

# IDNR

## Tier 2 Site Cleanup Report Leaking Underground Storage Tank Site Assessment for the Iowa Department of Natural Resources

# DNR COPY IDNR

### CON 12-15 Doc #15987

### SITE IDENTIFICATION

LUST No. UST Registration No. 

Site Name:	Hunter Oil - DNR#25-11256-JS-1445
Site Address:	HWY 69 and Baker Street
City:	Minburn

### RESPONSIBLE PARTY IDENTIFICATION

Name:	Jim Anderson/Hunter Enterprises	Phone #:	
Street:	<del>911 Main Street</del> 2825 Prospect Ave.		
City:	Adel	State:	Iowa
		Zip Code:	50003

 Classification:  High Risk  Low Risk  No Action Required

 Recommend:  Tier 3  Corrective Action
 Is this a revised Tier 2 SCR?  Yes  No

### STATEMENT OF CERTIFICATION

I, Marcia Eckhoff, Groundwater Professional Certification No. 1669, am familiar with all applicable requirements of Iowa Code § 455B.474 and all rules and procedures adopted thereunder including, but not limited to, the Department of Natural Resources Tier 2 guidance. Based on my knowledge of those documents and information I have prepared and reviewed regarding this site, UST Registration No. \_\_\_\_\_, LUST No. \_\_\_\_\_, I certify that this document is complete and accurate as provided in 567 IAC § 135.10(11) and meets the applicable requirements of the Tier 2 site assessment.

Print: Name/Address/Phone # of Certified Groundwater Professional

Marcia Eckhoff  
Seneca Environmental Services  
4140 NE 14th Street  
Des Moines, Iowa 50313 (515) 262-3500

Signature: Date (Sent/Given to Responsible Party): 5-24-00

I certify that I have reviewed this document, appendices and attachments for submittal to the Iowa Department of Natural Resources. To the best of my knowledge, the site history and scaled site plan are accurate.

Jim Anderson/Hunter Enterprises  
 Print: Name of Responsible Party

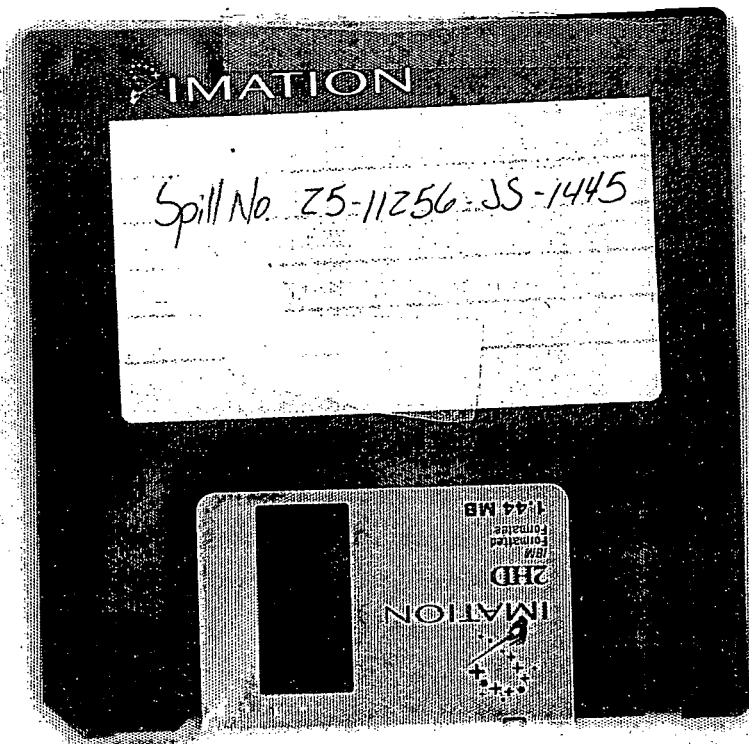
Jim Anderson 5-30-2000  
 Signature Responsible Party Date (Sent/Given to IDNR)  
President

### Official IDNR Use Only

 Date Received:   
 Reviewer: 

 Comment Letter Date:   
 Approved: Y  N

15987



To view this disk, it  
is located at DNR records in  
Des Moines, Iowa.

## TIER 2 REPORT CHECKLIST

Printed from the software

<input checked="" type="checkbox"/> <input type="checkbox"/> Report Cover Sheet. Signed by certified groundwater professional and responsible party. ....	1
<input checked="" type="checkbox"/> Tier 2 Report Checklist .....	2
<b>Summary Sheets:</b>	
<input checked="" type="checkbox"/> <input type="checkbox"/> Tier 2 Data Before Modeling .....	4
<input checked="" type="checkbox"/> <input type="checkbox"/> Site Hydrogeology .....	5
<input checked="" type="checkbox"/> <input type="checkbox"/> Preliminary Pathway Evaluation Requirements .....	6
<input checked="" type="checkbox"/> <input type="checkbox"/> Tier 2 Receptor Summary.....	7
<b>Report Body:</b>	
<input checked="" type="checkbox"/> Sampling Results ( <input type="checkbox"/> pages 10-12) .....	9
<input checked="" type="checkbox"/> Receptor Survey -- Groundwater Well Survey.....	14
<input checked="" type="checkbox"/> Receptor Survey -- Affected Property Owner Table.....	15
<input checked="" type="checkbox"/> Receptor Survey -- Commingled Plume Discussion.....	16
<input checked="" type="checkbox"/> Receptor Survey -- Off-Site Contamination Source Support Discussion.....	16
<input checked="" type="checkbox"/> Free Product.....	16
<input checked="" type="checkbox"/> Receptor Survey -- Enclosed Space Survey .....	17
<input checked="" type="checkbox"/> Receptor Survey -- Surface Water Survey .....	18
<input checked="" type="checkbox"/> Risk Justification and Corrective Action Proposed .....	19
<input checked="" type="checkbox"/> <input type="checkbox"/> Monitoring Plan.....	21

2000 MAY 31 A 11: 21  
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NATURAL RESOURCES

**Pathway Assessment Attachments:**

**Groundwater Pathways:** If a receptor type must be evaluated, check the box at the left and include the Receptor ID (Identification) Map. If any potential or actual receptors are identified by the Receptor ID Map, the Receptor Evaluation Map (for each applicable chemical for each receptor) and SSTL Table (for each receptor) must be provided in the corresponding appendix. Check the boxes in the table for those items attached.

Pathway	Receptor ID Map	Receptor Evaluation Map						SSTL Tables
		B	T	E	X	D	WO	
<input type="checkbox"/> 1a. GW Ingestion - Drinking Water Wells								
<input type="checkbox"/> 1b. GW Ingestion - Nondrinking Water Wells								
<input type="checkbox"/> 2. GW Ingestion - Protected GW Source								
<input checked="" type="checkbox"/> 3a. GW Vapor - Confined Space Residential	X							
<input checked="" type="checkbox"/> 3b. GW Vapor - Confined Space Nonresidential	X							
<input checked="" type="checkbox"/> 4. GW Vapor - Potential Confined Space	X	X						X
<input checked="" type="checkbox"/> 5a. GW Vapor - Sanitary Sewer Residential	X							
<input checked="" type="checkbox"/> 5b. GW Vapor - Sanitary Sewer Nonresidential	X							
<input checked="" type="checkbox"/> 6. GW Vapor - Potential Sanitary Sewer	X	X						X
<input checked="" type="checkbox"/> 7. GW to Plastic Water Line	X							
<input type="checkbox"/> 8. Surface Water								

**Soil Leaching Pathways:** Check the box at the left if this receptor type must be evaluated. The Receptor ID (Identification) Map and Soil SSTL Table (for each receptor) must be provided in the corresponding appendix.

Pathway	Receptor ID Map	Soil SSTL Table
<input type="checkbox"/> 9-1a. Soil Leaching to GW Ingestion - Drinking Water Wells		
<input type="checkbox"/> 9-1b. Soil Leaching to GW Ingestion - Nondrinking Water Wells		
<input type="checkbox"/> 9-2. Soil Leaching to GW Ingestion - Protected GW Source		
<input type="checkbox"/> 9-3a. Soil Leaching to GW Vapor - Confined Space Residential		
<input type="checkbox"/> 9-3b. Soil Leaching to GW Vapor - Confined Space Nonresidential		
<input type="checkbox"/> 9-4. Soil Leaching to GW Vapor - Potential Confined Space		
<input type="checkbox"/> 9-5a. Soil Leaching to GW Vapor - Sanitary Sewer Residential		
<input type="checkbox"/> 9-5b. Soil Leaching to GW Vapor - Sanitary Sewer Nonresidential		
<input type="checkbox"/> 9-6. Soil Leaching to GW Vapor - Potential Sanitary Sewer		
<input type="checkbox"/> 9-7. Soil Leaching to GW to Plastic Water Line		
<input type="checkbox"/> 9-8. Soil Leaching to Surface Water		

10.  Soil Vapor to Enclosed Space. If this pathway must be evaluated, check the box at the left and provide the Soil Vapor Map.

11.  Soil to Plastic Water Line. If this pathway must be evaluated, check the box at the left and provide the Soil to Plastic Water Line Map.

**Bedrock Pathway Assessment Attachments:**

- A. Justification for Bedrock Type
- B. Hydrogeologic Cross-section
- C.  Hydraulic Conductivity and Total Dissolved Solids Table(s)

<input type="checkbox"/> Pathway	B	T	E	X	TEH - D	TEH - WO
<input type="checkbox"/> 1. GW Ingestion - Actual Map						
<input type="checkbox"/> 2. GW Ingestion - Potential Map						
<input type="checkbox"/> 3. Soil Gas Plume Map						
<input type="checkbox"/> 7. GW to Plastic Water Line Map						
<input type="checkbox"/> 8. Surface Water Map						
<input type="checkbox"/> 9. Soil Leaching Map						
<input type="checkbox"/> 10. Soil Vapor Map						
<input type="checkbox"/> 11. Soil to Plastic Water Line Map						

**Other Maps:**

- 12.  Groundwater Summary Corrective Action Map
- 13.  Soil Summary Corrective Action Map
- 14. Monitoring Plan Map
- 15. Landowner Map
- 16. X, Y Coordinates Map (on a Site Map)
- 17. Zoning Documentation
- 18.  Groundwater Source Width/Length Map
- 19.  Soil Source Width/Length Map
- 20.  Soil Contamination Plume Map
- 21.  Groundwater Contamination Plume Map
- 22. Groundwater Flow Direction Map
- 23. Well Survey Map
- 24. Enclosed Space and Conduit Map
- 25. Surface Water Map

**Other Appendices:**

- 26. Laboratory Data Sheets / Chromatograms
- 27. Construction Diagrams for Soil Vapor Mon. Wells
- 28. Soil Boring Logs/Mon. Well Construction Diagrams
- 29. Well Logs (drinking and non-drinking water wells)
- 30. Off-Site Contamination Source Support Data
- 31. Tier 1 Selected Information
  - Pages 5, 6 and 10 of the Report Body
  - Appendix 1 - Topographic Site Map
  - Appendix 4 - Field Screening Map
  - App. 11 - Tank Tightness Test Results
  - Appendix 14 - "K" Measurements

**32. Corrective Action Documentation - optional**

- Declaration of Restrictive Covenants / Institutional Controls
- Abandoned Water Well Plugging Record(s)
- Water Supply (IDNR) / Designated County Agent Notification
- Report of Plastic Water Line Removal and / or Relocation
- Utility Company Notification
- Sanitary Sewer Notification
- Report of Excavation Activities and, if applicable, completed Land Application Notification Form.

**Computer Disk**

## TIER 2 DATA BEFORE MODELING

Free Product Present? No	Groundwater encountered? Yes	SCR conversion? Yes
TEH-diesel required? Yes	TEH-waste oil required? No	Bedrock: No,

Analytical Data							
Groundwater Maximums				Soil Maximums			
	Date	B/MW #	Concentration (ug/L)		Date	B/MW #	Concentration (mg/kg)
B	07/26/1988	MW 1	9600	B	02/03/1999	BH4B	<0.009
T	07/26/1988	MW 1	13000	T	09/06/1989	BH 9	0.009
E	10/10/1997	MW 12	12000	E	02/03/1999	BH4B	<0.009
X	10/10/1997	MW 12	76000	X	06/29/1989	BH 6	0.09375
TEH d	09/20/1989	MW 3	1481000	TEH d	07/18/1996	MW 17	400
TEH wo	10/27/1989	MW 3	275000	TEH wo	07/18/1996	MW 17	<50

Soil Gas	Benzene		Toluene		Ethylbenzene		TEH d	
	Sampled Soil Gas	Result	Sampled Soil Gas	Result	Sampled Soil Gas	Result	Sampled Soil Gas	Result
Soil Source								
Groundwater Source								

Initial Receptor Evaluation	
Ingestion-Actual	Water supply well survey within 1,000 ft? Yes
	Drinking water wells within 1,000 ft? No
	Non-drinking water wells within 1,000 ft? No
Ingestion-Potential	Protected groundwater source? No      Maximum K: 0.08384 (0.08384) m/d
	Institutional control within 1,000 feet? No      Minimum TDS: ( ) mg/L
Vapors	Explosive vapor levels within 500 ft? No
	Institutional control within 500 feet? GW Sources: No      Soil Sources: No
Plastic water lines	Shallowest depth to groundwater? 0.74 (0.74) feet
	Plastic water line within 200 feet of source? No
Surface water	Designated use segment within 500 feet? No      Designation(s):
	Any surface water within 200 feet? No      Pass visual inspection? N/A

Site Name: Hunter Oil - DNR#25-11256-JS-1445

Site HydrogeologyFlow/Migration

Head gradient (i, ft/ft)	0.0196
Hydraulic conductivity (K, m/day)	0.08384
MAIN PLUME/FLOW(degrees)	173
RANGE of Plume/FLOW (degrees)	68
Upgradient (fraction)	0.04

Source Dimensions

Groundwater Plume Source Width (Sw-GW) (ft)	63
Soil Plume Source Width (Sw-Soil) (ft)	118
Groundwater Plume Source Length (W-GW) (ft)	65
Soil Plume Source Length (W-Soil) (ft)	114

Soil Parameters

		<u>Default</u>
Fraction organic carbon (foc) (g-C/g-Soil)	0.01	0.01
Total Porosity (Qt)(cm <sup>3</sup> /cm <sup>3</sup> -Soil)	0.3	0.3
Soil bulk density (ps)(g/cm <sup>3</sup> -Soil)	1.86	1.86

**Tier 2 Data Before Modeling Justification Section.** Justification must be provided if diesel and/or waste oil was stored at the site and the answer given for the following question is "No": "TEH-diesel required?" and/or "TEH-waste oil required?". Justification must also be provided if the answer to "Groundwater encountered?" was answered "No" or anytime an answer given may not be obvious to the IDNR.

Soil sample BH4 taken on 6/29/89 was redrilled on 2/3/99. Results from this redrill were less than the IDNR action levels. All previous soil data was thus reduced by the percent reduction of this decrease. Benzene data was reduced by 99.95%, toluene by 99.82%, ethybenzene by 99.85%, and xylenes by 99.55%.

**Site Hydrogeology Justification Section.** Explain which points were used to determine the gradient at the site. If necessary for clarification, provide justification for the variables used in the Site Hydrogeology section here.

The gradient was determined using a groundwater flow map from data obtained from the SCR with data from 9/18/96. The gradient was determined along the groundwater flow direction line from the 1041' contour near MW11 to the 1037' contour near MW15 over a distance of 204 feet. This gradient represents the average gradient across the site.

## PRELIMINARY PATHWAY EVALUATION REQUIREMENTS

**X=Evaluation Required** (A receptor identification plume must be generated.)

Pathway	Receptor Type	B	T	E	X	TEHd	TEHwo
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### Groundwater Pathways

Groundwater Ingestion	Drinking Water Wells-DWW	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)
	Nondrinking Water Wells-NDWW	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)
	Protected Groundwater Source-PGWS	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)

Groundwater Vapor to Enclosed Space	Confined Space Residential-CSR	X	S<TL	S<TL	N/A	S<TL	N/A
	Confined Space Nonresidential-CSNR	X	S<TL	S<TL	N/A	S<TL	N/A
	Sanitary Sewer Residential-SSR	X	S<TL	S<TL	N/A	S<TL	N/A
	Sanitary Sewer Nonresidential-SSNR	X	S<TL	N/A	N/A	S<TL	N/A

Groundwater to Plastic Water Line	Plastic Water Lines(PWL)	X	X	X	X	X	X
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Surface Water	DU-Cold Water-B(CW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Warm Water-B(WW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Limited Resources-B(LR)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Lakes & Wetlands-B(LW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Drinking Water-C	RNP	RNP	RNP	RNP	RNP	RNP
	DU-State-Owned Lake	RNP	RNP	RNP	RNP	RNP	RNP
	AT-All Surface Water	NGU	NGU	NGU	NGU	NGU	NGU
	AT-Ponds & Lakes	NGU	NGU	NGU	NGU	NGU	NGU

### Soil Leaching Pathways

Soil Leaching to Groundwater Ingestion	Drinking Water Wells-DWW	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)
	Nondrinking Water Wells-NDWW	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)
	Protected Groundwater Source-PGWS	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)	NAR(P1)

Soil Leaching to Groundwater Vapor to Enclosed Space	Confined Space Residential-CSR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Confined Space Nonresidential-CSNR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Sanitary Sewer Residential-SSR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Sanitary Sewer Nonresidential-SSNR	SS<STL	SS<STL	N/A	N/A	SS<STL	N/A

Soil Leaching-GW to Plastic Water Line	Plastic Water Lines(PWL)	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
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Soil Leaching to Surface Water	DU-Cold Water-B(CW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Warm Water-B(WW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Limited Resources-B(LR)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Lakes & Wetlands-B(LW)	RNP	RNP	RNP	RNP	RNP	RNP
	DU-Drinking Water-C	RNP	RNP	RNP	RNP	RNP	RNP
	DU-State-Owned Lake	RNP	RNP	RNP	RNP	RNP	RNP
	AT-All Surface Water	NGU	NGU	NGU	NGU	NGU	NGU
	AT-Ponds & Lakes	NGU	NGU	NGU	NGU	NGU	NGU

### Other Soil Pathways

Soil Vapor to Enclosed Space	Confined Space Residential-CSR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Confined Space Nonresidential-CSNR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Sanitary Sewer Residential-SSR	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
	Sanitary Sewer Nonresidential-SSNR	SS<STL	SS<STL	N/A	N/A	SS<STL	N/A

Soil to Plastic Water Line	Plastic Water Lines(PWL)	SS<STL	SS<STL	SS<STL	N/A	SS<STL	N/A
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## Preliminary Pathway Evaluation Requirements Legend

X: Evaluation required.

NAR: No Action Required.

CNE: Can not evaluate, questions have not been answered for receptor type.

N/A: Chemical is not applicable.

NSC: No source concentration for the chemical.

S<TL: GW Source  $\leq$  GW Target Level.

NAR(NP): Not a PGWS.

NAR(IC): IC for Enclosed Spaces within 500 feet of GW/Soil sources.

NAR(SG): Soil gas passed at GW/Soil source.

NAR(P1): Well survey done, no DWWs, no NDWWs, not a PGWS.

NAR(P2): Well survey, no DWWs, no NDWWs, PGWS, IC within 1000 feet.

NAR(P3): Well survey, no DWWs, NDWW plume(s)  $\leq$  1000 feet.

NAR(P4): Well survey, no NDWWs, NDWW plume(s)  $\leq$  1000 feet.

NAR(P5): PGWS, IC for PGWS, PGWS plume(s)  $\leq$  1000 feet.

NAR(P6): Depth to GW  $\geq$  20 feet.

NGU: There are no general use surface water bodies with 200 feet of the sources.

RNP: User has indicated (DU/GU) is not present within (500/200) feet.

VIP: Visual Inspection Passed.

SS<STL: Soil source  $\leq$  Tier 2 soil default target level.

S<TL(GW): Modeled GW at Soil Source  $\leq$  GW Target Level.

**GROUNDWATER SOURCE, TIER 2 RECEPTOR SUMMARY**

V-2.2,

Type	Receptor	RISK						Conf.	Corrective Action(s) Completed	Current Risk	To Tier 3
		Group I				TEH					
		B	T	E	X	D	W				
PGWS	No-IC	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No		N	NO
PGWS	IC	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No		N	NO
PCS	No-IC	L	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No		L	NO
PCS	IC	N	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No		N	NO
PSS	No-IC	L	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No	5	L	NO
PSS	IC	N	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	No		N	NO

Corrective Actions:

1. Plugged drinking water wells	5. Notified sanitary sewer public authority	9. Established institutional controls
2. Plugged non-drinking water wells	6. Notified utility company-plastic water line	10. Conducted soil excavation
3. Notified IDNR Water Supply Section	7. Relocated plastic water lines	11. Cleared with soil gas
4. Notified designated county authority	8. Replaced plastic water lines	

**SOIL VAPOR/SOIL TO PLASTIC WATER LINE, TIER 2 RECEPTOR SUMMARY**

**V-2.2,**

Type	Receptor	RISK						Conf.	Corrective Action(s) Completed	Current Risk	To Tier 3
		Group I				TEH					
		B	T	E	X	D	W				
PCSR	Source, SV	N	N	N	N/A	N	N/A	No	N	NO	
PCSNR	Source, SV	N	N	N	N/A	N	N/A	No	N	NO	
PSSR	Source, SV	N	N	N	N/A	N	N/A	No	N	NO	
PSSNR	Source, SV	N	N	N/A	N/A	N	N/A	No	N	NO	
PPWL	Source, Soil to PWL	N	N	N	N/A	N	N/A	No	N	NO	

**Corrective Actions:**

1. Plugged drinking water wells	5. Notified sanitary sewer public authority	9. Established institutional controls
2. Plugged non-drinking water wells	6. Notified utility company-plastic water line	10. Conducted soil excavation
3. Notified IDNR Water Supply Section	7. Relocated plastic water lines	11. Cleared with soil gas
4. Notified designated county authority	8. Replaced plastic water lines	

**SOIL LEACHING, TIER 2 RECEPTOR SUMMARY**

V-2.2,

Type	Receptor	RISK						Conf.	Corrective Action(s) Completed	Current Risk	To Tier 3
		Group I				TEH					
		B	T	E	X	D	W				
PGWS	No-IC	N(1)	N(1)	N(1)	N/A	N(1)	N/A	No		N	NO
PGWS	IC	N	N	N	N	N	N	No		N	NO
PCS	No-IC	N	N	N	N	N	N	No		N	NO
PCS	IC	N	N	N	N	N	N	No		N	NO
PSS	No-IC	N	N	N	N	N	N	No		N	NO
PSS	IC	N	N	N	N	N	N	No		N	NO

Corrective Actions:

1. Plugged drinking water wells	5. Notified sanitary sewer public authority	9. Established institutional controls
2. Plugged non-drinking water wells	6. Notified utility company-plastic water line	10. Conducted soil excavation
3. Notified IDNR Water Supply Section	7. Relocated plastic water lines	11. Cleared with soil gas
4. Notified designated county authority	8. Replaced plastic water lines	

## Sampling Results:

### Field Screening Results

Complete the table below with the field screening results for each boring, monitoring well, and probe point location. In the first column provide the depth increments over which vapor screening was conducted beginning with the ground surface. Label the increments and total depth of boring in units of feet from the ground surface. Place an asterisk (\*) at the depth on each column for every soil sample analyzed. Place a water level symbol (v) at the depth on each column to represent the static water level. This page may be duplicated for additional sampling points.

Sample Identification	Example		SG1	SG2	BH4B	TMW3		
Date Sampled	10/23/96		2/3/99	2/3/99	2/3/99	6/25/99		
Depth of Reading -	depth							
- Ground Surface	0	0						
-	1'	0	0	0	0	0		
	2	10	0	0	0	0		
	3	21	0	0	0	2		
	4	25	0	0	0	6v		
	5	24	31	0	0	54		
	6	29	53v	0	0	63		
	7	90		17v	0	14		
	8	120			0	4		
	9	*400			4v	0		
	10	v300			16	0		
	11	180			31			
	12	20			28			
	13	0			44			
	14	0			46*			
	15	0			23			
	16	0			0			
	17	0			0			
	18	0			0			
	19	0			0			
	20	0			0			
Total Depth of Boring	f5'		6.5'	7'	20'	10'		

**Soil Boring and Monitoring Well Placement.** Describe soil and groundwater sampling methods. Explain why those samples selected for laboratory analysis represent the highest contamination concentrations encountered during soil boring / monitoring well installation. Explain why the source(s) has been adequately investigated. If groundwater samples were obtained from wells with free product, describe the method used to collect the samples.

Refer to the SCR submitted on April 3, 1996 and the revised SCR submitted October 3, 1996.

MW1, MW2, and MW3 were initially installed to determine if contamination was present on site downgradient from the former AST area. BH4/MW4, BH5/MW5, BH6/MW6, MW11, MW12, MW16, and MW17 were installed near the former ASTs and product piping. The remaining wells and borings were installed to delineate the contaminant plume. BH7/MW7, BH3/MW3, BH11/MW10, MW15 was placed downgradient from the site. It appears as if this site has been adequately investigated as both the soil and groundwater plumes have been delineated. Soil samples taken from previous borings were taken at the highest PID readings encountered during drilling. BH4B was drilled as part of the RBCA investigation to determine current soil concentrations adjacent to the soil source at BH4. TMW3 was drilled to collect a water sample adjacent to the destroyed MW3.

Water samples collected during Seneca activities: Current sampling by Seneca consisted of the following: All monitoring well were purged of three casing volumes of water, or until the water was observed to be free of sediment or until dry. When it was determined that the well had been adequately purged and developed, groundwater was allowed to return to its static level. Upon recovery, samples were taken by utilizing a clean, clear, disposable PVC bailer. The sample was visually observed for the presence of product, product sheen, or emulsion and observed for petroleum vapors. The sample was poured into a laboratory cleaned 40 mL vial, iced, and shipped to a certified laboratory for analysis. This method minimizes the risk of cross contamination and allows for the collection of groundwater which is representative of the surrounding formation. Sampling was performed using clean latex gloves. Water levels were taken using and Alconox cleaned water probe.

Soil samples collected during Seneca Activities: Soil borings were advanced using a 6.25" hollow stem auger. Five foot long sections of soil were recovered using a five foot long continuous sampler. Soil samples were collected at the previous sample depth or at the highest PID reading. Soil samples were collected using latex gloves to prevent the possibility of cross contamination.

*Pre 70 reduction*

**Soil Analytical Data (mg/kg) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)			Group 1				Group 2		Naphth.	TPH
		Ground Surface	Sample Depth	SWL	B	T	E	X	TEH-D	TEH-WO		
BH 4/MW 4	06/29/1989	1048	N	1042.76	20	4.5	5.8	5.6	256	N	N	N
BH 4	06/29/1989	1048	1043	1042.76	3	2.3	2.4	2.42	230	N	N	N
BH 4	06/29/1989	1048	1038	1042.76	3.2	1.2	0.76	1.6	N	N	N	N
BH 5	06/29/1989	1047.57	1040.57	1042.63	0.88	0.48	<0.02	<0.02	N	N	N	N
BH 6	06/29/1989	1047.2	1043.2	1040.64	2.8	1.3	<0.02	21	N	N	N	N
BH 6	06/29/1989	1047.2	1038.2	1040.64	1.8	0.24	0.38	2.4	N	N	N	N
BH 6	06/29/1989	1047.2	1031.2	1040.64	0.39	0.49	0.1	1.8	N	N	N	N
BH 7	09/06/1989	1044.9	1037.4	1038.14	<0.005	0.005	0.009	0.014	<1	N	N	N
BH 8	09/06/1989	1045.24	1042.24	N	0.008	<0.005	<0.005	0.012	<1	N	N	N
BH 9	09/06/1989	1048.01	1042.01	1043.34	0.01	0.014	<0.005	0.018	<1	N	N	N
BH 10	09/06/1989	1042.74	1037.74	1042.74	<0.005	0.009	<0.005	0.01	<1	N	N	N
BH 11	09/06/1989	1045.2	1040.2	1039.7	<0.005	<0.005	<0.005	<0.005	<1	N	N	N
MW 14	11/09/1995	1041.7	1038.2	1032.44	<0.5	<0.5	<0.5	<0.5	<10	<10	N	N
MW 15	11/09/1995	1042	1036	1033.24	<0.5	<0.5	<0.5	<0.5	<10	<10	N	N
MW 17	07/18/1996	1049.01	1042.01	1042.52	<0.5	<0.5	0.58	2.54	400	<10	N	N
MW 18	08/16/1996	1046.26	1042.26	1042.17	<0.5	<0.5	<0.5	<0.5	<10	<10	N	N
MW 19	09/18/1996	1043.93	1037.93	1038.17	<0.5	<0.5	<0.5	<0.5	<10	<10	N	N

*Post 90 reduction*

**Soil Analytical Data (mg/kg) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)			Group 1				Group 2		Naph.	TPH
		Ground Surface	Sample Depth	SWL	B	T	E	X	TEH-D	TEH-WO		
BH 4/MW 4	06/29/1989	1048	N	1042.76	0.009	0.008	0.009	0.025	256	N	N	N
BH 4	06/29/1989	1048	1043	1042.76	0.00135	0.0041	0.0037	0.0107	230	N	N	N
BH 4	06/29/1989	1048	1038	1042.76	0.00144	0.0021	0.00118	0.00714	N	N	N	N
BH4B	02/03/1999	1048	1034	1041.5	<0.009	<0.008	<0.009	<0.025	N	N	N	N
BH 5	06/29/1989	1047.57	1040.57	1042.63	0.000396	0.000853	<0.000031	<0.00009	N	N	N	N
BH 6	06/29/1989	1047.2	1043.2	1040.64	0.00126	0.00231	<0.000031	0.09375	N	N	N	N
BH 6	06/29/1989	1047.2	1038.2	1040.64	0.00081	0.000426	0.00059	0.01071	N	N	N	N
BH 6	06/29/1989	1047.2	1031.2	1040.64	0.000176	0.000871	0.000155	0.008036	N	N	N	N
BH 7	09/06/1989	1044.9	1037.4	1038.14	<0.000002	0.000009	0.000014	0.0000625	<1	N	N	N
BH 8	09/06/1989	1045.24	1042.24	N	0.000004	<0.000009	<0.000008	0.0000536	<1	N	N	N
BH 9	09/06/1989	1048.01	1042.01	1043.34	0.000005	0.009	<0.000008	8.004E-05	<1	N	N	N
BH 10	09/06/1989	1042.74	1037.74	1042.74	<0.000002	0.000016	<0.000008	0.0000446	<1	N	N	N
BH 11	09/06/1989	1045.2	1040.2	1039.7	<0.000002	<0.000009	<0.000008	<0.00002	<1	N	N	N
MW 14	11/09/1995	1041.7	1038.2	1032.44	<0.000225	<0.000889	<0.000776	<0.0022	<10	<10	N	N
MW 15	11/09/1995	1042	1036	1033.24	<0.000225	<0.000889	<0.000776	<0.0022	<10	<10	N	N
MW 17	07/18/1996	1049.01	1042.01	1042.52	<0.000225	<0.000889	0.0009	0.01134	400	<10	N	N
MW 18	08/16/1996	1046.26	1042.26	1042.17	<0.000225	<0.000889	<0.000776	<0.0022	<10	<10	N	N
MW 19	09/18/1996	1043.93	1037.93	1038.17	<0.000225	<0.000889	<0.000776	<0.0022	<10	<10	N	N

**Groundwater Analytical Data (ug/L) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)				Group 1				Group 2		Naphth.	FP Type	FP Default?
		Ground	TOC	TOS	SWL	B	T	E	X	TEH-D	TEH-WO			
Cafe Well	07/26/1988	N	N	N	N	<1	<1	N	<1	N	N	N	N	N
MW 7	09/20/1989	1044.9	1044.7	1041.9	1038.14	12	18	N	36	1300	N	N	N	N
MW 7	11/15/1990	1044.9	1044.7	1041.9	1038.14	0.185	0.332	<0.022	<10	<100	N	N	N	N
MW 7	07/10/1992	1044.9	1044.7	1041.9	1037.86	<1	<1	<1	<1	730	N	N	N	N
MW 7	12/28/1992	1044.9	1044.7	1041.9	1036.63	<1	<1	2	1	310	N	N	N	N
MW 7	06/23/1993	1044.9	1044.7	1041.9	1038.19	<1	<1	<1	<1	<20	N	N	N	N
MW 7	01/04/1994	1044.9	1044.7	1041.9	1037.85	<1	<1	<1	1	100	N	N	N	N
MW 7	03/28/1994	1044.9	1044.7	1041.9	1038.1	3	2	3	6	840	N	N	N	N
MW 7	09/08/1994	1044.9	1044.7	1041.9	1038.53	2	2	3	8	950	N	N	N	N
MW 7	03/01/1995	1044.9	1044.7	1041.9	1038.12	<1	<1	<1	2	70	N	N	N	N
MW 7	09/07/1995	1044.9	1044.7	1041.9	1038.12	<1	<1	<1	<1	820	N	N	N	N
MW 7	03/12/1996	1044.9	1044.7	1041.9	1037.97	<2	2.6	<2	4.6	N	N	N	N	N
MW 7	06/10/1996	1044.9	1044.7	1041.9	1038.67	<2	<2	<2	2.2	110	N	N	N	N
MW 7	09/18/1996	1044.9	1044.7	1041.9	1037.84	<2	2.1	2.1	<2	N	N	N	N	N
MW 7	10/10/1997	1044.9	1044.7	1041.9	1037.38	<2	4.3	3	3.6	N	N	N	N	N
MW 7	06/10/1998	1044.9	1044.7	1041.9	1038.27	<2	<2	<2	<3	N	N	N	N	N
MW 7	06/08/2099	1044.9	1044.7	1041.9	1038.86	<2	<2	<2	<3	N	N	N	N	N
Sewer	11/26/1986	N	N	N	N	27000	46000	N	54000	N	N	N	N	N
Sewer	11/30/1990	N	N	N	N	2.14	1.37	2.17	0.289	16600	N	N	N	N
Sewer	12/18/1995	N	N	N	N	<2	42	<2	<2	N	N	N	N	N
MW 1	02/10/1987	1047.9	1047.65	N	1040.29	23000	14000	N	3600	N	N	N	N	N
MW 1	01/29/1988	1047.9	1047.65	N	1040.29	7100	5600	970	5200	N	N	N	N	N
MW 1	07/26/1988	1047.9	1047.65	N	1040.29	9600	13000	N	9300	N	N	N	N	N
MW 1	06/29/1989	1047.9	1047.65	N	1040.29	240	460	<20	1100	N	N	N	N	N
MW 1	09/20/1989	1047.9	1047.65	N	1040.29	182	1382	862	2872	<1000	N	N	N	N
MW 1	10/27/1989	1047.9	1047.65	N	1040.29	370	390	90	380	29000	N	N	N	N
MW 2	02/10/1987	1045.9	1045.73	N	1039.97	37	8	N	37	N	N	N	N	N
MW 2	01/29/1988	1045.9	N	N	1039.97	170	20	280	459	N	N	N	N	N
MW 2	07/26/1988	1045.9	1045.73	N	1039.97	89	14	N	580	683	N	N	N	N
MW 2	06/29/1989	1045.9	1045.73	N	1039.97	880	100	<2	730	N	N	N	N	N
MW 2	09/20/1989	1045.9	1045.73	N	1039.97	32	28	21	45	<1000	N	N	N	N
MW 2	10/27/1989	1045.9	1045.73	N	1039.97	82	40	76	160	<1000	N	N	N	N
MW 2	09/08/1994	1045.9	1045.73	N	1039.97	160	3	1	63	N	N	N	N	N
MW 2	03/01/1995	1045.9	1045.73	N	1039.97	140	6	5	5	N	N	N	N	N
MW 2	03/01/1995	1045.9	1045.73	N	1039.97	190	1	61	9	N	N	N	N	N
MW 2	09/13/1995	1045.9	1045.73	N	1039.97	190	1	61	9	2200	N	N	N	N
MW 2	03/12/1996	1045.9	1045.73	N	1039.97	130	6.2	56	37.6	N	N	N	N	N
MW 2	06/10/1996	1045.9	1045.73	N	1039.97	260	<4	150	69	N	N	N	N	N

**Groundwater Analytical Data (ug/L) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)				Group 1				Group 2		Naphth.	FP Type	FP Default?
		Ground	TOC	TOS	SWL	B	T	E	X	TEH-D	TEH-WO			
MW 2	09/18/1996	1045.9	1045.73	N	1039.97	87	9.1	52	17	N	N	N	N	N
MW 3	02/10/1987	1045.61	1045.36	N	1040.08	29000	19000	N	11000	N	N	N	N	N
MW 3	01/29/1988	1045.61	1045.36	N	1040.08	18000	12000	2300	9200	N	N	N	N	N
MW 3	07/26/1988	1045.61	1045.36	N	1040.08	30000	39000	N	33000	N	N	N	N	N
MW 3	06/29/1989	1045.61	1045.36	N	1040.08	15000	21000	<40	14000	N	N	N	N	N
MW 3	09/20/1989	1045.61	1045.36	N	1040.08	131	987	732	1342	1481000	N	N	N	N
MW 3	10/27/1989	1045.61	1045.36	N	1040.08	820	2300	1800	4800	N	275000	N	N	N
TMW3	06/25/2099	1045.61	1045.36	N	1039.36	104	408	3390	16500	<76000	<76000	N	N	N
MW 4	06/29/1989	1048	1047.75	1043	1040.41	160	100	<2	120	N	N	N	N	N
MW 4	09/20/1989	1048	1047.75	1043	1042.76	24	28	21	48	8600	N	N	N	N
MW 4	10/27/1989	1048	1047.75	1043	1042.76	18	180	35	39	272	<1000	N	N	N
MW 4	03/15/1991	1048	1047.75	1043	1042.76	51	6	8	93	158	N	N	N	N
MW 5	06/29/1989	1047.57	1047.32	1042.57	1040.81	<2	<2	<2	<2	N	N	N	N	N
MW 5	09/20/1989	1047.57	1047.32	1042.57	1042.63	32	25	12	78	147	<1000	N	N	N
MW 6	06/29/1989	1047.2	1046.92	1042.2	1040.65	1300	99	<2	4400	N	N	N	N	N
MW 6	09/20/1989	1047.2	1046.92	1042.2	1040.64	34	12	N	28	74	<1000	N	N	N
MW 6	10/27/1989	1047.2	1046.92	1042.2	1040.64	68	92	38	42	5000	N	N	N	N
MW 6	03/01/1995	1047.2	1046.92	1042.2	1040.6	160	48	210	510	N	N	N	N	N
MW 6	03/12/1996	1047.2	1046.92	1042.2	1040.6	170	15.7	1100	140	N	N	N	N	N
MW 6	09/18/1996	1047.2	1046.92	1042.2	1039.61	40	39	56	25	N	N	N	N	N
MW 6	10/10/1997	1047.2	1046.92	1042.2	1038.21	30	<20	22	27	N	N	N	N	N
MW 6	06/10/1998	1047.2	1046.92	1042.2	1041.78	34	8.9	37	28	N	N	N	N	N
MW 8	09/20/1989	1048	1047.89	1044	1043.34	12	23	18	34	89	<1000	<1000	N	N
MW 8	03/15/1991	1048	1047.89	1044	1043.34	<1	<1	<1	<1	<5	N	N	N	N
MW 9	09/20/1989	1048	1047.77	1044.5	1042.74	18	22	20	78	2300	<1000	N	N	N
MW 9	09/08/1994	1048	1047.77	1044.5	1041.54	9	3	2	3	1000	N	N	N	N
MW 9	03/01/1995	1048	1047.77	1044.5	1042.74	2	<1	<1	5	500	N	N	N	N
MW 9	03/12/1996	1048	1047.77	1044.5	1041.29	35	46.4	27.9	23.4	N	N	N	N	N
MW 9	09/18/1996	1048	1047.77	1044.5	1039.5	140	110	110	110	N	N	N	N	N
MW 9	10/10/1997	1048	1047.77	1044.5	1039.06	160	65	75	35	N	N	N	N	N
MW 9	06/10/1998	1048	1047.77	1044.5	1044.77	<2	8.5	6.2	14	N	N	N	N	N
MW 9	06/08/1999	1048	1047.77	1044.5	1043.35	45	<2	17.4	3.2	N	N	N	N	N
MW 10	09/20/1989	1045.2	1044.9	1041.2	1039.7	10	18	8	34	<1000	<1000	N	N	N
MW 10	11/20/1990	1045.2	1044.9	1041.2	1039.7	2.29	3.56	0.567	1.99	<10	<100	N	N	N
MW 10	07/10/1992	1045.2	1044.9	1041.2	1036.8	190	9	6.8	19	6500	N	N	N	N
MW 10	12/28/1992	1045.2	1044.9	1041.2	1040.2	<1	<1	<1	<1	<20	N	N	N	N
MW 10	06/23/1993	1045.2	1044.9	1041.2	1041.01	<1	<1	<1	<1	<20	N	N	N	N

**Groundwater Analytical Data (ug/L) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)				Group 1				Group 2		Naph.	FP Type	FP Default?
		Ground	TOC	TOS	SWL	B	T	E	X	TEH-D	TEH-WO			
MW 10	01/04/1994	1045.2	1044.9	1041.2	1039.03	<1	<1	<1	<1	<20	N	N	N	N
MW 10	03/28/1994	1045.2	1044.9	1041.2	1039.93	<1	<1	<1	<1	<20	N	N	N	N
MW 10	09/08/1994	1045.2	1044.9	1041.2	1038.93	<1	<1	<1	<1	<20	N	N	N	N
MW 10	03/01/1995	1045.2	1044.9	1041.2	1039.54	<1	<1	<1	<1	<20	N	N	N	N
MW 10	09/07/1995	1045.2	1044.9	1041.2	1039.54	3	<1	<1	<1	130	N	N	N	N
MW 10	03/12/1996	1045.2	1044.9	1041.2	1040.38	<2	<2	<2	2.9	N	N	N	N	N
MW 10	06/10/1996	1045.2	1044.9	1041.2	1041.42	<2	<2	<2	<2	<100	N	N	N	N
MW 10	09/18/1996	1045.2	1044.9	1041.2	1038.82	<2	<2	<2	<2	N	N	N	N	N
MW 10	10/10/1997	1045.2	1044.9	1041.2	1038.01	<2	<2	<2	<2	N	N	N	N	N
MW 10	06/10/1998	1045.2	1044.9	1041.2	1041.88	<2	<2	<2	<3	N	N	N	N	N
MW 10	06/08/1999	1045.2	1044.9	1041.2	1040.5	<2	<2	<2	<3	N	N	N	N	N
MW 11	09/08/1994	1047.8	1047.55	1044.3	1037.96	2300	1000	260	3800	23000	N	N	N	N
MW 11	03/01/1995	1047.8	1047.55	1044.3	1041.67	2900	3000	5300	26000	750000	N	N	N	N
MW 11	03/12/1996	1047.8	1047.55	1044.3	1041.44	750	300	430	1900	N	N	N	N	N
MW 11	09/18/1996	1047.8	1047.55	1044.3	1041.06	1300	690	2300	13000	N	N	N	N	N
MW 11	10/10/1997	1047.8	1047.55	1044.3	1037.42	1200	15000	17000	13000	N	N	N	N	N
MW 11	06/10/1998	1047.8	1047.55	1044.3	1042.06	2500	2300	1300	5600	N	N	N	N	N
MW 11	06/08/1999	1047.8	1047.55	1044.3	1044.6	266	117	1800	11400	N	N	N	N	N
MW 12	09/08/1994	1046.9	1046.63	1042.9	1040.16	300	130	62	5200	54000	N	N	N	N
MW 12	03/01/1995	1046.9	1046.63	1042.9	1041.27	860	1500	4000	18500	160000	N	N	N	N
MW 12	03/12/1996	1046.9	1046.63	1042.9	1041.51	640	1600	3500	20000	N	N	N	N	N
MW 12	09/18/1996	1046.9	1046.63	1042.9	1040.16	400	400	1600	8300	N	N	N	N	N
MW 12	10/10/1997	1046.9	1046.63	1042.9	1039.16	680	4000	12000	76000	N	N	N	N	N
MW 12	06/10/1998	1046.9	1046.63	1042.9	1043.1	400	340	3200	16000	N	N	N	N	N
MW 13	09/08/1994	1048.4	1048.15	1046.4	1042.66	1	<1	<1	2	30	N	N	N	N
MW 13	03/01/1995	1048.4	1048.15	1046.4	1041.64	<1	<1	<1	1	40	N	N	N	N
MW 13	03/12/1996	1048.4	1048.15	1046.4	1042.42	<2	<2	<2	<2	N	N	N	N	N
MW 13	09/18/1996	1048.4	1048.15	1046.4	1041.57	<2	<2	<2	<2	N	N	N	N	N
MW 14	12/01/1995	1041.7	1041.3	1039.2	1032.44	<2	<2	<2	<2	<100	N	N	N	N
MW 14	10/20/1997	1041.7	1041.3	1039.2	1036.27	<2	<2	<2	<2	N	N	N	N	N
MW 14	06/10/1998	1041.7	1041.3	1039.2	1040.96	<2	<2	<2	<3	N	N	N	N	N
MW 14	06/08/1999	1041.7	1041.3	1039.2	1034.13	<2	<2	<2	<3	N	N	N	N	N
MW 15	12/01/1995	1042	1041.77	1039.5	1033.24	<2	<2	<2	<2	<100	N	N	N	N
MW 15	06/17/1999	1042	1041.77	1039.5	1034.56	<2	<2	<2	<3	N	N	N	N	N
MW 16	06/17/1996	1047.98	1047.85	1045.98	1041.58	110	52	240	67	11000	N	N	N	N
MW 16	10/10/1997	1047.98	1047.85	1045.98	1038.48	72	250	620	1400	N	N	N	N	N
MW 16	06/10/1998	1047.98	1047.85	1045.98	1041.84	52	28	110	79	N	N	N	N	N
MW 16	06/08/1999	1047.98	1047.85	1045.98	1043.31	14.4	<2	14.7	16.9	N	N	N	N	N

**Groundwater Analytical Data (ug/L) -- No LUST # Assigned**

Boring / Well #	Date Sampled	Elevations (ASL)				Group 1				Group 2			FP	FP
		Ground	TOC	TOS	SWL	B	T	E	X	TEH-D	TEH-WO	Napth.	Type	Default?
MW 17	07/18/1996	1049.01	1048.84	1044.01	1042.52	37	510	650	2200	14000	N	N	N	N
MW 18	08/16/1996	1046.26	1046.01	1044.26	1042.17	<2	<2	<2	<2	<100	N	N	N	N
MW 19	09/18/1996	1043.93	1043.75	1039.25	1038.17	<2	<2	<2	<2	<100	N	N	N	N
MW 19	10/20/1997	1043.93	1043.75	1039.25	1038.12	<2	<2	<2	<3	N	N	N	N	N
MW 19	06/10/1998	1043.93	1043.75	1039.25	1038.17	<2	<2	<2	<2	N	N	N	N	N
MW 19	06/17/1999	1043.93	1043.75	1039.25	1036.03	<2	<2	<2	<3	N	N	N	N	N
BH8	09/06/1989	1045.24	N	N	N	<5	<5	<5	<5	<1000	N	N	N	N

### Soil Gas Analytical Data

Complete the table below with soil gas analytical data for each vapor sampling point. Group sampling events by location then arrange chronologically with the oldest data first.

Sample Label	Receptor Evaluated	Date Sampled	Elevations (feet Above Sea Level)			Benzene ( $\mu\text{g}/\text{m}^3$ )	Toluene ( $\mu\text{g}/\text{m}^3$ )
			Ground Surface	Soil Vapor Sample	Static Groundwater		
SG1	GWV:ES	2/3/99	1047.8	1041.3	1040.3	40,000	110,000
SG1	GWV:ES	2/18/99	1047.8	1041.3	1040.3	664,000	356,000

**Soil Gas Sampling Methods.** If soil gas measurements were taken, describe the soil gas sampling methods and explain why the methods provide representative samples. Attach construction diagrams for each soil vapor monitoring well (Appendix 27).

The well was drilled utilizing a drill rig using a 4" solid flight auger. Following drilling a 1" PVC pipe was inserted into the well. The well was set to 6' as the static water level at the time of well installation was 6.5' below grade in a nearby well. The bottom 1' of the PVC pipe was screened. The soil gas samples were collected and analyzed according to NIOSH method 1501. The well was completed at 10:30 am. A soil gas sample was not collected from this well until 2:30 pm on 2/3/99.

**Soil Gas Sampling Location Justification.** Explain why the location of each vapor sample is adequate for evaluating the identified actual receptors. Indicate which chemicals of concern exceed soil and groundwater target levels, and whether the source locations have been evaluated as potential receptors using soil gas results.

SGW1 was installed adjacent to MW11, the groundwater source for benzene. The confirmation sample results were greater than the IDNR action levels for soil vapor sampling, thus causing the Groundwater Vapor to Enclosed Space pathway to require evaluation. Since the time of soil gas sampling, additional groundwater sampling has been conducted and a new groundwater source at MW1 has been identified.

SG2 was installed adjacent to the soil source for benzene, toluene, and ethylbenzene so that in the event concentrations from the soil redrill at this location remained above Tier 1 levels, soil gas sampling could be utilized as an alternative method of removing the Soil Vapor to Enclosed Space pathway. Soil concentrations from the redrill were less than the Tier 1 levels and soil gas sampling was not needed.

### Indoor Vapor Analytical Data

Complete the table below with indoor vapor analytical data for each enclosed space receptor sampled. Group sampling events by location then arrange chronologically with the oldest data first.

Receptor Evaluated	Date Sampled	Elevations (feet Above Sea Level)			Benzene ( $\mu\text{g}/\text{m}^3$ )	Toluene ( $\mu\text{g}/\text{m}^3$ )
		Ground Surface	Basement Floor	Static Groundwater		
NA						

**Indoor Vapor Sampling.** If indoor vapor measurements were taken, describe the sampling methods and explain why the methods provide representative sample.

Indoor vapor measurements were not taken.

### Groundwater Elevations

Identify the methodology and device used to determine static groundwater levels. Explain any anomalous measurements or fluctuations in water levels with special emphasis on those which may alter general groundwater gradient or flow direction.

Reference the SCR submitted on April 3, 1996 and the revised SCR submitted October 3, 1996, Section IV.H.

Water levels taken since the completion of the SCR were determined using the following protocol. The monitoring wells were opened and the water level was allowed to stabilize. The water level was then determined using an Alconox cleaned Solinst water level meter. The water level was measured from the north side of the casing and was subtracted from the predetermined top of casing elevation ASL to obtain the static water elevation ASL.

No anomalous water levels were observed which may have altered the groundwater gradient or flow direction.

Describe the benchmark used to survey for groundwater surface elevations, including its location and elevation.

Reference the SCR submitted on April 3, 1996 and the revised SCR submitted October 3, 1996, Section IV.H.

If water levels were corrected due to the presence of free product, describe the method used to determine the static water level.

Static water levels were not corrected due to the presence of free product.

## RECEPTOR SURVEY:

Groundwater Well Survey								
Well Number as identified on Groundwater Well Survey Map	NA							
<b>Well Status</b>								
Active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Abandoned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plugged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
According to Chapter 39	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not according to Chapter 39	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Well Use</b>								
Municipal Well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Drinking Well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production Well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SIC Code								
Other: Used for car wash	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Used for heating solar panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Abandoned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Static Water Level Elevation								
Well Depth Elevation								
Well Diameter								
Casing Material								
Screened Interval								
Well Log Provided?	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Well owners and locations. Provide the name and address of each well owner.</b>								
Well Number - Well Owner Name	Address				City	State	Zip Code	
<b>Public Entities. Provide the name and address for each public entity contacted to determine well locations and details. Indicate the date each public entity was contacted.</b>								
Geological Survey Bureau, 109 Trowbridge Hall, Iowa City, Iowa 52242 : 4/5/99								
Terry Brooks, Dallas County Sanitarian, 801 Court Street, Adel, Iowa 50003: 6/22/99								
<b>Plugging Methods. Describe the plugging method for those wells not sealed according to Chapter 567-39 IAC.</b>								
NA								

### AFFECTED PROPERTY OWNER TABLE

List all properties within any Receptor ID Plume and under the "Z" (zoning) column, provide the zoning for each property with either "R" for residential or "NR" for nonresidential; mark "Y" or "N" regarding whether that property owner was contacted to determine if there is a drinking or non-drinking water well on their property; and provide the date the property owner was contacted. This page may be duplicated.

	Z	Property Owner Name	Property Address	Owner Mailing Address
1	NR	Former Cooper Hunter Station	Site Property	PO Box 217 Adel, Iowa 50003
		Contacted? N Date: / /		
2	NR	Minburn Telephone Company	416 Chestnut Minburn, Iowa 50167	416 Chestnut Minburn, Iowa 50167
		Contacted? N Date: / /		
3				
		Contacted? Y / N Date: / /		
4				
		Contacted? Y / N Date: / /		
5				
		Contacted? Y / N Date: / /		
6				
		Contacted? Y / N Date: / /		
7				
		Contacted? Y / N Date: / /		
8				
		Contacted? Y / N Date: / /		
9				
		Contacted? Y / N Date: / /		
10				
		Contacted? Y / N Date: / /		
11				
		Contacted? Y / N Date: / /		
12				
		Contacted? Y / N Date: / /		

**Well Survey / Contact Method.** Identify the method (on-site well survey or letters) for surveying the area within 300 feet of the sources or within the largest receptor identification plume (whichever is smaller). If letters were sent, provide a copy of the letter in Appendix 23 and state how many letters were sent and how many replies were received.

An on foot well survey was conducted by Seneca personnel during a site visit on 6/8/99. No additional wells were located within 300 feet of the site.

### COMMINGLED PLUME DISCUSSION

If contamination at the site appears to be commingled with another site provide the owner name and address, and if assigned by the IDNR, the Registration and LUST numbers. If the site does not have a Registration or LUST number, provide justification for an off-site source in the section below.

NA

### OFF-SITE CONTAMINATION SOURCE SUPPORT DISCUSSION

Provide a detailed justification for any conclusions concerning off-site contamination sources.

NA

### Free Product

Indicate whether free product has ever been observed at the site and in which wells. If the site has a history of free product, indicate the date the last "Free Product Recovery Report" was submitted. Discuss the status and effectiveness of the free product recovery system.

NA

**Enclosed Space / Conduit Survey**

Conduit Number (on map)	Description (main or service?)	Construction Material	Conduit Backfill Material	Slope of Conduit	Burial Depth	Relationship to Groundwater Level	% LEL
1	Gas Line	Steel	Native Clay	Grade	4-5'	3-4' below	NAMP
2	Water Main	Cast iron	Native Clay	Grade	4-5'	3-4' below	NAMP
3	Water Service to former shop	capped					NAMP
4	Storm Sewer	Concrete	Native Clay	South	10'	9' below	0
5	Sanitary Sewer Service to former shop	capped	Native Clay	Grade	6'	5' below	0
6	Sanitary Sewer Main	Clay tile	Native Clay	East	10-15'	9-14' below	0
7	Phone Line	Wrapped cable	Native Clay	Grade	3'	2' below	NAMP
8	Water Service	Copper	Native Clay	Grade	3'	2' below	NAMP
9	Sanitary Sewer Service	Clay tile	Native Clay	Towards Main	6'	5' below	NAMP
10							
11							
12							

**Survey contacts.** Provide the name and address for each public entity and adjacent property owner contacted to determine enclosed space and conduit details and locations. Provide the date of the most recent enclosed space / conduit survey.

The most recent enclosed space/ conduit survey was conducted during SMR activities on 6/22/99.  
 Randy Bennett, City of Minburn City Clerk's Office, PO Box 213, Minburn, Iowa 50167

**Vapor History.** Describe any historic and current problems with vapor accumulation in confined spaces. Indicate the date(s) and where vapors were noted. Describe the measures taken to abate the condition and the current status.

Historically, no vapor accumulation has been observed.

Surface Water Survey			
Surface Water Name	Classification - designated or general use	Description	Visual Observations
NA			

Surface Water Sampling Analytical Data ( $\mu\text{g/L}$ )							
(This previously collected data may not be used to clear the surface water pathway)							
Sample Location	Date Sampled	Group 1				Group 2	
		B	T	E	X	TEH-D	TEH-WO
NA							

**Surface Water Survey.** Explain how the surface water survey was conducted. If surface water samples were collected, describe the sampling methods. Provide a justification for taking samples.

A surface water survey was conducted during SMR activities on 6/8/99. No surface water bodies were identified within 500 feet of the site.

## RISK JUSTIFICATION AND CORRECTIVE ACTION PROPOSED:

### Groundwater Ingestion Pathway

No drinking or non-drinking water wells have been identified and the site has not been classified as a protected groundwater source.

### Groundwater Vapor to Enclosed Space Pathway

An attempt was made to eliminate this pathway with soil gas sampling at the groundwater source, but the confirmation soil gas sample indicated vapor levels above the IDNR action levels, thus requiring evaluation of this pathway. Following additional groundwater sampling, the groundwater source at MW11 was eliminated. MW1 is now the current groundwater source.

CSR: The area is zoned for non-residential use. No residential properties were identified within this receptor ID plume.

CSNR: The source has been identified as a low risk receptor. No actual receptors were identified within this pathway.

SSR: The area is zoned for non-residential use. No residential sanitary sewers were identified within this receptor ID plume.

SSNR: The source has been identified as a low risk receptor. No actual receptors were identified within this pathway.

Low risk monitoring will be conducted for this pathway. A Sanitary Sewer Notification has been sent to the proper authorities.

### Groundwater to Plastic Water Line Pathway

No plastic water lines were identified within 200 feet of the site. A Utility Company Notification has been sent to the proper authorities.

### Surface Water Pathway

No surface water bodies have been identified within 500 feet of the site.

**Soil Leaching to Groundwater Pathway**

Soil source concentrations were below the Tier 1 levels.

**Soil Vapor to Enclosed Space Pathway**

Soil source concentrations were below the Tier 1 levels.

**Soil to Plastic Water Line Pathway**

Soil source concentrations were below the Tier 1 levels.



**Groundwater Monitoring Plan Summary Table: Benzene**

V-2.2,

MW Location	Actual (ug/L)	SSTL (ug/L)	Institutional Control	Receptor Label	Description	Type	Risk	Minimum Frequency
MW 1	9,600.							
		4,774.	No	PCS	PCS	S	L	Annual
		9,547.	No	PSS	PSS	S	L	Annual
MW 2	260.							
		4,774.	No	PCS	PCS	T-ML	L	Annual
		9,547.	No	PSS	PSS	T-ML	L	Annual
MW 6	34.							
		4,774.	No	PCS	PCS	TG-Down Gra	L	Annual
		9,547.	No	PSS	PSS	TG-Down Gra	L	Annual

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Pathway Assessment Attachments**

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Groundwater Pathways**

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 3A  
Groundwater Vapor  
Confined Space Residential**

3a. GW Vapor-Confined Space Residential  
Receptor ID Map

V-22

T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < 3 data  
T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC

CHESTNUT STREET

MINBURN  
TELEPHONE CO

RECOVERY TRENCH

FORMER AST AREA  
5-10K DIESEL AND  
GASOLINE TANKS

FORMER  
SHOP

FORMER  
HEATING

HIGHWAY 169

ALLEY

No residential confined  
spaces identified in search area

5TH STREET

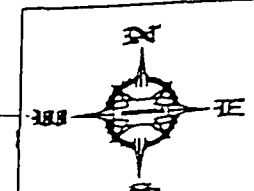
MINBURN  
CAFE

LOCUST STREET

1 inch = 50 feet

TELEPHONE  
GAS  
SEWER  
STORM SEWER  
ELECTRIC  
WATER  
PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- ⊙ MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER  
PROJECT NO: 6801007



**Seneca**  
Environmental Services

REVISED:  
DATE: 5/26/99

SITE: COOPER HUNTER STATION  
HIGHWAY 169 & BAKER STREET  
MINBURN, IOWA  
VAPOR CONFINEMENT MAP

FACILITY ID: 00000  
SCALE: 1" = 50'

REVIEWED BY: INT  
DRAWN BY: SMF

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 3B  
Groundwater Vapor  
Confined Space Nonresidential**

T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < data  
T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC

CHESTNUT STREET

MINBURN  
TELEPHONE CO.

RECOVERY TRENCH

FORMER AST AREA  
5-10K DIESEL AND  
GASOLINE TANKS

FORMER SHOP

FORMER  
STATION

HIGHWAY 169

ALLEY

*No non-residential confined spaces  
identified within plume*

5TH STREET

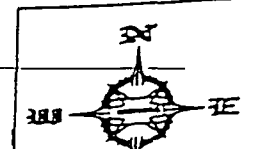
MINBURN CAFE

LOCUST STREET

1 inch = 50 feet

TELEPHONE  
GAS  
SEWER  
STORM SEWER  
ELECTRIC

● SOIL BORING  
◆ SOIL BORING WITH  
MONITORING WELL  
○ MONITORING WELL



FILE NAME COOPER		REVISED
PROJECT NO. 6301007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET		REVIEWED BY: INT
FACILITY ID: 00000		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

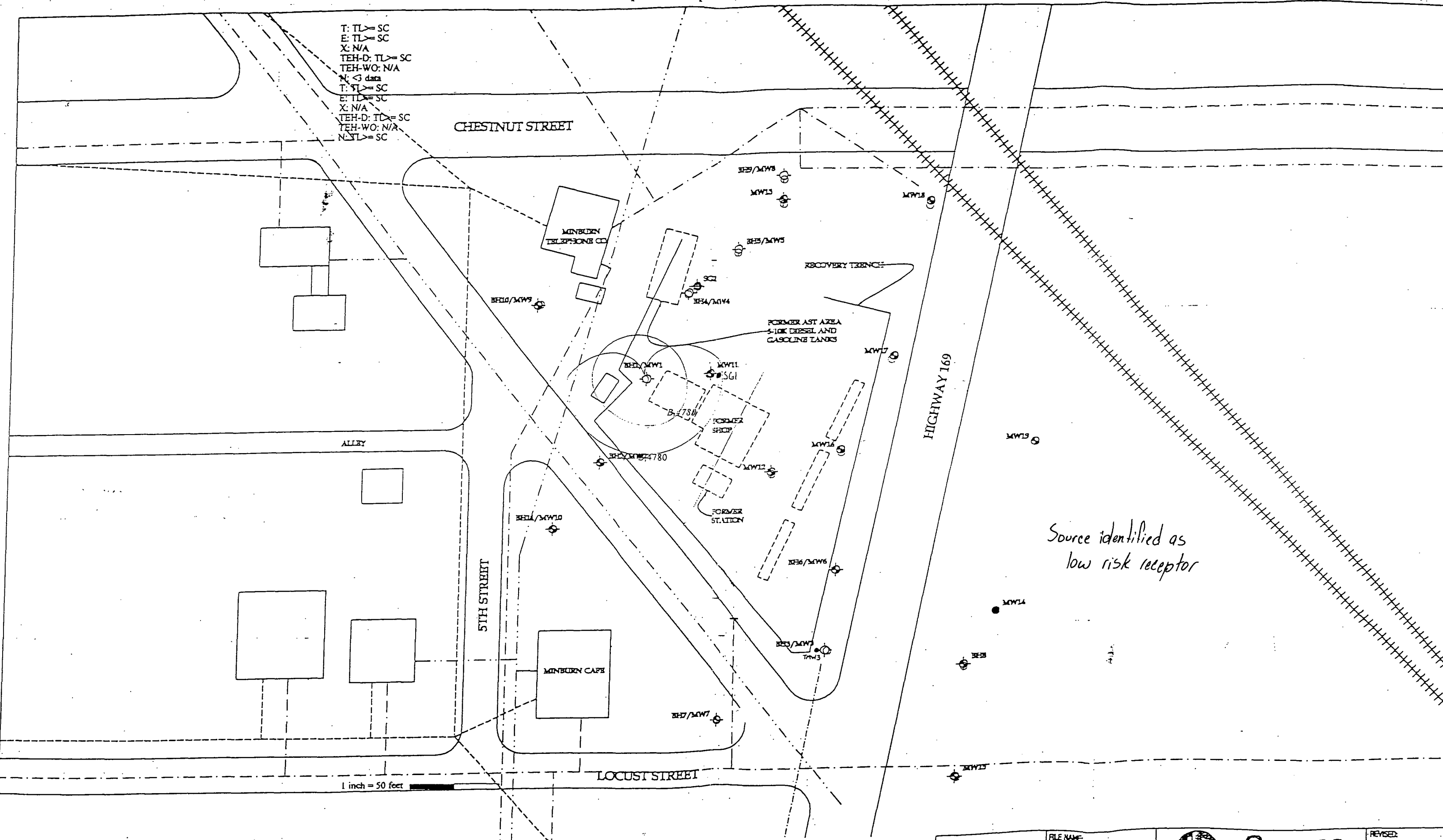
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**Appendix 4  
Groundwater Vapor  
Potential Confined Space**

3b. GW Vapor-Confined Space Nonresidential  
Receptor ID Map

V-22

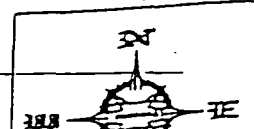
T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < data  
T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC



1 inch = 50 feet

TELEPHONE  
GAS  
SEWER  
STORM SEWER

● SOIL BORING  
● SOIL BORING WITH MONITORING WELL



FILE NAME COOPER		REVISED
PROJECT NO. 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION 1169 L. RAYBURN STREET	FACILITY ID: 0000	REVIEWED BY: TNT

**GW Source, Potential Confined Space, Benzene****Lust No.: SPILL#25-11256-JS-1445****Risk Classification Summary**

	Benzene	Toluene	EthylBen.	Xylenes	TEH-D	TEH-WO	Naph.
NIC	L	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)
IC	N	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)

**Monitoring Summary for Benzene**

well	Actual	Criteria	NIC-SSTL	IC-SSTL	Receptor
MW 1	9,600.	S	4,774.	19,537.	SW
MW 6	34	TG-Down Gradient	4,774.	NA	PCS
MW 2	260	T-ML	4,774.	8,374.	SW

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 5A  
Groundwater Vapor  
Sanitary Sewer Residential**

T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < data  
T: TL > SC  
E: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC

CHESTNUT STREET

MINNBURN  
TELEPHONE CO

RECOVERY TRENCH

FORMER AST AREA  
5-10K DIESEL AND  
GASOLINE TANKS

HIGHWAY 169

ALLEY

No sewers identified in  
search area.

5TH STREET

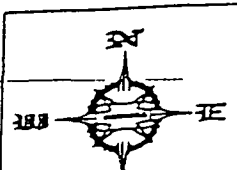
MINNBURN CAFE

LOCUST STREET

1 inch = 50 feet

TELEPHONE  
GAS  
SEWER  
STORM SEWER  
ELECTRIC  
WATER

● SOIL BORING  
◆ SOIL BORING WITH  
MONITORING WELL  
◇ MONITORING WELL  
▲ MONITORING WELL



FILE NAME: COOPER  
PROJECT NO: 6801007



**Seneca**  
Environmental Services

REVISED:  
DATE: 5/26/99

SITE: COOPER HUNTER STATION  
HIGHWAY 169 & BAKER STREET  
MINNBURN, IOWA

FACILITY ID: 00000  
SCALE:  
REVIEWED BY: INT  
DRAWN BY:

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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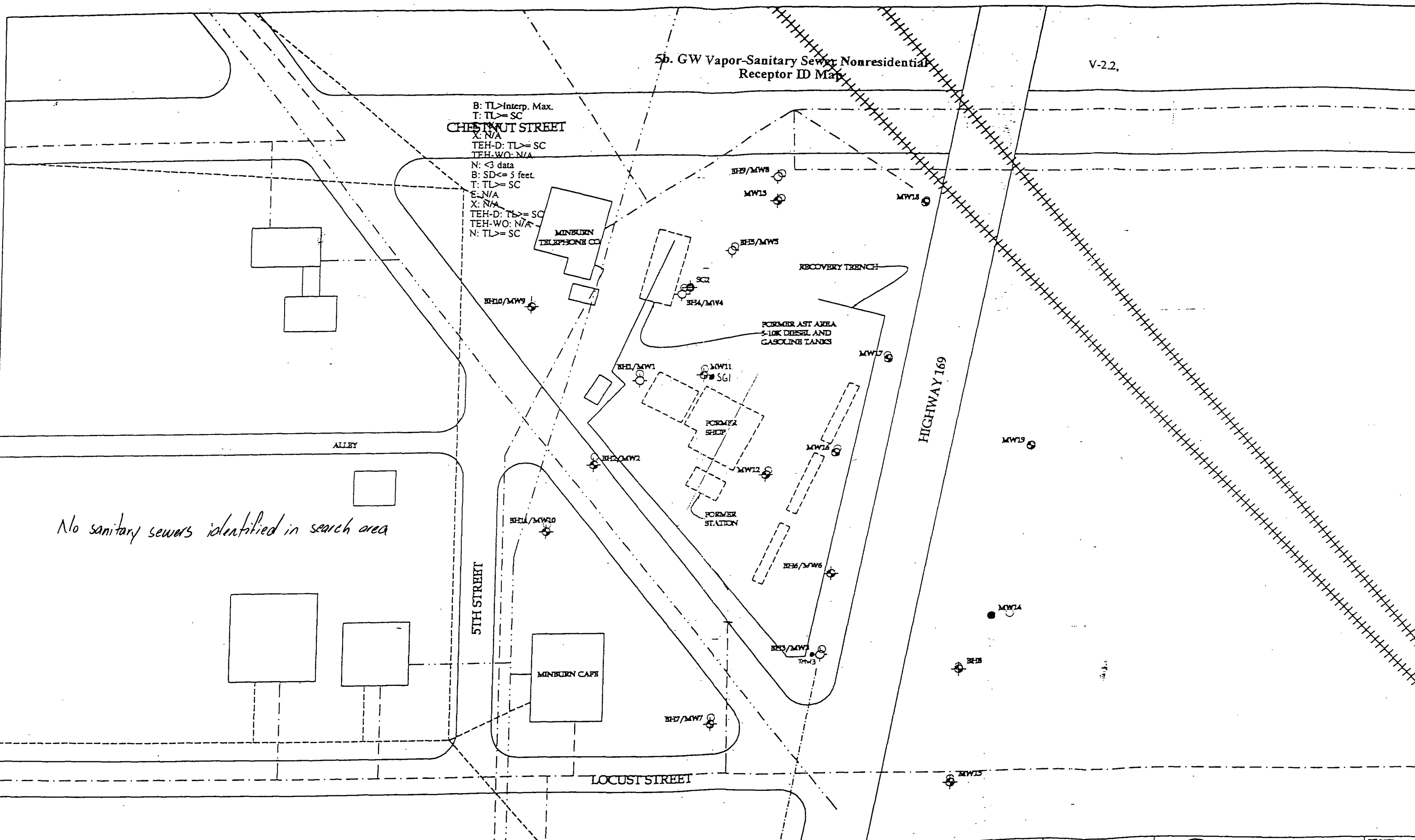
**Appendix 5B  
Groundwater Vapor  
Sanitary Sewer Non-Residential**

Sp. GW Vapor-Sanitary Sewer Nonresidential  
Receptor ID Map

V-2.2

B: TL > Interp. Max.  
T: TL > SC  
CHESTNUT STREET  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < 3 data  
B: SD <= 5 feet.  
T: TL > SC  
E: N/A  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC

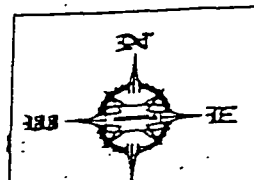
No sanitary sewers identified in search area



1 inch = 50 feet

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- ⊖ MONITORING WELL
- ⊙ SOIL GAS WELL



FILE NAME COOPER		REVISED:
PROJECT NO. 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINNBURN, IOWA		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY:
SCALE		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

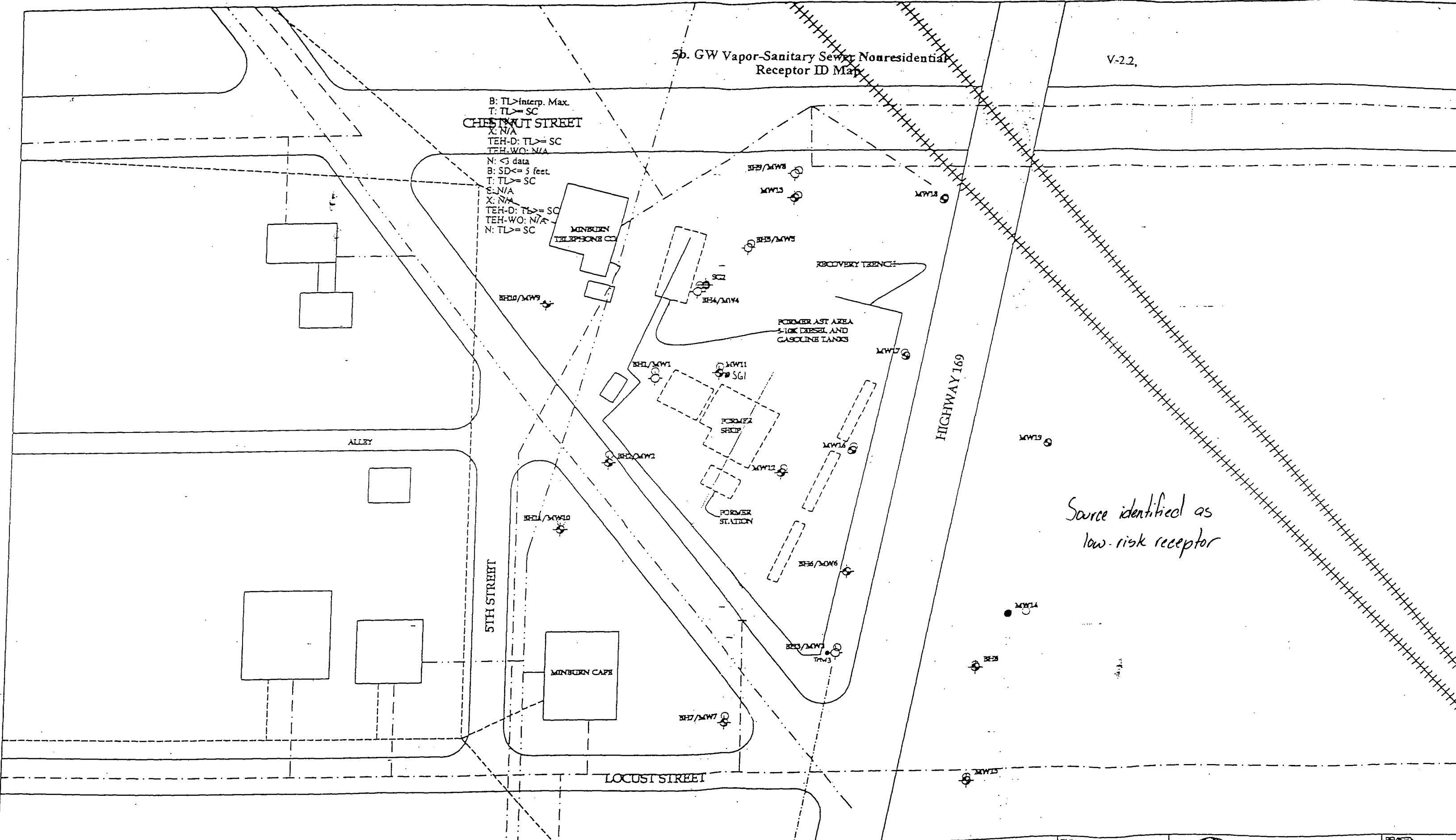
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**Appendix 6  
Groundwater Vapor  
Potential Sanitary Sewer**

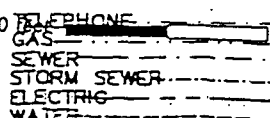
5b. GW Vapor-Sanitary Sewer Nonresidential  
Receptor ID Map

V-2.2.

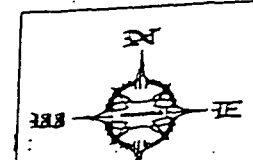
B: TL > Interp. Max.  
T: TL > SC  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: < 3 data  
B: SD <= 5 feet  
T: TL > SC  
S: N/A  
X: N/A  
TEH-D: TL > SC  
TEH-WO: N/A  
N: TL > SC



1 inch = 50 feet



- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL



FILE NAME COOPER		REVISED
PROJECT NO. 5801.007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET 2.00 AC. TOTAL ROWA		FACILITY ID: 00000
		REVIEWED BY: INT
		DRAWN BY:

**Risk Classification Summary**

	Benzene	Toluene	EthylBen.	Xylenes	TEH-D	TEH-WO	Naph.
NIC	L	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)
IC	N	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)	N(PE)

**Monitoring Summary for Benzene**

well	Actual	Criteria	NIC-SSTL	IC-SSTL	Receptor
MW 1	9,600.	S	9,547.	18,937.	SW
MW 6	34	TG-Down Gradient	9,547.	NA	PSS
MW 2	260	T-ML	9,547. Out of Range		SW

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 7  
Groundwater to Plastic Water Line**

SUG

1042

7.5 to Plastic Water Line  
ID Map

Roge  
Park

WT

0.4000

0.75000

1038

No PVC  
identified in  
search area

TEH-WO: <3 data  
N: <3 data  
X: SD <= 5 feet  
N: No GW SC

**Seneca Environmental Services**

Date: July 13, 1999

Hunter - Cooper  
Minburn

Spill Number:  
11256-JS-1445

Groundwater to  
Plastic Water Line  
Scale: 1" = 500'

Seneca Job #6801007

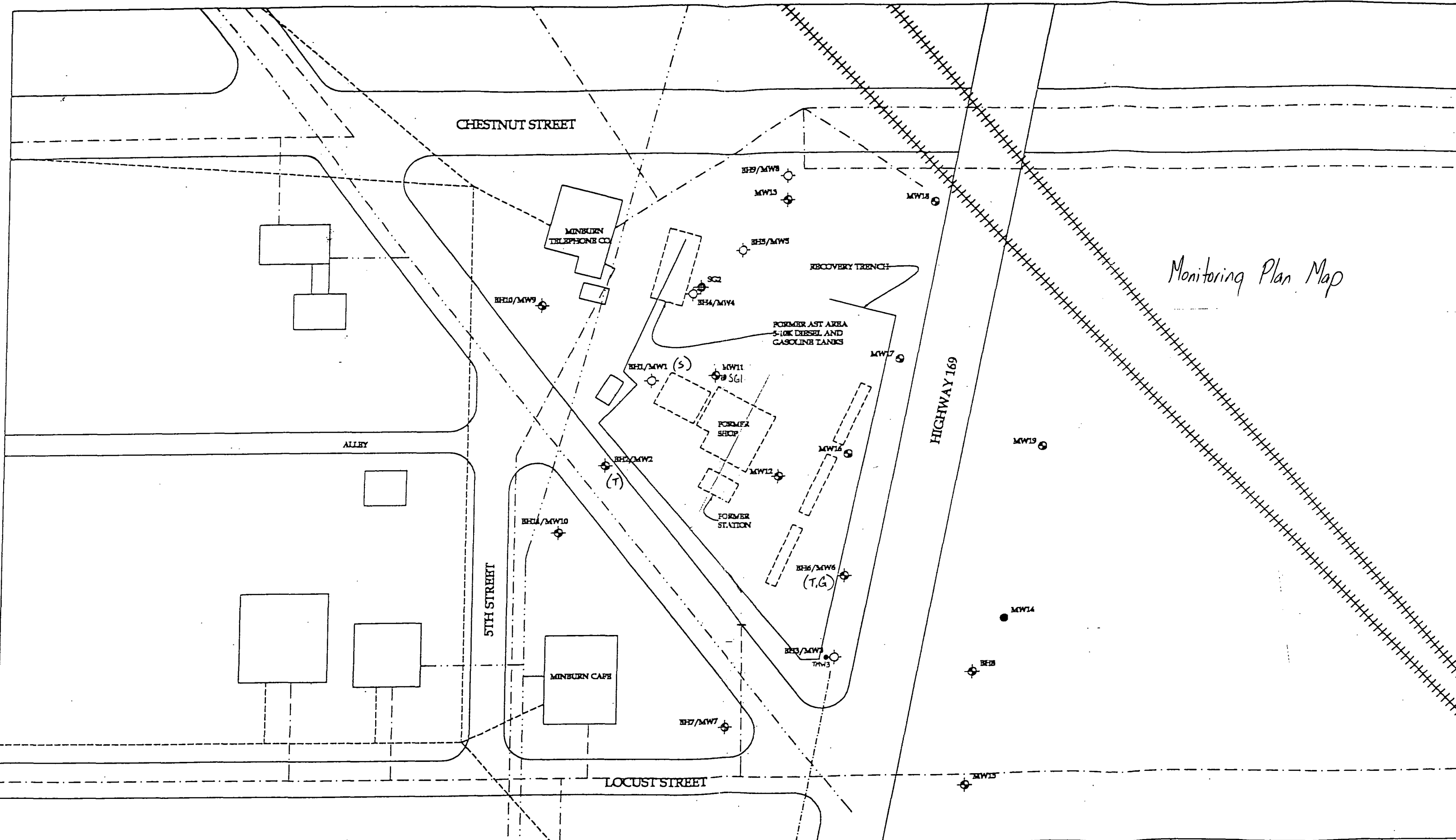
- 500 feet

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

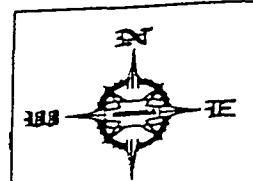
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**Appendix 14  
Monitoring Plan Map**

Monitoring Plan Map



- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL
- TELEPHONE
- - - GAS
- - - SEWER
- · - · STORM SEWER
- ELECTRIC
- · - · WATER
- · - · PRODUCT LINES

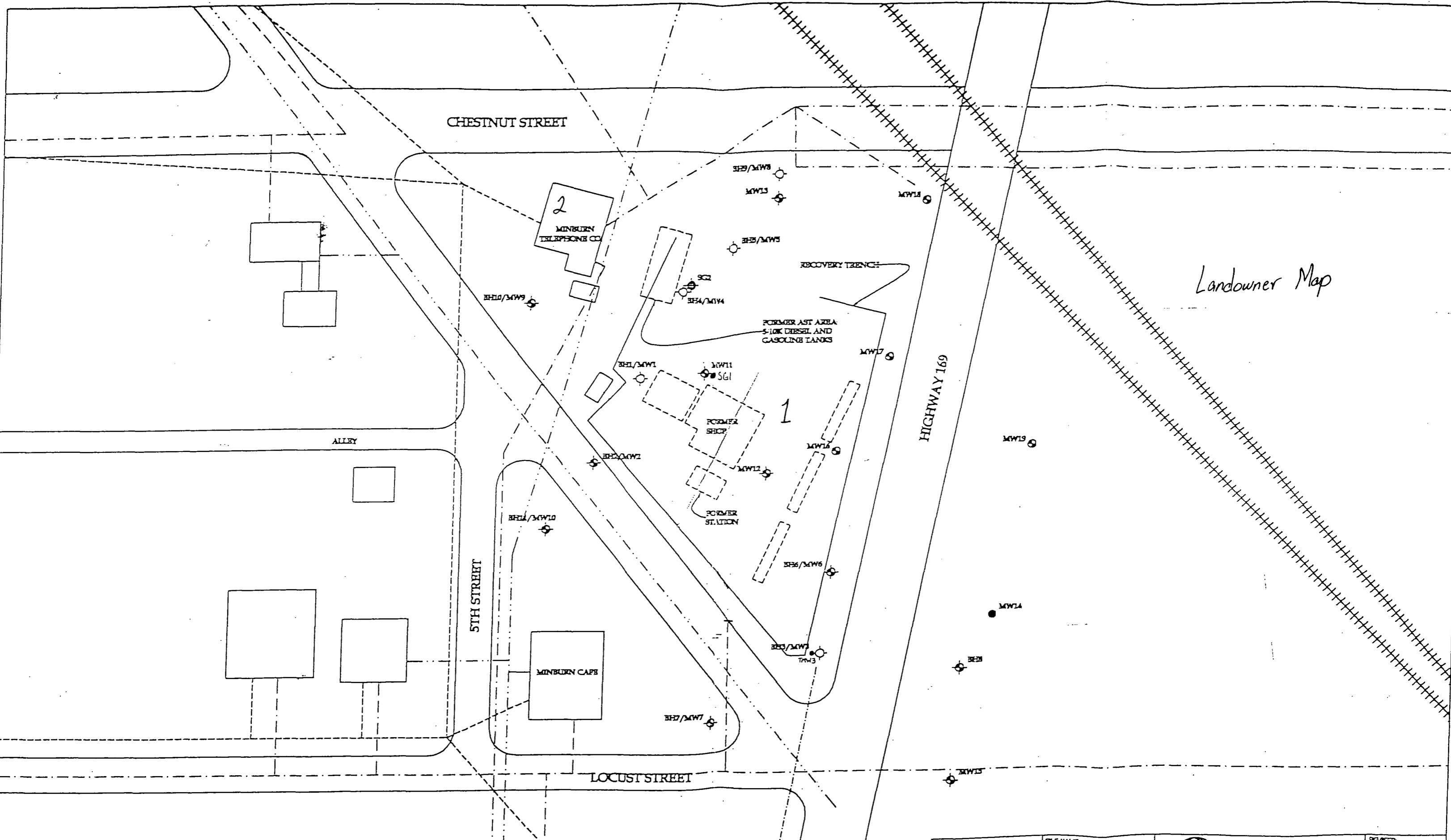


FILE NAME COOPER	 <b>Seneca</b> Environmental Services	REVISED:
PROJECT NO. 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XX COORDINATE MAP		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY: SMH
SCALE 1" = 50'		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

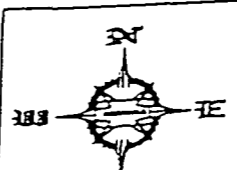
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**Appendix 15  
Landowner Map**



Landowner Map

- SOIL BORING
  - ⊕ SOIL BORING WITH MONITORING WELL
  - ⊙ MONITORING WELL
  - ▲ SOIL GAS WELL
- TELEPHONE  
 GAS  
 SEWER  
 STORM SEWER  
 ELECTRIC  
 WATER  
 PRODUCT LINES

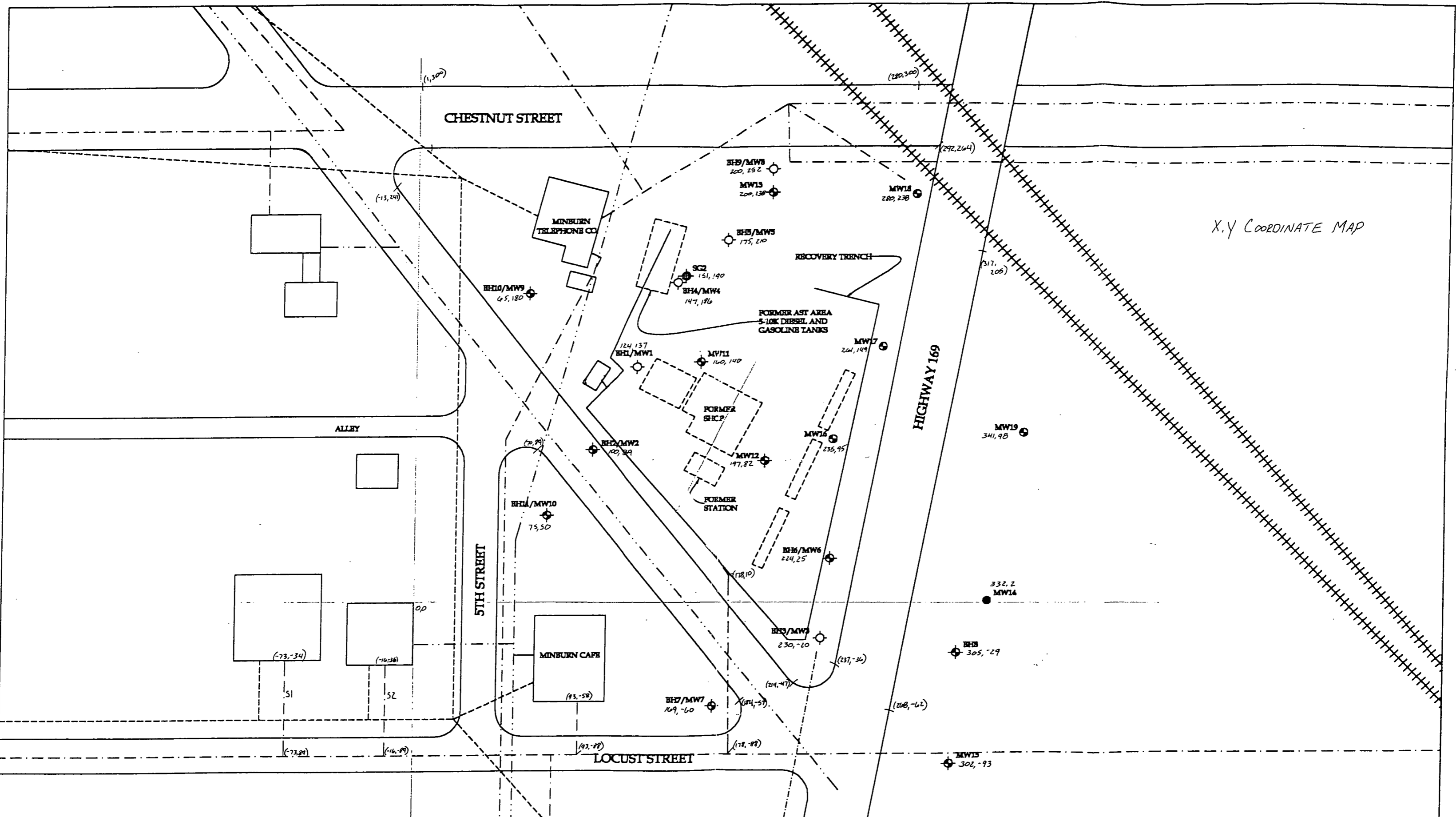


FILE NAME COOPER		REVISED
PROJECT NO. 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY:
SCALE		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 16  
X, Y Coordinates Map**

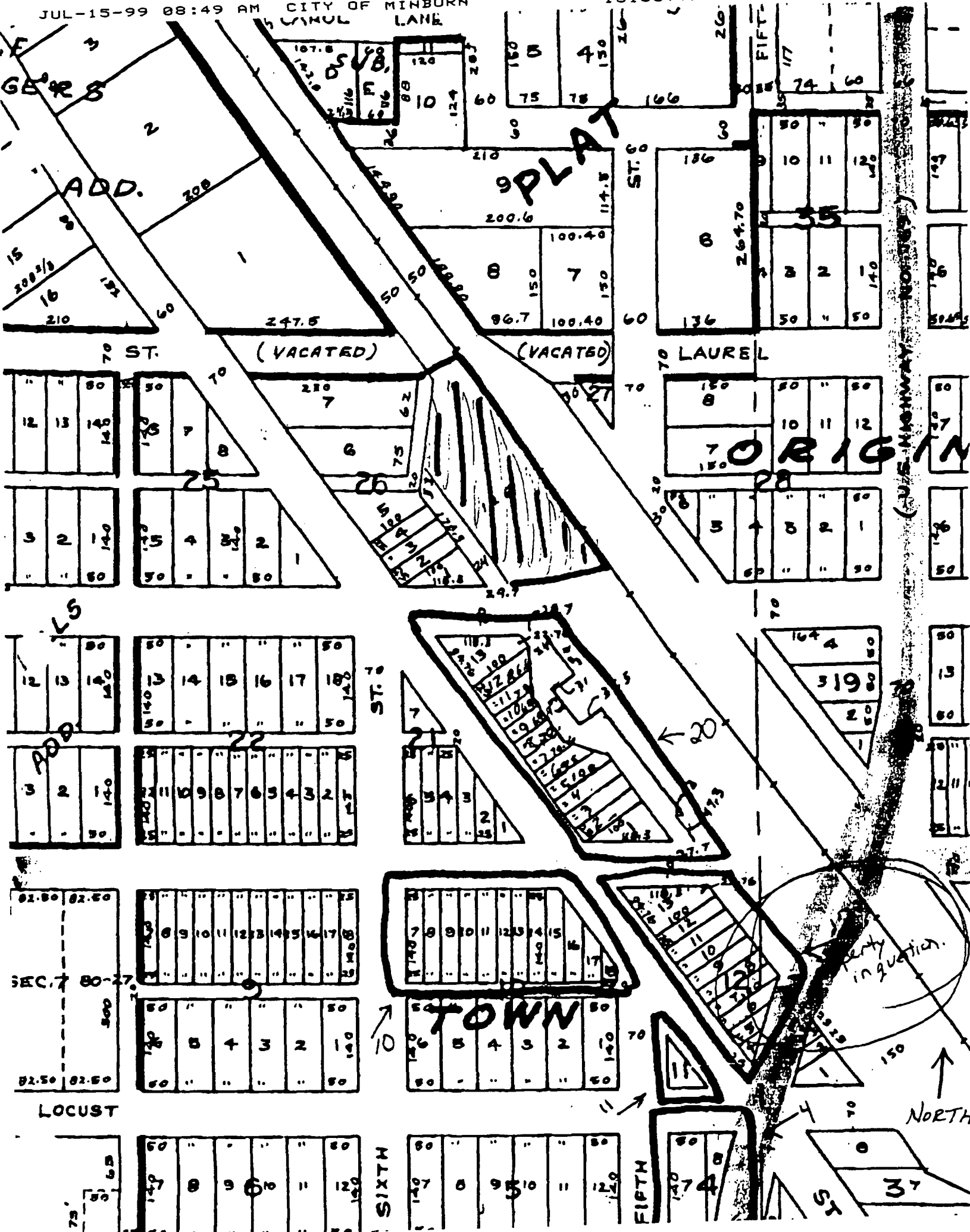


**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 17  
Zoning Documentation**

**Zoning information provided by the Minburn City Clerk at 515-677-2245**



CHAPTER 121

MINBURN, IOWA

the work to the completion thereof. The building official shall be given at least twenty-four (24) hours notice of the starting of work under a permit.

121.12 REVOCATION. The building official may revoke a permit or approval issued under the provisions of this chapter in case there has been any false statement or misrepresentation as to a material fact in the application or plans on which the permit or approval was based.

121.13 PERMIT VOID. In the event that construction covered by a permit is not initiated and underway within thirty (30) days and/or completed within one year from the date of issuance of a permit, such permit shall be deemed void and of no effect.

121.14 RESTRICTED RESIDENCE DISTRICT ESTABLISHED. The following area is hereby defined and established as a restricted residence district:

All that area lying within the corporate limits of the City except the following described area:  
(Code of Iowa, Sec. 414.24)

*These are the only established blocks designated Business at this time*

- Lots 7 and 8, Block 4
- North one-half of Block 10
- Block 11
- Lots 4 through 13, Block 12 ← *Yes*
- Block 20
- Railroad Industrial Property between Walnut Street and Laurel Street on the west side of Railroad Tracks.

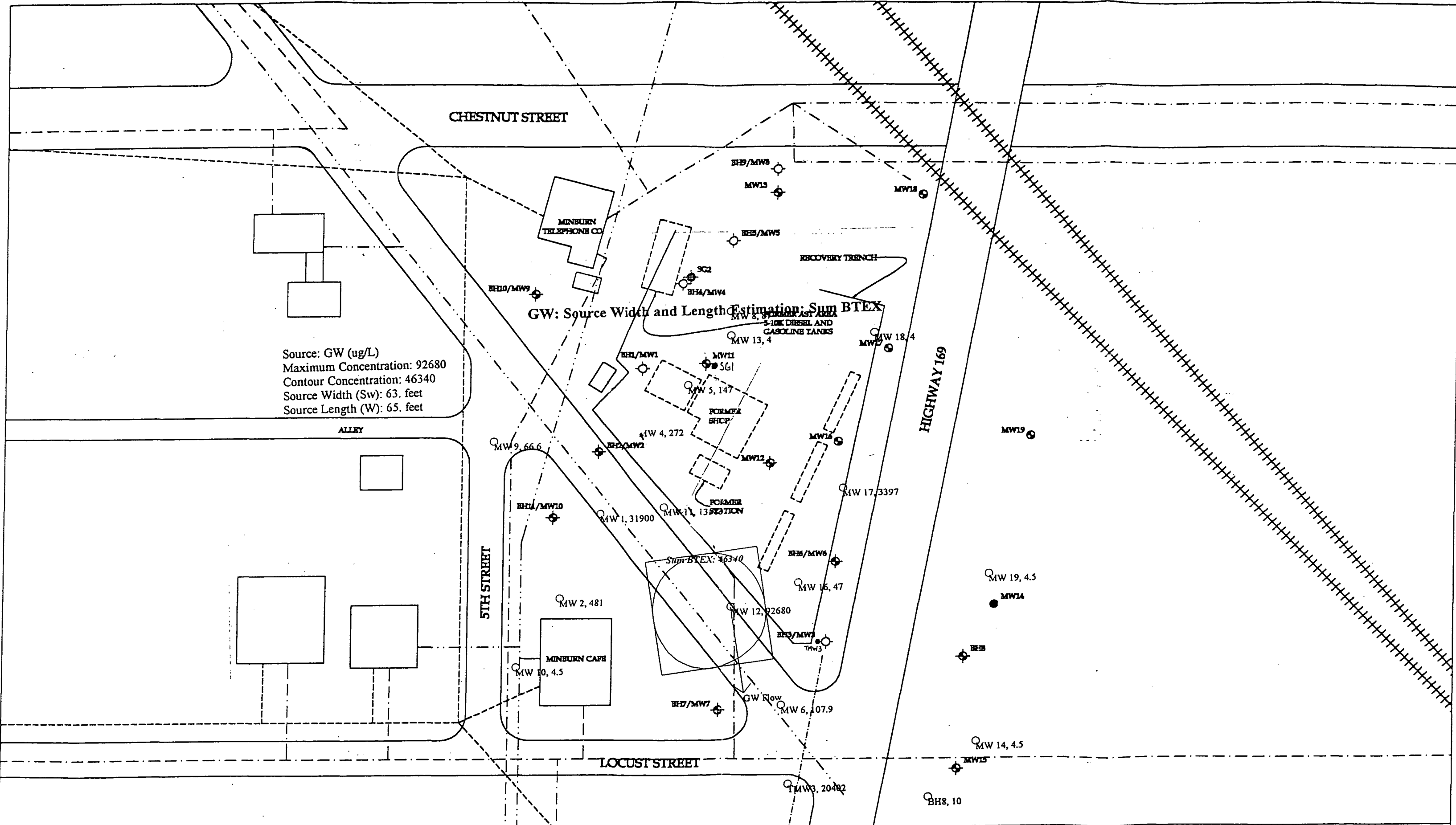
121.15 NOTICE REQUIREMENTS. Whenever a restricted residence district is established or changed, a public hearing must be held, notice of which shall be given at least seven (7) days in advance in the manner prescribed in Section 20.05. In no case shall the public hearing be held earlier than the next regularly scheduled City Council meeting following the published notice.  
(Code of Iowa, Sec. 414.24)

121.16 SETBACKS. All buildings shall be set back at least twenty-five (25) feet or the average of the setback within two hundred (200) feet each side of the proposed structure from the property line and next to the right of way of the street, and no buildings shall be built closer than five (5) feet or ten percent (10%) of the width of the lot to the side lot line, nor shall any principal building be built in the rear forty percent (40%) of the lot, but in no event closer than five (5) feet of the property line, without special Council permission. (Amended by Ordinance No. 111-96)  
Supp. Sep-96

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 18  
Groundwater Source Width/Length Map**



Source: GW (ug/L)  
 Maximum Concentration: 92680  
 Contour Concentration: 46340  
 Source Width (Sw): 63. feet  
 Source Length (W): 65. feet

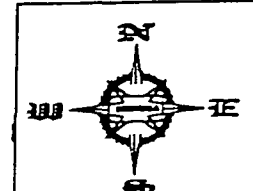
**GW: Source Width and Length Estimation: Sum BTEX**

MW 8, 31000 (AST AREA)  
 5-10K DIESEL AND GASOLINE TANKS

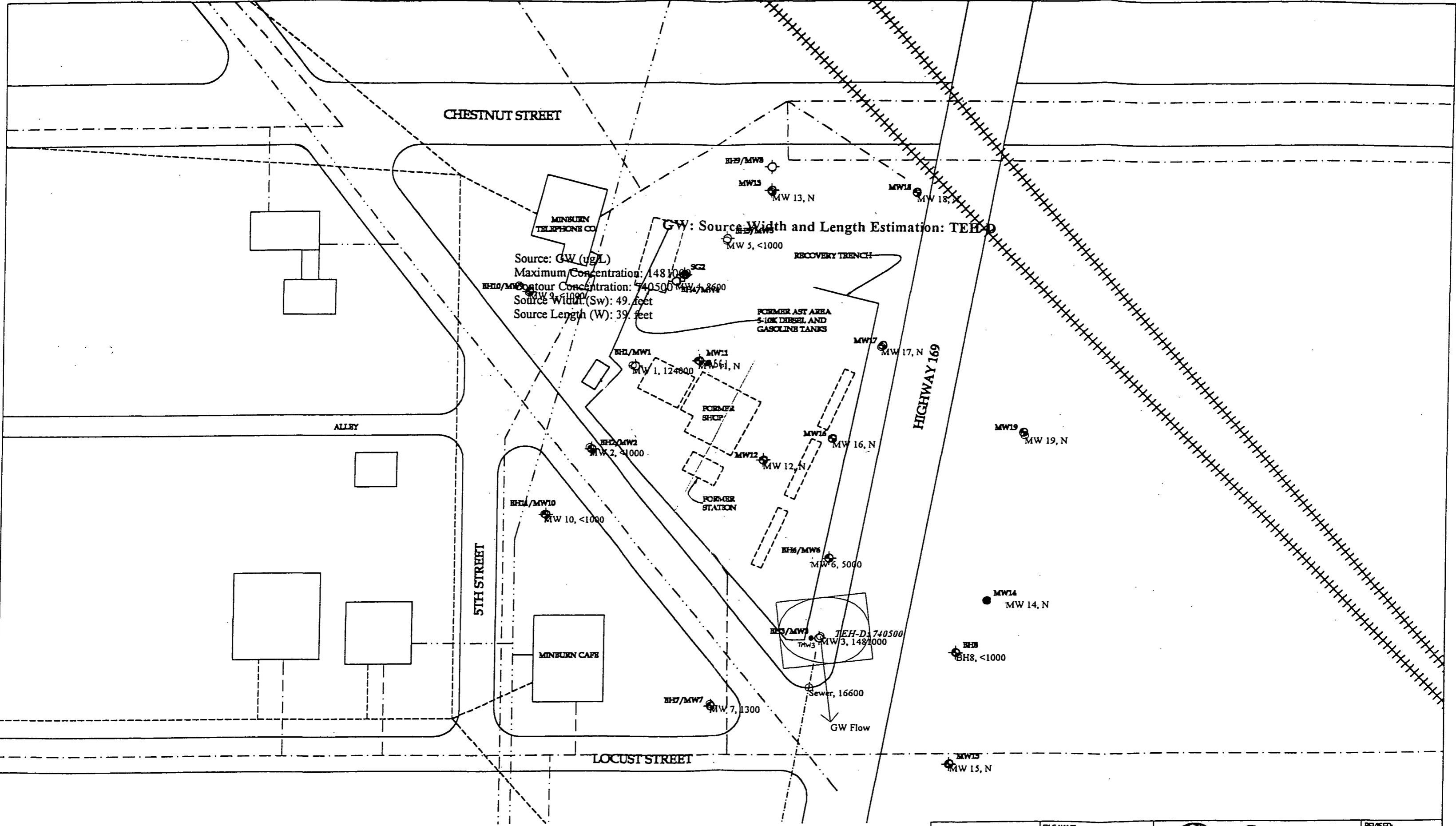
Supr BTEX: 46340

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- ◇ MONITORING WELL
- ◆ SOIL GAS WELL

1 inch = 50 feet



FILE NAME: COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XX COORDINATE MAP	FACILITY ID: 00000	REVIEWED BY: INT
	SCALE: 1" = 50'	DRAWN BY: SMH



	FILE NAME: COOPER		REVISED:
	PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		FACILITY ID: 00000	REVIEWED BY: INT
		SCALE: 1" = 50'	DRAWN BY: SMH

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

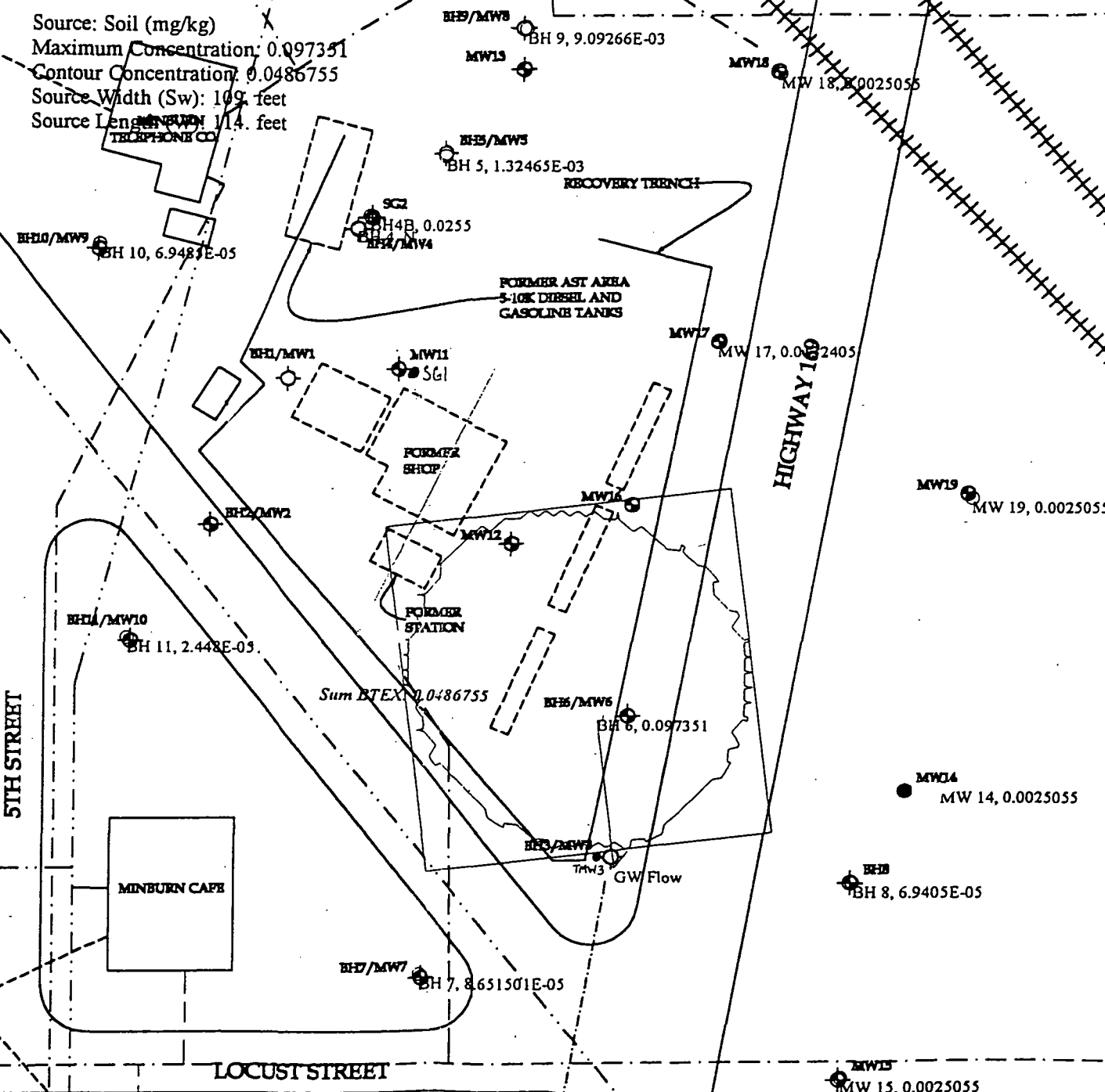
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**Appendix 19  
Soil Source Width/Length Map**

CHESTNUT STREET

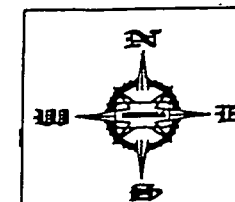
Soil: Source Width and Length Estimation; Sum BTEX

Source: Soil (mg/kg)  
Maximum Concentration: 0.097351  
Contour Concentration: 0.0486755  
Source Width (Sw): 109 feet  
Source Length (L): 114 feet



TELEPHONE  
GAS  
SEWER  
STORM SEWER  
ELECTRIC  
WATER  
PRODUCT LINES

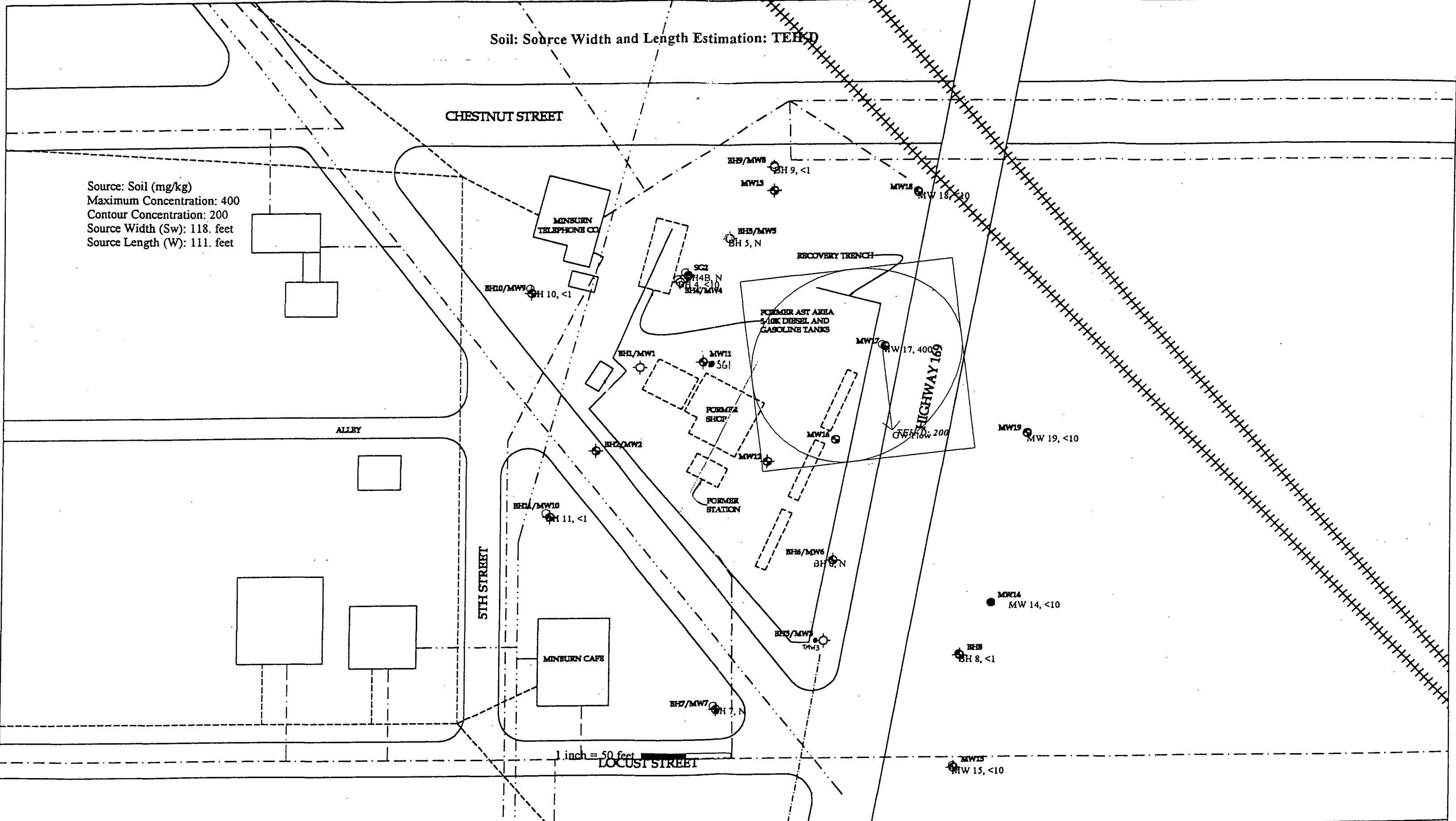
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP	FACILITY ID: 00000	REVIEWED BY: INT
	SCALE: 1" = 50'	DRAWN BY: SMH

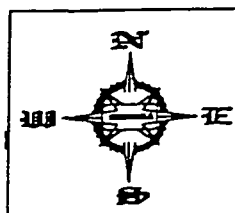
Soil: Source Width and Length Estimation: TEHD

Source: Soil (mg/kg)  
 Maximum Concentration: 400  
 Contour Concentration: 200  
 Source Width (Sw): 118. feet  
 Source Length (W): 111. feet



1 inch = 50 feet

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL

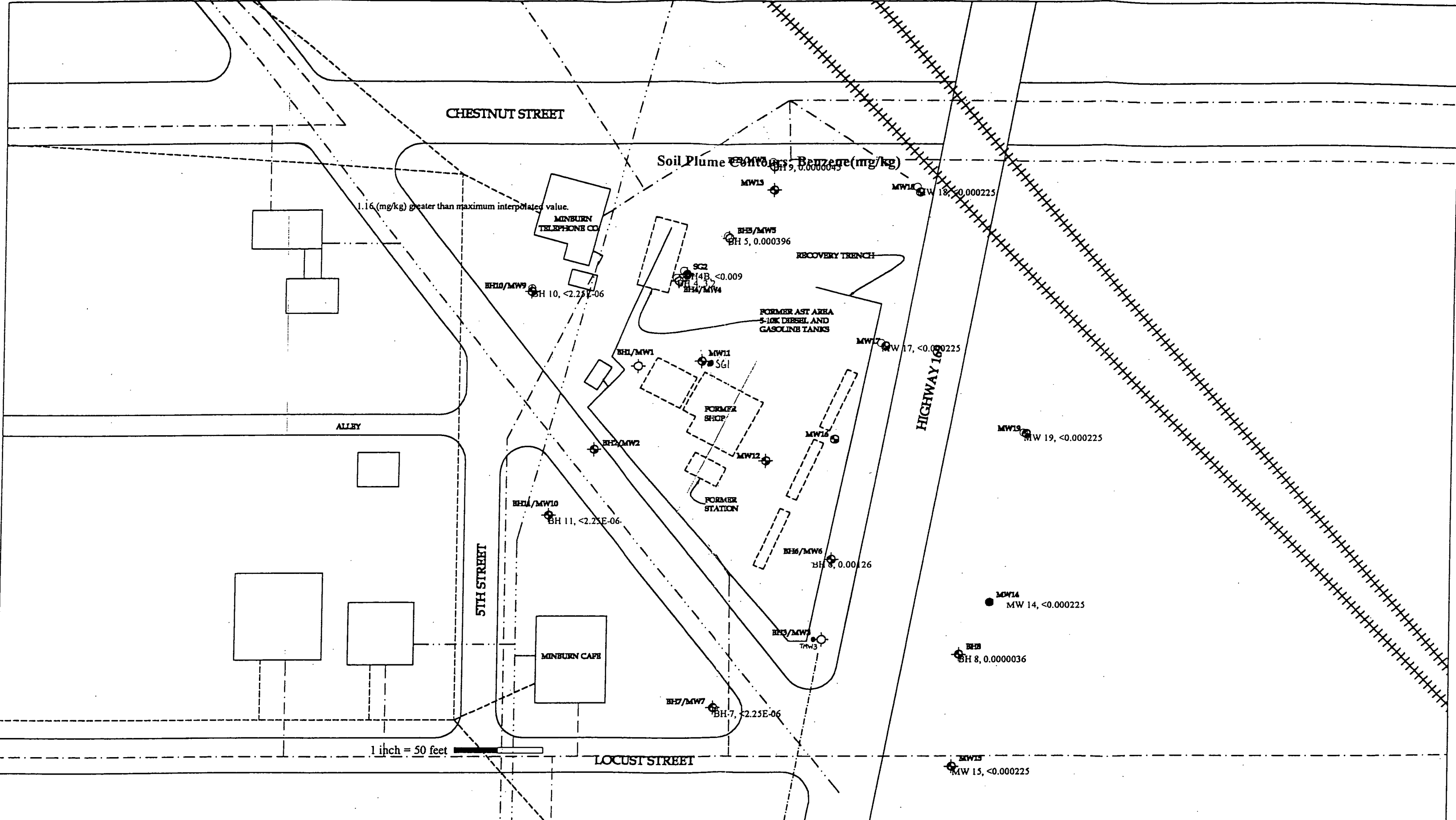


FILE NAME COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY: SMH
SCALE: 1" = 50'		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

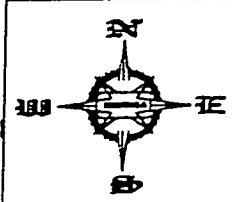
**Appendix 20  
Soil Contamination Plume Map**



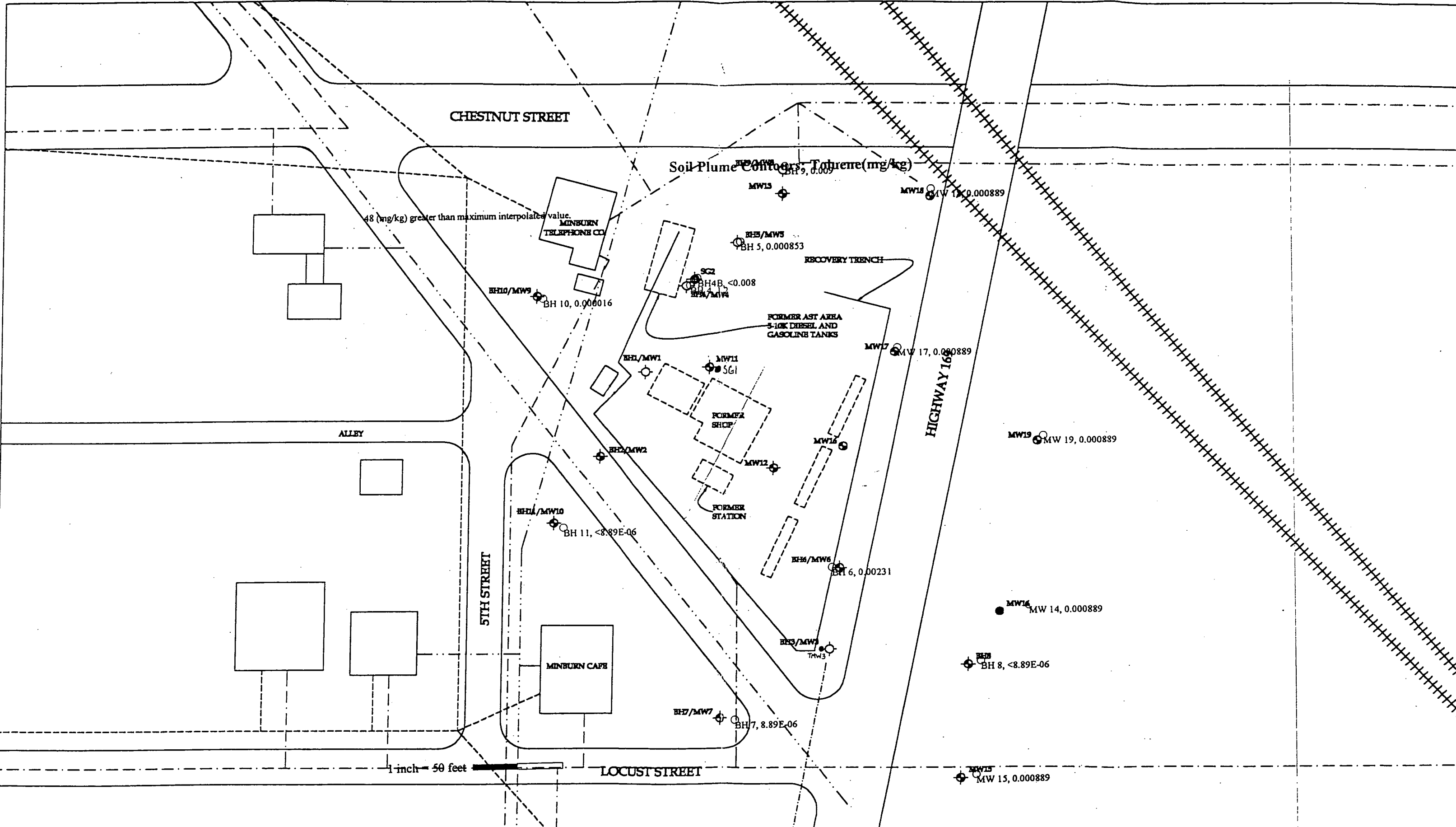
1 inch = 50 feet

TELEPHONE  
GAS  
SEWER  
STORM SEWER  
ELECTRIC  
WATER  
PRODUCT LINES

- SOIL BORING
- ◆ SOIL BORING WITH MONITORING WELL
- ◇ MONITORING WELL
- ◆ SOIL GAS WELL

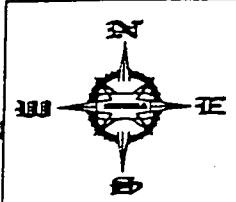


FILE NAME COOPER		REVISED:
PROJECT NO: 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		FACILITY ID: 00000
		REVIEWED BY: INT
		SCALE: 1" = 50'
		DRAWN BY: SMH

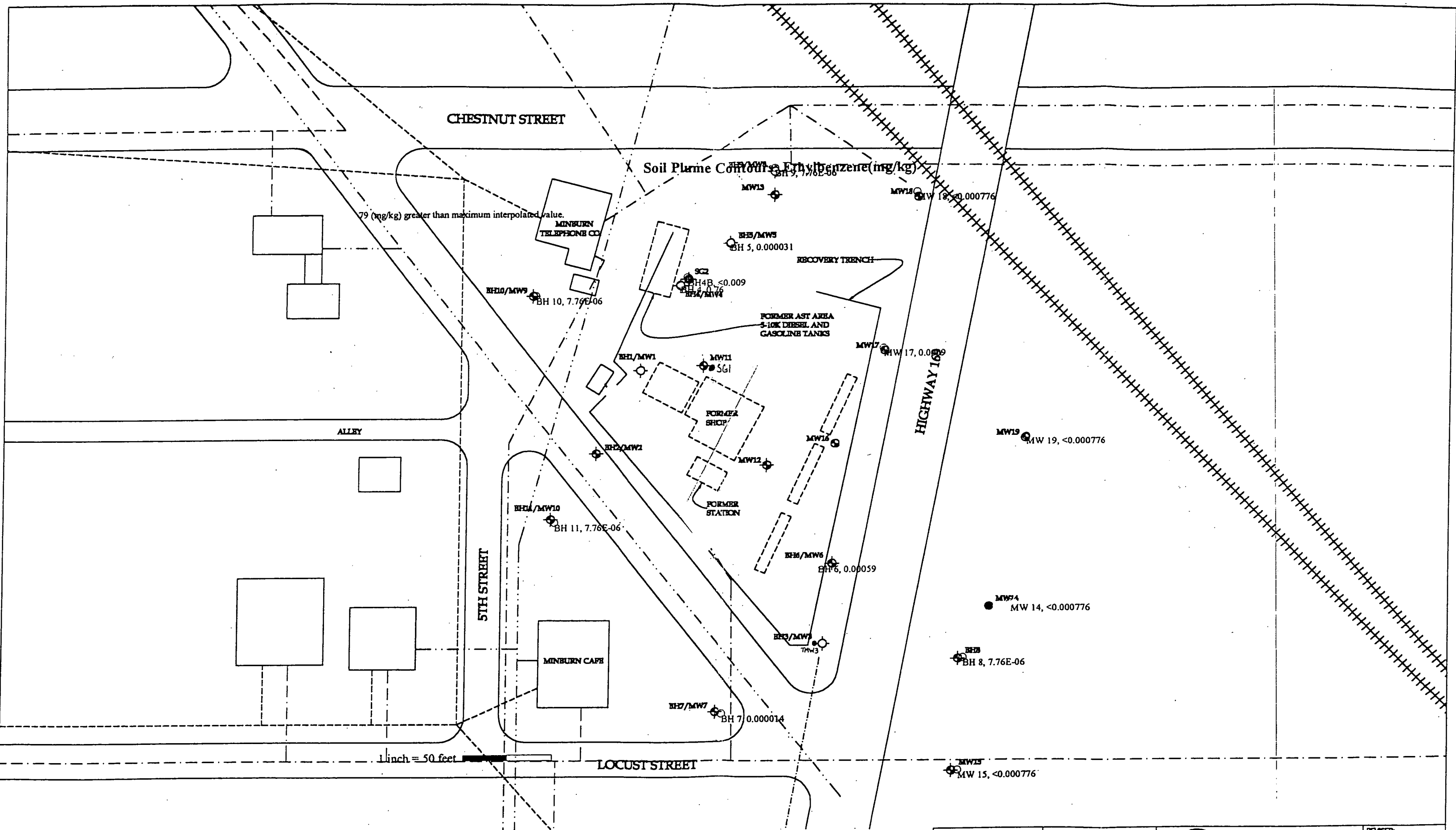


1 inch = 50 feet

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL

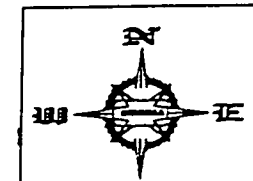


FILE NAME: COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		REVIEWED BY: INT
SCALE: 1" = 50'		DRAWN BY: SMH



TELEPHONE  
 GAS  
 SEWER  
 STORM SEWER  
 ELECTRIC  
 WATER  
 PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER		REVISED:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY: SMH
SCALE: 1" = 50'		



**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 21  
Groundwater Contamination Plume Map**

GW Plume Contours: Benzene (ug/L)

CHESTNUT STREET

MINBURN TELEPHONE CO

RECOVERY TRENCH

FORMER ASP AREA  
5-TON DIESEL AND  
GASOLINE TANKS

FORMER SHOP

FORMER STATION

HIGHWAY 169

ALLEY

5TH STREET

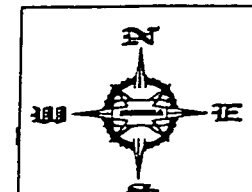
MINBURN CAFE

LOCUST STREET

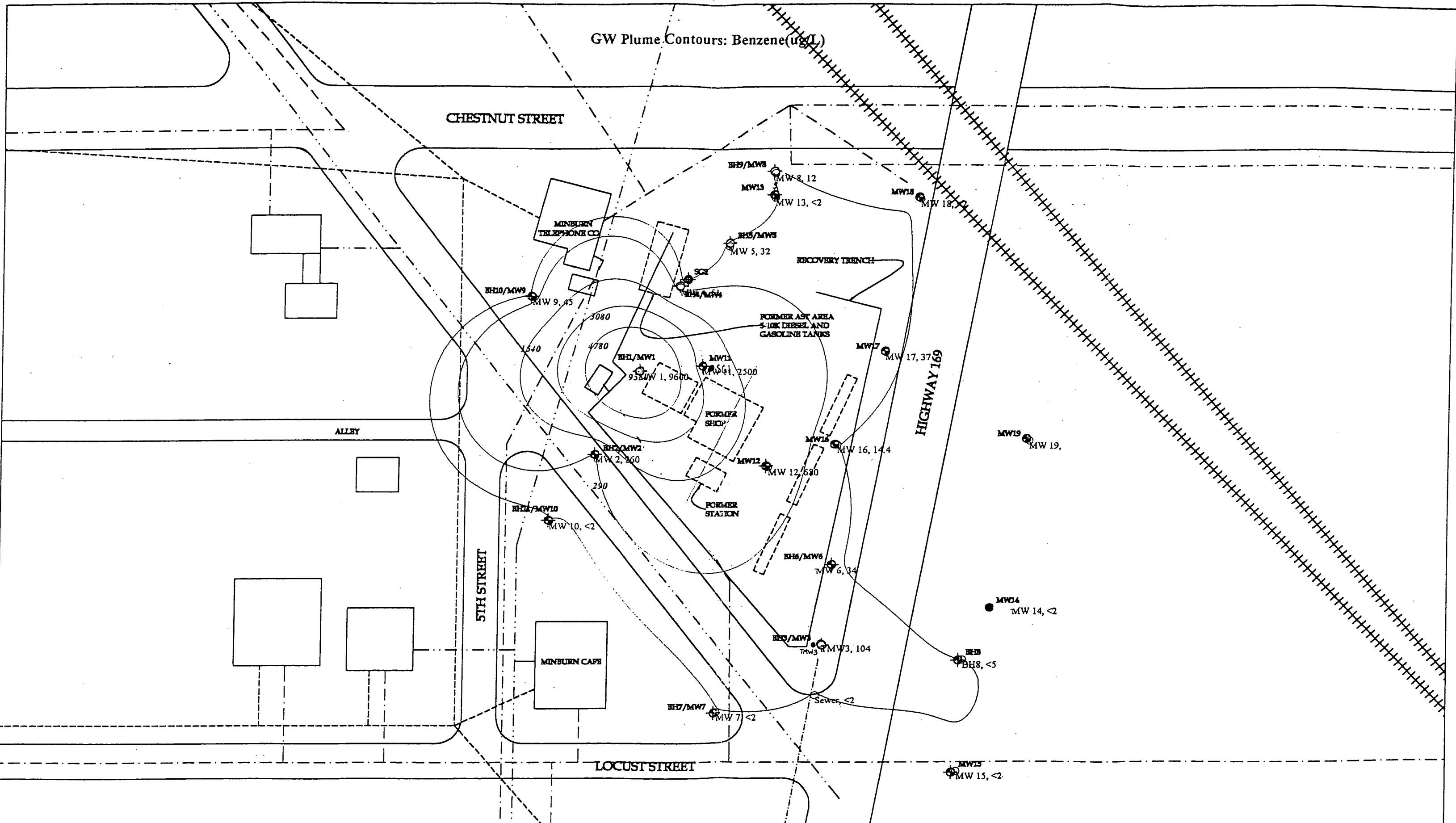
1 inch = 50 feet

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES

- SOIL BORING
- ◆ SOIL BORING WITH MONITORING WELL
- ◇ MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER	 <b>Seneca</b> Environmental Services	REVISED:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		REVIEWED BY: INT
FACILITY ID: 00000 SCALE: 1" = 50'		DRAWN BY: SMH



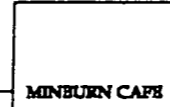
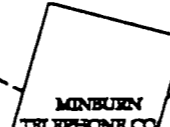
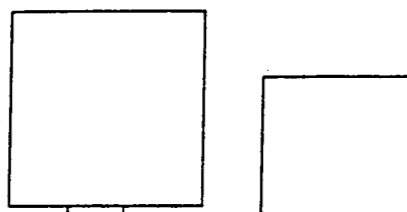
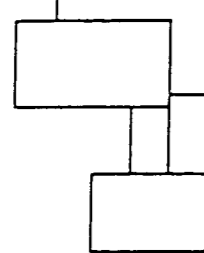
GW Plume Contours: Toluene(ug/L)

CHESTNUT STREET

5TH STREET

LOCUST STREET

HIGHWAY 169



BH10/MW9  
MW 9, <2

BH1/MW1  
MW 1, 13000

BH2/MW2  
MW 2, 9.1

BH11/MW10  
MW 10, <2

BH7/MW7  
MW 7, <2

BH9/MW8  
MW 8, 23

MW13  
MW 13, <2

BH5/MW5  
MW 5, 25

SC2  
MWA/M190

MW11  
MW 11, 117

MW12  
MW 12, 4000

BH6/MW6  
MW 6, 8.9

BH3/MW3  
MW 3, 2300

MW17  
MW 17, 51

MW16  
MW 16, <

MW19  
MW 19, <

MW14  
MW 14, <

BH8  
BH8, <5

MW15  
MW 15, <2

RECOVERY TRENCH

FORMER AST AREA  
5-10K DIESEL AND  
GASOLINE TANKS

FORMER  
SHIP

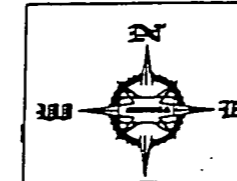
FORMER  
STATION

Sewer, 42

1 inch = 50 feet

- TELEPHONE
- - - GAS
- - - SEWER
- - - STORM SEWER
- - - ELECTRIC
- - - WATER
- - - PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME  
COOPER

PROJECT NO.  
6801007



**Seneca**  
Environmental Services

REVISED:  
DATE: 5/26/99

SITE: COOPER HUNTER STATION  
HIGHWAY 169 & BAKER STREET  
MINBURN, IOWA

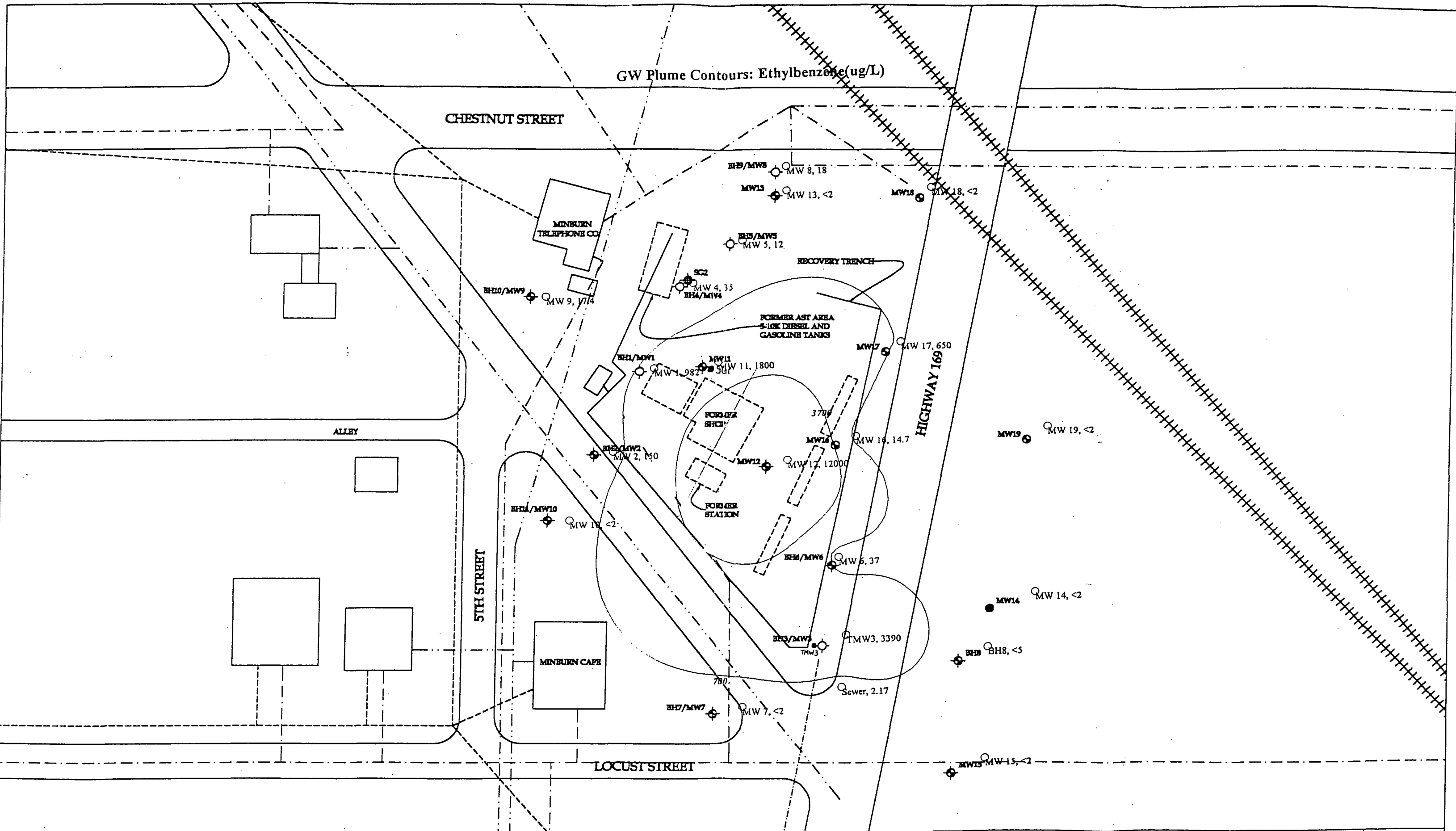
FACILITY ID:  
00000

SCALE:  
1" = 50'

REVIEWED BY:  
INT

DRAWN BY:  
SMH

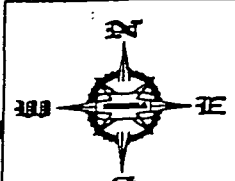
GW Plume Contours: Ethylbenzene (ug/L)



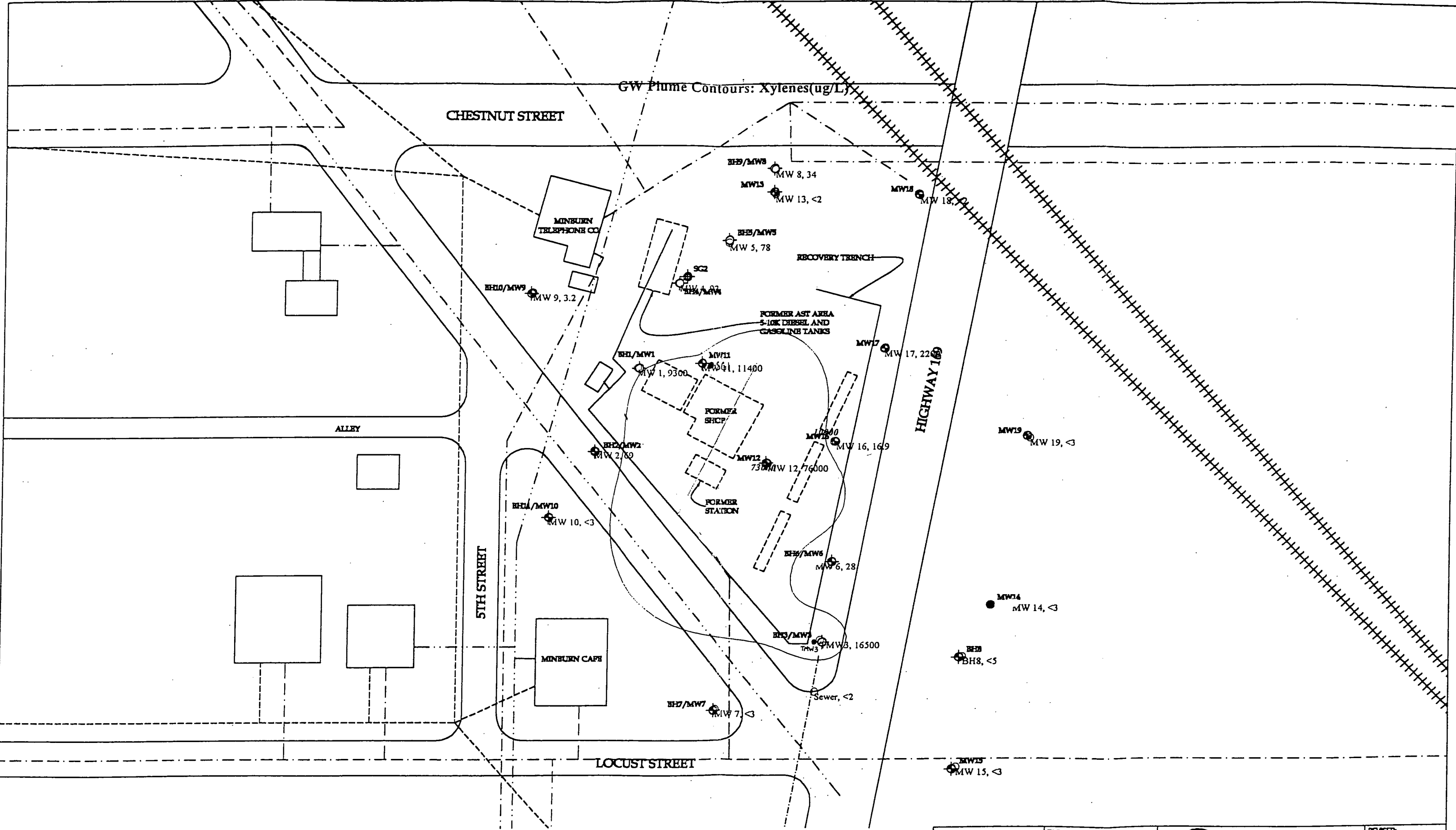
1 inch = 50 feet

TELEPHONE  
 GAS  
 SEWER  
 STORM SEWER  
 ELECTRIC  
 WATER  
 PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER		REVISED:
PROJECT NO: 6901007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA BY COORDINATE MAP		REVIEWED BY: INT
FACILITY ID: 00000	SCALE: 1" = 50'	DRAWN BY: SMT



GW Plume Contours: Xylenes(ug/L)

CHESTNUT STREET

ALLEY

5TH STREET

LOCUST STREET

HIGHWAY 169

MINBURN TELEPHONE CO

MINBURN CAFE

FORMER SHIP

FORMER STATION

RECOVERY TRENCH

BH10/MW9  
MW 9, 3.2

BH9/MW8  
MW 8, 34

MW13  
MW 13, <2

BH5/MW5  
MW 5, 78

BH1/MW1  
MW 1, 9300

MW11  
MW 11, 11400

MW17  
MW 17, 2200

BH2/MW2  
MW 2, 60

MW12  
MW 12, 76000

MW16  
MW 16, 169

BH11/MW10  
MW 10, <3

BH6/MW6  
MW 6, 28

MW19  
MW 19, <3

BH3/MW3  
MW 3, 16500

MW14  
MW 14, <3

BH7/MW7  
MW 7, <3

Sewer, <2

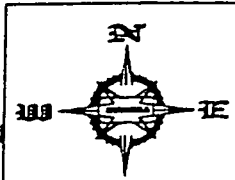
BH8  
BH8, <5

MW15  
MW 15, <3

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES

1 inch = 50 feet

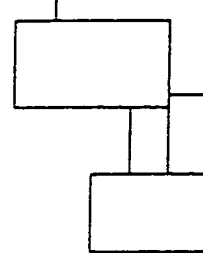
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME: COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA		REVIEWED BY: INT
FACILITY ID: 00000	SCALE: 1" = 50'	DRAWN BY: SMH

GW Plume Contours: TEH-1 (ug/L)

CHESTNUT STREET



MINBURN TELEPHONE CO

BH9/MW8  
MW 8, <1000  
MW13  
MW 13, N  
MW18  
MW 18, N

BH5/MW5  
MW 5, <1000

RECOVERY TRENCH

BH10/MW9  
MW 9, <1000

MW4, 8600

FORMER EAST AREA  
5-10K DIESEL AND  
GASOLINE TANKS

BH1/MW1  
MW 1, 124000

MW11  
MW 11, N

MW17  
MW 17, N

ALLEY

BH2/MW2  
MW 2, <1000

FORMER  
SHOP

MW16  
MW 16, N

MW19  
MW 19, N

BH11/MW10  
MW 10, <1000

FORMER  
STATION

MW12  
MW 12, N

BH6/MW6  
MW 6, 5000

MW14  
MW 14, N

5TH STREET

BH3/MW3  
MW 3, 1481000

BH8  
BH8, <1000

MINBURN CAFE

BH7/MW7  
MW 7, 1300

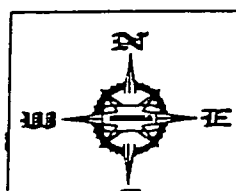
Sewer, 16600

LOCUST STREET

MW15  
MW 15, N

1 inch = 50 feet  
TELEPHONE  
GAS  
STORM SEWER  
ELECTRIC  
WATER  
PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL

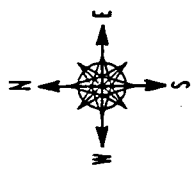


FILE NAME COOPER		REVISIONS
PROJECT NO: 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XX COORDINATE MAP		FACILITY ID: 00000
		SCALE 1" = 50'
		REVIEWED BY: INT
		DRAWN BY: SMH

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 22  
Groundwater Flow Direction Map**



### LEGEND

- Monitoring well
- Borehole
- Groundwater Flow Direction

All elevations in feet  
above mean sea level.

Measured on 9/18/96

Hydraulic Conductivity Tests  
Performed on MW2 and MW5

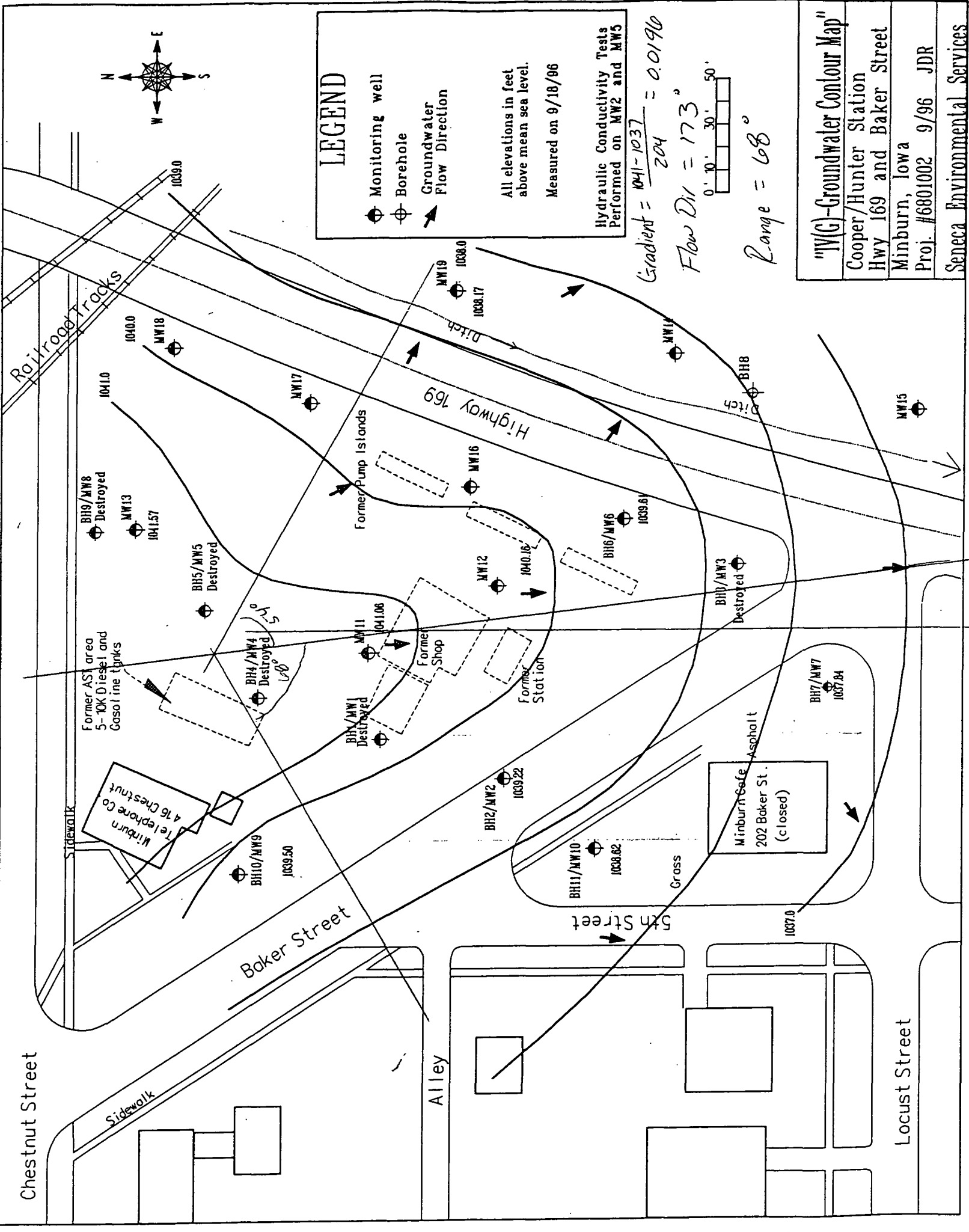
Gradient =  $\frac{1041 - 1037}{204} = 0.0196$

Flow Dir =  $173^\circ$

Range = 608'

**"IV(G)-Groundwater Contour Map"**

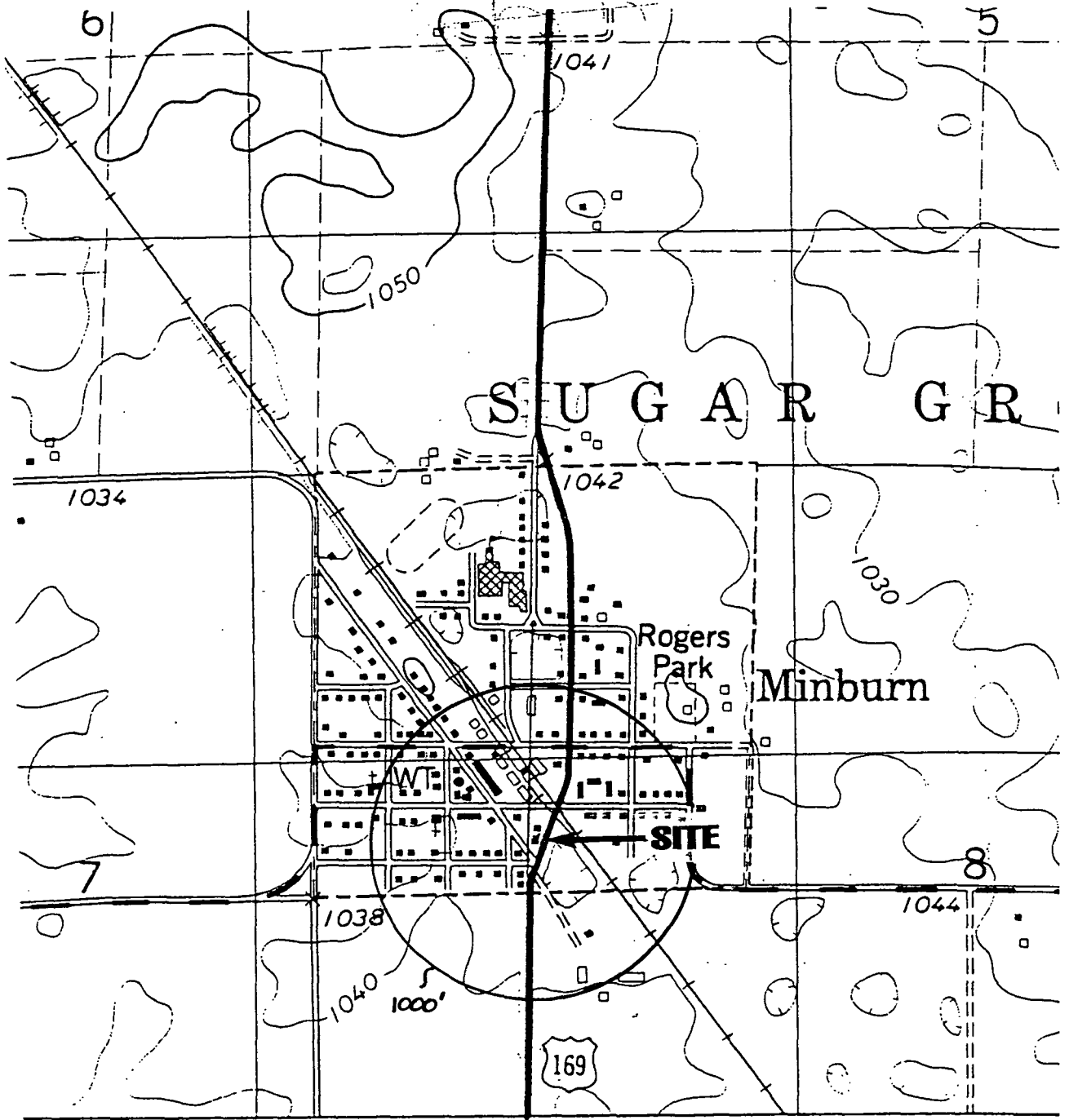
Cooper/Hunter Station  
Hwy 169 and Baker Street  
Minburn, Iowa  
Proj. #6801002 9/96 JDR  
Seneca Environmental Services



**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 23  
Well Survey Map**



4.3 MI. TO IOWA 44  
ADEL (U.S. 6) 10 MI. ↓

15000mE

● INTERIOR-G

NORTH ↑

**Seneca Environmental Services**

Date: July 13, 1999

Hunter - Cooper  
Minburn

Spill Number:  
11256-JS-1445

**Well Survey Map**

Seneca Job #6801007

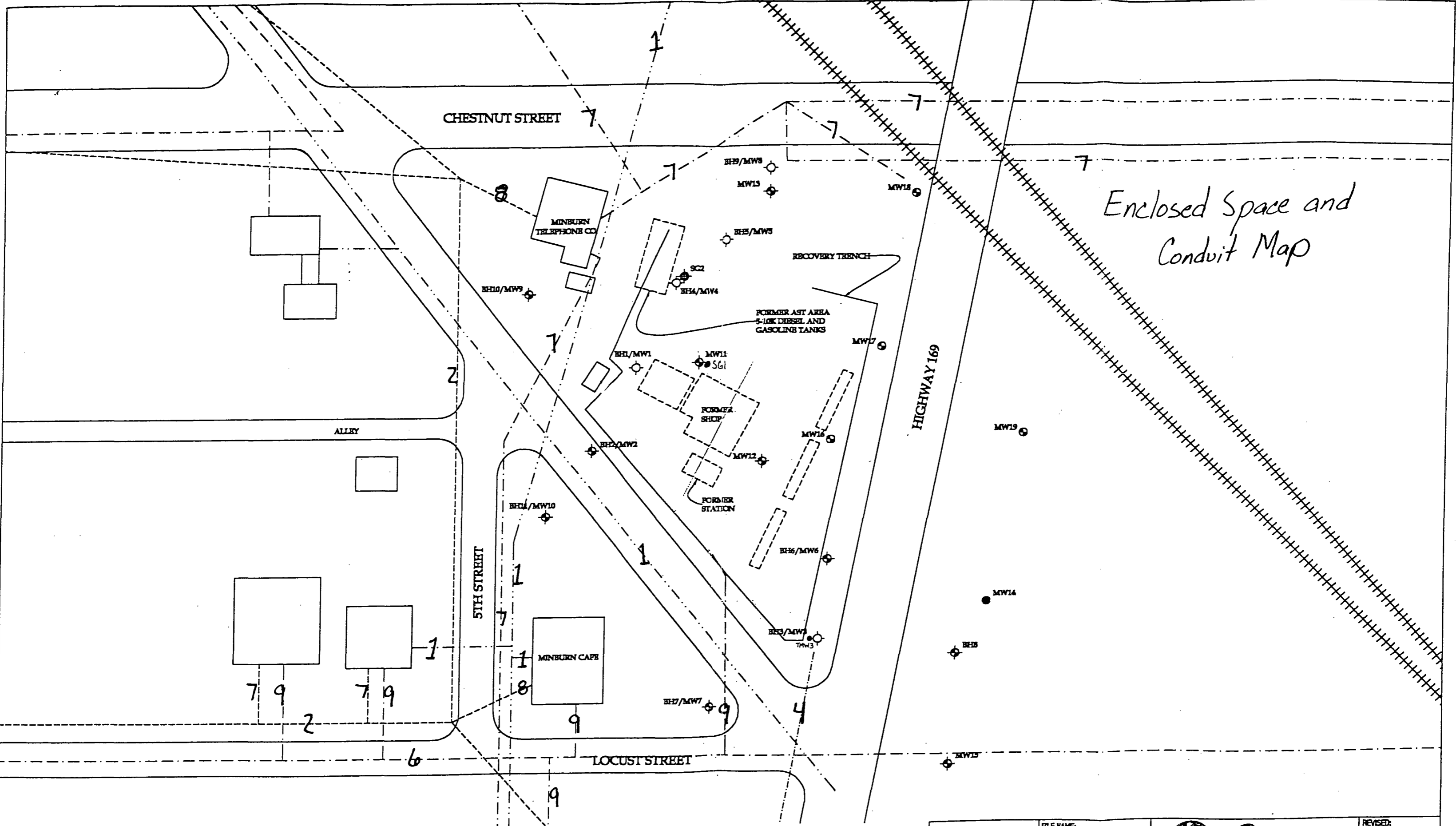
Scale: 1" = 1000'

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

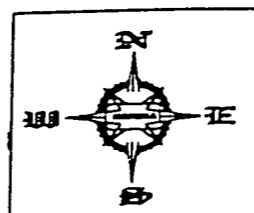
**Appendix 24  
Enclosed Space and Conduit Map**

Enclosed Space and  
Conduit Map



TELEPHONE  
 GAS  
 SEWER  
 STORM SEWER  
 ELECTRIC  
 WATER  
 PRODUCT LINES

- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- ⊖ MONITORING WELL
- ◆ SOIL GAS WELL

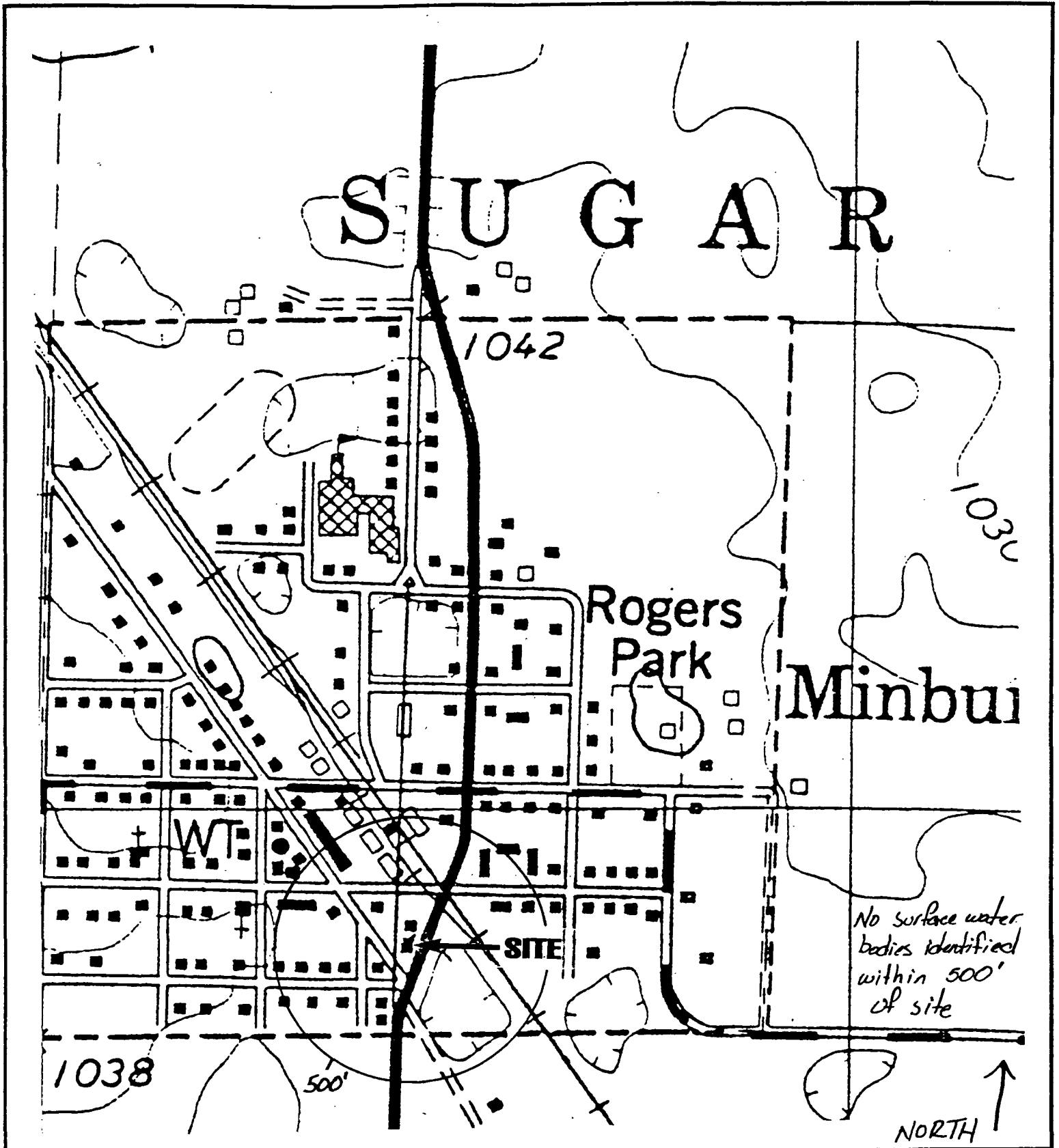


FILE NAME COOPER		REVISED:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		REVIEWED BY: INT
FACILITY ID: 00000		DRAWN BY: SMH
SCALE: 1" = 50'		

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 25  
Surface Water Map**



<b>Seneca Environmental Services</b>		Date: July 13, 1999
Hunter - Cooper Minburn	Spill Number: 11256-JS-1445	<b>Surface Water Body Map</b>
Seneca Job #6801007		Scale: 1" = 500'

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

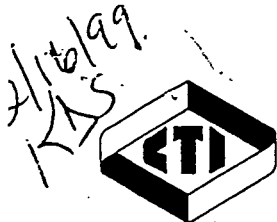
---

**Other Appendices**

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 26  
Laboratory Data Sheets / Chromatograms**



# Commonwealth Technology, Inc.

Laboratory Division

Accredited Lab Data for Today's Environment

1230 Lange Court  
Baraboo, WI 53913-3901  
Phone: 800-228-3012  
Fax: 608-356-2766  
email: fyi@ctenv.com

## ANALYTICAL REPORT

SENECA ENVIRONMENTAL  
MARCIA ECKHOFF  
4140 E 14TH ST  
DES MOINES, IA 50313

Note: None

Customer #: LS1000000458  
Work Order: 9902000141  
Report Date: 02/12/99  
Date Received: 02/05/99  
Arrival Temperature: On Ice  
Collected By: STEVE REINDERS  
Collector's Phone: 515-262-3500

Report Submitted By: *[Signature]*  
Record Reviewer

Project Name: COOPER HUNTER

Project Number: 6801007

Sample I.D. #:	Sample Description:	Date Sampled:	Time Sampled:	Sample Type:
228562	BH4B	02/03/99	PM	SOIL

Analyte	Result	Units	Qualifier	Reporting Limits	Date Extracted	Date Analyzed	Analyst	Method
Benzene	< 0.0090	µg/g		0.0090	02/08/99	02/08/99	RDW	IA-OA1
Toluene	< 0.0080	µg/g		0.0080	02/08/99	02/08/99	RDW	IA-OA1
Ethylbenzene	< 0.0090	µg/g		0.0090	02/08/99	02/08/99	RDW	IA-OA1
Xylene, Total	< 0.025	µg/g		0.025	02/08/99	02/08/99	RDW	IA-OA1



IDNR Lab Certification Number IA146 DATCP Certification Number: 000289



## ANALYTICAL REPORT

Report To
Marcia Eckhoft Seneca Environmental Services 4140 E. 14th St. P.O. Box 3360 Des Moines, IA 50316

Sample Information
Work Order: 1902.0194 Date Received: 02/05/99 11:15 AM Collector: Steve Reinders Collector Phone: 800-369-3500 Report Date: 02/17/99

Site Information
Cooper Hunter Station Job#6801007

Comments
Specific sample comments (if any) are shown below.

Sample No.	Description	Date Collected	Matrix	Detection	Method	Analyst	Date
Analyte			Analysis Result	Limit			Analyzed
1902260	SG-1	2/3/99	air				
Benzene			40. mg/m3	5.	NIOSH 1501	FIZ	02/10/99
Toluene			110. mg/m3	5.	NIOSH 1501	FIZ	02/10/99
1902261	Blank	2/3/99	air				
Benzene			< 5. mg/m3	5.	NIOSH 1501	FIZ	02/10/99
Toluene			< 5. mg/m3	5.	NIOSH 1501	FIZ	02/10/99

*Jeff King*  
Keystone Laboratories, Inc.

< = less than; ug/L = ppb; mg/L = ppm; mg/kg = ppm

Note: This report may not be reproduced except in full, without written approval of the laboratory.

Keystone 8.8

1902.0194



NATIONAL ENVIRONMENTAL TESTING, INC.

LABORATORY REQUEST FORM

NAME: Marcia Eckhoff
COMPANY: Seneca Environmental
ADDRESS: 4140 NE 14th St.
CITY, ST, ZIP: Des Moines IA 50313
PHONE: 515-262-3500
FAX: 515-262-2469

P.O. NUMBER: 1297407
INVOICE TO:
PROJECT NAME/ NUMBER: Cooper Hunter Station 6801007

CEDAR FALLS DIVISION
704 ENTERPRISE DRIVE
CEDAR FALLS, IA 50613

PH: (319) 277-2401 FAX: (319) 277-2425

Table with 7 columns: SAMPLE DESCRIPTION, SAMPLE DATE, MEDIA TYPE, SAMPLE TIME (Mins.), AIR VOLUME (Liters), ANALYSIS, PUMP NUMBER. Contains handwritten entries for sample 561 and a blank sample.

CHAIN OF CUSTODY

Collected by: Steve Keinders Date/Time: Method of Shipment: Date/Time:
Relinquished by: Steve Keinders 2-3-99 Received by: [Signature] 2-5-99 11:15
Relinquished by: Kim D. Swensen 2-5-99 Received for NET by:

Fax Results: Yes No Sample Condition Upon Receipt: Acceptable Other (explain below)
Date Results Requested:
Laboratory Use Only
Comments:
Authorized by: Date: (Client must provide signature for services.)

ADS  
3/4/99

# TestAmerica

INCORPORATED

## ANALYTICAL REPORT

Rob Berkley  
SENECA ENVIRONMENTAL  
SERVICES, INC.  
4140 N.E. 14th St.  
Des Moines, IA 50313


03/02/1999

COOPE MINBURN  
PROJECT #6801007

Date Received: 02/20/1999  
Job Number: 99.01720

	Result	Units	Date Taken	Analysis Method
494634 SGI				
Air Volume	0.2078	Liters	02/18/1999	
Benzene (RBCA)	0.138	mg	02/18/1999	NIOSH 1501
Benzene (RBCA)	664,000	ug/m3	02/18/1999	
Toluene (RBCA)	0.074	mg	02/18/1999	NIOSH 1501
Toluene (RBCA)	356,000	ug/m3	02/18/1999	
494635 Blank				
Air Volume	---	Liters	02/18/1999	
Benzene (RBCA)	<0.005	mg	02/18/1999	NIOSH 1501
Benzene (RBCA)	---	ug/m3	02/18/1999	
Toluene (RBCA)	<0.005	mg	02/18/1999	NIOSH 1501
Toluene (RBCA)	---	ug/m3	02/18/1999	

LIMIT OF QUANTITATION: Listed for blank value  
ANALYZED BY: TestAmerica - Nashville Division

  
Michael K. McGee, CIH  
Division Manager  
AIHA Lab Accreditation No. 285



# TestAmerica

INCORPORATED

## ANALYTICAL REPORT

Marcia Eckhoff  
 SENECA ENVIRONMENTAL  
 SERVICES, INC.  
 4140 N.E. 14th St.  
 Des Moines, IA 50313  
 800-369-3500

07/08/1999

Job Number: 99.07907

Sample Number: 515363

Collected by: R. Berkley

Collectors Phone No.: 800-369-3500

Job Description: HUNTER COOPER

Date Taken: 06/25/1999

Date Received: 06/25/1999

Sample ID: TW3 Proj. #6801007

Analyte	Result	Units	Result		Date Analyzed	Method	Quantitation	
			Flag	Analyst			Limit	Matrix
Extraction Prep	complete			sdv	07/01/1999	IONA-OA2		Water
EXTRACTABLE HYDROCARBONS-WATER								
Total Extractable Hydrocarbons	1,500,000	ug/L		sjg	07/07/1999	IA-OA2/S-8015	76,000	Water
Diesel	<76,000	ug/L		sjg	07/07/1999	IA-OA2/S-8015	76,000	Water
Gasoline	1,500,000	ug/L		sjg	07/07/1999	IA-OA2/S-8015	76,000	Water
Motor Oil	<76,000	ug/L		sjg	07/07/1999	IA-OA2/S-8015	76,000	Water
VOLATILES - BTEX (WATER)								
Benzene	104	ug/L		mmk	07/01/1999	IA-OA1	20	Water
Toluene	408	ug/L		mmk	07/01/1999	IA-OA1	20	Water
Ethylbenzene	3,390	ug/L		dmd	06/29/1999	IA-OA1	2.0	Water
Xylenes, Total	16,500	ug/L		dmd	06/29/1999	IA-OA1	3.0	Water

All results are calculated on a wet weight basis.



R. L. Bindert  
 Operations Manager  
 IA UST LAB CERTIFICATION NO. 0007

Company: Seneca Environmental Your PO #: 134092

Send Report To: Marcia Invoice To: \_\_\_\_\_

Address: 4140 NE 14th St. TA Quote #: \_\_\_\_\_

City/State/Zip Code: Des Moines IA 50313 Project Name: Hunter Cooper

Telephone Number: 515-262-3500 Fax: \_\_\_\_\_ Project Number: 6801007

Sampled by: (Print Name) Rob Berkley Project Manager: Marcia

(Signature) [Signature] Proj. Mgr. Telephone: \_\_\_\_\_

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative								Matrix				Analyze For:				RUSH TAT (Must call ahead)	Standard TAT	Fax Results						
							Ice	HNO <sub>3</sub> (Red & White Label)	HCl (Blue & White Label)	NaOH ( Orange & White Label)	H <sub>2</sub> SO <sub>4</sub> Plastic (Yellow & White Label)	H <sub>2</sub> SO <sub>4</sub> Glass (Yellow & White Label)	None (Black & White Label)	Other ( Specify)	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify: _____											
<del>TW3</del>	<del>6/25</del>	<del>11:00</del>	<del>3</del>	<del>X</del>			<del>X</del>	<del>X</del>						<del>X</del>					<del>X</del>	<del>0A1</del>	<del>0A2</del>										
TW3	1		1	X			X						X	X																	

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.  
 NOTICE: Pre-Arrangements must be made AT LEAST 48 Hours in ADVANCE to receive results with RUSH turn around time commitments; additional charges may be assessed.  
 NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:

Relinquished by: <u>[Signature]</u>	Date: <u>6/25/99</u>	Time: <u>1:15 PM</u>	Received by:	Date:	Time:	Relinquished by:	Date:	Time:
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by: <u>[Signature]</u>			Temperature Upon Receipt:			Laboratory Comments:		

TOTAL P.03

JUL-12-1999 15:13  
TESTAMERICA-CF  
319 277 2425 P.03/03

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 27  
Construction Diagrams for  
Soil Vapor Monitoring Wells**

# SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well Number: SG 1	Facility: Hunter Oil	Facility Street Address: HWY 169 and Baker Street, Minburn, IA
Boring Depth (ft) X Diameter (in): 6.5' x 4"		Drilling Method: SF
Well contractor Name: Rewerts Registration Number: 40480		Logged By: Steve Reinders

Ground Surface Elevation (ASL): NA	Top of Casing Elevation (ASL): NA
---------------------------------------	--------------------------------------

Date: 2-3-99	Date: 2-3-99	UST Number: NA	LUST Number: 11256-JS-1445
Start Time: 10:00a	End Time: 10:30am		

Depth (feet)	Well Construction Details	Blow Count	Sample No.	Sample Type	PID/FID Reading	USCS Class.	Soil Classification
0	cement						Overlay Material -
1	bentonite riser				0	OL	Grass/topsoil - black, moist, crumbly, pebbles and organics, no odor
2					0		
3					0		
4					0		
5	sand				31	CL	Dark blue/gray silty clay, soft, moist, very strong odor, no mottling or oxidation
6	screen				53		
7							
8	Total Depth (TD) = 6.5'						
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

\* SS (Split Spoon) HSA (Hollow Stem Auger)

Observations	Date:	2-3-99			
Water Levels (ASL)	Level:	7' BGS			
Static Water Level v	Time:	10:30am			

# SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well Number: SG 2	Facility: Hunter Oil	Facility Street Address: HWY 169 and Baker Street, Minburn, IA
Boring Depth (ft) X Diameter (in): 7'x4"		Drilling Method: SF
Well contractor Name: Rewerts Registration Number: 40480		Logged By: Steve Reinders

Ground Surface Elevation (ASL): 1048.00	Top of Casing Elevation (ASL): 1047.77
--	---

Date: 2-3-99	Date: 2-3-99	UST Number: NA	LUST Number: 11256-JS-1445
Start Time: 9:30am	End Time: 10:00am		

Depth (feet)	Well Construction Details		Blow Count	Sample		PID/FID Reading	USCS Class.	Soil Classification
				No.	Type			
0	cement							Overlay Material -
1	bentonite	riser				0	OL	Grass/topsoil, dark brown, moist, crumbly, organics, no odor
2						0		
3						0	CL	Light brown silty clay, dry, some oxidation, medium-firm, no odor
4						0		
5						0		
6	sand					0		
7	v	screen				17	CL	Gray/green silty clay, slight sand, moist, some oxidation, medium-firm, strong odor
8								
9	Total Depth (TD) = 7'							
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

\* SS (Split Spoon) HSA (Hollow Stem Auger)

Observations	Date:	2-3-99			
Water Levels (ASL)	Level:	1040.77			
Static Water Level v	Time:	9:00am			

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

---

**Appendix 28  
Soil Boring Logs /  
Monitoring Well Construction Diagrams**

## SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well Number: <b>BH 4B</b>	Facility: <b>Hunter Oil</b>	Facility Street Address: <b>HWY 169 and Baker Street, Minburn, IA</b>
Boring Depth (ft) X Diameter (in): <b>20'x6.25"</b>		Drilling Method: <b>HSA</b>
Well contractor Name: <b>Rewerts</b>		Logged By: <b>Steve Reinders</b>
Registration Number: <b>40480</b>		

Ground Surface Elevation (ASL): <b>NA</b>	Top of Casing Elevation (ASL): <b>NA</b>
--	---

Date: <b>2-3-99</b>	Date: <b>2-3-99</b>	UST Number: <b>NA</b>	LUST Number: <b>11256-JS-1445</b>
Start Time: <b>8:45am</b>	End Time: <b>9:15am</b>		

Depth (feet)	Well Construction Details	Blow Count	Sample		PID/FID Reading	USCS Class.	Soil Classification	
			No.	Type				
0							Overlay Material -	
1	BORING ONLY				0	OL	Grass/topsoil - dark brown, moist, crumbly, organics	
2					0		No odor	
3						0	CL	Light brown silty clay, dry, some oxidation, medium-firm,
4						0		No odor
5						0		
6					0			
7					0	CL	Gray/green silty clay, slight sand, moist, some oxidation,	
8					0		medium-soft, slight odor	
9	v				4			
10					16			
11					31		Black mottling	
12					28	CL	Brown silty fat clay, cobbles, some oxidation, moist and	
13					44		soft, still mottled with gray, slight odor	
14			1	H SA	46	CL	Brown silty lean clay, moist, soft, extremely heavy,	
15					23		some oxidation, some black mottling, no odor, cobbles,	
16					0		higher clay content	
17					0	CL	Light brown silty clay, extremely firm, gray mottling, small	
18					0		pebbles, some oxidation, no odor	
19					0		Heavier oxidation, no mottling	
20	Total Depth (TD) = 20'				0		Heavy gray mottling, no odor	
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

\* SS (Split Spoon) HSA (Hollow Stem Auger)

Observations	Date:	2-3-99			
Water Levels (ASL)	Level:	9' BGS			
Static Water Level v	Time:	9:00am			

# SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DIAGRAM

Boring/Well Number: <b>TMW3</b>	Facility: <b>Hunter Oil</b>	Facility Street Address: <b>HWY 169 and Baker Street, Minburn, IA</b>
Boring Depth (ft) X Diameter (in): <b>4' x 15'</b>		Drilling Method: <b>Hand Auger</b>
Well contractor Name: <b>Andrew High</b>		Logged By: <b>Sean Smith</b>
Registration Number: <b>40539</b>		

Ground Surface Elevation (ASL): <b>1045.61</b>	Top of Casing Elevation (ASL): <b>1045.36</b>
---	--

Date: <b>6/25/99</b>	Date: <b>6/25/99</b>	UST Number: <b>NA</b>	LUST Number: <b>11256-JS-1445</b>
Start Time: <b>9:30am</b>	End Time: <b>10:00am</b>		SPILL#

Depth (feet)	Well Construction Details	Blow Count	Sample		PID/FID Reading	USCS Class.	Soil Classification	
			No.	Type				
0							Overlay Material <b>Grass</b>	
1					0		1-3' Topsoil, black, soft, moist, no odor	
2					0			
3					2			
4		Screen				6		3-10' Clay, silty, dark gray, moist, slight odor from 4-8',
5						54		no oxidation.
6						63		
7						14		
8						4		
9						0		
10						0		
11								
12							TD @ 10'	
13							Temporary Well	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

\* SS (Split Spoon) HSA (Hollow Stem Auger)

Observations	Date:	6/25/99			
Water Levels (ASL)	Level:	1039.36			
Static Water Level v	Time:	9:00am			

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 31  
Tier 1 Selected Information**

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 31  
Tier 1 Selected Information  
Pages 5, 6, and 10 of the Report Body**

## SITE HISTORY

Site Activity and Owner Chronology			
Date the petroleum release was discovered (mm/dd/yy): Reference the SCR submitted 10/3/96, Section A			
Date the petroleum release was reported to IDNR (mm/dd/yy): Reference the SCR submitted 10/3/96, Section B			
Describe the circumstances of the discovery of the release and the initial actions taken to abate the release.  Reference the SCR submitted 10/3/96, Section D & E			
<b>Site Owner Chronology:</b> Provide a chronological summary of past and present site and tank owners and operational history in the table below. Begin with the present and work backwards. Include all periods of time petroleum products have been stored, used or sold at the site. This page may be copied for additional site history.			
Has this page been copied? Y <input type="checkbox"/> N <input type="checkbox"/>			
Date:	Reference the SCR submitted 10/6/96, Section C		
Land Owner Name and Address:			
Tank Owner Name and Address:			
Operator Name and Address:			
Contract Agreements:			
Site Activities:			

## SITE HISTORY (continued)

<b>Current Site Conditions</b>						
Description of Existing UST System (This page may be photocopied if more than six tanks exist at this site) [X] Check here if no USTs currently exist at the site						
Tank Number	1	2	3	4	5	6
Capacity						
Product Stored						
Construction Material						
Operational Status Check one box only for each tank						
Contains product	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Contains no product and is out of use	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tank and Line Tightness Tests						
Tank Leak Rate (g/h)						
Line Leak Rate (g/h)						
<p><b>Tank and Line Tightness Test.</b> Explain the cause of testing anomalies and discuss any corrective actions or repairs made to the system. Identify the leak detection method. Confirm that the method and results have been reviewed and note whether releases are indicated.</p> <p>No tanks currently exist on site.</p>						
<p><b>Financial Responsibility.</b> Indicate the financial assurance mechanism for the site and the status of coverage for corrective action:</p> <p>The site is self covered.</p>						
<p><b>Site Geology.</b> Provide a general description.</p> <p>Reference the SCR submitted 10/6/96, Section II.A.</p>						
<p><b>Surrounding Land Use.</b> Provide a general description of the current surrounding land use. Identify relevant land use restrictions and known future land use (e.g., surrounding properties are zoned for residential use).</p> <p>The site and surrounding properties are zoned for business use.</p>						

## SAMPLING RESULTS (continued):

Hydraulic Conductivity				
Complete the table below with the well geometry variables used to calculate hydraulic conductivity for each well which was slug tested. Indicate the units (meters, feet, seconds, etc.) for each variable and the date the tests were conducted.				
Monitoring Well Number	MW 2	MW 4	MW 5	
Date of Slug Test (mm/dd/yy)	6/30/89	6/30/89	6/30/89	
Static Water Level	1039.97	1040.76	1040.77	
Volume of Slug ( L )	4.617	5.203	5.947	
H ( m )	4.987	6.584	6.599	
$L_e$ ( m )	2.493	3.048	3.048	
$L_w$ ( m )	2.493	3.292	3.299	
$r_c$ ( m )	0.0254	0.0254	0.0254	
$r_w$ ( m )	0.1016	0.0762	0.0762	
$r_e$ ( m )	0.04579	0.03767	0.03767	
gravel pack porosity ( % as a decimal )	0.15	0.15	0.15	
Hydraulic Conductivity ( m/d )	0.03623	0.03847	0.08384	

**Hydraulic Conductivity.** Explain why the location/number of data points where hydraulic conductivity was determined adequately provides a representative indication of conductivity at the site. If a program other than AQTESOLV or BRSLUG was used to calculate hydraulic conductivity, identify the program name, version, vendor name, address, and phone number. Provide a justification if adjustments were made to best fit line for the plots of time versus drawdown data.

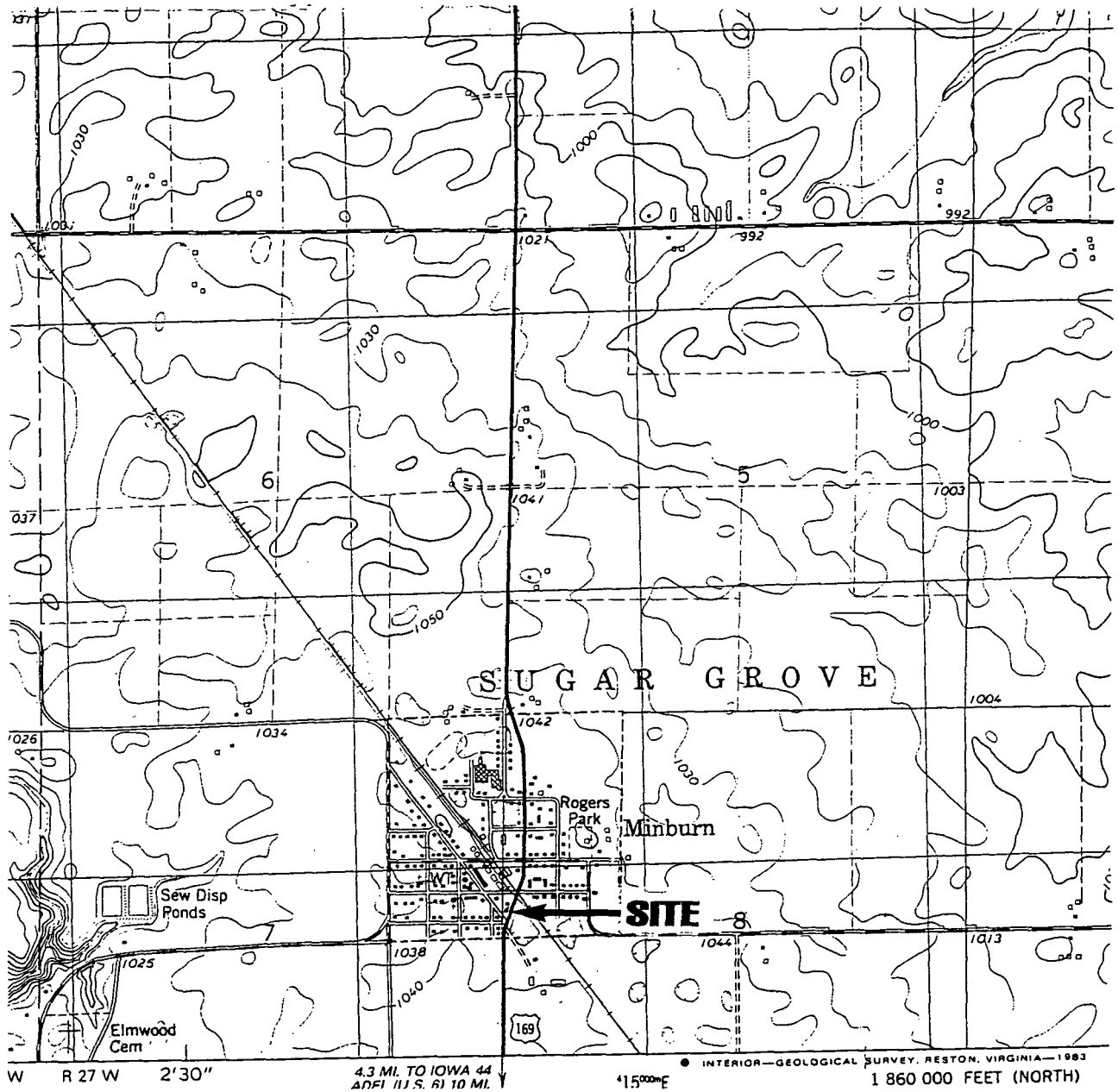
Reference the SCR submitted 10/6/96, Section II.B. and IV.B.

Porosity of filter pack was changed 0.15. The first 10% and the last 10% of recovery was weighted as 0 for monitoring wells MW 2, MW 4 and MW 5. Best fit lines were provided by the computer. No adjustments were made. Software used for this exercise was AQTESOLV for Windows Version 2.13. Hydraulic Conductivity data is provided in this report.

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 31  
Tier 1 Selected Information  
Appendix 1 - Topographic Site Map**



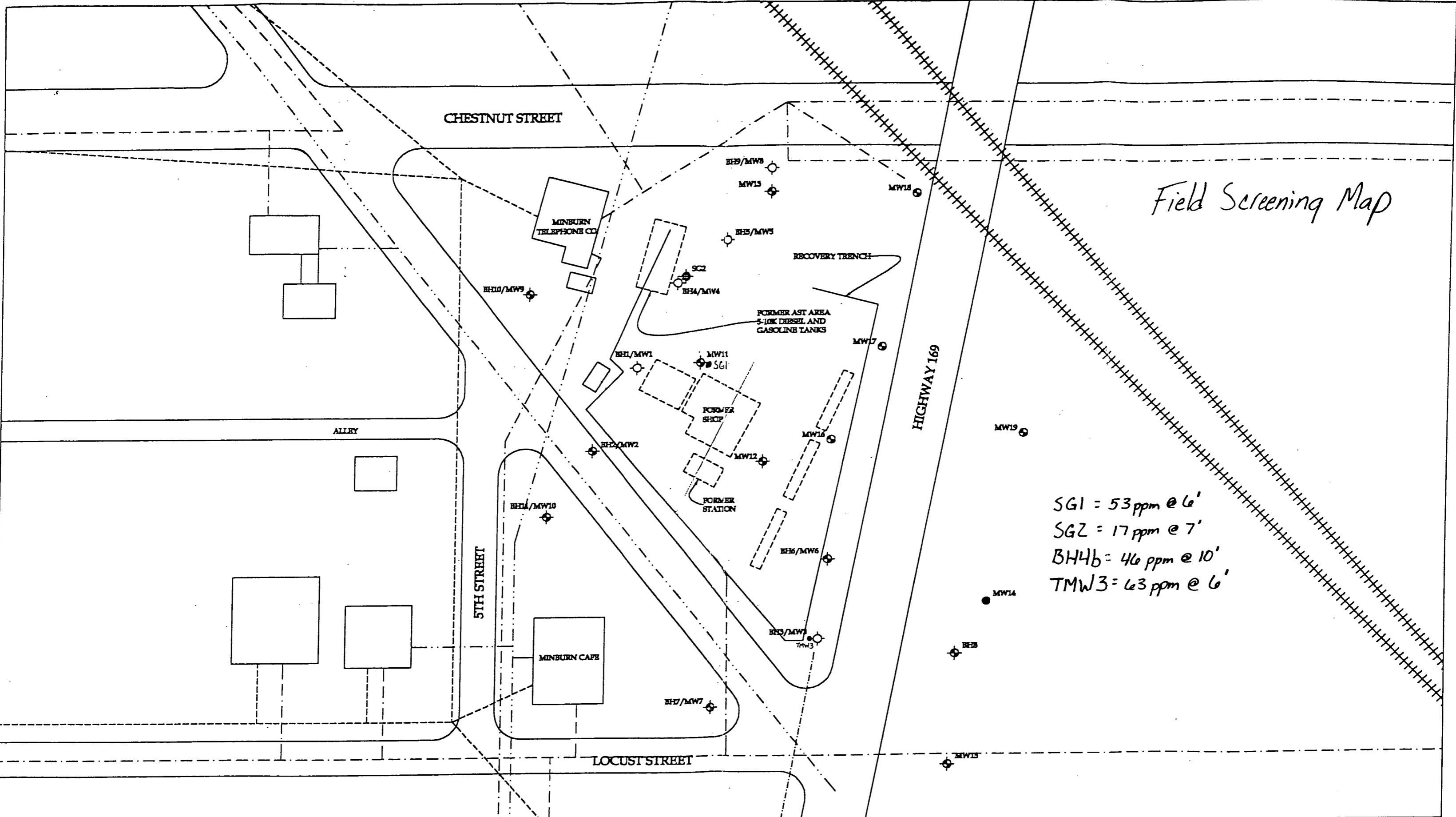
<b>Seneca Environmental Services</b>		Date: July 13, 1999
Hunter - Cooper Minburn	Spill Number: 11256-JS-1445	Topographic Site Map
Seneca Job #6801007		Scale: 1" = 2000'

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 31  
Tier 1 Selected Information  
Appendix 4 - Field Screening Map**

# Field Screening Map



SG1 = 53 ppm @ 6'  
 SG2 = 17 ppm @ 7'  
 BH4b = 46 ppm @ 10'  
 TMW3 = 63 ppm @ 6'

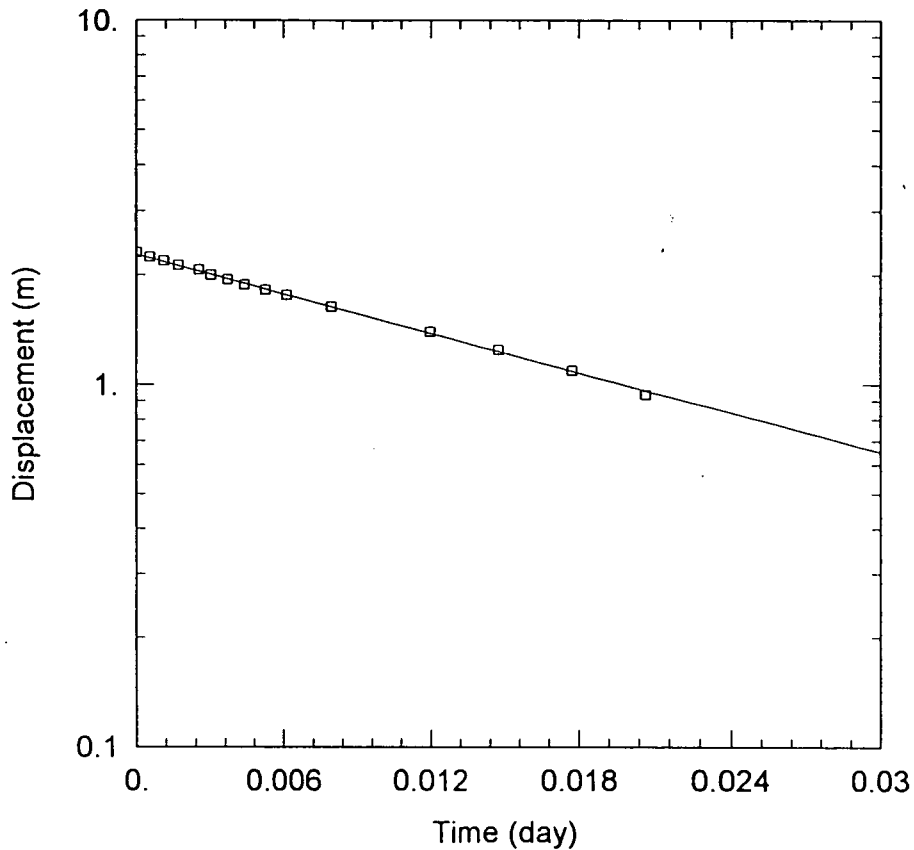
- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES
- SOIL BORING
- ⊕ SOIL BORING WITH MONITORING WELL
- MONITORING WELL
- ◆ SOIL GAS WELL

	FILE NAME COOPER		REVISIONS
	PROJECT NO. 6801007		DATE 5/26/99
SITE COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA XY COORDINATE MAP		FACILITY ID: 00000	REVIEWED BY: INT
		SCALE 1" = 50'	DRAWN BY: SMH

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 31  
Tier 1 Selected Information  
Appendix 14 - "K" Measurements**



MW2

Data Set: D:\CLIENTS\HUNTER~1\HUNTER2.AQT  
 Date: 05/13/99 Time: 08:31:49

PROJECT INFORMATION

Company: Seneca Environmental Services  
 Client: Cooper-Hunter Oil  
 Project: 6801007  
 Test Location: Minburn, Iowa  
 Test Date: 6/30/98

SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice  
 $K = 0.03623$  m/day  
 $y_0 = 2.278$  m

AQUIFER DATA

Saturated Thickness: 4.987 m

Anisotropy Ratio ( $K_z/K_r$ ): 1.

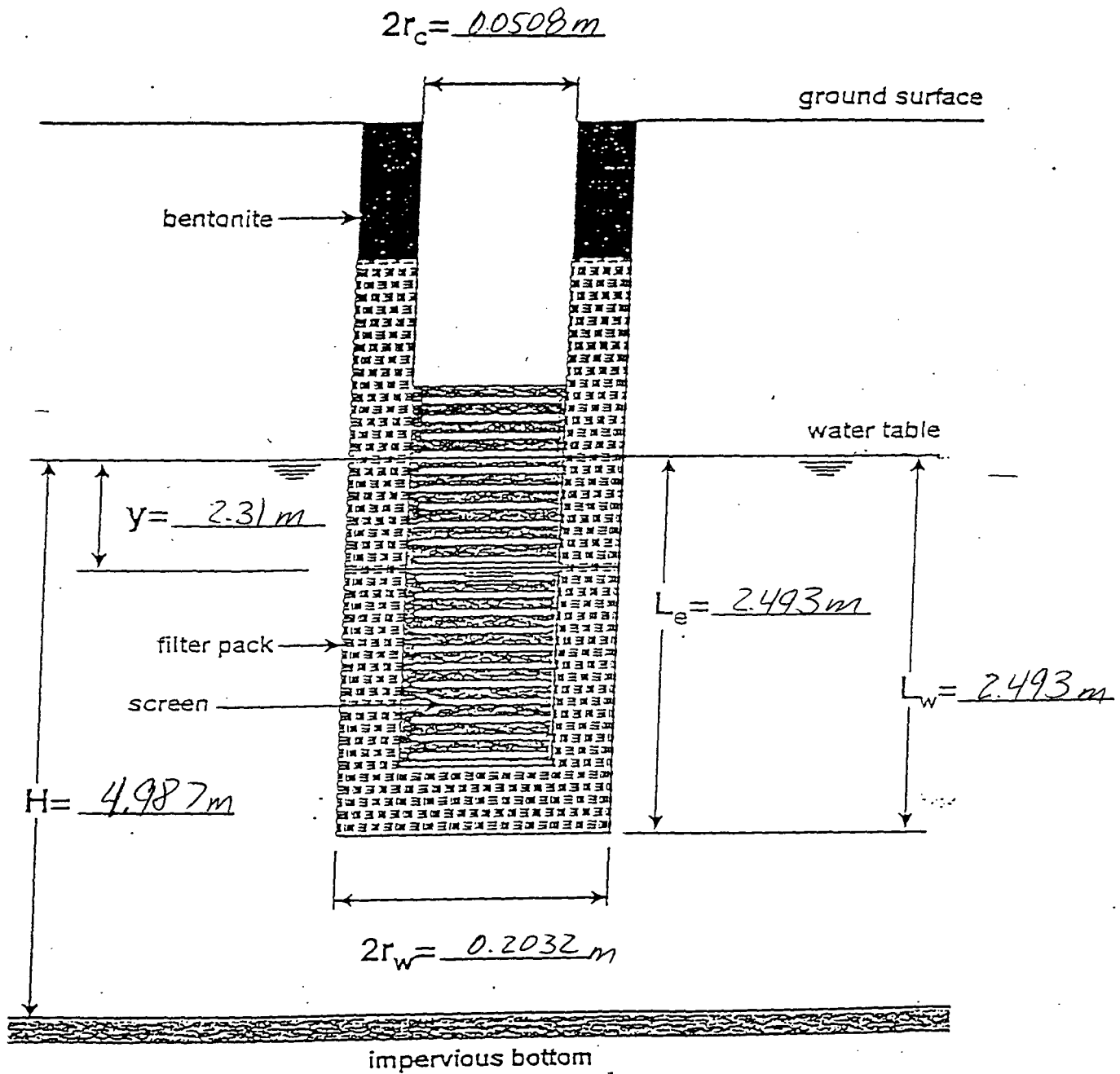
WELL DATA

Initial Displacement: 2.31 m  
 Casing Radius: 0.0254 m  
 Screen Length: 2.493 m

Water Column Height: 2.493 m  
 Wellbore Radius: 0.1016 m  
 Gravel Pack Porosity: 0.15

# Hydraulic Conductivity Well Diagram

MW2



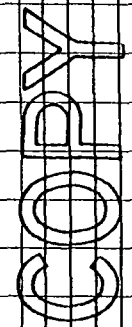
Slug Test - 10/22

4" screen from top down

Initial SWL = 5.92' - Depth 14.1'

Time	min	depth (ft)	
0.00	0	13.5	7.58
0.47 sec	.78333	13.3	7.38
1m 35s.	1.58333	13.1	7.19
2m 26s.	2.43333	12.9	6.98
3m 38s	3.63333	12.7	6.78
4m 49s	4.31666	12.5	6.58
5m 20s	5.33333	12.3	6.38
6m 02s	6.33333	12.1	6.18
7m 32s	7.53333	11.9	5.98
8m 50s	8.83333	11.7	5.78
11m 27s	11.45	11.3	5.38
17m 45s.	17.23333	10.5	4.58
21m 15s	21.25	10.0	4.08
25m 33s	25.55	9.5	3.58
29m 45s.	29.75	9.0	3.08

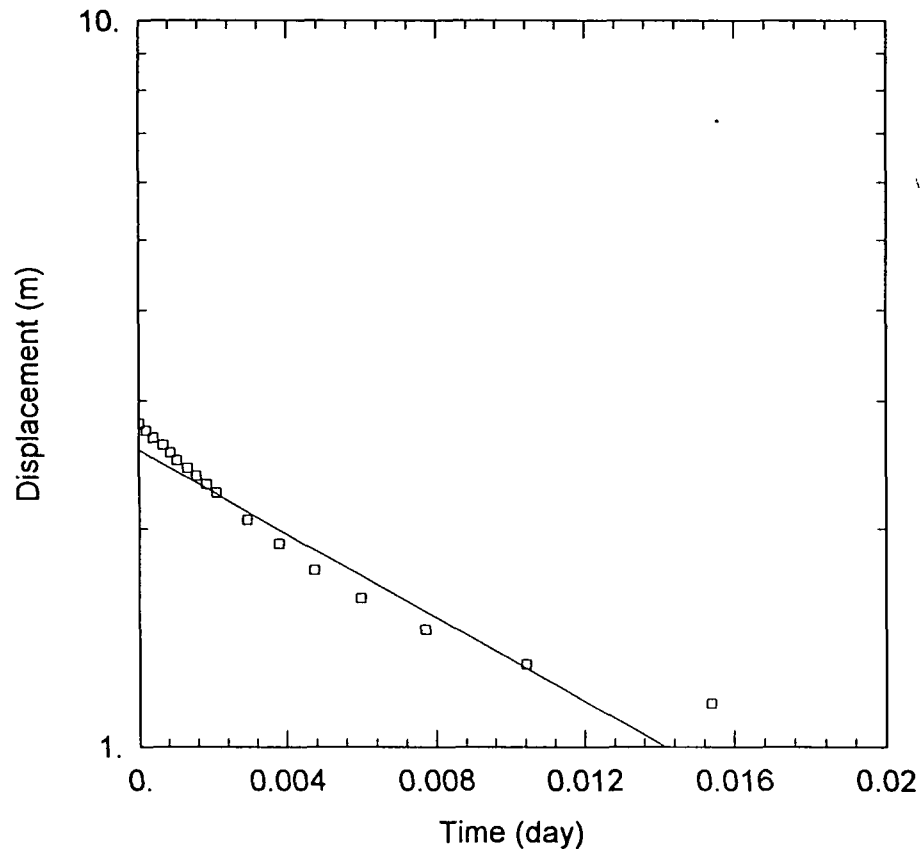
13.5	7.58	5
6	4	
7.58	9	
2.67		
5.25		
9.50		
4.0		



Static Water Level

MW1	7.34'	H <sub>2</sub> O	} slight odor
MW5	6.51'	H <sub>2</sub> O	
MW6	7.00'	H <sub>2</sub> O	odor + green

no product visible



MW4

Data Set: D:\CLIENTS\HUNTER~1\HUNTER4.AQT  
 Date: 05/13/99 Time: 08:34:07

PROJECT INFORMATION

Company: Seneca Environmental Services  
 Client: Cooper-Hunter Oil  
 Project: 6801007  
 Test Location: Minburn, Iowa  
 Test Date: 6/30/89

SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice  
 $K = 0.03847$  m/day  
 $y_0 = 2.567$  m

AQUIFER DATA

Saturated Thickness: 6.584 m

Anisotropy Ratio ( $K_z/K_r$ ): 1

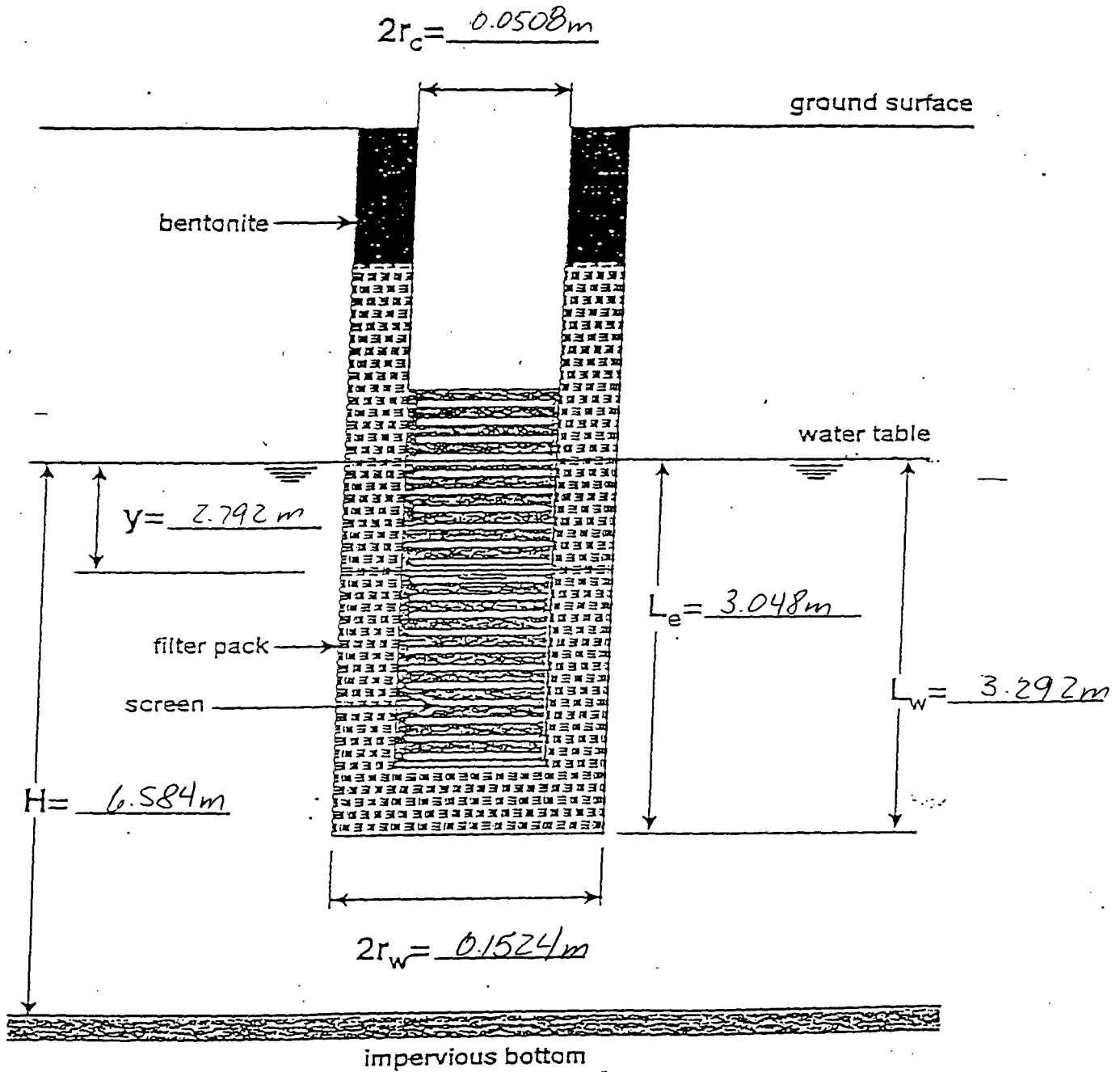
WELL DATA

Initial Displacement: 2.792 m  
 Casing Radius: 0.0254 m  
 Screen Length: 3.048 m

Water Column Height: 3.292 m  
 Wellbore Radius: 0.0762 m  
 Gravel Pack Porosity: 0.15

# Hydraulic Conductivity Well Diagram

MW/4



6-30-89

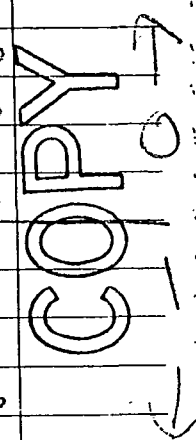
Stag Test - MW4

2" well - 18' 1/2" - 10 g. screen

Depth

Initial SWL - 7.24'

Time	mm	Depth (ft)	draw down
0	0	16.4'	9.16
17s	.2833	16.2'	8.96
35s	.5833	16.0'	8.76
56s	.9167	15.8'	8.56
1m 15s	1.25	15.6'	8.36
1m 30s	1.5	15.4'	8.16
1m 54s	1.9	15.2'	7.96
2m 14s	2.2333	15.0'	7.76
2m 37s	2.6167	14.8'	7.56
3m 01s	3.0167	14.6'	7.36
4m 13s	3.5667	14.0'	6.76
5m 28s	5.4667	13.5'	6.26
6m 49s	6.8167	13.0'	5.76
8m 37s	8.6167	12.5'	5.26
11m 07s	11.1167	12.0'	4.76
15m 20s	15.3333	11.5'	4.26
22m 16s	22.2667	11.0'	3.76



9-11-89

BH-9/MW-8

0-6' CLAY, dk brn, silty, no odor, H-Nu  
@ 3-6' = 0-2 ppm

6-14' CLAY, tan-yel brn, silty, trace sch, no odor, moist  
water level @ 6-7'  
TD = 14'

Collected Soil Sample @ 3-6'

BH-10/MW-9

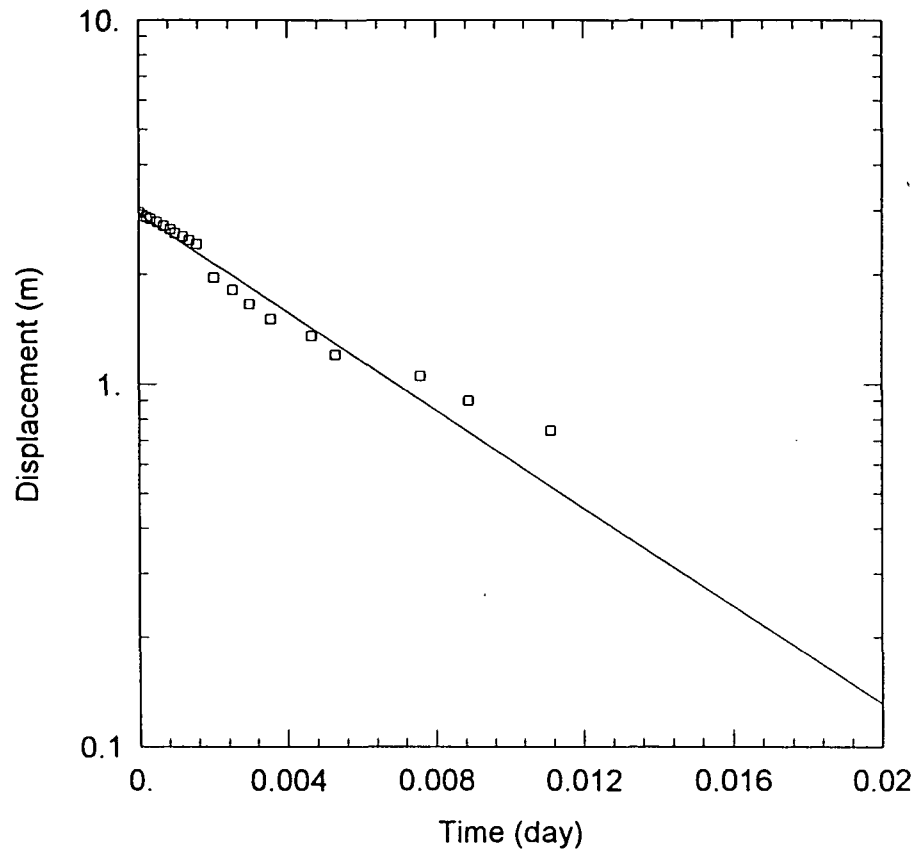
0-3' CLAY, dk brn, silty, no odor  
3-13.5' CLAY, tan-yel brn, silty, moist, no odor

TD = 13.5' water level @ 5-5 1/2'  
Collected Soil sample @ 3-5', H-Nu @ 3-5' = 0-2 ppm

BH-11/MW-10

0-5' CLAY, dk brn, silty, no odor  
5-13.6' CLAY, tan to yel-brn, silty, moist, no odor

TD = 13.6' water level @ 6-6.5'  
H-Nu @ 3.5-5' = 0-2 ppm  
Collected Soil Sample @ 3.5-5'



MW5

Data Set: D:\CLIENTS\HUNTER~1\HUNTER5.AQT

Date: 05/13/99

Time: 08:29:56

PROJECT INFORMATION

Company: Seneca Environmental Services

Client: Cooper-Hunter Oil

Project: 6801007

Test Location: Minburn, Iowa

Test Date: 6/30/89

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.08384 m/day

y0 = 2.934 m

AQUIFER DATA

Saturated Thickness: 6.599 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Initial Displacement: 2.972 m

Casing Radius: 0.0254 m

Screen Length: 3.299 m

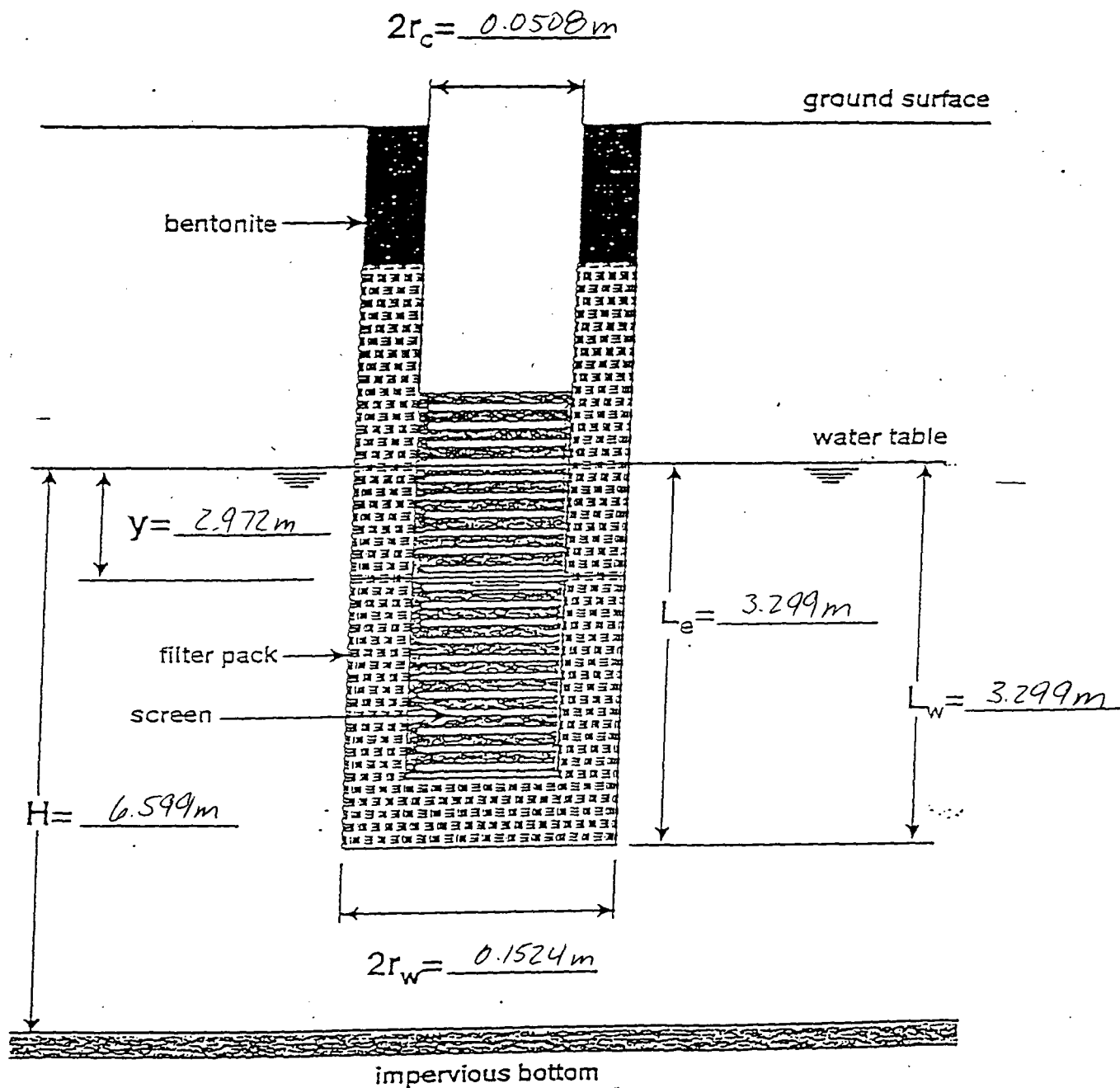
Water Column Height: 3.299 m

Wellbore Radius: 0.0762 m

Gravel Pack Porosity: 0.15

# Hydraulic Conductivity Well Diagram

MW5



6-30-89

Slug Test - MW5

2" well - 17'41" - 10' 30" <sup>depth</sup>

Initial SWL - 6.55'

Time	MM	Depth (ft)	Standard (+)
0	0	16'3"	9.75
17s	.28333	16	9.45
27s	.45	15.9'	9.35
43s	.71666	15.9'	9.15
58s	.9666	15.5'	8.95
1m13s	1.21666	15.3'	8.75
1m28s	1.4	15.1'	8.55
1m42s	1.7	14.9'	8.35
1m58s	1.9666	14.7'	8.15
2m14s	2.2333	14.5'	7.95
2m54s	2.9	13.0'	6.45
3m37s	3.6166	12.5'	5.95
4m17s	4.28333	12.0'	5.45
5m06s	5.1	11.5'	4.95
5m55s	5.9166	11.0'	4.45
6m42s	6.7	10.5'	3.95
7m30s	7.65	10.0'	3.45
12m46s	12.7666	9.5'	2.95
16m39s	16.65	9.0'	2.45

9-5-89

BH-7/MW-7  
 0-0.5' Asphalt  
 0.3-1' Bin to base material containing Silty Sand  
 w/ gravel, limy

1'-4.5' Clay, brn, silty w/ scattered small med.  
 gravel

4.5'-13' Clay, faint grayish, silty, sandy,  
 moist TD=13'

Soil Karren lining w/ auger @ 9' H-Nu=30 ppm  
 prob soil gas - no odor, no contamination

Soil Sample Collected @  
 No odor

9-11-89

BH-8 (on state right of way lands)

0-1.5' Clay, dk brn, silty, moist

1.5-5' Clay, tan-yellow, moist to wet  
 standing water @ 3' - No odor

TD=5' H-Nu @ 2.3 = 0 ppm

Continuous sampler 0-4' Sample collected 2-3'  
 No odor

Water sample collected at end of day @ 4:15 PM  
 Standing water in hole between 1.5-2.0' below  
 surface

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 32  
Corrective Action Documentation**

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 32  
Corrective Action Documentation  
Utility Company Notification**

# IOWA DEPARTMENT OF NATURAL RESOURCES

## UTILITY COMPANY NOTIFICATION

Complete form and submit it to: the utility company which supplies water service to the area and to the Underground Storage Tank Section, Iowa Department Of Natural Resources, 502 East Ninth Street, Des Moines, IA 50319-0034.  
(PLEASE TYPE OR PRINT)

Responsible Party Name: Hunter Enterprises Phone: (515 ) 226 - 0128

Tank Site Name: Former Cooper Hunter Staion Spill No. 11256-JS-1445

Address of Tank Site: Baker and Hwy 169 City: Minburn Zip Code: 50167

Utility Company Name: City Hall Phone: (515) 677 - 2245

Address: PO Box 213 City: Minburn State: IA Zip Code: 50167

### LEGAL DESCRIPTION OF PROPERTY

SW  $\frac{1}{4}$  SW  $\frac{1}{4}$  NW  $\frac{1}{4}$  Section No. 8

Township No. 80 N Range No. 27 W County Dallas

	Maximum Concentrations of Chemicals of Concern Remaining At the Site					
	Group 1				Group 2: Total Extractable Hydrocarbons	
	Benzene	Toluene	Ethylbenzene	Xylenes	Diesel	Waste Oil
Soil (ppm)	<0.009	0.009	<0.009		400	
Tier 1 levels	1.8	120	43		10,500	
Groundwater (ppb)	9600	13000	12000	76000	1,481,000	275,000
Tier 1 levels	290	7,300	3,700	73,000	75,000	40,000

Provide site maps showing the extent of soil and groundwater contamination exceeding Tier 1 levels in relation to all existing plastic water lines within 200 feet of the source of contamination. (Provide a single map for soil contamination and a single map for groundwater contamination indicating all areas exceeding the Tier 1 levels.)

1. Will active corrective action for soil and/or groundwater to plastic water lines be required at the site?  no  
 yes
2. If yes, what is the proposed corrective action? \_\_\_\_\_

I certify that the foregoing information is true and correct to the best of my knowledge and agree to provide any additional information the department or utility company may need concerning this site.

Print Name , Address and Phone Number of Certified Groundwater Professional

MARCIA ECKHOFF #1669  
4140 NE 14TH STREET  
DES MOINES, IA  
( 515 ) 262 - 3500

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Hunter Cooper Station  
Highway 169  
Minburn, Iowa  
Tier 2 SCR**

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**Appendix 32  
Corrective Action Documentation  
Sanitary Sewer Notification**

# IOWA DEPARTMENT OF NATURAL RESOURCES

## SANITARY SEWER NOTIFICATION

Complete form and submit it to: the public authority responsible for sewer construction in the area and to the Underground Storage Tank Section, Iowa Department Of Natural Resources, 502 East Ninth Street, Des Moines, IA 50319-0034.

(PLEASE TYPE OR PRINT)

Responsible Party Name: Hunter Enterprises Phone: (515 ) 226 - 0128

Tank Site Name: Former Cooper Hunter Staion Spill No. 11256-JS-1445

Address of Tank Site: Baker and Hwy 169 City: Minburn Zip Code: 50167

Utility Company Name: City Hall Phone: (515) 677 - 2245

Address: PO Box 213 City: Minburn State: IA Zip Code: 50167

### LEGAL DESCRIPTION OF PROPERTY

SW 1/4 SW 1/4 NW 1/4 Section No. 8

Township No. 80 N Range No. 27 W County Dallas

	Maximum Concentrations of Chemicals of Concern Remaining At the Site			
	Group 1			Group 2
	Benzene	Toluene	Ethylbenzene	Diesel
Soil (ppm)	<0.009	0.009	<0.009	400
Tier 2 levels	2.32	96	158	95,000
Groundwater (ppb)	9600	13000	12000	1,481,000
Tier 2 levels	3,080	40,390	91,930	4,400,000
Soil Gas ( $\mu\text{g}/\text{m}^3$ ) (optional)	664,000	356,000		
Tier 1 levels	600,000	9,250,000		

Provide site maps showing the area where soil and groundwater concentrations and soil gas samples exceed target levels. (Provide a single map for each of the following: soil gas concentrations, soil concentrations and groundwater concentrations indicating all areas exceeding the target levels.)

I certify that the foregoing information is true and correct to the best of my knowledge, was submitted to the public authority and agree to provide any additional information the IDNR or utility company may need concerning this site.

Print Name , Address and Phone Number of Certified Groundwater Professional

MARCIA ECKHOFF #1669  
4140 NE 14TH STREET  
DES MOINES, IA  
( 515 ) 262 - 3500

Signature: \_\_\_\_\_

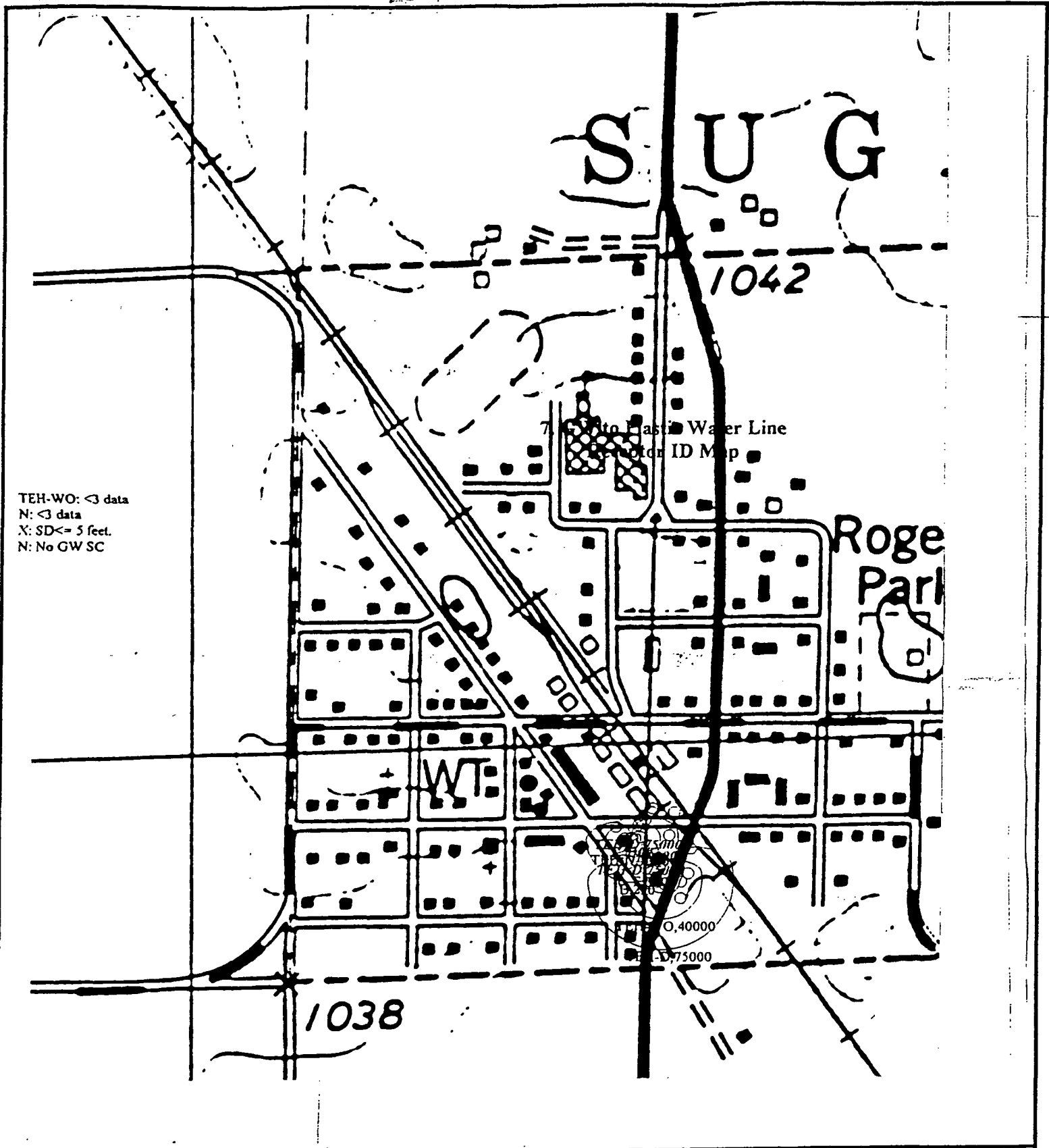
Date: \_\_\_\_\_

## Purpose of DNR Form 542-1531

Petroleum contamination from an underground storage tank system has been encountered at this site. Contamination remains which is above the allowable levels for drinking water. Petroleum can permeate plastic pipe which can damage or weaken the pipe. A health hazard arises once the petroleum enters and contaminates the drinking water within the pipe.

The table on the front side of this form contains the maximum contamination levels found in the soil and groundwater at this site. Below these numbers is a row containing the Iowa Department of Natural Resources' (DNR) Tier 1 levels. The DNR considers contaminant levels above these values to have the potential to impact the integrity of plastic water lines.

This form provides information regarding the levels of petroleum contamination remaining at this site for your use when working with existing water lines as well as for determining the placement/construction material for future water lines. For more information regarding the contamination at this site, please contact the Underground Storage Tank Section, Iowa Department of Natural Resources, 502 East Ninth Street, Des Moines, IA 50319-0034, (515)281-8693.



TEH-WO: <3 data  
 N: <3 data  
 X: SD<= 5 feet.  
 N: No GW SC

7" to Plastic Water Line  
 Spill ID Map

Roge  
 Park

WT

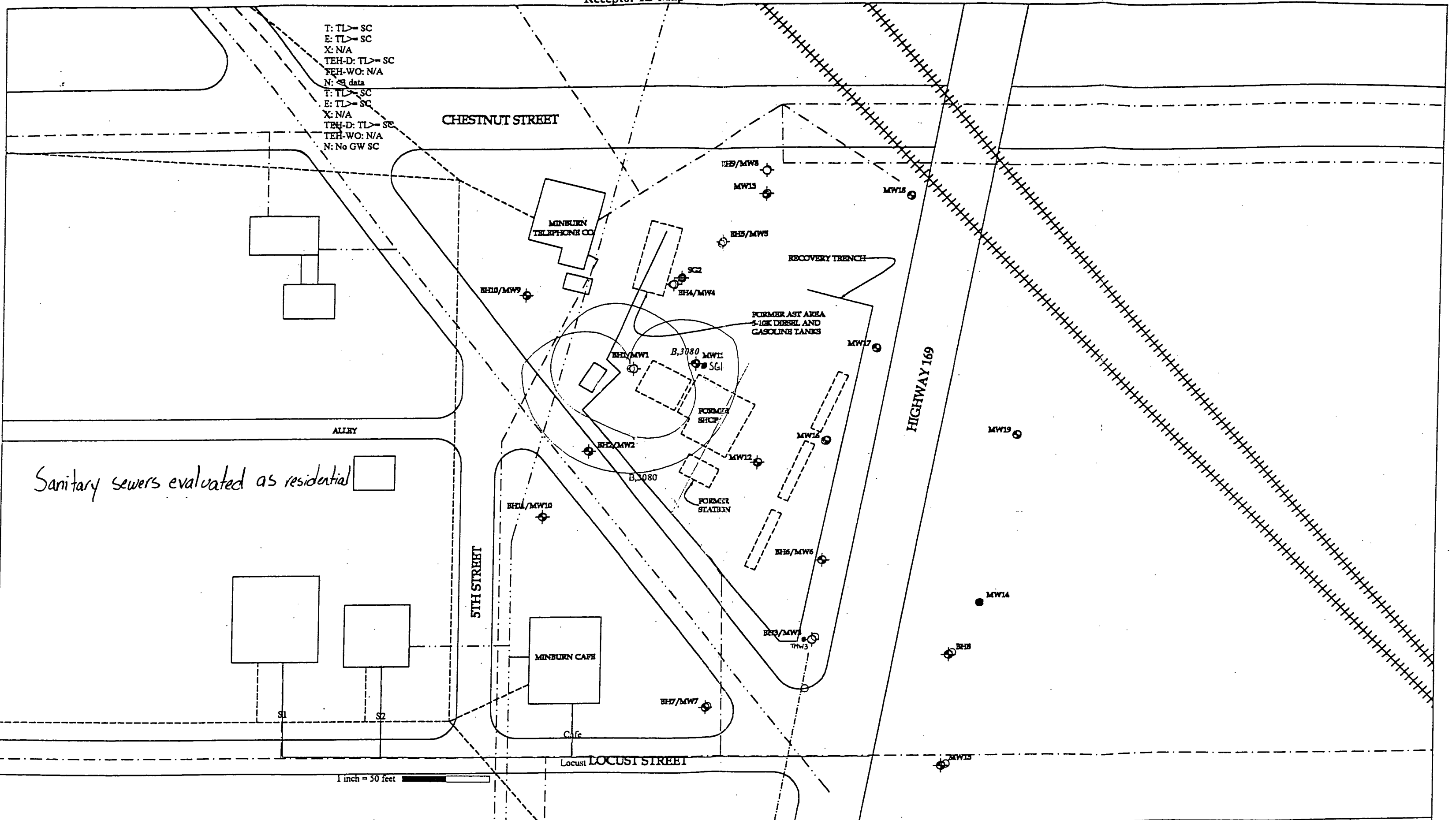
0,4000  
 5,75000

1038

<b>Seneca Environmental Services</b>		Date: July 13, 1999
Hunter - Cooper Minburn	Spill Number: 11256-JS-1445	Groundwater to Plastic Water Line Scale: 1" = 500'
Seneca Job #6801007		

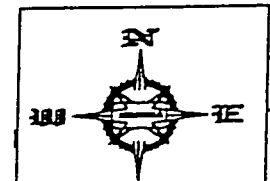


T: TL - SC  
 E: TL - SC  
 X: N/A  
 TEH-D: TL - SC  
 FEH-WO: N/A  
 N: No data  
 T: TL - SC  
 E: TL - SC  
 X: N/A  
 TEH-D: TL - SC  
 FEH-WO: N/A  
 N: No GW SC



1 inch = 50 feet

- TELEPHONE
- GAS
- SEWER
- STORM SEWER
- ELECTRIC
- WATER
- PRODUCT LINES
- SOIL BORING
- ◆ SOIL BORING WITH MONITORING WELL
- ◇ MONITORING WELL
- ◆ SOIL GAS WELL



FILE NAME COOPER		REVISION:
PROJECT NO: 6801007		DATE: 5/26/99
SITE: COOPER HUNTER STATION HIGHWAY 169 & BAKER STREET MINBURN, IOWA	FACILITY ID: 00000	REVIEWED BY: INT
SCALE: 1" = 50'		DRAWN BY: SMH