

ORGANIC SEDIMENT REMOVAL SYSTEMS, LLC



Restoring Ponds and Lakes Throughout the USA

Golf Course Info Packet

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a quick overview...



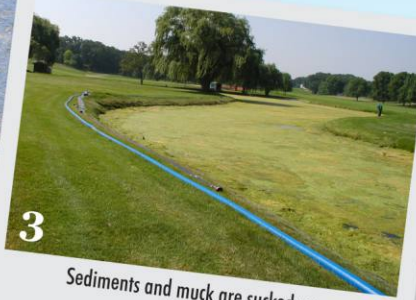
1

Your pond is ready for OSRS cleaning.



2

Our certified divers jump into action with our patented system.



3

Sediments and muck are sucked up...



4

...and transferred to our uniquely designed silt containers.



5

Silt containers can sit up to 2,000 ft. away from ponds, retaining sediments and muck...



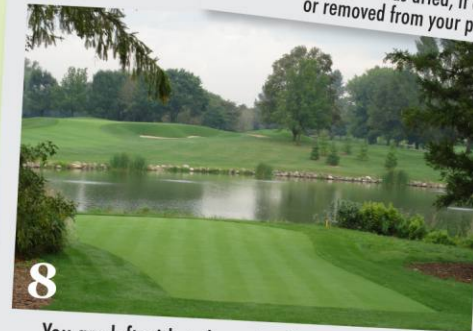
6

...releasing clean water back to your pond.



7

After the sediment has dried, it can be dispersed or removed from your property.



8

You are left with a clean, healthy pond to enjoy.

What Organic Sediment Removal Systems Can Do for You!

Golf courses represent significant investments, both for property owners and the golfers who frequent them. Maintaining their pristine condition is paramount. This includes the aesthetics and functionality of your on-course ponds and water features.

However, over time, these essential elements can suffer from sediment buildup, reduced depth, and declining water quality due to factors like:

- Runoff, containing fertilizers and other nutrients
- Decaying organic matter like leaves and grass clippings
- Erosion
- Clogged intake screens, cisterns and eventually cause excessive wear on your pump

These issues can lead to unsightly algae blooms, clogged irrigation intakes, decreased water storage capacity, and an overall diminished playing experience. Addressing these challenges proactively is crucial for maintaining your course's value and appeal.

Restore and revitalize with hydraulic dredging:

Hydraulic dredging offers a highly effective and minimally disruptive solution for rejuvenating your golf course ponds.

Here's how it benefits your course:

Benefit	Description
Increased Pond Depth	Removes accumulated sediment and muck, restoring the pond's original depth and enhancing its visual appeal. Enhances water capacity for irrigation and stormwater storage.
Improved Water Quality	Removes nutrient-rich sediments that fuel algae growth, leading to clearer water, reduced odor, and a healthier aquatic ecosystem.
Enhanced Irrigation Capacity	Increases water storage volume, crucial for irrigation during dry periods and drought conditions. Increases stormwater storage to prevent flooding, course closures or limited cart use rules.
Better Drainage & Playability	It prevents waterlogging and drainage problems around the pond areas, maintaining optimal playing conditions.



Benefit	Description
Less Invasive Process	Our divers operate underwater, using our patented system, minimizing disturbance to the surrounding landscape, fairways, and cart paths compared to mechanical dredging. By utilizing scuba divers, the only damage to the course is footprints. Our operation does not hinder daily play, meaning while we dredge, your course is still open for business.
Efficient & Targeted Sediment Removal	Effective for removing fine silt and sediment, with the ability to target specific problem areas like intake screens, wet wells and heavy accumulations where water currents deposit sediments that ultimately form islands.
Eco-Friendly Solution	Limits the dispersion of contaminated sediments into the water, protecting aquatic life and the environment. Our patented system allows us to operate around protected species and plants.

By **investing** in hydraulic dredging, you're not just cleaning a pond, you're investing in the longevity, playability, and beauty of your entire golf course. It's a proactive approach to prevent future, more costly problems and ensure your water features continue to enhance the golfing experience for years to come.

From municipal courses to PGA Championship courses and everything in between. Our current scorecard has included over 400 courses. Including courses that hosted a Ryder Cup, 9 PGA Major Tournaments, 13 PGA Tournaments and a President's Cup in 2026!



Our services include:

- We do sediment removal service in Pump Station Wet Wells & Cisterns.
- We do sediment removal around intake screens, so you pump clear water.
- We also remove and replace intake screen and grates.
- We do sediment removal in entire ponds and streams and creeks.

Pump Station Wet Well & Cistern Cleaning

OSR Systems' unique ability to access hard-to-reach areas is a dream come true for golf course superintendents. The first 3 weeks of our spring season in the Midwest is dedicated to getting pump stations back online from the winter thaw. Sediments are drawn into your irrigation system due to the tremendous volume the irrigation system demands, clogging intakes or the wet wells themselves. It is not uncommon to find intake screens completely buried and sediment build up in the intake pipes and wet well. Because organic sediments are suspended in the water column, pumps will continue to pull sediments through the system. Eventually, you will notice a decrease of water volume in the wet well, and the drawdown will be very noticeable due to the lack of water entering the wet well. You'll also notice sediments starting to clog the sprinkler heads.



OSR sends divers into the wet well, removing bottom sediments causing the reduction in water. We also check the pump screens, clean around the intakes and check the intake screens for damage and replace and install new screens.

Screen Intakes and Grate Service



Finding pump screens disconnected at the bottom of the wet well is very common. Bolts holding the screen rust over time, along with screens themselves. Eventually, they fall off and leave the pump unprotected. Divers will bring the pump screens to the surface, clean the screens and reattach with new bolts.



This is a 50-inch grate which was on top of a 48-inch culvert. There was 8 to 10 inches of sediment on top of the grate and completely buried. Irrigation pumps are so powerful, they can pull water through the cake mass. The 36-inch intake pipe entering the cistern was $\frac{1}{2}$ full of sediments and two feet of sediment was found in the wet well. We removed all the sediments around the intake, pipes, and wet well.



New intake screen awaiting installation



Replacing this one



How Organic Sediment Removal Systems Works

OSR Systems uses a hydraulic (suction) method of pumping the bottom sediments (MUCK) from any areas of ponds and lakes. This is an extremely clean, powerful and cost-effective way of removing the organic bio-mass, loam soils, clays and other sediments, filling in the bottom of ponds and lakes without the use of heavy equipment. Furthermore, our system is environmentally friendly and does not interfere with or harm the existing wild and aquatic life which presently inhabit ponds and lakes.

Main Difference:

High-volume suction pumps are used with our patented suction heads to remove the bottom sediments instantly by direct contact. Direct contact removes the sediments without dispersing sediments into the water column, such as augers and cutter heads do. The difference is divers are used to operate the suction heads into the sediments. Using divers has a tremendous advantage, due to their ability to locate only the sediments needed to be removed, type of sediments, and can target certain sediment areas and depths. They can easily follow the contour of the bottom and deeper channels of ponds and lakes. This also allows the divers to find deeper crevices, freeing up covered springs, taper the bottom banks and avoid disruption to aquatic life.

Bottom sediments are shallowing the body of water, changing the original engineered design, intended function, and water capacity of the pond or lake. Our system is a very powerful, but passive way to remove bottom sediments without changing or disrupting the original design and engineered function. Divers can not only distinguish the different sediments to be removed, saving time and cost, they also do not damage lined ponds. Divers can also target specific areas, fit into culverts, cisterns, wet wells, such as pump stations of irrigation systems, and remove sediments from clogged intake screens, making this system extremely efficient.

Put an inch of chocolate in a glass of milk. Now try removing the chocolate with a spoon. The agitation of the spoon, stirring some of the chocolate into the milk column is how excavators, draglines, augers and cutter heads work. Now, try our system. Place a straw in the bottom of the chocolate and suck out the chocolate. The chocolate is removed with no mess, the bottom is restored, and you have a clean glass of milk.

Once the bottom sediments are removed, the pond is returned to its original bottom. This greatly enhances the water clarity and quality, deepening the pond, leaving more water volume, higher oxygen levels and giving your pond a fresh new start as it was in the very beginning.

Figure 1

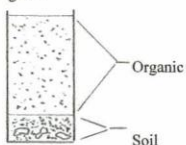
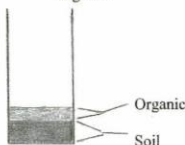


Figure 2



A cylinder-core sample of sediment compression when water is removed.

In most ponds, the sediment is layered. The bottom layer, depending on the ground the pond was dug in, averages around three inches of soft and clumpy clays. This material is usually left behind by the excavators of ponds and caused by water permeation. Next is a layer of fine clays and soils, which has the viscosity of a fine cream. These layers usually occur when the pond first fills with water and the sides become soluble and slowly flow to the bottom. The third layer is typically 90% organic biomass and 10% of loam soils. This material generally accumulates on an average of one inch per year in normal conditions.



**Let's compare the old solution with the new solution
and you decide which is the better approach.**

The Old Solution – Mechanical Dredging

Mechanical dredging is most effective when the pond has been completely drained, and the bottom sediments have had time to dry. This means all aquatic life must either be relocated or killed off. Pumps must be maintained to keep the pond dry and hope it doesn't rain.



If the pond is dredged wet, as soon as the dredge hits the bottom sediments, the very fine particles explode into the water column by the action of the excavator bucket. This saturates the water column with sediments, killing off most of the existing aquatic life and leaves the pond a black, mucky mess. Once the dredging is finished, the suspended sediments then settle back to the bottom of the pond, especially the organic bio-mass, and much of the dredging benefits are lost.





Heavy Equipment Problems:

- Causes severe disruptions to golf course operations
- Aquatic life is killed off or relocated
- Pond must be completely dry for efficiency
- Excavating wet loses most of the benefits
- Extensive damage to the surrounding golf course's pristine landscape
- The cost in many cases is so expensive, and most mechanical dredgers will not even consider smaller projects

The New Solution – Organic Sediment Removal Systems

Divers guide our patented suction head into the bottom sediments, instantly removing sediments by direct contact. Augers need to slide or agitate the material four feet or more into a small center-fixed location on the barge. This disperses the sediments into the water column. Direct contact removes the sediments without dispersing sediments into the water column. This is performed by divers operating the suction heads into the sediments. Using divers has a tremendous advantage. Divers can distinguish the different sediments to be removed, saving time and cost without damage to lined ponds. They can easily follow the contour of the bottom and deeper channels. Divers can also target specific areas, freeing up covered springs, irrigation systems, culverts, and cisterns, such as pump stations and intake screens, making this system extremely efficient.

The Results Are Crystal Clear

- The restoration of the natural bottom without disturbing existing aquatic life
- A dramatic reduction of sediments, nutrients, weeds, and algae
- An expanded living space for aquatic life and a richer environment
- No damage to lined ponds, plastic, rubber or clay
- Target specific areas, deep areas, and only organic bio-mass saving time
- Cleaner water and a healthier ecosystem, increasing property values
- Higher oxygen levels and no harmful gases from anerobic bacterium
- A great reduction in chemical usage
- A cost of up to 50% less than mechanical dredging without damage to existing landscape



Before



After

Imagine removing the bottom sediments and aquatic vegetation from this lined pond above. This was simply done with our system without any damage to aquatic life, (fish, turtles and frogs) or replacement of the liner, and no damage to the pristine landscape areas.



Before



After

Discharge Sites: Where the bottom sediments are removed (pumped) to

Silt containers are used to capture the sediments. Silt containers are polypropylene material woven with a 50-micron sieve. This filter allows the sediments to remain in the silt container while allowing the carriage water to escape on the property. This allows a much smaller size area or footprint for the discharge site. A one-acre pond area containing one foot of bottom sediments can be placed in a 30 foot wide x 100 foot long silt container.



After the sediments dewater and hard dry, they can be hauled off site or spread out on the surrounding area and seeded over to avoid hauling charges. Most sediments are good soils and will not harm grasslands or wooded areas. The pump used can reach 200 feet out into a pond or be placed on a floating platform to target areas further out. We can discharge back up to 2,000 feet, even further with the use of booster pumps. For those who do not have an adequate discharge area, there are other alternative ways to contain the sediments and haul off site. We are having remarkable success in removing bottom sediments in lakes and ponds in this manner and are confident we can be of valuable service for your project.

After the sediments have completely dried and the container fabric has been removed, you are left with a mound of rich organic loam soils and some clays. Most of our clients spread the material onsite and/or seed over the material to avoid hauling charges.

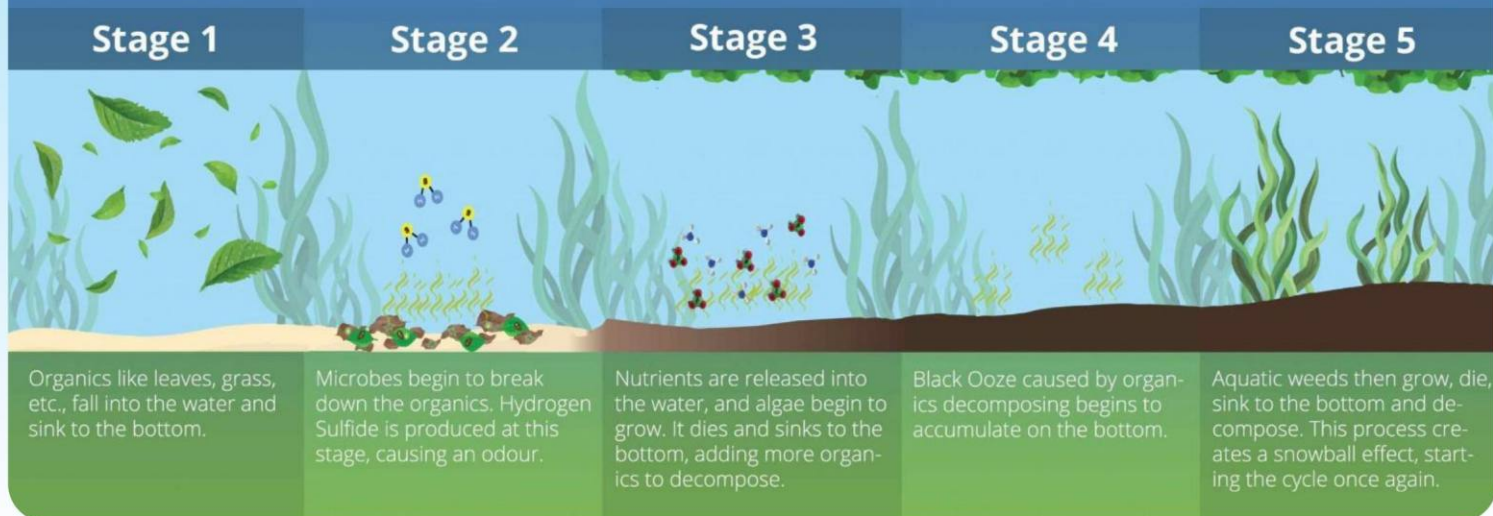


Compacted organic sediment material can be integrated with other soils to build tee boxes, elevate greens, regrade low areas in fairways or any other way to improve your course's aesthetics.

The Health of your Pond Relies on You!

Lifecycle of a pond

5 Stages of Muck



Unfortunately, for all ponds at the moment of creation, they start a decaying process. This is nothing to be alarmed about. It is just part of a natural cycle of nature, trying to reclaim or "fill in a hole in the ground we call a pond", or any body of water, transforming them into a swamp, to a marsh, to a bog, and finally a prairie. Unless we intercede.

The MUCK accumulating at the bottom of this pond is nutrient rich and creates a vicious, deteriorating cycle. In essence, instead of the aerobic bacteria feeding the animal kingdom, and continuing a natural, healthy food chain, the anaerobic bacteria disrupts this natural process and feeds the plant kingdom increasing algae and weed growth, thus suffocating the pond.



Natural springs and aerators help, but eventually, even they lose ground to this natural process as the pond continues to a hypertrophic state. The above picture is a perfect example of the hypertrophic state.

Every pond is in a decaying process the moment it is created. The problem is, organic matter from surrounding forestry, aquatic weeds, algae, and soils settle at the bottom of the pond, taking the form of MUCK. This gradually fills in the pond and is the direct and main cause of the many problems that lake and pond owners have. MUCK harbors nutrients that cause excessive weed and algae problems, which also reduces oxygen levels which deteriorates the ecosystem of a pond.



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