



## FACT SHEET

### COMMERCIAL SLUDGE PUMPS

Sludge Pump Selection and Cost Information  
Fact Sheet Series  
May 2014

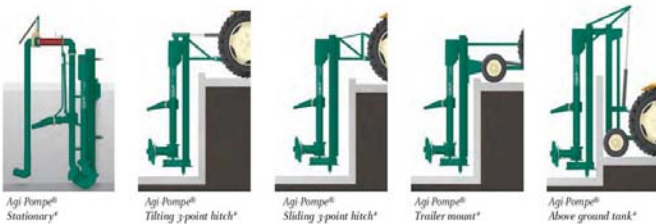
This fact sheet provides information on a variety of commercially available pumps suitable for pumping piggery and/or feedlot sludge.

#### Centrifugal Pumps

Centrifugal pumps are generally the cheapest option and are suited for smaller sludge removal operations. There is a wide range of centrifugal sludge pumps (chopper pumps) on the Australian market. Most manufacturers offer various designs including submersible and non submersible, impeller types and casing material types, all for a range of pipe diameters.

#### Non - submersible

Examples of pumps specifically designed for pumping sludge from ponds are listed in Table 1. They either have an adjustable pump length or can be driven by a tractor (Figure 1). Supplied by GEA Farm Technologies – <http://www.gea-farmtechnologies.com/au/en/>.



**Figure 1 – Five versions of Agi-Pompe and super pump of GEA**

There are also heavy duty horizontal centrifugal sludge pumps available as shown in Figure 2. These pumps are designed for continuous pumping of abrasive material and are designed for a long life.



**Figure 2 – Slurry Pro heavy duty centrifugal sludge pump**

Pump	Description	Revolutions Per Minute (RPM)	Capacity (m3/hr)
Agi-Pompe	To agitate, chop and transfer effluent containing fibrous material and high percentage solids	540 RPM (with 120 HP min), 1000 RPM (with 160 HP min)	Up to 4878
Super Pump	To handle thick manure slurry with a low chopped straw content	540 RPM (with 90 HP min), 1000 RPM (with 180 HP min)	Up to 4878
Articulated screw propeller agitator	Effectively mix sludge from the pond floor, large impeller for faster agitation without splash and less odours, optional side to side articulation	540 RPM (with 120 HP min)	

**Table 1 – Example pumps from GEA**

#### Submersible

An example of a Flygt submersible centrifugal sludge pump is provided in Figure 3. There are a variety of these pump types readily available on the market.



**Figure 3 – Flygt submersible centrifugal sludge pump**

Features of submersible centrifugal sludge pumps:

- Cost effective and portable.
- Electrical motor.
- Handle sludge with up to 10 per cent TS content.
- Semi open impeller design to reduce blockages.
- Minimal number of parts and simple design.

## Positive Displacement Pumps

Positive displacement pumps generally have a higher initial cost and are best suited for large-scale or continuous sludge removal operations with high TS content. For example, desludging a large pond with 10 years sludge accumulation. Regular desludging is recommended to avoid TS concentrations of >10 per cent which make sludge more difficult to remove.

### Diaphragm Pumps

Commercial examples of diaphragm pumps used to pump municipal and mining slurries include:

GEHO PD Slurry Pumps -  
<http://www.weirminerals.com/default.aspx>

Advantages are:

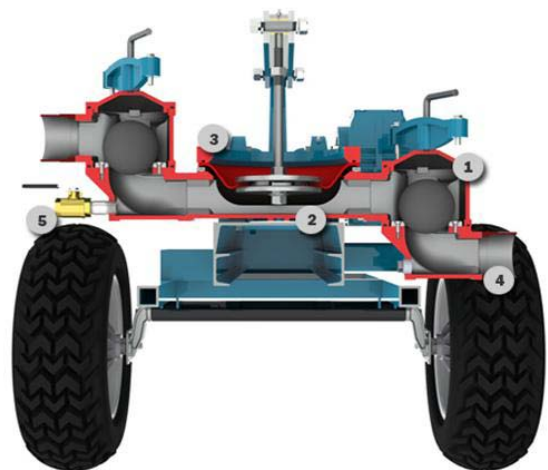
- Handle abrasive, corrosive and high temperature slurries.
- Can be used to feed biomass into digesters.
- Low maintenance requirements and operating costs.



**Figure 4 – Heavy duty industrial GEHO PD - ZPM Pump**

Mud Sucker – <http://www.wastecorp.com/mudsucker/slurry-pump.html>

1. Solids crushing ball valve.
2. Cast iron fluid channel.
3. Santoprene diaphragms.
4. Pump sizes to suit 75 mm or 100 mm pipeline.
5. Pressure relief valve.



MUD SUCKER® BW SERIES - WALKING BEAM DIAPHRAGM PUMPS

**Figure 5 – Walking Beam Diaphragm Pump - Mud Sucker BW Series**



Sandpiper (AODD pumps) – <http://www.sandpiperpump.com/>

- Two diaphragms for handling solids.
- Portable and available in 25 mm to 100 mm pipeline.



**Figure 6 – Sandpiper heavy duty ball pump**

Plunger and Piston Pumps

Commercial options for plunger and piston pump types suitable for pumping wastewater include:

Komline-Sanderson Plunger Pump – [http://www.komline.com/docs/ks\\_plunger\\_pump.html](http://www.komline.com/docs/ks_plunger_pump.html)

Advantages are:

- Self priming, consistent flow rate.
- Can run dry without damage.
- Handles high solids concentrations.
- Low maintenance cost, replacement parts easily accessible.



**Figure 7 – Komline-Sanderson plunger pump**

GEHO also provide crankshaft and hydraulic driven piston pumps – [http://www.weirminerals.com/products\\_\\_services/piston\\_pumps.aspx](http://www.weirminerals.com/products__services/piston_pumps.aspx)

- Handle sludge's with moderate abrasiveness, medium to high viscosity and mild corrosiveness.



**Figure 8 – GEHO DHC valve operated hydraulic piston pump**





## Screw Pumps

Screw (progressing cavity) pumps are often referred to by the specific manufacturer or product names. Hence names can vary from industry to industry and even regionally; examples include:

Moineau (after the inventor, Rene Moineau) – <http://gb.pcm.eu/en/>

Advantages are:

- Pulsation free, low shear stress operation.
- Steady flow regardless of sludge viscosity or pressure.



**Figure 9 – EcoMoineau M progressing cavity pump**

Mono pump – <http://www.monopumps.com.au/>

Advantages are:

- High pressure pumping over long distances.
- Gentle pumping action minimises shear and crush damage.



**Figure 10 – Installed Mono 'EZ strip' progressing cavity pump**

## Vane Pumps

Vane pumps are the most common type of pump used on vacuum tankers.

Battioni Pagani Pompe – <http://www.battionipaganipompe.it/bp/default.asp?sLang=EN>

Advantages are:

- Contains an exhaust/compressor to fill agricultural tanks. and a centrifugal pump used for sludge spreading.



**Figure 11 – Battioni Pagani Pompe vacuum rotary blade pump**

## **Key Points**

- A large range of centrifugal sludge pumps are available from a variety of manufacturers. Some are specially designed for pumping sludge from ponds.
- Centrifugal pump types are usually cheaper and portable but will wear down faster than positive displacement pumps.
- The various design types of positive displacement pumps are effective at handling sludge with high TS content > 10 per cent.
- Positive displacement pumps are larger and most require a permanent installation.
- Piggery and feedlot managers choosing a sludge pump should review the manufacturer's specifications and select a pump type that is best suited for their requirements.



## Other Fact Sheets in this Series

- Selecting a Sludge Pump.
- Types of Sludge Pumps.

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