



# WACO GOES TO ANY DEPTH TO COMPLETE THE JOB

## Project Details



It is not every day that mechanical construction work in central Virginia requires scuba divers to be involved. That is exactly what Waco needed, after being awarded a contract by the City of Virginia Beach for HVAC improvements at the Lake Gaston Pumping facility. Since 1998, this facility has been providing the cities of Virginia Beach and Chesapeake with up to 60 million gallons a day of fresh drinking water. Water is pumped through a pipeline 76 miles long and then through a series of ponds reservoirs and local piping to deliver this water almost 120 miles from Lake Gaston to Virginia Beach and Chesapeake.

The pump house at Lake Gaston contains 6 immense vertical pumps and motors for pumping the water through the 60 inch diameter pipeline. These pumps generate a large amount of heat and must be cooled by air conditioning. The existing cooling system consisted of a 40-ton chiller and an air handling unit. In an effort to reduce energy usage and operating costs, the City of Virginia Beach hired an engineering firm to design a more efficient system. The newly designed system would consist of an 80-ton Trane™ water source heat pump with two 40-ton geothermal heat exchangers. The heat exchangers

would be located underwater in a 35 foot deep wet well and would utilize the constant temperature of the lake water to provide cooling to the heat pump. This is a very efficient system that incorporates a natural resource as its energy source.

The wet wells had to be completely pumped out in order to install the heat exchangers. Unfortunately, the sixty-inch valves that allow water from the lake to flow into the wet wells would not fully close. Waco had to fabricate two eight-foot diameter plates to cover the openings and seal off the lake water from the wet well, so that the wells could then be pumped out. This is where the scuba divers came in. The plates were fabricated in four pieces due to the heavy weight of the ½ inch steel plate. The divers had to drill eighty anchor-bolt holes for each plate underwater. Re-bar in the concrete had to be cut with an underwater torch. The plates were then floated into place using inflatable buoys, and bolted, sealing off the water inlet. The wet wells were then pumped out and cleaned, so that the heat exchangers could be installed.

The contract specified that the wet wells could be out of service for no more than 3 weeks, which was a critical aspect that required extensive planning and coordination.

### Project Facts:

- Safety: Confined Space requirements adhered to when entering a 11 ft x 31 x 35 foot wet well
- Environmental: All grit, silt and debris cleaned inside wet well could not be returned to the lake and had to be disposed of offsite.
- 80 Ton Trane™ Water Source heat pump
- 2 each 40 Ton Geothermal Heat Exchangers
- Project Manager: Fletcher Braswell

Waco used their own work force to mount the new heat exchangers and install the piping that lead to the main pump room. Waco also disassembled and removed the 40 ton chiller, chiller pumps and piping to make room for the new 80 ton water source heat pump. In addition, the system had to tie into an existing boiler so that the pump room could be heated during the winter months.

The project was completed in a 6 month time frame and is providing the cost savings and efficiency that will help keep a constant fresh water supply to Virginia Beach and Chesapeake for years to come.



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