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Received: FEB 22 2002

Southwest Regional  
Office - MPCA - Marshall



STS CONSULTANTS, LTD.  
Remedial Investigation Report  
Form - Martin County West High  
School, Sherburn, Minnesota

STS Project 97730-XXA

*Look #  
12855*



THE INFRASTRUCTURE IMPERATIVE

**Vigna, John**

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**From:** Carlson, Steven J. [SMTP:carlson@stsconsultants.com]  
**Sent:** Tuesday, April 30, 2002 4:51 PM  
**To:** 'JohnV'  
**Subject:** UTM locations for 2 LUST sites.

Per your request, here are the UTM coords I estimated by USGS map interpretation/interpolation (Zone 15) of the 1000 meter grid and reported in Northing, Easting:

- LK12,855 at the High School: 4835000, 360400 ←
- LK 12,856 at the Bus Garage: 4834300, 360200

These estimates should be accurate within 50 meters.

Steve Carlson, Senior Consulting Scientist  
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(763)315-6340  
*The Infrastructure Imperative*

Pace Project Number: 1037471  
Client Project ID: Former Streges Auto E00-1355

Pace Sample No: 102317856 Date Collected: 10/04/00 Matrix: Soil  
Client Sample ID: GP-4A Date Received: 10/06/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Pyrene	650	ug/kg	480	10/12/00	RANI	129-00-0	
Benzo(a)anthracene	ND	ug/kg	480	10/12/00	RANI	56-55-3	
Chrysene	ND	ug/kg	480	10/12/00	RANI	218-01-9	
Benzo(b)fluoranthene	550	ug/kg	480	10/12/00	RANI	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	480	10/12/00	RANI	207-08-9	
Benzo(a)pyrene	ND	ug/kg	480	10/12/00	RANI	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	480	10/12/00	RANI	193-39-5	1
Dibenz(a,h)anthracene	ND	ug/kg	480	10/12/00	RANI	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	480	10/12/00	RANI	191-24-2	
Nitrobenzene-d5 (S)	73	%		10/12/00	RANI	4165-60-0	
2-Fluorobiphenyl (S)	90	%		10/12/00	RANI	321-60-8	
Terphenyl-d14 (S)	108	%		10/12/00	RANI	1718-51-0	
Phenol-d6 (S)	92	%		10/12/00	RANI	13127-88-3	
2-Fluorophenol (S)	86	%		10/12/00	RANI	367-12-4	
2,4,6-Tribromophenol (S)	82	%		10/12/00	RANI	118-79-6	
Date Extracted				10/10/00			

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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**Tanks and Emergency Response Section**  
**Minnesota Pollution Control Agency**

**Remedial Investigation Report Form**

Fact Sheet #3.24

April 1996

This form must be completed for all sites in which a remedial investigation (RI) is conducted--this includes either a *Limited Site Investigation (LSI)* or a *full RI*. Completing this form will provide the MPCA with the minimum amount of information necessary for a *full RI*. Additional information should be included if deemed important for making a site cleanup decision. If the consultant has concluded that a *Limited Site Investigation* is applicable to this site, Section 6 and Section 7 may be deleted from this report.

Refer to MPCA fact sheet #3.19 "Leaking Underground Storage Tank Investigation and Cleanup Policy" for guidance for the overall objectives of an RI and other MPCA fact sheets regarding investigations.

When a tank has been excavated, refer to fact sheets #3.6 "Excavation of Petroleum Contaminated Soil" and #3.7 "Excavation Report Worksheet for Petroleum Release Sites" for reporting requirements.

If free product is discovered the initial reporting should be done in accordance with fact sheet #3.3 "Free Product: Evaluation and Recovery" and fact sheet #3.4 "Free Product Recovery Report Worksheet."

Leak Number: LEAK0000 12,855 Date: 12/19/2001

Responsible Party: Martin County West I.S.D. 2448 R.P. phone #: 507/728-8276

Facility Name: Martin County West High School

Facility Address: 16 West 5th Street City: Sherburn

County: Martin Zip Code: 56171

Location of site: LAT: \_\_\_\_\_ LONG: \_\_\_\_\_ Circle one: UTM/State

*See attached page* 

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### Section 1: Emergency and High Priority Sites

1. Is an existing drinking water well impacted? YES  NO
2. Are there existing vapor impacts? YES  NO
3. Is there an existing surface water impact as indicated by 1) a product sheen on the surface water or 2) a product sheen or volatile organic compounds in the part per million range in ground water in a well located close to the surface water. YES  NO
4. Has the release occurred in the last 30 days? YES  NO
5. Has free product been detected at the site? YES  NO
6. Is sand or gravel aquifer impacted which is tapped by water wells within or potentially within 500 feet from the edge of the plume **or** does impacted soil overlie a karsted limestone or fractured bedrock? If yes, explain: YES  NO

If you answered YES to any of questions 1 through 6 above describe below the actions taken to date to reduce or eliminate the risk posed by the release.

### Section 2: Site and Release Information

2.1 Describe the land use and pertinent geographic features within 1000 feet of the site.

The entire 1000 foot radius is developed as school yard and athletic fields. Residential land uses are found beyond the school grounds.

Table 1.

Provide the following for all tanks that have been at the site:

Tank #	UST or AST	Capacity	Contents	Age (installed)	Status*	Condition
001	UST	6,000	Fuel Oil	1956	Removed 6/21/99	UST had leaked
002	UST	10,000	Fuel Oil	1973	Removed 6/21/99	No leaks evident
003	UST	6,000	Fuel Oil	1999	In use	Installed as replacement

\*Indicate: removed (date), abandoned in place (date), or currently used

Notes: The new UST was installed in the excavation left after removal of previous USTs.

2.2 Describe the status of the other components of the tank system(s), (i.e., piping and dispensers) for those tanks listed above.

**All former piping outside the building was removed. New piping was placed in the trench left after removal of former UST system components.**

2.3 Identify and describe the source or suspected source(s) of the release.

**A 1/4 inch hole was seen in UST 001, so this tank is the suspected source of release.**

2.4 What was the volume of the release? (if known): unknown gallons

2.5 When did the release occur? (if known): prior to 1999

### Section 3: Excavated Soil Information

3.1 Was soil excavated for off-site treatment?

YES

**NO**

If YES then complete the fact sheet #3.7 "Excavation Report Worksheet for Petroleum Release Sites" and include it as an appendix.

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

Volume removed: \_\_\_\_\_

\_\_\_\_\_ cubic yards

3.2 Indicate soil treatment type:

\_\_\_\_\_ land treatment  
\_\_\_\_\_ thermal treatment  
\_\_\_\_\_ composting/biopiling

other ( natural attenuation )

Name and location of treatment facility: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### Section 4: Extent and Magnitude of Soil Contamination

4.1 Were soil borings conducted in or immediately adjacent to all likely source areas (e.g., UST basins, AST areas, piping, dispensers, remote fill pipes, known spill areas)?

**YES**

NO

4.2 To adequately define the vertical extent of contamination soil borings should be completed at least five feet below the water table or ten feet below the

**YES**

NO

deepest measurable (field screening and visual observation) contamination, whichever is deeper. Were all soil borings completed to the required depth?

- 4.3 To adequately evaluate site stratigraphy at least one boring should be completed 20 feet below the water table, unless a confining layer is present. Was this done? YES NO

If you answered *NO* to any of the three previous questions, explain why the borings were not conducted in the required locations or to the required depths (see fact sheet #3.19 "Soil and Ground Water Investigations Performed During Remedial Investigations" regarding exceptions and ~~MPCA approval for depth of drilling~~):

- 4.4 Indicate the drilling method:
- hollow-stem auger  
 sonic drilling  
 push probes  
 other ( )  
*Note: contact MPCA staff hydro before use of flight augers)*

Table 2.

Complete the following table indicating jar headspace results (in ppm) for soil samples from soil borings.

Sampling Interval	Depth (ft)	Soil Boring				
		GP-1	GP-2	GP-3	GP-4	GP-5
S-1	1-3	19(C)	20(C)	37(C)	3(C)	3(C)
S-2	5-7	5(C)	99(C) *	10(C)	3(C) *	4(C)
S-3	9-11	4(C)	140(C)	4(C) *	12(C)	3(C)
S-4	13-15	4(C)	5(C)	10(C)	7(C)	3(C)
S-5	17-19	12(C)	2(C) *	4(C) *	--	2(C) *
S-6	21-23	5(C)	--	--	--	--
S-7	25-27	7(C)	--	--	--	--
S-8	31-33	5(C)	--	--	--	--
S-9	34-36	4(C) *	--	--	--	--

Notes: (type of PID/FID)

( ) = Soil Classifications are presented within the parentheses.

CL, ML-CL, SC are USCS classifications for clay-rich soils, classified here as "C".  
 SM is a USCS classification for silty sand.

ML is the USCS classification for silt, classified here as "C".  
 Elevated PID readings are shown in **Bold**.

*0-15 ppm = background according to boring logs.*



**Table 3.**

Indicate the laboratory analytical results for soil samples in mg/kg.

Boring, Depth(ft)	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO	Lab Type
GP-1 (34 - 36 ft.)	6/21/00	<0.05	<0.05	<0.05	<0.06	--	<10	Fixed Lab
GP-2 (4 - 8 ft.)	6/21/00	<0.05	<b>0.26</b>	<b>0.58</b>	<b>2.6</b>	--	<b>2100</b>	Fixed Lab
GP-2 (18 - 20 ft.)	6/21/00	<0.05	<0.05	<0.05	<0.06	--	<10	Fixed Lab
GP-3 (10 - 10.5 ft)	6/21/00	<0.05	<0.05	<0.05	<0.06	--	<10	Fixed Lab
GP-3 (18 - 20 ft.)	6/21/00	<0.05	<0.05	<0.05	<b>0.47</b>	--	<b>130</b>	Fixed Lab
GP-4 (4 - 8 ft.)	6/21/00	<0.05	<0.05	<0.05	<0.06	--	<10	Fixed Lab
GP-5 (16 - 18 ft.)	6/21/00	<0.05	<0.05	<0.05	<0.06	--	<10	Fixed Lab
SRV	1999	1.5	107	200	110	NE	NE	--
SLV	1999	0.034	6.4	4.7	45	NE	NE	--

Results in mg/kg.

Notes:

-- = not analyzed

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit

**BOLD** type indicates a detection of petroleum hydrocarbons

SRV = Tier 1 Soil Reference Values derived by MPCA for the 1999 Working Draft: Risk-Based Guidance for the

Soil-Human Health Pathway, Vol. 2.

SLV = Tier 1 Soil Leaching Values calculated by MPCA for risk screening purposes.

NE = a formal standard for this compound is not established.

**Table 4.**

Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in soil samples. Indicate contaminant and list in reported units mg/kg.

Well/Boring, Depth (ft)	Date Analyzed							

Notes:

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit.

-- = Compound was not analyzed.

4.5 If any non-petroleum compounds were detected list them below and identify possible sources of these compounds.

4.6 Describe the vertical and horizontal extent and magnitude of soil contamination.

**The horizontal extent of impacts appears to be limited to the vicinity of GP-2 and GP-3, which indicates the UST basin and piping trench was impacted. The vertical extent appears to be defined, based on PID screening results. This was confirmed by analytical results for samples collected from GP-2.**

### **Section 5: Aquifer Characteristics/Ground Water Contamination Assessment**

5.1 Indicate the hydraulic conductivity and the method used to determine it. Attach all supporting information for the determination in the Methodologies appendix:

- |                                       |                                     |  |
|---------------------------------------|-------------------------------------|--|
| <u>5x10<sup>-5</sup></u> _____ cm/sec | <input checked="" type="checkbox"/> | estimate from reference                          |
|                                       | <input type="checkbox"/>            | slug test  |
|                                       | <input type="checkbox"/>            | permeability test                                |
|                                       | <input checked="" type="checkbox"/> | Hazen approximation from grain-size distribution |

5.2 Indicate the thickness of the aquifer. If the investigation does not provide enough information to determine the aquifer thickness, assume the aquifer is greater than 20 feet thick:

- |  |
|--|
| _____ less than 10 feet                                      |
| _____ between 10 and 20 feet                                 |
| <input checked="" type="checkbox"/> _____ 20 feet or greater |

5.3 Describe in detail the geology underlying the site including confining layers, bedrock formations and the lateral extent of these formations:

**Geoprobe borings encountered clay-rich drift in all locations except GP-4 which encountered sandy soils at 7.5 feet below grade.**

**According to Bedrock Hydrogeology (Map S-2 by University of Minnesota Geological Survey), the bedrock aquifer is a Cretaceous sandstone unit. The Bedrock Geology sheet (Map M-14) identifies this unit as the Sioux Quartzite, a much older and more solid bedrock that does not consistently yield high-rate pumping, but is used as an aquifer where sufficient fracturing allows production wells to yield pumpable quantities of water. The**

**Geologic Map of Minnesota (Depth to Bedrock Sheet) shows the bedrock depth to be approximately 200 feet below surface.**

The impacted aquifer or the aquifer that is likely to be impacted at the site is considered a resource aquifer if one of the following situations exist:

- The aquifer is a current water supply source.
- The water bearing unit has a hydraulic conductivity greater than  $1 \times 10^{-2}$  cm/sec and a minimum thickness of 10 feet.
- The water bearing unit has a hydraulic conductivity between  $1 \times 10^{-4}$  cm/sec and  $1 \times 10^{-2}$  cm/sec and a minimum thickness of 20 feet.
- The water bearing unit has a hydraulic conductivity less than  $1 \times 10^{-4}$  cm/sec and no other viable source of water supply is available. (*Bedrock may be considered a resource aquifer if it is the only water supply available.*)

5.4 Based on the aquifer characteristics and water supply availability, is the aquifer at the site a resource aquifer? YES  NO

5.5 If other water supplies are available, explain.

**Water supply in the Sherburn community is derived from a buried artesian outwash aquifer and is also available from an underlying bedrock aquifer.**

5.6 Are there any other reasons the impacted aquifer should not be considered a resource aquifer?

**Table 5.**

Indicate the water level measured in all of the soil borings.

	Soil Boring				
	GP-1	GP-2	GP-3	GP-4	GP-5
Water level depth, ft	Dry	8.5	10	9.6	10

Notes:

5.7 Is contaminated soil in contact with ground water?

**YES** NO

If **YES** or if ground water contamination appears likely then complete tables 6 and 7 below.

**Table 6.**

Indicate the laboratory analytical results for water samples collected from the borings, temporary wells or push probes.

Boring Number	Date Sampled	Sampled Depth	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	DRO (mg/L)	Lab Type
GP-2	6/21/00	8.5	<830	<830	<830	<2030	<830	720	Fixed Lab
GP-4	6/21/00	9.7	<1.0	<1.0	<1.0	<2.5	<1.0	<1.0	Fixed Lab
GP-5	6/21/00	10	<1.0	<1.0	<1.0	<2.5	<1.0	40-100 Fixed Lab	Fixed Lab
HRL			10	1000	700	10000	N/A	N/A	

Results in ug/L, except for DRO which is mg/L.

Notes:

-- = not analyzed

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit

HRL = Health risk Limit for drinking water standards, established by the Minnesota Department of Health, January 1996.

N/A = HRL not established for this parameter.

**BOLD** type indicates detected concentration of petroleum hydrocarbons.

Groundwater was not encountered in soil borings GP-1 or GP-3.

**Table 7.**

Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes. Indicate contaminant and report in units of ug/l (ppb).

Boring Number	Date Sampled	n-Butyl-benzene	sec-Butyl-benzene	p-Iso-propyl-toluene	n-propyl-benzene	Napthalene	1,2,4-Tri-methyl-benzene	1,3,5-Tri-methyl-benzene
GP-2	6/21/00	9700	2900	1400	2000	14000	5100	1900
GP-4	6/21/00	<1.0	<1.0	<1.0	<1.0	2.1	<1.0	<1.0
GP-5	6/21/00	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
HRL (ug/L)		N/A	N/A	N/A	N/A	300	N/A	N/A

Results in ug/L.

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit  
HRL = Health risk Limit for drinking water standards, established by the Minnesota Department of Health, January 1996.

N/A = No HRL has been established for this compound.

**BOLD** type indicates the analytical result exceeds the HRL.

**5.8** If any non-petroleum compounds were detected list them below and indicate whether they exceed the HRLs. Also, identify possible sources of these compounds.

**The compounds detected are associated with petroleum fuels such as heating oil, therefore the LUST is believed to be the source of these compounds. Naphthalene exceeded the HRL in the former UST basin only.**

**5.9** If contaminated soil is not in contact with ground water, what is the \_\_\_\_\_ feet distance separating the deepest contamination from the surface of the water table? Was this distance measured during site activities, referenced from geologic information, or estimated based on professional opinion during a site visit?

**5.10** Describe observations of any evidence of a fluctuating water table and a seasonal high water table (e.g., mottling). Also, from other sources of information describe the range of natural water table fluctuations in the area.

**The water encountered was associated with narrow fissures/seams in the clay-rich till. One can expected fluctuations due to variability of precipitation and infiltration.**

**5.11** In your judgment, is there a sufficient distance separating the petroleum contaminated soil (or an impacted non-resource aquifer) from the underlying resource aquifer to prevent petroleum contamination of the resource aquifer? Please explain in detail. In your explanation consider the data and information of this section as well as the nature of the petroleum release (i.e., volume, when it occurred, petroleum product).

**YES**       **NO**

**The release likely occurred prior to 1999 based on information provided by the School District. The spread of contamination appears to be slow in the clay-rich till soils impacted. The source of water supply in this area is separated from the impacted non-aquifer by thick deposits of glacial till. The well logs (Appendix E) show more than 200 feet of glacial till. These wells are located approximately 1/2 mile from the project site.**

### Additional Ground Water Investigation

Complete Section 6 and Section 7 only if: 1) a resource aquifer has been impacted at or above Minnesota Department of Health Risk Limits (HRLs), 2) a resource aquifer has been impacted below the HRLs, but the levels are likely to reach the HRLs, or 3) there is an insufficient distance separating the petroleum contaminated soil (or an impacted non-resource aquifer) from the underlying resource aquifer. Regardless of whether you are submitting a Limited Site Investigation or a full RI, all sections following Section 7 must be completed.

### Section 6. Extent and Magnitude of Groundwater Contamination

Table 8.

Monitoring well construction.

Well Number	Unique Well Number	Date Installed	Relative Surface Elevation	Riser Height Above Grade	Bottom of Well (Elevation)	Screen Interval (Elev. - Elev.)

Notes: (location and elevation of benchmark)

Table 9.

Water table summary.

Well Number	Date	Depth of Water from Top of Casing	Product Thickness	Depth of Water Below Grade	Relative Groundwater Elevation
MW-1					
MW-2					
MW-3					
MW-4					

Notes: (GW above/below screen, etc.)

6.1 Were any deep monitoring wells completed at the site? YES NO

If YES, which are deep wells?

Before a deep well is installed contact the MPCA project hydrologist for guidance on its necessity and placement. A deep monitoring well may be necessary if 1)contamination

exist more than 10 feet below the water table or 2) the impacted aquifer is a resource aquifer or is hydraulically connected to a resource aquifer presently utilized by a water supply well located within 500 feet of the site.

Provide estimates of the following additional aquifer parameters:

Horizontal Gradient (dh/dl): \_\_\_\_\_  
 Vertical Gradient (dv/dl): \_\_\_\_\_  
 Porosity: \_\_\_\_\_  
 Flow direction: \_\_\_\_\_  
 Hydraulic Conductivity (K) \_\_\_\_\_ m/s  
 Pore velocity: \_\_\_\_\_ meters/year

**Table 10.**

All ground water monitoring data should be collected from a minimum of *two quarterly sampling events*.

Indicate the laboratory analytical results for water samples.

Well #	Date	Benzene	Toluene	Ethylbenzene	Xylene	MTBE	GRO	DRO
MW-1								
MW-2								
MW-3								
MW-4								

*Notes: (e.g., free product, dry well, units etc.)*

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit.

-- = Compound was not analyzed.

HRL = Health Risk Limit for drinking water standards, established by the Minnesota Department of Health, January 1996.

**Table 11.**

Indicate other notable contaminants (either petroleum or non-petroleum derived) detected in water samples.

Well #	Date Analyzed								

*Notes: units*

< = Less than symbol indicates that compounds analyzed were below the shown reporting limit.  
 -- = Compound was not analyzed.

HRL = Health Risk Limit for drinking water standards, established by the Minnesota Department of Health, January 1996.

- 6.2 If any non-petroleum compounds were detected list them below and indicate whether they exceed the HRLs. Also, identify possible sources of these compounds.
- 6.3 Is there a clean or nearly clean (below HRLs) downgradient monitoring well located along the longitudinal axis of the contaminant plume? (approximately 20 degrees plus or minus the axis) YES NO
- 6.4 Is there a worst case well completed through the source area of the release? YES NO  
 If you have answered *NO* to any of the above three questions, please explain why a well was not completed in the required location.
- 6.5 Provide an estimate of the longitudinal length of the dissolved contaminant plume: \_\_\_\_\_ feet
- 6.6 Describe the extent and magnitude of the ground water contamination:

**Section 7: Evaluation of natural attenuation**

**Table 12.**

Complete the bioactivity data in the table below. Data should be from two quarterly rounds of sampling. Refer to the fact sheet #3.21 "Assessment of Natural Biodegradation at Petroleum



Tank Release Sites” for acceptable methodologies and indicate the chosen method in the Methodologies appendix.

Monitoring Well	Temp. °C	pH	Dissolved oxygen (mg/l)	Nitrate (mg/l)	(Fe II) (mg/l)	(H <sub>2</sub> S, HS <sup>-</sup> ) (mg/l)
MW-1						
MW-2						
MW-3						
MW-4						

Notes:

7.1 Discuss the results of the bioactivity evaluation. Specifically, compare the concentrations of the inorganic parameters inside and outside the plume.

7.2 In your judgment, is natural biodegradation occurring at this site? Please Explain. YES NO

### Section 8: Well Receptor Information/Assessment

Include in the appendices of this report: 1) a list of addresses within 500 feet from the edge of the plume and confirmation of status of water supply from the city utility billing department; 2) well logs; and 3) map showing ½ mile radius, 500 foot radius, water supply wells, other potential petroleum sources, and addresses for properties within 500 feet.

Table 13.

Complete the following table for all water supply wells located within 500 feet of the edge of the plume and any municipal or industrial wells found within ½ mile.

Unique Well #	Ground Elevation	Total Depth (ft)	Base of Casing (ft)	Static Elevation	Aquifer	Use	Owner	Distance & Direction from site
217092	1300	283	Unk	Unk	QBAA	Public	City of Sherburn	2000 ft. SSE
917093	1300	275	245	131	QBAA	Public	City of Sherburn	2000 ft. SSE

Notes:

8.1 Is municipal water available in the area?

YES  NO

8.2 Were all property owners within 500 feet of the nearest edge of the contaminant plume successfully contacted to determine if water wells are present? If No, please explain.

YES  NO  
(N/A)

8.3 Discuss the results of the ground water receptor survey and any analytical results from sampling conducted at nearby water wells. Comment on the risks to water supply wells identified within 500 feet from the edge of the plume as well as the risk posed by or to any municipal or industrial wells found within ½ mile. Specifically indicate whether water supply wells identified utilize the impacted aquifer. (Note: an impacted aquifer separated from another aquifer by a clay lens is not considered a separate aquifer.)

**No wells are identified within 500 feet of the release. The public supply wells are a considerable distance away, and the City is provided with municipal water.**

8.4 Are there any plans for groundwater development in the impacted aquifer within one half mile of the site, or one mile down gradient of the site if the aquifer is fractured? Please give the name, title and phone number of the person that was contacted for this information.

YES  NO

Ron Quade

Phone 507/764-4491

## Section 9: Surface Water Risk Assessment

9.1 Are there any surface waters or wetlands located within ¼ mile of the site?

YES  NO

If YES, indicate its name: \_\_\_\_\_

9.2 If surface water is present downgradient of the site, is there a clean down gradient soil boring or monitoring well located between the site and the surface water?

YES  NO  N/A

If NO, we assume that contamination discharges to surface water. Therefore, complete the following information:

Name of receiving water:

Plume width, (W):

\_\_\_\_\_ feet

Plume thickness, (H):

\_\_\_\_\_ feet

Hydraulic conductivity, (K):

\_\_\_\_\_ gal/day/ft<sup>2</sup>

Horizontal gradient, (dh/dl):

\_\_\_\_\_ (unitless)

Discharge, (Q) = H\*W\*K\*(dh/dl)/1440

\_\_\_\_\_ gal/min

If *YES*, identify them and indicate the distance to these features and discuss the contamination risk potential.

### Section 10: Vapor Risk Assessment/Survey

10.1 Is there a history of vapor impacts in the vicinity of the site ?

YES

NO

If *YES*, describe:

10.2 Is there any indication that free product or highly contaminated groundwater may be traveling offsite within the utility corridors? If *YES*, have they been investigated with borings or push probes?

YES

NO

10.3 Discuss the potential for vapor migration/accumulation near the site. In your discussion consider: soil types, product type, presence and distribution of free product or high concentrations of dissolved product. Also, compare the depth of contamination with the location of underground utility lines, location and depth of storm and sanitary sewers and location of nearby basements.

**The product type (fuel oil) and soil texture (clay) is not expected to result in high soil vapor migration risks. The nearby school has a below-grade boiler room. Vapor impacts were not identified by the PID meter survey conducted.**

If the vapor risk assessment indicated a risk of vapor impacts to buildings or utilities, complete the following table with vapor monitoring data collected. Location numbers should be mapped on an accompanying figure of the surveyed area.

Table 14.

Location #	Date	PID reading (ppm)	Percent of the LEL
Boiler Room NW	6-21-2000	0 - 1	0%

Notes:

10.4 Describe and interpret the results of the vapor survey.

No vapor impacts are identified.

## Section 11: Discussion

11.1 Discuss the risks associated with the remaining soil contamination?

The risks associated with remaining soil contamination is limited by the following conditions:

- 1) Human ingestion/contact: Impacted soils are found below a landscaped and sodded area. This risk scenario is extremely limited.
- 2) Vapor impacts: Limited likelihood to develop high vapor concentrations that migrate from release point; limited receptors (boiler room) in vicinity.
- 3) Groundwater: Soil concentrations were below Tier 1 SRV/SLV levels. The one HRL exceedance (naphthalene) is attenuated a short distance away.

11.2 Discuss the risks associated with the impacted ground water?

The risks associated with groundwater impacts are very limited because:

- The impacted unit is a non-aquifer.
- Potential receptors are separated from the impacted unit, by horizontal distance and by thick layers of clay.
- The spread of contaminated groundwater would be slow in the soil conditions identified.

11.3 Discuss other concerns not mentioned above:

## Section 12: Conclusions and Recommendations

Recommendation for site:      site closure  
   additional vapor monitoring  
   additional ground water monitoring  
   active cleanup

The recommendation above should be based on fact sheet #3.1 “Leaking Underground Storage Tank Investigation and Cleanup Policy.” Describe below how you applied the policy to support your recommendation.

**Closure is appropriate because:**

- **Impacts are defined.**
- **A resource aquifer is not impacted, and is separated from the impacted unit.**
- **Contamination identified is below all SLV/SRV/HRL action levels in perimeter borings.**

If additional monitoring is recommended, indicate the proposed monitoring schedule and frequency:

If active cleanup is proposed then MPCVA staff will review this remedial investigation report at a higher than normal priority to determine if active cleanup is required. We will respond with either a request for proposal for additional monitoring or a corrective action design report. Please indicate below what cleanup technology you are considering at this time.

## Section 13: Required Figures

Indicate attached figures:

- Figure 1:* Site location map (*approximate scale is not acceptable*) and a large scale site map show all potential receptors within 300 feet of the site. The large scale site map should show those properties with basements and wells.

- Figure 2:* One or more site map showing: structures; all past and present petroleum storage tanks, piping, and dispensers; extent of soil excavation; boring and well locations (including any drinking water wells on site); horizontal extent of soil contamination; horizontal extent of ground water contamination; and location of end points for all geologic cross sections.
- Figure 1:* Well receptor survey map showing 1/2 mile radius, 500 foot radius, water supply wells, other potential sources of contamination.
- Figure 2:* Vapor survey map showing utilities and buildings with basements and monitoring locations (if a survey was required).

## **Section 14: Appendices**



Indicate attached appendices.

- Appendix A* Excavation Report Worksheet for Petroleum Release Sites.
- Appendix B* Laboratory analytical reports for soil and ground water.  
STS soil laboratory records for grain size distribution.
- Appendix C* Methodologies and procedures, including field screening of soil, other field analyses, soil boring, soil sampling, well installation, and water sampling.
- Appendix D* Geologic logs for each well or boring using attached template.
- Appendix E* Copies of water supply well logs with legible unique numbers.

## **Section 15: Consultant (or other) information**

*By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leaksite. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leaksite that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be*

*found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. Rules 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.*

Name and Title:	Signature:	Date signed:
<u>Steve Carlson, Senior Proj. Scientist</u>		<u>11/11/02</u>
<u>Robert L. DeGroot, P.E. - Principal</u>		<u>11/11/02</u>
_____	_____	<u> / /</u>
_____	_____	<u> / /</u>

Company and mailing address: STS Consultants, Ltd.  
10900 - 73rd Avenue N., Suite 150  
Maple Grove, MN 55369  
Phone: ~~163~~ (612) 315-6300  
Fax: ~~(612)~~ 315-1836

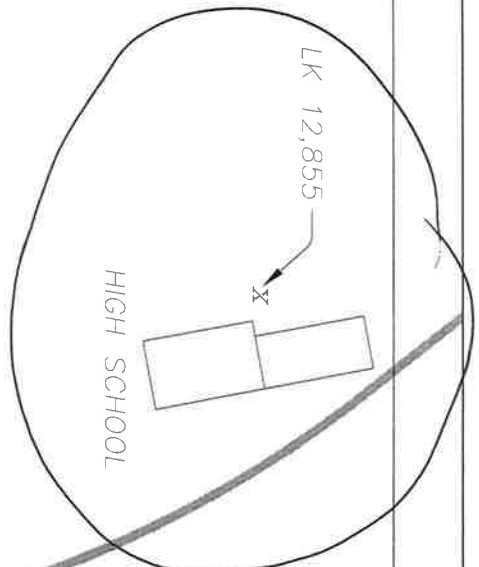
Upon request, this document can be made available in other formats, including Braille, large print and audio tape. TTY users call 612/282-5332 or Greater Minnesota 1-800-657-3864.

119th St.

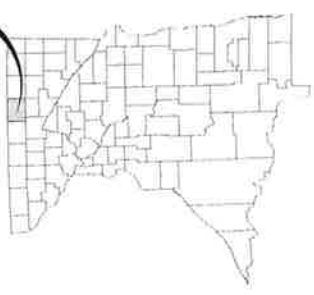
Temperance Lake Rd.



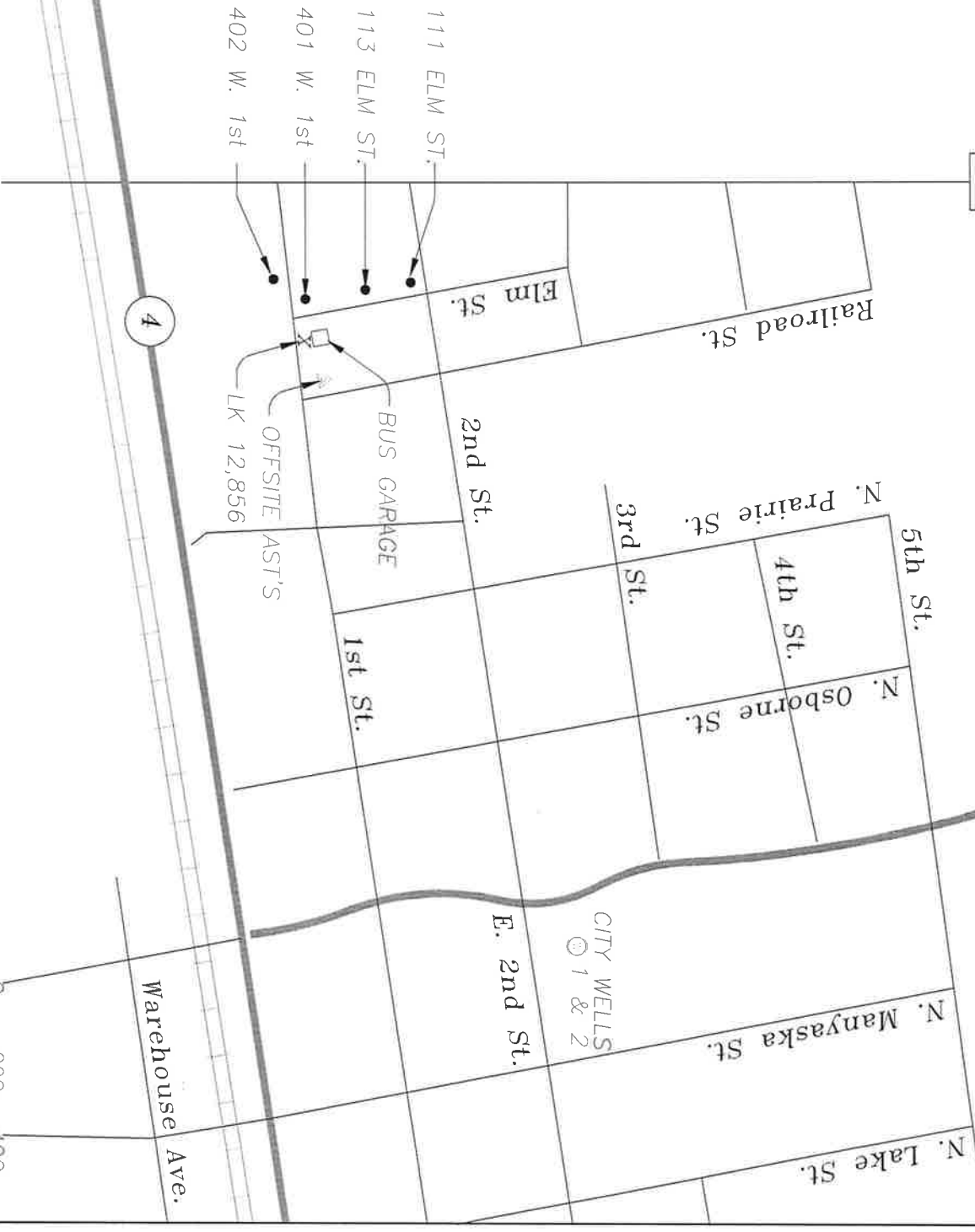
13



LK 12,855  
HIGH SCHOOL



SHERRBURN, MN



SCALE IN FEET

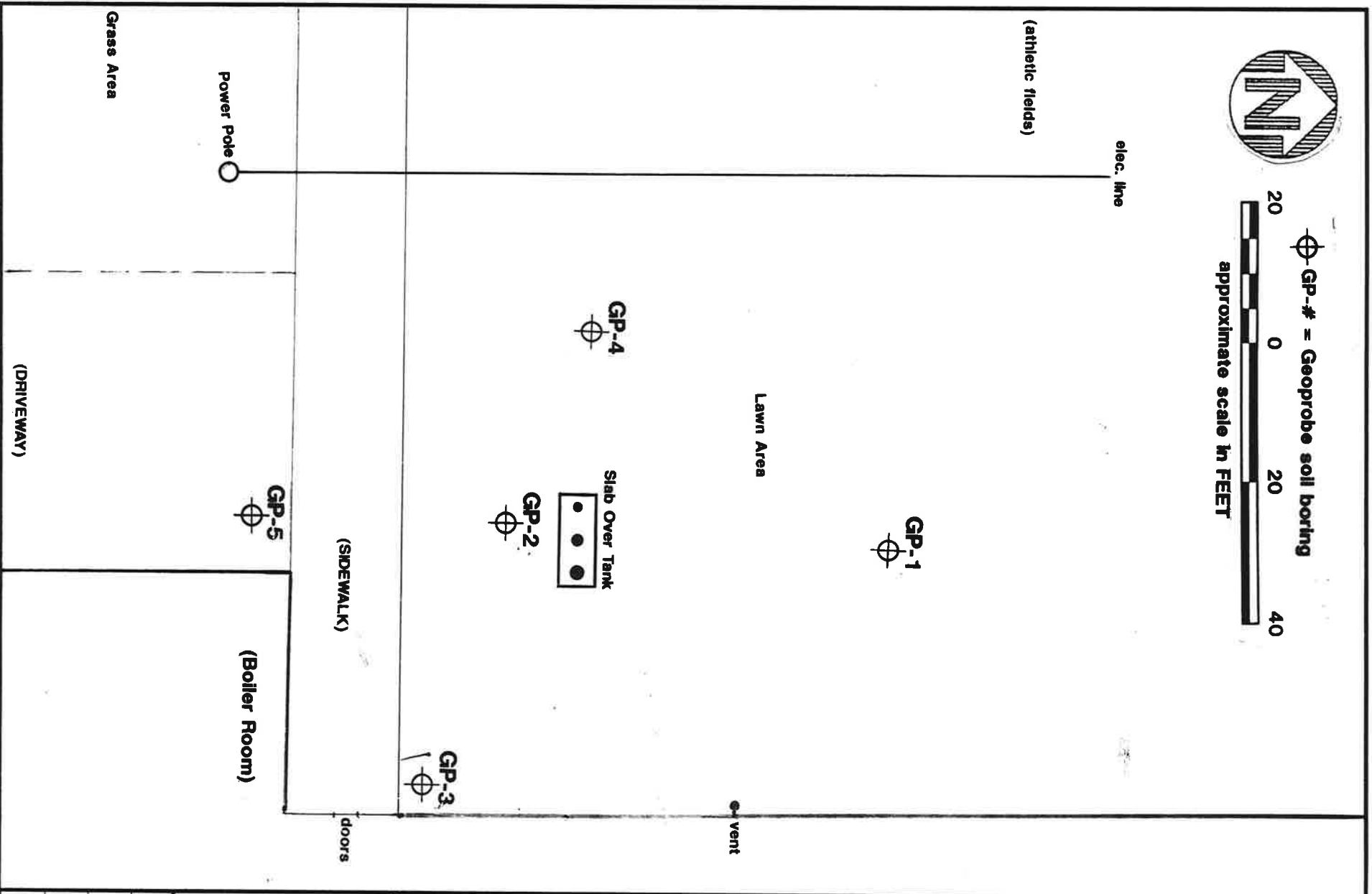


STS Consulting Engineers Ltd.

SITE LOCATION DIAGRAM  
LK 12,855 AND LK 12,856  
MARTIN COUNTY W. ISD 2448  
SHERRBURN, MINNESOTA

DESIGN BY	TJM	12.21.01
CHECKED BY	SJC	
APPROVED BY	FLD	
TITLE	SCALE	APPROXIMATE
06314001.DWG		
SIS PROJECT NO.	FIGURE NO.	
9--31A	1	





**SOIL BORING LOCATIONS  
MARTIN COUNTY WEST HIGH SCHOOL  
LK #12,855  
SHERBURN, MINNESOTA**



STS Consultants Ltd.  
Consulting Engineers

STS PROJECT NO.  
97730-XA

STS PROJECT FILE

SCALE  
Approx.

SHEET NO.  
FIG. 2

DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
CADFILE	



OWNER  
**Martin Co. I.S.D 2448**

LOG OF BORING NUMBER  
**GP-1**

PROJECT NAME  
**Sherburn High School LSI**

ARCHITECT-ENGINEER  
**STS Consultants, Ltd.**

SITE LOCATION  
**16 W. 5th St. Sherburn, MN 56171**

DEPTH(FT)	ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	SURFACE ELEVATION	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. <sup>3</sup>	PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH				
										TONS/FT. <sup>2</sup>	1	2	3	4

						12	SOIL - FILL											
		1	GP				SILTY CLAY, black at 1.2 - 4 ft, and dark brown at 4 - 8 ft, stiff (CL-ML)	19	*									
		2	GP			8.0	SILT, grey, firm (ML)	5	*									
		3	GP					4	*									
		4	GP			14.0	CLAY, TRACE SAND, grey very stiff (CL)	4	*									
		5	GP					12	*									
		6	GP					5	*									
		7	GP					7	*									
		8	GP					5	*									
		9	GP			36.0		4	*									

End of boring at 36.0 ft  
 Drilled with Geoprobe to full depth  
 All samples placed in zip-closure polyethylene bags, and screened with photovac photoionization detector (PID) equipped with a 10.6 eV lamp source and calibrated to a benzene reference. Background PID readings = 0 to 5 PID units. Grouted borehole with high solids bentonite grout upon completion.

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	DRY	BORING STARTED 6/21/00	STS OFFICE Minneapolis Area - 06
WL		BORING COMPLETED 6/21/00	ENTERED BY GN
WL		RIG/FOREMAN Geoprobe/Todd-NTS	APP'D BY SJC
			SHEET NO. 1 OF 1
			STS JOB NO. 97730-XA



OWNER  
**Martin Co. I.S.D 2448**  
 PROJECT NAME  
**Sherburn High School LSI**

LOG OF BORING NUMBER **GP-2**  
 ARCHITECT-ENGINEER  
**STS Consultants, Ltd.**

SITE LOCATION  
**16 W. 5th St. Sherburn, MN 56171**

DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	SURFACE ELEVATION	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. <sup>3</sup>	PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH						
								TONS/FT. <sup>2</sup>	2	3	4	5		
				0.8	SOIL - FILL			⊗	STANDARD PENETRATION BLOWS/FT.					
	1	GP			SILTY CLAY, brown/grey, firm (CL-ML)	40	40	⊗						
	2	GP				20	20	⊗						
	3	GP				99	99	⊗						
	4	GP				140	140	⊗						
	5	GP		11.5	CLAY, TRACE SAND, grey very stiff (CL)	30	30	⊗						
	6					5	5	⊗						
	7	GP				2	2	⊗						
	8	GP				2	2	⊗						
20.0				20.0	End of boring at 20.0 ft Drilled with Geoprobe to full depth All samples placed in zip-closure polyethylene bags, and screened with photovac photoionization detector (PID) equipped with a 10.6 eV lamp source and calibrated to a benzene reference. Back ground PID readings = 0 to 15 PID meter units Grouted borehole with high solids bentonite grout upon completion.									

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	8.5	BORING STARTED 6/21/00	STS OFFICE Minneapolis Area - 06
WL		BORING COMPLETED 6/21/00	ENTERED BY GN
WL		RIG/FOREMAN Geoprobe/Todd-NTS	APPD BY SJC
			SHEET NO. 1 OF 1
			STS JOB NO. 97730-XA



**OWNER**  
**Martin Co. I.S.D 2448**

**LOG OF BORING NUMBER**

**GP-3**

**PROJECT NAME**  
**Sherburn High School LSI**

**ARCHITECT-ENGINEER**  
**STS Consultants, Ltd.**

**SITE LOCATION**  
**16 W. 5th St. Sherburn, MN 56171**

DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. <sup>3</sup>	PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH TONS/FT. <sup>2</sup>	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %
	SAMPLE TYPE		SAMPLE DISTANCE RECOVERY	STANDARD PENETRATION BLOWS/FT.	10	20	30	40

10.0	1 GP	1.1 SURFACE ELEVATION SOIL - FILL						
7.5	2 GP	SILTY CLAY AND SOME SILT - brown, firm (CL-ML)		37 *	10 *			
5.0	3 GP			14				
2.5	4 GP			4				
18.0	5 GP	CLAY, TRACE SAND, grey very stiff (CL)		4				
20.0	6 GP	End of bring at 20.0 ft Drilled with Geoprobe to full depth All samples placed in zip-closure polyethylene bags, and screened with photovac photoionization detector (PID) equipped with a 10.6 eV lamp source and calibrated to a benzene reference. Back ground PID readings = 0 to/5 PID meter units. Grouted borehole with high solids bentonite grout upon completion.	* Calibrated Penetrometer					

The stratification lines represent the approximate boundary lines between soil types: In situ, the transition may be gradual.

WL	10	BORING STARTED 6/21/00	STS OFFICE	Minneapolis Area - 06
WL		BORING COMPLETED 6/21/00	ENTERED BY GN	SHEET NO. 1 OF 1
WL		RIG/FORAMAN Geoprobe/Todd-NTS	APP'D BY SJC	STS JOB NO. 97730-XA



STS Consultants Ltd.

OWNER

Martin Co. I.S.D 2448

LOG OF BORING NUMBER

GP-4

PROJECT NAME

Sherburn High School LSI

ARCHITECT-ENGINEER

STS Consultants, Ltd.

SITE LOCATION

16 W. 5th St. Sherburn, MN 56171

DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. <sup>3</sup>	PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH				
							TONS/FT. <sup>2</sup>	1	2	3	4
							PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %		
							X	●	△		
							⊗	○	△		
							10	20	30	40	50
							STANDARD PENETRATION BLOWS/FT.				
				SURFACE ELEVATION							
				SILTY SOIL, black (FILL)							
				1:1							
				SANDY CLAY, brown, firm (SC)		3					
				7.5							
				SILTY SAND, brown, moist, firm (SM)		3					
				10.0							
				3 GP		12					
				12.5							
				4 GP		15					
				15.0							
				5 GP		7					
				16							
<p>End of broing at 16.0 ft            Drilled with Geoprobe to full depth            All samples placed in zip-closure polyethylene            bags, and screened with photovac photoionization            detector (PID), equipped with a 10.6 eV lamp            source and calibrated to a benzene reference.            Back ground PID readings = 0 to15 PID meter units            Grouted borehole with high solids bentonite grout            upon completion.</p>											
<p>* Calibrated Penetrometer</p>											
<p>The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.</p>											
WL 9.6			BORING STARTED 6/21/00			STS OFFICE			Minneapolis Area - 06		
WL			BORING COMPLETED 6/21/00			ENTERED BY GN			SHEET NO. 1 OF 1		
WL			RIG/FOREMAN Geoprobe/Todd-NTS			APP'D BY SJC			STS JOB NO. 97730-XA		



STS Consultants Ltd.

OWNER

Martin Co. I.S.D 2448

LOG OF BORING NUMBER

GP-5

PROJECT NAME

Sherburn High School LSI

ARCHITECT-ENGINEER

STS Consultants, Ltd.

SITE LOCATION

16 W. 5th St. Sherburn, MN 56171

DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	SURFACE ELEVATION	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. <sup>3</sup>	PHOTO-IONIZATION DETECTOR READING (PPM)	UNCONFINED COMPRESSIVE STRENGTH					
								TONS/FT. <sup>2</sup> 1	2	3	4	5	
								PLASTIC LIMIT % $\times$ --- WATER CONTENT % $\bullet$ --- LIQUID LIMIT % $\Delta$ --- STANDARD PENETRATION BLOWS/FT. 10 $\otimes$ --- 20 --- 30 --- 40 --- 50					

2.5	1	GP		2.0	SILTY CLAY, dark brown, stiff (CL-ML)		3	*									
5.0	2	GP		8.0	SILTY SAND, brown, wet, firm (SM) Aquifer		4	*									
7.5				10.0	SILTY CLAY, brown, firm (CL) Confining layer		3	*									
12.5	4	GP					3	*									
15.0	5	GP		15.0	CLAY, TRACE SILT, grey very stiff (CL)		2	*									
17.5	6	GP		18.0	End of boring at 18.0 ft Drilled with Geoprobe to full depth All samples placed in zip-closure polyethylene bags, and screened with photovac photoionization detector (PID), equipped with a 10.6 eV lamp source and calibrated to a benzene reference. Back ground PID readings = 0 to 5 PID meter units Grouted borehole with high solids bentonite grout upon completion.		2	*									
18																	

The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual.

WL	10	BORING STARTED 6/21/00	STS OFFICE Minneapolis Area - 06
WL		BORING COMPLETED 6/21/00	ENTERED BY GN
WL		RIG/FOREMAN Geoprobe/Todd-NTS	APPRD BY SJC
			SHEET NO. 1 OF 1
			STS JOB NO. 97730-XA

MINNESOTA DEPARTMENT OF HEALTH  
WELL AND BORING SEALING RECORD  
Minnesota Statutes, Chapter 1031

Minnesota Well and Boring  
Sealing No. \_\_\_\_\_  
Minnesota Unique Well No. \_\_\_\_\_  
(Leave blank if not known)

H 167418

WELL OR BORING LOCATION

County Name Murtin

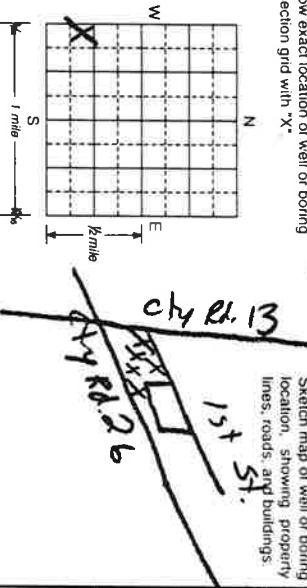
Township Name Sherman Township No. 102W Range No. 32W Section No. 7 Fraction (sm. → lg.) Muskegon

Numerical Street Address or Fire Number and City of Well or Boring Location  
14 West 15th St.

Date Sealed 6/22/00 Date Well or Boring Constructed 6/22/00

Depth Before Sealing 36 ft Original Depth 36 ft

STATIC WATER LEVEL



PROPERTY OWNER'S NAME  
Independent School District 2448

Property owner's mailing address: if different than well location address indicated above  
308 4th St.  
P.O. Box 268  
Wilcome, MN 56181

WELL OWNER'S NAME  
same

Well owner's mailing address if different than property owner's address indicated above  
same

ACQUIFER(S)  
 Single Aquifer  Multi-aquifer

WELLBORING  
 Water Supply Well  Monitor Well  
 Env. Bore Hole  Temp. Geo. probe

CASING TYPE(S)  
 Steel  Plastic  Tile  Other Temp Geo probe

CASINGS(S)  
Diameter: 1 in from 0 to 36 ft  
Depth: 36 ft  
Set in oversize hole?  Yes  No  Unknown

Annular space initially grouted?  
 Yes  No  Unknown

SCREEN/OPEN HOLE  
Screen from 10 to 15 ft Open Hole from 0 to 16 ft

OBSTRUCTIONS  
 Rods/Drop Pipe  Check Valve(s)  Debris  Fill  No Obstruction

Type of Obstructions (Describe) \_\_\_\_\_

Obstructions removed?  Yes  No Describe \_\_\_\_\_

PUMP  
Type \_\_\_\_\_  
 Removed  Not Present  Other Temp Geo probe

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE:  
 No Annular Space Exists  
 Annular space grouted with tremie pipe  
 Casing Perforation/Removal  
in: from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
in: from \_\_\_\_\_ to \_\_\_\_\_ ft.  Perforated  Removed  
Type of perforator \_\_\_\_\_

GEOLOGICAL MATERIAL	COLOR	HARDNESS OF FORMATION	FROM		TO
<u>F: 11</u>	<u>Brn</u>	<u>tight</u>	<u>0</u>	<u>3</u>	<u>4</u>
<u>Silty clay</u>	<u>Brn</u>	<u>soft</u>	<u>3</u>	<u>12</u>	<u>12</u>
<u>Sand</u>	<u>Brn</u>	<u>loose</u>	<u>12</u>	<u>16</u>	<u>16</u>
<u>clay</u>	<u>Brn</u>	<u>soft</u>	<u>16</u>	<u>20</u>	<u>20</u>
<u>Course-to-fine clay</u>	<u>gray</u>	<u>soft</u>	<u>20</u>	<u>36</u>	<u>36</u>

OTHER WELLS AND BORINGS

Other unsealed and unused well or boring on property?  Yes  No How many? \_\_\_\_\_

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

Grouting Material Bentinite from 0 to 36 ft 4 bags

from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ bags

from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ bags

from \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ bags

REMARKS, SOURCE OF DATA, DIFFICULTIES IN SEALING

NTS# 5328.11

H 167418

Contractor Business Name NTS License or Registration No. M0167

Authorized Representative Signature [Signature] Date 6/26/00

Name of Person Sealing Well or Boring \_\_\_\_\_