Where is all the Clean Water?
The process that occurs when sediment fills a lake or other body of water is known as eutrophication. It is a natural process that evolves over a number of years, until lakes become swamps and marinas become waterfront real estate. Accelerated eutrophication occurs when ground cover vegetation is disturbed within the drainage basin. This disturbance occurs during construction projects, farming operations, natural disasters or any other time the ground cover is disturbed.

What might occur naturally over a period of a hundred years or more can occur in a matter of months during a construction project in which no effective erosion control measures are put in place. Too often, silt fences and other erosion control measures are not properly installed or maintained after installation. All of this leads to topsoil ending up in the water, and over time, this causes the surface water to disappear. Long before it disappears however, the character of the water declines to the point that it becomes a detriment to the community. A space that was once occupied with clean water is now occupied with mud.

When is it Time to Dredge?
Think that murky water is just an inconvenience or an eyesore? Think again. The clarity of a lake, marina or pond may have a significant impact on property values in a community. In fact, according to a study conducted by the University of Maine, a one-meter drop in water clarity causes real estate values to plummet by 10 to 15 percent. In some cases, people have purchased waterfront property and, after a few short years of development upstream, they end up with swamp-front property that cannot be resold.

The first sign of trouble is shallow water near the head of the lake or at the end of the coves where the most drainage enters the water. Boat motors start churning up mud and unsightly weeds begin to emerge. At first this area is limited to a small area. However, over time, this area grows, and the surface water area starts shrinking in size. It becomes more difficult to maneuver boats without damaging expensive motors.

The second warning sign is that the water quality begins to deteriorate. After rainfall or high winds, more sediment is deposited and re-suspended. The water takes longer to clear and it is a murky brown color. The water quality is noticeably lower than in years past. This reflects on the aesthetics of the entire community.

The final sign that it’s time to dredge may show up in the form of diminished irrigation capacity. This might manifest itself as sediments clogging up sprinkler heads or it might show up as a limited quantity of water available in high usage months. As sediments fill the lake, less water capacity is available for irrigation, since the sediments are taking up the space that was once occupied with water.

When a lake disappears and waterfront property plummets in value, we then truly understand the value of clean water.

What is the Dredging Process?
There are typically three ways to approach the cleaning a body of water:

Drain the Water and Excavate
Draining a lake may be the least expensive option, but will usually have the greatest environmental impact and often take the longest to complete. This method will usually require building a haul road to provide access for heavy trucks to haul the sediment offsite. Damage to shoreline, re-grading the haul road and re-landscaping the area are all inconveniences and additional costs to consider.

In addition, draining the lake is highly susceptible to weather issues. Since water will naturally drain to this area, even a small rain may impact the schedule for an extended period of time. It may take weeks or
months for the material to dry enough to excavate and haul offsite. Another consideration is the undetermined amount of time until the lake is restored and filled again with water. Depending on the size of the drainage basin and the amount of rainfall, it may take several months for the lake to fill back to capacity.

Mechanical Dredging from the Shore
This method addresses sediment issues from the shoreline. Heavy excavation equipment is hauled to the shoreline. Surrounding trees and other obstructions are often removed and the shoreline leveled for the equipment to work safely. Haul roads must be constructed for trucks to have access to excavating equipment. Most common mechanical excavators such as dragline and long-reach excavators used in this kind of excavation reach 40 or 50 feet from the shoreline, so candidates for this type of dredging are small ponds or the ends of coves.

Mechanical Excavation from Barges
This method of excavation involves an excavator or crane with a clamshell bucket. The barge is moved into place and excavated material is placed in the barge. When the barge is full, it is towed to shore where another excavator unloads the material onto the shore or into a truck. This method requires several pieces of heavy equipment and handling of the material multiple times.

Portable Hydraulic Dredging
Another option for removing sediment from the lake bottom is using a hydraulic dredge. The dredge floats on the water and pumps the material through a temporary pipeline to an offsite location, often several thousand feet away. The dredge acts like a floating vacuum removing sediment very precisely.

Hydraulic dredges use a discharge line, and possibly a return line, which are the only disturbances to the surrounding environment. These lines can easily be run under roads or sidewalks. Other than this, the dredge, which is not much larger than a small boat, is the only machine to be seen. It is an unobtrusive method that does not require disturbing the shoreline and requires one trip in to put the dredge in the water and one trip out when the project is complete.

What Happens to Hydraulically Dredged Sediment?
Hydraulic dredging uses the energy of pumping water at a high velocity through a pipeline to carry sediment away from the lake bottom to a distant location. Because moving water is utilized as the mode of transportation for the sediment, the water and sediment must be separated once the sediment has reached its final destination.

Settling Basin
The least expensive way to separate the sediment from the water is to construct a temporary settling basin. Since the slurry velocity greatly decreases once it is discharged into a settling basin, there is no longer energy to carry the solids. Therefore, the solids fall to the bottom and clear water flows over a weir to return to the lake or continue downstream. When the dredging is complete and ample time is given for this material to dry, the area can then be leveled and seeded. The material can also be loaded out and beneficially deposited at other various sites to fill in low areas, utilized for topsoil, etc.

Geotextile Tubes
Another creative dewatering method is the utilization of geotextile tubes. With this method, the slurry is pumped into large geotubes, which might be 6 to 8 feet tall when filled and may be 100 to 300 feet in length, depending on the area available. The sediments stay in the tubes and the water filters out through the geotextile membrane. Geotubes are most suited to projects that have only a limited area available for dewatering and sediment placement, which is often the case on golf courses and small community lakes.
Mechanical Dewatering
A third dewatering method is with mechanical dewatering equipment. This option often allows the most rapid dewatering process, but is usually the most expensive. Utilizing mechanical dewatering equipment allows for the material to be dewatered and hauled off as it is being dredged. For some upscale communities, this convenience is often worth the additional costs.

How do I choose a Dredge Contractor?
Here are ten questions that will help you qualify a contractor:

1. Does the contractor have several years of hydraulic dredging experience on similar types of projects? **Make sure the contractor isn’t learning a new skill at your expense. You may be exposed to additional risk such as the ability of the contractor to complete the project.**
2. Can the contractor supply multiple references on similar types of projects? **A professional, well-qualified contractor should have a long list of references, not just three or four.**
3. Is hydraulic dredging a sideline to the contractor’s core business such as excavating or dock work? **You’ll want to ensure the contractor is an expert at dredging specifically, not something more general like general excavating, pile driving, deck work or seawalls.**
4. Does the contractor own equipment? Does the contractor own more than one dredge? **When companies must rent dredges, there can be unexpected delays in the project due to scheduling conflicts, equipment breakdown, and lack of spare parts onsite.**
5. Can the contractor bond the project? **The contractor should have bonding capacity for a minimum of the total amount of your project.**
6. Does the contractor have adequate marine insurance and can the contractor name the owner and engineer as additional insured on the policy? **This is absolutely mandatory to mitigate the risk associated with the project.**
7. Is the contractor mobile? How quickly can the contractor mobilize for a project in your area? **Frequently the permitting process takes longer than expected. You’ll want to make sure the dredge contractor can respond quickly when you’re ready to move ahead. Don’t evaluate a contractor based on the location of their home office, but rather based on their history of mobilizing rapidly.**
8. Does the contractor have a professionally trained mobile workforce? **Training should include a minimum of new technology, safety, environmental protection and OSHA.**
9. Does the contractor have proper environmental controls in place as standard procedures? **Considerations include use of biodegradable oil and spill containment kits. Being proactive is the first step to protecting the environment.**
10. Does the contractor have a good safety record and policies in place for accident prevention? **The contractor should have a written safety plan and provide the last three years of their EMR ratings.**

What is the Permitting Process?
Under the Federal Clean Water Act and Amendments, the Corps of Engineers is required to regulate dredging in accordance with certain environmental criteria. Before any dredging can be done in a significant body of water, a permit must be obtained.

In many states, the Corps has given jurisdiction over to a state agency. The usual result is that the Corps and the State use a “Joint Permit Application” form. These forms can be obtained from the Corps of Engineers General Regulatory Branch at the appropriate District Office. In nearly all cases, they can also be obtained “online” from the District’s web site or from the involved state agency.

For smaller projects, there is what is known as a “General Permit.” These can be obtained in as little as a couple of weeks after the completed application is submitted. In some states, certain maintenance activities, such as re-dredging a previously dredged private canal, fit an exemption and do not require permitting. For larger projects and new work dredging, individual permits are normally required. Obtaining an individual permit typically requires approximately 6 months due to the extensive review process.
To start the permitting process, call the nearest Corps of Engineers office. Check their website for the office that handles your area (http://www.usace.army.mil/). They will give you the information you need to reach the person who handles permit applications in your area. The project owner can typically complete most of the information on the permit application, but an experienced engineering company normally undertakes the more complicated projects.

**Required information will probably include:**

- Quantity of materials to be dredged.
- The location and condition of the proposed disposal site.
- Names and addresses of nearby landowners.
- A list of likely environmental impacts.

If the sediments have been contaminated by pollutants, the state or Corps of Engineers will require testing of the sediment and water to determine the likely impacts on water quality.

Sketches of the work to be done, including any proposed levees and water control structures. Typically, a survey is needed to show the depths on the area to be dredged and illustrate the reason the dredging is needed.

**How do I keep the Project on Schedule?**

A smooth-running project is the responsibility of both the owner and contractor. Here are a few ways an owner can ensure a smooth-running project:

**Selection of a Contractor**

Many owners will seek multiple bids prior to starting a dredge project. This process is probably the most crucial factor to a successful project. When evaluating a contractor, look at the bottom line, but also look at the experience level and professionalism, as well as the type and condition of equipment. Frequently the cheapest choice will end up costing more money later.

**Communication**

Prior to mobilization, designate a single point of contact for both the owner and the dredge contractor. A smooth flow of information on both sides will impede any miscommunication down the road.

**Flexibility**

Understand that dredging involves many variables, including equipment breakdowns and weather interruptions. A professional contractor will be able to make quick adjustments to compensate for unplanned downtime. The owner should also be flexible in trusting the contractor to be up and running as quick as possible.

**How are Dredge Contractors Compensated?**

Most professional dredge contractors provide a firm quote prior to beginning any project. The quote should include all the specifics of the project, including estimated start and completion dates, description of project, quantities to be dredged and a disposal plan.

Fees for these services vary by type of project and region of the country. However, there is a fairly standard formula for compensation among professional dredging contractors:

**Mobilization**

This fee will be charged as a lump sum once all equipment is on-site and material is being removed.
**Paid by Quantity**
On a regular (weekly or monthly) basis, the contractor should be compensated a flat fee per cubic yard removed based on the quantity removed to date. The quantity can be determined through pre, interim and post-dredge surveys.

**Permits & Surveys**
Generally, the owner will be responsible for costs associated with permitting and surveys. Be sure this is clearly spelled out prior to mobilization.

**About Dredge America**
Dredge America has extensive experience and expertise over the past 25+ years as one of the leading hydraulic dredging companies in North America. We are uniquely qualified to provide the highest quality services and have become the respected name in professional dredging services because hydraulic dredging is our only business. All our resources are focused on being the best at this core competency.

Our experience and reputation has been earned one project at a time. Dredge America has dredged an array of materials under varying conditions and solved the challenges through superior project management and expert problem-solving skills.

Our ability to solve problems and perform tasks efficiently is greatly enhanced by how many times we have experienced similar projects and site and material challenges. The history of our ability to solve problems is a testament to our ability to solve future challenges.

Dredge America is mobilizing highly qualified people on-site where challenges occur and where problems need to be solved immediately. Our field supervisors are empowered to act as contract representatives for Dredge America and can therefore make critical decisions in the field, lessening potential delays and increasing the adaptability of the field crew.

Dredge America provides proper insurance for marine work. Included are P&I coverage and various other specialized coverages including long shoreman’s and Jones Act coverage. Dredge America enjoys an excellent safety record because of a proactive safety program. Our crews are trained and MSHA certified. In addition, Dredge America is a drug-free workplace.

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