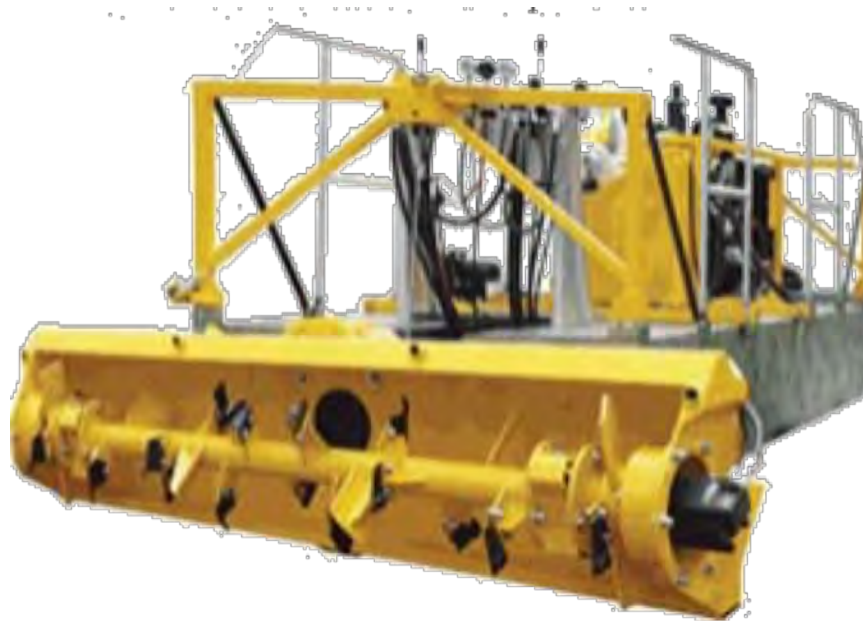




Heartland Dredging

ECO-FRIENDLY SERVICES



ValentiHeld Group

SEDIMENT REMOVAL IN RETENTION PONDS



Heartland Dredging
ECO-FRIENDLY SERVICES

TYPES OF DREDGING

- **Mechanical** – Use of land-based earthmoving equipment such as excavators, bulldozers and dump trucks to remove sediment and haul it away.



- **Hydraulic** – Using a floating barge with a suction head lowered to the bottom and pumping the sediment through a pipeline directly to an onshore disposal location.



WHY REMOVE POND SEDIMENT?

Retention ponds provide the vital function of controlling storm water run-off in developments



Large amounts of pond sediment can lead to
poor water quality



Excessive organic sediment promotes harmful algal blooms



Shallow water can lead to excessive weed growth



Low oxygen levels can harm fish and other aquatic life and even lead to fish kills



Reduced storage capacity for irrigation



Reduced property values



CHALLENGES TO REMOVING POND SEDIMENT



Material is very sloppy and runny. Contains over 50% water. Removing enough water to make the material manageable is difficult and costly.





Access to retention ponds is typically very limited and locations for permanent disposal are also very limited.

MECHANICAL DREDGING



For small ponds a conventional excavator or long stick excavator can be used from shore to remove the sediment and load directly in to trucks





Larger ponds require equipment in the pond to push the material to a loading point near the edge of the pond.

MECHANICAL DREDGING



MECHANICAL DREDGING

- Typically ponds are pumped out for a period of time before material removal.
- Material does not dry out. The best you get is a thin crust on the surface.
- Material may need to be spread out on shore for a period of time before truck off.
- Barge mounted excavators can be used on very large ponds and lakes that cannot be pumped out.

MECHANICAL DREDGING



ADVANTAGES OF MECHANICAL DREDGING

- Able to remove large debris such as logs, stumps, large rocks.
- Can be used to deepen a pond beyond its original design.
- Able to remove hard material.
- In the right situation can be less expensive than hydraulic dredging.

DISADVANTAGES OF MECHANICAL DREDGING

- Very disruptive to adjacent homeowners
- Process is very messy and sloppy
- Very unpleasant odor
- Significant damage around the pond that must be restored.
- Pond has to be completely emptied.
- Loss of all fish and other aquatic life.

HYDRAULIC DREDGING



A floating barge is placed in the water and cables are used to control the lateral movement



A pump is mounted to a pipe with a spinning head on the end. The pipe is lowered to the bottom and the cutter head feeds material and water to the pump.





The pump sends a slurry of roughly 25% material and 75% water through a 6" diameter plastic pipe to an onshore disposal area.

TYPES OF DISPOSAL

- Geotextile tubes
- Containment Basin

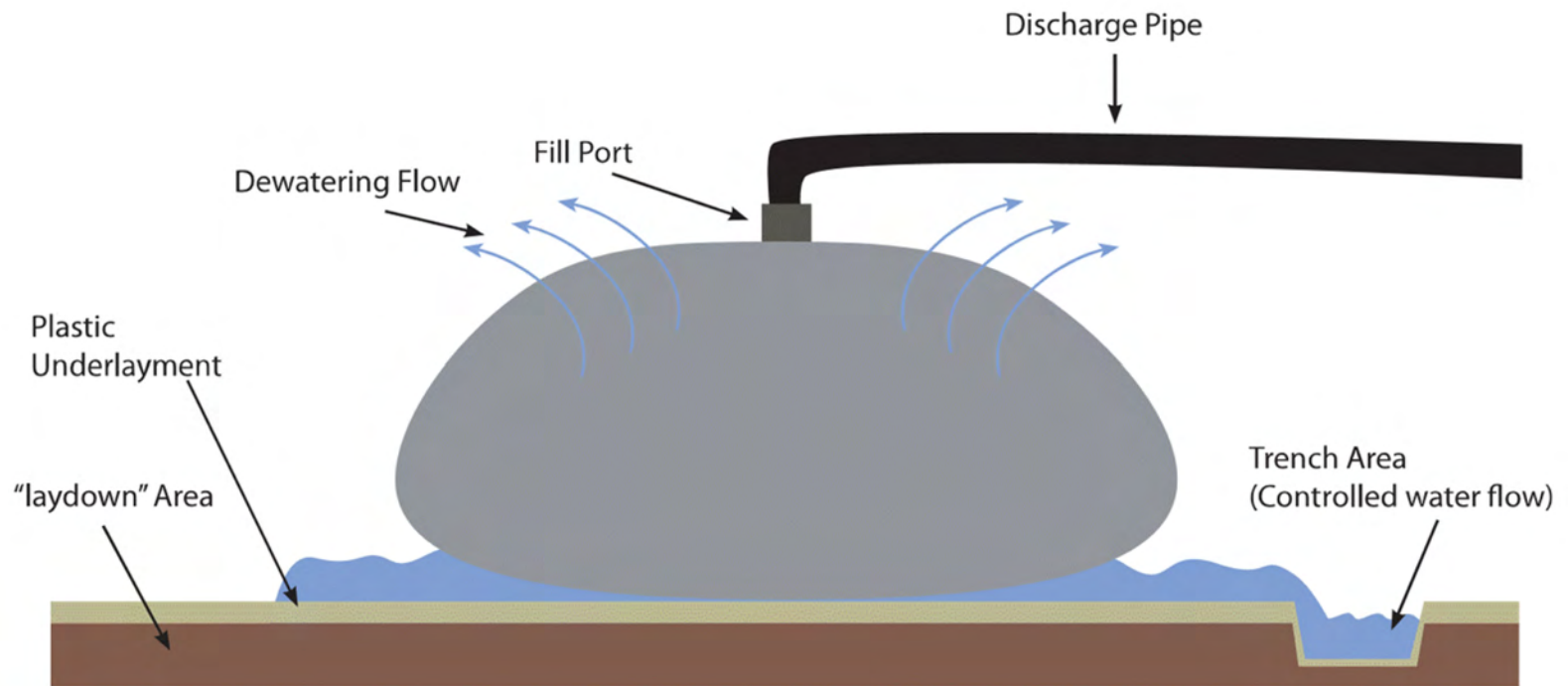


- **Geotextile Tubes** – Large fabric containers (typically 30' to 50' wide, 50' to 100' long and up to 10' tall) made from heavy duty woven geotextile fabric

GEOTEXTILE TUBES

- Slurry from the dredge is pumped into the tube and solids are retained as the water leaches out and returns to the pond.
- Results in the reduction of total solids volume by up to 50% from the in place volume.
- Material remains in the tubes to dewater for up to 12 weeks.
- After drying, tubes are cut open and the material is dry enough to be spread out and re-seeded or loaded in to trucks.
- Requires much less area than containment basin
- Can be much more expensive method since the tubes are not reusable.

Cross Section of Tube



Geotextile Tube Placement



Geotextile Tube Placement



Geotextile Tube Placement



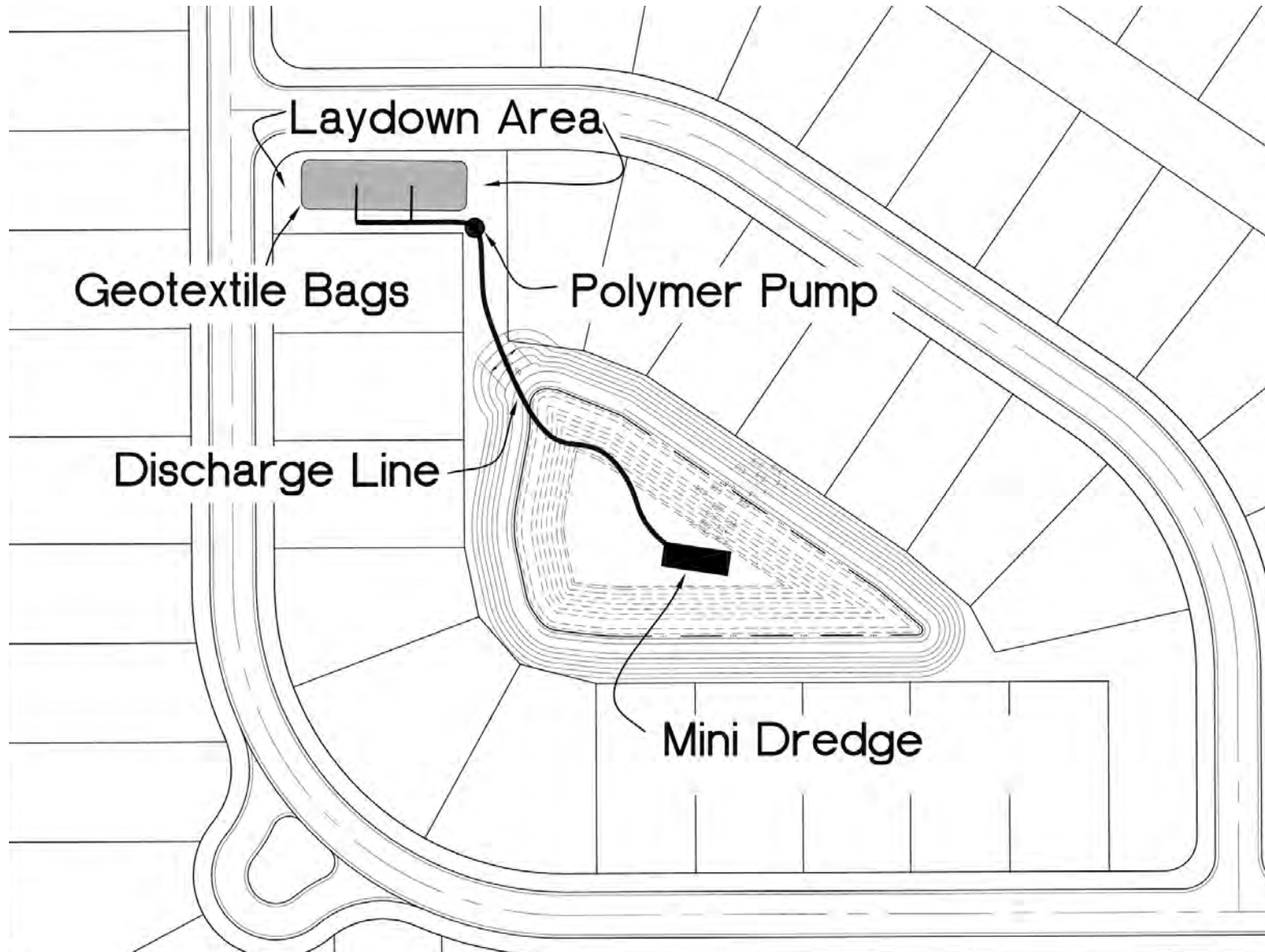
Clean Water Returns to Waterway



Clean Water Returns to Waterway



Typical Layout



Onsite Disposal











Sediment Volume Reduction



Consolidated Material Removal



CONTAINMENT BASIN

- Berm is constructed around an area to retain the dredge slurry
- The area fills up with dredge slurry and the solids settle out and clear water stays on the surface.
- A weir on the opposite end from the input location is used to drain off only the clear water on top.
- Requires a large area of a couple acres or more.
- Not feasible for most smaller residential retention ponds due to the high cost to construct the need for a large open area.

CONTAINMENT BASIN



CONTAINMENT BASIN



CONTAINMENT BASIN



ADVANTAGES OF HYDRAULIC DREDGING

- Minimal Disruption
- No unpleasant odors.
- Area around the pond is not destroyed.
- Pond does not need to be pumped out.
- Little or no impact on fish and other aquatic life.

DISADVANTAGES OF HYDRAULIC DREDGING

- Cost – Hydraulic dredging and pumping in to geotextile tubes tends to be more expensive than other types of dredging.
- Debris – Cannot remove large debris such as logs, stumps and large rocks.

COST OF DREDGING

Many factors impact the cost of dredging

- Size of the pond
- Depth of sediment
- Material type
- Location of the disposal area

COST OF DREDGING

- Hydraulic dredging using geotextile tubes for ponds $\frac{1}{2}$ acre and larger costs in the range of \$25 to \$35 per cubic yard.
- $\frac{1}{2}$ acre pond with 3.0' of sediment contains approximately 2,400 cubic yards of material or roughly 200 dump truck loads. The total cost for a pond this size would be \$60,000 to \$85,000.
- If the material needs to be trucked off the cost can be much higher.

COST OF DREDGING

- It takes planning to be prepared for the financial impact of pond dredging.
- Most HOA's are not expecting the high cost of dredging.

MEASURING POND SEDIMENT

- We can survey your ponds and provide a map of the bottom and sediment measurements to calculate sediment volumes.
- There is a small fee for this service but it will be credited against any dredging work that is done.

SAMPLE POND SURVEY



IS YOUR POND GOING TO NEED DREDGING?

- Sediment collects in all ponds. Some much more than others.
- Maintaining proper erosion control measures and keeping organics such as leaves out of the pond is critical in minimizing sediment build up.



Heartland Dredging
ECO-FRIENDLY SERVICES

QUESTIONS?

