Association for the Preservation of Clear Lake

Lake Association News

A newsletter for the Association for the Preservation of Clear Lake

FALL 2008

Dredging - An Up Close Look at How it Works

DREDGING PICTURES

Dredge cutter head used to dislodge lake sediment

Jon Nieman points out booster pump on dredge

Spud and track system at rear of dredge

Rocks from lake bottom that entered dredge pump

Jon Nieman from L.W. Matteson Company took time out of his day to provide a tour of how the dredging barge works. It was interesting to learn some of the intricacies of the dredging process, which we hope you will enjoy as well.

Starting from the front (bow) of the barge, the cutter head looks similar to the tip of a large drill bit. It is attached to a drive shaft that rotates the cutter head so the bottom sediment can be dislodged. Attached to the side of the cutter head is a 16" diameter pipe that is attached to a pump that provides the suction for removing the disturbed sediment. The arm on the cutter head can extend down to as much as 60 feet if needed. The bow swings back and forth in a 200 foot wide swath. This is accomplished by attaching the arm to two anchors placed 100 feet away on each side of the barge. Tightening one of the cables while releasing tension on the cable on the opposite side allows the front of the dredge barge to swing back and forth as it makes it cut.

Two large posts in the rear (stern) of the dredge barge, called spuds, anchor the stern in place. They are also responsible for moving the dredge forward. This is accomplished by the lifting of one of the rear spuds, moving the dredge forward on the track attached to the spud, replacing that spud, and repeating the process with the other one.

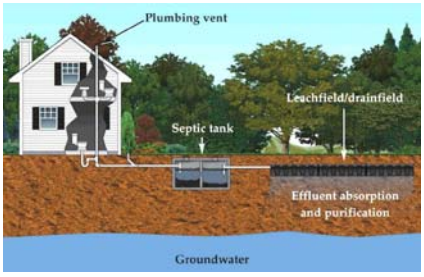
A crew of four to five people are on the dredge at all times. The dredge operator is responsible for controlling the movement of the barge and also the depth of the dredging cut. The operator is greatly aided by GPS technology which allows him to correlate his current position and depth with a map of the prescribed depth at that specific location. The operator continues dredging material until the prescribed depth is reached, or until he runs into the original lake bottom, and then the barge is moved forward.

The dredge is powered by several large diesel engines that total about 2,000 hp. It is estimated that the dredge uses about 1 gallon of diesel fuel for every hp, so roughly 2,000 gallons of diesel fuel are used daily. This would actually be more, but the booster pump on the shoreline of the lake, which moves the material the rest of the way to the containment site, is electric. Fuel is transported to the dredge barge in a separate vessel that has large fuel storage tanks.

On a good day, the dredge is capable of removing about 20,000 cubic yards of material. The company hopes to have about 75% of the project completed before they quit for the year, likely around Thanksgiving.

One interesting aspect of the project is that the lake does not have a very smooth bottom, but instead has small ridges and valleys. The dredge has to navigate around the ridges to avoid taking in rocks. The variation in lake bottom is actually beneficial from a fish habitat perspective.

Time of Transfer Law Goes into Effect January 1st, 2009



A new "Time of Transfer" law requiring septic system inspections at the time of property transfer will go into effect on January 1st, 2009. In a nutshell, this law means that each septic system in the State will be inspected when ownership of the property changes. If the septic system does not meet current guidelines, it will have to be upgraded to come into compliance. In order for a septic system to meet regulations, it needs to have some type of secondary treatment, typically known as a leach field or a drain field. See the diagram above for an example of a typical permitted septic system. This law has already been in place in Cerro Gordo County for the past few years, but the portion of the Clear Lake watershed that is in Hancock County will now also follow these same rules.

STORM DRAIN STENCILING PROJECT

Eagle Scout candidate Ryan Emerson partnered with the CLEAR Project to coordinate a storm drain stenciling project in the Clear Lake watershed. There are more than 350 storm drain inlets that collect runoff in developed areas and allow it to drain into Clear Lake. Each of those inlets was marked with a stencil depicting a fish and the message "Don't Dump - Drains To Lake". The message serves as an important reminder to people that what enters the drains ends up in our lake. About a dozen people, made up of primarily scouts, volunteered their time on a Saturday to complete the project.

Eagle Scout candidate Ryan Emerson stencils a storm drain

Lake Levels Fluctuate Greatly in 2008

The spring of 2008 will be remembered for the flooding that many Iowans endured. Although flooding was not a major issue at Clear Lake, the effect the large rain events had on the level of Clear Lake was dramatic. Despite the fact that Clear Lake is primarily fed by groundwater, surface water runoff also plays a large role in determining water levels.

Reviewing lake level data that began being recorded in the 1930's shows just how historic of an event the spring rains ended up being. A new all time high lake level was set on June 13th, 2008 when the lake elevation was recorded at over 16 inches above crest. No significant flooding took place as a result of the high water levels, but sandbags were used in some low lying areas around the lake.

As the summer progressed, the rain showers became infrequent and a couple months of below normal precipitation ensued. The lack of precipitation coupled with evaporation caused lake levels to continue to decline. Data collected during the Diagnostic and Feasibility Study (2001), showed that evaporation causes the lake to lose about 3 million cubic yards of water during a typical summer month, which is equivalent to about 5% of the lake volume.

Clear Lake levels in 2008. Normal crest elevation is 4.60 ft

As residents noticed the decreasing water levels, many believed that the dredging operation was having a significant impact. This is a logical assumption since the slurry removed by dredging is about 80% water and 20% sediment. In reality, even if the dredge spoil containment site is filled exclusively with water, it would still only account for about 3 million cubic yards of water removed from the lake, the same amount lost to evaporation in a typical summer month. Water that is removed from the lake during the dredging is also being returned to the lake, which further decreases the impact it has on water levels. At most, the dredging activities are likely only accounting for an inch or two of water level decline.

This fall the water level of the lake is about 8" below crest. Although it is not uncommon for the lake to be below crest in the fall, the two foot difference in having 16" of water above crest to 8" below crest is very noticeable and makes the low water levels seem more severe than normal. The lowest water level on record was observed on October 26th, 1989 when the lake was measured at 46" below crest.

When spring rains return in 2009, the lake will likely again return to full crest levels.

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