

Horse Creek Stewardship Program  
Draft 2017 Annual Report Review Comments

January 23, 2019

## 2017 HCSP Annual Report Comments – Sam Stone, PRMRWSA

### Executive Summary

Mining and Reclamation: reconnected to what? (referring to the number of acres in Brushy and Horse Creek that were reconnected in 2017).

***Reconnected to the watershed. These areas had previously been isolated by a ditch/berm system or similar means of keeping areas isolated. Land is reconnected to the watershed once there is approval by FDEP or other government agency.***

### Executive Summary

Water Quality Results: page x, first paragraph, Is this sentence talking about 2017 impact assessments or all previous impact assessments? (referring to sentence about completed impact assessments with none posing significant adverse ecological impact)

***It is referring to all the impact assessments for 2017 exceedances that have been completed to date.***

### Section 1

Page 1-1, check to make sure we still sample for 21 parameters

***As of 2017, 21 parameters are measured (results are listed for radium 226, radium 228, and total radium) and reported monthly.***

### Section 4.1

Page 4-11, are there any NPDES outfalls on Brushy Creek Basin?

***There are currently no permitted outfalls in the Brushy Creek Basin.***

### Section 5.2

Page 5-29, Figure 5-3, why is the Mosaic monthly data for HCSW-3 only showing once for the year?

***Added a statement of clarification to beginning of the second paragraph in section 5.2 to say: "During 2017, the staff gauge at HCSW-3 was either broken/missing, underwater, or not reachable as some wet season samples were taken from the bridge crossing at SR70 during most sampling events (Figure 5-3)."***

### Section 5.5

Page 5-37, this is good information to be added to other locations in the report talking about the NPDES structures.

***Comment noted.***

### Section 6.2

Page 6-51, turbidity, somewhere we may need to add some clarification. The continuous WQ recorder at HCSW-1 has been in operation since 2005. The same instrument was changed to send electronic data and alarms in 2014.

***Added the follow to the end of the first paragraph: "since the program was modified in 2014 to send electronic data and alarms (Section 3.1)."***

***The language about the alert system was clarified.***

## **Section 8.2**

Page 8-96, second to last paragraph, should it be added somewhere that the upstream stations are located where mining is complete and reclamation is complete?

***Not all of the upstream locations used for comparison purposes are upstream of current mining activities. Mining is still taking place at Altman, and the HC Inlet location is upstream of the Horse Creek outfalls but downstream of mining and reclamation activities.***

## **Section 8.3**

Page 8-97, Can it be stated here that overall from the period of 2003-present that the benthic has stayed consistent or stable?

***The first two sentences of this paragraph summarize the benthic data.***

## **Section 8.4**

Page 8-97, can we summarize in one statement? No change or stable (referring to last sentence of fish conclusions paragraph).

***There have been many changes in the fish results over time, they are just not showing a pattern or a consistent change.***

## **List of Changes from Sam Stone**

*Executive Summary, Introduction:* add “physical, chemical, and biological characteristics of” and remove “Basin” after “Mosaic mining activities” in the last sentence of the first paragraph.

***Change made.***

*Executive Summary, Introduction:* second paragraph, add “Horse Creek” at end of component number 2

***Change not made because current text reflects the HCSP agreement.***

*Executive Summary, Monitoring Program Components:* add “downstream of the NPDES outfalls” after “four locations” at start of paragraph.

***Updated sentence to read: “Four sampling stations, located downstream of Mosaic’s NPDES outfalls on Horse Creek, were monitored...”***

*Executive Summary, Water Quantity Results:* first paragraph, add “first before impacting streamflow” after “fill or resume flow” in second to last sentence.

***Revised the sentence to say “wetlands or small creeks either need to fill or resume flow first before contributing to the flow of larger systems.”***

*Executive Summary, Water Quality Results: page x:* first paragraph, add “during 2017” after “assessments already completed” to last sentence.

***Revised sentence to say “none of the observed exceedances during 2017”.***

*Executive Summary, Water Quality Results: page x:* fourth paragraph, add “(upstream of the NPDES outfalls) after “trends at the upstream stations” in the first sentence.

***Revised sentence to say “In addition, the trends at the upstream stations (upstream of or different basins from the Horse Creek NPDES outfalls)”***

*Section 1, page 1-1:* second paragraph, add “physical, chemical, and biological characteristics of” and remove “Basin” after “Mosaic mining activities” in the last sentence of the first paragraph.

***Change made.***

*Section 1, page 1-1:* fourth bullet, add “below the NPDES outfalls” at the end

***Change not made.***

Section 4.1, page 4-11: first sentence add "(below NPDES outfalls)" after "Four Horse Creek locations".

**Added "located downstream of Mosaic's permitted NPDES outfalls,"**

Section 5.3, page 5-31: add "during the same period" to end of paragraph.

**Change not made.**

Section 5.5, page 5-37: third paragraph, add "continued" after "wet season rains" in second sentence.

**Added "ended" instead.**

Section 6.2, page 6-51: turbidity first paragraph, add "(at station 1)" after "Turbidity measured by the continuous recorder"

**Added "(at HCSW-1)"**

Section 6.5, page 6-71: third paragraph, add "(upstream of NPDES outfalls)" to end of first sentence

**Change not made.**

Section 6.5, page 6-72: last paragraph, move "HCSW-1" after "TDS showed" instead of at end of sentence in parenthesis

**Revised to say "...TDS at HCSW-1 showed the opposite pattern with NPDES discharge.)"**

Section 7.1.2, pages 7-78: second paragraph, add "(Horse Creek Prairie)" after "an upstream wetland system" in last sentence.

**Change made.**

Section 7.2.2, page 7-87: first paragraph, add "sample" after "Each station in 2017" and "of" before "upstream conditions" at end of paragraph

**Changes made.**

Section 7.2.2, page 7-88: first paragraph, change "all site median diversity" to "overall site median diversity"

**Changed "all site" to "combined site".**

Section 7.2.2, page 7-88: second paragraph, add "sample" to third sentence between "summer event" and "winter event".

**Changes made**

Section 7.2.4, page 7-92: fourth paragraph, add "sample" to third sentence between "summer event" and "winter event"

**Changes made**

Section 8.2, page 8-96: fourth paragraph, add "(upstream of NPDES outfalls)" after "trends at the upstream stations" in first sentence.

**Revised sentence to say "In addition, the trends at the upstream stations (upstream in or different basins from the Horse Creek NPDES outfalls)"**

Section 8.2, page 8-96: last paragraph, add "increasing trends" to end of paragraph.

**Change not made**

Section 8.2, page 8-97: second paragraph, move "HCSW-1" after "TDS showed" instead of at end of sentence in parenthesis.

**Revised to say "...TDS at HCSW-1 showed the opposite pattern with NPDES discharge.)"**

Section 9.1, page 9-98: first bullet, rewrite after FTP to say “for TAG members to”.  
**Change made.**

## 2017 HCSP Annual Report Comments – Jeff Clark, EarthBalance®

Section 3.1, page 3-7: Table 3-1; Surprising that the Acres Reclaimed and the Acres Reconnected aren't filled in despite shapefiles being shown on Figure 3-1 for reclamation contouring and vegetation.

***The acres represented in reclamation contouring and vegetation are slightly different than the total acres reclaimed. There could be spatial and temporal overlap in reclamation activities that is not easily represented in GIS files. The acres reconnected are not in the GIS files shown in the figure. The acre totals for Table 3-1 have been filled in the revised report.***

Section 3.2, page 3-9: What dictates reconnection of reclaimed areas? Do reclaimed areas need to meet all vegetation criteria for all agencies before they're reconnected? That's the part that's missing from the 3.2 Reclamation discussion.

***Before an area can be reconnected to the basin, it needs to be vegetated and approved by FDEP. The criteria for reconnection may be permit-specific, and a detailed discussion of them is not relevant for this report.***

Section 5.2, page 5-29: Figure 5-3, Why is there only 1 gauge height data point at HCSW-3 for the whole year?

***The gauge was either broken/missing or underwater (or not reachable as some wet season samples were taken from the bridge crossing at SR70) for most of 2017.***

Section 5.5, page 5-37: No NPDES discharge was reported for 2017 despite relatively average rainfall for the year. Is the lack of discharge related to operational changes (water use) within the mine, distribution of rainfall events throughout the year, both, or some other reason? It's just surprising that no discharge was needed, and I don't see much of an explanation for that.

***While there are only two NPDES outfalls that discharge to Horse Creek (Fort Green D-003 and Wingate D-004), those are not the only permitted outfalls for the Fort Green or Wingate Mines. During 2017, water was either used elsewhere at the mine or discharged through alternate permitted outfalls that do not discharge to Horse Creek.***

Section 7.2.4, page 7-94: Figure 7-13, The points along the species accumulation curve for HCSW-1 appear to end at sampling event 39, whereas the other stations extend to 43 events. Is this in error?

***They continue, the total of fish species observed is just the same at HCSW-1 and HCSW-2 from sampling events 40 to 43. The marker for the HCSW-1 points have been increased in size so they show up in the revised figure.***

## 2017 HCSP Annual Report Comments – John Ryan, Sarasota County

*Executive Summary, Mining and Reclamation:* How much released over time? (referring to the acres reclaimed or reconnected)

***There were a total of 3,486.2 acres released by FDEP from 2003 through 2017 (3,284.4 acres in Horse Creek and 201.8 acres in West Fork Horse Creek).***

*Executive Summary, Water Quantity Results:* seems like this should be opposites (referring to flows and rainfall numbers for 2017)

***Comment noted.***

*Executive Summary, Water Quantity Results:* long-term average rainfall and streamflow would be a good graph

***Figure 5-8 in the 2017 annual report show monthly rainfall and streamflow at HCSW-1 (SR64) from 1979 to 2017.***

*Executive Summary, Water Quantity Results:* discuss Hurricane Irma date and quantity

***Additional text and data has been added to the report and Appendix K, including this sentence: "Hurricane Irma produced more than 5-8 inches of rain in the Horse Creek basin from September 10-11, which increased streamflow at the HCSW-1 USGS station from about 100 cfs to 771 cfs and gauge height by more than 5 feet. Streamflow at the HCSW-4 USGS station increased from about 756 cfs to 7460 cfs, and gauge height increased by 6 feet."***

*Executive Summary, Water Quality Results:* Because there were none, right? (referring to exceedances not occurring during times of NPDES discharge)

***Correct, there was no NPDES discharge in 2017 so any exceedance of a water quality standard did not occur during a time of NPDES discharge.***

*Executive Summary, Benthic Macroinvertebrate Results:* Don't know the meaning of monotonic

***Gradual change over time in a similar direction i.e. concentrations are either consistently increasing or decreasing over time (linear trends are a subset of monotonic trends). A monotonic upward (or downward) trend means that the variable consistently increases (or decreases) through time, but the trend may or may not be linear.***

*Executive Summary, Conclusions:* where can the raw data be found?

***A database of all the water quantity, quality, quality and biological data collected as part of the HCSP through the current reporting year is submitted with the finalized annual report in an Access database.***

*Section 1, page 1-3:* Figure 1-1, where is the water plant?

***Downstream of the confluence of Horse Creek with the Peace River in the Peace River on the northern bank.***

*Section 2, page 2-5:* Can we get percentages? (referring to land use activities and types of agriculture)

***This data is from the SWFWMD landuse GIS files and is several years old at this time. We do not think a more detailed breakdown would be helpful until a new file is released.***

*Section 4.3, page 4-14:* NNC should be used to evaluate this data.

***The TN and TP thresholds for the NNC are not impairment thresholds in the same way the Class III or Class I standards are for other parameters; biological assessment is necessary, not just ancillary, in determining impairment of Florida***

**waters for nutrients. In addition, TN and TP NNC threshold values (and the chlorophyll-a NNC standard) refer to annual geometric means, which are not shown in the graphics in the report; therefore it is not appropriate to include those values on the graphics. Appendix I gives a comprehensive assessment of the NNC status of Horse Creek at SR64.**

Section 4.5, page 4-18: major storm event should be in a table with dates.

**The relevant storm dates are listed in Appendix K.1 by month, now including Hurricane Irma.**

Section 5.1, page 5-26: Figure 5-1, how do these compare to monthly averages?

**During 2017, rainfall was below average at the Mosaic gauges (using the gauge average) during the dry season months and above average from June to September. Below is a table with the monthly average for the combined Mosaic gauges from 2003 to 2017 along with the monthly totals for 2017.**

| Month     | Period of Record Average Monthly Mosaic Rainfall | 2017 Average Mosaic Rainfall Gauge Totals |
|-----------|--|---|
| January   | 2.09   | 0.57                                      |
| February  | 2.01   | 0.75                                      |
| March     | 2.01   | 1.04                                      |
| April     | 2.30   | 0.11                                      |
| May       | 3.66   | 1.13                                      |
| June      | 8.09   | 12.91                                     |
| July      | 7.65   | 9.34                                      |
| August    | 7.31   | 8.76                                      |
| September | 6.11   | 9.86                                      |
| October   | 2.27   | 0.95                                      |
| November  | 1.14   | 0.82                                      |
| December  | 1.49   | 0.82                                      |

Section 5.1, page 5-27: Figure 5-2, looks like below average dry months and above average wet months. If so, the annual average would not be illustrative.

**Comment noted.**

Section 5.4, page 5-36: Figure 5-8, it might be easier to see if the colors were higher contrast like black and red.

**To maintain consistency between reports, the bright magenta color has been used to represent HCSW-1 in this and many previous reports. The contrast of using black for the monthly rainfall sums was actually too high and made the figure difficult to look at.**

Section 5.5, page 5-39: Figure 5-11, weird discharge = 0

**Comment noted.**

Section 5.5, page 5-37: Load should be calculated for this NPDES discharge. Do we know where slow flows are located? That is probably where chlorophyll-a or other effects will be seen. Muck accumulation areas?

**Load is not calculated as part of the HCSP. Areas of slow flow in the stream are generally unknown, except Horse Creek Prairie upstream of HCSW-2. Other slow flow areas may be too small to identify from aerials and are likely to be distributed throughout the stream. Some major bridge crossings may also be presumed to be**

**slow flow areas, as those typically create large basins with open canopy. Atypical areas, such as downstream of bridge crossings, are not considered to be presentative of stream conditions in some cases, especially for interpreting the NNC.**

Section 6.1, page 6-44: Table 6-1, what does yellow shading mean?

**It highlights parameters with significant trends, more specifically highlighting the slope of parameters with significant trends.**

Section 6.1, page 6-45: Table 6-2 and Table 6-3, why bold in some places in these tables?

**Bold text in all the tables indicate the results are statistically significant at  $p < 0.05$ .**

Section 6.2, page 6-53, color: Figure 6-9, I would think HCSW-2 would be darkest

**Comment noted. All stations have higher color during rainy season in 2017.**

Section 6.3, page 6-54, total nitrogen: is there a trend over time?

**Using HCSP data from 2003 to 2017, there was not a statistically significant trend in the Seasonal Kendall Tau analysis with a  $p < 0.05$  (see Table 6-1).**

Section 6.3, page 6-55, total nitrogen: Figure 6-10, what happened? (referring to decrease in all concentrations during September 2017 monitoring event)

**This sample was taken shortly after the passage of Hurricane Irma and there was a dilution in nitrogen concentrations with the increased water volume.**

Section 6.3, page 6-57, nitrate-nitrite nitrogen: Figure 6-12, trend?

**Because of the various MDLs used with the HCSP data, SWFWMD data was used for this analysis. Using the SWFWMD data from 2003 to 2017, there was not a statistically significant trend in the Seasonal Kendall Tau analysis with a  $p < 0.05$  (see Table 6-1).**

Section 6.3, page 6-58, total ammonia nitrogen: Figure 6-13, trend?

**Because of the various MDLs used with the HCSP data, SWFWMD data was used for this analysis. Using the SWFWMD data from 2003 to 2017, there was not a statistically significant trend in the Seasonal Kendall Tau analysis with a  $p < 0.05$  (see Table 6-1).**

Section 6.3, page 6-59, orthophosphate: Figure 6-14, trend?

**Using HCSP data from 2003 to 2017, there was not a statistically significant trend in the Seasonal Kendall Tau analysis with a  $p < 0.05$  (see Table 6-1).**

Section 6.3, page 6-60, chlorophyll-a: Figure 6-15, trend?

**Using HCSP data from 2003 to 2017, there was not a statistically significant trend in the Seasonal Kendall Tau analysis with a  $p < 0.05$  (see Table 6-1).**

Section 6.4, page 6-62, SC: Figure 6-16, salty near the water plant

**Comment noted. Those concentrations were in the dry season.**

Section 6.5, page 6-71: are the stations nitrogen limited?

**Most of Florida's waters are nitrogen limited, especially within the West Central part of the state (Bone Valley). Potential nutrient limitation was not determined as part of the HCSP.**

Section 6.5, page 6-72: NNC should be discussed (TN mg/L) and compared to data

**The TN and TP thresholds for the NNC are not impairment thresholds in the same way the Class III or Class I standards are for other parameters; biological assessment is necessary, not just ancillary, in determining impairment of Florida**



waters for nutrients. In addition, TN and TP NNC threshold values (and the chlorophyll-a NNC standard) refer to annual geometric means, which are not shown in the graphics in the report; therefore it is not appropriate to include those values on the graphics. Appendix I gives a comprehensive assessment of the NNC status of Horse Creek at SR64.

Section 7.1.3, page 7-81: Figure 7-3, trending up?

**There were no increasing trends in overall number of taxa at each station or at all stations combined; however, there was an increasing trend observed during the spring sampling events at HCSW-3 as stated in the report text.**

Section 7.1.4, page 7-82: Figure 7-4, trending up?

**There were no increasing trends over time in macroinvertebrate generic diversity score for individual stations or all Horse Creek stations combined as stated in the report text.**

Section 7.2.2, page 7-88: Figure 7-8, hard to see what's going on

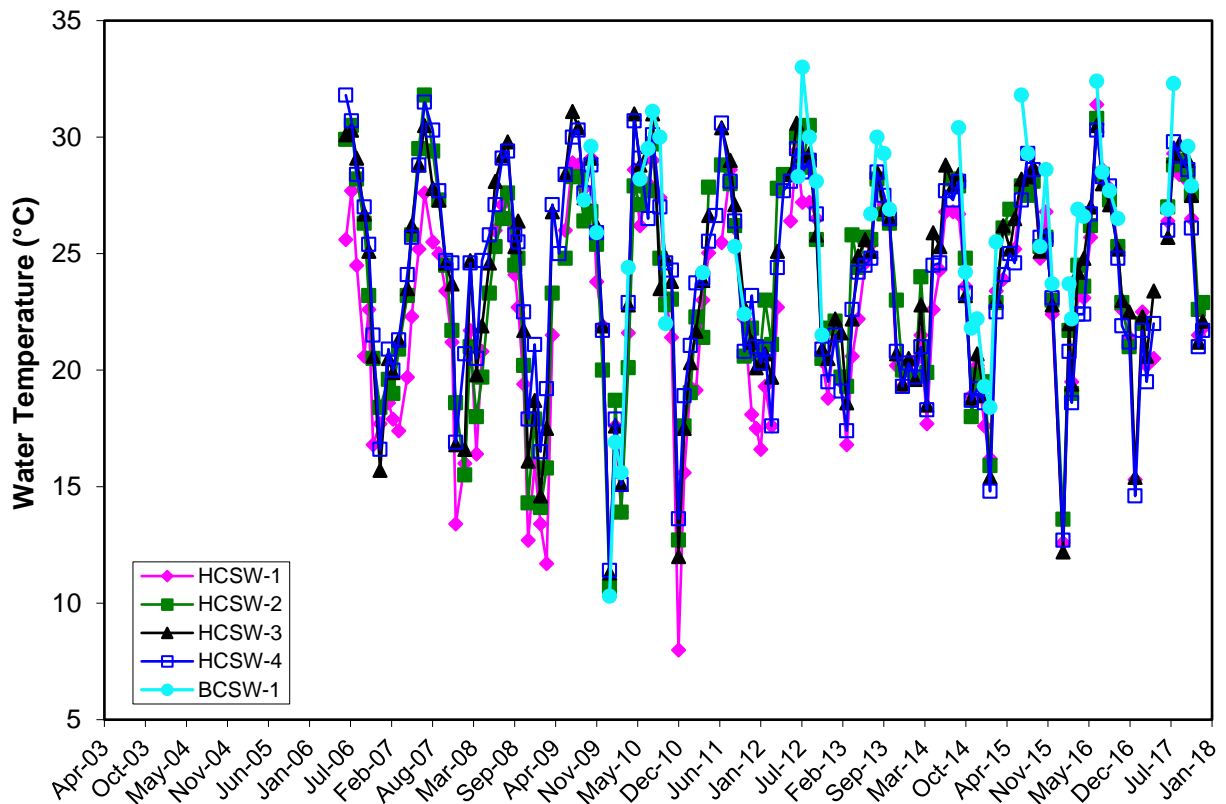
**Comment noted. There was no increasing or decreasing trends in fish diversity by year at individual stations or at all stations combined.**

Section 7.2.2, page 7-88: Figure 7-9, colors too similar (referring to HCSW-3 and HCSW-4)

**Comment noted.**

Section 7.2.4, page 7-92: summary of temperature data would be nice. 2010 cold?

**Below is a graph of the period of record HCSP water temperature data from the monthly sampling events. (Temperature data was only available from June 2016 through December 2017.)**



Section 7.1, page 8-95: annual rainfall is not informative

**Comment noted.**

Section 9, page 9-98: Excellent baseline study to add value to inevitable changes coming in the future. Is there anything we can do now to make those future changes more detectable when they happen?

**More than 15 years of consistent monthly water quality sampling, daily water quantity, and seasonal biology sampling is already a very good program compared to many fixed-station monitoring programs. If station locations are added in the future because of changes in mining activities, the HCSW-1 and HCSW-4 stations should be maintained because of the streamflow, water quality, and biology data collected there by other entities.**

Appendix C, page C-1: Figure C-1, definite trend?

**Using HCSP data from 2003 to 2017, there was a statistically significant trend in the Seasonal Kendall Tau analysis for both HCSW-1 and HCSW-4 for pH, but the magnitude was small (see Table 6-1). Previous reports show that this is a step-change and not a continuous increase.**

Appendix C, page C-6: Figure C-6, what happened here? (referring to drop in TN around November 2004)

**This was after the strong Hurricane season of 2004 where higher and more variable measurements in TKN and therefore TN were recorded during summer months.**

Appendix C, page C-28: Figure C-34, scale too large

**In order to compare values between stations, the range of values on each graph needs to be similar. There was higher nitrate-nitrite concentrations at HCSW-4 so the scale needed to reflect those values.**