

## **MEMORANDUM**

July 16, 2004

TO: File

FROM: Sam Stone

RE: Horse Creek Stewardship Program  
Horse Creek at Goose Pond Road (HCSW-2)  
High Chlorophyll Levels Impact Assessment

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In April 2004 the Horse Creek at Goose Pond Road (HCSW-2) sample location experienced chlorophyll levels above the trigger level of 15 ug/l as established in the IMC / Authority Settlement Agreement dated March 5, 2003. As stipulated by that agreement IMC proceeded to implement an impact assessment of these conditions and transmitted the written assessment to the Authority (see attached). The Authority staff in cooperation with Earth Balance has reviewed and discussed IMC's assessment and provide the following comments.

The chlorophyll levels over the past year are all below the trigger level and are relatively low at Stations 1, 3, and 4. From this information we can agree with IMC that the chlorophyll levels in excess of the trigger level found at Station 2 is most likely not related to phosphate mining activities located upstream of Station 1 and is likely related to some local condition at or upstream of Station 2. Special purpose sampling that occurred on May 27, 2004 showed that Horse Creek about 25 yards upstream of Station 2 is a more natural channel and has chlorophyll levels below the trigger level. This line of evidence supports the conclusion that low flow conditions and possibly pooled water at the sample site is the cause of the high chlorophyll levels.

Historical information was reviewed on Horse Creek. (see Table 2 from *Annual Report on Water Quality Status and Trends in the Peace and Myakka River Basins* by CHEC dated June 2001) From this table it was found that for the period 1997-2000 that Station 1 (Horse Creek near Myakka Head) had chlorophyll levels range from below detection levels (BDL) to 129 ug/l and that Station 4 (Horse Creek near Arcadia) had chlorophyll levels range from BDL to 31.5 ug/l. This information shows that chlorophyll levels have in the past exceeded the trigger level of 15 ug/l.

As a result of this event the Authority and IMC will continue to monitor for chlorophyll at Station 2 with the expectation that levels will return to normal with increased flows during the summer wet season.

xc: Pat Lehman  
Sunny Diver  
Ralph Montgomery



**PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY**  
*Serving the Citizens of Charlotte, DeSoto, Manatee & Sarasota Counties since 1982*

HON. ADAM S. CUMMINGS  
CHARLOTTE COUNTY

HON. TERRY L. WELLES  
DeSOTO COUNTY

HON. PATRICIA M. GLASS  
MANATEE COUNTY

HON. SHANNON STAUB  
SARASOTA COUNTY

PATRICK J. LEHMAN, P.E., EXECUTIVE DIRECTOR

**MEMORANDUM**

July 16, 2004

TO: Terry Briggs Charlotte County  
Robert Brown Manatee County  
James Chisholm DeSoto County  
John Ryan Sarasota County

FROM:  Sam Stone

RE: Horse Creek Stewardship Program  
Goose Pond Road (HCSW - 2)  
High Chlorophyll Levels Impact Assessment

Attached please find IMC's completed Impact Assessment for the above station. We will continue to monitor this location with the expectation that increased flows will improve this localized condition.

The Authority staff and Earth Balance are currently reviewing this sample location in light of the several problems experienced over the past year. Options under consideration are to replace the current Goose Pond Road location with a location further downstream, keep the Goose Pond location, or keep the Goose Pond location as a reference location (no assigned trigger levels) but add a down stream location so designated with assigned trigger levels.

In other matters, be advised that we are currently working on a detailed project status report to bring you up to date with all the project components along with the latest data from the project. We are scheduled to get this work out to you the week of July 19, 2004.

xc: Pat Lehman  
Sunny Diver  
Ralph Montgomery  
Ross Franklin

## MEMORANDUM

July 16, 2004

TO: File

FROM:  Sam Stone

RE: Horse Creek Stewardship Program  
Horse Creek at Goose Pond Road (HCSW-2)  
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Historical information was reviewed on Horse Creek. (see Table 2 from *Annual Report on Water Quality Status and Trends in the Peace and Myakka River Basins* by CHEC dated June 2001) From this table it was found that for the period 1997-2000 that Station 1 (Horse Creek near Myakka Head) had chlorophyll levels range from below detection levels (BDL) to 129 ug/l and that Station 4 (Horse Creek near Arcadia) had chlorophyll levels range from BDL to 31.5 ug/l. This information shows that chlorophyll levels have in the past exceeded the trigger level of 15 ug/l.

As a result of this event the Authority and IMC will continue to monitor for chlorophyll at Station 2 with the expectation that levels will return to normal with increased flows during the summer wet season.

xc: Pat Lehman  
Sunny Diver  
Ralph Montgomery



IMC Impact Assessment  
Chlorophyll a Concentrations - Horse Creek at Goose Pond Road  
June 29, 2004

As part of the Horse Creek Stewardship Program, IMC Phosphates samples four locations once per month on Horse Creek in Hardee and Desoto Counties for a number of chemical and physical parameters. One of these parameters is chlorophyll a. A "trigger level" of 15 mg/m<sup>3</sup> was set for chlorophyll a concentrations at all four locations in the Program. To date, 13 months of sampling have been completed and chlorophyll a concentrations determined at the stations. In April 2004, the chlorophyll a concentration at Goose Pond Road was greater than the trigger level. All of the Goose Pond Road data is listed below.

Date	Chlorophyll a (mg/m <sup>3</sup> )
April-03	4
May-03	5
June-03	4
July-03	7
August-03	1
September-03	2
October-03	6
November-03	1
December-03	2
January-04	2
February-04	4
March-04	8
April-04	16



Analysis

All chlorophyll a concentrations recorded as part of the Program are included in Table 1 (attached). A trigger level of 15 mg/m<sup>3</sup> is in effect for the State Road 64, Goose Pond Road, State Road 70, and State Road 72 stations. The lowest chlorophyll a concentrations to date have been recorded at State Road 70, slightly below those recorded at State Road 64 and State Road 72 (all three stations have very low concentrations). The Goose Pond road station is elevated compared to the other three stations, but the mean of all thirteen months for the Goose Pond Road station is 4.8 mg/m<sup>3</sup>, and excepting the April event, the greatest concentration was 8 mg/m<sup>3</sup>.

A special sampling program was carried out on May 27, 2004. The intent was to use the same stations sampled during the previous investigation of low dissolved oxygen concentrations at Goose Pond Road with the addition of Brushy Creek.. However, stream flow conditions were extremely depressed in late May (the flow at the USGS recorder on State Road 64 was less than 1 cfs) and the feeder streams (Cypress Branch, Osborn Branch, Brushy Creek) were dry or not flowing. As an alternative, four samples were taken from just the main stem of Horse Creek (from upstream to downstream: at State Road 64, at the exit from the Horse Creek Prairie, at Goose Pond Road, and at County Road 665). The results from these four special purpose stations



for chlorophyll a, nutrients, dissolved oxygen, dissolved organic carbon, turbidity, and pH are presented in Table 2. . The difference in chlorophyll a concentrations is startling.

Samples from May 27, 2004	Chlorophyll a (mg/m <sup>3</sup> )
Horse Creek at State Road 64	2
Horse Creek Prairie	8
Horse Creek at Goose Pond Road	69
Horse Creek at County Road 665	2

Looking at differences like this in chlorophyll concentrations, you would expect there to be some input or source of nutrients that is “causing” the elevated chlorophyll a concentrations. All of IMC Phosphates activities are well north of State Road 64 and there are no other known sources of industrial or domestic wastewater in Horse Creek. From north of State Road 64 all the way down to State Road 70, the portion of the basin that drains directly into the main channel of Horse Creek is dominated by seemingly ubiquitous cattle grazing. Further, there is no great trend or change in nutrient concentrations (some are slightly higher moving downstream, but nothing that equates to the elevated chlorophyll concentration).

### Conclusion

The elevated chlorophyll concentrations at the Goose Pond Road station seem to have more to do with the very low flow and the physical nature of the stream channel. There was less than a cfs flowing under State Road 64 and about ¼ of a cfs at Goose Pond Road during the May 27<sup>th</sup> special purpose sampling event. Up at State Road 64, the Horse Creek Channel is an incised stream bed. The Horse Creek channel flows into the Prairie about one mile south of State Road 64. The Horse Creek Prairie is a large herbaceous system that dominates several sections of land. The Horse Creek Channel reemerges from the south end of the Prairie and then flows under Goose Pond Road. At Goose Pond Road, the channel has been heavily dredged (either during the original construction of the road bridge or in response to flooding associated with a hurricane depending on who you ask). Water depths just upstream of the bridge were over five feet deep even during this special purpose sampling event, when depths upstream of the bridge in the more natural portion of the Channel exiting the Prairie were on the order of three inches. Although the water at Goose Pond Road was clear, it did have a visible amount of very fine organic matter. Just upstream the Prairie sample did not have an elevated chlorophyll concentration and just downstream the County Road 665 sample was tannic (colored) but clear with little particulate matter and almost no measurable chlorophyll. The pooled water in the dredged stream bed around the Goose Pond Road bridge also appears to have elevated levels of visible organic matter during this period of very low flow.

When the sampling locations were chosen for this program, the criteria included trying to use locations that had a sampling history from past water quality data collection efforts and selecting points that were accessible by the public so that third parties could take their own samples for comparison. With most land privately owned, road crossing and bridges are the few spots that meet these criteria. Sampling locations can have a great effect on water quality, especially during extreme conditions. If this disparity in chlorophyll concentrations persists in June, then we will move north of the Goose Pond bridge back into the more natural portion of the channel and collect samples there for comparison to samples collected just off the bridge. With the start of the rainy season, flow volumes will increase (already there has been a three order of magnitude change in June in stream flow at the State Road 64 USGS gauge, from less than 1/10<sup>th</sup> of a cfs to over 20 cfs) and greater flows likely will have a noticeably improved effect on this situation.



Table 1  
Horse Creek Stewardship Program Chlorophyll a Monitoring  
2003 - 2004

Sampling Location	Station_ID	Date	Chlorophyll-A mg/m <sup>3</sup>	
Horse Creek at State Road 64	HCSW-1	4/30/2003	1	U
Horse Creek at State Road 64	HCSW-1	5/27/2003	1	U
Horse Creek at State Road 64	HCSW-1	6/19/2003	1	
Horse Creek at State Road 64	HCSW-1	7/14/2003	1	U
Horse Creek at State Road 64	HCSW-1	8/28/2003	1	UJ3
Horse Creek at State Road 64	HCSW-1	9/25/2003	1	U
Horse Creek at State Road 64	HCSW-1	10/29/2003	2	
Horse Creek at State Road 64	HCSW-1	11/20/2003	1	U
Horse Creek at State Road 64	HCSW-1	12/16/2003	5	
Horse Creek at State Road 64	HCSW-1	1/29/2004	1	U
Horse Creek at State Road 64	HCSW-1	2/24/2004	1	U
Horse Creek at State Road 64	HCSW-1	3/16/2004	3	J3
Horse Creek at State Road 64	HCSW-1	4/14/2004	1	U
Horse Creek at Goose Pond Road	HCSW-2	4/30/2003	4	
Horse Creek at Goose Pond Road	HCSW-2	5/27/2003	5	
Horse Creek at Goose Pond Road	HCSW-2	6/19/2003	4	
Horse Creek at Goose Pond Road	HCSW-2	7/14/2003	7	
Horse Creek at Goose Pond Road	HCSW-2	8/28/2003	1	J3
Horse Creek at Goose Pond Road	HCSW-2	9/25/2003	2	
Horse Creek at Goose Pond Road	HCSW-2	10/29/2003	6	
Horse Creek at Goose Pond Road	HCSW-2	11/20/2003	1	
Horse Creek at Goose Pond Road	HCSW-2	12/16/2003	2	
Horse Creek at Goose Pond Road	HCSW-2	1/29/2004	2	
Horse Creek at Goose Pond Road	HCSW-2	2/24/2004	4	
Horse Creek at Goose Pond Road	HCSW-2	3/16/2004	8	J3
Horse Creek at Goose Pond Road	HCSW-2	4/14/2004	16	!!
Horse Creek at State Road 70	HCSW-3	4/30/2003	1	
Horse Creek at State Road 70	HCSW-3	5/27/2003	1	U
Horse Creek at State Road 70	HCSW-3	6/19/2003	1	U
Horse Creek at State Road 70	HCSW-3	7/14/2003	1	U
Horse Creek at State Road 70	HCSW-3	8/28/2003	1	UJ3
Horse Creek at State Road 70	HCSW-3	9/25/2003	1	U
Horse Creek at State Road 70	HCSW-3	10/29/2003	1	U
Horse Creek at State Road 70	HCSW-3	11/20/2003	1	U
Horse Creek at State Road 70	HCSW-3	12/16/2003	1	U
Horse Creek at State Road 70	HCSW-3	1/29/2004	1	U
Horse Creek at State Road 70	HCSW-3	2/24/2004	1	U
Horse Creek at State Road 70	HCSW-3	3/16/2004	1	UJ3
Horse Creek at State Road 70	HCSW-3	4/14/2004	1	
Horse Creek at State Road 72	HCSW-4	4/30/2003	1	
Horse Creek at State Road 72	HCSW-4	5/27/2003	1	U
Horse Creek at State Road 72	HCSW-4	6/19/2003	1	U
Horse Creek at State Road 72	HCSW-4	7/14/2003	1	
Horse Creek at State Road 72	HCSW-4	8/28/2003	1	UJ3
Horse Creek at State Road 72	HCSW-4	9/25/2003	1	U
Horse Creek at State Road 72	HCSW-4	10/29/2003	1	U
Horse Creek at State Road 72	HCSW-4	11/20/2003	1	U
Horse Creek at State Road 72	HCSW-4	12/16/2003	1	U
Horse Creek at State Road 72	HCSW-4	1/29/2004	3	
Horse Creek at State Road 72	HCSW-4	2/24/2004	1	U
Horse Creek at State Road 72	HCSW-4	3/16/2004	1	UJ3
Horse Creek at State Road 72	HCSW-4	4/14/2004	1	U

Table 2  
Goose Pond Road Chlorophyll a Impact Investigation  
May 27, 2004

Sampling Location	Chlorophyll-A mg/m <sup>3</sup>		Ammonia mg/l	TKN mg/l	Nitrate/Nitrite mg/l	Orthophosphorus mg/l	Dissolved Organic Carbon mg/l	Turbidity NTU	pH Std Units	Dissoved Oxygen mg/l
Horse Creek at State Road 64	2	J3	0.06	P 0.8	0.23	0.32	12	1.1	7.59	7.6
Horse Creek Prairie	8	J3	0.04	P 1.2	0.08	0.2	20	1.9	6.37	4
Horse Creek at Goose Pond Road	69	J3	0.05	P 1.4	0.08	0.27	25	3.7	6.53	4.6
Horse Creek at County Road 665	2	J3	0.19	P 1.2	0.18	0.46	29	2.7	6.71	4.7



**Table 2.** Constituent concentrations (mean and range) observed in October 1997 - September 2000 sampling events. ("BDL" indicates value below detection limit of analytical method.)

STATION	Turbidity (NTU)	TSS (mg/L)	Color	pH	Spec. Cond. (umhos)	DO (mg/L)	Chl a (ug/L)
Peace Creek Canal near Wahneta	6.8 (1.8 – 25.0)	6.9 (BDL – 34.1)	206 (5 – 350)	6.8 (5.9 – 7.5)	288 (125 – 646)	4.1 (0.2 – 8.3)	2.8 (BDL – 20.4)
Saddle Creek at Structure P-11	27.9 (8.6 – 61.0)	57.1 (7.2 – 211.0)	68 (35 – 156)	8.3 (6.5 – 9.6)	202 (147 – 324)	6.1 (1.7 – 11.6)	138.4 (13.4 – 512.0)
Peace River at Bartow	11.2 (1.3 – 55.0)	18.8 (BDL – 151.2)	173 (35 – 320)	6.7 (5.4 – 7.6)	277 (129 – 683)	3.9 (0.1 – 8.5)	23.2 (BDL – 155)
Peace River at Ft. Meade	6.8 (0.8 – 29.0)	10.6 (BDL – 54.0)	100 (20 – 225)	7.3 (6.0 – 8.5)	368 (172 – 685)	6.4 (4.1 – 12.2)	12.6 (BDL – 64.2)
Peace River at Zolfo Springs	4.8 (0.7 – 15.3)	7.2 (BDL – 30.0)	99 (15 – 200)	7.5 (6.3 – 9.0)	396 (194 – 733)	7.4 (4.2 – 11.6)	7.3 (BDL – 79.8)
Peace River at Arcadia	4.5 (0.5 – 15.8)	6.3 (BDL – 26.0)	143 (40 – 300)	7.4 (5.7 – 8.3)	368 (81 – 650)	7.2 (4.1 – 12.4)	2.7 (BDL – 26.7)
Joshua Creek at Nocatee	2.7 (0.6 – 7.5)	3.7 (BDL – 12.0)	106 (25 – 300)	7.2 (5.9 – 8.1)	949 (293 – 1989)	7.7 (5.4 – 20.2)	1.4 (0.5 – 8.5)
Charlie Creek near Gardner	3.0 (0.4 – 14.1)	3.3 (BDL – 10.0)	221 (50 – 500)	6.7 (5.1 – 7.7)	260 (BDL – 630)	6.5 (3.9 – 10.8)	0.7 (BDL – 2.6)
Horse Creek near Myakka Head	2.8 (0.8 – 18.6)	4.6 (BDL – 51.0)	218 (30 – 640)	6.8 (5.4 – 8.3)	159 (66 – 372)	7.3 (4.4 – 10.7)	4.6 (BDL – 129.0)
Horse Creek near Arcadia	2.6 (0.4 – 8.6)	3.5 (BDL – 32.0)	172 (25 – 500)	6.7 (4.4 – 7.8)	397 (72 – 907)	7.0 (3.9 – 11.2)	2.1 (BDL – 31.5)
Shell Creek near Punta Gorda	2.2 (1.0 – 4.7)	2.4 (BDL – 11.0)	121 (46 – 220)	7.5 (6.8 – 8.5)	716 (113 – 1300)	5.1 (1.4 – 8.9)	6.9 (BDL – 24.2)
Myakka River at Myakka City	1.8 (0.2 – 7.6)	2.6 (BDL – 10.0)	132 (40 – 300)	7.0 (6.3 – 7.9)	401 (119 – 859)	6.1 (3.3 – 10.1)	1.4 (BDL – 3.8)
Myakka River near Sarasota	2.4 (0.8 – 8.0)	3.3 (BDL – 24.0)	148 (40 – 300)	6.8 (4.6 – 8.5)	355 (101 – 809)	4.1 (BDL – 11.3)	5.8 (BDL – 23.3)
Deer Prairie Slough near North Port	6.9 (1.4 – 24.0)	7.7 (BDL – 53.0)	190 (20 – 350)	6.9 (6.0 – 8.0)	254 (58 – 533)	5.9 (1.1 – 11.6)	2.8 (BDL – 16.0)
Big Slough Canal near Myakka City	57.9 (1.1 – 28.0)	9.7 (BDL – 47.0)	165 (30 – 500)	7.1 (6.5 – 7.8)	617 (298 – 1419)	6.0 (2.3 – 9.6)	4.0 (BDL – 19.2)
Big Slough Canal near North Port	4.7 (1.1 – 14.7)	5.2 (BDL – 17.7)	146 (30 – 350)	7.3 (6.7 – 7.9)	684 (203 – 1276)	6.7 (1.8 – 16.8)	2.6 (BDL – 16.0)
Florida median <sup>a</sup>	5.2	6.5	70	7.2	366	5.8	12

<sup>a</sup> median lake value for chl-a; median stream value for all other constituents





IMC Phosphates Company  
P.O. Box 2000  
Mulberry, Florida 33860-1100  
863.428.2500

September 16, 2004

Regular Mail

Mr. Samuel S. Stone  
Environmental Affairs Coordinator  
Peace River Facility  
8998 S.W. County Road 769  
Arcadia, FL 31269

**RE: Horse Creek Stewardship Program  
Chlorophyll a Concentrations at Goose Pond Road and State Road 70  
August 2004**

Dear Mr. Stone:

Until August 2004, we had only recorded two chlorophyll a concentrations above the Stewardship Program trigger level of 15 mg/m<sup>3</sup> (at Goose Pond Road in April and May 2004). Although not all of the August 2004 laboratory analyses are finished at this time, two of the stations had chlorophyll a concentrations above the trigger level.

**Horse Creek Sampling Chlorophyll a Concentrations - August 30, 2004**

Horse Creek at State Road 64	< 1 mg/m <sup>3</sup>
Horse Creek at Goose Pond Road	35 mg/m <sup>3</sup>
Horse Creek at State Road 70	38 mg/m <sup>3</sup>
Horse Creek at State Road 72	13 mg/m <sup>3</sup>

As with the August dissolved oxygen concentrations, these elevated chlorophyll a concentrations are thought to be a result of Hurricane Charley (the high winds and resultant organic deposition being washed into the Creek). Also like the dissolved oxygen depression, the effect was weakest at the northern end of the Basin. This is also the only portion of the Basin with any potential influence from IMC's mining operations (all mining operations are north of State Road 64).

The course of action we would prefer is to not perform a formal impact assessment for chlorophyll a at Goose Pond Road and State Road 70 for the August 2004 event at this time. We would rather wait and see if chlorophyll a concentrations drop back to "normal" levels in the September sampling. If you have any other questions or need any further information, please contact me at (813) 634-3922, extension 3655 at your convenience.

Sincerely,

Ross Franklin



**PEACE RIVER/MANASOTA REGIONAL WATER SUPPLY AUTHORITY**  
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MANATEE COUNTY

HON. SHANNON STAUB  
SARASOTA COUNTY

PATRICK J. LEHMAN, P.E., EXECUTIVE DIRECTOR

September 22, 2004

Ross Franklin  
IMC Phosphates  
PO Box 2000  
Mulberry, FL 33860-1100

RE: Horse Creek Stewardship Program  
Potential Impact Assessments for July and August 2004

Dear Mr. Franklin:

The Authority has received written notification from IMC of water quality trigger levels being exceeded in July and August 2004. Specifically these events can be described as follows.

July, stations 2 and 3 had levels of Dissolved Oxygen below the trigger level of 5.0 mg/l.

July, station 2 had a total radium greater than the trigger level of 5.0 pCi/l.

August, station 2 and 3 had levels of chlorophyll above the trigger level of 15 mg/m<sup>3</sup>.

After considerable discussion and review of these events it has been decided that an impact assessment at this time with current high flows in Horse Creek would not prove beneficial. We therefore suggest that the impact assessments be deferred until the stream flows in Horse Creek are near normal for this time of year. Prior to implementing these assessments IMC and the Authority need to also review any subsequent water quality results collected for these parameters at these stations.

Should you have any questions concerning this matter please contact me.

Yours truly,

A handwritten signature in cursive script that reads "Samuel S. Stone".

Samuel S. Stone  
Environmental Affairs Coordinator

xc: Sunny Diver  
Ralph Montgomery  
Pat Lehman