



# Wildlife Refuge Upgrades to FHP Geothermal HVAC System

## Case Study



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### Geothermal Retrofit In Central PA at the Middle Creek Wildlife Visitors Center

#### Background

Wildlife has always been an important part of Pennsylvania's cultural heritage. For over a century, the Pennsylvania Game Commission has managed the Commonwealth's wildlife resources. With more than 700 full-time employees and thousands of part-timers and volunteers, the agency provides a host of benefits to wildlife, state residents and visitors. Tourists flock to the Middle Creek Wildlife Visitors Center in Kleinfeltersville to view snow geese, as well as other waterfowl, birds and wildlife. Tundra swans are attracted to Middle Creek annually because it provides a secure resting and water-roosting area from late February and early March. The large birds converge on Middle Creek as a migratory stopover before continuing north to the arctic for breeding. Their stay ranges from a few days to a few weeks.

The Pennsylvania Game Commission installed a new Bosch FHP geothermal HVAC system at the Middle Creek Visitors Center to replace two aging rooftop units and provide a more comfortable, energy-efficient environment for visitors and staff. According to Chief of PA Game Commission Engineering Division Foster "Chip" Schaffer, P.E., "The Visitors Center is an observation and education building located within 4,000 acres of game land including a 350-



*Bosch FHP LV Series 8 and 10 ton commercial heat pumps installed in the ceiling of the auditorium. connect into existing ductwork system to provide year-round comfort*

acre lake. It was built in the 1970s and the existing air-to-air rooftop units were aging and it was increasingly difficult finding replacement parts. We had some previous experience using geothermal systems with a couple of other state facilities, so we decided to upgrade to geothermal here at Middle Creek."

#### Installation Summary

The Visitor Center requires 40 tons of cooling, so with the assistance of Leibold Mechanical, a family-owned HVAC installer, they selected eight Bosch FHP EC and LV Series water-to-air units ranging from one to 10 tons capacity. According to Clayton Leibold, "the one-ton units are spaced throughout the building and, along





Tundra Swans on lake, photos courtesy Joe Kosack / PGC Photo. Middle Creek Visitors Center shown below.

with the larger units mounted on the ceiling, tie into the building's existing ductwork.

A fresh air intake with a 22-kW electric heater tempers incoming outside air. Electric baseboard heaters provide warmth to several small vestibules; otherwise the geothermal system is designed to meet demand for heating and cooling year-round."

Twenty geothermal wells, each 300 ft deep in a closed loop system are tied into a header routed to the equipment room which houses two 5-hp circulating pumps. The two aging rooftop units were removed, geothermal wells drilled and the system piped and commissioned by Leibold, who purchased the geothermal equipment from FHP Representative Energy Transfer Solutions in Kennett Square, PA. The PA Game Commission opted to replace the old

roof and increased the new roof thickness to improve the R-value, which in turn enhances the performance & efficiency of the new HVAC system.

### Summary and Conclusion

The renovation project began in early 2014 and completed in spring. The Visitors Center remained open as usual during the renovation project, and no public programs were disrupted. "Leibold has done a good job for us; we're pleased with the new geothermal HVAC system and anticipate high performance with lower energy bills," reported Chip Schaffer.



Twenty wells each 300 ft deep provide a closed-loop geothermal field routed to the mechanical room.



#### Project Name:

- ▶ Middle Creek Wildlife Refuge, Kleinfeltersville, PA

#### Property Owner:

- ▶ Pennsylvania Game Commission

#### Engineers:

- ▶ H&H Sales Associates, Mechanicsburg

#### Application:

- ▶ Conversion to Bosch FHP EC and LV Series geothermal heat pumps

#### Installing Contractor:

- ▶ Leibold Mechanical, Inc., Pottsville

#### Manufacturer's Representative:

- ▶ Energy Transfer Solutions, Kennett Square

#### Project Completion:

- ▶ Spring 2014