

R.F. MACDONALD CO. PROVIDES TURNKEY, PERMANENT PUMP SYSTEM FOR MOVING POND WATER IN GREEN WASTE DECOMPOSITION PROCESS



The R.F. MacDonald Co. Analysis & Solution

The solid waste site had been using rental diesel pumps, which utilized prime assist with foot valves, but large amounts of fine organic solids caused the foot valves to clog and fail. The foot valves were necessary to keep the suction lines flooded during shutdown.

Additionally, the lack of circulation allowed the pond water to become stagnant, producing unwanted odors.

After excessive pump maintenance and downtime, the pumps were deemed too expensive and unreliable. An economical and permanent solution was required with the desire to use the site's self-generated electrical power.

Based on a history of success with the customer, R.F. MacDonald Co. was asked to develop a permanent, turnkey pumping solution with full system reliability.

Full-Service Capability

- **Piping:** Experienced technicians installed 280 feet of 4-inch high-density polyethylene pipe (HDPE).
- **Electrical:** Certified controls experts replaced the existing VFD with a new control panel on a newly poured 8-inch concrete pad.
- **Fabrication:** Skilled pump experts designed and built stainless steel custom pump stands to easily move the pumps and withstand a corrosive environment.



Toyo-Heavy HNS Submersible Slurry Pump with Custom Stand



Pump Positioning and Installation

Solid Waste Site
Bay Area, CA
Pump System Design & Installation

Customer Application

In Northern CA, a solid waste site creates an organic compost product by using green waste collected from curbside bins that have been ground to ≤ 1.5 -inch pieces using a Covered Aerated Static Pile (CASP) process for decomposition and pathogen reduction.

Liquid management is critical to the process and involves water in contact with green waste in a closed-loop system.

The CASP process encourages organic decomposition and requires an initial addition of water containing common bacteria and fungi.

First, contact water is sprayed to inoculate the freshly ground material, which kick-starts the decomposition process. Excess contact water, that is not absorbed by the material, is then captured and allowed to flow back into the contact water pond where it is stored. Finally, the contact water is pumped back to the CASP located at an elevation of 80-feet above the pond and the process repeats.

PUMP CASE STUDY

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R.F. MacDonald Co. provided three heavy duty pumps sourced from Toyo-Hevvy. The transfer process uses two pumps as part of a multi-stage design to move the pond water, a light slurry, uphill to the CASP. The third pump provides circulation within the contact water pond.

One Toyo-Hevvy HNS submersible pump generates 600 GPM at 127 feet of TDH to boost the light-slurry pond water 22 feet uphill to the booster pump. Choosing a submersible lift pump eliminated the challenge of keeping the suction lines flooded. It also generates ample suction at the booster pump.

The Toyo-Hevvy HNH booster pump generates an additional 127 feet of TDH, pumping over another hill to the CASP green waste pile.

The third pump is a circulation pump, which discharges through 280 feet of HDPE in the shape of a giant T with nozzles located at the ends. This helps evenly circulate the product throughout the pond, which has greatly reduced the amount of odor.

The new pump system has met all performance expectations. Both booster and circulation applications have been working reliably since startup in December 2020.

R.F. MacDonald Co. is proud to offer reliable pumping solutions for the green waste decomposition process.



Toyo-Hevvy HNH Booster Pump



Lift Pump to Booster Pump



Control Panels and VFDs