



Village of Pingree Grove Water & Wastewater Treatment Plants



Water Treatment Plant

WATER SUPPLY WELLS

The water supply for the Village of Pingree Grove and Cambridge Lakes comes from two (2) new deep wells. The deep wells (Well No. 1 and Well No. 2) are to be drilled over 1,330 feet deep into the Galesville aquifer. Each well can produce 1,400 gallons of water per minute.



WATER TREATMENT PLANT

Water from the deep wells is pumped first to a draft aerator and detention tank. The aerator strips off any gas in the raw water. The raw well water is then pumped to three (3) ion-exchange softening units where radium and hardness are removed. Chemicals are added to the water prior to discharge into the distribution system (Chlorine for disinfection, Fluoride for preventing tooth decay, and Polyphosphate for corrosion resistance). A home water softener will not be required for the majority of the residents.



TREATED WATER CHARACTERISTIC

pH	7.9
Hardness	26 mg/L
Radium	2 pCi/L
Chlorine residual	2.0 mg/L
Fluoride	1 mg/L

ELEVATED STORAGE TANK

A 1.0-million gallon elevated storage tank is being constructed for the Village of Pingree Grove. The storage tank provides emergency water supply for the distribution system and maintains adequate water pressure for the area.



SUMMARY

The facility construction will be complete August 1, 2005.

The WWTP/WTP projects are a design/build venture by Lintech Engineering, LLC of Crystal Lake, IL and Joseph J. Henderson & Son, Inc. of Gurnee, IL.

The Water Supply Wells were constructed by Layne-Western of Aurora, IL.

The Elevated Storage tank was constructed by Chicago Bridge & Iron (CBI) of Plainfield, IL.

DESIGN/BUILDER



Lintech Engineering, LLC
500 Coventry Lane, Suite 270
Crystal Lake, IL 60014
815-479-5180



Joseph J. Henderson & Son, Inc.
4288 Old Grand Avenue
Gurnee, IL 60031
847-244-3222

Wastewater Treatment Plant

INTRODUCTION

The Village of Pingree Grove Wastewater Treatment Plant (WWTP) is designed to treat 1.0 million gallons of wastewater each day primarily from the Cambridge Lakes development. Cambridge Lakes is a new development in Pingree Grove, ultimately consisting of over 2,500 residential homes and new commercial area. The Village of Pingree Grove will own and operate the WWTP.



PRELIMINARY TREATMENT

Wastewater from the development flows through gravity sewer pipes and a lift station to reach the Pingree Grove WWTP. The wastewater is first pumped to the screen building. A fine screen removes coarse material and washes, compacts, and transports the materials for disposal.

SECONDARY TREATMENT

Secondary treatment is designed to remove dissolved organic solids in the



wastewater. These organics are removed biologically in an aeration tank consisting of mechanical aerators. Oxygen is mixed and transferred in the aeration tank to allow micro-organisms to convert the dissolved organics and ammonia to a stable product. The wastewater is treated in the aeration tank for over 15 hours to allow removal of organics and ammonia. The WWTP also incorporates an advanced process to further remove nitrogen and phosphorus for greater level of treatment. The wastewater then flows to two clarifiers designed to settle out suspended solids.



TERTIARY TREATMENT

After secondary treatment, the wastewater flows to two automatic sand filters. The sand filters filter out any remaining fine suspended solids and produce a clear effluent.



CHLORINE DISINFECTION

The final process is disinfection of the wastewater using chlorine. Chlorine solution is injected into the wastewater and destroys any disease-causing organisms remaining in the water.

EFFLUENT REUSE

The reuse of treated wastewater effluent is a valuable method of water conservation. The clean effluent from the WWTP will be used to irrigate parks, open areas, and berms. Effluent is pumped from the WWTP through a force main system to the irrigation sites from mid-April to mid-November. Over the winter months, the treated effluent is held in a storage pond. A series of monitoring wells are designed to sample and test the irrigation sites each month.

SOLIDS HANDLING

Solids that are removed from the wastewater are pumped to an aerobic digester. In the digester, air is added to oxidize the solids to reduce volume and increase stability. The digested solids are then dewatered by a belt filter press and trucked off-site.



WWTP DESIGN DATA

Flow Parameters

Design Flow	1.0 mgd
Peak Hourly Flow	3.0 mgd

Influent Parameters

Biological Oxygen Demand (BOD ₅)	1,700 lbs/day
Suspended Solids (TSS)	2,000 lbs/day
Ammonia Nitrogen (NH ₃ -N)	35 mg/L

Effluent Parameters

BOD	3 mg/L
SS	1 mg/L
NH ₃ -N	< 1 mg/L
Total N	< 10 mg/L
Fecal Coliform	< 10/100 mL