

May 10, 2016

### Turkey Creek Phosphorus and Nitrogen Removal Project

The Turkey Creek Muck Removal Project in Palm Bay, Florida is located on the Indian River Lagoon which suffers from high levels of harmful nutrients.

The project is now at 75% completion and part of the larger Indian River Lagoon cleanup effort in Brevard County; this project involves dredging over 235,000cy.



The dredged material was pumped to a Dredged Material Management Area (DMMA), which is owned by the Florida Inland Navigational District (FIND), located approximately 2 miles to the North of the dredge area. Gator Dredging, the prime contractor for Brevard County, has teamed with Gator Aquatic Technologies of Mulberry, FL to implement an innovative Phosphorus and Nitrogen removal system.

Gator Aquatic Technologies utilized a patent pending process that integrates a series of NSF certified, aquatically safe chemicals to remove total Phosphorus and total Nitrogen from the dredged slurry. The innovative process combines liquid solids separation with soluble nutrient removal in a single phase; whereby the free, soluble, harmful nutrients are captured and bound with the sediments.



The chemicals were dosed directly into the incoming dredge line as the dredge slurry is monitored continuously, and adjustments are made automatically by the injection system utilizing our H2Optimizer® systems. The treated water is then reintroduced to Indian River Lagoon adjacent to the DMMA. Through this integration method, we are utilizing the energy already put into the transport of slurry at 6000gpm without the need to add additional energy cost and infrastructure.



This technology is preventing thousands of pounds of Phosphorus and Nitrogen from reentering the eco system. Removal of the Phosphorus and Nitrogen will reduce the growth of algae that is largely responsible for the most recent fish-kill in the Indian River Lagoon.

Contract requirements dictated that the total Phosphorus levels must be < 75ppb for the effluent returning to the lagoon

Gator Aquatic Technologies has successfully separated the muck and soluble nutrients; returning clarified water with total Phosphorus levels non-detectable (< 20 µm/L) and reductions in total Nitrogen of > 92%.

**This represents more than 41,000lbs of phosphorus and 116,000lbs of Nitrogen that have been removed from the lagoon during the Gator Aquatic Technology treatment phase of the Turkey Creek Muck Removal Project as shown in Tables 1 & 2 below.**



TABLE 1

Turkey Creek Total P Removal in ppb					
Date	Incoming	Dredge Discharge	Gallons processed	lbs of P Removed	DMMA Discharge
	ppb	ppb	gal	lbs	ppb
4/5/2016	112,000				1730
4/6/2016	68400				1770
4/7/2016*	40500	ND*	2,995,200	1,011.69	258*
4/8/2016	82700	87.3	7,188,480	4,958.02	394
4/9/2016	24000	ND	7,055,489	1,412.23	189
4/10/2016	64200**	77	6,875,321	3,681.24	
4/11/2016	64200**	119	7,258,939	3,886.64	
4/12/2016	52000	67.7	6,402,240	2,776.52	
4/13/2016	64200**	ND	7,362,720	3,942.21	
4/14/2016	64200**	ND	6,906,240	3,697.79	
4/15/2016	64200**	ND	4,854,240	2,599.10	
4/16/2016	64200**	ND	1,467,360	785.67	
4/18/2016	72000	ND	3,283,200	1,971.50	
4/19/2016	64200**	ND	6,230,880	3,336.19	
4/20/2016	64200**	ND	7,256,160	3,885.15	
4/21/2016	62000	ND	6,949,440	3,593.42	
AVG	64200	ND	<b>Total lbs of P removed</b>	<b>41,537.36</b>	
* Started treating in the pipe line for nutrient removal					
** Average incoming					

TABLE 2

TKN Removal				
Date	Incoming	Dredge Discharge	Gallons processed	lbs of N Removed
	ppb	ppb	gal	lbs
4/5/2016	908,000			
4/6/2016	240,000			
4/7/2016*	124,000	975	2,995,200	3,073.16
4/8/2016	177,000	2,130	7,188,480	10,483.79
4/9/2016	52,500	2,130	7,055,489	2,963.91
4/10/2016	89,000**	2,630	6,875,321	4,952.47
4/11/2016	94,000**	2,790	7,258,939	5,521.81
4/12/2016	122,000**	2,810	6,402,240	6,364.11
4/13/2016	149,000**	4,410	7,362,720	8,878.56
4/14/2016	163,000**	4,820	6,906,240	9,110.86
4/15/2016	146,000**	4,330	4,854,240	5,735.42
4/16/2016	153,000**	4,530	1,467,360	1,816.94
4/18/2016	377,000	26,800	3,283,200	9,589.14
4/19/2016	401,000**	28,500	6,230,880	19,357.16
4/20/2016	250,000**	12,400	7,256,160	14,378.69
4/21/2016	251,000	4,990	6,949,440	14,258.33
AVG	281,000**		<b>Total lbs of N removed</b>	<b>116,484.36</b>
* Started treating in the pipe line for nutrient removal				
** Calculated incoming from discharge and average removal percentage				