Sanitary Sewer Report Phase III

Pickerel Lake
MSA Project No. 11167

Prepared By:
MSA Professional Services, Inc.
Baraboo, WI 53913

TABLE OF CONTENTS

LIST OF FIGURES

APPENDIX

INTRODUCTION/PURPOSE

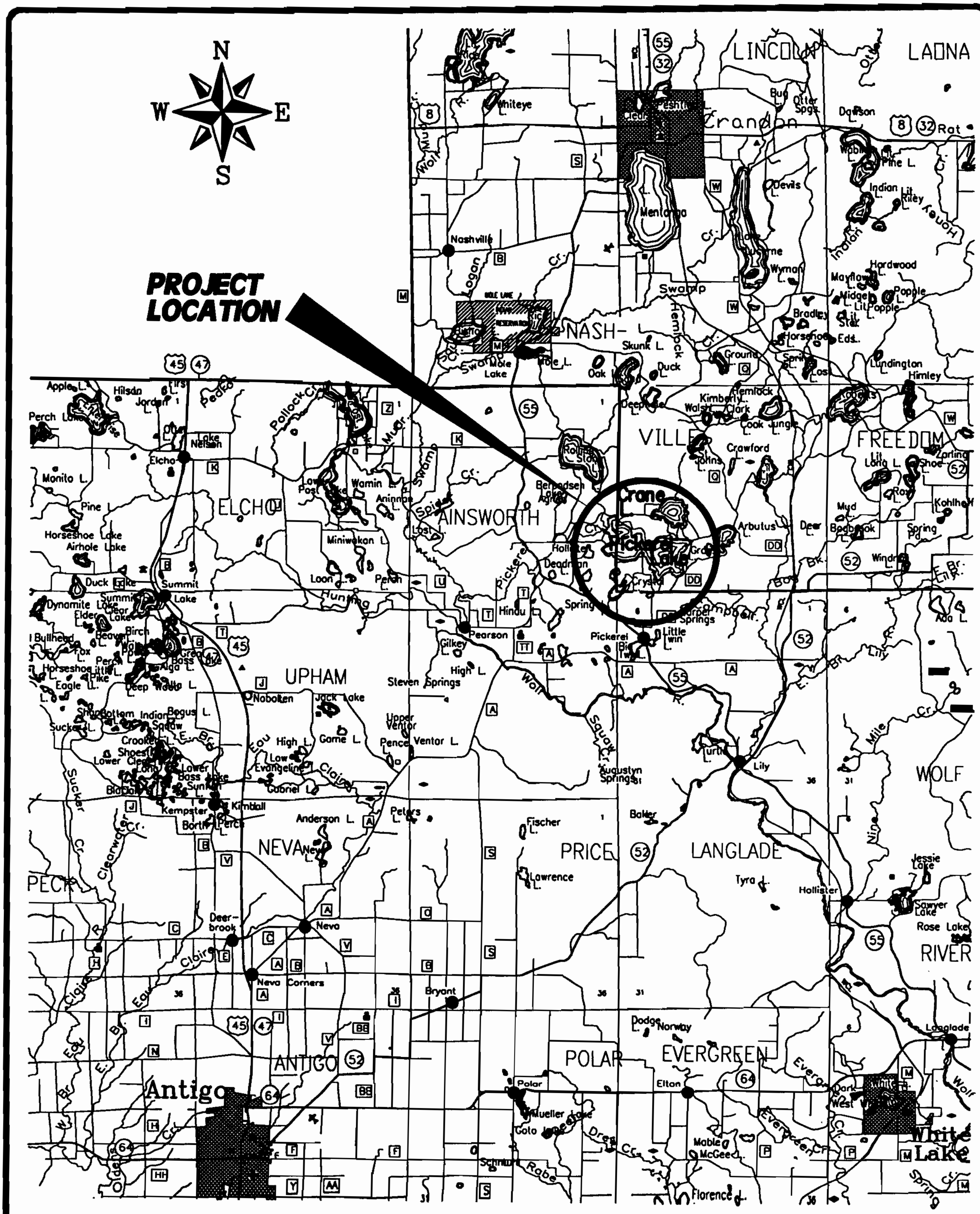
Pickerel Lake is located in the southwestern corner(Figure 1) of Forest County in the Town of Nashville and in Langlade County in the Town of Ainsworth. The lake is included in the Pickerel/Crane Lake Protection and Rehabilitation District (Lake District). Pickerel Lake is very highly developed along the northern shoreline on Pickerel Lake Road and along the eastern shoreline on C.H. "DD". Other areas of development occur along South Shore Drive, Firelite Lane, Frazer Lane, and Pine Point Road. The development around the lake is predominantly residential with a few resorts, campgrounds and taverns. All development around the lake is served by on-site septic systems for sewage treatment and individual wells for water supply. Many of the wells are driven points located in pits or in the dwelling.

The Lake District initiated an effort in the winter of 1995/96 to obtain grants from the Department of Natural Resources to conduct a study of the existing septic systems serving the homes within the district. The study was under taken to determine the type of systems being used and of particular concern was the siting of the system in relationship to the lake and the groundwater which ultimately drains into the lake. The purpose of this report is to outline the parameters of the study and to present the results of the inspections performed during August and September 1998. This report presents the results of Phase III of the study.

SITE/SOILS DISCUSSION

The development around Pickerel Lake has been progressing for quite some time. While initial development began in the 1920's and 1930's, steady growth primarily along the shoreline has continued to the present time. As a result, the type of septic systems constructed and the siting of those systems, covers quite a wide spectrum. Initial development of most of the lots around the lake included the use of a "privy" or outhouse as the primary means of sewage disposal. As improvements and upgrading of properties occurred septic systems were added to modernize the cabins and vacation homes. Most of the early septic systems installed were septic tank/seepage pit (drywell) systems, while those constructed in the last 20 to 30 years have been septic tank/drainfield systems. Most of the lots around the lake were platted using a 60' - 100' width. Dwelling and outbuilding construction, driveways, potable well setback and steep slopes all combine to limit the available area for replacement septic systems

There is no published soil survey for Forest County. Soils encountered during the course of this study are generally found to be similar to the Antigo-Pence Association. These soils are described as "well drained, nearly level to very steep, silty and loamy soils on outwash plains, kames, and eskers." The soil conditions generally can be described as loamy sands over outwash sand and gravelly sand. The subsoil in most borings consisted of a very sandy, gravelly, substratum which would be considered very rapidly permeable. Because of rapid permeability most soils in the area would be considered poor filters of septic tank effluent. In some areas fine textured (very fine sand or silty) bands occur at depths which affects the proper function of an on-site wastewater disposal system. The best soils for septic tank wastewater disposal are those with a uniform medium texture and are free of high groundwater, bedrock, and seasonal saturation for a depth of three(3') below the bottom of the septic system disposal point.



LOCATION MAP	SCALE: NONE	DATE: SEPT., 1998	**MSA** TRANSPORTATION • MUNICIPAL • REMEDIATION DEVELOPMENT • ENVIRONMENTAL
	FIELD BOOK: N/A	MSA PROJECT #: 11167	1230 South Boulevard Baraboo, WI 53913
	DRAWN BY: DAW	MSA FILE #: FIGURE1.DWG	608-356-2771 1-800-362-4505 Fax: 608-356-2770
V:\1998\11167\FIGURE1.DWG	CHECKED BY:	FIGURE 1	

STUDY PROCEDURE

Due to the limited grant monies to fund this project, the Lake District personnel selected sites to be inspected in each phase of this study based on a previous study conducted by Foth and Van Dyke in 1993. The Foth and Van Dyke study rated sites by the age of the system, the distance from the lake and the elevation above the lake among other criteria. Systems ranked at 10 or less in the 1993 study were the initial sites to be evaluated. The purpose of this study is to describe the systems and evaluate them for compliance with current state code. The question asked at each site was "can this system be installed at this depth and in this location by today's standard", if the question was answered "no", then the system was listed as "failed" based on one of the criteria listed in the Wisconsin Administrative Code which applies to the evaluation of existing septic systems.

Because of the seasonal and intermittent occupancy of most of the dwellings in the study area, MSA sent out questionnaire's to all land owners. The septic system questionnaire asked for information regarding the type of system on the lot, the age, usage, and location of the system in relationship to the lot lines, the lake and buildings. These surveys were returned by many of the land owners and were quite useful in identifying the location of the drainfield during the inspection. A copy of the questionnaire is included in this report (see Figure 2).

The inspection of each of the lots was conducted using the owners questionnaire as a starting point. Each lot inspected was documented on an inspection report form (see Figure 3). The actual field copies of the inspection forms including soil boring logs are in the Appendix. The inspection report form identifies the property by fire number, road name, and owner's name, if known. The report contains a sketch indicating the relative position of the septic system on the lot (the sketch is not to scale) and it has a section which was used to indicate a reason for failure for that particular system if applicable.

The following guidelines were set up by the district and followed during the course of this study:

- septic systems were to be inspected to determine if they were sited in code compliant soils.
- systems were to be inspected by two possible methods: Option "A" or "B"(both of which are described in detail elsewhere in this report).
- privy sites were to be inspected, those lots which only have a privy as the primary means of wastewater disposal are included with the inspection reports. Many of the sites listed by the owner as having "only a privy" were found to have a "grey" water barrel for kitchen sink discharges. These are considered to be septic systems by code definition.
- holding tank sites were not inspected.

PICKEREL/CRANE LAKE PROTECTION & REHABILITATION DISTRICT
Land Owner's Questionnaire - Septic System Evaluation Survey III
July 1998

Please Complete and Return to: MSA Professional Services, Inc., 1230 South Boulevard, Baraboo, WI 53913

1. Owner's Name_____
   Owner's Mailing Address _____

   Lake Property Address_____
   (Fire No. & Road)

2. Septic System Information

   Owner at Time of Construction _____ ☐ Unknown
   Date of Construction _____ ☐ Unknown
   Septic System Contractor _____ ☐ Unknown

   Type of System ☐ Septic Field ☐ In-Ground Pressure ☐ Holding Tank
   ☐ Seepage Pit ☐ Mound ☐ Privy
   ☐ Other _____

   Date Septic Tank Last Pumped _____ ☐ Unknown

   Septic Tank Capacity _____ ☐ Unknown

   Comments_____

3. Type of Property (Please indicate number of days occupied per year in appropriate space)

TYPE	SEASONAL	YEAR-ROUND	
Home	_____	_____	Bedrooms_____
Duplex	_____	_____	Bedrooms_____
Cottages	_____	_____	Units_____
Rest./Tavern	_____	_____	Seats_____
Campsite	_____	_____	Sites_____

   Other_____

4. Have you ever had a problem with your system? ☐ Yes ☐ No

   If yes, was it: ☐ Sewage Backup into Building ☐ Surface Discharge
   ☐ Odor ☐ Soggy Ground
   ☐ Other_____

(PLEASE COMPLETE REVERSE SIDE)

W:\DATA\10\11167\WP\QUEST01.WPD

FIGURE 2

The inspection of each property consisted of the following general items:

- identify the septic system location and type.
- measure the depth of the drainage system.
- determine the suitability of the soils to a depth of 3' below the bottom of the system by either drilling to the depth with a hand auger and/or by use of a hand level, determine the systems relative height above lake level.
- draw a sketch showing system components and dimensions to lake, well, buildings, etc.
- fill out form and boring log if soil boring was required, indicated reason for failure of the system if applicable.

During an inspection of a lot notes were made of such things as relationships of the septic system drainage area to wells, lake shore, buildings, steep slopes, etc. If these setbacks did not meet current code, the system was not necessarily checked as failed, unless it also was sited in non-code compliant soils. A failing private sewage system was one which causes or results in any of the following conditions:

1. The discharge of sewage into surface water or groundwater.
2. The introduction of sewage into zones of saturation which adversely affects the operation of a private sewage system.
3. The discharge of sewage to a drain tile or into zones of bedrock.
4. The discharge of sewage to the surface of the ground.
5. The failure to accept sewage discharges.

The 5 reasons for failure of a system are based on criteria set forth in COMM 83. The Department of Commerce is the regulatory state agency which has authority over septic system installation in the State of Wisconsin. Septic system inspections at Pickerel Lake were conducted with these regulatory requirements as the basis for decisions regarding the individual systems' inspected. This study attempts to identify those septic systems that have the greatest potential for causing contamination to Pickerel Lake. Septic systems located within 3' of a seasonally saturated zone in the soil profile are the most likely to contribute a significant amount of untreated wastewater to the groundwater which ultimately ends up in the lake. Reason number 5 listed above is checked on some reports and is meant as a notification to the home owner that a potentially problem exists concerning their system. At the time of the inspection ponding of effluent in the vent of the drainfield or seepage pit was more severe than normally expected. Owners should keep a close watch on the system and carefully monitor the water usage in the structure to extend the life of the septic system. Reason number 4 is sited as a failed system when a discharge pipe is spotted exiting a structure and discharging to the surface. This condition may be associated with a clear water sump pit and may therefore be legal. Further inspection of the interior plumbing will need to be done by the county officials responsible for issuing enforcement orders on non-code compliant septic systems to determine if this situation is actually a cause for action by the home owner to replace the septic system.

INSPECTION METHODS

OPTION "A"

On-site wastewater disposal systems located in the Pickerel/Crane Lake District were evaluated by the following method:

Each site was inspected to determine the location and depth of the wastewater disposal system (drainfield) and the soil conditions to a depth of three feet below the system (drainfield). Soil conditions in the vicinity of the individual wastewater disposal system (the drainfield) were evaluated and recorded. Depth, color, and texture of the soil horizons were noted along with any observed redoximorphic features (soil mottles). Depth to observed water (if within three feet of the system bottom), bedrock and/or refusal was noted, if applicable. Soil evaluations were done with a hand auger, spade or posthole digger.

Soil mottles were used to determine whether a system is located in a code compliant area. Wisconsin Plumbing Code COMM 83 requires a three-foot separation between the bottom of the disposal system and any zone of seasonal saturation, as determined by soil mottles. The system depth was determined by measuring down the vent pipe in the drainfield or drywell. If such pipe could not be located, further information must be supplied by the owner so a depth of the system can be determined. Once the depth of the system was established, a measurement was made to determine the relative height above lake level and the distance to the lake shoreline from the vent pipe. If the system was located high enough above lake level so that lake water elevation could not be used to determine if the system was in code compliant soils, then a soil boring was made in the area of the system (drainfield) to determine soil suitability. Soil borings were not be necessary at all sites. In areas of similar topography and soil morphology, random soil borings within the area were used to determine soil suitability. In some cases a soil test performed for the replacement of a nearby septic system is referenced on the inspection form. These soil evaluations were usually done with a backhoe and therefore should be viewed as a more complete review of the soils than can be obtained from a hand auger boring. On that basis, the inspector used the soil profile on the soil report as a determining factor for evaluation of the system if all other factors regarding the site supported that soil report data.

Visual observations of sewage effluent surfacing or direct discharge into the lake was noted. This would result in the system being classified as none code compliant. If these pipes, lines, tiles, etc. were not observed, this does not guarantee that illegal lines directing sewage effluent to the lake do not exist. These pipes or drain lines are impossible to detect when they are below the soil/water surface. All discharge lines from a dwelling were identified as sewage discharge pipes and as such are "illegal" unless the owner can show the inspector or the county enforcement agency that the connection to these pipes is a permitted use.

OPTION "B"

This option included all the services listed under Option "A" plus the following:

MSA had the septic tank pumped and inspected at each site where the homeowner located the tank. The tank was pumped by a registered septage hauler and the contents disposed of in accord with DNR statutes pertaining to septage waste disposal. The septic tank was inspected for obvious leaking spots and the baffles were checked to insure that they are still in place. During this inspection, no one was allowed to enter the septic tank. All observations were made from the surface using a high power light and a mirror to check the interior surface of the tank.

PICKEREL LAKE
SANITARY SURVEY RESULTS

Total number sites inspected - 66

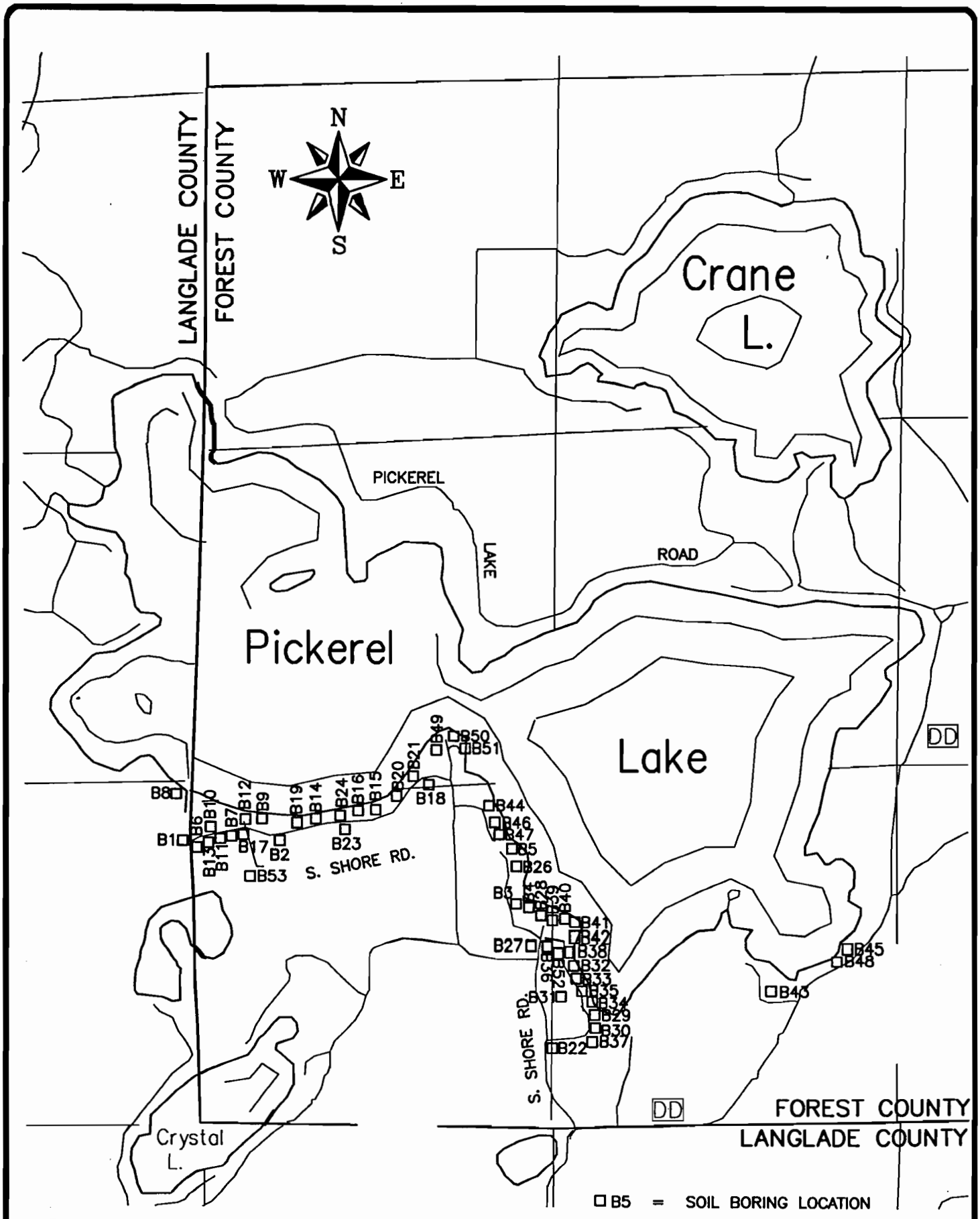
Number of sites with septic system determined to be non-code compliant as defined in COMM 83 State Plumbing Code - 19

Number of sites where no determination could be made - 5

Failure rate for septic system sites
19 out of 61(66 - 5) = 31%

All septic system evaluation sheets are located in the Appendix of this report. The summary on the following pages identifies the sites inspected and indicates results, type of system, and/or comments regarding the system. In a number of cases a complete inspection was not conducted. Usually this occurred because the septic system either could not be located or if the location was identified by the owner, there was no vent pipe on the drainage portion of the system and a depth of the system could not be determined. In those cases, home owners will need to supply further information regarding the location and depth of their systems' so that a complete inspection can be conducted.

A site that is listed as "passed" is not to be construed as a recommendation of the system, it simply means that within the parameters of this study the system could be reconstructed in the place and at the depth it currently occupies. A replacement system, of course, would be larger and configured differently from the existing system in most cases. In some cases additional comments are attached to the system evaluation form, these comments are meant to bring to the attention of the owner other deficiencies that exist that are detrimental to the optimum operation of an on-site sewage disposal system. In many cases full time operation and use of these systems would cause an abrupt failure of the system and possible discharge to the ground surface or backup of sewage into the dwelling.



SOIL BORING MAP

SCALE: NONE	DATE: SEPT., 1998
FIELD BOOK: N/A	MSA PROJECT #:11167
DRAWN BY: DAW	MSA FILE #: FIGURE4.DWG
CHECKED BY:	FIGURE 4

MSA
TRANSPORTATION • MUNICIPAL • IRRIGATION
DEVELOPMENT • ENVIRONMENTAL
PROFESSIONAL SERVICES
1230 South Boulevard Baraboo, WI 53913
608-356-2771 1-800-362-4005 Fax 608-356-2770