

Comments Received Regarding the Peace River Cumulative Impact Study

Will the consultants look at changes in the outcomes from original reclamation/mining permits vs. what the final "in the ground" end product is? I think a huge problem is that when a mine is permitted we really have no idea what the landscape will be post reclamation because so many permit modifications are granted over the life of the mine.

Are the consultants going to look at water quality trends in relation to percentage of impervious surfaces in the various subbasins? A number of studies have indicated that when impervious surface exceeds 15% of the water quantity of streams deteriorate significantly.... This could be an important topic for public policy and peace river management decisions.

I am very concerned about the district not setting minimum aquifer levels in the peace basin. Fish and wildlife use groundwater that is near the surface and accessible thru numerous sinkholes along the river. Fish migrate in low water/drought via the subsurface connections in the karst formations.... If no minimum groundwater levels are set, the river can drop dramatically below the floodplain. Also, when the river flows down into sinkholes, tons of organic material is lost from the floodplain which is causing significant changes to the river morphology and ecology i.e. damaging, killing cypress, impacts to amphibians due to drying of ephemeral wetlands, fish spawning, habitat and cover for young fry, tadpoles, etc., changes in water chemistry and macroinvertebrates, etc.

Marian Ryan
Sierra Club

Examine variations in the length of time (over time) of minimum/low/flow events aka differences in hydrograph profiles.

Compare aquifer levels to base flow levels in areas of karst formations to see if there is a correlation.

John Ryan
Sierra Club

You should be aware of a pertinent FIPR final report (study conducted by Schreuder, Inc.) that is in the final stages of review and editing in preparation for publication, titled "Impact of Phosphate Mining on Streamflow" (FIPR Project No. 01-03-145R). We anticipate it should be approved for release to the public by July.

In your hydrologic analyses, do you (will you) consider interbasin transfers (e.g., from water treatment plants). Are these significant or only minor factors?

What are the relative impacts of rainfall, municipal, agricultural, mining, other industry, etc., on stream flow? It appeared that rainfall was the overriding factor, but how do the other possible impacts rank in importance? How do the various impacts affect distribution of flow (baseflow, floodflow, median flow)? The Schreuder report mentioned above indicates that baseflow is increased and floodflow is reduced in mining affected basins compared to other basins.

As you consider the effects of different land uses on water budgets and streamflow, don't forget the possible effects of evapotranspiration changes with different land uses (e.g., forest vs. pasture or housing).

Can you quantify groundwater augmentation of streamflow?

Toward the end of your hydrology presentation in Bartow you did it, but I want to reemphasize the importance of showing data in figures for different streams on the same scale to help avoid erroneous comparison conclusions.

Dr. Steven G. Richardson
Florida Institute of Phosphate Research

The following comments are being submitted for consideration by the Department and the District on behalf of CF Industries, Inc. by Jim Sampson.

The comments below follow the format of the May 24 presentation.

OVERVIEW

1. On slide 11, Key Watershed Stressors, an additional bullet under Urbanization should be added “direct and permanent habitat loss”.
2. Slide 11 identifies Phosphate Mining as a key stressor and lists direct habitat loss as an area of concern. This should carry a caveat that recognizes the reclamation/restoration of habitat and habitat preservation as a positive trend in modern mining practices to address habitat loss.
3. On slide 15, Phosphate Mining through 2000, the narrative describes 55% of lands mined as having been reclaimed. While this may be accurate, a clearer picture of reclamation progress would be conveyed if the percentage of reclaimed land for nonmandatory and mandatory lands is shown.

WATER QUANTITY

1. Were the nonmandatory lands that have not had their historic surface connections restored considered in the evaluation of flow impacts to the Peace River?

WATER QUALITY

1. The summary slide should include a bullet that identifies historic discharges from domestic wastewater treatment plants to the upper Peace River. I believe the City of Lakeland historically discharged treatment plant waters to the Peace basin and diverted that discharge to the Alafia basin in the 1980s.
2. Historic Lake Hancock discharges should also be listed in the summary as a contributor to water quality impacts in the upper, middle and lower Peace River.
3. On slide 54, Conclusions, several NPDES discharge sites are noted on Payne Creek. This leads the reader to infer that all of these sites are used regularly to discharge effluent to the stream. However, it is common for mine sites to have alternate discharge sites and not use all of the sites. For example, CF had four discharge sites at one time but normally only used two of the sites. This should be clarified in the final report.
4. On slide 56, Conclusions, no mention is made of urbanization’s contribution to water quality impacts. If there are none, then perhaps the costly stormwater regulations for municipalities are not needed. However, I doubt that is the case. Certainly, this area of water quality impacts should be discussed in the final report.

FISH SPECIES

Discharges from Lake Hancock have long been recognized as a source of poor water quality that adversely impacts the Peace River. The SWFWMD and others have been working diligently to reduce these impacts. At times, pea green water has been observed at Zolfo Springs and below as

a result of water from Lake Hancock. To what extent was this impact considered in the evaluation of fish species?

Also, I do not recall mention of municipal stormwater discharges (see comment 4. under Water Quality above). How might these discharges impact fish species.

Regarding potential impacts from mining activities, CF believes the report should identify and quantify, where possible, differences in impacts from historic mining and reclamation practices and current practices. As conclusions and summary statements are being developed regarding the impacts to the Peace River that are attributed to mining, it would seem important to identify what impacts are a result of outdated mining and reclamation practices that are no longer occurring. This would be particularly helpful as the stakeholders group begins to develop the Watershed Management Plan.

Jim Sampson
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I thoroughly enjoyed the meeting last night (June 21 in Arcadia). Some great information and discussion.

Comments:

The phosphate industry is well represented at these meetings. Rightfully so, they have a vested interest. The phosphate industry has the ability to significantly impact the watershed of the Peace River, good or bad as do many of the major land owners. They have the ability to make the watershed better if the land is managed and restored appropriately. Regulations, stewardship and programs need to make sure this happens.

The ultimate land use of the watershed will probably be urban/residential if trends continue the way they are today. There needs to be a watershed land use plan with population projections to determine how the watershed should develop to insure the long-term protection of the river. The counties and cities within the watershed areas will play a critical role in managing the watershed in the decades to come. Setbacks, buffers and upland habitat protection will be within the purview of the local governments. Alternate land use patterns (higher densities with more open space and agriculture protection) will need to be implemented. A model watershed protection code and land use policies should be adopted with the Central Florida Regional Planning Council leading the way.

Presently, the WMDs require only that peak flows not be greater from proposed developments. The volumes of flow off of the site are not regulated and could alter the hydrology. Also, we only require between 50% and 80% treatment of stormwater....what are the cumulative impacts of the stormwater that is not treated? Total phosphorus and other toxics will go up in the river as a result. A build out scenario should be created with pollutant runoff modeling performed to insure long term protection.

Much of the focus was on wetland areas. The relationships between wetlands and uplands is essential in a balanced ecosystem. No new losses of native upland habitat should be one of the goals. Some great new land stewardship programs are becoming available that could make this happen.

Thanks for the opportunity. Please let me know if I can be of assistance.

Mike Britt
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Comments on Land Use Changes

1 - Mosaic requests that FDEP and its consultants provide the GIS coverages in ARCGIS/Digital form. We are particularly concerned about the accuracies of the information presented relative to mining impacts and land use classifications on properties owned or controlled by Mosaic. Please let me know when we can get them.

2 - Getting tired of the continual references to Kissingen Springs as the model of mining's impact. I am probably too sensitive to that but thought I should mention it!

Tom Myers
Mosaic Fertilizer, LLC

Include data on wetlands not yet restored from mining activities so as to more accurately determine total wetland loss basin wide.

John Ryan
Sierra Club

Hydrology – Effects of mining: Please show actual MGD figures for groundwater withdrawals.
68% of total GW withdrawal prior to 1950

10% of total GW withdrawals now (est. stated was 2002?)

Reclamation plans long term outcomes should be defined as part of the DRI and modifications should not be granted unless they are granted under a major modification status.

I don't think that there is enough data available if the SWFWMD can unilaterally decide that we cannot restore the aquifer level in the upper Peace River.

What is more important??? Approximately 50% of our potable water supply goes to watering grass? We aren't really serious about enforcing watering restrictions. We don't have xeriscaping ordinances to reduce irrigation needs. The coastal counties have a surplus of alternative sources of water to meet their future needs. We are currently only planning to "slow down" saltwater intrusion – Not stop it. We should be reserving water to restore the aquifer not facilitate additional development.

Marian Ryan
Sierra Club

Local (city/county) involvement for land use decisions should be a key component to watershed plan. Regional Planning Council / Comp plans have to play a role. Local governments in watershed are relatively unsophisticated and need help.

Mike Britt

I have several follow up comments from the meeting in Arcadia on June 21, 2006

1. Overall Presentation slide 7. This slide gives the wrong impression in that the first bullet under Phosphate Mining states “Loss of large area of contributing watershed”

This may state a common belief among many people, but it is not correct. The mines capture the water within the active mine area, but the water is released to the watershed through NPDES discharge points. The timing of the flow is altered, but for the most part, the volume is not. See the attached PBS_J cov. map which shows the areas that are active mining – this is not “large” by the Peace River basin standard. All of the reclaimed land is connected. The only land use that I am aware of that has a loss of contributing watershed is the power plants – they evaporate the excess rain water on the cooling ponds. Otherwise, on an average the rain (~54”) exceeds the combined recharge and evaporation (~45”), to give a net runoff of about 9”. If the water is captured, then it will build up in lakes, and the lake will eventually overflow, thus the area will be contributing to the watershed.

2. Overall Presentation slide 11 titled Key Watershed Stressors. This slide was modified between the Bartow and Arcadia meeting, but is still in need of work to truthfully represent the current state.

Under the section on Phosphate Mining: “Direct Habitat Loss” should be restated “Direct Temporary Habitat loss”. The reclamation puts the habitat back as required by law. The second bullet repeats what is covered above. This should be removed. The third bullet “reduction in recharge potential” is not clear. This needs to be defined or eliminated. There is no reduction in the recharge potential to the Intermediate and Floridian Aquifer south of Bartow. USGS and SWFWMD studies show the area south of Bartow having no recharge (0-2”). Studies by Ardaman (both calculation and field test) confirm that there is no change to the potential in the surficial aquifer to have any significant impact on recharge to the intermediate or Floridian aquifers. If the recharge is to the streams, USGS and SWFWMD studies show that mined basins have higher base flow than unmined basins, which is a function of the surficial aquifer being recharged and draining to the streams.

3. In regard to the land use that Pam Latham showed, I commented at the meeting that the GIS coverage used on the maps simply coded areas as phosphate mining, and did not give the land use. Mosaic provided PBS&J GIS coverage that showed the land use in detail for 1975 and 2000. This reflected the areas that were not yet impacted and those that had been reclaimed. (See attached file for example of what was provided). This information needs to be incorporated into the study, otherwise the analysis of phosphate mining impacts are not valid. The coverage that PBS&J provided has the areas coded as to status, but does not have land use (see attached map). These coverages clearly show that much of the area is reclaimed => the land use is back into natural systems and should be included in the analysis.

4. As I pointed out, the rules and statutes are only part of the picture. Policy does control a lot of land use decisions. The BOMR policy of not allowing wetland reclamation prior to 1980 is part of the reason for wetland loss. The EPA area wide Phosphate EIS has several finding that impacted land use and water use. These need to be included in the analysis of legal / policy affects on land use and water use changes. I did not see any inclusion of SWFWMD WUP negotiations that reduced the amount of ground water use in favor of surface water. Permit conditions often have greater impact than the supporting rules.

5. I have not seen any analysis of the Peace Creek drainage basin impacts – this is lumped into the “north of Bartow” and the impact is lost in the Lake Hancock issues. This should be a separate analysis.

Ted Smith
Mosaic Fertilizer, LLC

After the May 24 CIS public meeting in Bartow, CF asked Dr. Doug Durbin with BRA to review the presentation slides and provide any comments that he had on the information contained therein. Because the CIS report document will likely be looked to as the definitive work on the assessment of cumulative impacts in the Peace River watershed, CF is very interested in seeing a final document that is fact and science based in summary and conclusions of the stressors and impacts in the basin. It was in accordance with this thinking that CF sought outside expertise to review and comment on the presentation on fishes.

I have attached Dr. Durbin's and Ms. Raymond-Robbins' collective comments for your consideration.

Thanks.

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Dear Jim,

Biological Research Associates (BRA) is providing comments on the “Fishes” component of the Peace River Cumulative Impact Study, as portrayed through the electronic file ("PRCIS_Fishes.pdf") available on the FDEP Bureau of Mine Reclamation website. Please note that it is difficult to fully interpret many of the slides and graphics without the benefit of narrative text explaining the origin of the information, specific analytical methods employed, and/or the exact conclusions being derived. Thus, some of our comments may be overly cautious, while at the same time, having more complete knowledge of the data used and the analyses performed could raise additional concerns.

- To the extent the author attributes the alleged changes in the fish community to anthropogenic causes, he should align his conclusions with the analyses done by other authors associated with the Cumulative Impact Study, (i.e., the authors of the portions pertaining to Water Quality and Water Quantity). Absent such a connection, the author appears to make leaps of deduction from observed patterns to underlying causes without any apparent analysis as to the various possible causes or timing of such changes.
- Two graphics are included near the beginning of the presentation which appear to relate fish species richness to a “Habitat Index” for various watersheds in the region. The data used to generate these plots is not indicated, so it is impossible to assess the meaning of the plots, or what is implied by Habitat Index. The position of various rivers on these plots is interesting; for example, the Myakka River and Little Manatee River appear near the lower end of the Habitat Index scale, although both are commonly viewed as high quality valuable natural resources.

Also curious is the fact that the “Historic Peace River” and the “Modern Peace River” are each plotted with exactly the same Habitat Index value, but somewhat different fish species richness; the meaning of this is not evident.

- The bulk of the analysis appears to be based on presence/absence data from the various fish collections in the basin. This means the presence of just one individual from a given species in a sample carries the same weight as dozens or hundreds of individuals of another species within the same sample. Obviously, sampling locations or methods that yielded more species (even in very low numbers) might distort the overall picture of the fish community in time and space.
- As pointed out by the author in a summary slide, fish sampling in the Peace River Basin has been sporadic. Sampling efforts conducted over the years have differed greatly in their geographic scope and collection intensity and methodologies. There has not been a comprehensive sampling effort performed in recent years. The most recent sampling effort in the freshwater portion of the river noted by the author was in 1992 (it was referred to as "continuous sampling from 1983 to 1992" but was actually a series of discrete sampling efforts ranging from an average of less than one to about two samples per year). That sampling effort used only one sampling method (electrofishing) and focused on the main stem of the river, which could not be expected to provide optimal habitat for all fish species in the watershed. Thus, conclusions drawn from that data must take into account the clear possibility that the sampling results could be skewed or distorted by the age and paucity of data, as well as the sampling method employed.
- Comparisons among the various fish ‘studies’ were made using a mathematical tool called a rarefaction curve, which estimates the number of species obtained for a given amount of collecting effort. To provide accurate comparisons, all sampling should be done using the same methodology because various sampling approaches are known to be biased toward certain species or sizes of fish. If the sampling methods are not similar, some species might be over or under-represented in some samples. The author of the study indicated the largest overall fish sampling effort was that of the Florida Game and Freshwater Fish Commission from 1983 to 1992. Reports authored by the FGFWFC indicate that sampling during the first half of that period was conducted during the day, while the second half of the period utilized night-time sampling. This change in the methodology employed can likewise lead to a substantial difference in the species and/or relative abundances obtained.
- A large number of the fish evaluation slides display results of Mao Tau analysis. While Mao Tau rarefaction curves may be used to interpolate species richness within the range of empirical data, they should not be used to extrapolate species richness beyond the actual sampling effort. When Mao Tau rarefaction curves are used to compare communities, the richness of the communities can only be compared up to the maximum sampling effort of the least sampled community or time frame. Several of the graphics indicating results of Mao Tau analysis appear to indicate more fish samples than BRA is aware of from the indicated portions of the Peace River basin.
- Surprisingly, the slides presented from the analysis fail to list the name of even one fish species in the Peace River basin. If rarefaction analysis (apparently the only statistical tool employed in this effort) indicated temporal changes in the community, why is there no presentation of those species apparently in decline or absent in recent collections? Without this information, it is impossible to assess the validity of the data or draw any conclusions therefrom.
- The hydrologic analysis conducted as a separate component of the Cumulative Impact Study compared temporal patterns from several watersheds in an attempt to identify or isolate trends or

patterns that may be specific to the Peace River Basin. A similar effort could easily be conducted for the fish analysis, because fish collections have also been made in many of the river basins surrounding the Peace River watershed. Without such a comparison to other similar basins, there is no opportunity for seeing larger regional patterns beyond the boundary of the Peace River basin. Such a comparison might well indicate similar changes in fish communities of adjacent or nearby watersheds, suggesting a regional effect rather than a basin-specific change. This is precisely what happened when the hydrology of the Peace River was compared with that of other rivers in Southwest Florida.

- A number of the graphics simply cannot be clearly interpreted without further explanation. For example, conclusions cannot be drawn for many of the plots illustrating sampling results for estuarine species in comparison with salinity levels without further information or interpretation.

- Only a selected subset of potential causative factors for impacts to the fish community in the Peace River is provided. Little mention is made of the well-documented poor water quality conditions associated with Lake Hancock and a number of other water bodies in the upper Peace River Basin. Nor is significant mention made of the numerous permitted discharges of domestic wastewater which have occurred in the watershed historically.

- The fish analysis fails to provide any detailed mechanism(s) for the purported loss of fish populations. That is, aside from potential generic changes in water quality and instream flows, there are no physical or physiological mechanisms suggested as the reason(s) for the decline or disappearance of fish taxa. Given the broad array of tolerances for environmental conditions exhibited by fish, it would be helpful to have possible explanations of why the fish community may have seen the specific changes alleged by the author. Again, such changes might also be found in other watersheds in the region, with similar potential effects on biological communities there.

- The study results point to the potential influence of a number of spills from clay settling areas. However, the largest of these spills happened many decades ago (the last occurring in 1971), and significant regulatory and technological steps have been taken to minimize the likelihood of any similar event occurring in the future by setting specific and stringent design, construction, and operation standards for such impoundments. Thus, it should be made clear that, even if historic spills affected the fish community, the current operation of clay settling areas by the mining industry does not pose a similar threat and is already highly regulated. Likewise, the fact that phosphate mining took place in the river bed one hundred years ago is irrelevant to changes purported to have occurred in recent decades, particularly given the fact that mining is now prohibited within the floodplain of the Peace River (let alone the channel itself), as well as most of the river's permanent tributaries.

- No discussion is made regarding why fish communities in the watershed as a whole would be negatively affected by phosphate mining activities, given the fact that some tributaries in the Peace River watershed do not currently have mining activities within their subbasins at all, or had no mining at the time the most recent fish sampling was conducted. If mining, or any other activity, only occurred in a portion of the watershed, other parts of the watershed should serve as refugia for fish species such that recolonization could take place after periods of stress, etc. This would likewise apply to any effects associated with the clay settling area spills of four decades ago. Thus, any asserted connection drawn between phosphate mining or clay settling areas and a decline in fish populations in the watershed should be examined very carefully.

- The Florida Game and Freshwater Fish Commission (now the Florida Fish & Wildlife

Conservation Commission) conducted the largest overall fish sampling effort performed on the Peace River (1983-1992) and concluded that the fish community in the river has shown “resilience” to historic water quality and water quantity changes. It also concluded that an extended period of lower flows associated with reduced rainfall likely had an influence on the fish community, consistent with the conclusions reached by the author of the Water Quantity portion of this Cumulative Impact Study. The conclusions of this significant sampling effort should be incorporated into the author’s analysis.

- The text slides near the end of the series present a number of statements and concepts that are not directly linked to the graphic slides that precede them. Presumably, they are intended to provide some explanation for changes in the Peace River fish community, but without additional detail and a substantiating linkage to the fish data, they do not serve this purpose.

- Finally, the Department and District may wish to consider a peer review of the analysis and conclusions of “The Patterns of Fish Species from Fresh Water through the Tidal Peace River Continuum” as presented at the 24 May 2006 public meeting in Bartow. Given the possibilities (noted above) that the data and/or conclusions could be misinterpreted or misapplied, a peer review would add credence to the final report. There are a number of highly qualified ichthyologists and fishery biologists who could perform such a peer review.

We hope you find these comments helpful. Please contact me if you need clarification or further information.

Sincerely,

Douglas J. Durbin, Ph.D.
Vice President/Senior Water Resource Analyst

Kristan M. N. Raymond-Robbins
Ecologist

As part of your analysis (especially PRIM) can you evaluate the area of the Green Swamp that was historically part of the Peace River included in the modeling to understand the implication of increased headwater contribution to the Peace.

By 2025 the Federal DOT is requiring a underpass in upper Peace above the Saddle Creek area that is water centered.

John Ryan
Sierra Club

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1. My understanding is that the phosphate mining companies have definitive evidence that the only native community that they can successfully reclaim/restore is herbaceous wetlands. What is the evidence that they can successfully reclaim/restore other native communities?
 2. Have the water budget consultants looked at specific effects of mined lands on recharge, especially the average 40% of land surface that is in slime ponds post reclamation.

3. RE: Discussion of regulatory effectiveness – I think the true measure of regulatory effectiveness is the quality of the end product.... In this case the land form and hydrology of the Peace River Basin. We have pretty dismal results to date:
- a. Though Water Resources Act required MFL's we still don't have minimum levels set for the Peace River (especially upper basin).
 - b. Agriculture is exempt from many regulations and agriculture conversion is the precursor to development, also destroys numerous environmental values.
 - c. Phosphate mining is not a temporary use of the land. We will end up with 40% of the post mining landscape in slime ponds – land whose overall value is significantly reduced from pre-mining values, both environmentally and economically.
 - d. Regulations call for phosphate companies to spend huge amounts of money to reclaim habitat values of land that will not be conserved.
 - e. We, the public, have had to pay for mining related disasters to the exclusion of old mined lands reclamation trust funding.
 - f. There is no requirement for phosphate mining reclamation to function in the post mining landscape at buildout.
 - g. There is no funding/program to address the special needs of mined lands i.e. invasive exotic plants, restoration of hydrology.

Marian Ryan
Sierra Club

Under water supply in the strawman, you should add that the SWFWMD look at control structures on lakes to see if it would be beneficial to rebuild them to hold the 100 year flood.... I believe that the WMD is in the process of reconstructing the Lake Fannie outfall in Winter Haven at a less than desirable level.

We don't want to repeat past mistake of allowing development to encroach and reduce storage capacity and ability to let lakes flux more naturally.

Marian Ryan
Sierra Club

My compliments to Mr. Cantrell and his crew on being able to put together a cohesive story and facilitate discussion of a very complex and sometimes emotional issue.

Theresa Connor
Sarasota County
