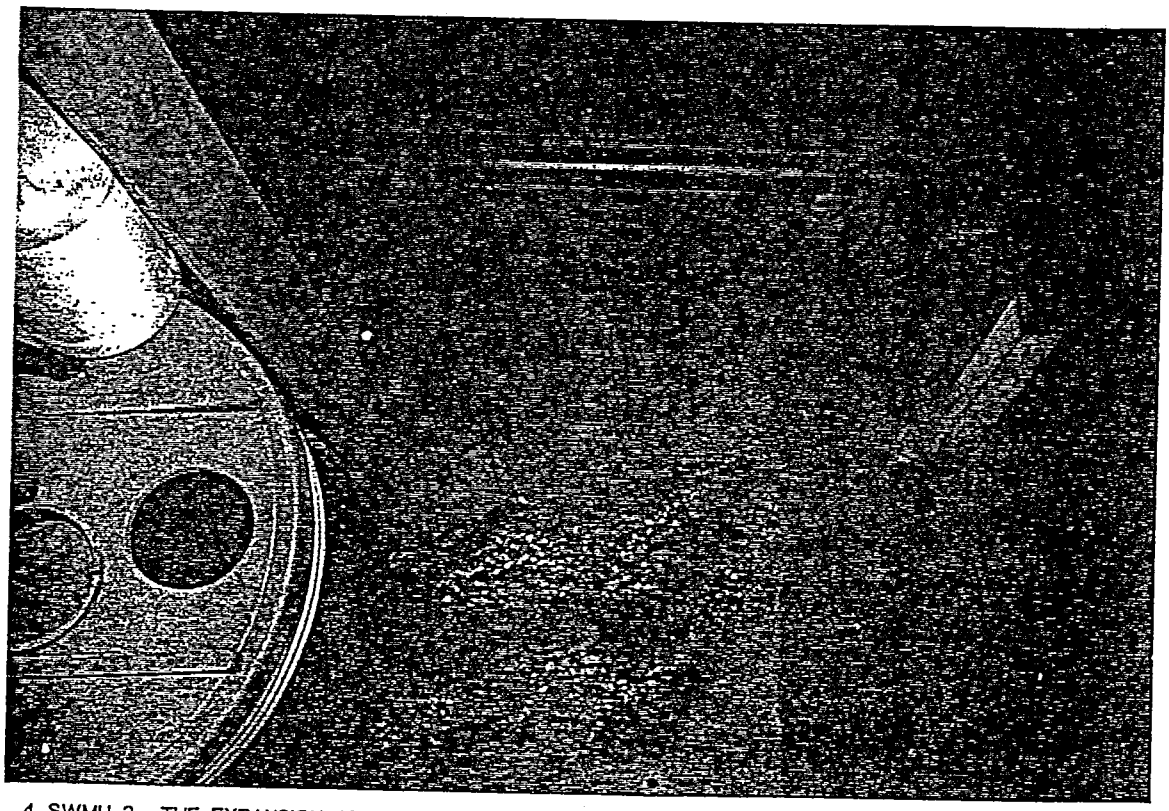
Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
1

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.3		09/15/93	

3. SWMU 3. FLOOR IN THE VICINITY OF THE SOLVENT 140 RECOVERY STILL.



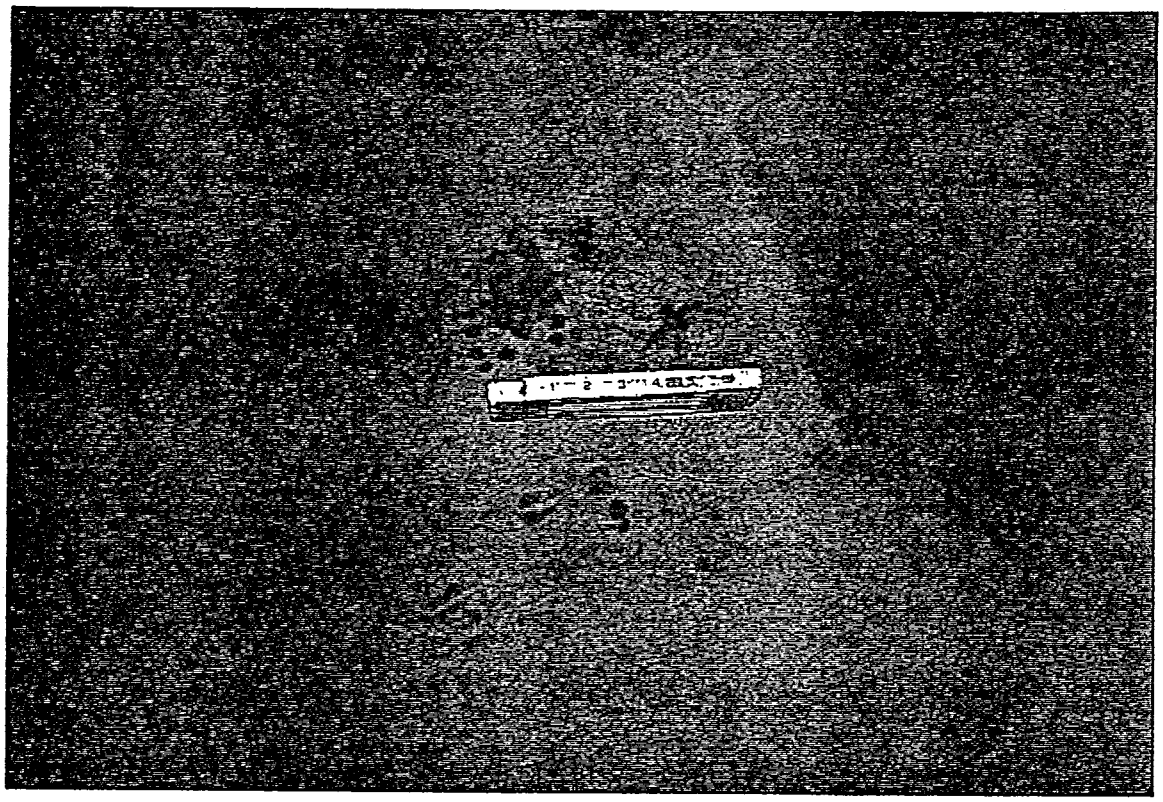
4. SWMU 3. THE EXPANSION JOINT AT THE FLOOR-COLUMN INTERFACE CAN BE SEEN. THE LEG FOR THE SOLVENT 140 STILL IS ON THE RIGHT.

Harding Lawson Associates
Engineering and
Environmental Services

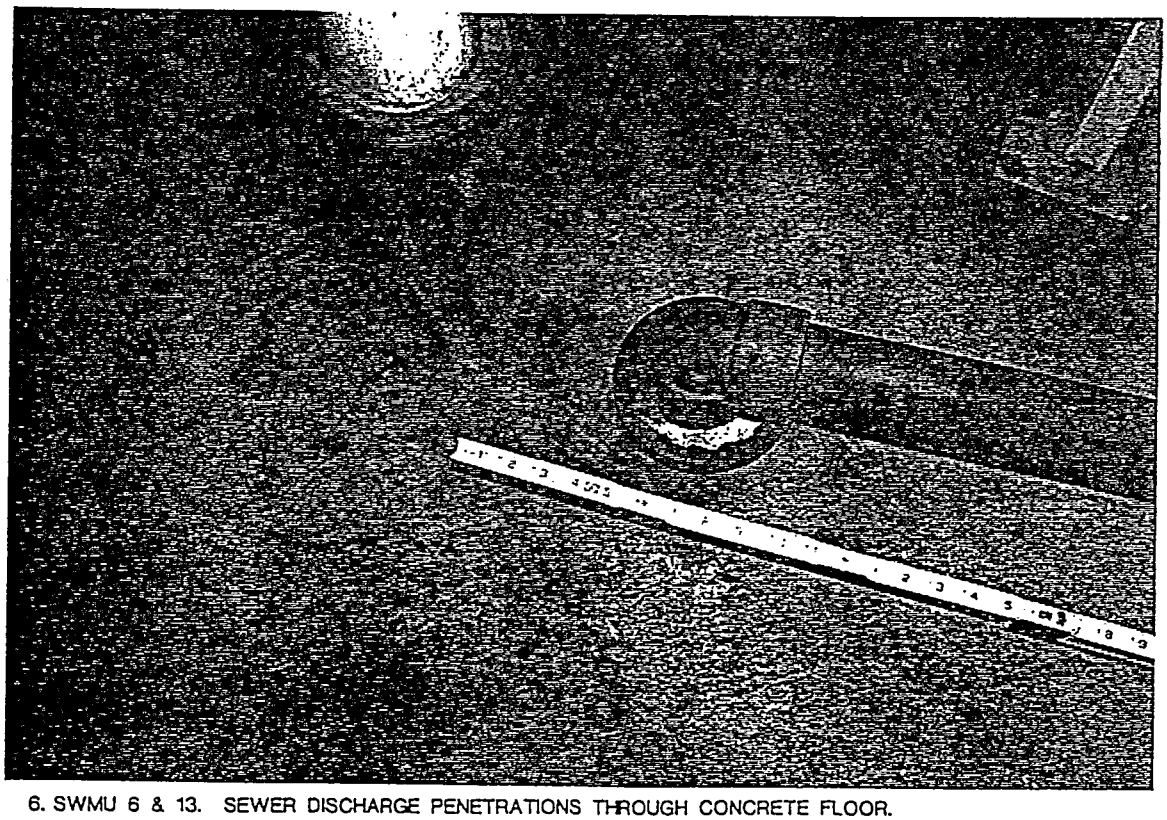
Photographs
Sauer–Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
2

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088.1.3		09/15/93	



5. SWMU 6 & 13. SMALL, MINOR CRACK IN CONCRETE FLOOR OF WASTEWATER TREATMENT ROOM.



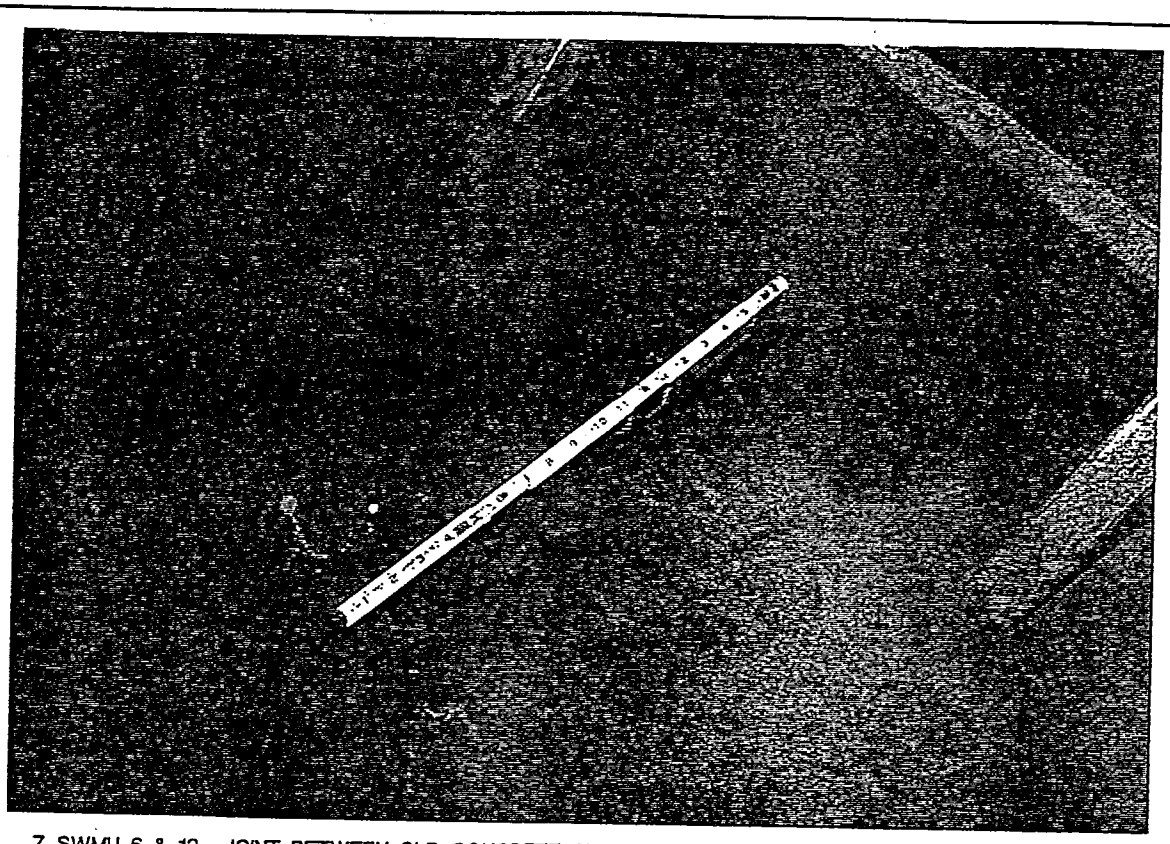
6. SWMU 6 & 13. SEWER DISCHARGE PENETRATIONS THROUGH CONCRETE FLOOR.

Harding Lawson Associates
Engineering and
Environmental Services

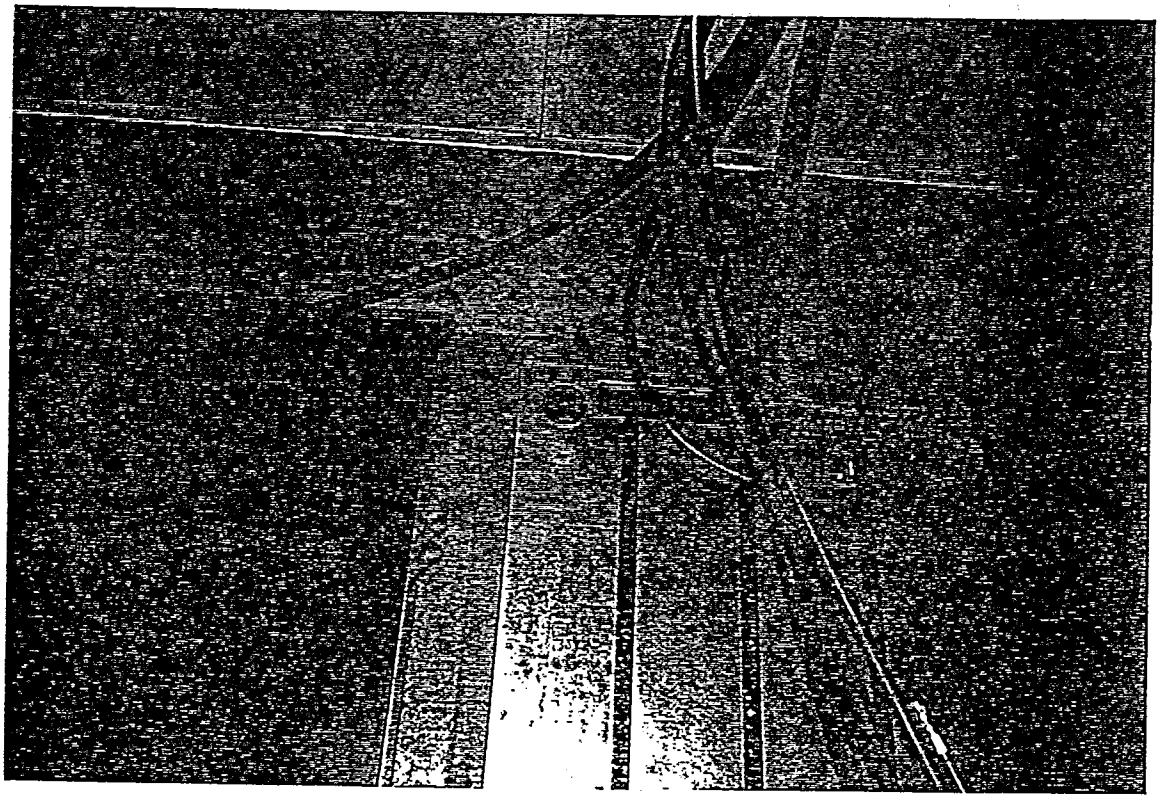
Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
3

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.3		09/15/93	



7. SWMU 6 & 13. JOINT BETWEEN OLD CONCRETE AND NEW CONCRETE IN WASTEWATER TREATMENT ROOM. NOTE THE TIGHTNESS OF THE JOINT.



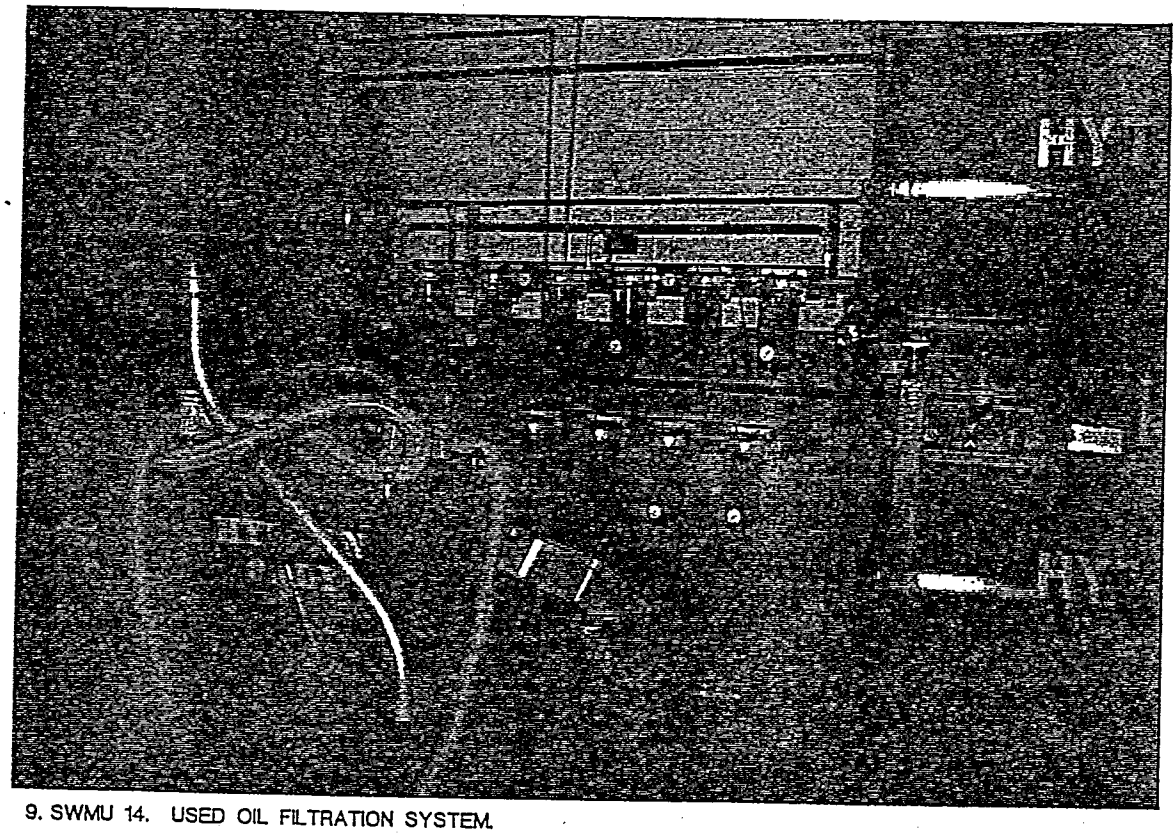
8. SWMU 12. USED OIL SUMP IN SOUND LAB. NOTE CAULKING AT WALL-FLOOR INTERFACE. CONCRETE SURFACE IS IN EXCELLENT CONDITION.

Harding Lawson Associates
Engineering and
Environmental Services

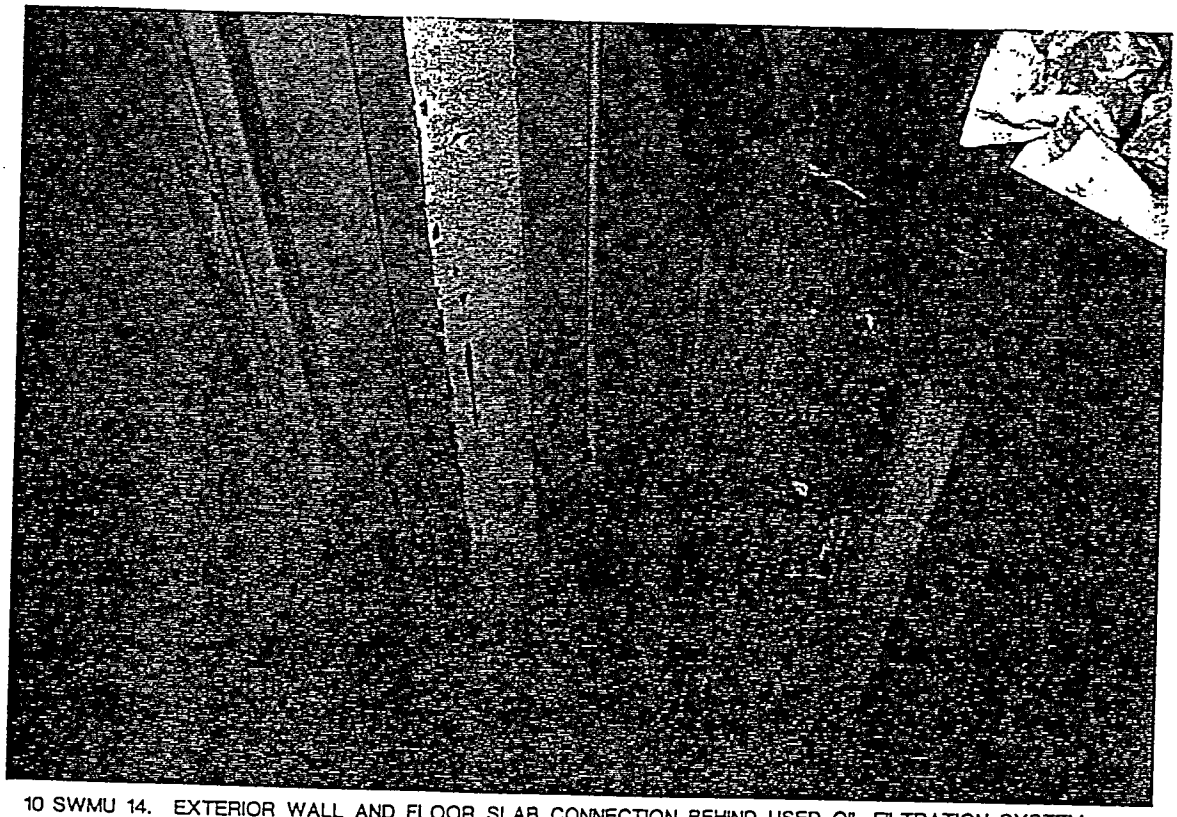
Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
4

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.3		09/15/93	



9. SWMU 14. USED OIL FILTRATION SYSTEM.



10 SWMU 14. EXTERIOR WALL AND FLOOR SLAB CONNECTION BEHIND USED OIL FILTRATION SYSTEM. YELLOW METAL IS THE JAMB FOR AN EXTERIOR DOOR.

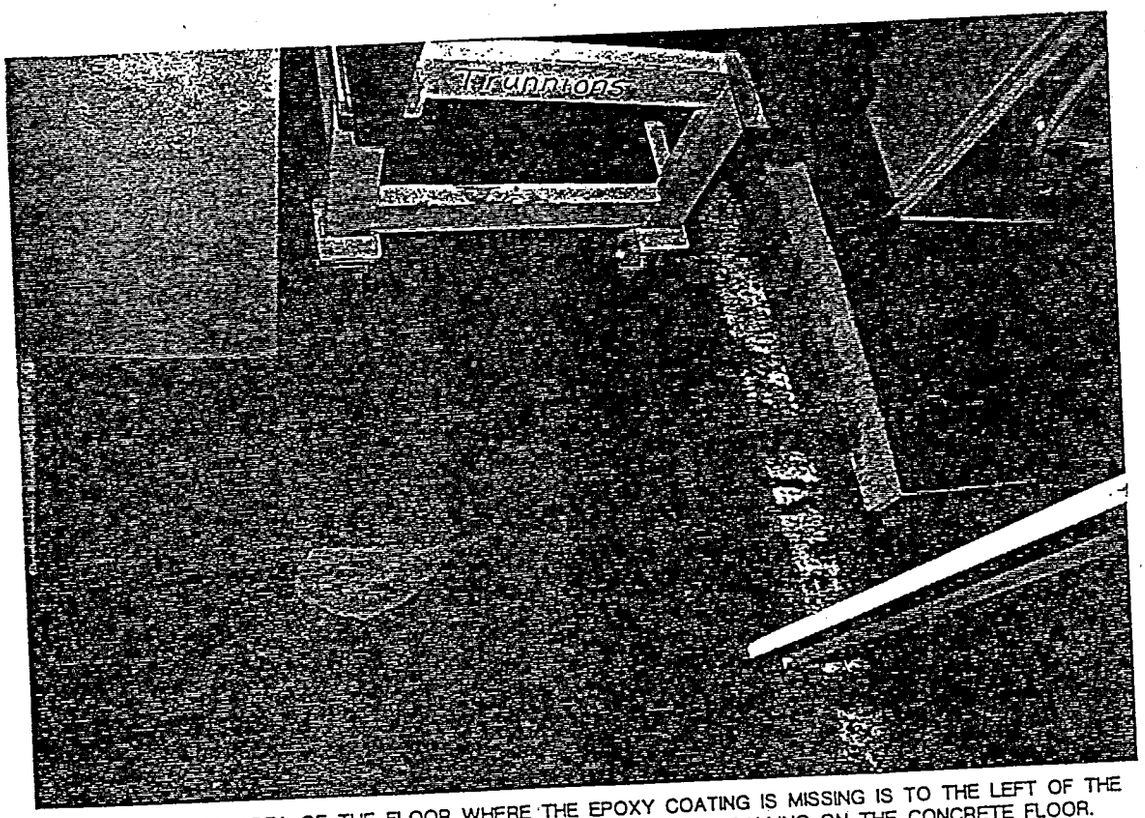
Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
5

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088.1.3		09/15/93	

11. SWMU 15. COLUMN AND FLOOR EXPANSION JOINT. THE EXPANSION JOINT IS PROTECTED BY THE EPOXY COATING.



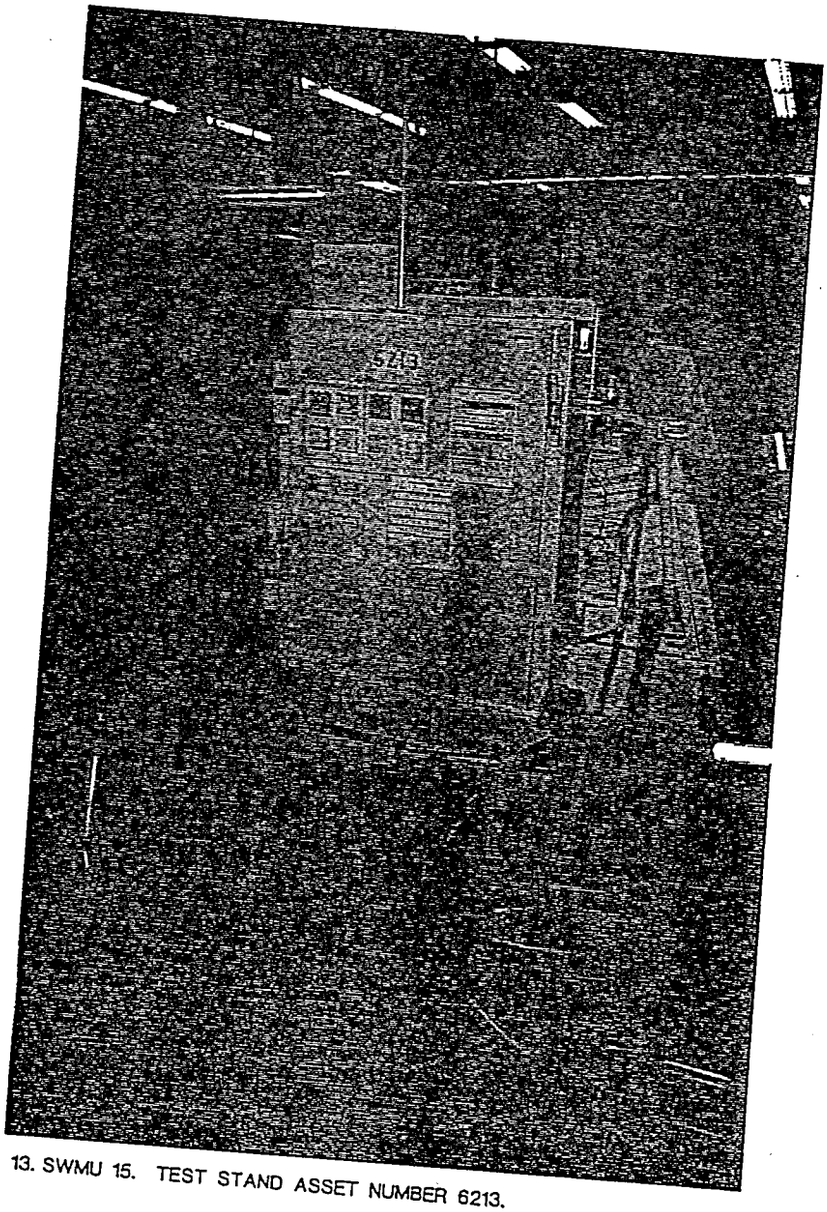
12. SWMU 15. AN AREA OF THE FLOOR WHERE THE EPOXY COATING IS MISSING IS TO THE LEFT OF THE OIL COLLECTION PAN. NOTE THE ABSENCE OF CRACKING OR SPALLING ON THE CONCRETE FLOOR.

Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
6

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.3		09/15/93	



13. SWMU 15. TEST STAND ASSET NUMBER 6213.

Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
7

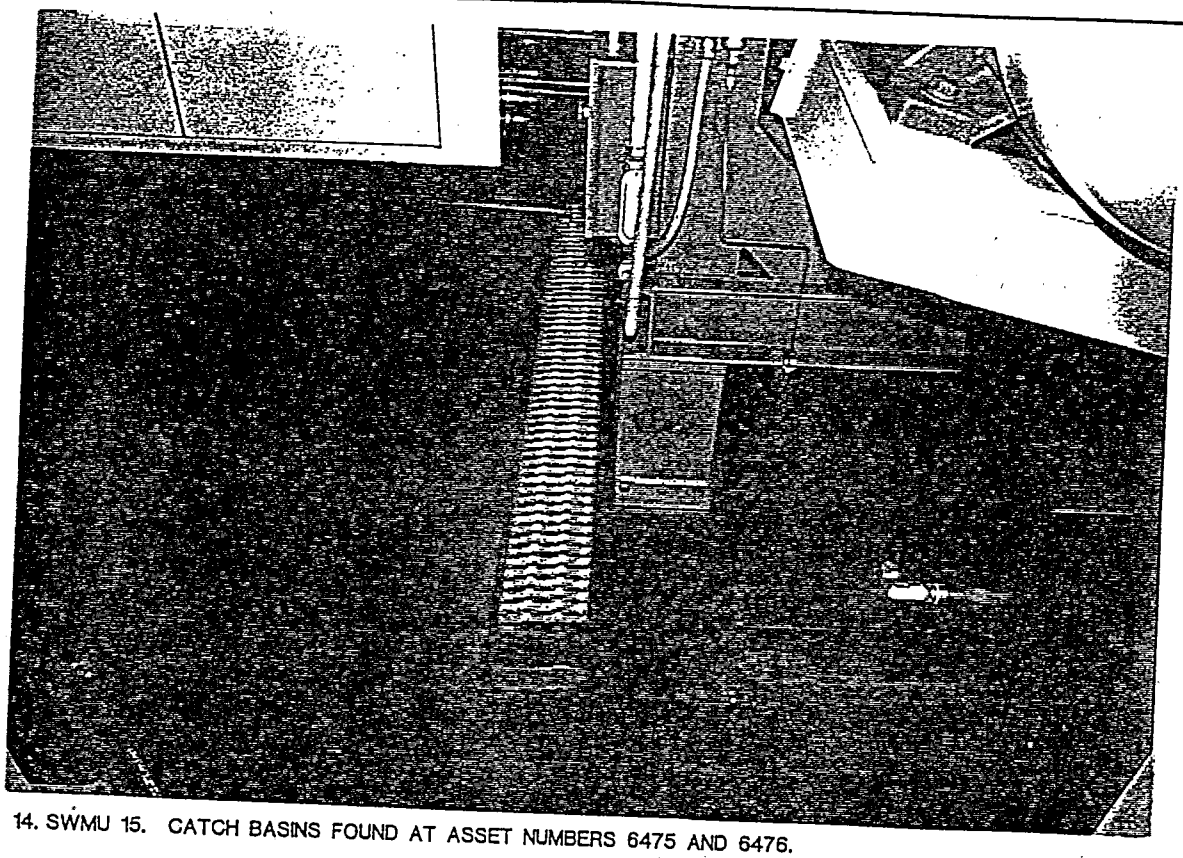
DRAWN
EWS

PROJECT NUMBER
23088.1.3

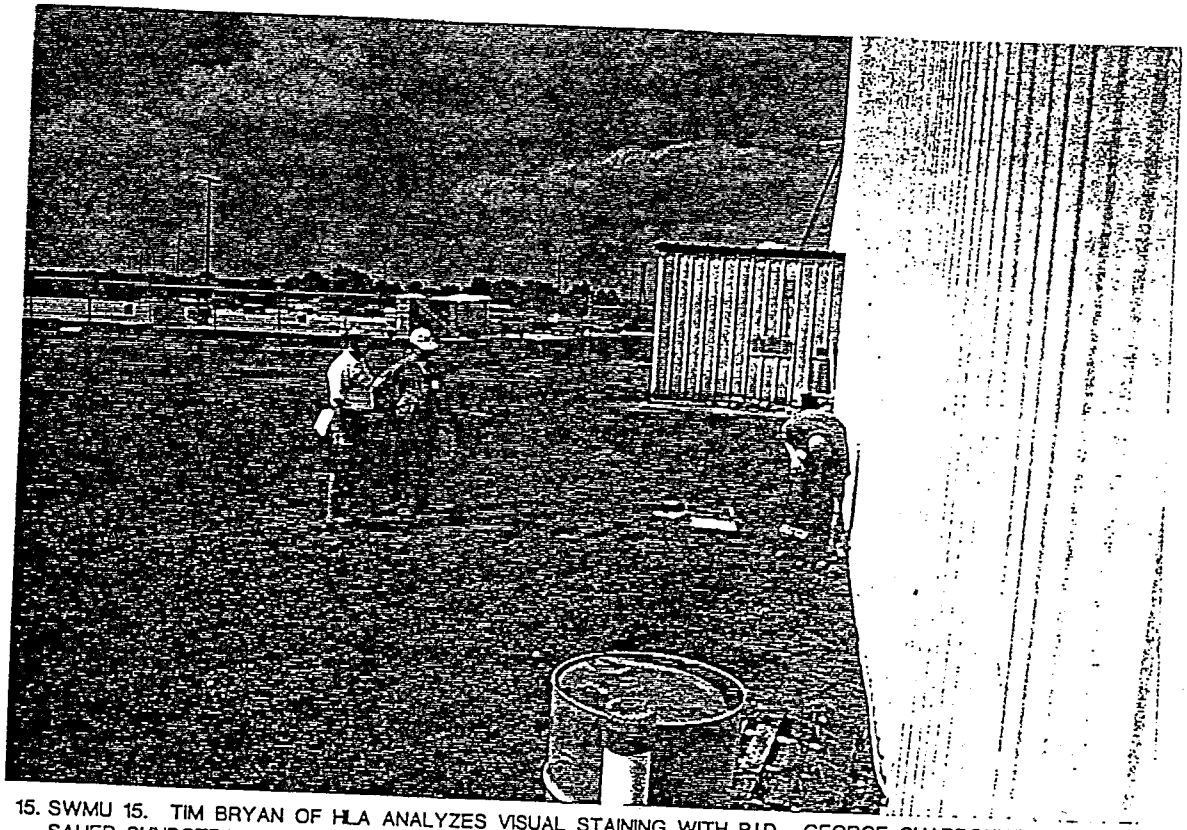
APPROVED

DATE
09/15/93

REVISED DATE



14. SWMU 15. CATCH BASINS FOUND AT ASSET NUMBERS 6475 AND 6476.



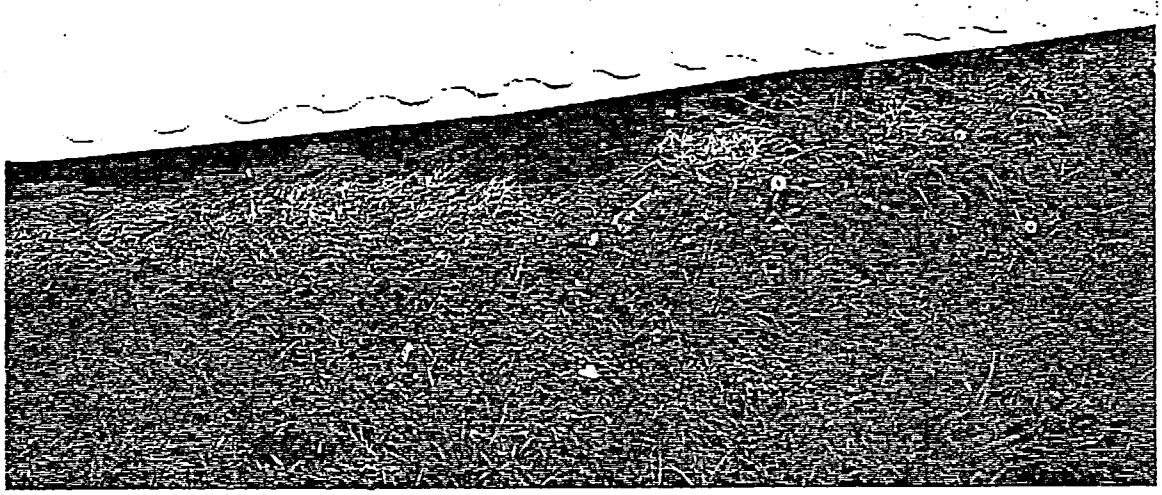
15. SWMU 15. TIM BRYAN OF HLA ANALYZES VISUAL STAINING WITH P.I.D. GEORGE CHARBONNEAU OF SAUER-SUNDSTRAND AND STEVE ANDERSON OF HLA ARE OBSERVING.

Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
8

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088.1.3		09/15/93	



16. SWMU 15. STAINING OUTSIDE OF SWMU 15, ASSET NUMBER 6476.

Harding Lawson Associates
Engineering and
Environmental Services

Photographs
Sauer-Sundstrand Facility
2800 East 13th Street
Ames, Iowa 50010

FIGURE
9

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.3		09/15/93	

APPENDIX G

SOIL BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS (MORE THAN HALF IS LARGER THAN No. 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOILS (MORE THAN HALF IS SMALLER THAN No. 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT 50% OR LESS)		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50%)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

- ⊠ – Bulk or classification sample
- ■ – Sample preserved for possible laboratory analysis
- ▨ – Hydropunch sample
- I – Core sample
- ▽ – First-encountered groundwater level
- ▼ – Static groundwater level
- Blows/ft – Blows required to drive sampler 12 inches with a 140-pound hammer falling 30 inches. Blow counts for S&H samplers are converted to approximate "equivalent" SPT N values (N = 0.5 X S&H blows per foot). P = Push
- (10YR 4/4) – Munsell soil color 1990 edition
- PID – Photoionization Detector reading (10.2-electron-volt lamp, calibrated using an isobutylene standard)
- OVA – Organic Vapor Analyzer (flame ionization detector) calibrated using a methane standard
- * – Sample submitted for chemical analysis

KEY TO BORING LOG

Harding Lawson Associates
Engineering and Environmental Services

Soil Classification Chart & Key to Test Data
Hydro-Transmission Plant
2800 East 13th Street
Ames, Iowa 50010

FIGURE G-1

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
EWS	23088,1.16	T. Bryan	06/95	

Boring No. SOUTH-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/9/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		BLACK SILTY CLAY (CL) [FILL] slightly moist, soft, some organics and sand, upper 10-inches roots throughout light brown layers at 1.2, 2.3 and 3.2 feet, some gravel
	0.0			
	0.0			
	0.0			LIGHT GRAY SANDY CLAY (CL) moist, soft, some gravel
	0.0	5		LIGHT BROWN CLAYEY SAND/SANDY CLAY (SC/CL) moist, soft, plastic wet at 6.0 feet
	0.0			
*	0.0		■	
	0.0			
	0.0			
	0.0	10		LIGHT BROWN SANDY CLAY/CLAYEY SAND (CL/SC) moist, soft, iron oxide staining throughout, trace gravel sub-angular
	0.0			
	0.0			
	0.0			
*	0.0	15	■	color and texture same as above
	0.0			DARK GRAY SILTY CLAY (CL) moist, medium stiff, trace gravel, iron oxide staining
	0.0			DARK GRAY SILTY CLAY (CL) moist, medium stiff, trace gravel, rounded, sample is plastic, no iron oxide staining present
	0.0			
	0.0	20		DARK GRAY SILTY CLAY (CL) moist, very stiff to hard, trace gravel sub-rounded to rounded
	0.0			
	0.0			CLAYEY SAND/SILTY SAND (SC/SM)
	0.0			DARK GRAY SILTY CLAY (CL) moist, very stiff to hard, trace gravel sub-rounded to rounded
	0.0	25		CLAYEY SAND/SILT SAND (SC/SM)
	0.0			DARK GRAY SILTY CLAY (CL) moist, stiff, plastic, some gravel rounded to sub-rounded
	0.0			
	0.0			
	0.0			
	0.0	30		
	0.0			
	0.0			
	0.0			
	0.0	35		Boring terminated at 35.0 feet. Groundwater encountered at 6.0 feet during drilling. Boring backfilled with cement-bentonite grout on 9-9-93.
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-101

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE
G-2

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/10/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		BLACK SANDY SILT (ML) [FILL] topsoil, moist, soft, some organics (roots throughout)
	0.0			BLACK SANDY SILT (ML) [FILL] moist, soft, some sand and gravel, layers of brown silty clay
	0.0			
	0.0			
		5		YELLOWISH ORANGE SANDY CLAY (CL) moist, soft to stiff, very plastic, some gravel sub-rounded
	0.0			
	0.0			
	0.0			
	0.0			
*	0.0	10	■	∇
	0.0			LIGHT BROWN SANDY CLAY (CL) soft, moist, very plastic, some gravel, iron oxide staining primarily along small (<2-inches) horizontal cracks and around some gravel
	0.0			
	0.0			
	0.0			
		15		color and texture same as above
	0.0			
	0.0			
	0.0			
	0.0			DARK GRAY SILTY CLAY (CL) moist, stiff, some iron oxide staining
*		20	■	
	0.0			CLAYEY SAND/SILTY SAND (SC/SM) wet, loose to medium dense
	0.0			RED BROWN SAND (SW) wet, well graded
	0.0			DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML) moist, stiff, very low plasticity
	0.0			
	0.0	25		DARK GRAY SILTY SAND/CLAYEY SAND (SM/SC) moist, loose to medium dense
	0.0			DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML) moist, very stiff, very low plasticity, trace gravel (<1/4-inch) sub-rounded
	0.0			
	0.0			
	0.0	30		
	0.0			color and texture same as above
	0.0			
	0.0			
	0.0			
		35		Boring terminated at 35.0 feet. Groundwater encountered at 9.75 feet during drilling. Boring backfilled with cement-bentonite grout on 9-10-93.
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-102

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-3

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-103

Equipment Rebuilt Mobil B40

Elevation NA Date 9/10/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		DARK GRAY CLAYEY SILT (ML) [FILL] moist, medium stiff, low plasticity, some organics in upper 1 ft, roots throughout
	0.0			
	0.0			LIGHT BROWN SILTY CLAY/CLAYEY SILT (CL/ML)
	0.0			DARK GRAY SILTY CLAY (CL) moist, stiff, plastic
	0.0	5		
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	10		
	0.0			LIGHT GRAY SANDY CLAY (CL) moist, soft, very plastic, some iron oxide staining, some black staining
	0.0			
*	0.0		■	LIGHT GRAY CLAYEY SAND (SC) moist, loose, iron oxide staining
	0.0	15		
	0.0			
	0.0			LIGHT GRAY SILTY CLAY (CL) moist, stiff, low plasticity, trace gravel sub-rounded, iron oxide staining
	0.0			
	0.0	20		
	0.0			
*	0.0		■	LIGHT GRAY SILTY CLAY (CL) moist, stiff, trace sub-rounded gravel, low plasticity, iron oxide staining
	0.0			LIGHT GRAY CLAYEY SAND (SC) moist, medium loose
	0.0	25		DARK GRAY CLAYEY SILT/SILTY CLAY (ML/CL) moist, very stiff, low plasticity, trace gravel (<1-inch), rounded to sub-rounded
	0.0			
	0.0			
	0.0			
	0.0	30		
	0.0			DARK GRAY SILTY CLAY (CL) moist, very stiff, plastic, trace gravel sub-rounded (<1-inch)
	0.0			
	0.0			
	0.0	35		Boring terminated at 35.0 feet. No groundwater encountered during drilling. Boring backfilled with cement-bentonite grout on 9-10-93.
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-103

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-4

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-104

Equipment Rebuilt Mobil B40

Elevation NA Date 9/13/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
		0		BLACK CLAYEY SILT (ML) [FILL] moist, soft, some organics (roots throughout)
	0.0			BROWN SILTY CLAY (CL) [FILL] moist, soft, some sand, plastic
	0.0			
	0.0			
	0.0			BLACK SILTY CLAY (CL) moist, soft, plastic
	0.0	5		
	0.0			grades to light brown
*	0.0			BROWN CLAYEY SAND (SC) wet, loose
	0.0			
	0.0			BROWN SANDY CLAY (CL) wet, soft, very plastic
	0.0	10		
	0.0			YELLOWISH ORANGE SANDY CLAY (CL) moist to wet, soft, very plastic, trace gravel sub-rounded
	0.0			
	0.0			
	0.0			
	0.0	15		YELLOWISH ORANGE SANDY CLAY (CL) moist, soft, very plastic, trace gravel sub-rounded
	0.0			
	0.0			DARK GRAY SILTY CLAY (CL) moist, stiff (stiffer at base), low plasticity
	0.0			
	0.0	20		DARK GRAY SANDY CLAY (CL) moist, medium stiff, plastic
	0.0			
	0.0			
*	0.0			
	0.0			
	0.0	25		DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML) moist, medium stiff, low plasticity
	0.0			
	0.0			poor recovery, cobble in sample
	0.0	30		
	0.0			color and texture same as above
	0.0			WELL GRADED SAND (SW) wet, loose
	0.0			DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML) moist, stiff, low plasticity
	0.0	35		Boring terminated at 35.0 feet. Groundwater encountered at 7.7 feet. Boring backfilled with cement-bentonite grout on 9-13-93.
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-104

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1)

FIGURE G-5

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-105

Equipment Rebuilt Mobil B40

Elevation NA Date 9/11/93

Lab Test	PID (ppm)	Depth ft Sample	Description
	0.0	0	DARK GRAY TO LIGHT BROWN CLAYEY SILT/SILTY CLAY (ML/CL) moist, soft, some sand, some organics in the upper 1.0 foot (roots throughout)
	0.0		
	0.0		
	0.0		BLACK SILTY CLAY (CL) moist, soft, plastic
	0.0	5	DARK TO LIGHT GRAY SILTY CLAY (CL) moist, soft, very plastic
	0.0		
*	0.0		CLAYEY SAND/SILTY SAND (SC/SM) moist to wet, loose
	0.0		LIGHT GRAY SANDY CLAY (CL) moist, very soft to soft, very plastic, iron oxide staining throughout, black (manganese) staining 7.5 to 9.0 feet, mottled
	0.0		
	0.0	10	
	0.0		YELLOWISH ORANGE CLAYEY SAND/SANDY CLAY (SC/SM) moist, soft, very plastic, iron oxide staining
	0.0		
	0.0		
	0.0	15	LIGHT BROWN SILTY CLAY (CL) moist, soft, plastic, some sand, iron oxide staining color changing to light gray
	0.0		
	0.0		
	0.0		iron oxide staining absent below 18.0 feet
	0.0		
*	0.0	20	RED-BROWN SILTY SAND/CLAYEY SAND (SC/SC)
	0.0		BROWN SILTY SAND/CLAYEY SAND (SM/SC) wet, loose, no plasticity, sand is fine grained, poorly graded
			driller notes heaving sand
	0.0	25	DARK GRAY SILTY CLAY (CL) moist, stiff, plastic, trace gravel sub-rounded, sand
	0.0		
	0.0		driller noted no heaving
		30	
	0.0		DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML) moist, very stiff, low plasticity, trace gravel sub-rounded
	0.0		
	0.0		
	0.0	35	Boring terminated at 35.0 feet. Groundwater encountered at 19.1 feet during drilling. Boring backfilled with cement-bentonite grout on 9-11-93.
		40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-105

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1)

FIGURE G-6

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-106

Equipment Rebuilt Mobil B40

Elevation NA Date 9/11/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
		0		BLACK CLAYEY SILT (ML) moist, soft, some organics (roots throughout)
	0.0			DARK GRAY TO BLACK SILTY CLAY (CL) moist, soft, plastic, some sand
	0.0			LIGHT GRAY SILTY CLAY (CL) moist, very soft, very plastic, iron oxide mottle, trace organics (roots)
	0.0			
	0.0	5		YELLOWISH ORANGE SILTY CLAY (CL) moist, very soft, very plastic, trace gravel sub-rounded
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	10		color and texture same as above, iron oxide staining
	0.0			
	0.0			
*	0.0			LIGHT BROWN SILTY SAND/CLAYEY SAND (SM/SC) wet, loose
	0.0	15		DARK GRAY CLAYEY SILT/SILTY CLAY (ML/CL) moist, very stiff, trace gravel sub-rounded
	0.0			
	0.0			
	0.0			
	0.0	20		
*	0.0			DARK GRAY SILTY SAND/CLAYEY SAND (SM/SC) wet, loose
	0.0			DARK GRAY SILTY CLAY (CL) moist, very stiff, plastic, trace gravel sub-rounded
	0.0			
	0.0			
	0.0	25		poor recovery, color and texture same as above
				Boring terminated at 26.0 feet. Groundwater encountered at 13.7 feet during drilling. Boring backfilled with cement-bentonite grout on 9-11-93.
		30		
		35		
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-106

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-7

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-107

Equipment Rebuilt Mobil B40

Elevation NA Date 9/17/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		DARK GRAY CLAYEY SILT (ML) moist, soft, low plasticity
	0.0			
	0.0			
	0.0			LIGHT GRAY FAT CLAY (CH) moist, soft, very plastic, some sand
*	0.0	5		LIGHT GRAY CLAYEY SAND (SC) moist, loose, plastic
	0.0			LIGHT GRAY FAT SANDY CLAY (CL) moist, soft, very plastic, some sand stiffers at 8.0 feet
	0.0			
	0.0			
	0.0	10		
	0.0			LIGHT GRAY FAT SANDY CLAY (CH) moist
	0.0			
	0.0			LIGHT GRAY CLAYEY SAND (SC) moist to wet, loose
	0.0			DARK GRAY LEAN CLAY (CL) slightly moist, very stiff, low plasticity, tough
	0.0	15		
	0.0			
*	0.0			DARK GRAY WELL GRADED SAND (SW) wet, loose
	0.0			
	0.0			DARK GRAY LEAN CLAY (CL) slightly moist, very stiff, low plasticity, medium toughness, trace gravel sub-rounded
	0.0	20		
	0.0			
	0.0			
	0.0			
	0.0			color and texture same as above
	0.0	25		
	0.0			
	0.0			
	0.0			
	0.0			DARK GRAY CLAYEY SAND (SC) wet, loose, fine to medium sand
		30		DARK GRAY LEAN CLAY (CL) slightly moist, very stiff, low plasticity, medium toughness, trace gravel sub-rounded
		35		
		40		

Boring terminated at 30.0 feet.
Groundwater encountered at 13.9 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-17-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-107

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE **G-8**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-108

Equipment Rebuilt Mobil B40

Elevation NA Date 9/21/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		DARK GRAY FAT CLAY (CH) moist, soft, plastic, low toughness
	0.0			
	0.0			LIGHT GRAY FAT CLAY (CH) moist, soft plastic, some sand, red mottle (iron oxide) staining
	0.0			
	0.0	5		color and texture same as above
	0.0			
	0.0			
	0.0			
*	0.0			
	0.0	10		
	0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, stiff, very plastic, low to medium toughness
	0.0			
	0.0			
*	0.0	15		BROWN POORLY GRADED SAND (SP) wet, loose, sand is fine to medium grained
	0.0			
	0.0			OLIVE GRAY LEAN CLAY (CL) moist, stiff, medium to high toughness
	0.0			
	0.0			OLIVE GRAY CLAYEY SAND (SC) moist to wet, medium dense, sand is fine grained
	0.0	20		
	0.0			
	0.0			OLIVE GRAY SAND (SC) wet, loose, sand is fine
	0.0			OLIVE GRAY CLAYEY SAND (SC) wet, medium dense, no plasticity
	0.0	25		OLIVE GRAY SAND (SC) wet, loose, sand is fine
	0.0			OLIVE GRAY LEAN CLAY (CL) moist, stiff, plastic medium to high toughness, trace gravel sub-rounded
	0.0	30		Boring terminated at 30.0 feet. Groundwater encountered at 8.7 feet during drilling. Boring backfilled with cement-bentonite grout on 9-21-93.
		35		
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-108

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-9

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-109

Equipment Rebuilt Mobil B40

Elevation NA Date 9/21/93

Lab Test	PID (ppm)	Depth ft Sample	
	0.0	0	BLACK FAT CLAY (CH) moist, soft, very plastic, some organics upper 1 foot
	0.0		
	0.0		LIGHT GRAY FAT CLAY (CH) moist, soft, very plastic, some sand, iron oxide staining
	0.0		
	0.0	5	
	0.0		RED BROWN SAND (SP) wet, loose, coarse grain
	0.0		YELLOWISH ORANGE FAT CLAY (CH) moist, soft, very plastic, low toughness
	0.0		
	0.0	10	
	0.0		YELLOWISH ORANGE LEAN CLAY (CL) moist, stiff, plastic, medium toughness, iron oxidation throughout
	0.0		blocky texture 13 to 14 feet
	0.0		gray at base
	0.0	15	
	0.0		BROWN WELL GRADED SAND (SW) wet, loose
	0.0		
*	0.0		DARK GRAY LEAN CLAY (CL) moist, hard, tough, plastic, trace sub-rounded gravel
	0.0		
	0.0	20	DARK GRAY SAND (SW) wet, loose, fine sand
*	0.0		
	0.0	25	DARK GRAY FAT CLAY (CH) moist, soft, plastic, trace gravel sub-rounded
		30	Boring terminated at 30.0 feet. Groundwater encountered at 12.7 feet during drilling. Boring backfilled with cement-bentonite grout on 9-21-93.
		35	
		40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-109

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE **G-10**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-110

Equipment Rebuilt Mobil B40

Elevation NA Date 9/21/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
		0		BLACK CLAYEY SILT (ML) moist, soft, low plasticity, low toughness
	0.0			YELLOWISH BROWN FAT CLAY (CH) moist, soft, high plasticity, low toughness, trace gravel, sub-rounded, some sand
	0.0			
	0.0			high dry strength
	0.0	5		color and texture same as above
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	10		
	0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, medium stiff, plastic, iron oxide staining throughout, some sand
	0.0			
	0.0			DARK GRAY FAT CLAY (CH) moist, medium stiff, plastic
	0.0	15		
	0.0			
*	0.0			DARK GRAY SAND (SP) slightly moist, loose
	0.0			DARK GRAY LEAN CLAY (CL) slightly moist, stiff, low plasticity,low toughness, some fine sand, trace gravel sub-rounded, high dry strength
	0.0			
	0.0	20		
	0.0			
	0.0			
	0.0			
	0.0	25		color and texture same as above
	0.0			
	0.0			
	0.0			
*	0.0	30		Boring terminated at 30.0 feet. Groundwater not encountered during drilling. Boring backfilled with cement-bentonite grout on 9-21-93.
		35		
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-110

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-11

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-111

Equipment Rebuilt Mobil B40

Elevation NA Date 9/16/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		DARK GRAY FAT CLAY (CH) moist, soft, plastic, some organics (roots throughout)
	0.0			LIGHT GRAY FAT CLAY (CH) moist, soft, plastic
*	0.0			LIGHT GRAY CLAYEY SAND/SILTY SAND (SC/SM) moist to wet, loose
	0.0	5		YELLOWISH ORANGE FAT CLAY (CH) moist, very soft black staining 5 to 7 feet
	0.0			
	0.0			BROWN SANDY CLAY/CLAYEY SAND (SC/SM) moist, loose, plastic becoming stiff at 8.0 feet
	0.0			
	0.0			
	0.0	10		
	0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, soft, very plastic, some sand, iron oxide staining, low toughness
	0.0			
	0.0			
	0.0			YELLOWISH ORANGE LEAN CLAY (CL) moist, stiff
	0.0	15		GRAY LEAN CLAY (CL) moist, sitff, some sand
	0.0			
*	0.0			GRAY FINE SAND (SP) wet, loose, some fines
		20		
	0.0	25		DARK GRAY LEAN CLAY (CL) slightly moist, stiff to hard, tough
	0.0			
	0.0			
	0.0			
	0.0			
	0.0			
		30		Boring terminated at 30.0 feet. Groundwater encountered at 5.4 feet during drilling. Boring backfilled with cement-bentonite grout on 9-16-93.
		35		
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-111

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-12

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-112

Equipment Rebuilt Mobil B40

Elevation NA Date 9/16/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
	0.0	0		DARK GRAY LEAN CLAY (CL) moist, soft, some plasticity, some organics (roots throughout)
	0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, soft, very plastic, some sand
	0.0			
	0.0	5		YELLOWISH ORANGE FAT CLAY (CH) moist, soft, very plastic, some sand, iron oxide staining associated with some sand
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	10		
	0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, soft to medium stiff, plastic
	0.0			
	0.0			
*	0.0			
		15		
				DARK GRAY FAT CLAY (CH) moist, soft to medium stiff, plastic
	0.0			
*	0.0			DARK GRAY SILTY SAND/CLAYEY SAND (SM/SC) wet, loose
	0.0	20		DARK GRAY LEAN CLAY (CL) moist, stiff to hard, low plasticity, some sand
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	25		
				color and texture same as above
	0.0			
	0.0			
	0.0			
		30		Boring terminated at 30.0 feet. Groundwater encountered at 19.6 feet during drilling. Boring backfilled with cement-bentonite grout on 9-16-93.
		35		
		40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-112

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-13

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-113

Equipment Rebuilt Mobil B40

Elevation NA Date 9/16/93

Lab Test	PID (ppm)	Depth ft	Sample	Description
*	0.1	0		DARK GRAY FAT CLAY (CH) moist, soft, very plastic, some organics (roots throughout)
	0.2			LIGHT GRAY FAT CLAY (CH) moist, soft, very plastic, some sand, red mottle (iron oxide staining)
	0.0			
	0.0	5		LIGHT GRAY SANDY FAT CLAY (CH) moist, soft, very plastic, red (iron oxide) mottle
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	10		
	0.0			color and texture same as above
	0.0			
	0.0			DARK GRAY LEAN CLAY (CL) moist, stiff, tough, low plasticity
*	0.0			BROWN WELL GRADED SAND (SP) wet, loose
	0.0	15		DARK GRAY LEAN CLAY (CL) moist, stiff, tough, low plasticity
	0.0			
	0.0			
	0.0			
	0.0			
	0.0	20		DARK GRAY CLAYEY SAND (SC) wet
	0.0			DARK GRAY LEAN CLAY (CL)
	0.0			DARK GRAY CLAYEY SAND (SC) wet
	0.0			DARK GRAY LEAN CLAY (CL)
	0.0			DARK GRAY CLAYEY SAND (SC) wet, loose
	0.0	25		DARK GRAY LEAN CLAY (CL)
	0.0			WELL GRADED SAND (SC) wet, loose
	0.0			DARK GRAY LEAN CLAY (CL) moist, stiff to hard, low plasticity, tough
	0.0			DARK GRAY CLAYEY SAND (SC) wet, loose
	0.0	30		DARK GRAY LEAN CLAY (CL)
		35		
		40		

Boring terminated at 30.0 feet.
Groundwater encountered at 14.3 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-16-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-113

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-14

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SOUTH-114

Equipment Rebuilt Mobil B40

Elevation NA Date 9/21/93

Lab Test	PID (ppm)	Depth ft Sample	Description
	0.0	0	BLACK FAT CLAY (CH) moist, soft, very plastic, some organics (roots) upper 6-inches
	0.0		LIGHT GRAY FAT CLAY (CH) moist, soft, very plastic, iron oxide staining throughout
	0.0		
	0.0		black staining at 4.5 feet
	0.0	5	YELLOWISH ORANGE FAT CLAY (CH) moist, soft, very plastic, some sand, trace gravel sub-rounded
	0.0		
	0.0		
	0.0		
	0.0	10	
	0.0		color and texture same as above
*	0.0		DARK GRAY FAT CLAY (CH) moist, soft to medium stiff, very plastic, some sand
	0.0		
	0.0		
	0.0	15	DARK GRAY POORLY GRADED SAND (SP) wet, loose, fine grained sand
	0.0		NO RECOVERY
		20	DARK GRAY LEAN CLAY (CL) moist, medium stiff, some fine sand
	0.0		
	0.0		
*	0.0		DARK GRAY POORLY GRADED SAND (SP) moist, loose, fine grained sand, heaving sand
	0.0	25	
		30	Boring terminated at 30.0 feet. Groundwater encountered at 15.0 feet during drilling. Boring backfilled with cement-bentonite grout on 9-21-93.
		35	
		40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SOUTH-114

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-15

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. BACK-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/9/93

Blows/ft	Lab Test	PID (ppm)	Depth ft	Sample
4		0.0	0	
		0.0		
2		0.0		
		0.0		
4		0.0	5	
		0.0		
7	*	0.0		
		0.0		
6		0.0		
		0.0	10	
4	*	0.0		
		0.0		
8		0.0		
		0.0		
4		0.0	15	
			20	
			25	
			30	
			35	
			40	

BROWN SILTY CLAY (CL)
slightly moist, soft, plastic, some organics (roots throughout)

LIGHT RED-BROWN SILTY CLAY (CL)
moist, soft, very plastic, trace sand and gravel sub-rounded

RED-BROWN SILTY CLAY (CL)
moist, soft, very plastic, trace sand and gravel sub-rounded
color and texture same as above, iron oxide staining around gravel, clay color grades to dark gray lower 6-inches

DARK GRAY SILTY CLAY (CL)
moist, medium stiff, plastic, trace sand and gravel sub-rounded

color and texture same as above

color and texture same as above

NO RECOVERY 14 TO 16 FEET

Boring terminated at 16.0 feet.
No groundwater encountered during drilling.
Boring backfilled with cement-bentonite grout on 9-9-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring BACK-101

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-16

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. BACK-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/9/93

Blows/ft	Lab Test	PID (ppm)	Depth ft Sample	
4			0	DARK BROWN SILTY CLAY (CL) [FILL] moist, soft, trace sand, some organics (roots throughout), topsoil encountered obstruction at 8.0 inches
		0.0		NO RECOVERY 2.0 TO 4.0 FEET
4				BROWN CLAYEY SAND (SC) [FILL] moist, soft, some gravel, sub-rounded
		0.0		
		0.0	5	LIGHT BROWN SANDY CLAY/CLAYEY SAND (SC/CL) moist, soft, high plasticity, high dry strength color and texture same as above, some gravel and iron oxide staining on gravel
4	*	0.0		
		0.0		
		0.0		
5		0.0		
		0.0		
		0.0		
8		0.0		color and texture same as above, some gravel and iron oxide staining on gravel, grades to dark gray in lower 6-inches
		0.0	10	
		0.0		NO RECOVERY 10.0 TO 12.0 FEET
8		0.0		
		0.0		DARK GRAY CLAYEY SILT (ML) moist, stiff, trace sand and gravel sub-rounded, high dry strength
		0.0		
10	*	0.0		
		0.0		DARK GRAY CLAYEY SILT (ML) moist, stiff, trace sand and gravel sub-rounded
		0.0	15	
12		0.0		
		0.0		Boring terminated at 16.0 feet. No groundwater encountered during drilling. Boring backfilled with cement-bentonite grout on 9-9-93.
			20	
			25	
			30	
			35	
			40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring BACK-102

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-17

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU15-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/28/93

Blows/ft	Lab Test	PID (ppm)
4		0.0
		0.0
		0.0
1		0.0
	*	0.0
		0.0
2		0.0
		0.0
		0.0
4		0.0
		0.0
		0.0
5		0.0
		0.0
		0.0
3		0.0
		0.0
		0.0
4		0.0
		0.0
		0.0
3	*	0.0
		0.0
		0.0
		0.0

Depth ft / Sample

0

BLACK CLAYEY SILT (ML) [FILL]
moist, soft, some organics (roots throughout), topsoil, low dry strength

LIGHT BROWN POORLY GRADED SAND (SP) [FILL]
slightly moist, loose, fine grained sand
color and texture same as above

5

YELLOWISH ORANGE FAT CLAY (CH)
moist, soft, very plastic

YELLOW ORANGE/DARK GRAY LEAN CLAY (CL)
moist, medium stiff, mottled

10

DARK GRAY/YELLOW ORANGE LEAN CLAY (CL)
moist, soft, mottled

YELLOW ORANGE SANDY FAT CLAY (CH)
moist, soft, very plastic, low toughness

15

Boring terminated at 16.0 feet.
Groundwater encountered at 3.0 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-28-93.

20

25

30

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU15-101

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-18

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU15-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/28/93

Blows/ft	Lab Test	PID (ppm)
		0.0
2		0.0
		0.0
		0.0
2		0.0
		0.0
		0.0
2		0.0
		0.0
4	*	6.9
		7.6
		0.0
2		0.7
		0.7
		0.0
		5.8
3		3.8
		1.0
		0.5
3		1.8
		0.6
		0.5
4	*	0.5
		0.5
		0.4
6		0.5
		0.3
		0.4
6		0.3
		0.3

Depth ft / Sample

0

BLACK CLAYEY SILT (ML) [FILL]
moist, soft, some organics (roots throughout)

BROWN SAND (SP) [FILL]
moist, loose, poorly graded, medium to fine grain, sample wet at base

5

GRAY SAND (SP) [FILL]
moist, loose, poorly graded medium to fine grained

DARK GRAY SAND (SP) [FILL]
wet, loose, poorly graded, medium to fine grained
hydraulic oil odor

BROWN BLACK FAT CLAY (CH)
moist, soft, very plastic, mottled, some gravel angular

10

YELLOWISH ORANGE/DARK GRAY LEAN CLAY (CL)
moist, medium stiff, medium plasticity, mottled, some sand and gravel sub-rounded

YELLOWISH ORANGE/LIGHT GRAY FAT CLAY (CH)
moist, soft, plastic, mottled
color and texture same as above

15

YELLOWISH ORANGE FAT CLAY (CH)
moist, medium stiff, plastic, trace gravel sub-rounded

OLIVE GRAY LEAN CLAY (CL)
moist, medium stiff, medium plastic, tough, trace gravel sub-rounded

20

Boring terminated at 20.0 feet.
Groundwater encountered at 3.3 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-28-93.

25

30

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU15-102

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-19

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU3-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/29/93

Blows/ft	Lab Test	PID (ppm)
		0.0
2		0.0
		0.0
3		0.0
		0.0
2		1.2
	*	37.0
		18.5
2		0.0
		0.0
	*	0.0
3		0.0
		0.0
		0.0
3		0.0
		0.0
		0.0
4		0.5
		0.0
		0.0
6		0.0
		0.0

Depth ft / Sample

0

BROWN GRAVELLY SILT (ML) [FILL]
moist, loose, some sand and organics (roots throughout)

BROWN SILTY SAND/CLAYEY SAND (SM/SC) [FILL]
moist, loose, some gravel sub-rounded

5

YELLOWISH ORANGE FAT CLAY (CH)
moist, soft, very plastic, low toughness, trace gravel sub-rounded, some black mottle, sand at base of sample

LIGHT GRAY FAT CLAY (CH)
moist, soft, very plastic, low toughness, some sand, trace gravel sub-rounded

10

LIGHT GRAY/RED FAT CLAY (CH)
moist, soft, very plastic, low toughness, mottled, trace sand and gravel sub-rounded

YELLOW ORANGE FAT CLAY (CH)
moist, soft, plastic, low toughness, trace sand and gravel sub-rounded

15

YELLOW ORANGE LEAN CLAY (CL)
moist, medium stiff, plastic, tough, trace gravel sub-rounded

Boring terminated at 16.0 feet.
Groundwater encountered at 13.0 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-29-93.

20

25

30

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU3-101

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-20

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU3-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/29/93

Blows/ft	Lab Test	PID (ppm)
		0.0
		0.0
		0.0
6		0.0
		0.0
		0.0
15		0.0
		0.0
		0.0
13	*	999.0
		999.0
		18.0
5		3.4
		3.6
		40.0
4	*	0.0
		0.0
		0.3
8		0.0
		0.0
		0.0
13		0.0
		0.0
		0.0
		0.0

Depth ft / Sample: 0, 5, 10, 15, 20, 25, 30, 35, 40

ASPHALTIC CONCRETE

DARK RED BROWN CLAYEY SAND/SILTY SAND (SC/SM)
moist, loose, well graded fine to coarse sand, trace gravel angular

DARK RED BROWN SAND (SW)
moist, medium dense, fine to coarse sand, well graded, some gravel (angular), little fines

GREENISH GRAY SAND (SP)
wet, loose, petroleum odor

YELLOWISH ORANGE FAT CLAY (CH)
moist, soft, very plastic, medium toughness, trace gravel sub-rounded

CLAYEY SAND (SC)
moist, loose, fine to medium grain sand (~0.1 ft. thick)

YELLOWISH ORANGE FAT CLAY (CH)
moist, soft, very plastic, medium toughness, trace gravel sub-rounded

LIGHT BROWN LEAN CLAY (CL)
slightly moist, medium stiff, plastic, tough, trace gravel sub-rounded, iron oxidation along cracks

OLIVE GRAY LEAN CLAY (CL)
slightly moist, stiff, plastic, tough, trace gravel sub-rounded

Boring terminated at 16.0 feet.
Groundwater encountered at 7.5 feet.
Boring backfilled with cement-bentonite grout on 9-29-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU3-102

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1) FIGURE G-21

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU4A-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/27/93

Blows/ft	Lab Test	PID (ppm)	Depth ft	Sample	Description
		0.0	0		BLACK LIGHT BROWN CLAYEY SILT (ML) [FILL] moist, soft, low plasticity, high dry strength, mottled
4		0.0			
		0.0			
		0.0			YELLOW BROWN FAT CLAY (CH) moist, soft, high plasticity, some sand, iron oxidation (red) staining, high dry strength
3		0.0			
		0.0			
		0.0	5		BROWN SAND (SW) moist, very loose, well graded
2		0.0			
		0.0			
	*	0.0			wet
1		0.0			
		0.0			DARK GRAY SAND (SW) wet, very loose, fine to coarse grain sand, well graded, petroleum odor
		0.0			
1		0.0			
		0.0	10		YELLOWISH ORANGE FAT CLAY (CH) moist, very soft, very plastic
		0.0			
4		0.0			
		0.0			OLIVE GRAY FAT CLAY (CH) moist, soft, plastic, trace sand and gravel sub-rounded
		0.0			
4	*	0.0			
		0.0			
		0.0	15		stiff
10	*	0.0			
		0.0			
		0.0			

Boring terminated at 16.0 feet.
Groundwater encountered at 7.7 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-27-93.

20 25 30 35 40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU4A-101

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1)

FIGURE **G-22**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU4A-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/27/93

Blows/ft	Lab Test	PID (ppm)
		0.0
3		0.0
		0.0
2		0.0
		0.0
		0.0
2		0.0
		0.0
1	*	0.0
		0.0
		0.0
2		0.0
		0.0
1	*	0.3
		0.4
		0.2
7		0.2
		0.2
		0.0
19		0.0
		0.0

Depth ft / Sample

0

DARK BROWN/BLACK FAT CLAY (CH) [FILL]
moist, soft, plastic, mottled, some organics (roots), sand and sub-rounded gravel

BROWN SAND (SW)
moist to wet (at base), very loose sand, fine to coarse grain, well graded, petroleum odor

5

10

GRAY SAND (SW)
wet, very loose, sand fine to coarse grain, well graded, petroleum odor

15

LIGHT GRAY LEAN CLAY (CL)
moist, very stiff, medium plasticity

LIGHT GRAY POORLY GRADED SAND (SP)
moist, medium dense, fine grain sand

Boring terminated at 16.0 feet.
Groundwater encountered at 5.2 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-27-93.

20

25

30

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU4A-102

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-23

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16		6/95	

Boring No. SWMU4A-103

Equipment Rebuilt Mobil B40

Elevation NA Date 9/24/93

Blows/ft	Lab Test	PID (ppm)	Depth ft	Sample	Description
			0		BROWN TO BLACK CLAYEY SILT (ML) [FILL] moist, soft, low plasticity, low toughness, low dry strength, mottled
2		0.0			
		0.0			YELLOWISH ORANGE FAT CLAY (CH) moist, soft, high plasticity
3		0.0			
		0.0			
		0.0			SAND (SW) wet, very loose, fine to coarse grain, well graded, petroleum odor
2	*	0.0	5		
		0.0			
		0.0			
1		0.0			
		0.0			
		0.0			
1		0.0			
		0.0	10		DARK GRAY SAND (SW) well graded
		0.0			LIGHT GRAY LEAN CLAY (CL) moist, medium stiff, medium plasticity, tough
4		0.0			
		0.0			
		0.0			
7	*	0.0			
		0.0			
		0.0			
12	*		15		
			20		
			25		
			30		
			35		
			40		

Boring terminated at 16.0 feet.
Groundwater encountered at 4.0 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-24-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU4A-103

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-24

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU4A-104

Equipment Rebuilt Mobil B40

Elevation NA Date 9/24/93

Blows/ft	Lab Test	PID (ppm)	Depth ft Sample	
		0.0	0	BROWN CLAYEY SAND (SP) [FILL] moist, soft, some organics (roots)
3		0.0		
		0.0		BLACK FAT CLAY (CH) moist, soft, high plasticity, iron oxidation (red staining) in pockets
4		0.0		
		0.0		DARK GRAY TO LIGHT GRAY FAT CLAY (CH) moist, soft, high plasticity, mottled
		0.0	5	LIGHT GRAY SAND (SW) very moist to wet, loose, fine to coarse grain, well graded
6	*	0.0		
		0.0		LIGHT GRAY SAND (SW) wet, loose, fine to coarse grain, well graded, grades to dark gray at base, driller has problem with heaving sand
3		0.0		
		0.0		
6		0.0		DARK GRAY SAND (SW) wet, loose, well graded, very slight petroleum odor
	*	0.0	10	
3	*	0.0		GREENISH GRAY FAT CLAY (CH) moist, soft, medium plasticity, low toughness, trace gravel sub-rounded
		0.0		
8		0.0		GREENISH GRAY FAT CLAY (CH) moist, medium stiff, medium plasticity, medium toughness, trace sand and gravel sub-rounded
		0.0		
10		0.0	15	GREENISH GRAY LEAN CLAY (CL) moist, stiff, medium plasticity, tough, trace sand and gravel sub-rounded
		0.0		
			20	
			25	
			30	
			35	
			40	

Boring terminated at 16.0 feet.
Groundwater encountered at 4.4 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-24-93.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU4A-104

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-25

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU6-101

Equipment Rebuilt Mobil B40

Elevation NA Date 9/14/93

Blows/ft	Lab Test	PID (ppm)	Depth ft Sample	
		0.0	0	DARK GRAY TO LIGHT BROWN SILTY CLAY (CL) [FILL] moist, soft, plastic, glass shard in sample, some sand
3		0.0		color and texture same as above
	*			
8		0.0		
				DARK GRAY SANDY SILT (ML) moist, medium stiff, low plasticity, some organics (roots) (former topsoil horizon)
6		0.0	5	
				LIGHT GRAY SILTY CLAY (CL)
4	*	0.0		DARK GRAY SILTY SAND/CLAYEY SAND (SM/SC) wet, loose
		0.0		
		0.0		
2		0.0		LIGHT GRAY SILTY CLAY (CL) moist, soft, very plastic, iron oxide (red staining)
		0.0	10	
3		0.0		LIGHT GRAY SANDY CLAY (CL) moist, soft, very plastic, iron oxide (red staining) present
		0.0		color and texture same as above
6		0.0		
		0.0		
		0.0		LIGHT GRAY SILTY CLAY (CL) moist, stiff, low plasticity, trace gravel sub-rounded
12		0.0	15	
		0.0		
		0.0		Boring terminated at 16.0 feet. Groundwater encountered at 9.5 feet during drilling. Boring backfilled with cement-bentonite grout on 9-14-93.
			20	
			25	
			30	
			35	
			40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU6-101

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 1)

FIGURE G-26

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. SWMU6-102

Equipment Rebuilt Mobil B40

Elevation NA Date 9/14/93

Blows/ft	Lab Test	PID (ppm)
		0.0
4		
	*	0.0
6		
	*	0.0
3		0.0
		0.0
4		0.0
		0.0
		0.0
2		0.0
		0.0
		0.0
3		0.0
		0.0
		0.0
8		0.0
		0.0
		0.0
10		0.0
		0.0
		0.0

Depth ft / Sample

0

DARK GRAY TO LIGHT BROWN SILTY CLAY (CL) [FILL]
moist, soft, plastic, some organics (roots throughout)

DARK GRAY TO LIGHT BROWN SILTY CLAY (CL)
moist, medium stiff, plastic, mottled

5

POORLY GRADED SAND (SP)
moist, loose

DARK GRAY SILTY CLAY (CL)
moist, soft, very plastic

SILTY SAND/CLAYEY SAND (SM/SC)
moist, loose

10

LIGHT GRAY SILTY CLAY (CL)
moist, soft, very plastic, iron oxide (red-brown) staining mottled

LIGHT GRAY RED/BROWN SILTY CLAY (CL)
moist, soft, plastic, mottled, trace gravel sub-rounded

LIGHT GRAY RED-BROWN SANDY CLAY (CL)
moist, medium stiff, plastic, mottled

DARK GRAY SILTY CLAY (CL)
moist, stiff, plastic, trace gravel sub-rounded

15

Boring terminated at 16.0 feet.
Groundwater encountered at 9.2 feet during drilling.
Boring backfilled with cement-bentonite grout on 9-14-93.

20

25

30

35

40

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SWMU6-102

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

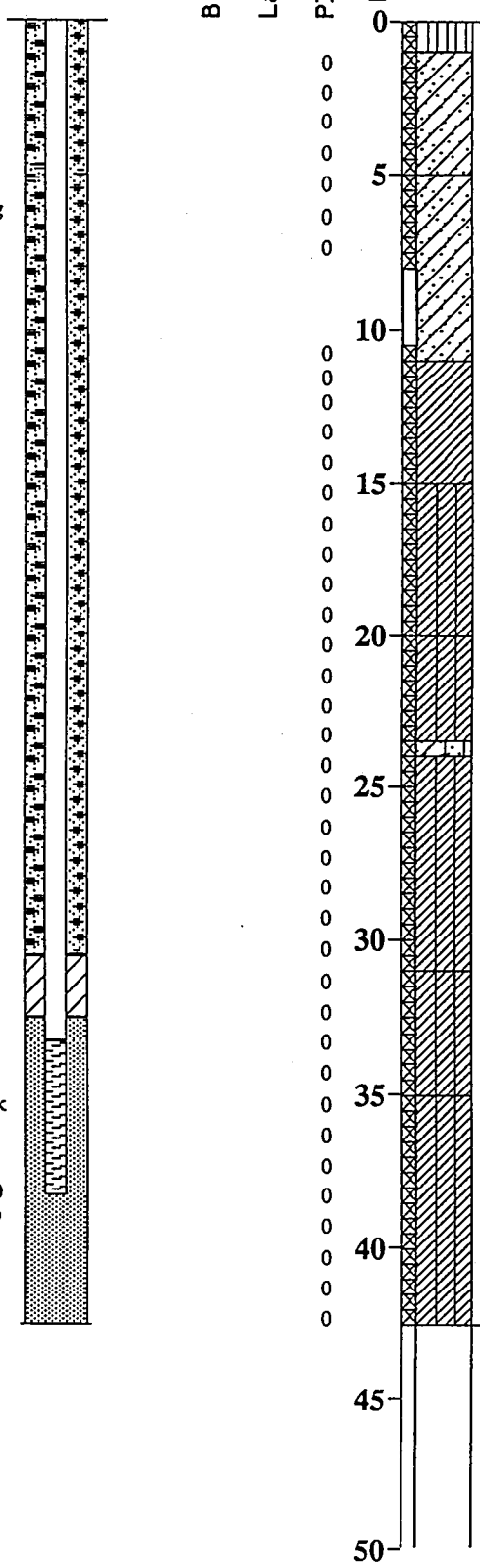
FIGURE G-27

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R2D

Equipment Rebuilt Mobil B40

Elevation NA Date 9/15/93



BLACK CLAYEY SILT (ML)
slightly moist, soft, some organics (roots)

YELLOW BROWN CLAYEY SAND (SC)
slightly moist, medium stiff, some plasticity, trace gravel sub-rounded, iron oxide (red) staining

YELLOW BROWN CLAYEY SAND (SC)
moist, soft, plastic, trace gravel sub-rounded, iron oxide staining

DARK GRAY SILTY CLAY (CL)
slightly moist, medium stiff, very plastic, trace gravel sub-rounded

DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML)
slightly moist, low plasticity, trace gravel sub-rounded, high dry strength

DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML)
slightly moist, medium stiff to stiff, low plasticity

DARK GRAY SILTY SAND/CLAYEY SAND (SC/SM)
slightly moist, medium dense, not wet

DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML)
slightly moist, stiff to hard, trace gravel sub-rounded

DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML)
slightly moist, hard, trace gravel sub-rounded, typically 1/8 to 1/4 inch, driller notes hard drilling, increasing with depth 20 to 25 feet on to 35 feet

DARK GRAY SILTY CLAY/CLAYEY SILT (CL/ML)
slightly moist, hard, plastic, trace gravel sub-rounded, typically 1/8 to 1/4 inch

very hard drilling at 40 feet

Boring terminated at 42.5 feet.
Groundwater not encountered during drilling.
Boring converted to monitoring well on 9-15,16-93; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R2D

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

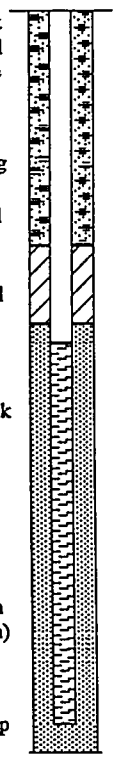
FIGURE G-28

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R2S

Equipment Rebuilt Mobil B40

Elevation NA Date 9/15/93



Blows/ft	Lab Test	PID-(ppm)	Depth ft	Sample	
			0		See Boring MW-R2D for log
	*	0			
13	*	0	5		
		0			
		0			
14	*	0			
		0			
		0			
			10		
			15		
			19		Boring terminated at 19.0 feet. Groundwater not encountered during drilling. Boring converted to monitoring well on 9-15,16-93; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
			20		
			25		
			30		
			35		
			40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R2S

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-29

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00076/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R6D

Equipment CME-75

Elevation NA Date 8/28/94

PID (ppm)	Depth ft	Sample	
0.0	0		BLACK SILTY CLAY (CL) slightly moist, few fine to coarse sand, trace fine to coarse gravel, medium plasticity, rootlets
0.0			
0.0	5		1-inch thick light olive brown layer at 4 feet bgs. high content of organic matter at approximately 4 to 5 feet bgs.
			OLIVE GRAY SILTY CLAY (CL) moist, trace fine to coarse gravel, few fine to coarse sand, medium to high plasticity
0.0			LIGHT OLIVE BROWN SILTY CLAY (CL) moist, few fine to coarse sand, trace fine to coarse gravel, medium to high plasticity, gray mottling
0.0	10		
0.0			slightly higher sand content, iron oxidation
0.0			DARK GRAY SILTY CLAY (CL)
	15		∇ moist, trace fine to coarse sand, trace fine to coarse gravel
0.0			LIGHT OLIVE BROWN CLAYEY SAND (SC) wet, fine sand, trace fine gravel
			DARK GRAY SILTY CLAY (CL) moist, trace fine to coarse sand, trace fine to coarse gravel, medium to high plasticity
	20		very thin brown sand seam at approximately 19 ft. bgs.
			few fine to coarse sand
0.0			
	25		
			DARK GRAY SANDY SILT (ML) very moist to wet, fine sand, fines
0.0			DARK GRAY SILTY CLAY (CL) moist, trace fine to coarse sand, trace fine to coarse gravel, medium to high plasticity
	30		
0.0			
	35		
0.0			
	40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R6D

Sauer-Sundstrand Ames RFI
Ames, Iowa

(sheet 1 of 3)

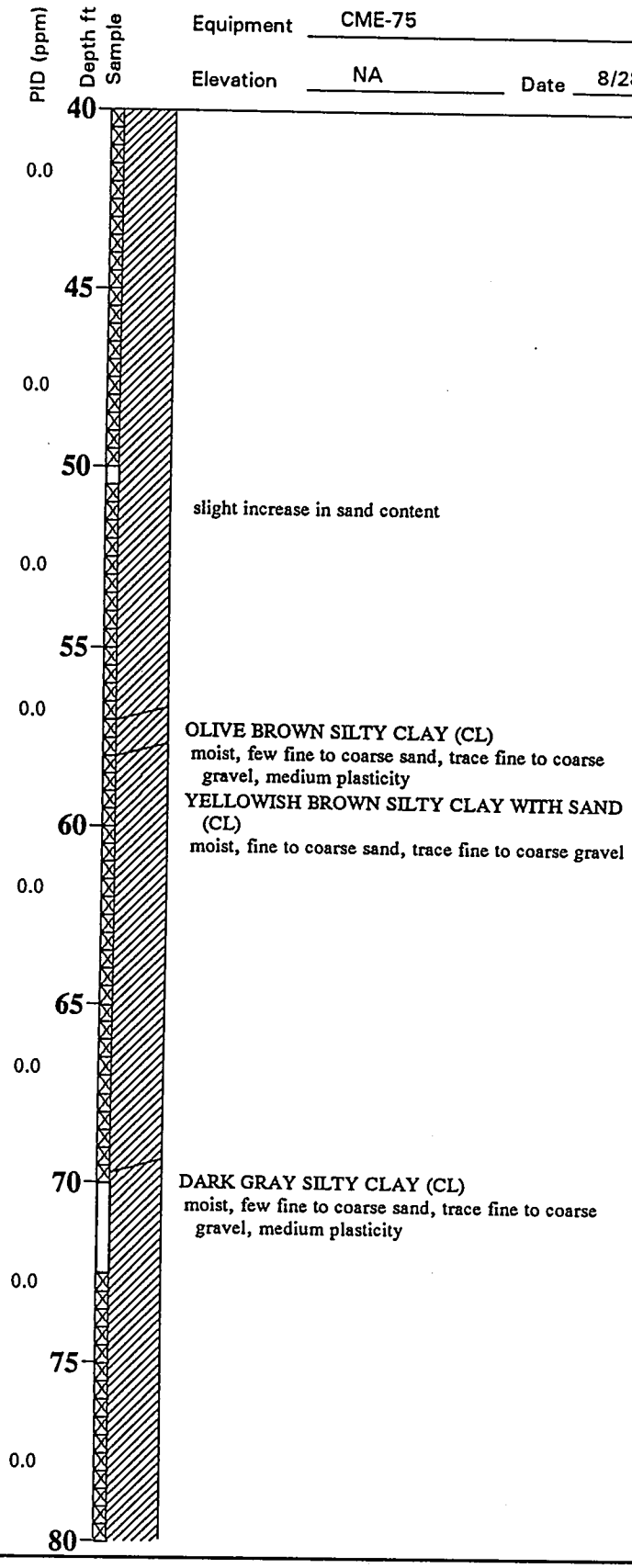
FIGURE G-30

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R6D

Equipment CME-75

Elevation NA Date 8/28/94



Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R6D

(sheet 2 of 3)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-30

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R6D

Equipment CME-75

Elevation NA Date 8/28/94

PID (ppm)	Depth ft	Sample
	80	
0.0		
	85	
0.0		
	90	
	95	
	100	
	105	
	110	
	115	
	120	

Boring terminated at 90 feet bgs.
Upper 60 feet bgs cased with a 10-inch SS conductor casing.
Groundwater not encountered during drilling between 60 to 90 feet bgs. Boring backfilled with cement-bentonite grout on 8-29-94.

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R6D

(sheet 3 of 3)

Sauer-Sundstrand Ames RFI
Ames, Iowa

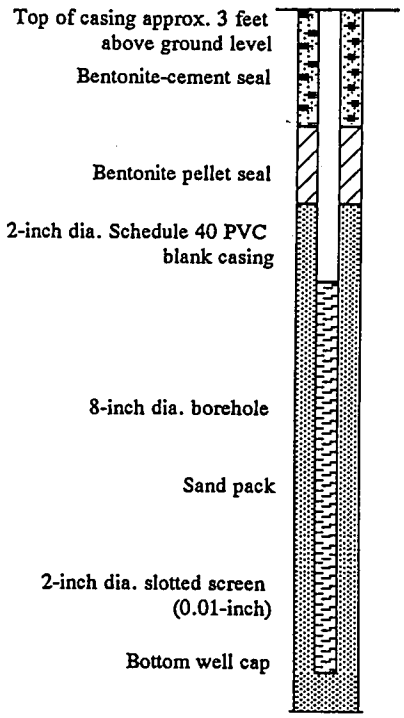
FIGURE G-30

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R6S

Equipment CME-75

Elevation NA Date 8/25/94



PID (ppm)	Depth ft	Sample	Description
	0		DARK GRAYISH BROWN CLAYEY SILT WITH SAND (ML) slightly moist, fine to coarse sand, trace fine to coarse gravel, rootlets
0.0			LIGHT OLIVE BROWN CLAYEY SILT WITH SAND (ML) slightly moist, fine to coarse sand, trace fine to coarse gravel
0.0			
0.0	5		BLACK SILTY CLAY (CL) moist, trace fine to coarse sand, trace gravel, medium to high plasticity, rich in organic material
0.0			DARK OLIVE GRAY SILTY CLAY (CL) moist, trace fine to coarse sand, black lamination very moist at 7.5 feet bgs
0.0	10		OLIVE GRAY SILTY SAND (SM) wet, fine to coarse sand, few fine to coarse gravel
0.0			LIGHT OLIVE BROWN SILTY CLAY (CL) very moist to wet, few fine to coarse sand, trace fine gravel very moist at 12 feet bgs
0.0			LIGHT OLIVE BROWN SILTY SAND (SM) wet, fine to coarse sand, few fine to coarse gravel
	15		OLIVE BROWN SILTY CLAY (CL) moist, few fine to coarse sand, trace fine gravel, medium plasticity,
			DARK GRAY SILTY CLAY (CL) moist, few fine to coarse sand, trace fine gravel, medium to high plasticity
	20		Boring terminated at 18.0 feet bgs. Boring converted to groundwater monitoring well MW-R6S; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
	25		
	30		
	35		
	40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R6S

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

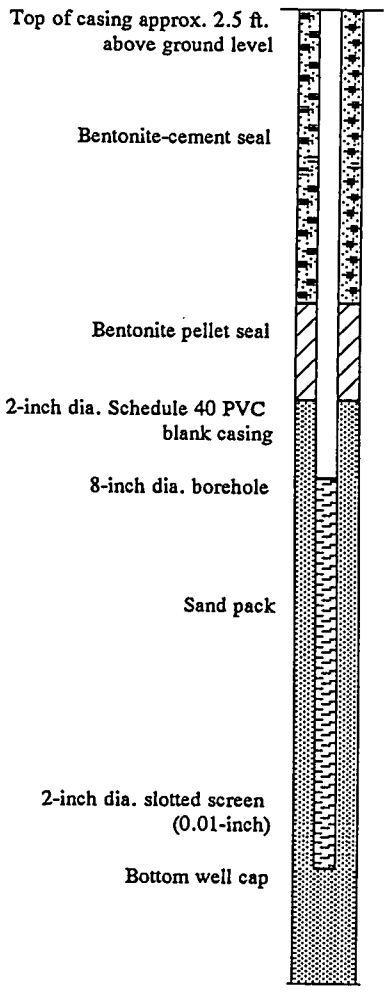
FIGURE G-31

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R13

Equipment CME-75

Elevation NA Date 8/23/94



PID (ppm)	Depth ft	Sample	Description
	0		BLACK SILTY CLAY (CL) moist, trace fine sand, trace fine to coarse gravel, medium to high plasticity
0.0			
0.0			
			brown mottling at 4.5 feet
0.0	5		LIGHT OLIVE BROWN SILTY CLAY (CL) moist, few fine to coarse sand, trace fine to coarse gravel, medium plasticity, gray mottling increased sand/gravel content at 6 to 7 feet bgs.
0.0			
0.0			
0.0	10		
			slightly moist, alot of iron oxidation, slight increase in fine sand content
0.0			
0.0	15		
0.0			
			change of color to olive brown at 16 to 17 feet bgs.
			DARK GRAY SILTY CLAY (CL) moist, few fine to coarse sand, trace fine gravel, medium to high plasticity
0.0			
			1-inch wet sand seam at 18.5 feet bgs.
0.0	20		OLIVE BROWN SILTY SAND (SM) fine to coarse sand, trace fine grained
0.0			DARK GRAY SILTY CLAY (CL)
0.0			
	25		Boring terminated at 25 feet bgs. Groundwater encountered at 18.5 feet bgs. Boring converted to groundwater monitoring well MW-R13; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
	30		
	35		
	40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R13

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

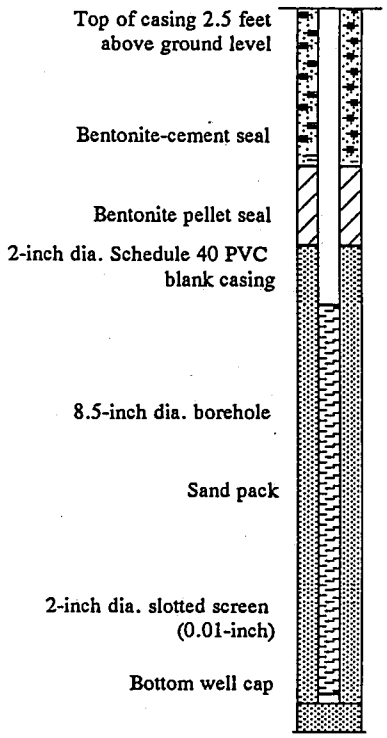
FIGURE G-32

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R14

Equipment MR-300

Elevation NA Date 6/22/94



PID (ppm)	Depth ft	Sample	
	0		VERY DARK GRAY SILTY CLAY (CL) moist, few fine to coarse grained sand, trace of fine gravel, medium to high plasticity
0.0			organic matter observed at 2.5 feet
0.0	5		
			change in color to black with some brown-red discoloration
0.0			change in color to very dark gray
			change in color to olive brown
			2-inch thick clayey sand lens, olive brown
0.0	10		change in color to dark grayish brown mottled with light olive brown
			very moist, increase in sand content to approximately 15-20%
0.0			DARK GRAYISH BROWN SANDY CLAY (CL) very moist to wet, fine grained sand, with trace of medium to coarse grained sand
0.0	15		trace of fine to coarse gravel at 12.5 feet with small (<1-inch) pockets of medium to coarse grained sand with few fine gravel
0.0			GRAYISH BROWN CLAYEY SAND WITH SILT (SC) very moist, fine to medium grain with trace coarse grained sand, with few fine to coarse gravel, subangular, pervasive iron oxide staining
	20		Boring terminated at 18.5 feet. Groundwater encountered at approximately 10.5 feet during drilling. Boring converted into a groundwater monitoring well on 6/22-23/94; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
	25		
	30		
	35		
	40		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R14

(sheet 1 of 1)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-33

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

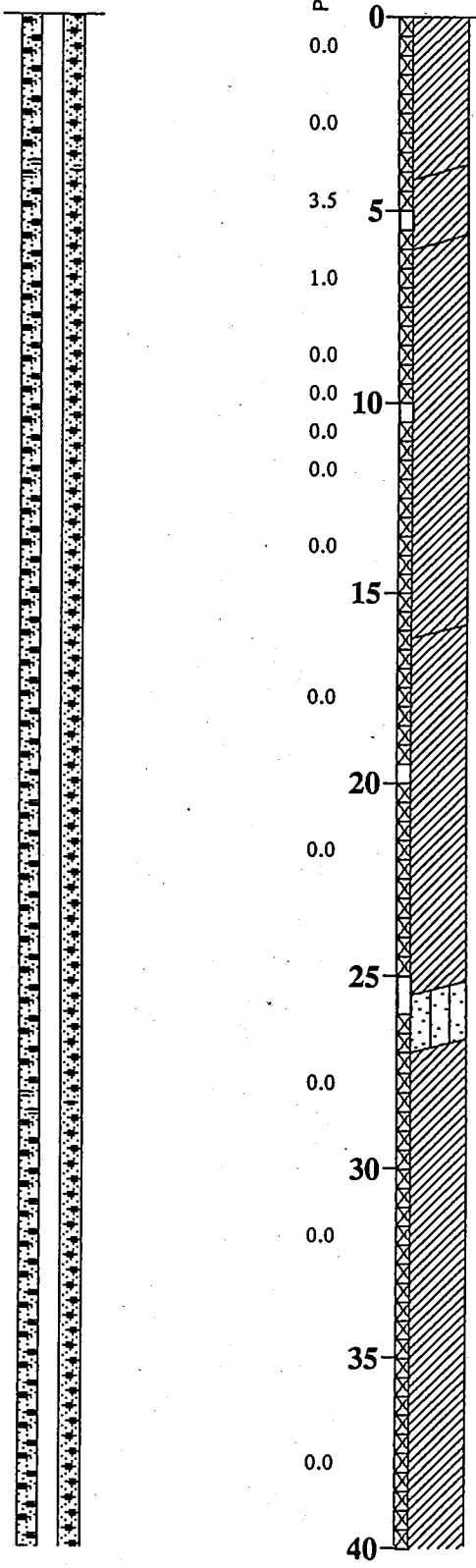
Boring No. MW-R17

Equipment CME-75

Elevation NA Date 8/27/94

Top of casing 2.5 feet above ground level

2-inch dia. Schedule 40 PVC blank casing



PID (ppm)	Depth ft	Sample
0.0	0	BLACK SILTY CLAY (CL) moist, trace fine to coarse sand, trace fine to coarse gravel, rootlets, medium to high plasticity
0.0		
3.5	5	DARK GRAYISH BROWN SILTY CLAY (CL) moist, few fine to coarse sand, trace fine gravel, medium plasticity
1.0		LIGHT OLIVE BROWN SILTY CLAY (CL) moist, few fine to coarse sand, trace fine to coarse gravel, medium plasticity, increased sand content at approximately 6.5 to 7.5 feet bgs
0.0		
0.0	10	
0.0		very moist, increase in sand content
0.0		small pockets of sand along the core
0.0		
	15	very moist to slightly wet at 14 to 16 feet bgs
0.0		DARK GRAY SILTY CLAY (CL) moist, few fine to coarse sand, trace fine gravel, medium to high plasticity
	20	
0.0		1/2-inch sand seam at 21 feet bgs
	25	DARK GRAY SILTY SAND (SM) very moist to wet, fine sand
0.0		DARK GRAY SILTY CLAY (CL) moist, trace fine to coarse sand, trace fine gravel 2-inch silty sand seam at 28 and 28.5 feet bgs, very moist to wet
	30	
0.0		fine gravel small wood fragment at 32 feet bgs
	35	1-inch silty sand seam at 34.5 feet bgs
0.0		1/2-inch silt sand seam at 36.8 feet bgs
	40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R17

(sheet 1 of 3)

Sauer-Sundstrand Ames RFI
Ames, Iowa

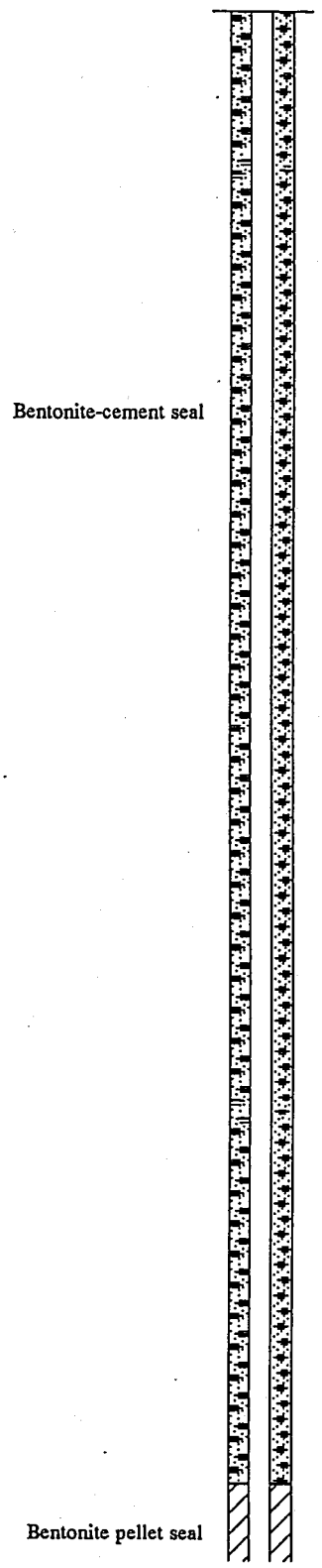
FIGURE G-34

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R17

Equipment CME-75

Elevation NA Date 8/27/94



PID (ppm)	Depth ft	Sample	
	40		
0.0			DARK GRAY SANDY CLAY (CL) very moist to wet, fine sand, medium plasticity
	45		
0.0			DARK GRAY CLAY WITH SAND (CL) very moist to wet, fine to coarse sand, trace fine to coarse gravel, medium to high plasticity
	50		poor recovery
0.0			
	55		
0.0			
	60		
0.0			YELLOWISH BROWN SILTY CLAY WITH SAND (CL) moist, fine to coarse sand, trace fine gravel, medium plasticity
	65		trace fine to coarse gravel
0.0			
	70		DARK GRAY SILTY CLAY (CL) moist, few fine to coarse sand, trace fine to coarse gravel, medium plasticity
0.0			
	75		
0.0			
	80		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R17

(sheet 2 of 3)

Sauer-Sundstrand Ames RFI
Ames, Iowa

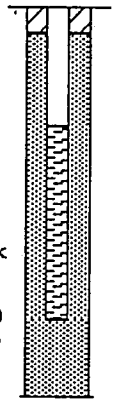
FIGURE G-34

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16		6/95	

Boring No. MW-R17

Equipment CME-75

Elevation NA Date 8/27/94



PID (ppm)	Depth ft	Sample	
	80		
0.0			
	85		LIGHT OLIVE BROWN SANDY SILT WITH CLAY (ML) very moist to wet, fine sand
0.0			DARK GRAY SILTY CLAY (CL) moist, few fine to coarse sand, trace fine to coarse gravel
	90		Boring terminated at 90 feet bgs. Upper 60 feet cased with a 10-inch SS conductor casing. Groundwater encountered at 85 feet bgs during drilling. Groundwater level rose up to 45.7 feet bgs overnight. Boring converted to groundwater monitoring well MW-R17; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
	95		
	100		
	105		
	110		
	115		
	120		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R17

(sheet 3 of 3)

Sauer-Sundstrand Ames RFI
Ames, Iowa

FIGURE G-34

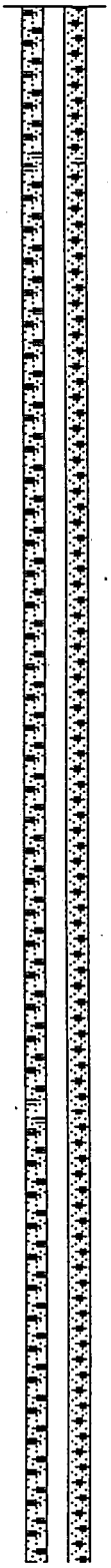
DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R30

Equipment Mobil B57

Elevation NA Date 8/25/94

Top of casing 2.5 feet above ground level



PID (ppm)	Depth ft	Sample
0.0	0	BLACK LEAN CLAY (CL) [FILL] slightly moist, some gravel, little sand
0.0		YELLOWISH BROWN LEAN CLAY (CL) slightly moist, some sand, little gravel
0.0	5	no recovery, slough in sample
0.0		GRAY FAT CLAY (CL) moist, some red mottle
0.0		YELLOWISH BROWN FAT CLAY (CH) very moist, little sand and gravel, some gray mottle, soft
	10	
0.0		YELLOWISH BROWN FAT CLAY (CH) very moist, soft, high plasticity, some fine to coarse sand
0.0		
0.0		BROWN FAT CLAY (CH) very moist, soft, high plasticity, some fine to coarse sand
0.0		
0.0		
0.0	15	DARK GRAY LEAN CLAY (CL) slightly moist, low plasticity, little fine to coarse sand, red oxidation staining along fractures
0.0		
0.0		DARK GRAY LEAN CLAY (CL) slightly moist, hard
0.0		
0.0		DARK GRAY SAND (SM) wet, well graded
0.0	20	DARK GRAY LEAN CLAY (CL) slightly moist, low plasticity, little fine to coarse sand
0.0		
0.0		
0.0		
0.0		
0.0		DARK GRAY SAND (SP) wet, loose, poorly graded, little fines
0.0	25	DARK GRAY LEAN CLAY (CL) moist, hard, low plasticity, little fine to coarse sand
0.0		
0.0		DARK GRAY SAND (SP) wet, loose, poorly graded, little fines,
0.0		
0.0		DARK GRAY LEAN CLAY (CL) moist, hard, low plasticity, little fine to coarse sand
0.0		
0.0	30	DARK GRAY SILTY SAND (SM) very moist, loose, fine to medium sand, low plasticity
	35	DARK GRAY LEAN CLAY (CL) moist, hard, low plasticity, fine to coarse sand
0.0		
0.0		DARK GRAY SILTY SAND (SM) moist, fine to medium sand
0.0		
	40	

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R30

(sheet 1 of 2)

Sauer-Sundstrand Ames RFI
Ames, Iowa

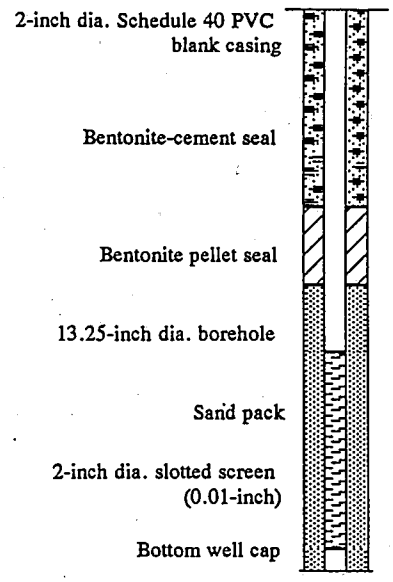
FIGURE G-35

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

Boring No. MW-R30

Equipment Mobil B57

Elevation NA Date 8/25/94



PID (ppm)	Depth ft	Sample	Description
0.0	40		DARK GRAY LEAN CLAY (CL) moist, hard, low plasticity, little fine to coarse sand
0.0			
0.0			
0.0	45		color and texture same as above
0.0			
0.0			
0.0	50		color and texture same as above
0.0			
0.0			POORLY GRADED SAND (SP) wet
			DARK GRAY LEAN CLAY (CL) moist, hard, low plasticity, little fine to coarse sand
0.0	55		
0.0			
0.0			
	60		Boring terminated at 57.0 feet bgs. Groundwater encountered at 7.9 feet bgs during drilling. Boring converted to groundwater monitoring well on 8/26-27/94; as per EPA requirements, bentonite pellet seal was allowed to hydrate overnight.
	65		
	70		
	75		
	80		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring MW-R30

(sheet 2 of 2)

Sauer-Sundstrand Ames RFI
Ames, Iowa

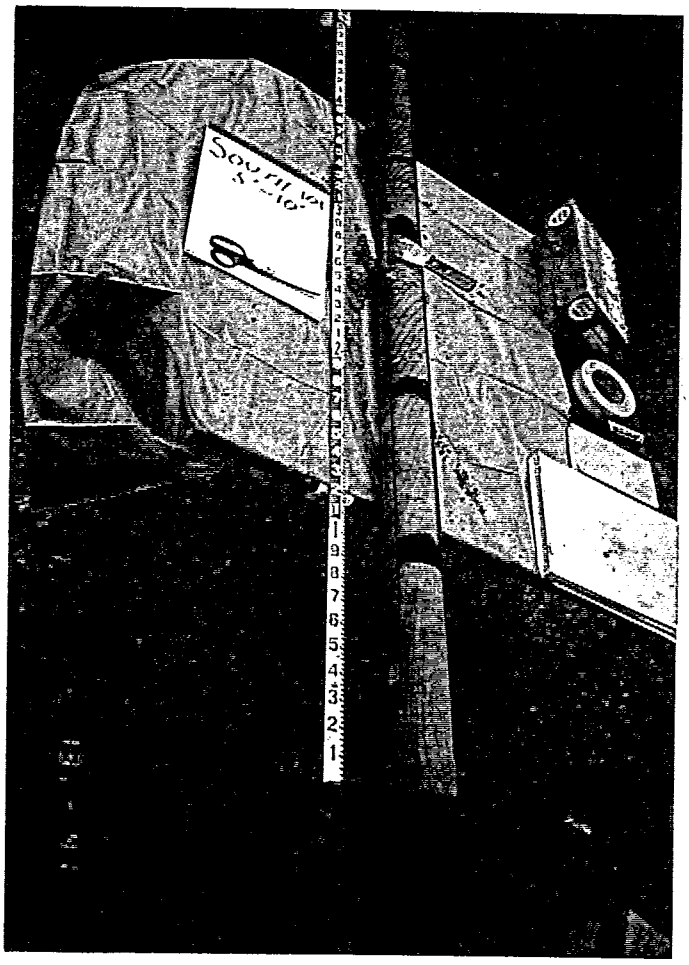
FIGURE G-35

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
00065/tk	23088,1.16	T. Bryan	6/95	

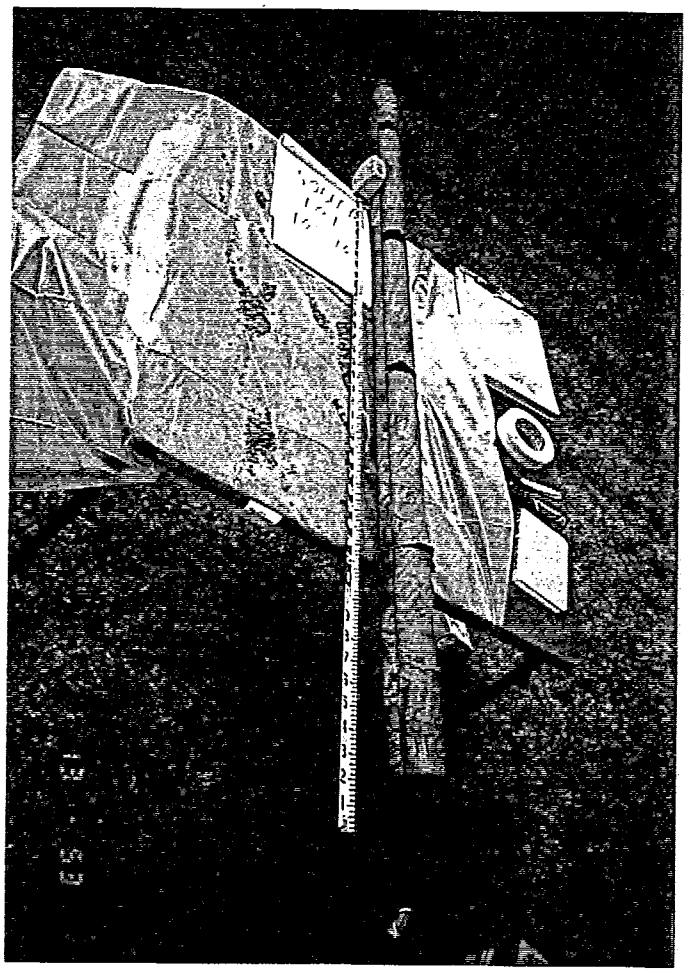
APPENDIX H

SOIL CORE PHOTOGRAPHS

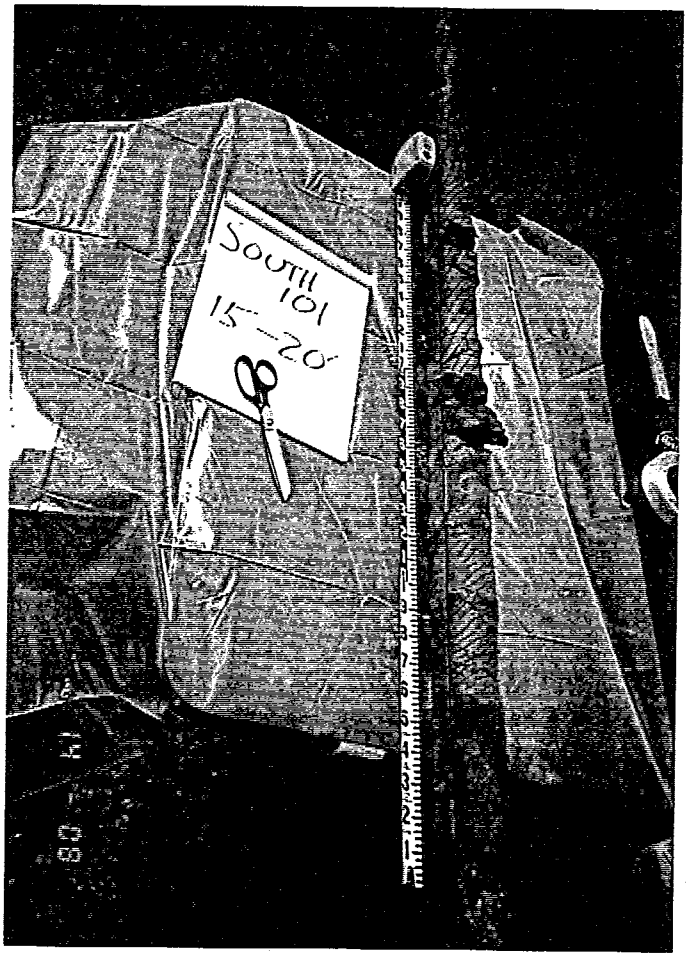
Soil boring SOUTH 101, 0 to 5 feet below ground surface.



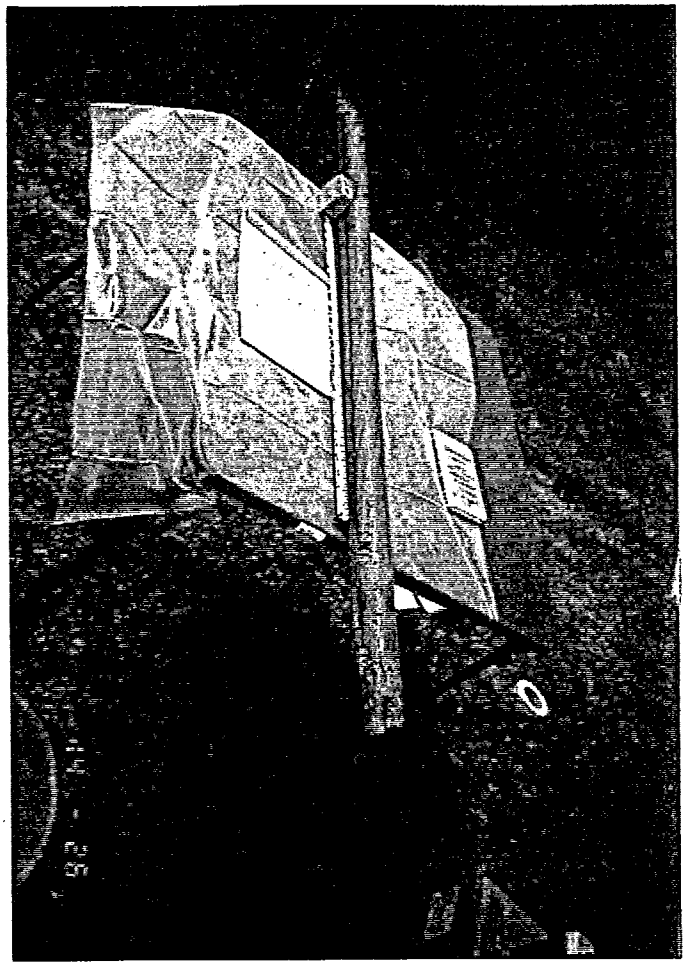
Soil boring SOUTH 101, 5 to 10 feet below ground surface.



Soil boring SOUTH 101, 10 to 15 feet below ground surface.

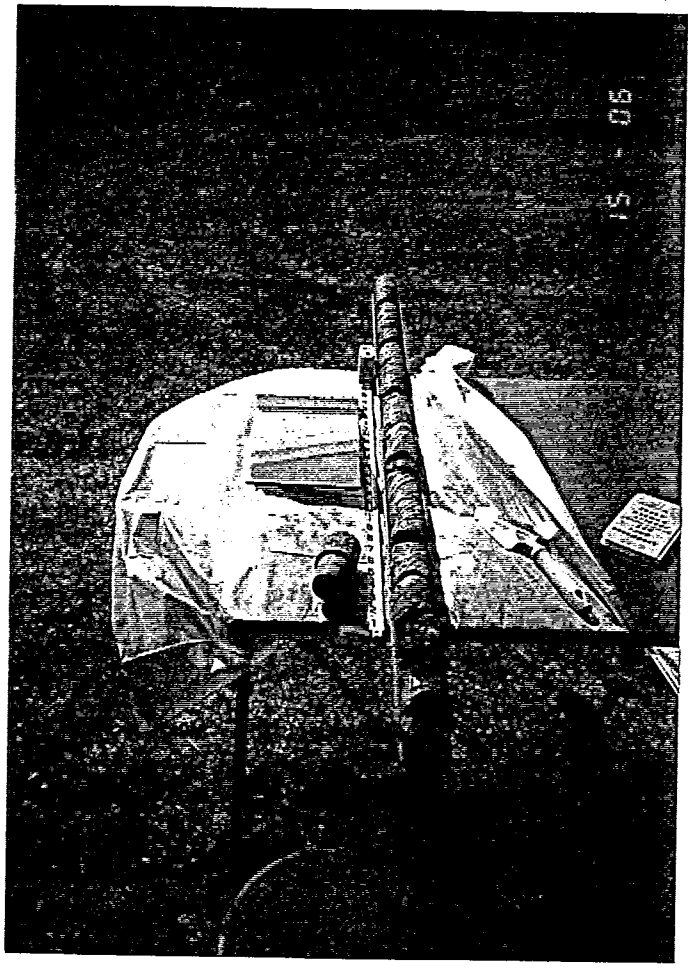


Soil boring SOUTH 101, 15 to 20 feet below ground surface.



Soil boring SOUTH 101, 20 to 25 feet below ground surface.

Soil boring SOUTH 101, 25 to 30 feet below ground surface.



Soil boring SOUTH 101, 30 to 35 feet below ground surface.

Soil boring SOUTH 102, 0 to 5 feet below ground surface.

Soil boring SOUTH 102, 5 to 10 feet below ground surface.

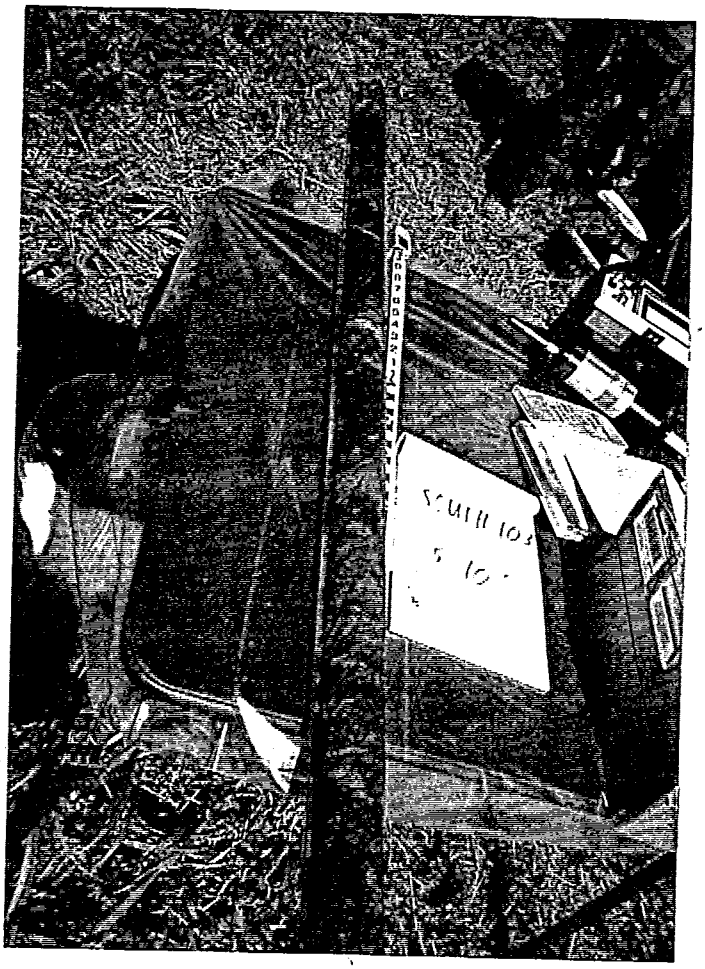
Soil boring SOUTH 102, 10 to 15 feet below ground surface.

Soil boring SOUTH 102, 15 to 20 feet below ground surface.

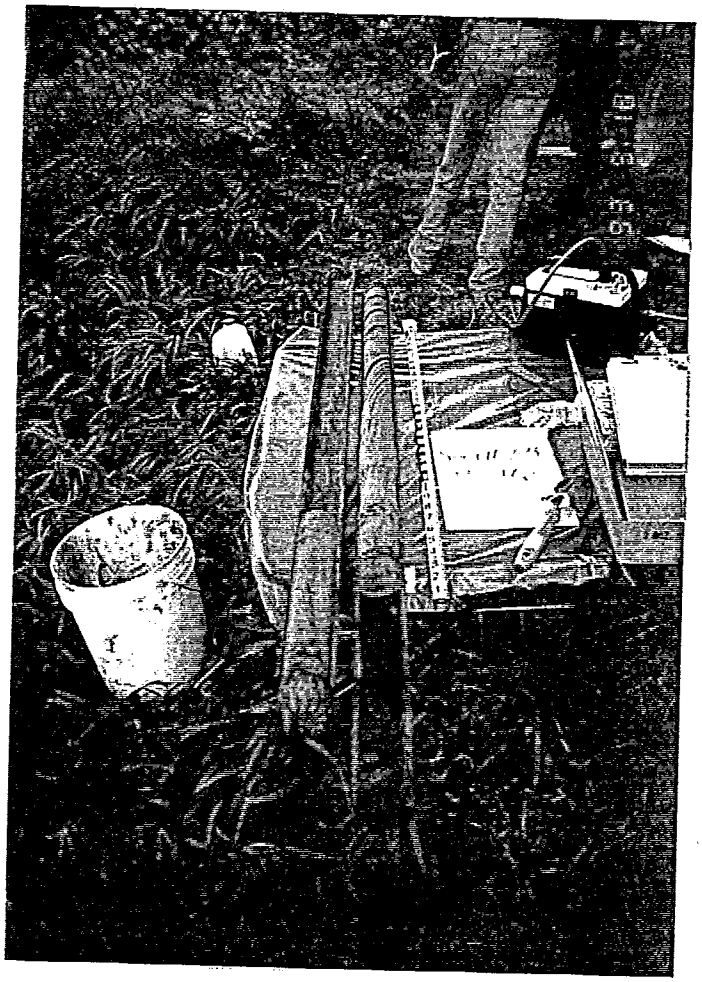
Soil boring SOUTH 102, 20 to 25 feet below ground surface.

Soil boring SOUTH 102, 25 to 30 feet below ground surface.

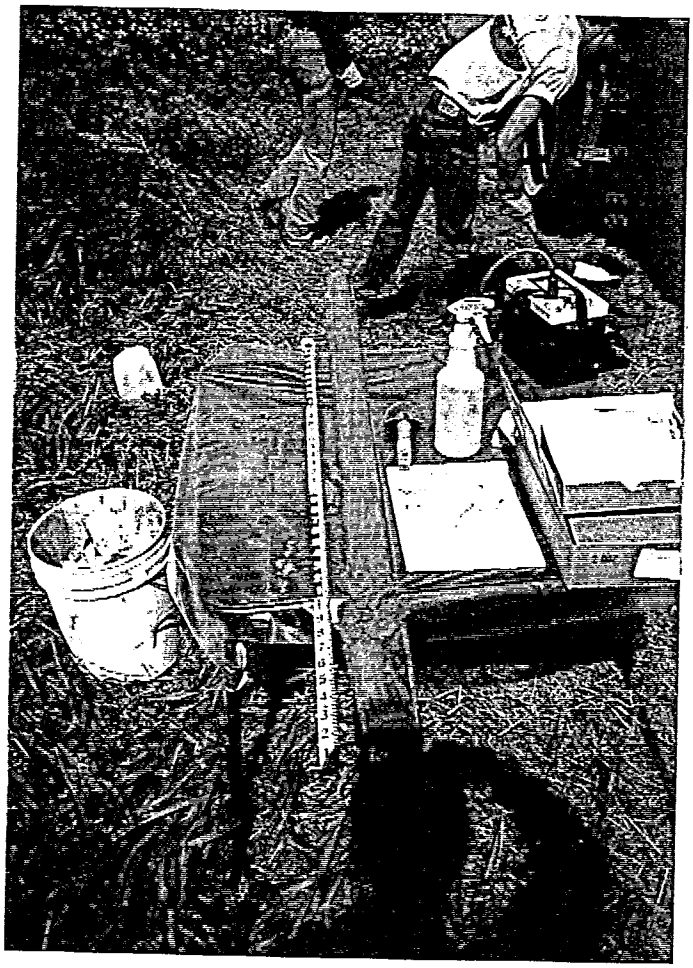
Soil boring SOUTH 102, 30 to 35 feet below ground surface.



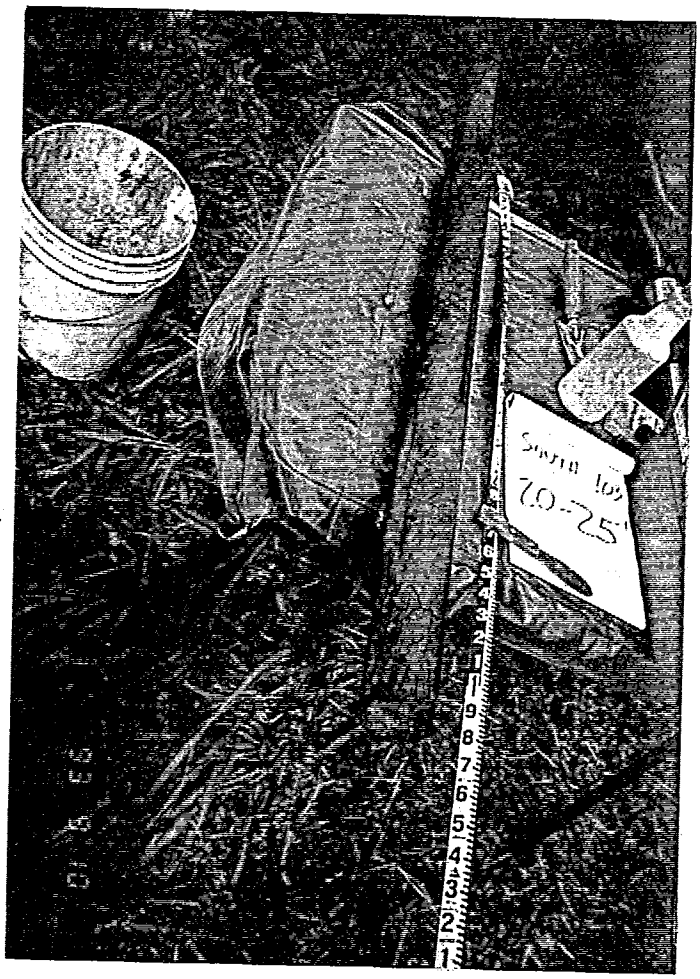
Soil boring SOUTH 103, 5 to 10 feet below ground surface.



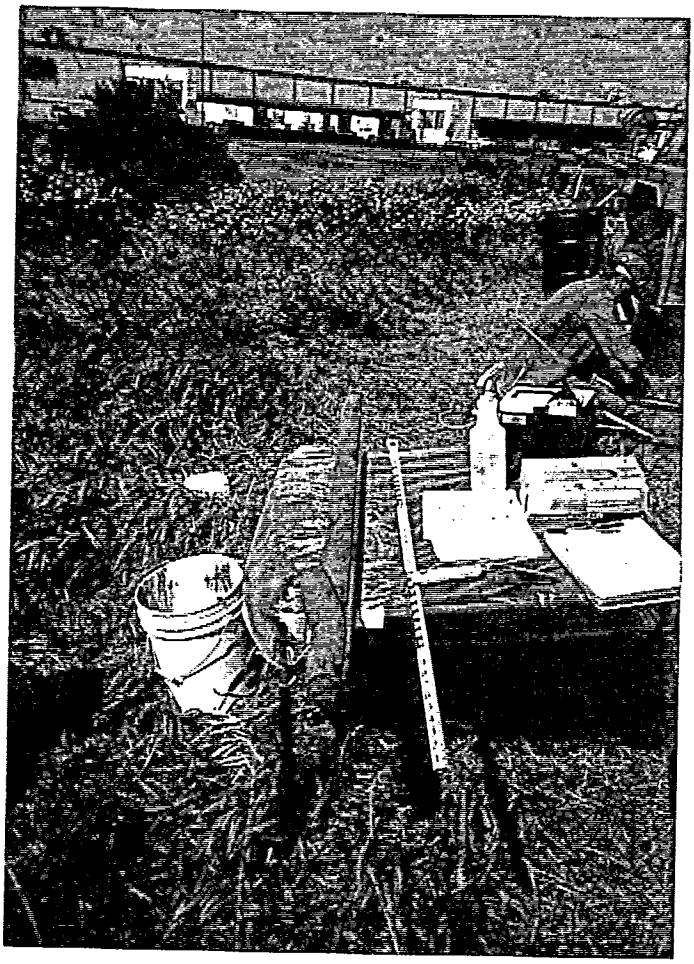
Soil boring SOUTH 103, 10 to 15 feet below ground surface.



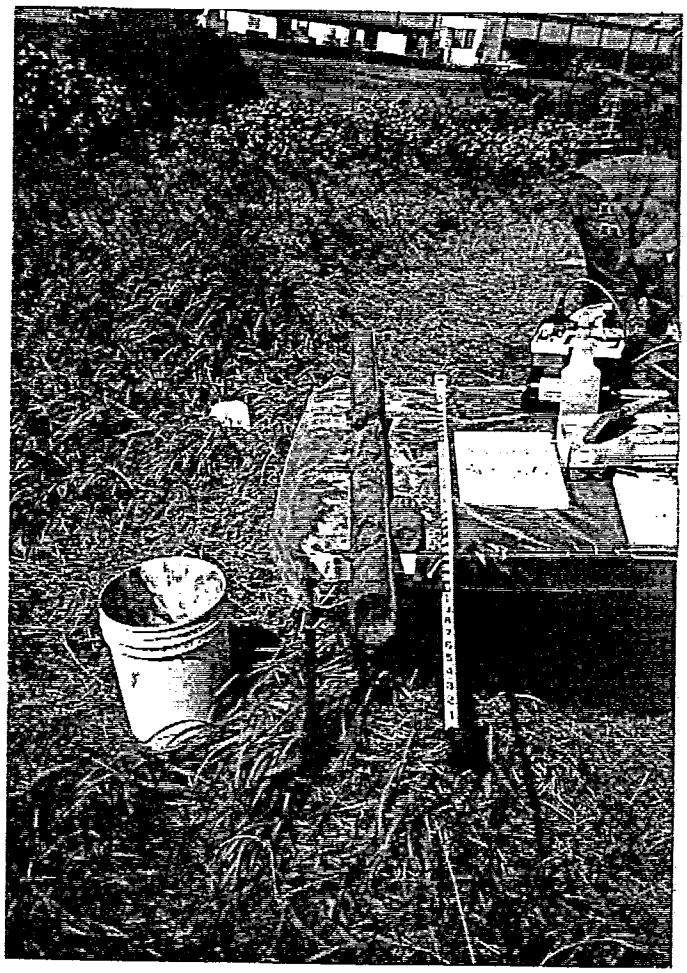
Soil boring SOUTH 103, 15 to 20 feet below ground surface.



Soil boring SOUTH 103, 20 to 25 feet below ground surface.

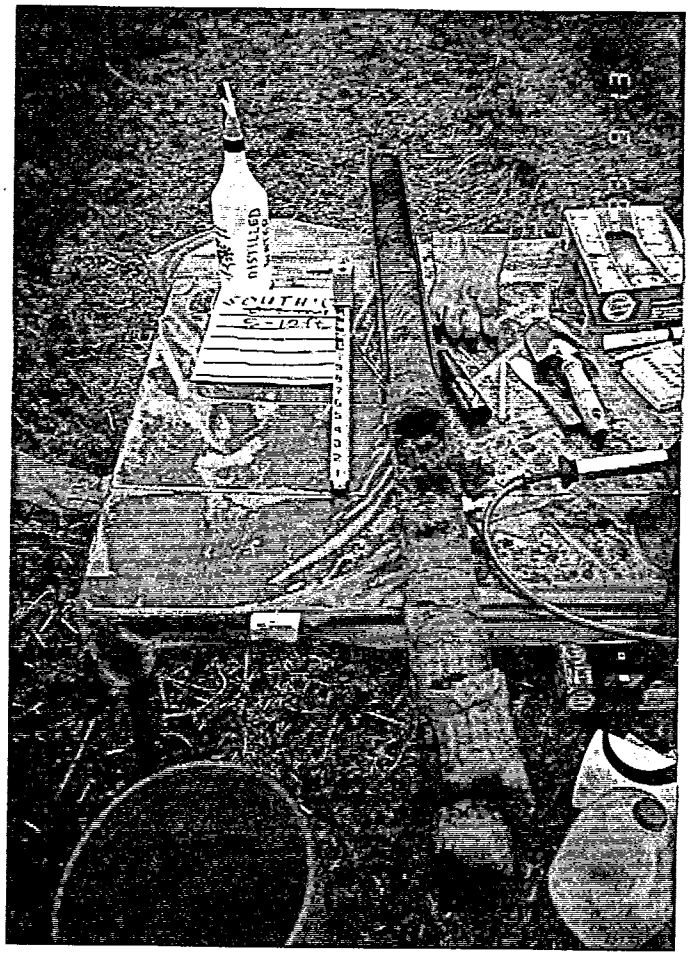


Soil boring SOUTH 103, 25 to 30 feet below ground surface.

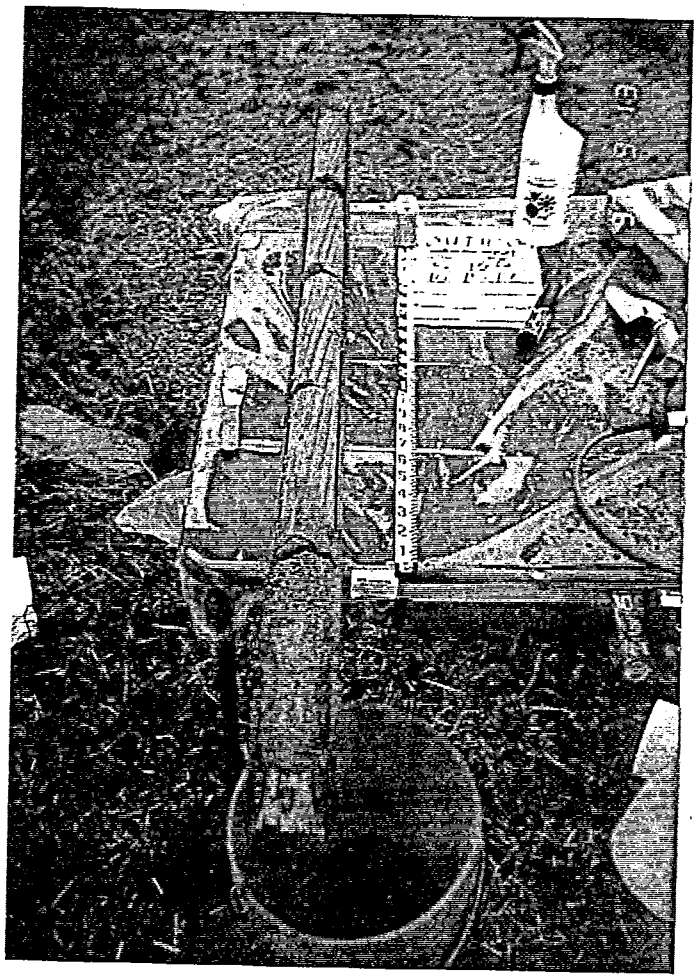


Soil boring SOUTH 103, 30 to 35 feet below ground surface.

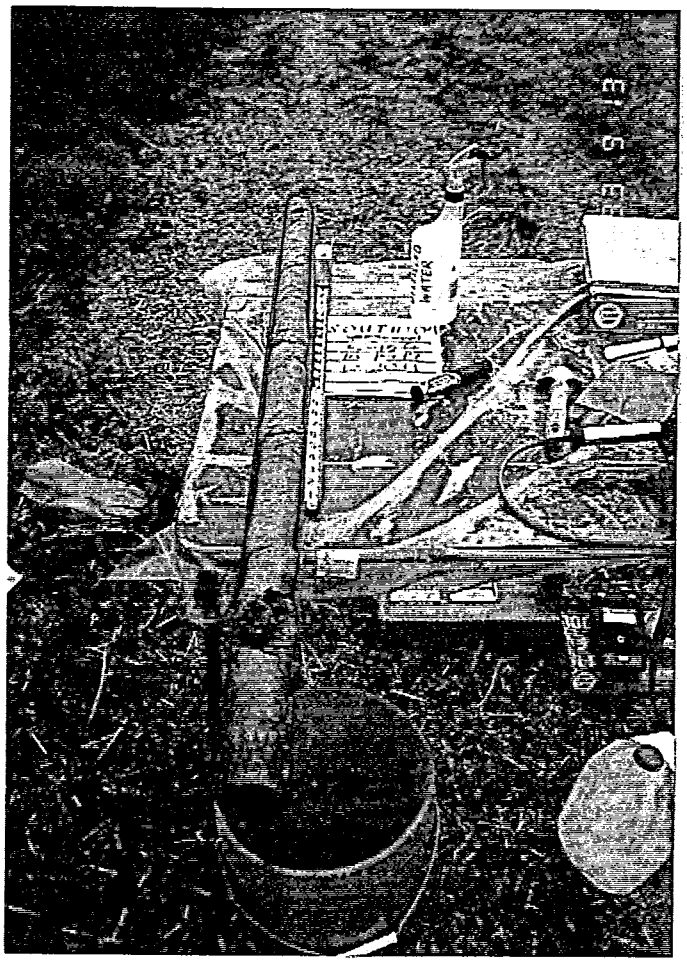
Soil boring SOUTH 104, 0 to 5 feet below ground surface.



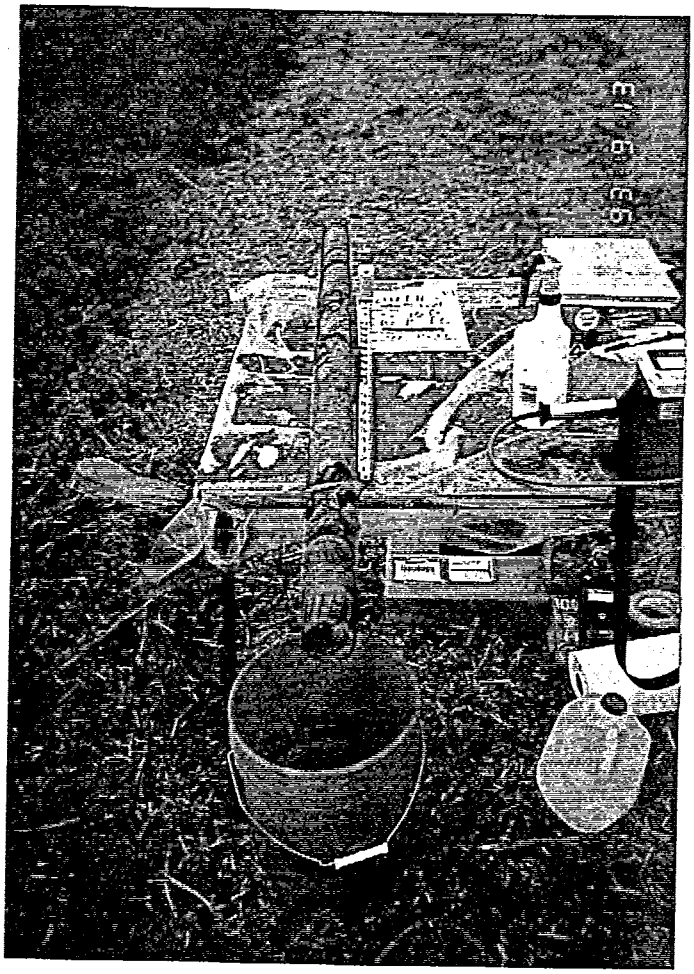
Soil boring SOUTH 104, 5 to 10 feet below ground surface.



Soil boring SOUTH 104, 10 to 15 feet below ground surface.

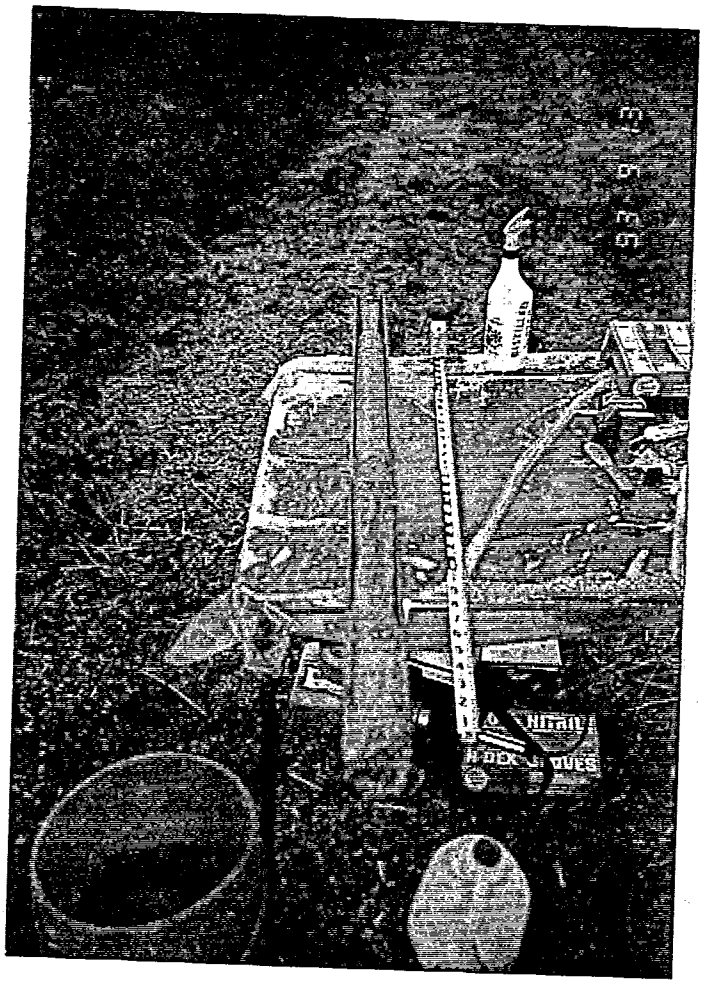


Soil boring SOUTH 104, 15 to 20 feet below ground surface.

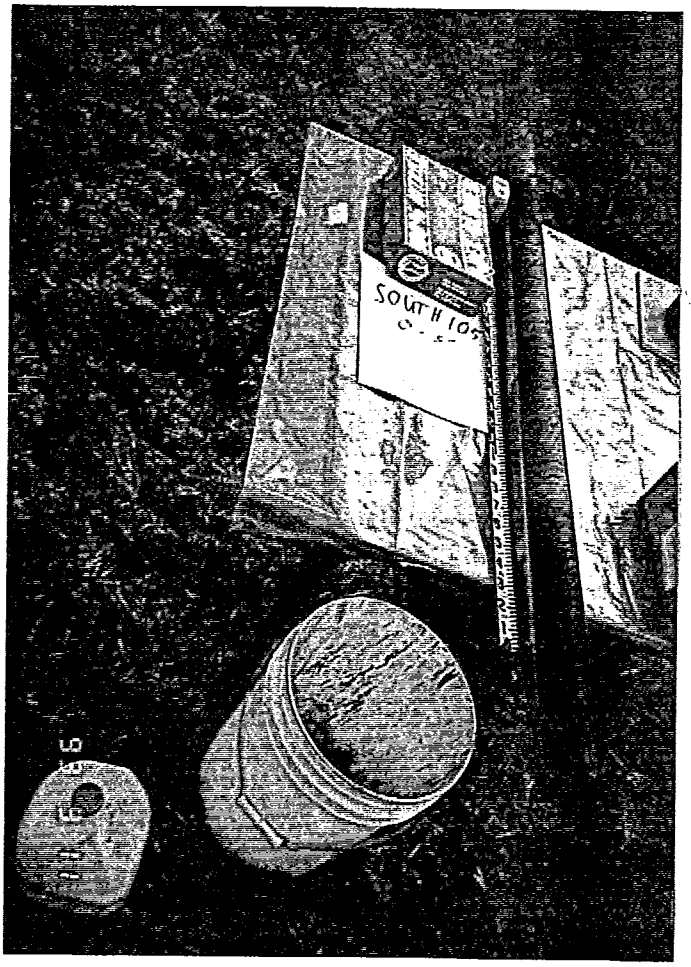


Soil boring SOUTH 104, 20 to 25 feet below ground surface.

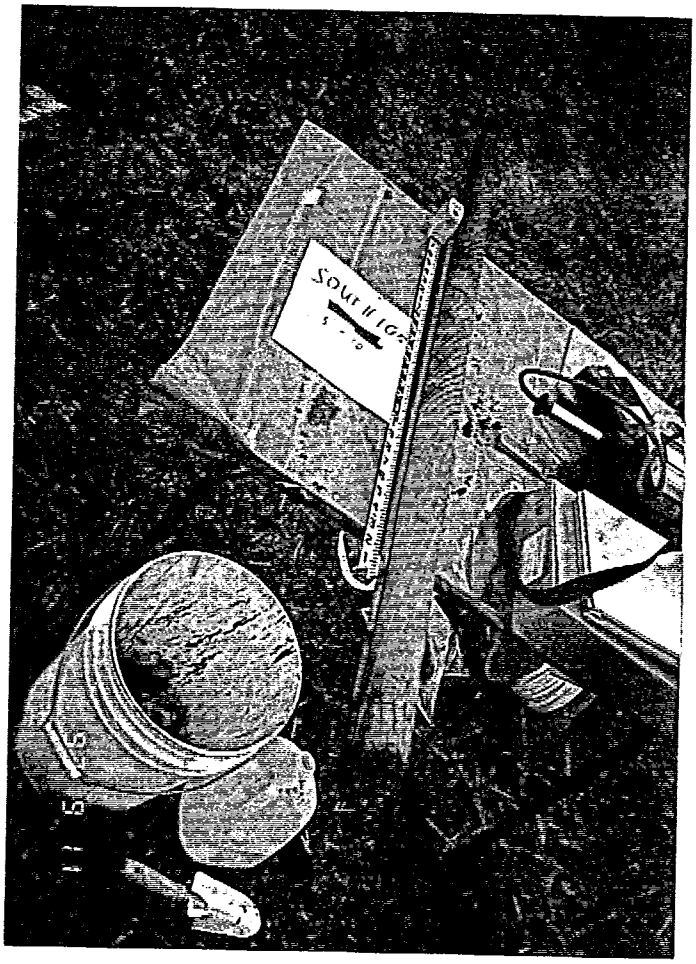
Soil boring SOUTH 104, 25 to 30 feet below ground surface.



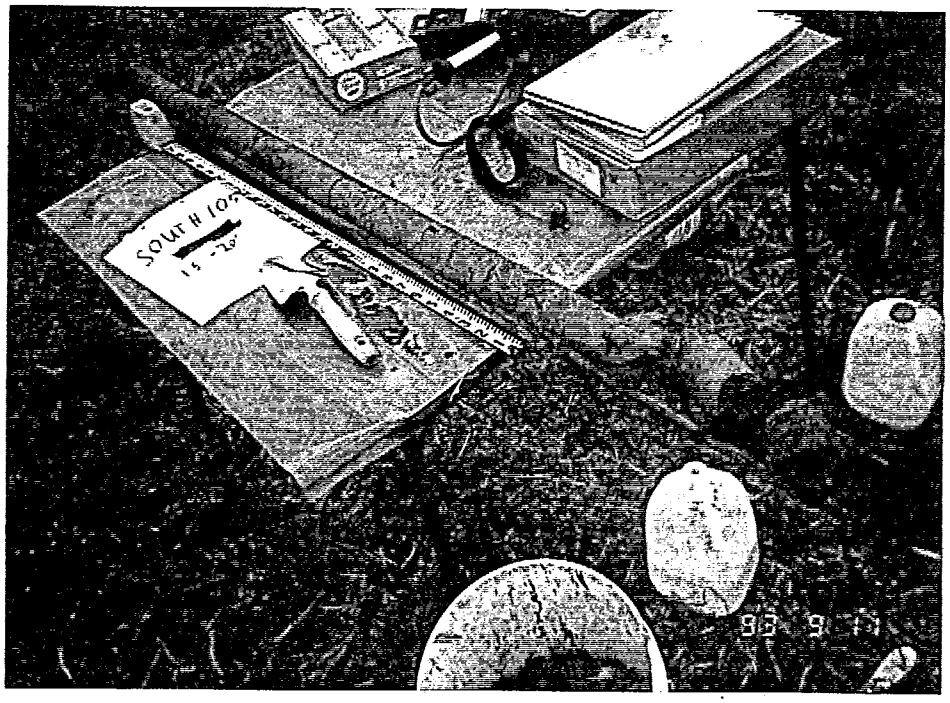
Soil boring SOUTH 104, 30 to 35 feet below ground surface.



Soil boring SOUTH 105, 0 to 5 feet below ground surface.



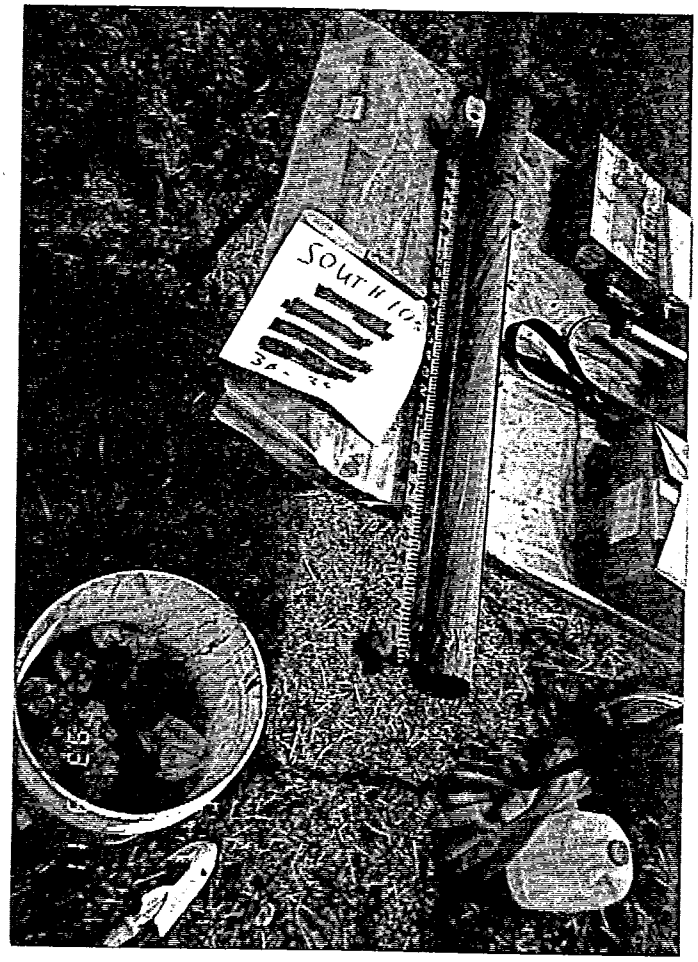
Soil boring SOUTH 105, 5 to 10 feet below ground surface.



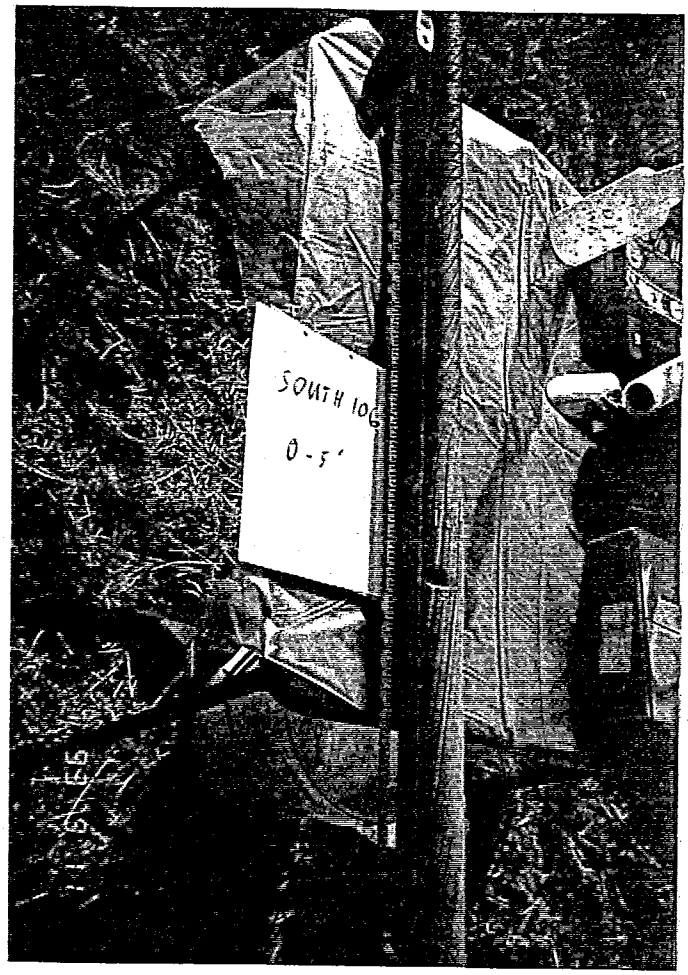
Soil boring SOUTH 105, 15 to 20 feet below ground surface.

Soil boring SOUTH 105, 20 to 25 feet below ground surface.

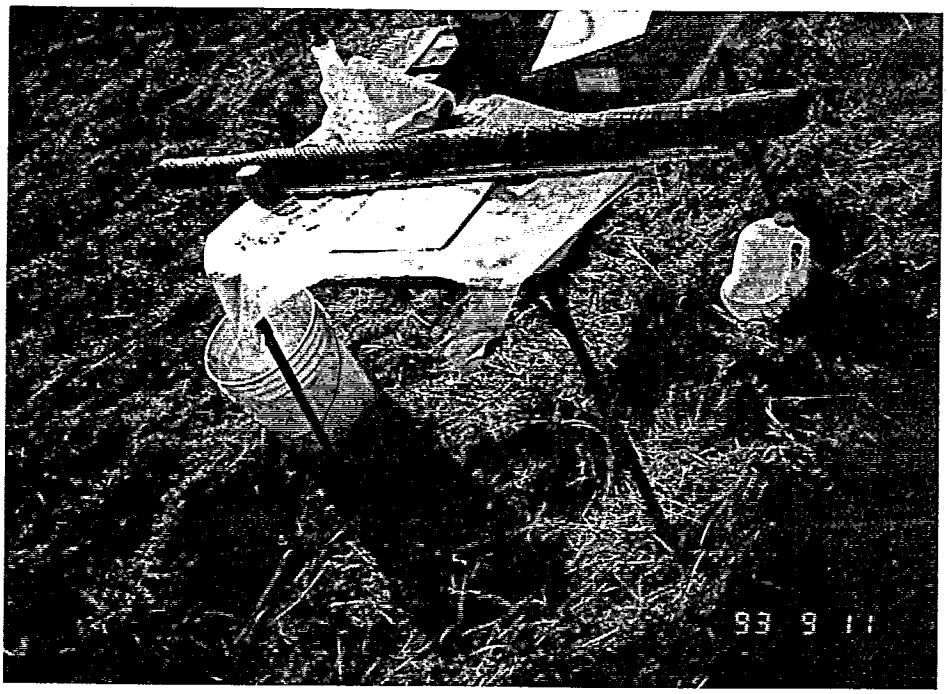
Soil boring SOUTH 105, 25 to 30 feet below ground surface.



Soil boring SOUTH 105, 30 to 35 feet below ground surface.

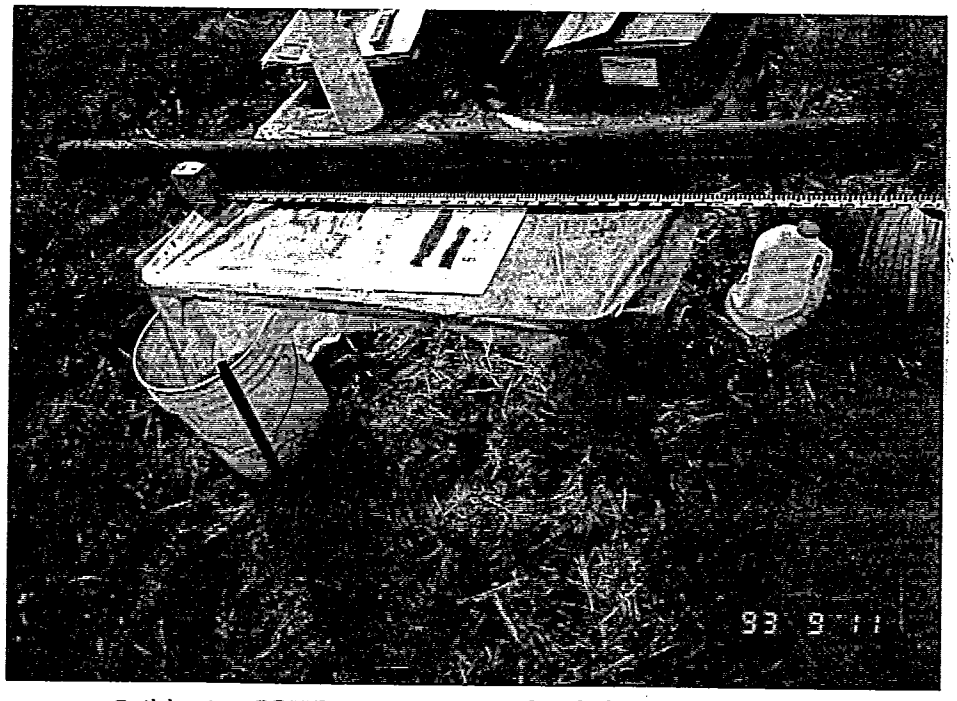


Soil boring SOUTH 106, 0 to 5 feet below ground surface.

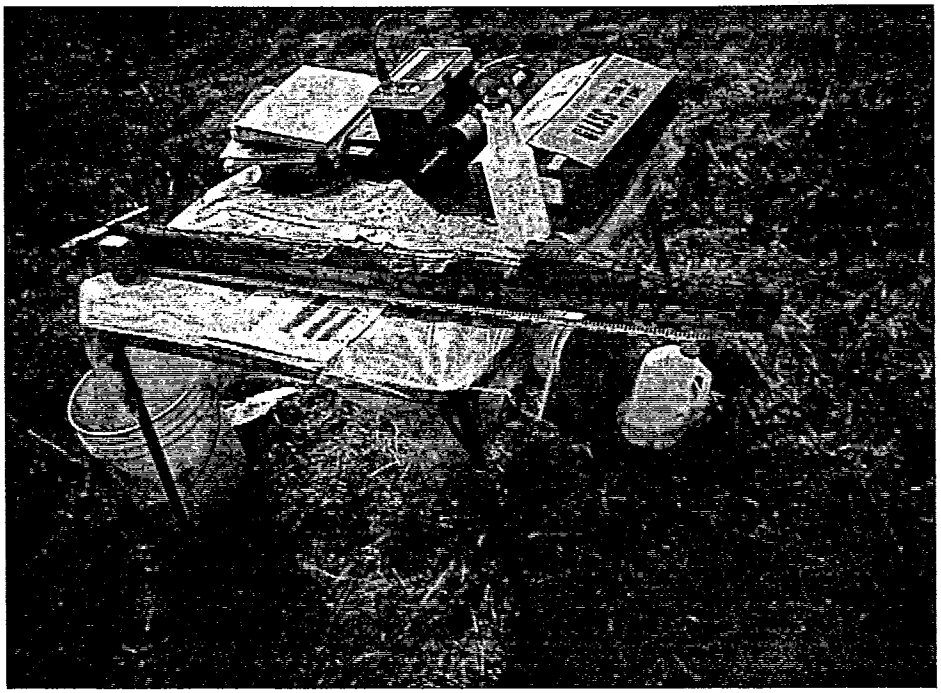


Soil boring SOUTH 106, 5 to 10 feet below ground surface.

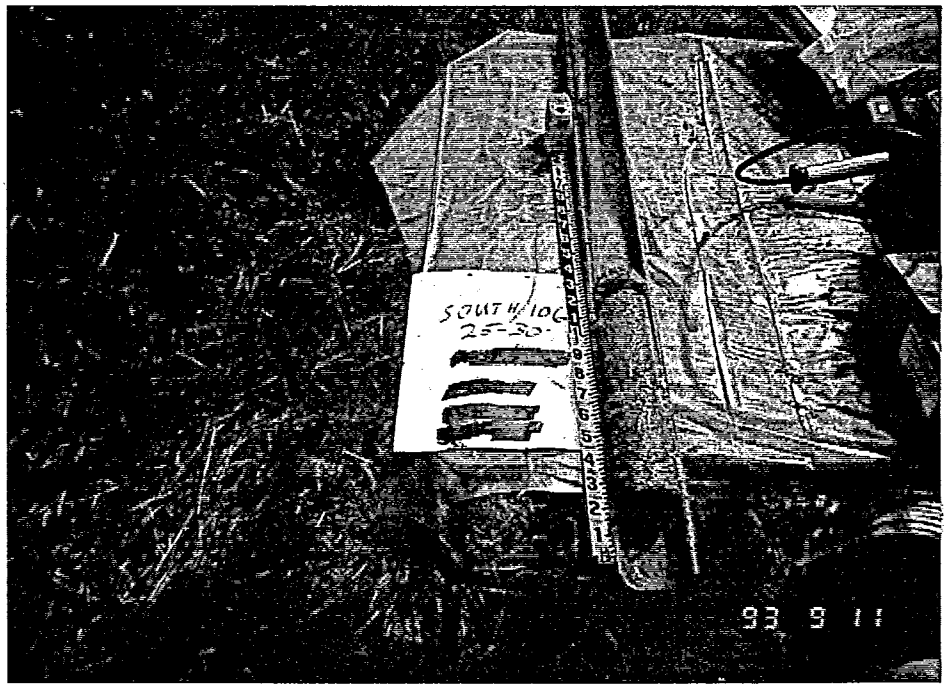
Soil boring SOUTH 106, 10 to 15 feet below ground surface.



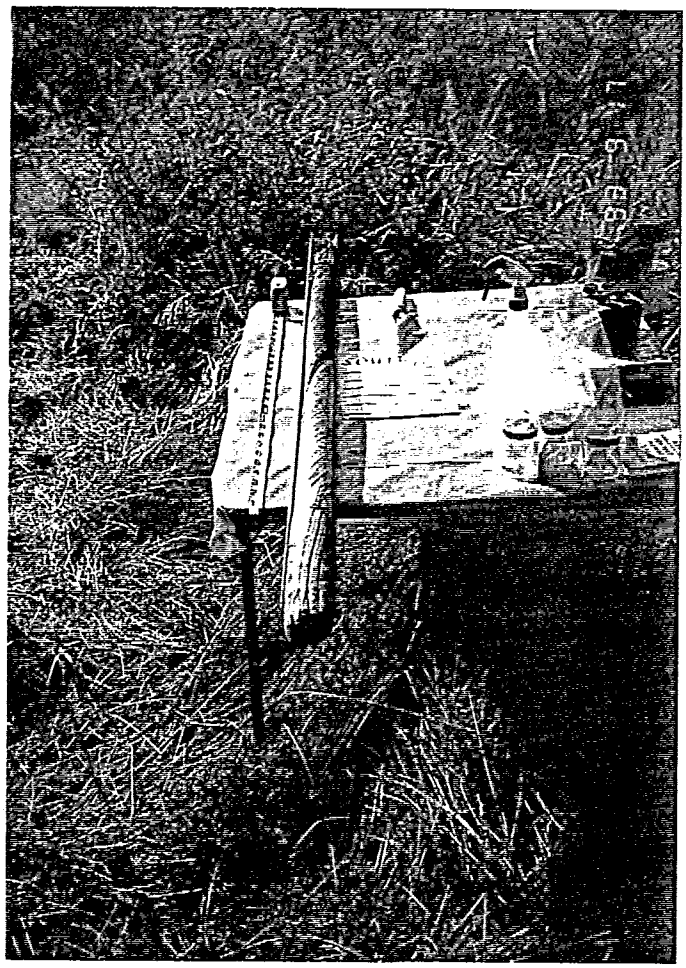
Soil boring SOUTH 106, 15 to 20 feet below ground surface.



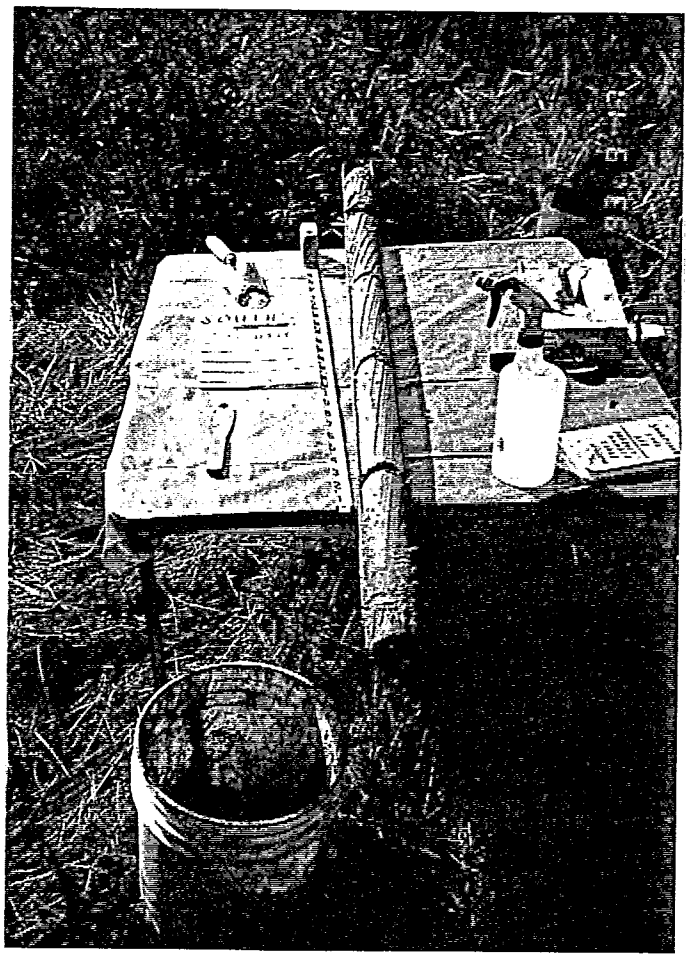
Soil boring SOUTH 106, 20 to 25 feet below ground surface.



Soil boring SOUTH 106, 25 to 30 feet below ground surface.



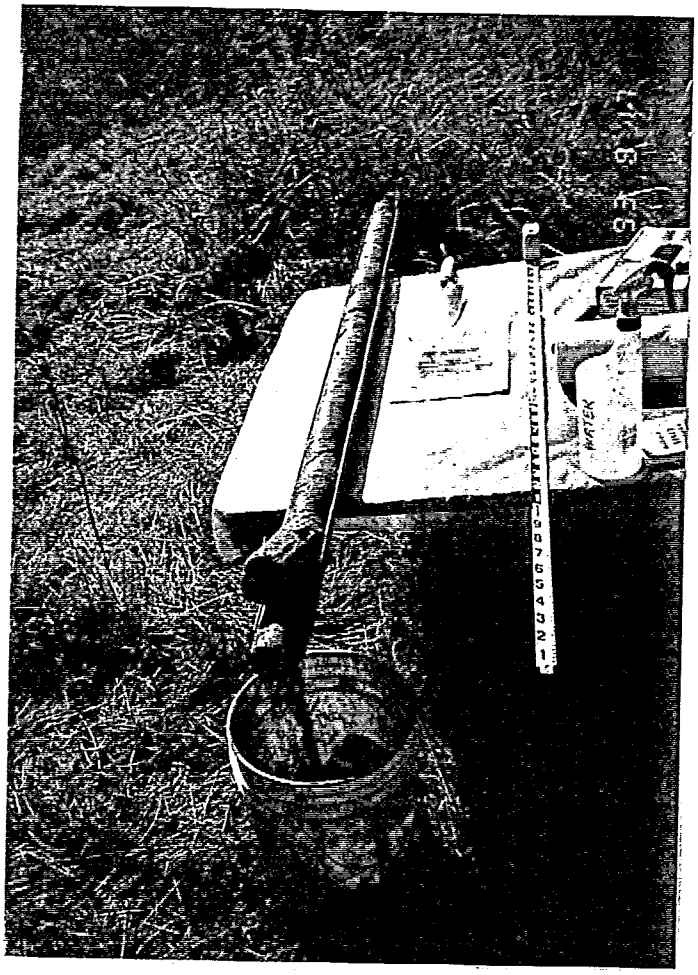
Soil boring SOUTH 107, 0 to 5 feet below ground surface.



Soil boring SOUTH 107, 5 to 10 feet below ground surface.

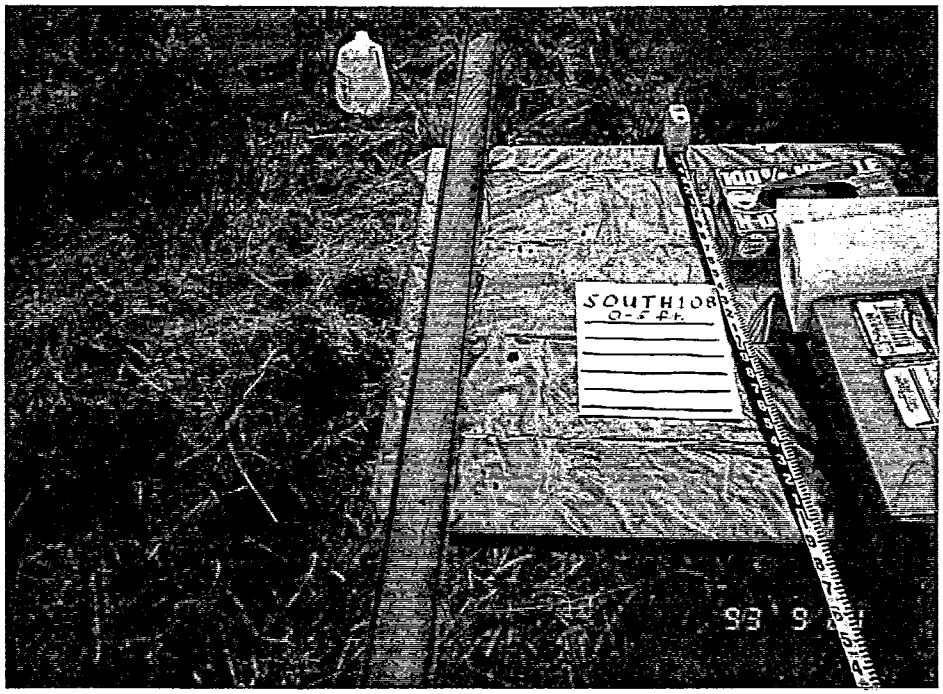
Soil boring SOUTH 107, 10 to 15 feet below ground surface.

Soil boring SOUTH 107, 15 to 20 feet below ground surface.



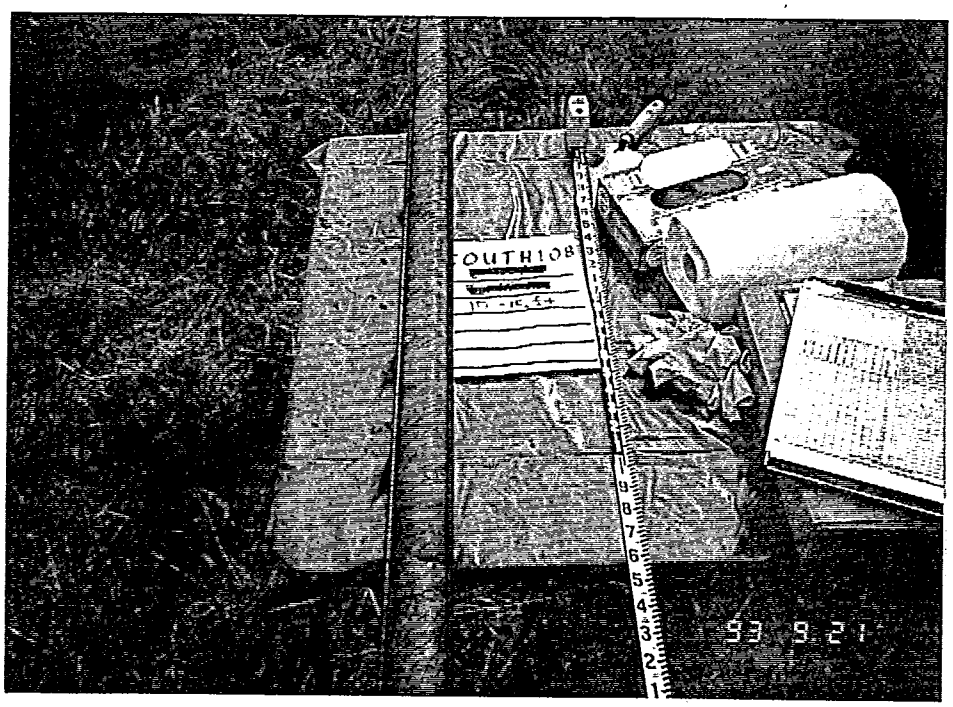
Soil boring SOUTH 107, 20 to 25 feet below ground surface.

Soil boring SOUTH 107, 25 to 30 feet below ground surface.



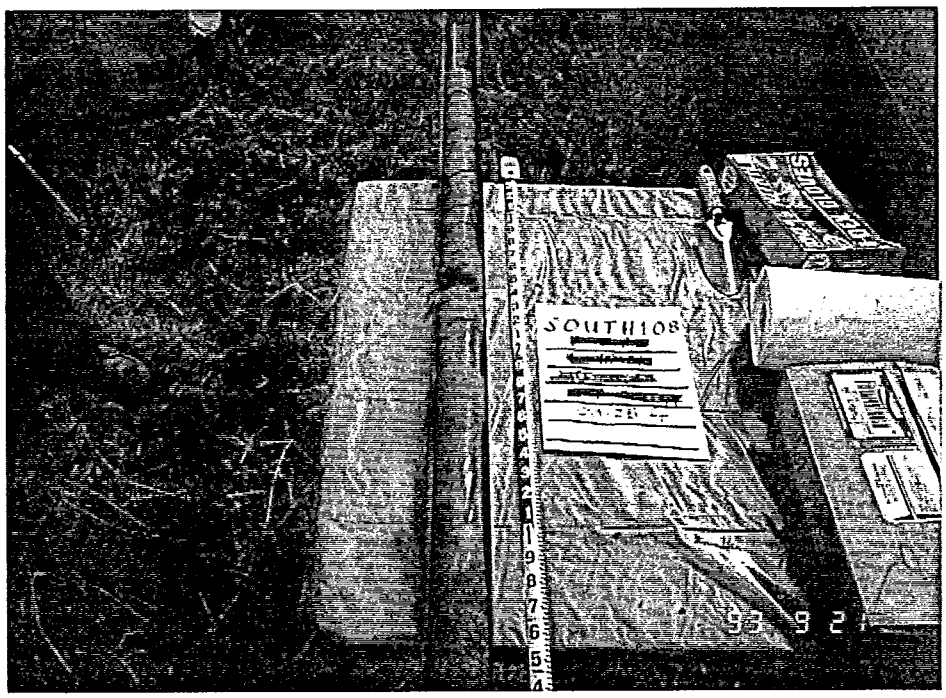
Soil boring SOUTH 108, 0 to 10 feet below ground surface.

Soil boring SOUTH 108, 5 to 10 feet below ground surface.

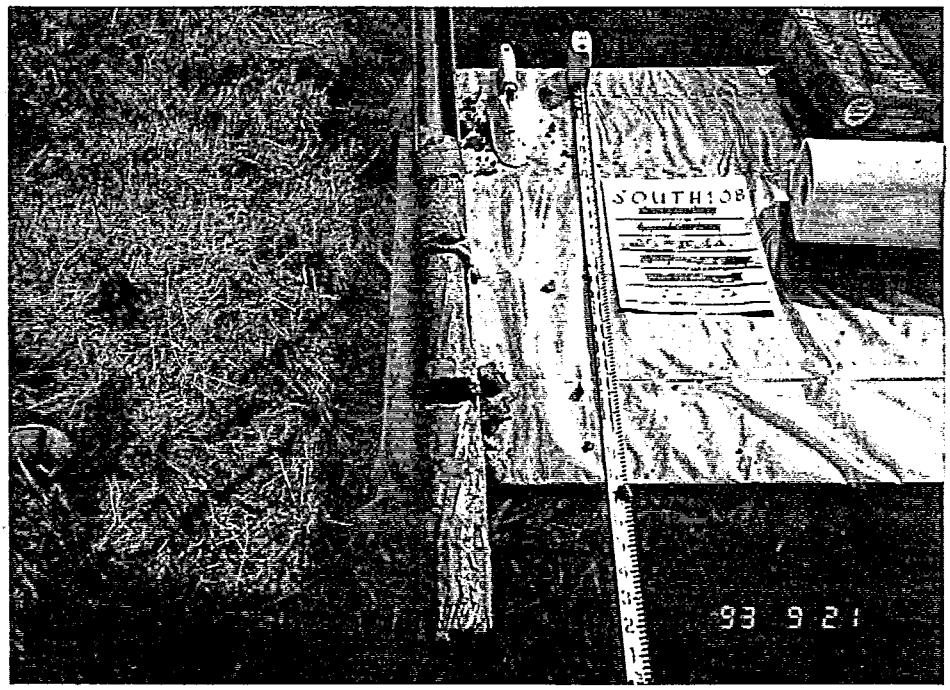


Soil boring SOUTH 108, 10 to 15 feet below ground surface.

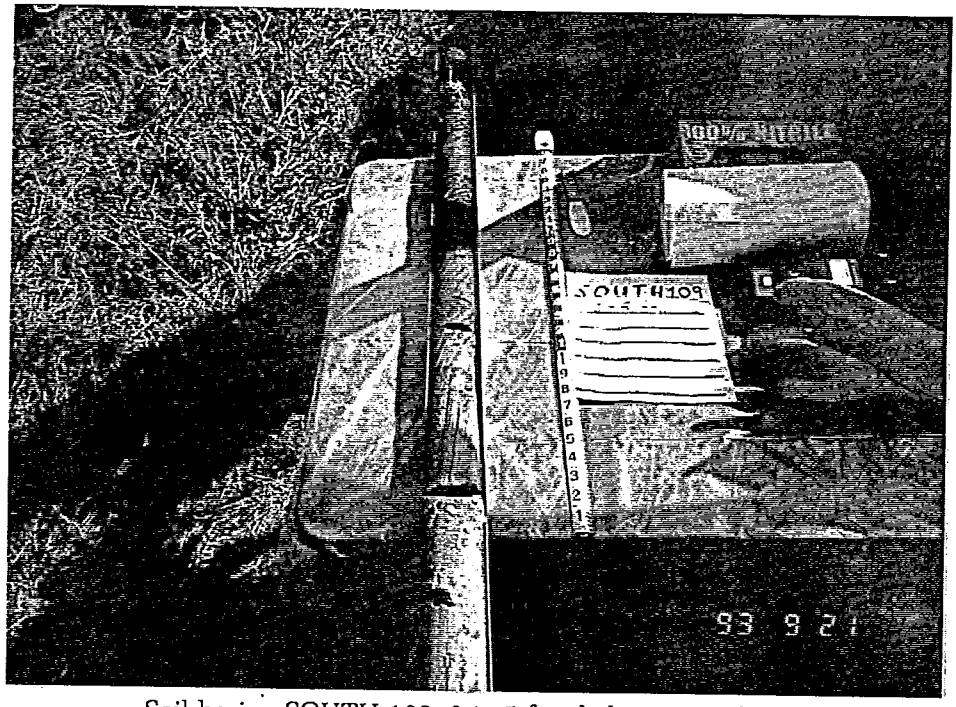
Soil boring SOUTH 108, 15 to 20 feet below ground surface.



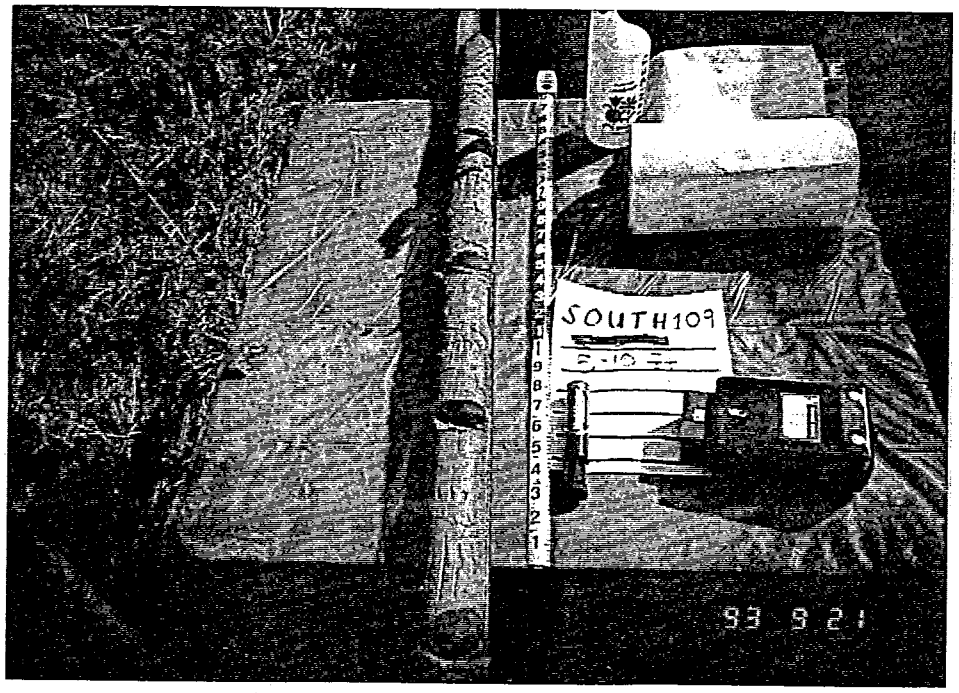
Soil boring SOUTH 108, 20 to 25 feet below ground surface.



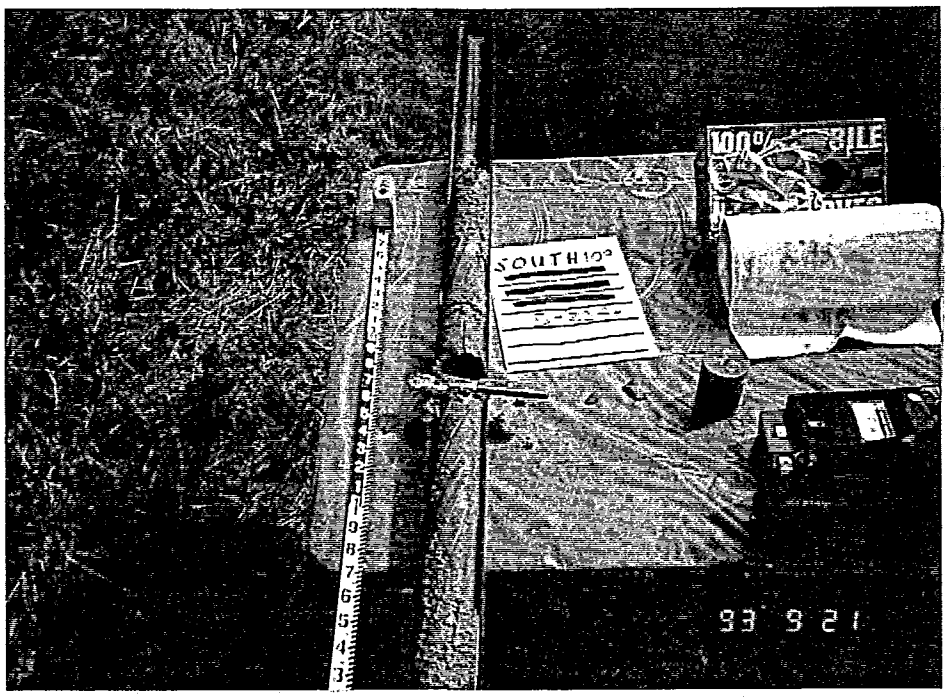
Soil boring SOUTH 108, 25 to 30 feet below ground surface.



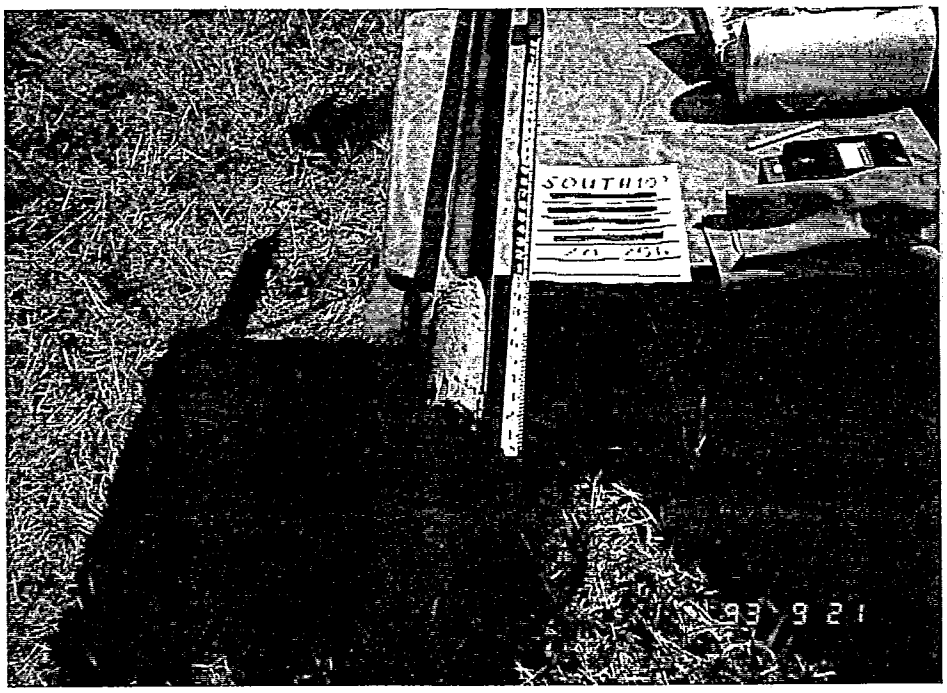
Soil boring SOUTH 109, 0 to 5 feet below ground surface.



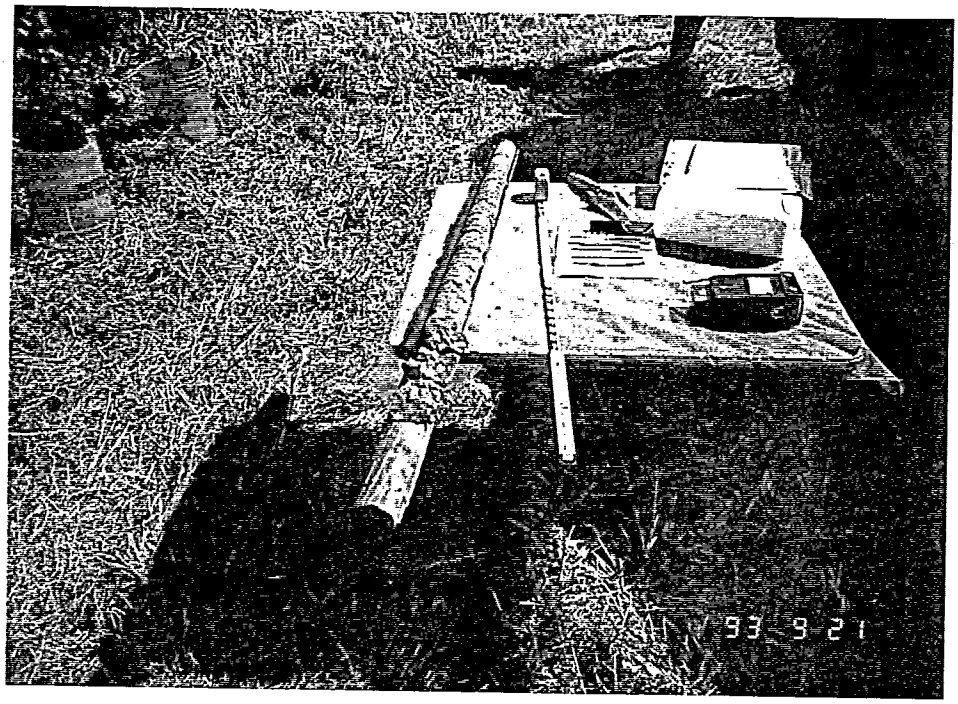
Soil boring SOUTH 109, 5 to 10 feet below ground surface.



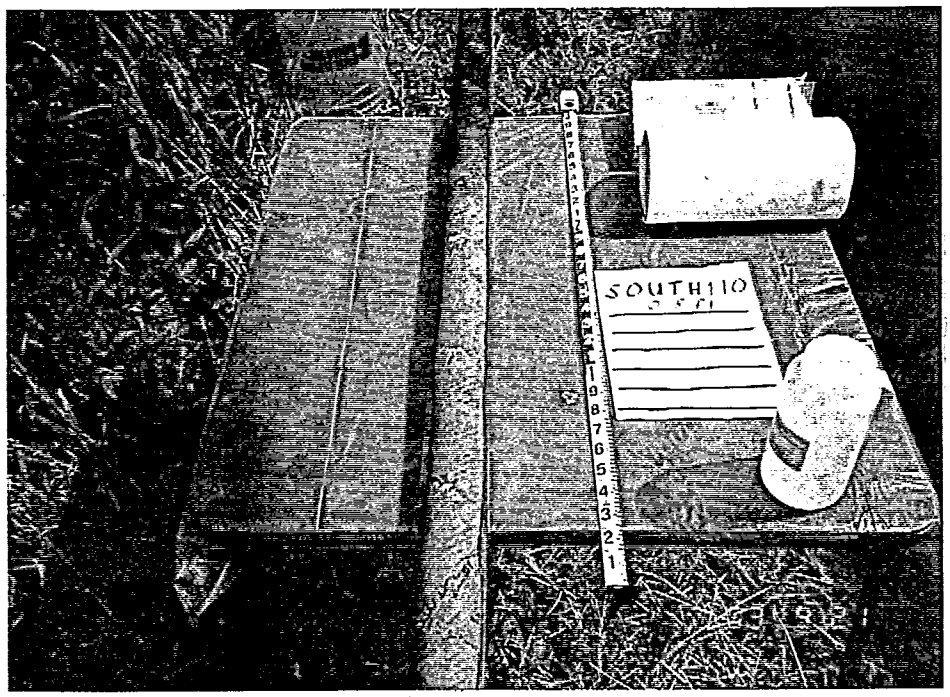
Soil boring SOUTH 109, 15 to 20 feet below ground surface.



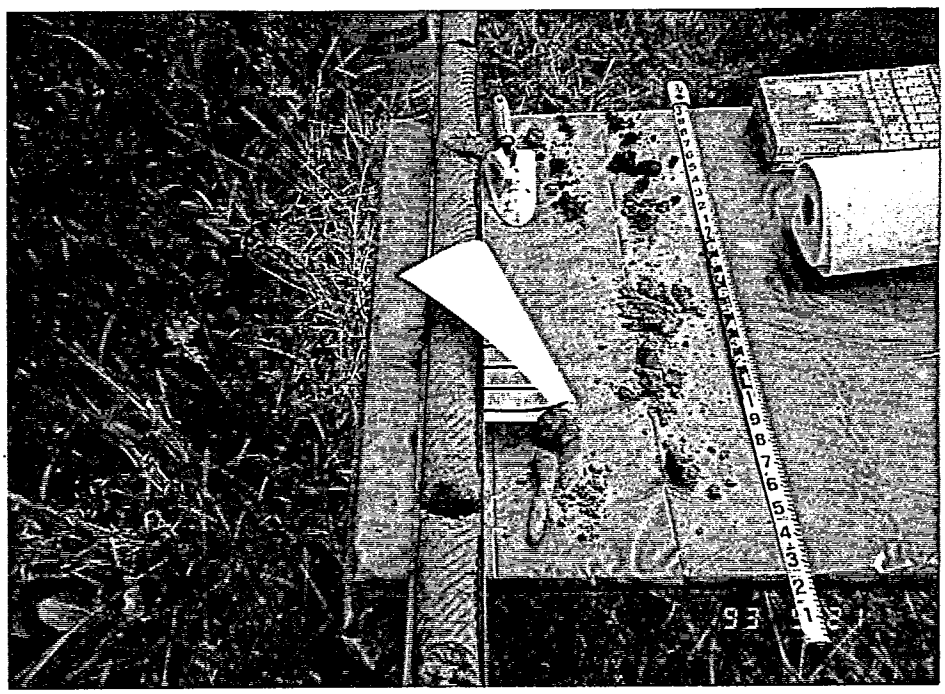
Soil boring SOUTH 109, 20 to 25 feet below ground surface.



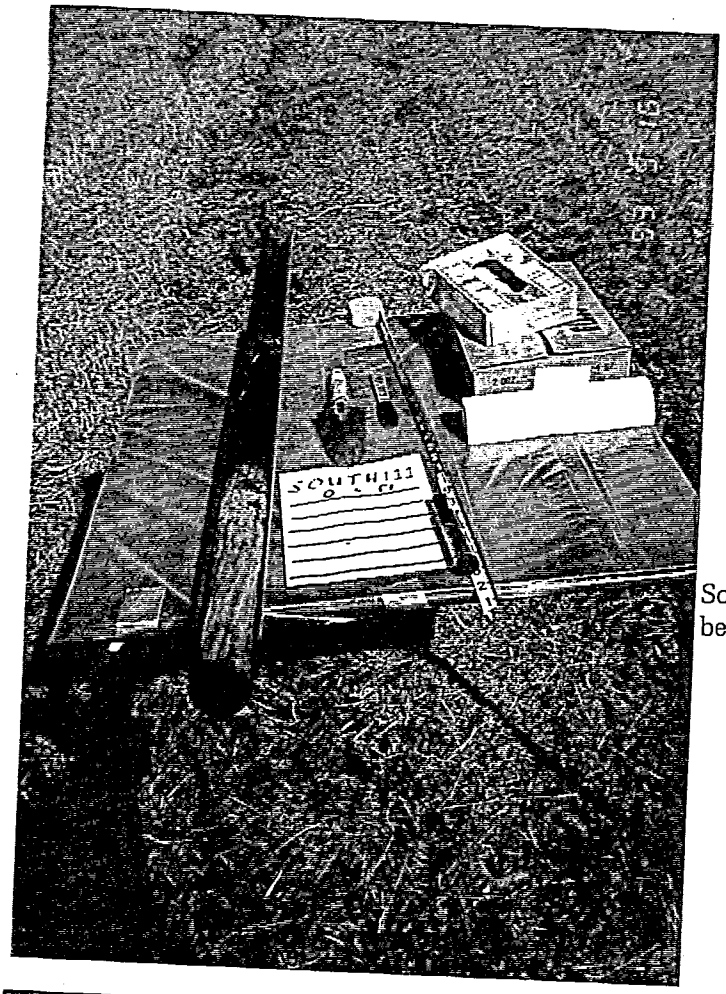
Soil boring SOUTH 109, 25 to 30 feet below ground surface.



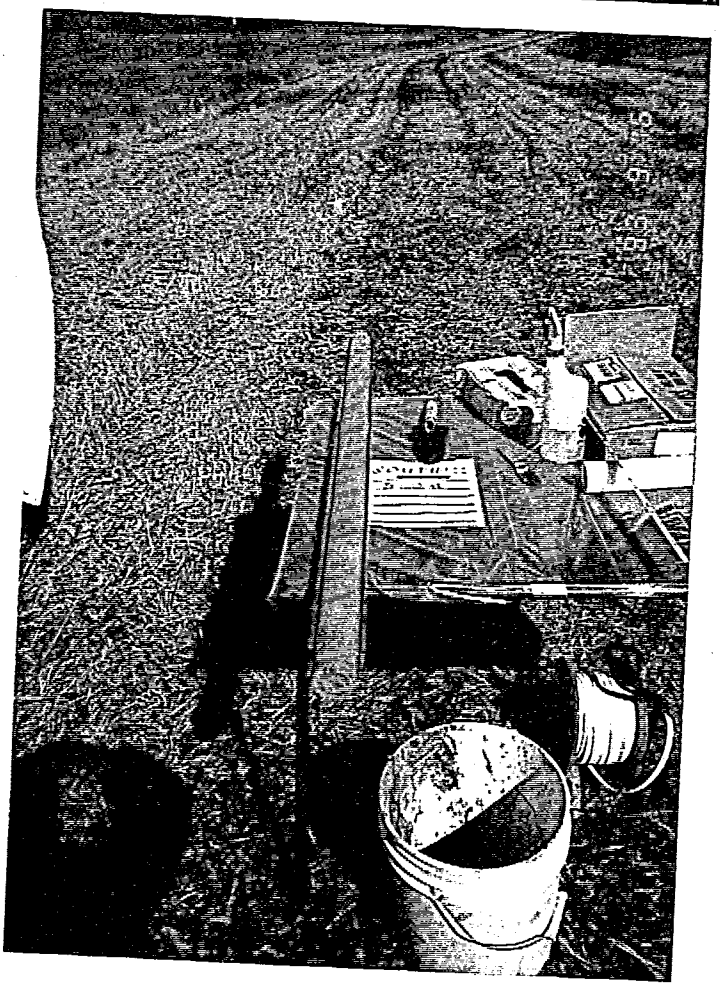
Soil boring SOUTH 110, 0 to 5 feet below ground surface.



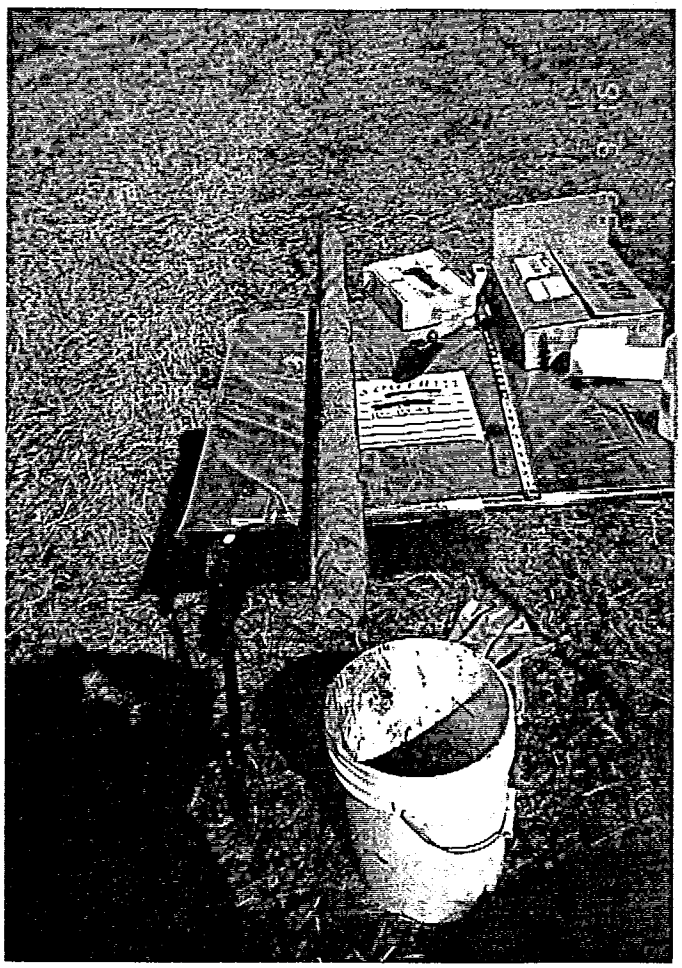
Soil boring SOUTH 110, 5 to 10 feet below ground surface.



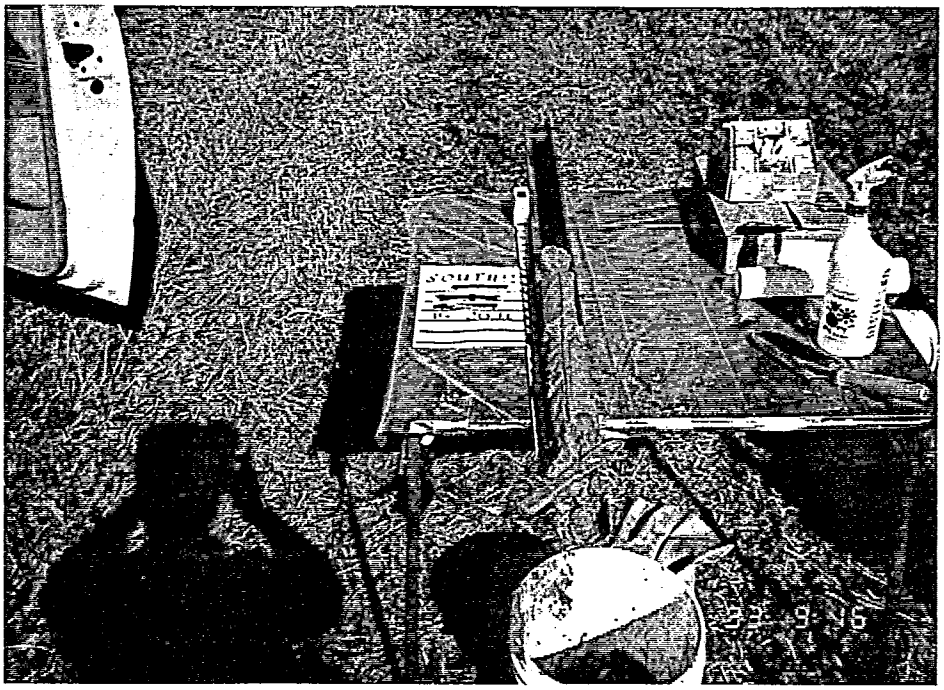
Soil boring SOUTH 110, 0 to 5 feet below ground surface.



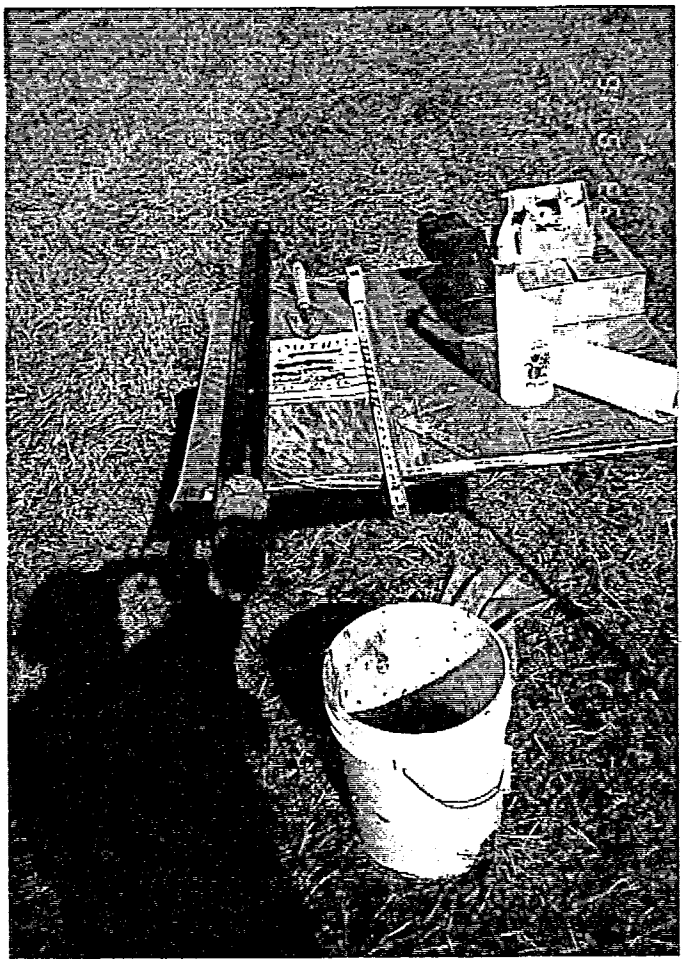
Soil boring SOUTH 110, 5 to 10 feet below ground surface.



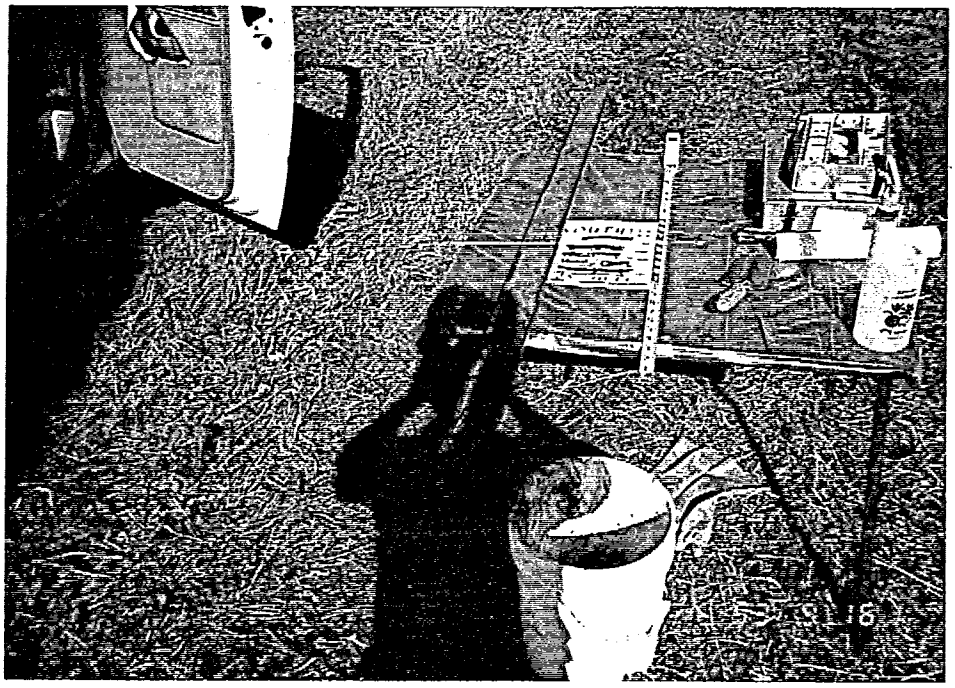
Soil boring SOUTH 111, 10 to 15 feet below ground surface.



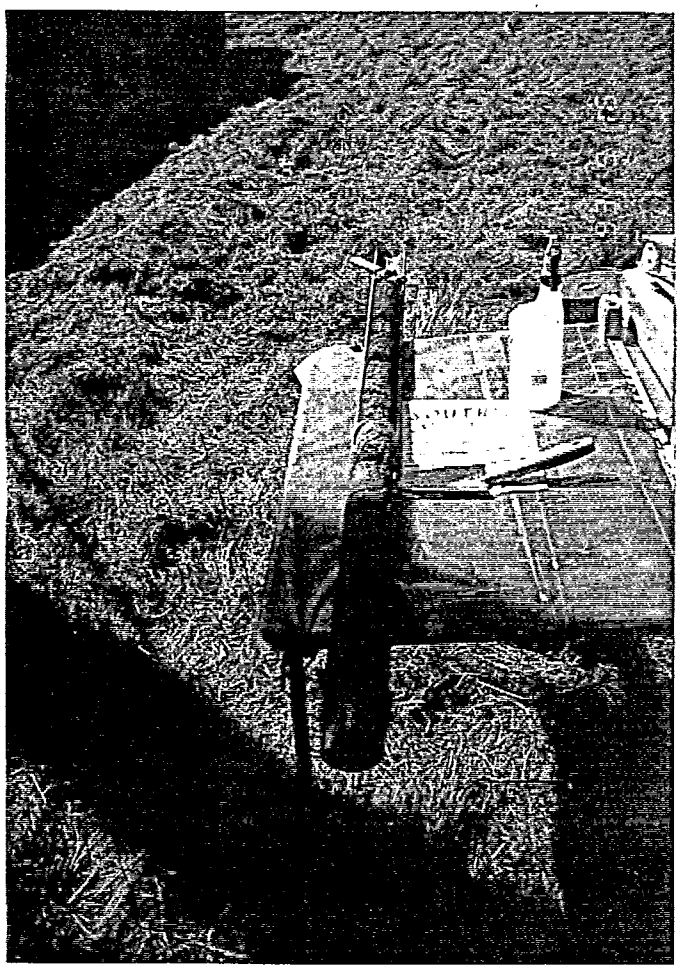
Soil boring SOUTH 111, 15 to 20 feet below ground surface.



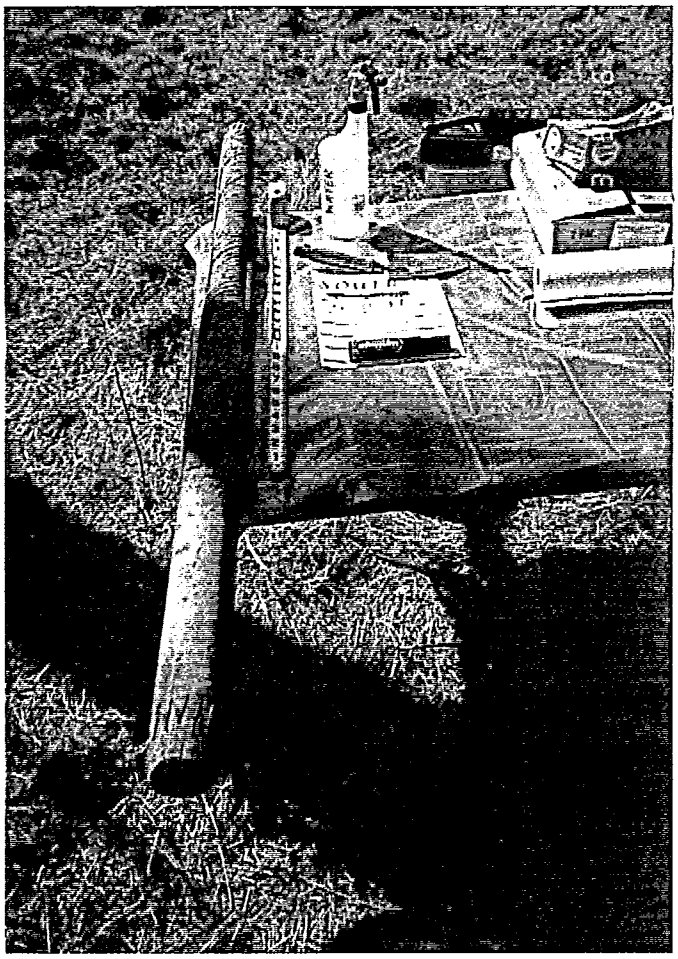
Soil boring SOUTH 111, 20 to 25 feet below ground surface.



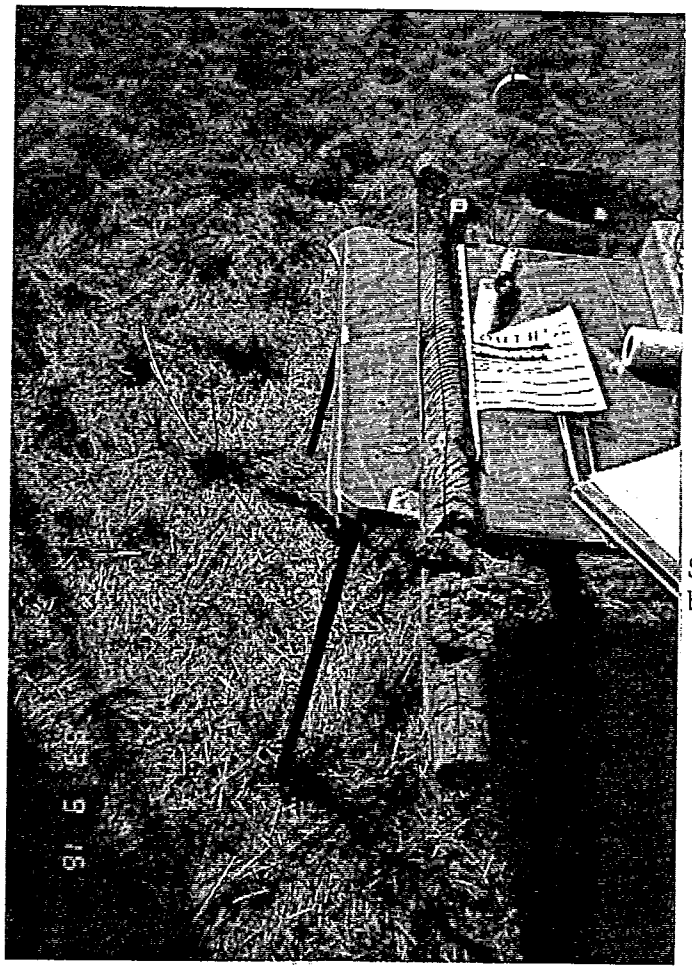
Soil boring SOUTH 111, 25 to 30 feet below ground surface.



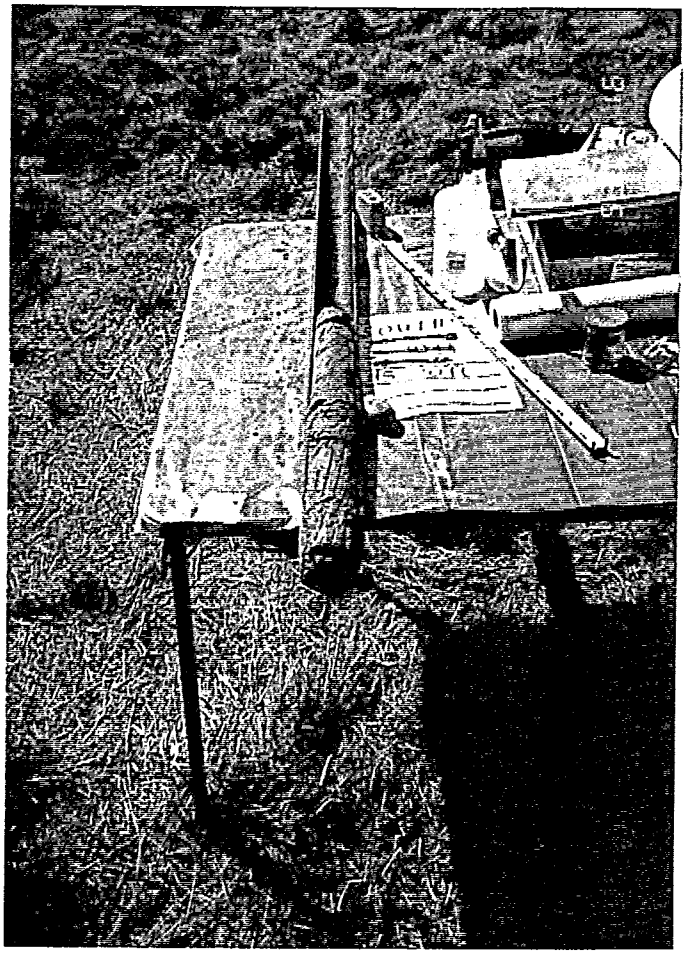
Soil boring SOUTH 112, 0 to 5 feet below ground surface.



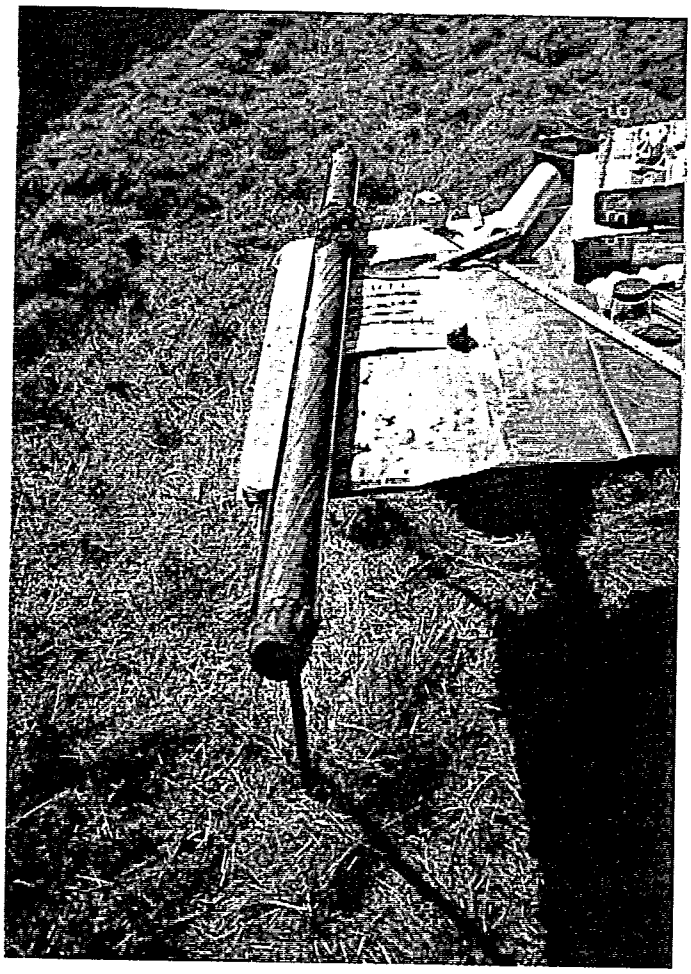
Soil boring SOUTH 112, 5 to 10 feet below ground surface.



Soil boring SOUTH 112, 10 to 15 feet below ground surface.

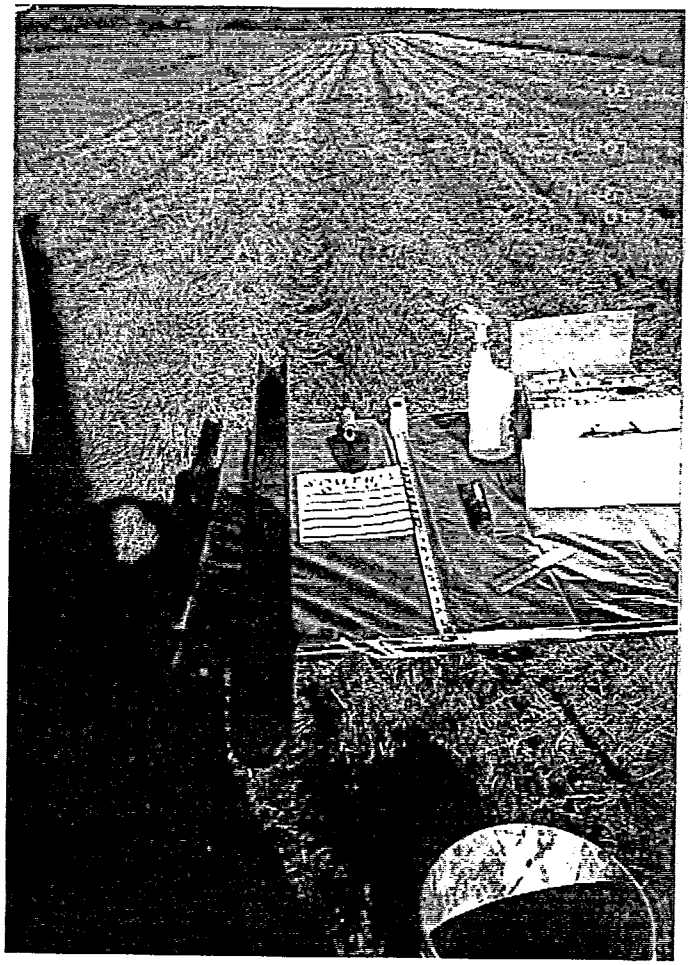


Soil boring SOUTH 112, 15 to 20 feet below ground surface.

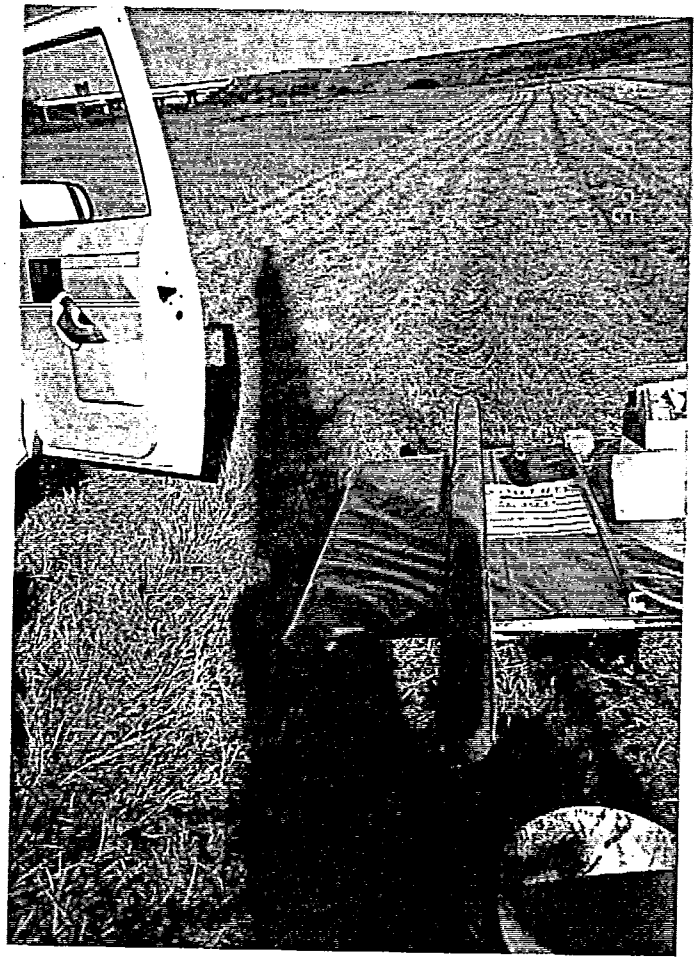


Soil boring SOUTH 112, 20 to 25 feet below ground surface.

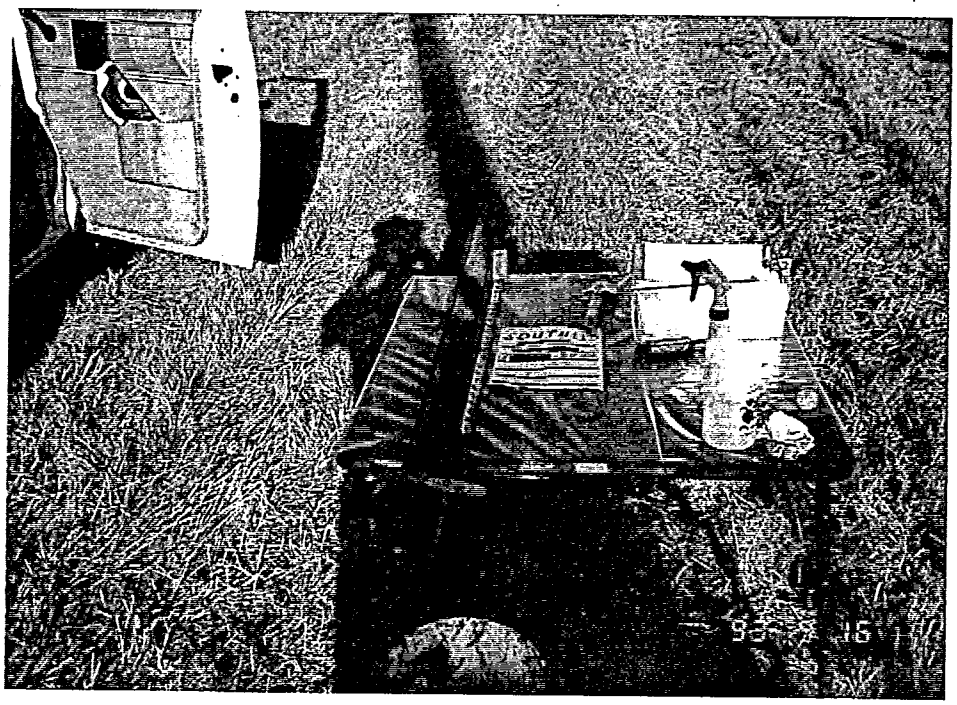
Soil boring SOUTH 112, 25 to 30 feet below ground surface.



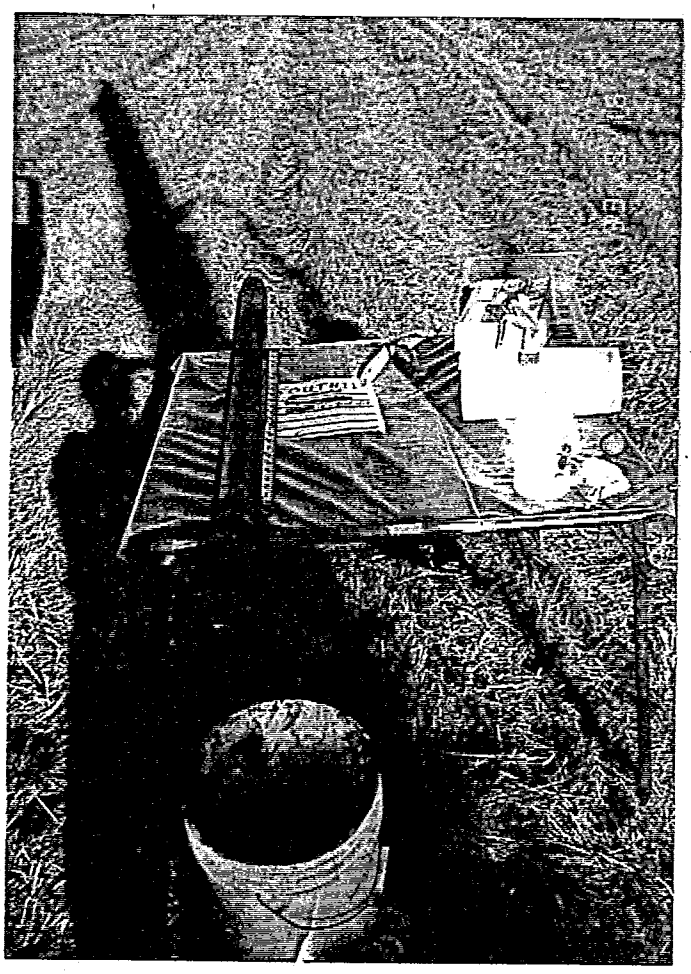
Soil boring SOUTH 113, 0 to 5 feet below ground surface.



Soil boring SOUTH 113, 5 to 10 feet below ground surface.

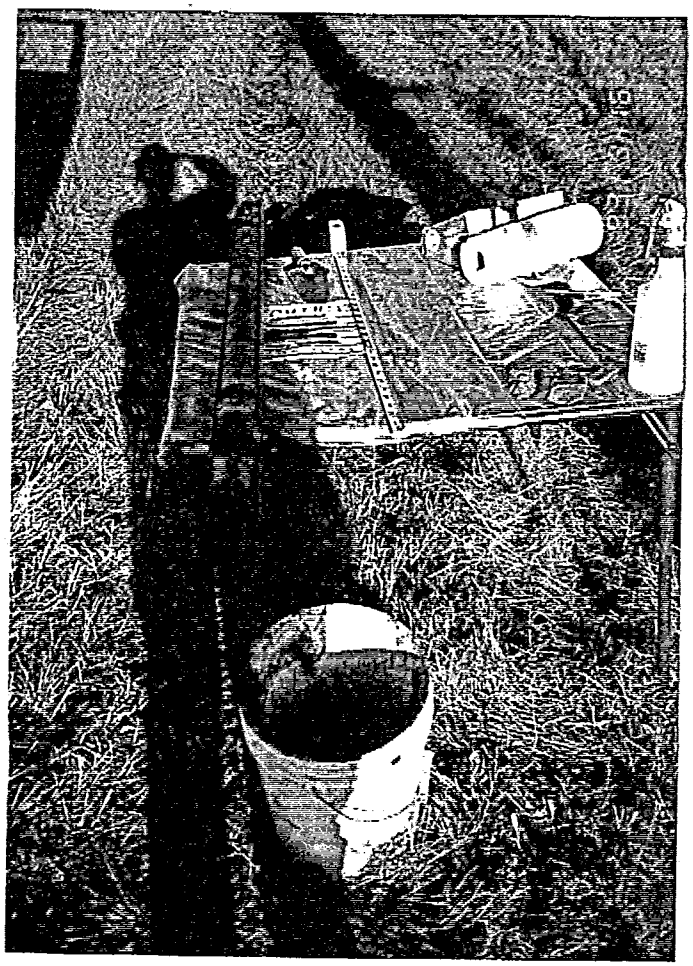


Soil boring SOUTH 113, 10 to 15 feet below ground surface.

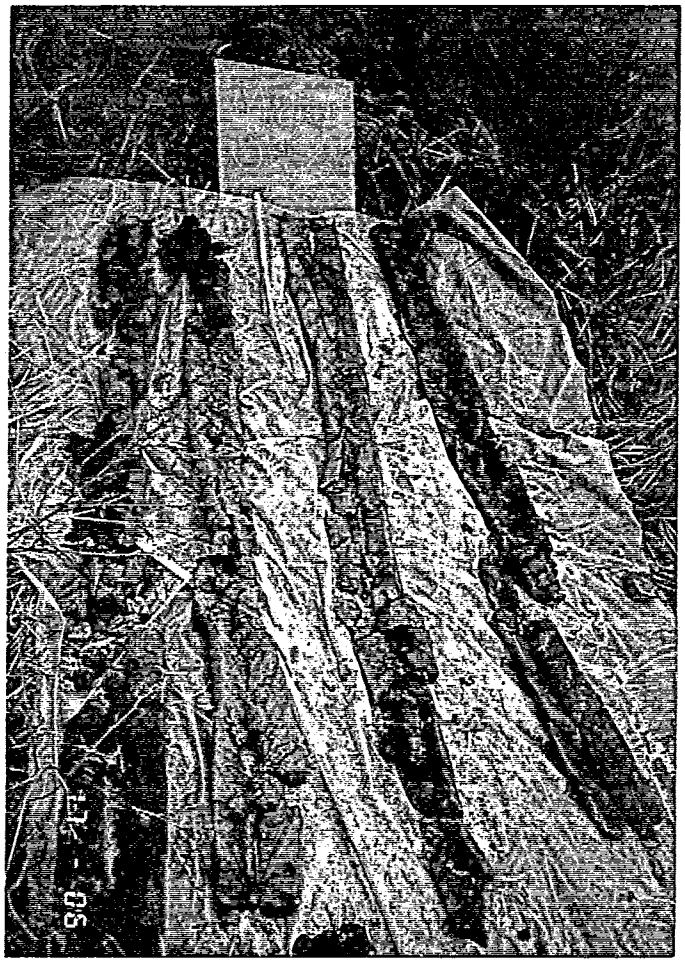


Soil boring SOUTH 113, 15 to 20 feet below ground surface.

Soil boring SOUTH 113, 20 to 25 feet below ground surface.

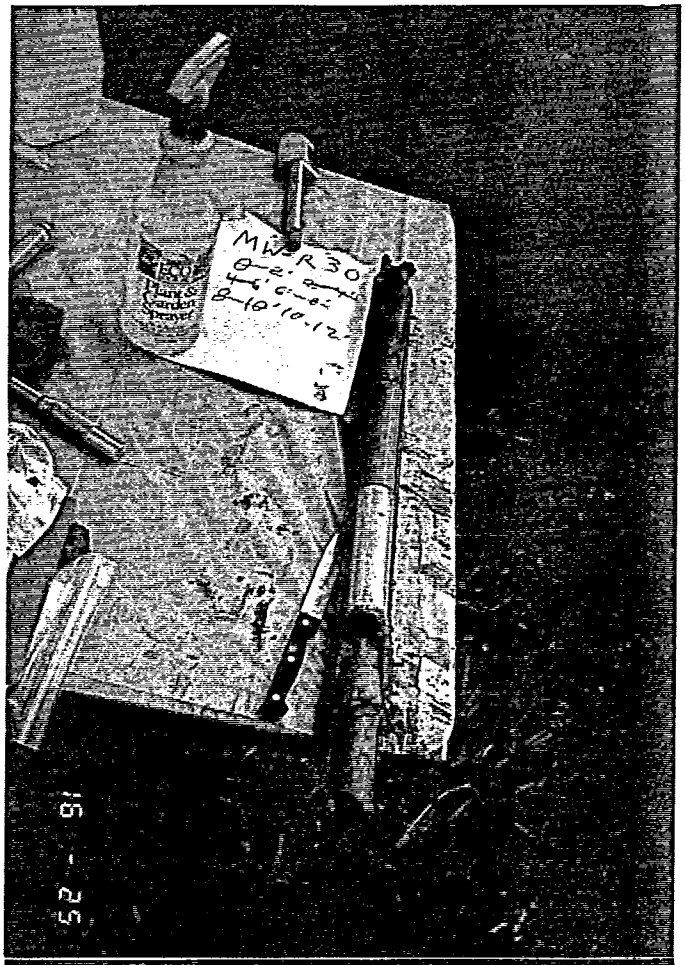


Soil boring SOUTH 113, 25 to 30 feet below ground surface.

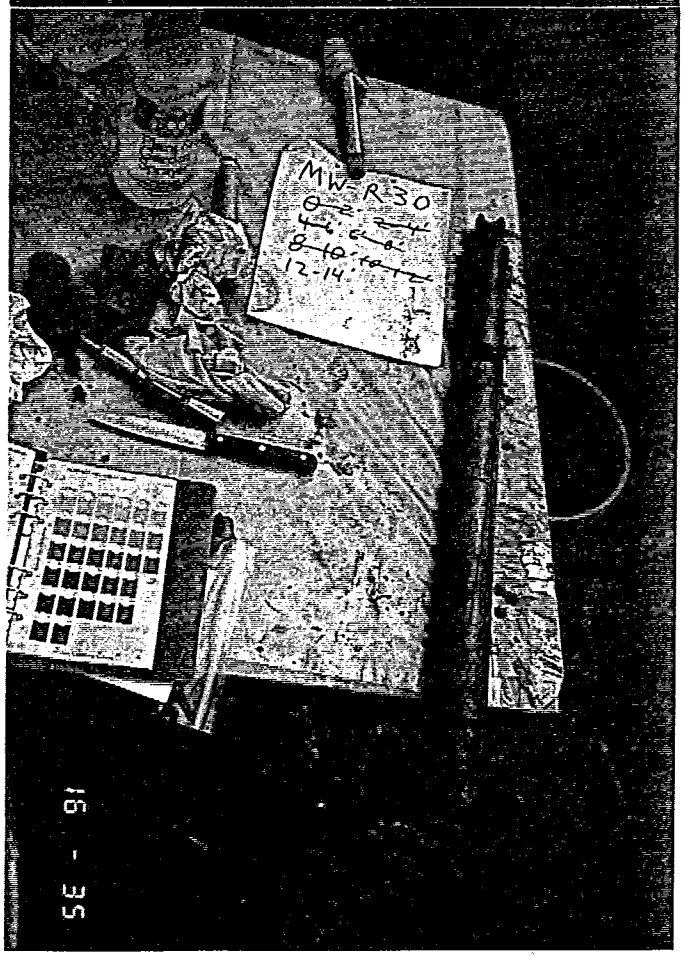


Monitoring well/soil boring MW-R17,
60 to 90 feet below ground surface

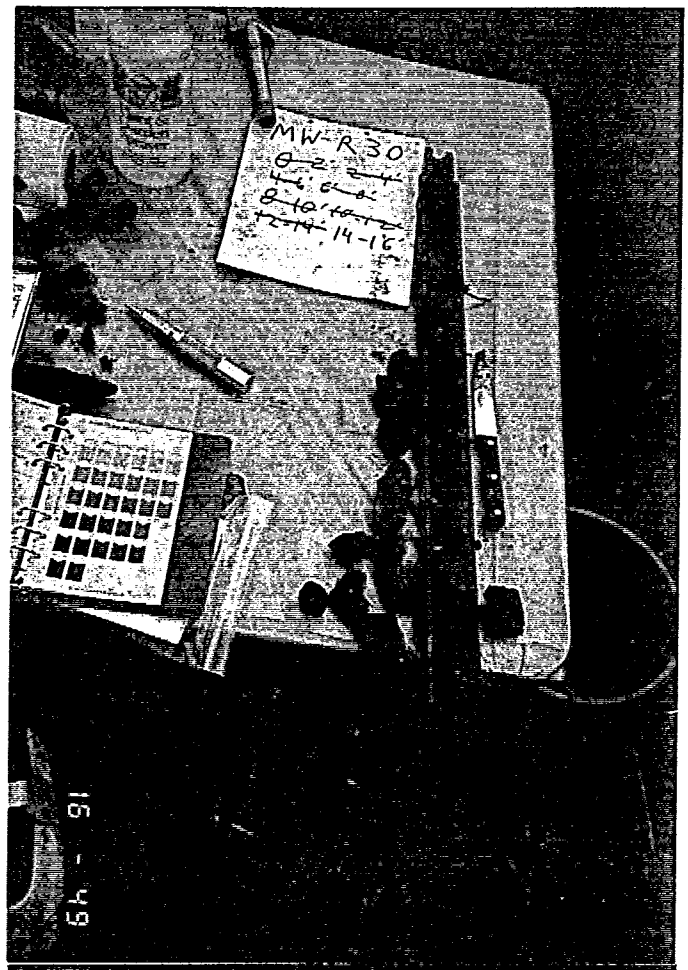
Monitoring well/soil boring MW-R6D,
0 to 20 feet below ground surface



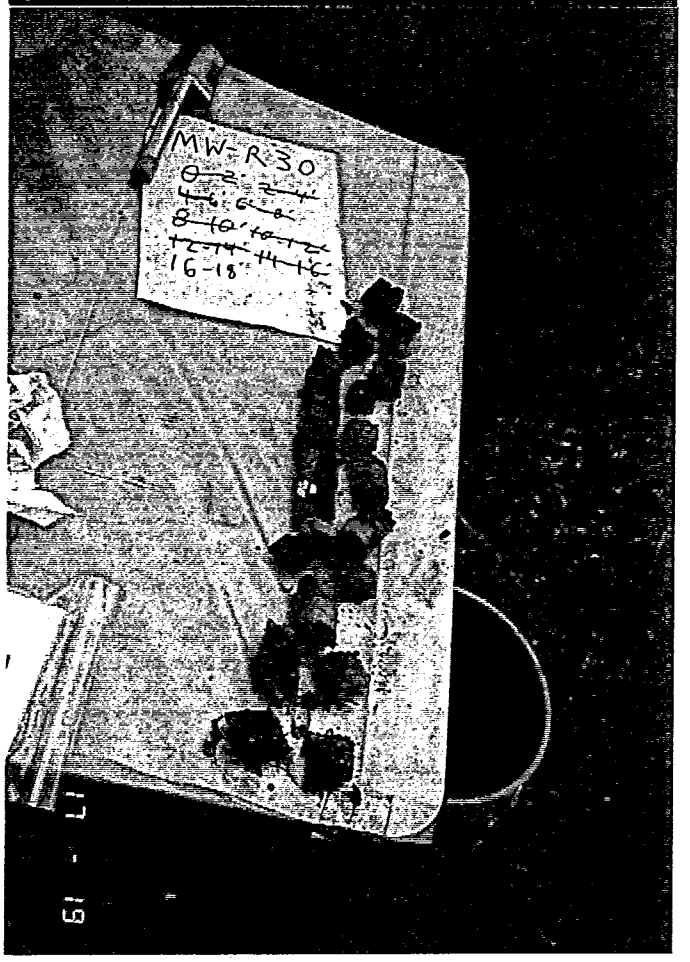
Monitoring well/soil boring MW-R30,
10 to 12 feet below ground surface



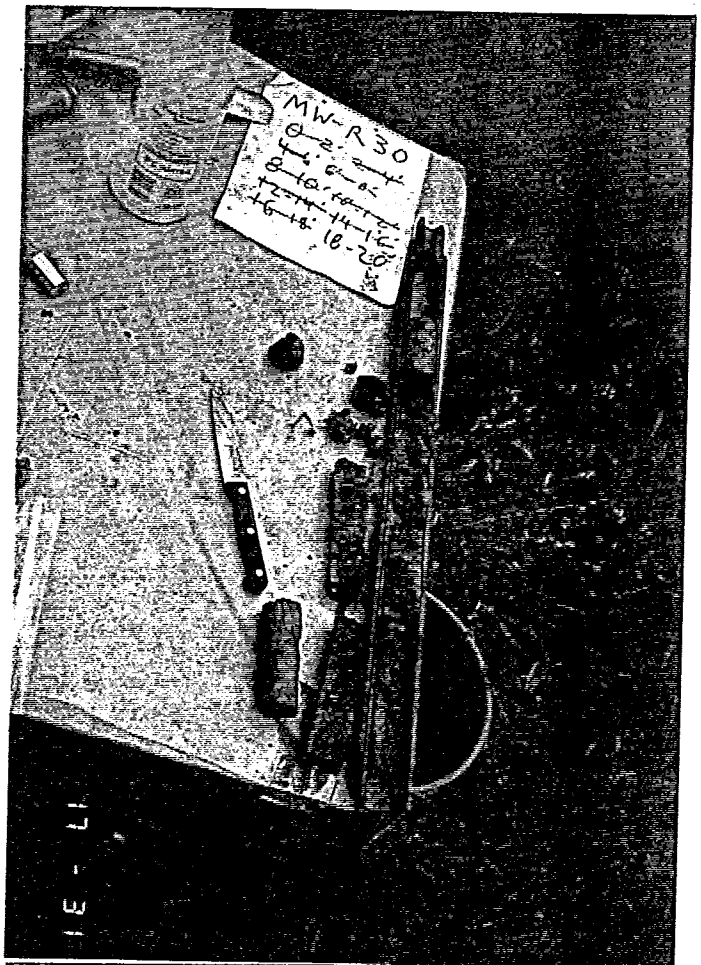
Monitoring well/soil boring MW-R30,
12 to 14 feet below ground surface



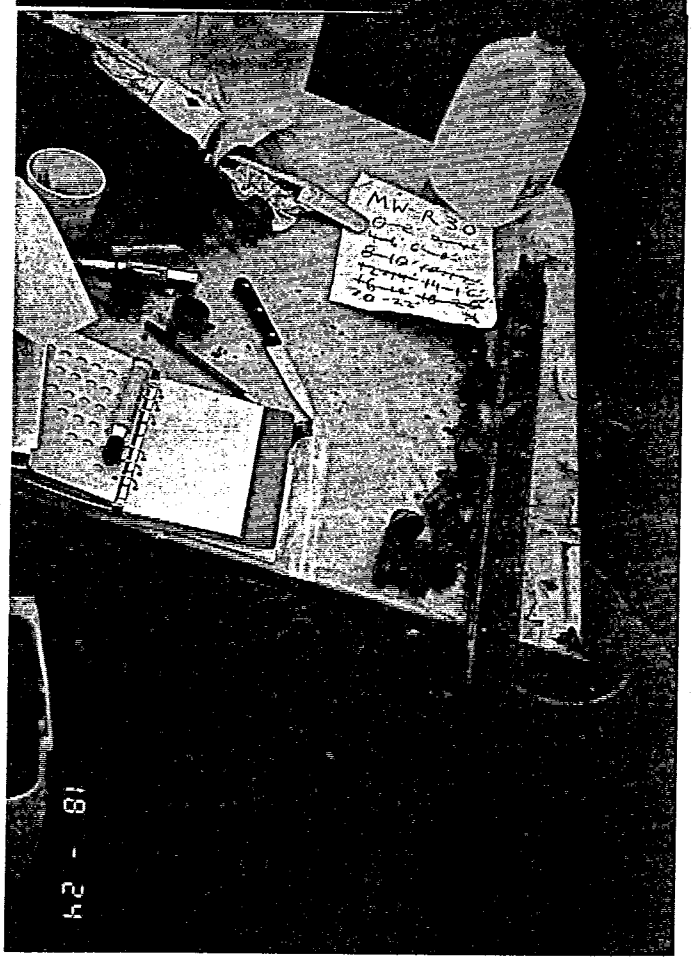
Monitoring well/soil boring MW-R30,
14 to 16 feet below ground surface



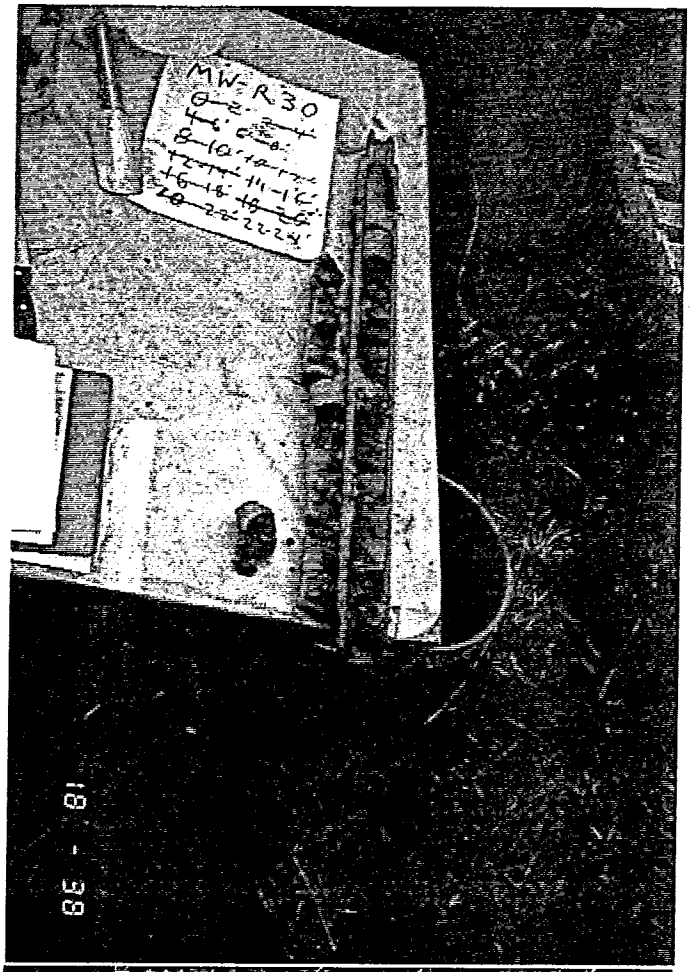
Monitoring well/soil boring MW-R30,
16 to 18 feet below ground surface



Monitoring well/soil boring MW-R30,
18 to 20 feet below ground surface

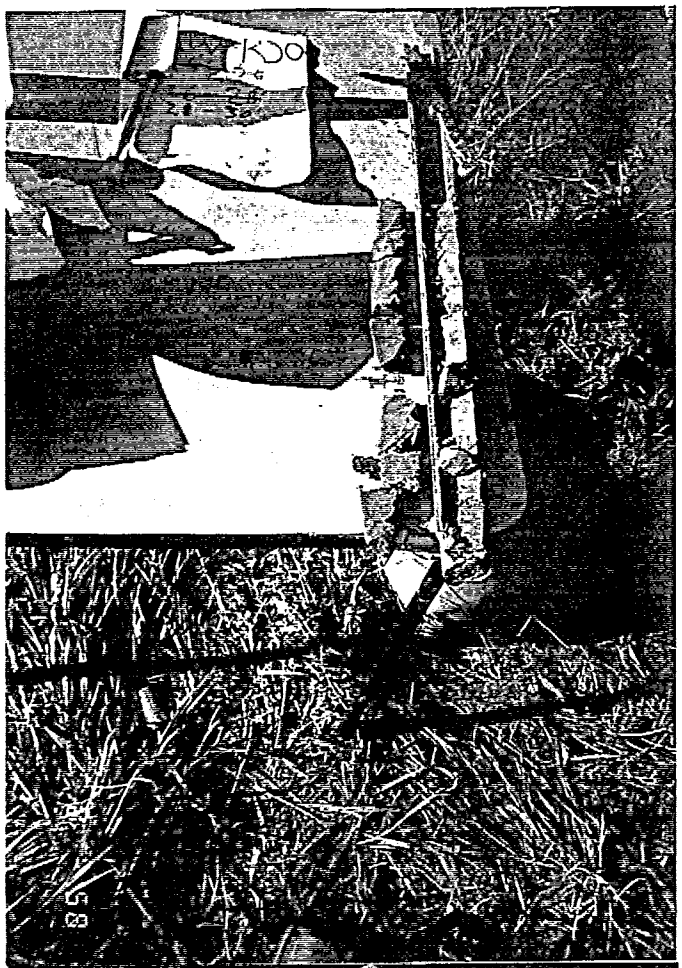


Monitoring well/soil boring MW-R30,
20 to 22 feet below ground surface



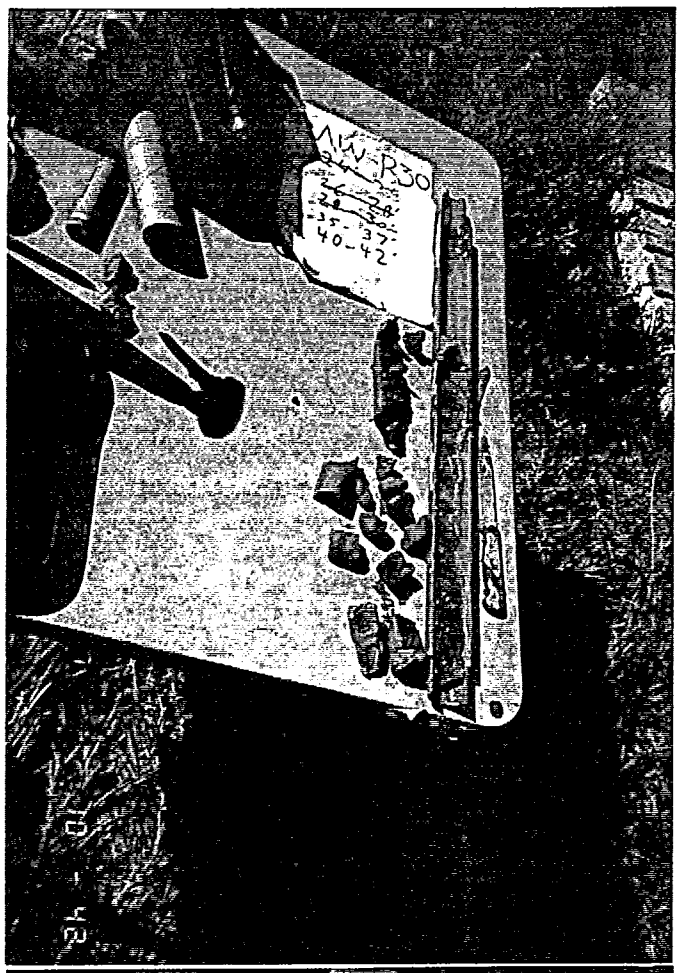
Monitoring well/soil boring MW-R30,
22 to 24 feet below ground surface

Monitoring well/soil boring MW-R30,
26 to 28 feet below ground surface

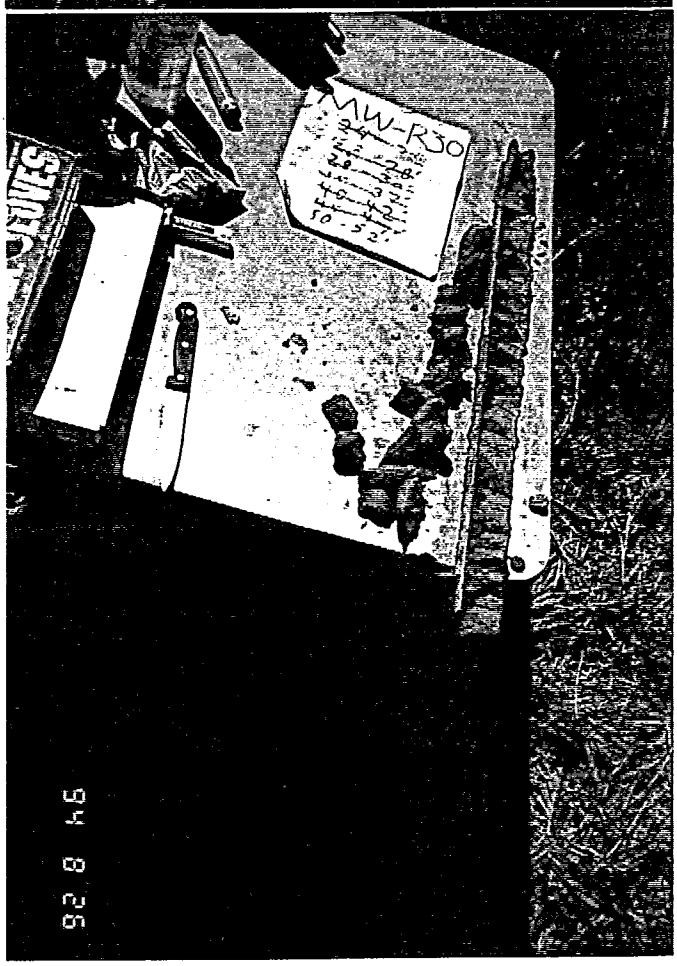


Monitoring well/soil boring MW-R30,
28 to 30 feet below ground surface

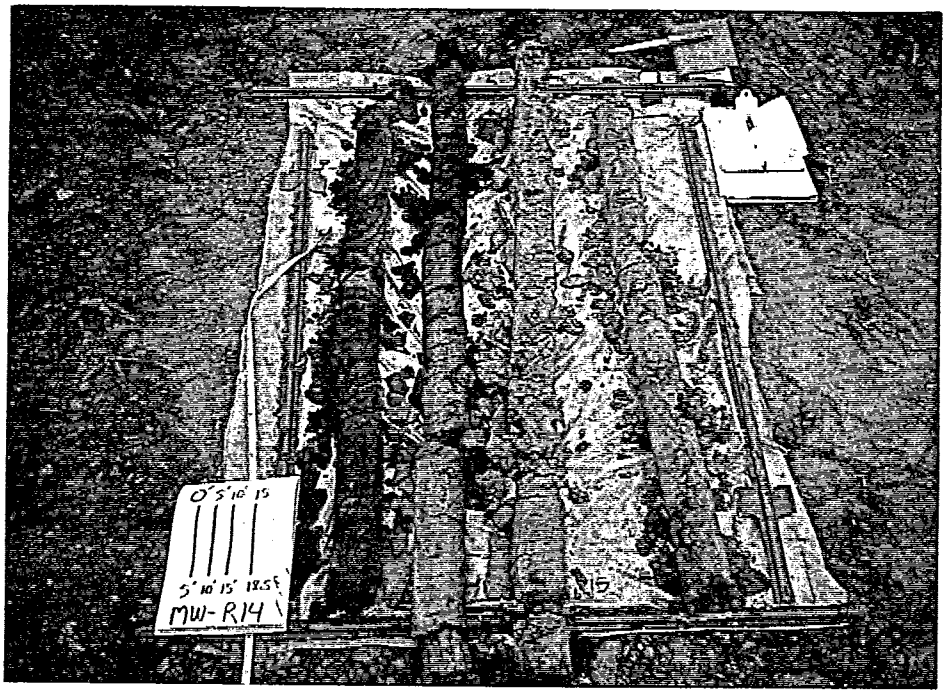
Monitoring well/soil boring MW-R30,
35 to 37 feet below ground surface



Monitoring well/soil boring MW-R30, 40 to 42 feet below ground surface



Monitoring well/soil boring MW-R30, 50 to 52 feet below ground surface



Monitoring well/soil boring MW-R14, 0 to 18.5 feet below ground surface