



## Hot Water Generation

**Customer:** Doane's Pet Care

**Location:** Muscatine, IA

**Scope of Work:** This pet food facility's process water has very high mineral content because it is sourced from local wells. The commercial gas-fired heat exchangers, providing critical process hot water, would foul due to scale in 6-8 weeks. The cleaning of the heat exchanger required one day of downtime which limited production output. This shutdown was required eight times per year.

- Upgrade Projects:**
- Armstrong International conducted an analysis that first reviewed whether steam or gas-fired hot water heaters would be the more effective technology to remedy the problem
  - Armstrong determined that a direct contact gas-fired hot water heater with integral source tank would solve the problem. Additionally, Armstrong recommended and engineered a heat recovery project to reclaim Btu's from excess process water being sent to drain. This water was re-routed to feed into the one million Btu Armstrong Flo-Direct® Complete Thermal Exchange (CTE) water heater.

**Terms:** The Flo-Direct® began supplying process hot water in September 2003.

- Benefits:**
- No required shutdowns to clean the direct-contact gas-fired Flo-Direct® unit, versus eight annual one day shutdowns with the past hot water heater
  - The Flo-Direct® is 99% efficient, versus 85% efficiency of the previously installed unit
  - The innovative engineering for the heat recovery of the excess process water provided \$8,000 in annual energy savings, as well as unspecified sewer savings
  - Doane's was so satisfied with the performance of the Armstrong Flo-Direct® that the heater has been installed at other facilities

