

CHAPTER 9

HAWTHORN WATER TOWER – WELL HOUSE #1

BACKGROUND

The Hawthorn Water Tower and Well House #1 were constructed in 1973. The water tower is a 500,000 gallon elevated steel water spheroid, as shown in Figure 9-1. The well house shown in Figures 9-2 and 9-3 originally included a 1,300 gpm well, but the well was abandoned when Vernon Hills began receiving Lake Michigan water from CLCJAWA. Since then, the room housing the well has been removed and the only items that are currently utilized in Well House #1 are the water tower level control panel and an AT&T bridge panel. All of the remaining equipment in the well house is over 40 years old, obsolete, and unused. LCPWD continues to pay for utilities and maintenance for this building. After the electrical panels are removed, the building can be repurposed by the county for other uses.



Figure 9-1
Hawthorn Water Tower

RECOMMENDATIONS

Electrical Equipment

The Well House was evaluated to determine whether or not the existing service could be reduced, since a large portion of its electrical equipment has been either decommissioned or removed, such as the 300 HP well pump that was fed from the MCC. The remaining loads fed from the MCC are exhaust fans, the lighting panel, and the equipment located in the base of the tower. Furthermore, while all exhaust fans are currently connected, two of them are locked out. This means that the main remaining load located within the building is the lighting panel. However, the lighting panel is important because it provides power for the building telemetry, building heating, and the police transmitter.



Figure 9-2
Well House #1 Exterior

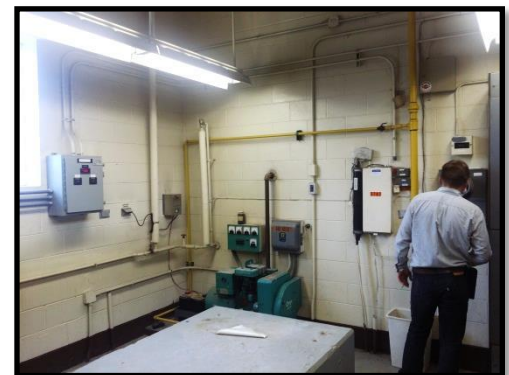


Figure 9-3
Well House #1 Interior

During the evaluation it was determined that the majority of the equipment located in the well house is obsolete or past its useful service life (including the old generator, MCC, AT&T bridge panel) and should be removed. It is recommended that the well house itself not be demolished at this time as it is in decent shape and in the future the County could repurpose it easier and cheaper than constructing a new one on the site. It is also recommended that the existing electric service be replaced with a smaller single phase service as the load has decreased significantly. During the replacement of the electric service, it is also recommended that the metering equipment be moved to the exterior of the building so that the LCPWD staff does not have to meet at the site monthly to allow the Utility Technician inside to read the meter. A preliminary cost estimate for the demolition of the equipment inside of the Well House and the electric service modifications can be found in the Capital Costs section at the end of this chapter.

SCADA System

Figures 9-4 through 9-7 show the existing control panels and SCADA system located in the Water Tower and Well House. The Hawthorn Water Tower radio telemetry system was installed in 2013. It consists of a MDS/GE 900 MHz spread spectrum radio and an Ethernet switch. Though the radio is operational and links back to the Vernon Hills WRF, there are no Programmable Logic Controllers (PLCs) or Remote Terminal Units (RTUs) connected to the radio. Switching over to the radio system will eliminate the need for the existing telephone line.



Figure 9-4
Well House #1
Existing Lighting Panel



Figure 9-5
Existing Tower
SCADA Panel



Figure 9-6
Existing Well House
Control Panel



Figure 9-7
Existing Well House
Telemetry Panel

It is recommended that a new SCADA PLC panel be installed in the Water Tower. Data for the suggested SCADA equipment can be found in Appendix E. The panel would include:

- Allen-Bradley CompactLogix L33ER PLC
- (2) 4-point analog input card

A 15-inch touchscreen on the front of the panel will provide control and display local data. An uninterruptible power supply (UPS) will maintain PLC function and data transmission in the event of a power failure. The existing tower level transmitter will be disconnected from the level indicator panel in the Well House and reconnected to the new Tower PLC. The existing Ethernet switch will be utilized to connect the new PLC to the SCADA network to provide control, status monitoring, and alarm monitoring data to the Master SCADA PLC at the Vernon Hills WRF.

Miscellaneous

Currently, the floor of the tower base is gravel. It is recommended that a concrete housekeeping pad be poured in the tower base. Additionally, HVAC upgrades for the tower base itself were evaluated, but it was determined that the control panel could be fitted with equipment to ventilate and heat it, meaning that HVAC upgrades in the tower base are not needed.

CAPITAL COSTS

The estimated capital costs for the recommended improvements are shown in Table 9-1. It includes contingencies, engineering, and administration.