SANITARY SEWER REPORT
CRANE LAKE
PHASE I

Project #10903.SS
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INTRODUCTION/PURPOSE

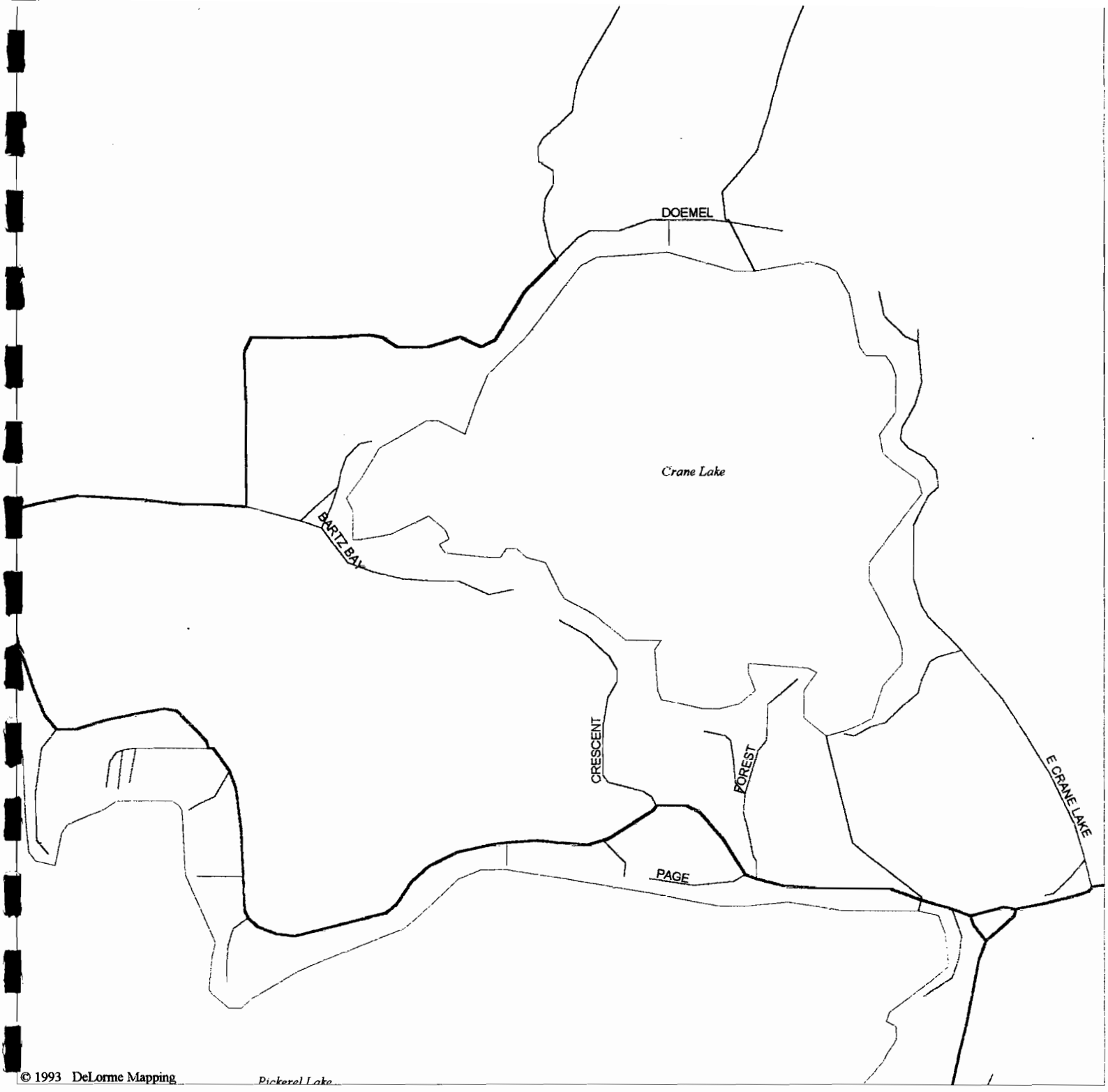
Crane Lake is located in the southwestern corner of Forest County. The lake is included in the Pickerel/Crane Lake Protection and Rehabilitation District (Lake District). Crane Lake is very highly developed along the eastern shoreline on East Crane Lake Lane and along the western shoreline on Doemel Lane. Other pockets of development occur along Bartz Bay Road, Cresent Lane, Forest Lane, Badger Lane and Bay Lane. The development around the lake is predominantly residential. 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 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 July 1996. This report presents the results of Phase I of the study.

SITE/SOILS DISCUSSION

The development around Crane 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 a point where almost all buildable areas are used up. 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 waste 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 and 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' width, so except for areas where two lots were combined, available area for replacement systems is limited.

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 soils over outwash sand and gravelly sand. The subsoil in almost all 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 and seasonal saturation for a depth of three(3') below the bottom of the septic system disposal point.



LEGEND

- County Boundary
- Street, Road
- Major Street/Road
- River
- Open Water

Scale 1:15,625 (at center)

1000 Feet

500 Meters

Crane Lake Area
Mag 15.00
Mon Jul 22 08:21:35 1996

FIGURE 1

STUDY PROCEDURE

Due to the limited grant monies to fund this project, the Lake District personnel selected parcels to be inspected in Phase I of this study based on a previous study conducted by Foth and Van Dyke in 1993. It was felt that the initial sites to be inspected should be the lots that received the highest ratings in the 1993 study. The 1993 study rated sites by the age of the system, the distance from the lake and the elevation above the lake among other criteria. The purpose of this study is to definitively 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 a soil boring log 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 "gray" water barrel for kitchen sink discharges. These are considered to be septic systems by code definition.
- holding tank sites were not inspected.

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 hand auger 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, lakeshore, buildings, 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.

INSPECTION METHODS

OPTION "A"

On-site wastewater disposal systems located in the Pickerel/Crane Lake Sanitary District(PCLSD) 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 ILHR 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 was supplied by the owner so a depth of the system could 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.

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. Each tank was resealed and the soil replaced over the manhole after the inspection was completed.

CRANE LAKE
SANITARY SURVEY RESULTS

Total number sites inspected - 37

Number of sites with septic system determined to be non-code compliant as defined in ILHR 83 State Plumbing Code - 30

Failure rate for septic system sites

30 out of 37 - 81%

All septic system evaluation sheets are located in the Appendix of this report. The list following this page identifies all sites evaluated in this phase of the study. Systems are listed as either "passed" or "failed". If they "failed" there is a reason for failure stated in the next column. Individual reports should be reviewed for more detail about the system/site conditions.

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.

CRANE LAKE
SANITARY SEWER SURVEY RESULTS

CRANE LAKE

	NAME	ADDRESS	EVALUATION RESULTS	REASON FOR FAILURE
1	Richard Borree	1071 E. Crane Lake Lane	Failed	1
2	Audrey Stecker	1065 E. Crane Lake Lane	Failed	1
3	Wayne Krueger	1059 E. Crane Lake Lane	Failed	2
4	Dennis Schwalbe	1053 E. Crane Lake Lane	Failed	2
5	Dennis Arndt	1047 E. Crane Lake Lane	Failed	1
6	Richard Timm	1035 E. Crane Lake Lane	Passed*	
7	John Christopherson	999 E. Crane Lake Lane	Failed	1
8	Herman Hopfensperger	929 E. Crane Lake Lane	Failed	2
9	Vernon Thompson	921 E. Crane Lake Lane	Passed*	
10	Ann Vanderbush	887 E. Crane Lake Lane	Failed	2
11	Elmer Grassl	863 E. Crane Lake Lane	Failed	1
12	J & B Trophy(cabin)	823 Forest Lane	Failed	2
13	J & B Trophy(house)	823 Forest Lane	Failed	2
14	Otto Litt	804 Cresent Lane	Passed*	
15	Arthur Kloss	828 Cresent Lane	Failed	2
16	William Klepel	846 Cresent Lane	Passed	
17	Gary Feller	852 Cresent Lane	Failed	2
18	Charles Borchardt	9354 Badger Lane	Passed	
19	Delores Benzschawel	9380 Badger Lane	Failed	2&5
20	Victor Gestwicki	9248 Bay Lane	Failed	2
21	Rich Grams	9252 Bay Lane	Passed*	
22	Curt Wolf	9178 Bartz Bay Road	Failed	2
23	Louis Mailloux	9214 Bartz Bay Road	Passed*	
24	Jack Doemel	9193 Doemel Lane	Failed	4
25	Robert Starich	9183 Doemel Lane	Failed	2
26	Jeff Sheldon	9167 Doemel Lane	Failed	2
27	Art Naparalla	9163 Doemel Lane	Failed	2
28	Mark Donnermeyer	9157 Doemel Lane	Failed	2
29	Leo Tresp	9153 Doemel Lane	Failed	2
30	Richard Laux	9149 Doemel Lane	Failed	2
31	Larry Nichols	9109 Doemel Lane	Failed	2
32	Richard Larson	9103 Doemel Lane	Failed	2
33	Lester Oerum	9091 Doemel Lane	Failed	2
34	Daniel Mitchell	9085 Doemel Lane	Failed	2
35	William Steffen	9051 Doemel Lane	Failed	2
36	Jerome Heiting	9033 Doemel Lane	Failed	1
37	Gerald Reynebeau	9193 Doemel Lane	Failed	1

Reasons For Failure

1. Discharge of sewage to surface or groundwater
2. Discharge of sewage to zones of seasonal saturation
3. Discharge of sewage to drain tile or bedrock
4. Discharge of sewage to ground surface
5. Failure of system to accept sewage discharge

Failure Rate = 30 of 37 = 81%

* w/comments