

MEMORANDUM

September 11, 2003

TO: File

FROM:  Sam Stone

RE: Horse Creek Stewardship Program
Horse Creek at Goose Pond Road (HCSW-2) / Low Dissolved Oxygen Impact Assessment

The Horse Creek at Goose Pond Road (HCSW-2) sample location has experienced dissolved oxygen (DO) levels below the minimum trigger level of 5.0 mg/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 IMC's assessment and discussed their conclusions and provide the following comments.

We agree with IMC's findings that DO levels immediately downstream of existing mining activities at HCSW-1 (Horse Creek at Hwy 64) are normal and that most likely lower DO levels at HCSW-2 (downstream of HCSW-1) are not the result of mining activities. DO levels downstream at HCSW-3 and HCSW-4 are normal during this same period and indicate that the low DO levels are localized and most likely have no negative impact to the Peace River, the Peace River Facility or the Charlotte Harbor estuary.

Additional historical data on Horse Creek and the Peace River was reviewed. (see *Annual Report on Water Quality Status and Trends in the Peace River and Myakka River Basins* by CHEC dated December 1999) This report showed that two stations on Horse Creek had recorded minimum DO levels of 1.0 mg/l and 1.9 mg/l during the 1970's, 1980's and 1990's. The report also showed the Peace River and its tributaries with recorded minimum DO levels ranging from .02-3.8 mg/l during this same time frame. This historical data indicates that the low DO levels recently found at HCSW-2 are not uncommon, and occur both in the Peace River and Horse Creek basins.

Finally, as an interim measure we support the DO survey proposed by IMC which will help to characterize this issue further. A more complete and in depth view of this issue will be completed in the near future as part of the required Horse Creek Historical Report. Until that report is completed, the issue of low DO at HCSW-2 will continue to be monitored closely.

xc: Pat Lehman
Sunny Diver
Ralph Montgomery

Table 9. Reported levels and trends in DO, 1970-1998.

Station	Period (years)	n (years)	n (obs)	Dissolved Oxygen (mg/L)			D.O.Trends (Mann-Kendall significance level)		
				Minimum	Mean	Maximum	Annual Minimum	Annual Mean	Annual Maximum
Saddle Creek Structure P-11	1973 – 1993	16	92	0.1	7.5	16.7	n.t. (>0.10)	n.t. (>0.10)	n.t. (>0.10)
Peace River Bartow	1971 – 1998	27	193	1.1	5.0	11.1	n.t. (>0.10)	n.t. (>0.10)	n.t. (>0.10)
Peace River Ft. Meade	1973 – 1998	25	168	1.0	6.1	11.2	↑ (<0.001)	↑ (0.02)	n.t. (>0.10)
Peace River Zolfo Springs	1971 – 1998	25	190	3.8	7.3	12.9	n.t. (>0.10)	↑ (0.09)	n.t. (>0.10)
Charlie Creek Gardner	1970 – 1998	20	128	3.5	6.8	16.8	n.t. (>0.10)	↓ (0.01)	n.t. (>0.10)
Peace River Arcadia	1971 – 1998	28	235	3.5	7.2	12.4	n.t. (>0.10)	↓ (0.03)	↓ (0.04)
Joshua Creek Nocatee	1972 – 1998	21	124	3.2	6.9	11.6	↑ (0.08)	n.t. (>0.10)	n.t. (>0.10)
Horse Creek Myakka Head	1979 – 1998	11	67	1.0	7.2	11.0	n.t. (>0.10)	↓ (0.06)	n.t. (>0.10)
Horse Creek Arcadia	1971 – 1998	27	173	1.9	7.1	11.7	↑ (0.02)	n.t. (>0.10)	n.t. (>0.10)
Shell Creek Punta Gorda	1972 – 1998	23	144	0.2	4.6	9.6	↑ (0.001)	n.t. (>0.10)	n.t. (>0.10)
Myakka River Sarasota	1978 - 1998	14	106	0.1	4.4	9.0	n.t. (>0.10)	n.t. (>0.10)	n.t. (>0.10)

Dissolved Oxygen Concentrations - Horse Creek at Goose Pond Road Preliminary Impact Assessment

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 dissolved oxygen. A "trigger level" of 5.0 mg/l was set for dissolved oxygen concentrations at Goose Pond Road in the Program. To date, five months of sampling have been completed and dissolved oxygen concentrations recorded.

Horse Creek at Goose Pond Road	April 2003	1.0 mg/l
Horse Creek at Goose Pond Road	May 2003	1.3 mg/l
Horse Creek at Goose Pond Road	June 2003	1.1 mg/l
Horse Creek at Goose Pond Road	July 2003	1.7 mg/l
Horse Creek at Goose Pond Road	August 2003	3.0 mg/l

In all five months, dissolved oxygen concentrations at Goose Pond Road have been below the trigger level.

Analysis

All dissolved oxygen concentrations recorded as part of the Program are included in Table 1 (attached). A trigger level of 5.0 mg/l (minimum) is in effect for the State Road 64, Goose Pond Road, State Road 70, and State Road 72 stations. The lowest dissolved oxygen concentrations to date have been recorded at Goose Pond Road. This is neither a new or novel occurrence. Attached is the Peace River Basin portion of the 1984 305B report. Low dissolved oxygen concentrations in Horse Creek at County Road 665 are specifically mentioned. County Road 665 is about three miles south of Goose Pond Road. The "source" of the depressed dissolved oxygen concentrations at both locations is the same, the Horse Creek Prairie. The Goose Pond Road station is just downstream of the Prairie. While the Prairie is a wonderful place, like any blackwater swamp it is not conducive to elevated dissolved oxygen concentrations.

The State Road 64 (the nearest downstream station to IMC Phosphates' mining activities), the State Road 70, and the State Road 72 stations do not exhibit depressed dissolved oxygen concentrations. The effect is localized and restricted to the reach of the Creek downstream of the Prairie.

The first annual Program report will include all Horse Creek data in the STORET database and the historical dissolved oxygen data will help to better frame this situation. In late September or October (when water levels have dropped near "normal" levels), a dissolved oxygen survey will be conducted at several locations on Horse Creek and its major tributaries. This survey will also help to define the dissolved oxygen characteristics of the Horse Creek basin. At this time, we do not see any evidence that IMC Phosphates' mining activities are the cause of the depressed dissolved oxygen concentrations at Goose Pond Road.



Table 1 - Horse Creek Stewardship Program Dissolved Oxygen Sampling
2003

Sampling Location	Date	Dissolved Oxygen
		mg/l
Horse Creek at State Road 64	4/30/2003	6.7
Horse Creek at State Road 64	5/27/2003	7
Horse Creek at State Road 64	6/19/2003	6.7
Horse Creek at State Road 64	7/14/2003	5.9
Horse Creek at State Road 64	8/28/2003	6.4
Horse Creek at Goose Pond Road	4/30/2003	1
Horse Creek at Goose Pond Road	5/27/2003	1.3
Horse Creek at Goose Pond Road	6/19/2003	1.1
Horse Creek at Goose Pond Road	7/14/2003	1.7
Horse Creek at Goose Pond Road	8/28/2003	3
Horse Creek at State Road 70	4/30/2003	6.6
Horse Creek at State Road 70	5/27/2003	6.4
Horse Creek at State Road 70	6/19/2003	5.5
Horse Creek at State Road 70	7/14/2003	5.5
Horse Creek at State Road 70	8/28/2003	5.4
Horse Creek at State Road 72	4/30/2003	6.6
Horse Creek at State Road 72	5/27/2003	6.8
Horse Creek at State Road 72	6/19/2003	6
Horse Creek at State Road 72	7/14/2003	6.3
Horse Creek at State Road 72	8/28/2003	5.4



WATER QUALITY INVENTORY

for the

STATE OF FLORIDA

Submitted in Accordance with the 1972
Federal Water Pollution Control Act
Public Law 92-500 Section 305(b)

June 1982 ,

JOE HAND and DEAN JACKMAN
Water Quality Monitoring Section
Bureau of Water Analysis
Division of Environmental Programs

PEACE RIVER BASIN

The Peace River originates in Green Swamp in Central Polk County and flows generally southwest for approximately 105 miles, entering the Gulf of Mexico at Charlotte Harbor (Figure 106). The drainage area encompasses over 2,300 square miles. Numerous lakes and large areas of poorly drained swamps, in the headwaters of the Peace River, act as an important recharge area for the Floridan aquifer. The mean flow of the Peace River at Arcadia is recorded as 900 cfs 36 miles upstream from the mouth. Primary tributaries of the Peace River include Peace Creek, Saddle Creek, Charlie Creek, and Shell Creek. The major urban areas in the basin include: Lakeland, Port Charlotte and Punta Gorda. Land use in the upper portion of the Peace River Basin includes predominantly agricultural land use. An additional large percentage of barren land (25%) reflects the extensive phosphate mining activities in this reach of the river. In the lower portion of the Peace River Basin, land use consists primarily of agriculture and range-land. Pollution sources in the Peace River Basin include domestic sewage discharges, heavy industrial discharges from phosphate mining activities, chemical and citrus processing plants, and surface runoff from urban, agricultural, range and barren (mined) areas.

The upper section of Peace River is characterized by its extremely high nutrient concentrations (TP = 3 - 5 mg/l, TN = 2-4 mg/l). Extensive mining for phosphate in the Peace River watershed results in discharge of sufficient amounts of phosphate to cause nutrient problems. There is a downstream gradient of decreasing nutrient concentrations from Saddle Creek to Charlotte Harbor (Figure 107). Along with the high nutrient levels, there are high chlorophyll levels in the river (CHLA = 33-93 ug/l) and elevated fecal coliform levels (FCOLI = 88-353 MPN/100ml). However, even with the poor chemical conditions, the biological diversities are fairly good (DI = 2.0 - 3.0). Water quality trends in the Peace River show increasing nitrogen levels during the last 6 years (Figures 108, 109 and 110).

Lake Hancock at the upper section of Peace River demonstrates very poor water quality. High nutrients (TP = 1.1 mg/l, TN = 9.7 mg/l) cause water quality problems which are evidenced by supersaturated dissolved oxygen (DO=15 mg/l), elevated pH (8.6) and low biological diversities (DI = 1.6). The trend plot for Lake Hancock (Figure 111) shows increasing phosphorus in the lake and overall poor quality during the last several years.

Many of Peace River tributaries (Payne Creek, Horse Creek, Charlie Creek) also show high phosphorus concentrations; however, their concentrations (TP = .5-.7 mg/l) are about one sixth of that of the main river. High fecal counts (1370 MPN/100ml) and low DO (1.5 mg/l) have been recorded for Horse Creek, while Shell Creek shows high phosphorus (1.44 mg/l) and low DO (4.0 mg/l). No significant trends are evident in Horse Creek (Figure 112).

The lakes in the headwaters of the Peace River, located in urban centers, such as Lakeland and Winter Haven, exhibit symptoms of nuisance algae conditions. The major sources of pollution are urban runoff, STP discharges and industrial wastes. Several of these lakes have been significantly improved due to removal of point sources (e.g., Bond Citrus from Lake Shipp and Lake Lulu).

square
co at

CHARLOTTE HARBOR

Charlotte Harbor and the associated estuaries between it and the Caloosahatchee River, comprise an area of critical concern due to its rapidly expanding population (Figure 113). Water quality is generally good presently (with the exception of high phosphorus values $TP=.3-.8$ mg/l), but the potential for severe damage to this very important body of water is high. The estuaries now serve as a sportfishery and nursery area for the very productive marine life of the area. They are impacted by the Peace River, Myakka River, and Caloosahatchee River. Major discharges to the system are the City of Punta Gorda (1.0 MGD), South Port Charlotte (1.5 MGD), a projected 24 MGD from the City of Ft. Myers to the Caloosahatchee River, Cape Coral (4.0 MGD), Ft. Myers Beach (2.7 MGD), Fiesta Village (1.5 MGD), and approximately 1 MGD each from Waterway Estates, Sanibel Island and Lehigh acres. DER, South Florida Water Management District and USGS are undertaking a study of the area which will describe existing water quality, and would result in a plan for the development of the area's resources.

MAP#	#EXC	DO	PH	FCOLI	CHLA	TP	TN	DI	COLOR	STATION
1	2	5.8	6.0	-1	-1	4.24	3.58	2.20	80	25020006
2	1	6.0	8.1	-1	-1	1.40	1.64	2.40	26	25020012
3	2	7.4	6.0	280	-1	0.01	3.16	0.80	30	25020108
4	2	7.3	7.5	-1	-1	0.02	1.33	1.50	-1	25020157
5	1	8.4	6.0	-1	-1	0.32	-1.00	1.70	-1	25020150
6	1	6.6	7.8	15	33	0.81	1.30	2.00	84	25020001
7	0	6.1	7.6	-1	-1	0.06	0.88	3.40	82	25020124
8	1	4.8	7.0	60	8	1.44	1.01	-1.00	00	25020120
9	0	7.1	7.2	-1	-1	0.31	0.01	3.20	80	25020524
10	2	6.9	7.0	-1	-1	0.61	1.27	-1.00	233	02207310
11	1	6.7	7.0	100	2	0.71	1.40	2.00	102	25020111
12	1	7.1	7.3	225	-1	3.03	2.20	-1.00	120	02206750
13	2	7.4	7.4	188	03	3.33	2.24	2.30	106	25020004
14	1	7.8	7.3	-1	-1	3.41	-1.00	2.80	80	25020450
15	2	6.9	7.2	-1	-1	0.53	1.53	-1.00	253	02206500
16	2	1.5	6.1	470	-1	0.48	1.60	-1.00	266	25020430
18	3	5.5	6.6	1370	-1	0.74	1.14	3.30	223	25020428
19	1	7.7	7.0	-1	-1	3.71	2.23	-1.00	55	02205637
20	2	6.8	6.8	-1	-1	0.56	-1.00	1.30	-1	25020254
21	2	5.5	7.0	353	37	4.06	3.60	3.00	64	25020008
22										
23	2	5.2	6.8	-1	-1	4.57	3.61	-1.00	83	02204650
24	3	15.0	8.6	-1	-1	1.10	0.60	1.60	-1	25020207
25	1	7.6	7.4	-1	-1	8.18	1.44	1.80	-1	25020208
26	1	-1.0	-1.0	-1	-1	0.10	1.10	1.60	-1	25020247

NAME

PEACE RIVER BR FLA HWY 84A
 PEACE RIVER BR MT PISCATAWAY RD
 UPSTR FR P 18 LITTLE PAYNE CR
 LAKE CONNIE V OF L ROCHELL CANAL
 LAKE HAINES IN SOUTHERNMOST COVE
 PEACE R US 41 BR
 SHELL CR 6 MI E OF SR 764
 SHELL CREEK AT SR 764 BRIDGE
 JOSHUA CR-1.2 MI N OF RT 76DA
 HORSE CREEK NR ARCADIA, FLA.
 HORSE CR SR 72 BR
 PEACE RIVER AT ARCADIA, FLA.
 PEACE RIVER BR FLA HWY #70
 PEACE R AT BR 1.5 MI W OF GARDNE
 CHARLIE CREEK NR GARDNER, FLA.
 HORSE CRK AT SR 663 BRDG

HORSE CRK AT SR 64 BRDG
 PEACE RIVER AT ZOLFO SPRINGS, FLA.
 PAYNE CREEK AT CENTER HILL RD
 PEACE RIVER BR FLA HWY #864

PEACE RIVER AT BARTOW, FLA.
 LAKE HANCOCK V SIDE
 LAKE ARIANNA 200 FEET OFF N SHOR
 LAKE PARKER 200 FT OFF SW SHORE

EXPLANATION

MAP# MAP ID NUMBER CORRESPONDING TO STATION
 #EXC NUMBER OF PARAMETERS EXCEEDING SCREENING LEVELS

DO DISSOLVED OXYGEN MG/L <3.5
 PH PH STANDARD UNITS <4.5 OR >8.5
 FCOLI FECAL COLIFORM MPN/100 ML >500
 TP TOTAL PHOSPHORUS MG P/L >.50
 TN TOTAL NITROGEN MG N/L >3.5
 DI NATURAL SUBSTRATE MACRO-INVERTEBRATE DIVERSITY INDEX <2.0
 COLOR COLOR PCU >200

Figure 106 (Continued). Peace River Water Quality Stations.

Dissolved Oxygen Concentrations - Horse Creek at Goose Pond Road Impact Assessment

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 dissolved oxygen. A "trigger level" of 5.0 mg/l was set for dissolved oxygen concentrations at Goose Pond Road in the Program. To date, eight months of sampling have been completed and dissolved oxygen concentrations recorded.

Horse Creek at Goose Pond Road	April 2003	1.0 mg/l
Horse Creek at Goose Pond Road	May 2003	1.3 mg/l
Horse Creek at Goose Pond Road	June 2003	1.1 mg/l
Horse Creek at Goose Pond Road	July 2003	1.7 mg/l
Horse Creek at Goose Pond Road	August 2003	3.0 mg/l
Horse Creek at Goose Pond Road	September 2003	1.3 mg/l
Horse Creek at Goose Pond Road	October 2003	2.9 mg/l
Horse Creek at Goose Pond Road	November 2003	2.8 mg/l

In all eight months, dissolved oxygen concentrations at Goose Pond Road have been below the trigger level.

Analysis

All dissolved oxygen concentrations recorded as part of the Program are included in Table 1 (attached). A trigger level of 5.0 mg/l (minimum) is in effect for the State Road 64, Goose Pond Road, State Road 70, and State Road 72 stations. The lowest dissolved oxygen concentrations to date have been recorded at Goose Pond Road. This is neither a new or novel occurrence. The Peace River Basin portion of the 1984 305B report specifically mentions low dissolved oxygen concentrations in Horse Creek at County Road 665. County Road 665 is about three miles south of Goose Pond Road. The "source" of the depressed dissolved oxygen concentrations at both locations is the same, the Horse Creek Prairie (the Goose Pond Road station is just downstream of the Prairie). While the Prairie is a wonderful and beautiful place, like any blackwater swamp it is not conducive to elevated dissolved oxygen concentrations.

A special sampling program was carried out on August 4, 2003. Dissolved oxygen concentrations were measured at Horse Creek at State Road 70, at Pine Level Road, and at State Road 72. Also, dissolved oxygen concentrations were taken at (all locations are on the attached map):

Horse Creek at State Road 64	6.3mg/l
Horse Creek at the exit from the Prairie	3.0 mg/l
Horse Creek at Goose Pond Road	2.0 mg/l
Horse Creek at County Road 665	3.3 mg/l

Stream conditions on this date (August 4, 2003) were extreme with water well out of the banks of Horse Creek and further sampling of other locations was not carried out. A second dissolved oxygen survey was performed on October 31, 2003. Stream flow was greatly reduced from the August sampling and the streams were well within their banks at the time of sampling.

West Fork of Horse Creek at Roberts Road	7.4 mg/l
Horse Creek at State Road 64	7.7mg/l
Elder Branch at County Road 665	4.1mg/l
Horse Creek at the exit from the Prairie	1.9 mg/l
Horse Creek at Goose Pond Road	2.7 mg/l
Horse Creek at County Road 665	5.6 mg/l



Horse Creek at State Road 70	6.3 mg/l
Brandy Branch at State Road 70	6.5 mg/l
Horse Creek at Pine Level Road	6.7 mg/l
Buzzard Roost Branch at Pine Level Road	6.6 mg/l
Horse Creek at State Road 72	6.6 mg/l

Only the Horse Creek Prairie exit, the Goose Pond Road Station, and Elder Branch (a tributary that flows into the Horse Creek Prairie) had dissolved oxygen concentrations below the 5.0 mg/l trigger limit. . All the other stations had dissolved oxygen concentrations greater than 5.0 mg/l (even the County Road 665 Station had a dissolved oxygen concentration greater than 5.0 mg/l on that day). The depressed dissolved oxygen concentration effect is localized and restricted to the reach of the Creek just downstream of the Prairie.

The first annual Program report will include all Horse Creek data in the STORET database and the historical dissolved oxygen data will help to better frame this situation. At this time, we do not see any evidence that IMC Phosphates' mining activities (all well north of State Road 64) are the cause of the depressed dissolved oxygen concentrations at Goose Pond Road.

Table 1 - Horse Creek Stewardship Program Dissolved Oxygen Sampling
2003

Sampling Location	Date	Dissolved Oxygen mg/l
Horse Creek at State Road 64	4/30/2003	6.7
Horse Creek at State Road 64	5/27/2003	7
Horse Creek at State Road 64	6/19/2003	6.7
Horse Creek at State Road 64	7/14/2003	5.9
Horse Creek at State Road 64	8/28/2003	6.4
Horse Creek at State Road 64	9/25/2003	6.3
Horse Creek at State Road 64	10/29/2003	7.5
Horse Creek at State Road 64	11/20/2003	8.4
Horse Creek at Goose Pond Road	4/30/2003	1
Horse Creek at Goose Pond Road	5/27/2003	1.3
Horse Creek at Goose Pond Road	6/19/2003	1.1
Horse Creek at Goose Pond Road	7/14/2003	1.7
Horse Creek at Goose Pond Road	8/28/2003	3
Horse Creek at Goose Pond Road	9/25/2003	1.3
Horse Creek at Goose Pond Road	10/29/2003	2.9
Horse Creek at Goose Pond Road	11/20/2003	2.8
Horse Creek at State Road 70	4/30/2003	6.6
Horse Creek at State Road 70	5/27/2003	6.4
Horse Creek at State Road 70	6/19/2003	5.5
Horse Creek at State Road 70	7/14/2003	5.5
Horse Creek at State Road 70	8/28/2003	5.4
Horse Creek at State Road 70	9/25/2003	5.1
Horse Creek at State Road 70	10/29/2003	6.4
Horse Creek at State Road 70	11/20/2003	7.6
Horse Creek at State Road 72	4/30/2003	6.6
Horse Creek at State Road 72	5/27/2003	6.8
Horse Creek at State Road 72	6/19/2003	6
Horse Creek at State Road 72	7/14/2003	6.3
Horse Creek at State Road 72	8/28/2003	5.4
Horse Creek at State Road 72	9/25/2003	5.6
Horse Creek at State Road 72	10/29/2003	6.7
Horse Creek at State Road 72	11/20/2003	7.2

Table 2

Horse Creek Basin Dissolved Oxygen Sampling
August 4, 2003

Station	Dissolved Oxygen
Horse Creek at State Road 64	6.3 mg/l
Horse Creek at the exit from the Prairie	3.0 mg/l
Horse Creek at Goose Pond Road	2.0 mg/l
Horse Creek at County Road 665	3.3 mg/l

Horse Creek Basin Dissolved Oxygen Sampling
October 31, 2003

Station	Dissolved Oxygen
West Fork of Horse Creek at Roberts Road	7.7 mg/l
Horse Creek at State Road 64	7.4 mg/l
Elder Branch at County Road 665	4.1 mg/l
Horse Creek at the exit from the Prairie	1.9 mg/l
Horse Creek at Goose Pond Road	2.7 mg/l
Horse Creek at County Road 665	5.6 mg/l
Horse Creek at State Road 70	6.3 mg/l
Brandy Branch at State Road 70	6.5 mg/l
Horse Creek at Pine Level Road	6.7 mg/l
Buzzard Roost Branch at Pine Level Road	6.6 mg/l
Horse Creek at State Road 72	6.6 mg/l



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

January 21, 2004

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

FROM:  Sam Stone

RE: Horse Creek Stewardship Program
Impact Assessment for Dissolved Oxygen

Background.

The Settlement Agreement between IMC Phosphates and the Peace River Manasota Regional Water Supply Authority dated March 5, 2003 includes a monitoring program for Horse Creek called the Horse Creek Stewardship Program (Program). One of several components found in the Program requires that chemical water quality parameters be monitored on a monthly basis at four (4) fixed surface water locations. The Program also establishes trigger levels for each chemical parameter and a process to assess the impact of exceeding those trigger levels. Following the initial assessment, a process is also provided in the Program that determines the cause for the exceedence, possible abatement of on going activities and / or evaluation and implementation of alternative corrective actions.

Attachments.

Attached you will find a Preliminary Impact Assessment Report from IMC dated September 3, 2003, an Authority memorandum dated September 11, 2003 and a Final Impact Assessment Report from IMC dated December 11, 2003.

Summary.

Below is a brief summary of the findings from the reports and data presented regarding exceedence of the dissolved oxygen trigger level at Horse Creek Surface Water Station 2 (Horse Creek at Goose Pond Road). The trigger level for dissolved oxygen (DO) is a level less than 5.0 mg/l. Starting upstream stations 1, 3 & 4 have not declined below the 5.0 level, but station 2 has been below 5.0 every month since the Program was started. This suggests that the cause for the low DO is localized between stations 1 & 2. Historically Horse Creek has had DO levels below 5.0 mg/l just down stream of our station 2 at Hwy 665.