**The Client**

The Palm Coast WWTP consists of 6.83 MGD primary, secondary, and tertiary treatment. The primary treatment includes automatic, continuous self-cleaning mechanical barscreens, biofilter odor control and grit removal.

**The Benefits**

- Increasing efficiency with SCADA system
- Gained value by working with one supplier
- Easy to operate
- Produces high quality effluent used for reclaimed water distribution

**The Client’s Needs**

The City of Palm Coast, located on the east coast of Florida, expanded their existing Wastewater Treatment Plant (WWTP) in 2005 to increase capacity to 6.83 MGD due to population growth and a desire to achieve reuse water standards for use of plant effluent within the City. The existing facility disposed effluent wastewater at rapid infiltration basin sites, spray fields, and a wet weather discharge site. With an upgraded biological treatment system and the addition of tertiary filtration, the plant would be able to send effluent to reclaimed reuse customers, which use the high quality water for golf course and lawn irrigation; therefore, providing the benefit of preventing the wasting of potable or surface water.

In conjunction with the expansion of mechanical equipment for the plant improvements, the City of Palm Coast upgraded the plant’s automation. The plant desired to expand their existing instrumentation and control for additional ease of operation.

**The Solution**

The existing secondary treatment system consisted of two identical process trains, each with a single oxidation ditch and two secondary clarifiers. The plant expansion added a third process train with a Kruger AE-DENITRO ditch system followed by two new circular clarifiers.

Tertiary treatment consists of Kruger Hydrotech Discfilters and high level disinfection (“bulk” NaOCl).

Treatment of the biosolids includes aerobic digestion and sludge thickening. After which, the sludge is hauled offsite for final treatment at a residuals management facility.
For the plant automation, Kruger provided PLC control panels for the Kruger supplied equipment, as well as additional equipment added during the expansion. Kruger also provided a plant wide SCADA system, instrumentation, motor control centers (MCC) and variable frequency drives (VFD).

**Process Description**

To meet the challenges identified by the City of Palm Coast, the new AE-DENITRO process train is designed to treat an additional design flow of 2.275 MGD for biological treatment.

The AE-DENITRO ditch system at Palm Coast consists of five (5) 40 hp brush aerators, two (2) 4.4 hp submersible mixers and one (1) effluent weir. The AE-DENITRO process uses alternating aerobic (for nitrification) and anoxic (for denitrification) phases to reduce effluent total nitrogen levels. This is achieved by separating aeration and mixing in the oxidation ditch, as well as incorporating automated dissolved oxygen (DO) control.

The Kruger Hydrotech Discfilter system consists of four (4) HSF2218-2F Discfilter units, installed below ground in concrete basins, for tertiary treatment to meet the entire plant’s TSS effluent requirements. The Discfilters use cloth filter media panels mounted onto vertical disc segments to separate solids from water.

The Kruger controls system upgrade consisted of an “open solution” utilizing Ethernet technology to protect the city’s ability to utilize tomorrow’s technologies. The Ethernet -based process control system implemented the open Modbus TCP protocol. System components include “intelligent” MCCs that communicate directly with the plant PLC’s.

**Results**

The effectiveness of Kruger’s AE-DENITRO system, followed by the Kruger Hydrotech Discfilter for tertiary treatment, allowed the Palm Coast WWTP to expand its capacity to accommodate the City’s population growth and add the production of reuse water for distribution to customers. In addition, Kruger’s supply of instrumentation, PLC’s, MCC’s and SCADA allowed the City to effectively and efficiently operate the plant on and offsite. Overall, the City gained the value and ease of working with one supplier, Kruger, for providing the central equipment for the upgrade, as well as the main portion of the plant controls.