

CHAPTER 2

INTRODUCTION

This report presents the conclusions and recommendations of the Wastewater Facilities Plan for the City of Rice Lake, Wisconsin. The planning area consists of the City of Rice Lake. This project was undertaken by the City of Rice Lake to evaluate wastewater treatment alternatives for the planning area over the next 20 years.

The facilities planning process is required by the Wisconsin DNR and U.S. EPA prior to expansion or modification of a wastewater treatment plant or to receive any grant money for the construction of wastewater treatment facilities. The planning process is a systematic economic, technical, and environmental evaluation of alternatives for wastewater treatment and disposal. The recommended wastewater treatment alternative must meet the required effluent limitations and be cost effective. The facilities planning procedure assures the public and all levels of government that decisions regarding the facilities are soundly made and consider all relevant factors.

PROJECT BACKGROUND

The Rice Lake Utilities owns and operates a 2.2 mgd wastewater treatment plant (WWTP) that treats wastewater generated within the City of Rice Lake and discharges treated effluent to the Red Cedar River. In 2007, the average daily flow to the plant was 1.55 mgd and the plant received an average of 5,459 lbs/day of biochemical oxygen demand (BOD).

The current wastewater treatment plant for the Rice Lake Utilities was upgraded in 1997 in accordance with a Facilities Plan completed in 1995. The 1997 plant had an average annual design capacity of 1.405 mgd and a 4,444 lbs/day of BOD. The upgrade of the plant facilities included influent screening, hauled wastes receiving, biological phosphorus removal, sludge thickening, digester modifications, and sludge storage facilities. In 2003 the Wisconsin Department of Natural Resource (WDNR) re-rated the WWTP for higher hydraulic and wasteload capacities. The annual average design capacity was increased to 2.2 mgd and 6,238 lbs/day of BOD.

The Rice Lake WWTP is currently meeting its permitted discharge standards. Effluent quality in 2007 averaged 21 mg/L BOD, 13 mg/L total suspended solids (TSS), and 0.64 mg/L total phosphorus (TP). However, influent plant loadings are all greater than the values used in the

1995 Facility Plan. Waste loadings for BOD, TSS, and TP are all in the range of 85% - 95% of the re-rated plant capacity.

In 2007, Rice Lake Utilities prepared an Operation and Needs Review (ONR) to address the planning needs of the plant for the next 5 to 10 years. The ONR identified a list of high priority infrastructure improvements to be undertaken, including:

- Improving grease and leachate handling in septage receiving areas
- Replacing/upgrading the grit handling facilities
- Reviewing various electrical and HVAC systems
- Increasing aeration system efficiency and capacity
- Improving the return activated sludge (RAS) system
- Upgrading the anaerobic digestion system and sludge storage

PURPOSE AND SCOPE

A Facilities Plan develops the most cost-effective and environmentally sound plan for wastewater management to abate existing sources of pollution, provide adequate treatment capacity for future growth in the planning area, and meet area wide water quality standards and water management goals issued by the WDNR. The most current planning guidelines and regulations distributed by the U.S. EPA and WDNR were used to prepare this report.

The scope of work for this Facilities Plan included the following activities:

1. Review existing data and facilities by visiting the facilities with Owner personnel, and obtaining copies of operating data and reports. The data will include: influent and effluent data as well as biosolids data for a minimum of three years. The data will also include any previous reports.
2. Analyze the performance of the existing plant and individual unit operations. Review existing facilities to identify items that will need upgrading or replacement. The study will focus on the results of the Operations and Needs Review.
3. Prepare an infiltration/inflow (I/I) analysis including analyzing existing plant data to determine the amount and type of I/I. Perform a cost-effectiveness analysis to evaluate the cost of additional plant hydraulic capacity to convey and treat I/I versus typical I/I reduction measures.

4. Prepare 20 year population and flow projections, using existing wastewater and population data and population projections from the Wisconsin Department of Administration and the City of Rice Lake Comprehensive Plan (2003). Review population and wastewater projections with the Owner.
5. Correspond with the Wisconsin Department of Natural Resources to develop effluent limits as appropriate for the projected wastewater flows.
6. Select, develop and investigate viable wastewater management alternatives that address the needs of the Owner. Conduct a brainstorming meeting with the Owner to obtain input and to screen the alternatives.
7. Prepare a mid-course review presentation to discuss the project with the Owner, DNR, and other interested agencies.
8. Prepare sizing and layouts for the viable alternatives. Identify potential arrangements on the present treatment plant site.
9. Prepare a cost-effectiveness analysis and a non-monetary evaluation of the viable alternatives. Estimate capital costs and operations and maintenance costs for the viable alternatives. Evaluate non-monetary advantages and disadvantages of the viable alternatives. Recommend a preferred alternative to the Owner.
10. Prepare an implementation plan and schedule for the selected alternative. Estimate the impact of the selected plan on the Owner's sewer user charge system.
11. Prepare a draft facilities plan report and submit 5 copies to the Owner for review.
12. Assist the Owner in conducting a public hearing on the draft facilities plan.
13. Finalize the facilities plan incorporating comments from the Owner, and submit the final facilities plan to the DNR. Review any DNR comments and prepare a response.

PLANNING AREA AND STUDY PERIOD

The City of Rice Lake is located in northwest Wisconsin, approximately 50 miles north of Eau Claire, and contains approximately 5,360 acres in Barron County with a service area population of approximately 8,600 people. The planning area for the Facilities Plan is shown in Figure 2-1.

In accordance with NR 110 of the Wisconsin Administrative Code, the planning period for the Facilities Plan will be 20 years. The planning period begins with the startup of the proposed facilities, which should occur in 2010. Therefore, the planning period encompasses the years 2010 through 2030.

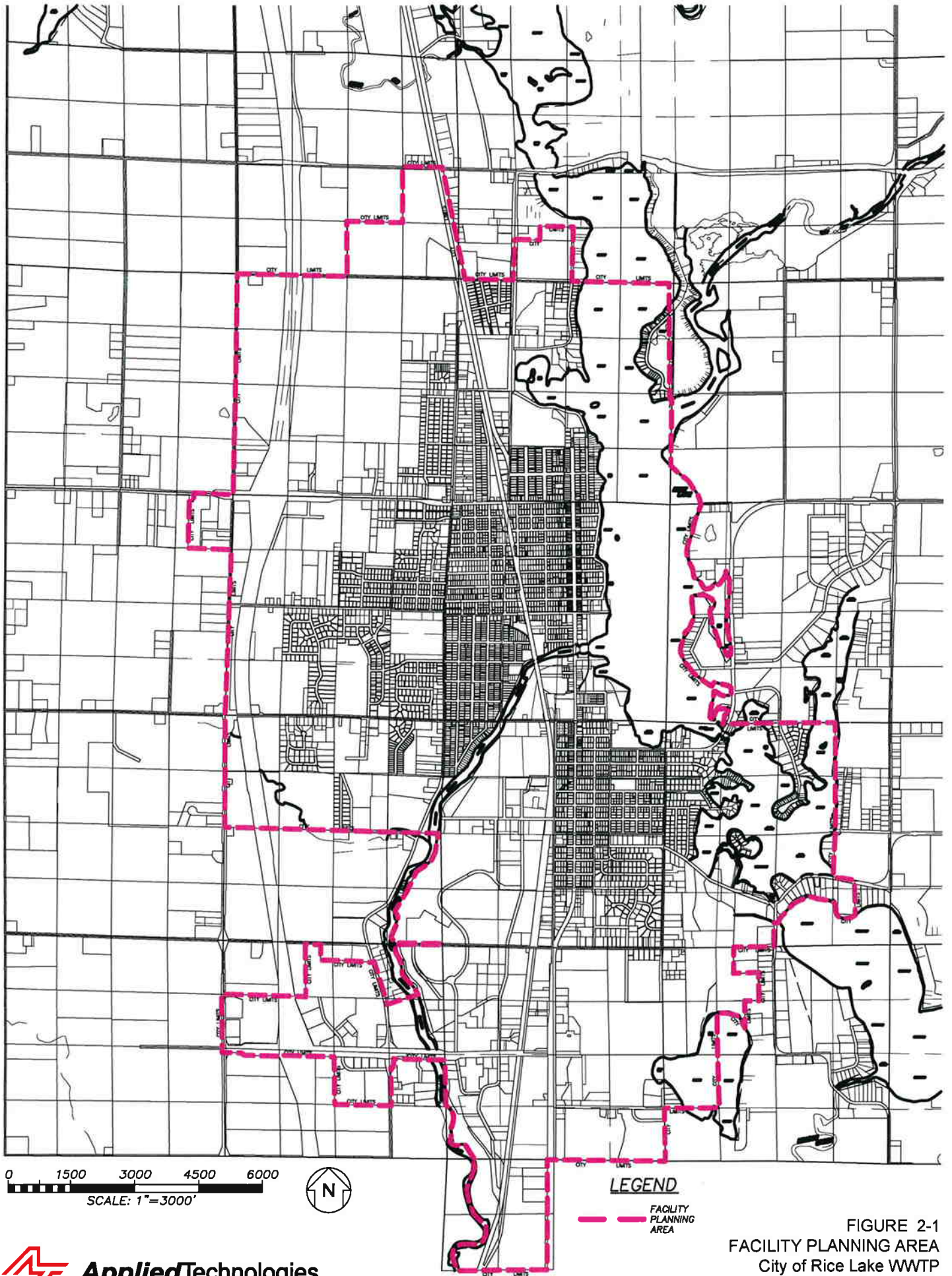


FIGURE 2-1
FACILITY PLANNING AREA
City of Rice Lake WWTP