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APPENDIX

Major revisions of the SWFRPC 208 Water
Quality Management Plan

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APPENDIX

Major Revisions of the SWFRPC 208 Water Quality Management Plan
due to Comment Received on the Draft Plan,
presented June 15, 1978

Chapter 1 - Executive Summary

Revision of this chapter reflects the major changes of the entire plan.

Chapter 2 - Introduction

No major revisions

Chapter 3 - Planning Boundaries

No major revisions

Chapter 4 - Population Land Use and Economic Projections

No major revisions

Chapter 5 - Water Quality Standards and Segment Classification

Section 5.2 - The chapter has been updated to include the recent revisions of Chapter 17-3, Pollution of Waters, Rules of the Department of Environmental Regulation.

Section 5.4 - The recommendation to reclassify the Peace River from Class III - Recreation - Propagation and Management of Fish and Wildlife to Class I - A Potable Water Supply - Surface Water has been added to this section for emphasis

Chapter 6 - Water Quality Assessment

Section 6.3 and 6.6 - A qualifying statement has been added to the explanation of results in the ecosystem analysis portions of the Plan. Sampling and data collection for this analysis was limited due to budget and time constraints and, as a result, the analysis should be considered preliminary.

Chapter 7 - Inventory and Analysis of Wastewater Treatment Facilities

No major revisions

Chapter 8 - Municipal Wastewater Treatment Needs

No major revisions

Chapter 9 - Industrial Wastewater Treatment Needs

No major revisions

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Chapter 10 - Non-Point Source Assessment

No major revisions

Chapter 11 - Non-Point Source Control Needs

No major revisions

Chapter 12 - Residential Waste Control Needs

No major revisions

Chapter 13 - Recommended Management Agencies for Control of Structural Domestic and Industrial Wastewater Treatment Systems

The chapter has been clarified to explain management agency responsibilities where collection-distribution systems of regional sewage facilities cross County and City boundaries of jurisdiction.

Chapter 14 - Recommended Control Programs for Non-Point Source Pollution

Section 14.3 - Caloosahatchee River Study Area

- a. The recommendation for the Lake Hicpochee wetland retention system is now recommended for consideration during the continuing planning process. This technique is still under considerable study by research groups. Study progress will be monitored so that in the future, if the system appears feasible, it may be recommended for implementation. Details of the Lake Hicpochee wetland system have been deleted from this chapter.
- b. The septic tank installation ordinance recommendation has been amended so that septic tanks are controlled only in the designated 201 Facilities Planning areas (LaBelle, Clewiston, Moore Haven and Lee County) and in subdivision areas.
- c. The septic tank operation ordinance recommendation has been amended so that septic tanks are controlled only in the designated 201 Facilities Planning areas and in subdivision areas.

Chapter 15 - Non-Point Source Management Agencies

Section 15.3 - Caloosahatchee River Study Area

Management agency designation for the implementation of the Lake Hicpochee wetland retention system has been deleted.

Chapter 16 - Implementation Schedule

Section 16.1

- a. The implementation schedule for the Lake Hicpochee wetland retention system has been deleted.

- b. All beginning and end dates for the implementation schedule have been postponed for six months.

Chapter 17 - Environmental Social and Economic Impact Assessment

All sections of this chapter have been expanded to give more detail about expected impacts.

Chapter 18 - Public Participation

No major revisions

Chapter 19 - Continuing Planning Process

This chapter has been revised to provide more detail on how the 208 Plan will be updated, including approximate time schedules and costs. The actual amount spent during the process, however, is dependent on availability of local and federal matching funds. During the next few weeks a detailed plan of study and federal grant application will be prepared.

Chapter 20 - Implementation Strategies

Section 20.2 - Caloosahatchee River Study Area

The implementation strategies for the Lake Hicpochee wetland retention system have been deleted.

Response to Comments on the Draft 208 Plan
from the Florida Department of Environmental Regulation

General Comment

As explained by the consultant, Post, Buckley, Schuh & Jernigan, Inc., who was responsible for the preparation of the document, the "Preliminary Control Alternatives for Charlotte Harbor" report was preliminary. Its purpose was to begin discussion on a recommended pollution control program for the harbor. Due to the nature of the report, readdressing comments on the report are not believed to be of value at this time. Instead, the staff believes that a review of the "Recommended Control Alternatives for Charlotte Harbor" report, submitted to FDER on March 16, 1978, may better address your concerns about the preliminary report.

Chapter 1

- Pg. 1-2 The 201 facilities were prioritized as the objective states. This will be reflected in Chapter 1. (See also Chapter 8)
- Pg. 1-3 The draft is being amended to add some detail. See also Chapter 18.
- Pg. 1-7 The comment has been incorporated.
- Pg. 1-6 The draft has been amended to add this recommendation. The standards were established using a chlorophyll a nutrient relationship which was explained in Chapter 6. Please note that due to the theoretical nature of the technique, the standards are recommended as "Interim" pending further study.
- Pg. 1-28 When reviewing Chapter 6 you will note that, when viewed on the whole, Naples Bay still has biological indicators of a viable, productive biological system in "good" health. Parts of the bay, however, exhibit signs of organic material overloading.
- Pg. 1-5 The draft has been slightly changed to explain that the economy of the region is expected to become more diverse or complex as the region grows.

Chapter 6

- Pg. 6-15 The paragraph has been rewritten.
- Pg. 6-22
- a. The alpha, beta and delta isomers of BHC, as indicated in the "Technical Appendix, Final Water Quality Report, Water Quality Data for Phillippi Creek and Charlotte Harbor."
 - b. Aldrin could have been resuspended due to a rainfall event.
 - c. Samples were not routinely precleaned, however, the results were generally monitored for sulfer peaks. In the event sulfer peaks were found, then the sample was re-run after precleaning.

d. Samples were not verified for this analysis.

Pg. 6-23 Metal verification was not done for this analysis.

Pg. 6-33 This was a typographic error and should be OPDDT.

Pg. 6-34 Alpha, beta and delta isomers of BHC.

Chapter 7

Pg. 7-4 This comment has been incorporated in the Plan.

Pg. 7-7 Statement Deleted

Pg. 7-12 Statement Deleted

Pg. 7-67 These values were calculated using discharge records of secondary and AWT STP's in the region. See Appendix 7-B of the Plan.

Chapter 9

Pg. 9-2 This comment has been incorporated into the plan.

Pg. 9-4 This comment has been incorporated.

Chapter 11

Pg. 11-8 Review of Chapter 6 containing the detail in which this chapter was based and on the Lemon Bay Water Quality Report, localized water quality problems do exist near residential areas (i.e., high fecal coliform levels in residential canals).

Pg. 11-8 Please refer to "The Control of Pollution from Hydrographic Modification," U.S. EPA, 1973 and "Finger-fill Canal Studies - Florida and North Carolina," EPA 904/9-76-017, 1976, which included data from the Charlotte Harbor hydrographic modification areas, showing poor water quality. (Listed in references to Chapter 11.

Pg. 11-20 Due to the number of drainpipes existing over a wide spread area, they are collectively referred to as a nonpoint source.

Pg. 11-20 The point of this comment is possible, however, this reason was not the only one used to suspect septic tanks.

Chapter 12

General The plan has been amended to reflect the proper date. Municipal refuse was the primary source of residuals. Further study on residual waste will be done during the continuing planning process.

Pg. 12-12 The statement you refer to could not be found on this page.

Pg. 12-18 The sentence has been changed as recommended. This suggestion should be considered during the continuing planning process.

Chapter 13

This comment may have more impact if it was directed to the 201 plans considering spray irrigation, and it will also be considered when reviewing spray irrigation sites in the future.

Chapter 14

Pg. 14-4 The 30% reduction was an estimate used by the consultant as reflected by numerous reports such as "Practices in Detention of Urban Stormwater Runoff," Poertner, H.G., APWA Special Report No. 43, 1974.

A small effort, studying the efficiency of retention/detention ponds is an excellent suggestion for the continuing planning process.

Chapter 19

Chapter 19 has been rewritten and shall now address these comments.



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

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MONTGOMERY BUILDING
TALLAHASSEE, FLORIDA 32301

REUBIN O'D. ASKEW
GOVERNOR

JOSEPH W. LANDERS, JR.
SECRETARY

July 17, 1978

David Burr
208 Project Director
South West Florida Regional
Planning Council
2121 West 1st Street
Ft. Myers, FL 33901

Subject: Water - Planning - 208
SWFRPC Draft Plan

Dear David:

Pursuant to Appendix A, Section 2.7 of the interagency agreement between SWFRPC & FDER, the Department has reviewed the above referenced documents. Attached you will find our staff comments and concerns.

Staff comments and revisions to Chapter 14 will be forwarded within a week.

Sincerely,

Robert H. Dunn
208 Agency Coordinator

RHD/saf

cc: David Peacock
Fred Bartleson

Attachment

SWFRPC response to comments by FDER on "Preliminary Control Alternatives for Charlotte Harbor" were not adequate and should be readdressed.

Chapter 1

- ✓ Page 1-2, The stated objective to "prioritize" 201 facilities is not met in Chapter 1.
 - ✓ Page 1-3, The 208 Advisory Committees should be discussed in some detail: membership, functions, etc.
 - ✓ Page 1-7, Section 1-3 should note that the 201 program can now pay up to 85% of the cost of wastewater treatment plants.
 - ✓ Page 1-6, lines 6 & 7, state "In this chapter, a recommendation is made to adopt Interim Water Quality criteria for nitrogen & phosphorus. I couldn't find the recommendations in this chapter. What are these criteria and how were they established?"
 - ✓ Page 28 - the Statement that in Naples fish production is suffering from high levels of organic material is not consistent with the prior statement that it is a viable, productive biological system in good health.
 - ✓ Page 1-15, Please explain what is meant by "economic infrastructure expected to become more sophisticated" ? on p. 1-5
- NOT ON ↑

Chapter 6

Chapter 6 addresses the abatement of discharges to the Caloosahatchee River but does not specify disposal.

Page 6-15, para 3, confusing paragraph

Page 6-22, para 1, Gamma BHC is often recognized as Lindane. Which isomer of BHC was detected? Aldrin seldom persists in the water column for any considerable time. What possibilities existed for slug loads during sampling? Sulfur often masks or shows false peaks in the vicinity of aldrin. Where the samples pre-cleaned for sulfur contaminants? Were any of the pesticides that were found verified? How were they verified?

Call
L&L

- Page 6-23, para 1, Were these high level metals verified? How?
- Page 6-33, para 3, What is DPDDT?
- Page 6-34, para 1, Which BHC? How does it differ from Lindane?

Chapter 7

- ↓ Page 7-4, last paragraph - Wasteload allocations have not been set for all surface dischargers. Intensive surveys have not been completed, e.g. Clewiston. When NPDES permits are renewed, WLA's will be required.
- ↓ Page 7-7, Table 7.2-1 - Delete "Allocation for emergency only" in footnotes 5 and 6. No discharge is permitted.
- ↓ Page 7-12, first paragraph - Delete last sentence. Discharges from these plants are not permitted.
- ↓ Page 7-67, last paragraph - Our staff believes that the average values given for TN and TP leaving discharging secondary and AWT plants is somewhat low. What are the basis for these figures?

Chapter 9

- ↓ Page 9-2, The industries mentioned may not produce "strong wastewater discharges," however, certain of the industries listed in table 9.2.1 have a potential for producing waste streams containing toxic materials. Consideration should be given to these waste streams in regards to possible STP shock loads and the proper disposal of their effluents and/or sludges.
- ↓ Page 9-4, regulatory programs - PL 94-580 (RCRA) will place restrictions on land disposal of effluents and sludges if they contain toxic materials in a concentration above allowable limits.

Chapter 11

Page 11-8, paragraph on Lemon Bay NPS problems - Please explain comment concerning the suspicion of localized septic tank problems when the area study indicates no problems.

" Page 11-8, center paragraph - There is nothing in this document to support the assumption that waterway modifications will adversely impact the harbor system. What is the basis for this assumption? Isn't it possible that some modifications could provide improvements?

Page 11-20, paragraph b - Shouldn't the referenced drainpipes through bulkheads, by definition, be considered point sources rather than non-point sources?

Page 11-20, paragraph 2 - Couldn't the strong "septic odors" experienced during low tide be due to decaying vegetative and animal life naturally found in that environment?

Chapter 12

Solid Waste Management Plan, as required by the Resource Recovery and Management Act, is due by July 1, 1979 not 1978.

The chapter did not cover all of the residual waste categories.?

The report did an excellent job on current municipal refuse practices.

Page 2-12, line 8 - I suggest the last sentence be changed to reflect that sludge "be properly disposed of". (See following comments)

Page 2-18 - Disposal of sludges in the region is generally a significant problem. There are little or no controls on where sludges (including septic tank pumpings) are deposited. Sludge disposal sites are generally not specifically identified or evaluated for environmental acceptability. The Ft. Myers office receives frequent complaints that septic tank trucks are dumping into drainage ditches, and

11

treated municipal sludge has been observed to be deposited in a dense housing area Lee County is certainly not a model for other Counties to emulate in this regard. I recommend the last sentence be changed to recommend disposal of septic tank residue in STP's or in remote areas that are approved as being environmentally acceptable after being inspected. In addition, a vigorous program of enforcement of dumping rules should be initiated to ensure that all dumping is done in the approved locations. This is not done at present and the subject should be addressed in Chapter 14 as a proposed regulatory program. It could well be that some of the problems noted in this study could be attributed to dumping practices rather than malfunction septic tank systems.

Chapter 13

Chapter needs some words to indicate that spray irrigation of sewage effluent should not be proposed in areas adjacent to existing or potential drinking water supplies.

Chapter 14

Page 14-4, para A.1. (&p. 14-38) where does the 30% nutrient reduction from stormwater detention/retention come from? Other plans have estimated 90-95%. Since there is some question about efficiency it might be well to include a small effort in the continuing planning process to determine how effective this method would be in S.W. Florida.

Chapter 19

This chapter is a very general overview of the areas proposed for investigation in the Continuing Planning Process. The chapter should present your proposed CPP in a specific format similar to the plan of study. Included should be a schedule showing completion dates of proposed work elements/outputs; staffing requirements; and identification funding sources.

Response to Comments Received from the General
Public at the June 15, 1978 Public Hearing

Fred Duisberg

Thank you for your comment.

Mr. Walter Howard

1. The Lake Hicpochee wetland retention system recommendation has been amended in the plan to reflect this concern you and others have expressed. The wetland retention idea for Lake Hicpochee will be further studied for feasibility during the continuing planning process before implementation.
2. The septic tank ordinances have also been amended due to this type of comment. For the Caloosahatchee River Basin the ordinance should be implemented in 201 Facilities Areas such as the LaBelle, Clewiston, and Moore Haven 201 Areas and within areas of the counties defined as subdivisions.
3. Due to the nature of the control programs, (ordinances and use of BMP's) detailed cost estimates could not be made. However, Appendix 20-A has been added to the plan to give generalized cost estimates.
4. Lack of coordination between agencies could be remedied partially by setting up a Interagency Advisory Committee. This is now being considered.

James D. English

Mr. English has submitted written comments which cover his oral presentation in slightly more detail. These written comments have been responded to separately. Please refer to the written comments for staff response.

Mr. Patrick Settles (General Development Corp. Counselor)

Mr. Settles submitted written comments at the public hearing which contained the detail of his presentation. The written comments have been responded to separately in this appendix. Please refer to the written comments for staff response. Please also refer to the hearing transcript for SWFRPC member response to Mr. Settles presentation.

Mr. Mike Morris (Flood Associates)

In his presentation, Mr. Morris indicated that written comment would be submitted, however, this comment was not received. Telephone conversation with Mr. Morris indicated that no staff response was necessary, instead he requested that his oral statement just appear in the transcript.

Mr. Richard Cantrell

Mr. Cantrell has submitted written comments which have been responded to separately. Please refer to the written comment and staff response.

Mr. William Helfferich (South Florida Water Management District)

The South Florida Water Management District have submitted written comments which have been responded to separately. Please refer to the written comments and staff response.

VERBATIM TRANSCRIPT OF THE 208 PUBLIC HEARING HELD AT THE RAMADA INN DURING THE REGULAR MONTHLY MEETING OF THE SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL ON THURSDAY, JUNE 15, 1978, AT 11:00 A.M.

AGENDA ITEM FIVE: PUBLIC HEARING ON 208 WATER QUALITY PLAN

Before I begin, I'd like to make some quick introductions. First off, I'm David Burr, the 208 Project Director; Mr. Henry Iler, the 208 Project Manager; Ms. Dollie Goldman is the Public Participation Specialist for primarily for the 208 Program. We also have our EPA official, David Peacock, who is a 208 project officer in Atlanta, Georgia. We have from the State, Mr. Bill Buzick, representing Tallahassee, Florida, Department of Environmental Regulation, Mr. Rob Dunn, also from Tallahassee who's been reviewing our specific 208. From our local office, Mr. Fred Bartleson, from the local DER office, Mr. Ron Blackburn. We also have. . .(slight disturbance regarding people standing in the back and there being vacant chairs in the front).

In case anybody's interested, this is a full copy of the 208 Plan. (Pointing) It is one copy. The Council has sent portions of the plan in the agenda package that are primarily related to the control programs, the management agencies and implementation strategies. We also have some supportive materials in this box here, and this box back here is another - all the support documents that were created by the staff and consultants in the preparation of the 208 plan. This (the plan) basically is the condensation of all the work and effort that was put together in the last three years. I'd also like to introduce the consultants who are primarily responsible for the creation of these two boxes primarily. From Environmental Science and Engineering, who was the Council's water quality consultant, Mr. Mel Lehman, and we also have, formerly with Environmental Science and Engineering, now with a competitive firm, Mr. Jerry Steinberg, who is the 208 project director for the consultant. Dr. Jerry Steinberg, thank you. We also have Dr. Sheldon Kelman, who is with Post, Buckley, Schuh and Jernigan, who is our engineering and management consultants, and Mr. John Patterson, who is also with Post, Buckley, Schuh and Jernigan. Did I get everybody?

The public hearing is primarily to kick off our 30-day comment period. We now are entering in a phase where all local governments, citizens, and anybody who want to comment on the 208 Plan up here has a 30-day time period in which they can submit written comments. These will have to be addressed in the final plan. Before we open it up for public comment, the staff would like to give a relatively short presentation. We'll try to keep it down to 30 minutes. Uh. . .it's going to be extremely difficult to get into any specifics when we are trying to discuss a plan this size in 30 minutes, so, bear with us.

Basically, over the past month, we have been having a series of Advisory Committee meetings, a total of seven, where we have been discussing with primarily our Advisory Committees and the public, anybody who wanted to come to these meetings were welcome to come. We've been primarily discussing the control programs, management agencies that implement the program. These have been going on for over a month. Copies of the plan were also made available at the Council Library, there was also a copy available at the

Sarasota County Planning Department, the Charlotte County Planning Department, Charlotte County Planners, there was a copy made available in the Glades and Hendry County area. Copies of the plan have, more copies of the plan, have been made and during, they will be distributed this week to the remaining areas that did not have access to a copy and some libraries so that the general public can go and use these plans over the next month.

Just to give a quick background on the 208 Program, it's actually been going on for over three years. We began looking into the program back in 1974, by June 9, 1975, we received a grant in the amount of \$949,000. That was the total amount of this project over the past 3 and ½ years. The council then set up accounting and procurement procedures and went through an extensive consultant selection process. We then sent our consultants out to collect available water quality data to give us some better ideas to water quality problems and condition of the Region and then the staff and consultants and Advisory Committees began setting out different areas of study.

Tape change.

The shaded in portions were the study areas that were chosen for work. (Pointing at map) Detailed water quality work where we go out and collect data, do engineering studies, etc. (a) is the Phillippi Creek Study Area, (c) was the Charlotte Harbor Study Area, (d) was the Caloosahatchee River and (e) was the Big Cypress Study Area. Those were the original suggestions from the staff of consultants and at a later date, the Council added the Lemon Bay study area, number (b). The detailed plan of study was prepared, submitted to EPA, accepted by the Council and the general work in the field, the consultants actually out there sampling began around June of 1976. Sampling continued on for, for over, just over a year. We tried to get a full year of data, wet season, dry season, an extensive analysis of the data was done by the Environmental Science and Engineering who were sampling in the Phillippi Creek, Charlotte Harbor, Caloosahatchee River, Big Cypress areas and by the University of South Florida for the Lemon Bay study area. Basically, these reports were then distributed to the general public, to the council members, to the Advisory Committee members around last November, December. We have had a series of committee meetings, we had a general council presentation where we discussed the results and again I'll briefly go over the results trying to condense them down as much as I can.

Phillippi Creek area - That (pointing at map) was our general sampling scheme of stations. The prime purpose was to look at urban runoff and to look at the quality water flowing into the estuary at the mouth of Phillippi Creek and to suggest cutbacks if necessary. The major findings based on recommended total nitrogen and total phosphorus which were the two prime constituents that we felt were important to water quality in South Florida and recommended levels that were used at the time we found that a 90% reduction of total phosphorus and a 70% reduction of total nitrogen loads were suggested.

Lemon Bay study - (point at map) the primary emphasis was looking at the input to Lemon Bay by septic tanks. It's a heavily septic tanked area. The general findings at this time were that septic tanks were not as significant as other nonpoint sources to Lemon Bay. It was also found that

pollutants, the major amount of pollutants were coming from the upland streams and from the urban area. Future study was primarily the major recommendation to then go in and look at these other nonpoint sources. Also some hot spots due to the sampling were identified as these shaded in areas and for different reasons it is explained in the report and our presentation.

Charlotte Harbor - this is the rough sampling program, the dots right here (pointing at map). The prime emphasis was to generalize what water quality was in the harbor, also determine the extent of the contributions from Peace River, the Myakka River, and the surrounding urban area, of loadings to the harbor. General findings of the study found that 85% of the total phosphorus load to the Harbor were contributed by the Peace River alone. 72% of the total nitrogen to the harbor was also contributed to the Peace River. The Myakka River contributes about 11% of the total phosphorus levels to the Harbor and 17% of the total nitrogen, so these two rivers are by large the prime contributors of nitrogen and phosphorus. The surrounding urban area forms about the remainder 4 or less percent. Based on total nitrogen and total phosphorus levels, that were suggested at the time, we recommended a 92% reduction of total phosphorus loads to the harbor and 58% reduction of total nitrogen loads. However, we did do some extensive biological studies in the harbor and we did from this short study, find out that the harbor was still a viable and productive estuary.

The fourth study area was the Caloosahatchee River (pointing at map). The emphasis in this study was to take a look at agricultural runoff primarily citrus, pasture and to look at the small urban area around LaBelle and its contribution to the Caloosahatchee River and also to try to identify the contribution of Lake Okeechobee to the loads of the Caloosahatchee River. Compared to the surrounding basin and agricultural areas. We generally found that approximately 50% of the total nitrogen and total phosphorus loads to the Caloosahatchee River come from Lake Okeechobee. The remaining 50% comes from our basin. Based on nitrogen and phosphorus levels that should be in the water, a 40% reduction of total nitrogen loads, a 50% of total phosphorus loads were suggested.

The last study area was the Big Cypress study area. (Pointing at map) The emphasis on this study was to just primarily characterize baseline water quality and to run biological water quality also. The general findings were that water quality was generally good for the intercoastal regions of Big Cypress Basin which primarily included Collier County. We did find some violations in suggested criteria in Naples Bay. The biological study was carried out in Wiggins Pass, Naples Bay and Chokoloskee Bay, we found that these estuaries were very productive, viable estuaries, however, Naples Bay did seem to have a fish production slightly impacted upon by organic waste loads to the harbor, or to the bay, and future study of Naples Bay to characterize that problem is indicated.

The overall criticisms that we have received on the water quality studies over the past several months, we first of all, that in our study area, we had a general lack of stormwater runoff data. This is primarily due to the time that we were out sampling, Mother Nature did not read the contracts, the rainfall was not as plentiful as we thought it was going to be so we did not get as much storm runoff as we had originally planned. The second, and

probably biggest weakness was the lack of acceptable phosphorus and nitrogen levels for estuarine and freshwater bodies, we tried to use some preliminary work by FDER, we came up with some standards and these were used as estimates of what the total loadings should be to suggest cutbacks.

Based on our water quality studies, and based on these major criticisms, we then designed control programs. As early as 1976, which was about November, we signed a contract with Post, Buckley, Schuh and Jernigan to begin preliminary engineering types of studies. These were primarily aimed at Phillippi Creek, Charlotte Harbor, and Caloosahatchee River where the prime purpose was to go out, look at the total loadings, and recommend cutbacks. We also looked at Lemon Bay, where septic tanks, where we found that a problem was going to be indicated. We came out with preliminary engineer reports around December of 1977 which was just a few months ago. These reports were the consultants first recommendations on various alternatives that could be employed by the region to cutback some of our pollution. We printed reports and we handed out these reports to the council, to our committees, to the general public once again, and followed that by another round of extensive committee meetings, we had a council presentation and he had a general hearing open to the public. These reports were then altered by the consultant, PBS&J, based on the amount of comment we got, and the comment both on our recommended control alternatives and on our preliminary water quality reports that were done by ES&E.

These reports, as well as a new series of reports, were then created to give us more specific control programs for each area. These were completed about last month, the copies were made and distributed to the Advisory Committees and over this last month, we have discussed those reports along with the general 208 Plan. The 208 staff took these reports and slightly altered them and included them in the plan as Chapter 14 and these were the prime portions that were handed out in the Council's agenda package. These were the recommended control programs for the entire area. I can go over these real quickly.

Due to the indications of the water quality report, we felt that nonpoint sources were more significant than point sources. We felt like they were so significant from our early indications that the entire region should consider some control program; however, this shows up on Table 14.3-1. I think the entire council was sent the areawide portion of areawide Chapter 14. It starts on page 14-1 to page 14-5. This program (pointing at table) is primarily non-regulatory in basis. We are not asking areas outside our study areas to adopt any ordinances right now. We are asking urban areas to consider best management practices in their functions. This includes storm-water retention, pet litter control, fertilizer and pesticide control, vehicle washing, septic tank user information, erosion control and public works. In other study areas, we are offering ordinances for such storm-water retention, septic tanks, erosion control. The areas outside our study areas could use these sections as an example of what we are recommending and how they can possibly adopt these ordinances if they felt it was necessary. The pet litter, fertilizer and pesticide control, vehicle washing, and septic tank user information were primarily public user information programs, where just information the general public on how to properly applicate fertizer and pesticides, for example.

The other main programs offered region-wide, is the agricultural best management practices program that is primarily an existing program that is carried on by the Soil Conservation Service and the agricultural extension agents where they complete a conservation plan for each individual agricultural interest along with the Soil Conservation Service agent, it's done free of charge right now. The development conservation plan is not only to increase productivity of your agricultural activity but also to minimize water quality pollution impacts. It is felt like the Clean Water Act of 1977 will provide federal assistance to local farmers to implement BMP's where they, the BMP, specifically will reduce water quality impacts.

The next major portion of the areawide program is number (c), the Continuing Planning Program, that felt like the 208 program was important enough to be continued on into the future. An annual update of the 208 plan is a requirement by EPA, by the federal government. This will be done. All the portions of the plan right here will be annually updated. It's if we find things are wrong, things are not going as we had planned in here, we can go back and alter that as we attain new data, as we monitor to make sure our programs are working. It also will include the possibility for future studies, and I will discuss this a little bit later in the continuing planning chapter towards the end. Finally, the last program was special programs which include public land purchases such as around Charlotte Harbor and environmentally endangered lands and wetland conservation programs.

For Phillippi Creek, (pointing at table), we step back from the, and suggested a certain program specifically for the Phillippi Creek area and coastal Sarasota County area based on the water quality results of the Phillippi Creek sampling. This included primarily urban control techniques, best management practices; however, we have gone a step further and requested that Sarasota County and the City of Sarasota consider a septic tank installation ordinance. A user ordinance, where you request a permit by individual users so that if they have a septic tank and it is properly installed, that it is maintained and that every so often, every two years, it is inspected and permitted just to make sure that the septic tank is properly functioning through time, it is not overloaded and that someone has not altered their septic tank so it is flowing straight into a water body.

Number 2 is the Erosion Control Ordinances (pointing at table). This was primarily in areas where to, under construction, that an erosion plan be submitted to the county and to the city to make sure that erosion was not causing problems due to, primarily, the large amount of construction that is currently going on in Southwest Florida.

The third one was stormwater control. (Pointing to Table). We felt that the Phillippi Creek, that stormwater should be retained similar to the predeveloped conditions. I believe that the City of Sarasota has this ordinance already. The county uses that criteria in their review of stormwater control plan; however, it is not a specific requirement.

The fourth program (pointing at table) is a general maintenance program which with extensive ditches and canals in the area, that if you use BMP's when maintaining these canals so they are not directly contributing any silt or vegetation clipping, street sweeping was also recommended as a consideration. It was found that vacuum type street sweepers are more effective than the

plain brush type and when going into or buying brand new equipment it was felt that vacuum type equipment should be considered. Finally, catch basins and storm sewer cleaning. It was found that after considerable sedimentation in these basins, that these could be flushed out with the early flushes of the rainy seasons, that these were cleaned prior to that time these sediments would not be getting into the water bodies.

Again, (pointing at table) we have free, just brought up again the agricultural best management practice program, which was area wide, its the same program, we just repeated it here for emphasis.

And the final program was to monitor Phillippi Creek in the future so that we would find if our control program, both regulatory and non-regulatory work were functioning right.

For the Lemon Bay area, (pointing at table) since we did not find that septic tanks were the prime contributor of pollutants, we recommended that the area just use the Sarasota and Charlotte County programs for septic tanks that we recommended for Phillippi Creek and Charlotte Harbor. However, if in the future, these programs are not adopted by either county, the Englewood Water Management District, could in the future, consider the use of this ordinance. This is also a user information program so that the Englewood water district or another agency could distribute information to the public on how to use their septic tank, to call on assistance when they think their septic tank is not working properly. Finally, we are offering also control monitoring there to make sure that our septic tank program is functioning properly and to also look into future studies for Lemon Bay to look at other nonpoint sources.

The Charlotte Harbor program (pointing at table) is much more complex primarily due to the nature that the Peace River is the major contributor of pollutants of nitrogen, phosphorus rather, to Charlotte Harbor. However, the majority of the Peace River Basin is outside our study area. So we could not go in and offer four different programs that should be considered upstream which included the recommendation of adoption of phosphate industry effluent guidelines that were recommended in the Phosphate EIS to be actually adopted now for both existing and future chemical processing plants. This would enforced under the current State 303 basin plan, NPDES system.

Number 2 (pointing at table) was that urban and agricultural areas upstream considered urban, or best management practices rather, in their activities.

Number 3 (pointing at table) was the reclassification of the Peace River from Class 3 to Class I. We felt that would further protect the Peace River. That was also a recommendation by the Council as a resolution.

And four was, (pointing at table) we felt that future studies would definitely needed primarily due to the lack of 208 type of study that was carried on upstream. We are not confident where the pollutant loadings are coming from upstream. We'd like to have a combination study in the future.

For the area itself, (inside the region) the Charlotte County and Sarasota areas, near the Harbor, we have offered a similar program to Phillippi Creek (under b)

(pointing at table) and on down which includes urban control programs, very similar to the Phillippi Creek program septic tank ordinances, erosion control, stormwater control ordinances and then the ditch and canal maintenance on the extensive canals in the region. We also wanted to repeat that agricultural BMP's would be important for the area and reemphasis that monitoring and future water quality studies are definitely necessary for the complex system of Charlotte Harbor.

Caloosahatchee River was also another very complex situation where we have 50% of our loadings coming from Lake Okeechobee the majority of which is also outside our region. However, in this study area, (pointing at table) we have recommended the agricultural best management practice, we felt it would be most important for the Caloosahatchee River basin. We have also recommended a special project for the Caloosahatchee River which is a wetland pilot study to obtain agricultural runoff in wetlands around the area.

Number 3 (pointing at table) we recommended that the entire Lake Okeechobee watershed basin including the upstream portions of the Kissimmee river and downstream distributing area, and Caloosahatchee River, be included in an overall management program that's carried out by an overall management agency. We felt like this, that the water quality management should be comprehensive in cover the entire watershed area for Lake Okeechobee.

Number D (pointing at table) we have again offered a very similar program for the urban areas of the Caloosahatchee River Basin which includes LaBelle, Moore Haven, and portions of Lee County, near Lehigh Acres. Septic tank installation ordinances, erosion control, stormwater control, maintenance program on the ditches and canals and future studies and monitoring to see that the nonregulatory program's are functioning properly.

Finally, for the Big Cypress area (pointing at table) that we did not suggest any cutbacks in pollutant loadings as of yet because of the lack of a detailed type of study. We have recommended a water quality monitoring program to be implemented by the Collier County region so that their estuarine water bodies can be monitored through time. If there are water quality problems indicated in the future, then Best Management Practices and control program similiar to our other study areas could be considered. It was also, due to the nature of the problem we found in Naples Bay, we recommended an extensive future study for the Naples Bay area. That was more or less the control programs recommended for the area.

We also, as part of the 208 program, was the inclusion of information collected in the 201 areas of Southwest Florida. These are primarily individual municipal wastewater treatment management plans which we had 7 ongoing programs, Lee County, Sarasota County, Charlotte, Collier (Coastal Collier Area), LaBelle, Moore Haven, and Clewiston 201 areas. The point source information was primarily taken directly from the 201 plans that were created for each one of these 201's. We did not alter it any and it's also included in Chapter 13 (Chapter 8 and Chapter 13 of the portions of the plan that were handed out to the Council).

Now Mr. Henry Iler will get up and give us a small presentation on the Management agency designations to carry out the control programs and implementation

strategies. Thank you Dave. I'll try to keep this as brief as possible because we want to leave plenty of time for people to make comments. Basically, Dave has gone over the programs that we felt would be necessary to control the pollution coming into the water bodies and my presentation will go over the management agencies that the public law says our plan will have in them. We are supposed to designate agencies to manage these programs and also schedules to implement these types of things.

First off, I'd like to talk about point sources, and as Dave has already said, we pretty much took what was already done and in the various 201 projects and we went to their meetings and coordinated with them and gave them comment on their work so our management structure for the wastewater plants throughout the region pretty much follow what is in the various 201 plans. Because we felt they could give more detail and they were in a better spot to look at these problems. Basically, you'll see here a table, (pointing at table) we have one of these tables, such as this and this, for each county laying out what wastewater plants will be needed, the functions that are necessary to carry out a construction of a plant, and then to operate it, and the various agencies that would be responsible for each of these functions. The north county plant in Sarasota County pretty much is going to carry out all that. We have one of these tables in Chapter 13 of the plan which goes over what lays out each plants that is going to be built and the agency that should manage it. I won't pick up the rest of them just to give you an idea of what they look like.

Also, we also felt like that there was also room for conservation of drinking water as it is used in generating wastewater and we felt that some recommendations should be made to conserve water as it is used in sewage and this type of thing. So we basically layed out that possibly in the future, we should look at smaller flush toilets, current, presently I believe that the ones that are used are 6-7 gallons. There are models that are not being used that are something like 3 1/2, a considerable savings could be gotten from that. Also, the use of aerators in faucets, just to lesson the amount of water used in bathrooms and kitchens and several other shutoffs, possibly just a general program of water conservation in wastewater throughout the region. Pretty much the implementing tool would be a public program for the smaller toilets. You could probably implement that during the permit stage and the agencies that implement pretty much are the building and zoning throughtout the region. We also pointed out some management people for that program.

Now to get on to the nonpoint source program, once again, we went through with each program and we are required under Public Law 92-500 to weight out the program and then the agencies to manage the program, and then what kind of schedule they might use, and activities they might go through to implement the programs. Mainly to give a hand on the what kind of progress is made in each program throughout the 20 years of the plan is to cover.

For the areawide program a lot of the you'll see that we have the agencies across this axis and we have the programs here, (pointing at chart) and an x in each of the boxes, well we had some lines there, would say that that agency has some function in that carrying out that program. We have a table in Chapter 15 of the plan for each program, the areawide program, the Phillippi Creek program, the Charlotte Harbor and the Caloosahatchee, Lemon Bay and Big

Cypress areas laying out the program on one side and what the agencies (pointing at chart) for the areawide program then for Phillippi Creek. We have another list, mainly this list involves the city and the county, and Dave has already gone over the program. We've got the DOT, Environmental Control, Health Department, Planning, Building and Zoning, and Agricultural and then the city has its various departments and once again we have the program and an (x) where they have some function in carrying out that program. So we can go through it fairly rapidly.

I'd like to pause a little bit on the Charlotte Harbor area because Dave brought up a point that in the Charlotte Harbor and Caloosahatchee Programs we have areas that are outside the region and our local governments don't have any say in what goes on so we had to look for regional agencies such as the water management people, the department of environmental regulation and so we also have lay out the program that Dave talked out. A little bit hard to read but just to you who can read it, (pointing at chart) the four basic things we like to see done in the Peace River Basin. And then we set out some agencies just very generally at the present time as to who would be useful in carrying out those parts of the Peace River Basin outside our study area.

Similarly, for the Caloosatchee area, we also have an inside the basin and outside the basin program, and this is going to run off a little bit, (pointing at chart) we'll try to get as much as we can. Outside the basin once again, we have an area where we don't have any say in what is done there and we are looking once again towards regional overall management of the Lake Okeechobee system for overall water quality and quantity programs. Once again, we have an inside the basin program, where we have the program here and the agencies. As you can see, in the Caloosahatchee basin we have many agencies, we have about 3 counties and about 3 urban areas so we have a lot of different agencies when we were drawing up this program. We wanted to say, we wanted to go for the philosophy of using local agencies and so we, even though it makes it more complicated, we felt that a lot of these areas, it just wasn't needed to have any kind of overall comprehensive agency to carry out all of these. And the local governments would much rather carry out it and have local say in what goes on. That is the Caloosahatchee Program. Very briefly, I have to apologize for the briefness of all this, but I know that everybody is probably falling asleep.

For the Big Cypress study area, once again, not quite as complicated a program, (pointing at chart) and the program to monitor, we have a regional agencies here and local Collier County and Naples and Everglades City and Pelican Bay. I'll fly through these. I need to stick up the lemon Bay chart and once again it is a very brief program but did deal with septic tanks and programs to monitor water quality. Once again, we had the planning council, the county, Charlotte and Sarasota, and the water management district there. Now, once again, we had management agencies and we had to carry it a step further and say what will these agencies do in order to carry out the plan.

We have to set out schedules, time periods and so we mainly set up a (let

me get my chart so I don't get totally lost). Mainly we just want in Chapter 20, we set out general strategies to implement schedules for these agencies, and we don't pretend to know all there is to know about all the local governments here. So our strategies in chapter 20 are necessarily general at the present time and as this comment period goes along and we have a chance to meet with local governments and building and zoning people, and just your people who carry on the day to day things we'll be able to put a lot more detail in the strategies. But we wanted to say that we have a lot to learn about it and we're going to take out time and do it the correct way. Presently, the purpose of the schedules basically to carry one step further and say that these are the management agencies and these are the schedules that we'd like to see them implement. This gives the person that's looking at the plan, say in 3 to 4 years, here's what the schedule was, it hasn't worked, what has gone wrong and let's try to fix it. Briefly, that's management agencies for the control programs and the schedule that implement I'd like to bring David up for just a brief period to talk about continuing planning and then I believe after that we will open it up for public comment. Thank you very much.

Just in closing, I'd like to bring up one important point, that the 208 plan is projected to be complete, this first draft, August 18, 1978. The plan should come back to the Council at that time in August to ask for your permission to submit this plan out to EPA and DER. EPA and DER have got preliminary copies of the plan and are also making comments. DER comments will have to be addressed in the final plan. This plan is required to be annually updated. When Council agreed to do the 208 program, they also agreed to do an annual update on the 208 plan. So this document here, (pointing at document) will change one more time before August 18, and will change every year based on new data that's brought up. However, beyond August 18, 1978 the 208 program is no longer 100% funded. Those portions of the plan that are recommended with conditions or recommended for approval with conditions by EPA will be eligible for 75 - 25% type funding where the federal government will contribute 75% of the cost, local area will match with 25% of the cost. So future studies are possible under the 208 program. Preliminary programs are offered to the council in Chapter 19. These were preliminary in nature, and again, over this 30 day period, this will be greatly increased in the amount of detail, and who will be doing the program and how much it will cost. That's about all I have to say on the program up till now. How about opening up for comment?

Chariman Rhodes: O.K. John?

Commissioner Pistor: Are we doing any studying on recirculation of effluent from waste treatment plants and also this deep injection idea of getting rid of effluent.

David Burr: Those types of studies were primarily addressed in the 201 plan that were done by the individual counties. We have looked into them (wetlands) as part of the 208 program but we didn't get into very great detail over the last two years. We did contract, you remember, with the University of Florida Center for Wetlands, and it was their responsibility to look at the use of wetlands for the recycle of both non-point and point source type

of wastewater. And as a result we have suggested a Lake Hicpochee study which would recycle essentially agricultural type runoff. These (wetlands) were considered for Phillippi Creek and they were also considered for the Charlotte Harbor area, however, we didn't feel like there was enough information that had been collected on the use of wetlands to authorize us to go ahead and recommend this region-wide, specific cases as of yet. We just felt like future studies was necessary.

Commissioner Pistor: I would like to see the effluent being used for like watering lawns and so forth.

Burr: That is addressed in the individual 201 Plans.

Commissioner Evans: We have a spray irrigation under the 201 in the City of Fort Myers using the effluent.

Pistor: for golf courses

Evans: no, no, they are going to grow . . .

Burr: I believe they are going to grow crops

Evans: some kind of a crop; animal feed

Pistor: inaudible effluent off.

Burr: I believe that it is being used in some certain areas for golf courses.

Pistor: We use effluent for inaudible .

Evans: It is more or less an experimental thing, spray irrigation, finding out how it works inaudible get revenue from inaudible exposure to the public, it think we better find this first and see how it works out.

Rhodes: If there are no further questions of David, I think we'll take a five minute break and kind of stretch and move around.

At this time we'll call upon the general public who have indicated that they would like to be heard. The first gentleman I have on the list is Fred Duisberg of Englewood. Would you please use the microphone. YOU don't have to stand close to it - two to three feet away from it would be fine.

Fred Duisberg: I'm Fred Duisberg of Englewood

Rhodes: You're not far enough away, Fred.

Duisberg: How's that, better

Rhodes: That's better

Duisberg: I'm here, specifically, representing Save our Bays Association of Sarasota County, but I'm also associated with Manasota 88, both of these organizations are deeply concerned with the environment and most especially with natural resources. I'm water quality chairman for Manasota 88 and natural resource chairman for Save Our Bays. So number 1 I'd like to commend the staff of SWFRPC on the work they have done. I think I'm familiar with it because I've attended various public hearings to the (even to their picnic) over in Wauchula. That was a two day affair. However, they have done an excellent job and it is an ongoing job, and I feel that it needs the complete support of the members of the Council. And I don't have too much to say otherwise as far as any let's say there are general questions that I think are pretty well answered.

I was under the impression from the press report that this meeting that the question of the EIS of the Phosphate Industry that is the Central Florida EIS would be in part of this meeting. Maybe that will come later.

Rhodes: It is scheduled next.

Duisberg: Well then O.K. primarily my statement would possibly include a letter that Save Our Bays has just sent out to Mr. Hagan of EPA in connection with that. So as far as this part of the meeting is concerned, I would say that the staff has done an excellent job and the organizations that I am with certainly commend them for it. Thank you.

Rhodes: O.K. On these requests looking at speaking request forms) for the ability to speak, there is a place indicated for the amount of time requested and most of the requestees have indicated five minutes, the time, I would hope that almost everyone who speaks would be able to limit their remarks to five minutes. Well, most of them have asked for five. Hopefully, they will be as brief (as indicated on the form).

Rhodes: Mr. Howard, Walter Howard

Mr. Howard: Mr. Chairman, Ladies and Gentlemen, I'm Walter Howard and I'm Chairman of the Caloosahatchee Basin Advisory Committee for the 208 Program and also on the Planning and Zoning Board of Hendry County. Basically, what I would like to convey today is our results at our last 208 meeting. First of all, lacking a quorum, we got a consensus of opinion that some of the comments, some of the proposals that are in the draft inaudible. Before I get to that through I like to commend the staff and the regional planning council for their cooperation with the group and for the input that was made available. inaudible. We had quite a bit of public input, was in the program, but a lot of the people had input in the inaudible agreement program that David will verify, but nevertheless from an overall standpoint the committee is pretty well in agreement that the pollution of our waters is pretty critical from the areas that we need to look at it in and we certainly want to better the quality of our water. There are a number of things though that we feel like that ought to be tempered just a little but, maybe approached from a little more reasonable standpoint. First thing I'd like to discuss is in the Caloosahatchee Basin we have a recommendation we have on the use of wetlands is due to the inaudible of the basin and

that may be a very good program but I think that basin state, that we have right now is no question right now as to the feasibility and the practicality.

TAPE CHANGE

How the studying of the inaudible area that the monitor would be placed on the other agencies and in cooperation with the other agencies that are doing studying now on wetlands, specifically, with the South Florida Water Management District and the Daners Flew Basin, and there are some others that could be done and we would like to see the monitoring of these programs to be sure of what is being done in the wetlands is really feasible in that respect. We can look back on the things that have been done in phase, the Kissimmee Basin for instance, where there is a lot of restoration work being proposed there. We, this agency, inaudible the study go in at this point in time and create a series of liberties and inaudible and without inaudible data that would prove to us that it is feasible at this point to create a project in there that perhaps we would have to go back and undo. This may be a very valid method of moving inaudible but we'd certainly like to see a little more time on it during the ongoing program to insure it is feasible for this area.

Another thought we'd like to propose would be in respect to the septic tank ordinance. Now, there are a number of areas in all of our counties, I'm sure, that septic tanks work fine. We have no real problem with them, other areas there are. To undertake a program right now on septic tank permitting for the entire area would require additional staff and certainly a two year period of renewing the permit is just a little bit too strong. Perhaps it would be better to let the Department of Health and Rehabilitation Services, could identify problem areas rather than take a permit on the entire area. As far as the agriculture is concerned, the best management practices, I really have no qualms. I think, with the input that we have, and agricultural people, and the staff, considering all these requests, we feel fairly comfortable with that. There is always this aspect through that we would like to keep in mind with a program of this nature, that is the economic problem. Nothing has been stated as this point in time, that inaudible is who is going to pay for the cost of what, and in fact that this bear in mind that all of our work to clean up the pollution that somebody's got to pay for it. Say, well it's federal grant but that gets right back to my pocket and your pocket so just for the sake of spending federal monies to get a program going is not enough justification. I think I'd like to see a program justified in the improvement of spending all of the money, whether federal or local and try to get a program underway is not only good for the water cleanup but also would be economically feasible. In fact, then the question was brought up at one point in time inaudible the lack of coordination between agencies. I know there has been every effort made by most people involving this program to coordinate it. Thought being that there are other agencies that are doing the work, have studies, and there ought to be a greater amount of coordination to try to utilize the information inaudible the other, every agency that's doing the work in that particular field. I'm sure that inaudible production has not been intentional. I feel like inaudible greater interests that we can play, to have

public information to try to get agencies coordinated. I feel like it is a reasonable approach to the whole 208 program where we can foster a spirit of cooperation between the public and the agency. The implementing agencies, and the project coordinator, all of his staff, I feel like the program would be very successful and there has been a tremendous improvement that I've noticed in this spirit of cooperation since the very beginning. I'd like to see it continue.

Chairman Rhodes: James D. English

English: I'm Jim English from Alva. When I turned in that piece of paper I didn't put anything on there to whom I represent before the committee, for I represent myself this morning. But I did want to mention to the council that I'm on the Board of Directors and Secretary of the Lee County Cattle-men's Association. I'm president of the Lee County Conservation Association and I'm on the Lee County Planning Commission and from time to time I held, attended some of the 208 meetings, as time has gone along. With regard to this whole program, and though, although I don't wish to be too critical this morning, I quite frankly, am disappointed, and I'm speaking primarily with regard to the Caloosahatchee River. I'm part of this program and I have to do with where I live and where I'm most familiar with the results we have arrived at in the program with regard to the Caloosahatchee River. I think it might be well for the Council to know that one of the criticisms in regards to the Caloosahatchee River is the fact that the program hasn't involved itself with the Caloosahatchee River and downstream of the Franklin Locks and really, if we are going to clean up the Caloosahatchee River we are going to have to clean it all up. And I don't think that if we're going to clean up the Caloosahatchee River, that we are going to do it without considering the whole river at some point. With regards to the Caloosahatchee River in the beginning, the Caloosahatchee River was as clear as a mountain stream and I want to make that statement again because as I go to these meetings, I had one guy, I think he had a Doctor's Degree, from Florida's Atlantic University or somewhere over on the east coast when I made that statement at the meeting, he came up to question me about it afterwards, said somebody told him that Caloosahatchee River meant "muddy river" that it's always been muddy so there's a good bit of misinformation going on as to where we started from and where we are and how we got there. And, most of what happened to the Caloosahatchee River has been the result of inaudible not activity.

The one thing that mentioned with regards to the Caloosahatchee and I think if we are going in the end to do anything, in other words, if we are going to clean up the Caloosahatchee River, the one thing that we have to consider at some point is the fact that the Caloosahatchee River has been dredged out, straightened out, and deepened to the point that it no longer flows to the extent that it did at one time. To give you some idea of the magnitude of the dredging operation along the Caloosahatchee River, the last time we dredged it out was in the 60's. The previous project had been 300 feet wide, I think it was, and 8 feet deep and they approximately doubled the width and tripled the depth, in other words, up above the inaudible dam up there now, instead of being 8 feet deep it's 27 feet deep. And this has had a considerable it has turned the Caloosahatchee River, so to speak, into nothing but a big cesspool. It doesn't flow, and it doesn't clean itself out so we need to really

look at that whole situation with regard to its effects and we also need to look at it and make in reference to one of the points that Mr. Howard made. We also need to look at it with regard to what it is going to cost. In other words, in some form, we are going to have to first of all, going to have to study the problem as it is and once we understand the problem and can compute what it is going to cost us to clean it up, then at that point we can make a decision whether it is economically feasible to clean it up and we haven't got the information at this point, in my judgement, to even make, even come to such a conclusion. So I would like to see in the final form, this program, I like to see it inaudible to the fact that this program with the Caloosahatche with its width and depth and its lack of flow and the problems which that causes with regard to pollution. And we are going to have to come up with some cost figures. Any then both you and the citizens here, at that point, can make some decision as to whether we can afford to go ahead. I think whatever we do, I like to say with regard to what Mr. Howard said, and I certainly agree, that anything that we do ought to be economically feasible. Because whether the money comes from the federal government or whether it comes from the state government, or whether it comes from the county government, it all comes out of your pocket and mine. In other words, it's the tax payers that are paying the bill in the end result.

In that regard, there are two things that I noted in that, in the report, in regards to the Lee County thing. One was the, they recommended under the 201, and I don't understand all these 201's and 208's and all these other numbers, and where I'm supposed to say what, so I'll just say (pause) whatever I am and if this is the wrong place to say this, you'll just have to forgive me. But one of the things I see in there under the 201 plan for Lee County is the purchase of, I believe, either a sewer system or a water system or both out at Lehigh Acres and it seems to be increasingly the attitude of government to take over everything. And one of the problems we are having here, not only in Lee County, but I think in all of South Florida, is with the influx of people that we are having, or have experienced, and are experiencing, and it appears we will experience for some time in the future. The biggest problem that we have is a shortage of capital to provide those facilities and services which have supposed to be furnished by the government. We just don't have the capital, we can't get the money to build the roads, or to put in the sewer systems, or the water system, or the libraries, or whatever it is, you know, that people come in and demand from their government. So, I think it is the wrong approach of the government to step in and start buying up facilities which have already been furnished by the private sector. In other words, if they've done it and continue to do it, I feel that the government ought to put what money and time we have on some of these other real problems.

And the other thing in the 201 plan, which our programs need greatly, is this recommendation to go off down here of U.S. 82 which runs from Fort Myers to Immokalee and buy 6 sections of land down there and put in a, well they are going to, they call it a spread program, or something, they take this sewage effluent and sprinkle it out and supposedly grow crops. Now, and they're proposing to go down and do it on that particular piece of land because it is cheaper. And the only thing that is going to be cheaper about it is the initial cost of the land. That is probably the cheapest land that you can

buy in Lee County or in this regional area right now. Of course, there is a reason for that. That area down there is what we always called the Number 4 marsh. It is mighty wet. It is not now suitable for that kind of an operation. So you may be able to buy this land cheaper. But, just to give you an some idea as to what type of land we're talking about, I know several years ago, we got into a discussion in regards to taxes in Lee County. And we had a big meeting in the courthouse and over there, of course, the inaudible stuck together to decide what we were going to do about the situation. The subject came up that there were different qualities of cattle pasture in Lee County. And there was one old fellow that been in the cattle business in Lee County all his life. He said, yes, he said that's true, and he said I can tell you were one of the sorriest cow pastures in Lee County is, and he said, that is down on the Number 4 marsh. He said, I moved my cows down there one time and I stayed there for a year and I didn't buy any and I didn't sell any and I left there with less cows than I went there with. Now that is a mighty sorry piece of land Ladies and Gentlemen. And it's going to be a fine action and operational disaster for the government to go down there and buy that piece of land and try to do what you think you are going to accomplish down there. And I know that, and there's some other folks who know that but the people that are the fire movers with regard to that program don't understand that. But it is going to be mighty expensive too, to the taxpayers of the United States of America, I guess, because 75% of the finances we get are going to be financed by the United States Government if we don't recognize that problem. And that will conclude my remarks, and I thank you very much.

Rhodes: Thank you very much. Patrick Settles.

Settles: I have some prepared remarks. (He passed out the attached letter)

Rhodes: Mr. Settles, are you going to make remarks outside the parameters of this written statement.

Settles: No, Mr. Chairman, if a

Rhodes: You are then anticipating reading this?

Settles: I was

Rhodes: For the sake of time, Mr. Settles, could you be very brief in going over this, rather than verbatim.

Settles: If you wish.

Rhodes: I'm just saying, in as much, as you have submitted one of these to each member of the Council and staff, it could be persued at a later date.

Settles: I'm Patrick Settles, I'm here on behalf of General Development Corporation. (Patrick Settles presented the attached document, verbatim) Thank you very much, if you have any questions be glad to answer for the Council.

General Development Corporation



G. Patrick Settles
Corporate Counsel

June 15, 1978

Re: Draft 208 Water Quality Management Plan for Southwest
Florida

Dear Mr. Chairman and Members of the Southwest Florida Regional
Planning Council:

After reviewing the draft 208 Water Quality Management Plan
for Southwest Florida and the Water Quality Reports upon which
it is based, we wish to submit the following comments and
recommendations.

Over the years, the policy of General Development has been,
and still is, to support all reasonable regulations. Pursuant
to this policy, we have supported the promulgation of such regu-
lations as the Department of Environmental Regulation dredge and
fill rule and the federal section 404 dredge and fill program.

However, after considering the proposed Southwest Florida
208 Plan, the data upon which it is based, the lack of scientific
knowledge regarding the water quality benefits of nutrient removal,
and the possible economic costs resulting from implementation of
this plan, General Development must take exception to certain
control techniques included within the recommended nonpoint source
control program.

Since first presented with the results of the data collection
and the recommended percentages of removal for Total Nitrogen and
Total Phosphorus, we and others have questioned the validity of
the conclusions. However, despite these concerns and questions,
the draft plan still recommends the removal of 53% of the existing
load of Total Nitrogen and 92% of the existing load of Total
Phosphorus from Charlotte Harbor. We do not believe that such
high percentages of nutrient removal are justified by the data.

As more fully explained in the Final Draft of the Supplemental
Water Quality Presentation to the Charlotte Harbor 208 Advisory
Committee (April, 1978), which is attached hereto and made a part
of this testimony, the Environmental Quality Laboratory compared

the chlorophyll a model used by the water quality consultants to actual observed values within the Harbor and found it to be of poor predictive value. The standard error of the estimate of chlorophyll a units was found to be almost half the proposed limit. In our opinion, no single nutrient concentration is desirable for an estuary. Important seasonal factors such as light, temperature, salinity, water color, turbidity, trace metals, and various vitamins can strongly influence algal growth in estuaries. Also set forth in this report is a simple, relatively inexpensive alternative method for determining the recommended limits of parameters.

Furthermore, nutrients in rainfall measured by the United States Geological Survey in southern Florida occasionally exceed the recommended water quality standards given in Chapter 5, Page 13 (and elsewhere in the draft plan) for estuaries, and commonly exceed those suggested for freshwater. This data may be found in Waller and Earle (1975) and in Matraw and Sherwood (1977).

However, even more fundamental than the issue of the accuracy and validity of the recommended loads of Total Nitrogen and Total Phosphorus are the benefits to be derived from removal of high percentages of these nutrients from Charlotte Harbor. We believe that there are too many uncertainties in the state of the scientific art to justify the expenditures required to remove these nutrients. Such doubts were raised by the Comptroller General of the United States in his report to Congress:

Exact scientific knowledge is lacking, however, as to the extent algae can be prevented from growing when varying combinations of the nutrients [nitrogen and phosphorus] are removed . . . While scientists know that phosphorus, nitrogen, light, temperature, and suspended solids affect the growth of algae to some degree, they cannot determine with certainty what the effect will be on preventing or reducing algae if one or more of these elements is increased or decreased. Comptroller General of the United States, Report to the Congress, Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction, at 27, 28 (December, 1976).

Hence, the Comptroller General concluded that EPA is financing some AWT facilities, for removal of nutrients and pollutants, without sufficient water quality data and planning, and that in many instances, these facilities may not be the most effective or efficient means for achieving water quality goals.

To refute this report, EPA retained its own consultant, the Vertex Corporation, which reached the same conclusion, but expressed it in more emphatic terms:

As a temporary measure, there is much to be said for doing away with all planning derived from WQS [Water Quality Standards]. EPA should consider asking Congress to strike section 303 of P.L. 92-500. The WQS we have seen are not a helpful adjunct to planning, and the wasteload allocations derived from them cannot withstand scientific scrutiny. What is to be gained by persisting in a costly, time-consuming method of planning that does not produce credible results? J. Horowitz and L. Bazel, The Vertex Corporation, An Analysis of Planning for Advanced Wastewater Treatment (AWT), at 36, 37 (July, 1977).

We feel that these similar questions raised by the Comptroller General and the EPA consultant as to the scientific uncertainties in this area add further credibility to our concerns.

However, the water quality consultants' own data indicated that approximately 85% of the Total Phosphorus in Charlotte Harbor originated upstream from the Peace River, 10% from the Myakka River, and approximately 5% from urban runoff. For Total Nitrogen, their data indicated that approximately 72% originated from the Peace River, 17% from the Myakka River, and 11% from the urban area surrounding the Harbor.

Based upon these percentages of nutrient contribution, logic would seem to dictate that the urban areas surrounding Charlotte Harbor are not the source of any imagined or real problem concerning nutrients and therefore should not be subject to an extensive regulatory scheme. However, such is not the case, as the draft plan recommends the implementation of a septic tank installation ordinance, septic tank maintenance ordinance, erosion control ordinances, stormwater control ordinances, and a ditch and canal maintenance program.

We believe that such a regulatory program to remove 5% and 11% of the Total Phosphorus and Total Nitrogen, respectively, assuming such action would be beneficial, could not be justified by any cost/benefit study, much less scientific data. This is not to say that possibly at some point in the future one of these proposed ordinances might not be needed, if there was

sound scientific data to support such a regulation. The draft plan proposes a water quality monitoring system to discern such a need, but to implement such a regulatory scheme now is scientifically unsound and economically unjustified.

We sympathize with the plight of the Southwest 208 staff in that the upstream portion of the Peace River, from which the majority of the nutrients originate, lies outside their planning boundaries. Therefore, they could not study and recommend appropriate regulatory measures for the river, and the planning agency within which it is located did not take action.

However, we do not feel that this justified the undue singling out of the community development industry to bear the brunt of these proposed regulations, many of which seem to be directed solely at our industry. If such a scheme is implemented, the cost to the private sector, and ultimately the homeowners, would be thousands of dollars, not to mention the additional time delays from overlapping agency jurisdiction. We question also whether the additional tax dollars required for administrative costs of this program can be adequately justified.

Let's look at a few specific examples of our concern. Although only one storm event was sampled at four of the monitoring stations, this apparently was the basis for an extensive stormwater control ordinance requiring applicants for building permits to submit a development drainage plan for the designated local agency's approval.

Although some aspects of the proposed erosion control ordinance are feasible and practical, other provisions, such as those regarding fees, bonding, and predevelopment procedures, are of questionable use and are costly.

With regard to the proposed septic tank ordinances, no scientific data has been submitted to indicate that septic tanks contribute nitrogen or phosphorus to Charlotte Harbor. Although a previously conducted EPA study indicated that dye placed in some Punta Gorda septic tanks was found in the adjacent canal, it failed to indicate that significant levels of phosphorus and nitrogen in the effluent were not removed by passing through the soils. Absent such data, we see no need for such ordinances.

A specific example of the added cost that would be required by implementation of such ordinance is the requirement for 20 feet of cleaned fill area around a septic tank drainfield.

Allowing for a cover on a drainfield of 24 inches below the ground, one has a depth of 36 inches at the bottom of the field. Assuming a bed requirement of 300 square feet, you would have to excavate about 33 cubic yards for the field and 355 cubic yards for the 20 foot perimeter. Using the cost of \$.60 per yard for excavation and \$1.50 for suitable material, you could have a cost of \$233 for excavation costs and \$566 for suitable material. Therefore this ordinance could add approximately \$800 to the cost of a septic tank system.

The proposed requirement that the drainfield be 36 inches above the water table elevation almost precludes the installation of any septic tanks in southern Florida. The only way of meeting this requirement would be to use elevated fields and pumping units.

We also do not believe that there is a need for a pumpout requirement for every 2-3 years. Our experience has shown that there is only an approximate accumulation of ten gallons of sludge per person per year. Similarly, our studies show that garbage grinders have little effect on sludge accumulation in tanks.

We do support the implementation of a program for septic tank inspection and monitoring. We further recommend that consideration be given to establishing septic tank service districts to properly maintain these systems.

The implementation of this proposed regulatory scheme, based upon questionable interpretation of and unwarranted extrapolation from data, will result in a significant economic cost to the private sector, and ultimately the homeowner, for fees, the use of new, costly, and unproven techniques, and continuing engineering studies followed by maintenance and monitoring costs.

Perhaps this situation is best described by the Vertex Corporations' assessment of the planning provisions of the Federal Water Pollution Control Act amendments in its recommendations to EPA:

In plain words, the Act requires the Nation to plan like mad and build like crazy. And that, we fear, is exactly what has happened. Planners and designers have tried to make the best of an impossible schedule by hastily doing what they can with inadequate data. In consequence, the

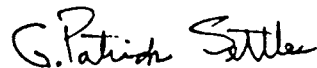
June 15, 1978

Page seven

planning documents are often less ennobled by scientific truth and engineering excellence than by practical expedience, and the planning process is degraded into a bureaucratic exercise undertaken in a race against the clock to comply with Federal requirements and to qualify for Federal subsidies. An Analysis of Planning, at 35.

For the foregoing reasons, General Development must take exception to the Charlotte Harbor Water Quality Reports and the above-mentioned regulations recommended for implementation in this area by the draft 208 Water Quality Management Plan for Southwest Florida. We intend to later supplement this response with specific comments regarding the Caloosahatchee study area. As a developer of large communities, we do share your concern for long-term and integrated planning of water resources. For this reason, we conduct geologic, hydrologic and environmental quality studies to assure the meeting of our commitments. We now, however, face considerable uncertainty due to the items discussed in this reply. We would appreciate any opportunity to discuss this document further.

Sincerely,



G. Patrick Settles
Corporate Counsel

GPS/lm

cc: Mr. Roland Eastwood, Executive Director
Southwest Florida Regional Planning Council
Mr. David Burr, 208 Project Director.
Mr. Ron Blackburn, DER
Mr. Gary Exner, DER

Rhodes: Yes, John

Pistor: I have a statement to make. This idea about not providing proper inaudible for storms, for the drainage. If you don't provide inaudible in the beginning when you are making the development, people that buy in the area are going to pay for it in the end anyhow. We have a very strict ordinance on this in Collier County and we're finding that due to the fact that it was only put into effect approximately 3 years ago, we're now being asked to correct all the problems that were created because of what inaudible prior to 1974 and we just inaudible
(A lot of mumbling went on for the next few seconds that was completely incoherent.)

Commissioner Evans: I'll have to disagree with you on that, it's not all site development as regulated by DER Permitting, of your smaller site developments are not regulated by that, only the developments like GDC makes, large developments. But as far as small developments, you don't need other than County approval of your site thing.

Settles: I believe you're right, I believe there are two breaks, one of 500 units and one of 750 units depending on the population of the _____

Schroeder: (couldn't hear)

Evans: Well, one of the major problems has been, there is no master drainage plan. In our county and when a development comes, each site plan is approved for drainage etc. and etc. Things are not approved or planned to complement the adjacent properties, you know, to make one major drainage plan. This is one of the problems we had. They are all approved separately. They all have their own little drainage plan and it doesn't fit in with the adjacent properties or anywhere close to it. It's what we all need to address ourselves to.

Rhodes: Any further questions Mr. Schroeder

Schroeder: Yes, I have one comment to make and that it is a lot cheaper to do this drainage job in the beginning than it is to try to correct later, because when you are working with raw lands you've got an entirely different problem than when you are working with something that's already developed. We've got one shopping center in the City of Naples that has a horrendous job of correcting the lack of proper drainage when the shopping center was put in 8 or 10 years ago. And it has cost the present holders of that land inaudible to make the correction.

Settles: Made some comments.

Pistor: Yeh, but you say here that anything requiring applicants for building permits to submit a development drainage plan with designations and I think that you're objecting to that phase of the project inaudible .

Rhodes: Thank you Mr. Settles: Michael Morris

Settles: Thank you.

Morris: My name is Mike Morris with Flood Associates, Consultant Engineers, and we represent the City of Fort Myers and we'd like to request that the City maintain responsibility for coordinating the implementation of plans for the City of Fort Myers system and we have a written statement that is being prepared that we like to submit to you ladies and executive director.

Rhodes: Thank you Mr. Morris. Jim Conway.

Dollie Goldman: He had to leave, Mr. Rhodes.

Rhodes: O.K.

Goldman: He'll submit his comments in writing.

Rhodes: Richard Cantrell

Cantrell: In the interest of time and my growling stomach and since the staff is already aware of the rather extensive disagreement between myself and other members of the planning community regarding the validity of the Charlotte Harbor study I will forego my time and rely on the written presentation.

Rhodes: You just used it up anyway. (Laughter)

Rhodes: Mr. William Helfferich

Hel fferich: I save the time also, I represent South Florida Water Management District and we have certain disagreements with what's been written in the 208 Plan, we responded in writing and will respond again during the 30-day comment period.

Rhodes: Thank you very much. O.K. are there any other comments to be made during this public hearing?

Roberts: Mr. Chairman _____

Eastwood: Well, this has a been a public hearing on the draft plan. There will 30 days of comment to develop the plan and come back to the council for a further hearing.

Fegers: Mr. Eastwood

Eastwood: Yes, Sir

Fegers: Mr. Eastwood, these remarks that Mr. Cantrell and all of the other gentlemen who said they were going to respond in writing, will the members of the council get copies of these responses.

Eastwood: Mr. Cantrell

Cantrall: What's the problem

Rhodes: Will the individual members of the council be getting copies of your comments.

Cantrell: I assumed you wanted them submitted to the staff. That would be

Rhodes: You will submit one to the staff and then if any of the members want a copy.

Cantrell: I think that question should be addressed to David.

Eastwood: What I'm getting at, are you going to furnish additional written comments to us?

Cantrell: Yes

Eastwood: If that's the case, if a council member wishes, we will xerox it and send a copy.

Fegers: I think so because I think these comments are important.

Burr: All the comments will be put in the appendix to the plan will just the comments.

Eastwood: Since Mr. Fegers has requested it, when we get these comments from Mr. Cantrell we'll just xerox it and send.

Burr: Just Mr. Cantrell

Fegers: No, no.

Rhodes: All of the written comments that come in.

Eastwood: All the comments that come in, just xerox them and send them out.

Fegers: Do you want a motion on that.

Eastwood: No you won't have to. It will also be attached as comments to the hearing files.

Roberts: Mr. Chairman, I have a comment to make to both Milt and Mr. Freeman there ain't no free lunch and I think that as a part of this study there should be an economic impact statement on every stage or task of this thing because these open ended statements it should be done inaudible but how much is it going to cost and I think that in connection with this study that the cost should be stated because it's going to run, or it could run into a million dollars to do the job. And if we don't know what it's going to cost how can we intelligently state what we should do or what we should recommend to the community what we should do.

Eastwood: Dave, aren't all the recommendations costed out in the plan:

Dave: Yes, they are:

Eastwood: They are all costed out.

Henry Iler: Except the programs that were going to be of a minimal cost.

Rhodes: Would you please come up and use the microphone.

Henry: The cost of the program in the 208 plan are given in Chapter 20 and some of the program's are what the consultants said were minimal costs and so we didn't go into small figures. But the major programs we did cost out. The ones _____.

Schroeder: How much does it cost to clean up the Caloosahatchee for example?

Henry: I don't have a total cost figure on that.

Schroeder: That's what I'm getting at.

Eastwood: There's no recommendation in the plan that the Caloosahatchee be cleaned up according to this present data. The recommendation is best management practices and recommendation is the possibility of inaudible septic tanks.

Schroeder: How many septic tanks are there? That's an additional cost upon construction. But what's it going to cost to implement an ordinance that says that you've got to provide your _____ septic tank in the area and have it inspected every two years permanently.

Rhodes: That's done by inaudible and you can put in your ordinances

Pistor: Isn't there a certain section of the state anyhow giving consideration to eliminating this area, septic tanks and making everyone put in a central sewer systems. I think that was two years ago, that was practically put in and then it was slightly delayed. I have a strong recollection _____ inaudible on borrowed time to get the sewer system.

Evans: Lee County is now in the process of working on sewer systems for almost the entire county. It is going to have to be a time element involved for expansion of the system.

Pistor: To talk about septic tanks, the ultimate in our county and your county is not septic tanks it is a central sewer system.

Rhodes: I think perhaps, in as much as we are going to continue next month with this discussion, before we do anything with the plan, inaudible to try to get them resolved between now and the next.

Pistor: Mr. Chairman, can I ask one simple question, is there a time limit on this as my understanding, that by August 15th there must be a position plan submitted for the continuation of the program. So we've only got a few months. Can someone answer that?

Dave: August 18, is when our 100% funding stops.

Pistor: The Council should make a decision by August 18th.

Dave: Hopefully, we can, however, that is up to the Council.

Rhodes: Now, let me ask the board what their pleasure is. It is now 12:30, that gentlemen's stomach is rumbling. We have the Central part of Phosphate EIS review and then the other items on the agenda to be included as well as going back to Number 3. Number 4, whatever. That doesn't need to be done until next month.

Eastwood: I'm afraid I'll lose a quorum _____

Roberts: I believe according to our By-Laws call for in the _____ of time, correct me on this, are you familiar with what I'm going to say.

Rhodes: No, we have to make a motion to close the public hearing before we do that.

Roberts: Mr. Chairman, in as much as, comments can be written and will be incorporated and will be sent to all the members of the Council, I move that _____.

Rhodes: You move to close the public hearing.

Roberts: Yes.

Pistor: To close it or to continue it next month.

Fegers: No, you can't you have to re-advertise it to continue it.

Dave: There is an official comment period that we are required to have so

Eastwood: We've got to close it because we've got a 30-day comment period that starts then

Rhodes: Any further discussion. Is there any body here who feels they would like to say something who has not indicated that they would like to speak, no response _____. All those in favor of closing the public hearing signify by saying aye.

All: Aye.

Rhodes: Opposed. Motion Carried

Response to Comments Received From
Mr. James D. English, Jr.

1. According to your historical description of the Caloosahatchee River, significant structural alterations have occurred to eliminate the many natural cleansing processes that maintained high water quality. Since these processes no longer occur, then to maintain high water quality two choices exist:
 - a. Remove as many pollutants as possible before discharge into the canal.
 - b. Accept poorer water quality than existed prior to alteration.

The 208 Plan attempted to pick the first choice as a plan of action. Basically, the plan calls for urban and agricultural best management practices and the use of Lake Hicpochee as a wetland retention system, similar to the historical description you have provided.

2. It is unfortunate that the entire Caloosahatchee River up to San Carlos Bay could not be studied. The 208 Advisory Committee for the SWFRPC selected the upstream portion of the river to study because of its importance as a drinking water supply, agricultural water supply and its recreation value. Funding constraints also did not allow study of longer scale. It was also considered that any cleanup or protection of upstream water quality would benefit downstream quality since the Caloosahatchee River is the largest single discharger of fresh water into the estuaries area down stream.

Finally, future study of the downstream basin is recommended and will hopefully be implemented during the continuing planning process.

3. Pollution entering the Caloosahatchee River from Lake Okeechobee was considered and is addressed in the Plan. See Chapter 6 for an assessment of its contribution (approximate 50% of total loading) and Chapter 14 for recommendations of its water quality management.
4. Future study of the river/canal and its assimilative capacity is recommended as you suggest. (See Chapter 19)
5. Your comments about the Lee County 201 Facilities Plan have been forwarded to Lee County for further review. The selected site was chosen based on a preliminary review of available land capable of both accepting effluent from a sewage treatment plant and on agricultural suitability. It also appears that parts of the site are now being used to grow crops. Before the area goes into full production, however, further detailed study will occur to determine which parcels of the site are most suitable for crop growth and what management practices will be needed to make it a productive site.

Alva, Florida 33920
July 14, 1978

Southwest Regional Planning Council
2121 West First Street
Fort Myers, Florida 33901

ATT: Mr. David Burr

RE: 208 Water Quality Management Plan

Ladies & Gentlemen:

I attended the public hearing regarding the proposed 208 plan held at the Ramada Inn on West First Street in Fort Myers on June 15, 1978 and wish to make the following written comments:

My family has lived in the Caloosahatchee River Valley for over 100 years. My grandfather came here by ox cart in 1875 and staked claim to a homestead with 1/2 mile of frontage on the river near Alva. That land along with some adjoining land which we have aquired from time to time as necessary has provided a livelihood for several generations of my family.

The present condition of the Caloosahatchee River is deplorable and disgraceful as far as water quality is concerned. Today the river is little more than a stagnant cesspool. In order to understand the problem and to determine what to do to correct it, I think it is necessary to have some understanding of how or what the river's condition was in the beginning and what was done to it to change it from what it was to what it is today.

When my grandfather came here in 1875 the water in the Caloosahatchee was as clear and pure as a mountain brook and they could drink directly from the river. The river at that time was a meandering stream with its beginning in Lake Hicpochee, a small fresh water lake some distance west of Lake Okeechobee, not Lake Okeechobee itself. From Lake Hicpochee the river flowed westerly in a ill defined course through a vast marsh to Lake Flirt which was located just East of LaBelle. On the west side of Lake Flirt a rock outcropping separated the lake and the upper reaches of the river from the river westerly or below that point, and the water flowed out of Lake

Flirt over the rock ledge in a water fall into the lower river. The differential in water elevation at that point was approximately eight to ten feet. The river westerly of the water fall was a very crooked meandering stream, in fact, the word Caloosahatchee was Indian for "Crooked River". It was fed by numerous creeks and by springs which flowed from outcroppings of limerock in the bed and banks of the river, so the river flowed continuously.

Originally, the water in Lake Okeechobee was of much poorer quality than that in the Caloosahatchee but there was no direct connection between the two, and the river had its own natural filtering system. The water from Lake Okeechobee flowed to the Caloosahatchee only during periods when the lake was very high by flowing overland to Lake Hicpochee through a vast expanse of sawgrass which acted as a filter. When the water reached Lake Hicpochee it spread out and slowed down which allowed remaining pollutants to settle out. Lake Hicpochee was also filled with aquatic vegetation which removed additional nutrients. The water then moved slowly through the marsh to Lake Flirt where it again slowed down and spread out allowing any remaining nutrients or pollutants to settle out or be absorbed by the aquatic vegetation, so that the water which spilled over the waterfall into the lower reaches of the river was good, clean, clear water.

Man has destroyed this natural system. In the 1800's the rock outcropping at Lake Flirt was blasted away, a canal was dug from that point easterly to Lake Hicpochee and a channel dredged from Lake Hicpochee across the sawgrass to Lake Okeechobee thus directly connecting the Caloosahatchee River to Lake Okeechobee for the first time. The additional water which this activity placed in the river during periods of excess runoff exceeded the river's capacity. To alleviate this flood problem US Army Corps of Engineers dug the Caloosahatchee Canal in the 1930's. This canal was approximately 300 feet wide with a bottom elevation 8 feet below sea level. A lock was constructed at Ortona about halfway between Lake Flirt and Lake Hicpochee. Sea water intrusion advanced to the Ortona Lock. In the 1960's the Caloosahatchee was dredged again by the Central and Southern Florida Flood Control District. The river was widened to approximately 600 feet and deepened to a bottom elevation of 24 feet below sea level. The district also constructed a lock near Olga in an unsuccessful attempt to stop the salt water intrusion. Since that work was completed, low flow together with excessive depth has inhibited proper oxygenation and enhanced eutrophication of the river. So, what was once a clean, clear, constantly flowing river system has been transformed into little more than a stagnant, polluted,

algae infested ditch.

Comes now the 208 water quality program and what to do about the existing situation. At the outset the committee was lobbied by Mr. Jack Harper, Director of Environmental Protection for Lee County to exclude from the study area that part of the river downstream of the Franklin (Olga) Lock. As a result of Mr. Harper's efforts, consideration of the affect of the urban areas of Fort Myers, East Fort Myers, Russell Park, Fort Myers Shores, South Fort Myers, North Fort Myers, Cape Coral, and the populated portion of Lehigh Acres on water quality in the Caloosahatchee River was excluded from this study and program. So, the 208 water quality management plan will not deal with the causes of pollution in that part of the river west of the Franklin Lock, the extent of that pollution, nor what, if anything should be done about it. This, in my judgement was a serious mistake. Pollution of the river will never be over come if, by design, we choose to ignore the effect on the river of pollutants from such a large urban area and population.

In the study area, above the Franklin Lock, the sampling done in an attempt to define ^{the} point sources of pollution was done at streams and tributaries which for the most part drain either agricultural areas or unpopulated residential subdivisions such as the uninhabited portions of Lehigh Acres. There is no evidence submitted which would substantiate a claim that either of these types of areas make any significant contribution, either point or non-point to the pollution of the Caloosahatchee River. There is some evidence to support the claim that the urban areas of LaBelle and Port LaBelle, which incidentally is being constructed in the bottom of what was once Lake Flirt, do make a contribution to the pollution of the river.

It seems to me that the two main pollution problems in the study area are: (1) the ^{the} point source of pollution entering the river from Lake Okeechobee; and (2) the non-point source of pollution having to do with increased width and depth of the river. This results in a "no flow" condition through most of the year which inhibits the systems ability to assimilate incoming nutrients and pollutants, and the depth which results in inadequate oxygenation and speeds eutrophication. The draft fails to address itself to a proper resolution of either of these problems. That part of the river in the study area will never be cleaned up as long as we choose, in the main, to ignore these factors. Although excluded from the study area, that reach of the river below the Franklin Lock will never be cleaned up until we "face up" to the pollution entering the river from the urban areas mentioned earlier and come to grips with what to do about it.

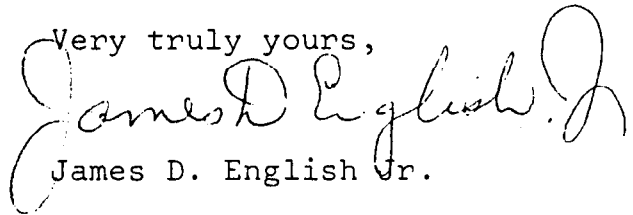
I note that the draft recommends purchase by Lee County or other government agencies of various facilities such as the Lehigh Acres waste water treatment facilities presently owned by private interests. One of the problems faced by rapidly developing areas such as Lee County is a shortage of available capital to provide for an expanding population, those facilities and services normally and historically provided by the government. This being true, I think it's a mistake to divert available capital for the purchase of existing facilities instead of using it to provide much needed additional facilities and services. The problem is of such a magnitude that private enterprise should be encouraged, where possible, to assist government, not be excluded by it. Any how, we are considering a plan to clean up pollution and prevent further pollution. Who owns the facilities is completely irrelevant and out of place in the plan.

Reference is made to a land spreading operation on six square miles of land in the Southeastern part of the County. The intended purpose is to dispose of sewage affluent and/or waste water by using it to grow forage and other agricultural crops for harvest and sale. I am excited about this concept, and agree with it wholeheartedly in principle. However, what is being considered here is an intensive agricultural operation on what is for the most part a sub-marginal tract of land. The only reasons I have heard given for considering this particular tract is the low purchase price, and the fact that the federal government will fund the purchase at no cost to the taxpayers over and above what they are already paying in taxes. I feel some consideration should be given not only to the initial purchase price, but to the overall cost of preparing this site for the type of operation contemplated as compared to the overall cost on an alternate site.

Some consideration should also be given to the chances of engaging in a successful operation of the type contemplated, whatever the cost. I am familiar with the land in question, it is referred to locally as the No. 4 Marsh. I have a B. S. degree in agriculture from the University of Florida. In my opinion, an attempt to engage in the type of operation contemplated on that site will be a financial and operational fiasco.

The statement has been made, "we are on the right track with the Lee County 208 plan and we should proceed as presently planned." I don't believe that statement to be accurate.

Very truly yours,

A handwritten signature in cursive script that reads "James D. English Jr." The signature is written in dark ink and is positioned above the typed name.

James D. English Jr.

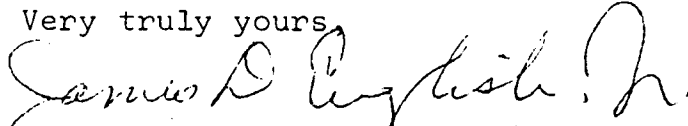
JDE/cc

Mr. David Burr
Southwest Florida Regional Planning Council
2121 West First Street
Fort Myers, Florida 33901

Dear Mr. Burr:

Here with are my comments about the 208 draft. I would like for the council members to receive a copy.

Very truly yours,



James D. English Jr.

JDE/cc

Enclosures:

Response to Comments Received from
the General Development Corporation dated June 15, 1978
and Presented at the Public Hearing

1. The chlorophyll a - nutrient relationship used by the 208 program is a preliminary method developed by the Florida Department of Environmental Regulation. It was used because no standards for nitrogen and phosphorus now exist for estuaries. The data presented by the Environmental Quality Laboratory (EQL) shows that the relationship, when applied to Charlotte Harbor, was not highly accurate. However, the alternate method for determining nitrogen and phosphorus levels proposed by EQL are not a substitute for the chlorophyll a numbers since they apply only to the Peace River freshwater discharge. Although one specific set of numbers for nitrogen and phosphorus may not be desirable, as you suggest, the staff feels that no standards or guidelines at all are even less desirable. The 208 Plan standards are recommended as "interim" until further study is done to specify final standards.

It is interesting to note that the EQL report that is cited in the comment recommends nitrogen and phosphorus reductions that were similar to the 208 Plan reductions, even though considerable objections to the 208 numbers were made. These are summarized below:

	Percent Reductions	
	208 Plan (Harbor)	EQL (Peace River)
Total Phosphorus	92%	69%
Total Nitrogen	58%	
Nitrate-Nitrite		82%

The 208 staff also requested Environmental Science and Engineering, Inc. (ES&E) the Council's 208 Water Quality Consultant to review EQL's report. In response, ES&E points out that the nitrogen/phosphorus method proposed by EQL also makes gross assumptions about the Charlotte Harbor-Peace River System. These assumptions are: (1) that Horse Creek is in an undisturbed state, (2) that in an undisturbed state it is very similar to how the Peace River was in an undisturbed state and (3) that Charlotte Harbor now requires nitrogen and phosphorus levels, similar to levels that it has in an undisturbed state. Differences in flow and geomorphology between the Horse Creek and Peace River could easily make nutrient concentrations, nutrient absorption and uptake, etc. very different. The "assimilation" approach is better than the historical approach because it takes into account the ecosystem dynamics and evolution.

2. According to EPA Region IV officials, the Vertex Report in which you quote, was a draft report which has not been approved by the EPA. In fact, EPA has refuted the report due to serious question on the reports conclusions and validity.
3. It is felt that a 5% contribution of total phosphorus and 11% contribution of total nitrogen to the loadings of Charlotte Harbor by urban areas are

significant and should also be controlled. The 208 projections only cover a 20-year period, beyond that time the local contribution could become larger. Since this is a planning program, preventative programs (i.e., ordinances, BMP's) to regulate future pollution is recommended. Also, the primary goal of Public Law 92-500 is to eliminate all discharge of pollution by 1985.

4. The community development industry was not intentionally singled out to bear the brunt of the proposed regulations. This industry is one of Southwest Florida's largest and affects large tracts of land which drain into the estuaries and other water bodies. Residential land use is the largest category of urban lands. In order to regulate the contributions of this large contributor, pre-planning before development is recommended.
5. The lack of storm data in the Charlotte Harbor area is recognized. The ordinances recommended, however, were also based on 208 data collected in other parts of this region and from general reports and studies on prevention of pollution from non-point sources.
6. The recommendations for septic tank service districts is a good one which will be considered when implementing the inspection and monitoring program.
7. The 208 Water Quality Program is an on-going program which will analyze, when possible, new data and alter the Plan as necessary based upon the new information collected. It is important that your firm share the concern for "long-term and integrated planning of water resources" as your comment states. Hopefully, in the future GDC will share the responsibility for water quality study and perhaps provide the public with the data and results of your studies before the final phase of future 208 work, so that misunderstandings about study methods and data can be avoided

Response to Comments Received from
The General Development Corporation dated July 14, 1978

Basically, these comments seem to reflect the same concerns of GDC as outlined in their comment for the Charlotte Harbor portion of the 208 Plan. (See GDC comment dated June 15, 1978).

Lack of detailed data is also recognized for the Caloosahatchee River Study, however, the control recommendations were recommended using an information base greater than only the 208 sampling program. The controls recommended are general "good housekeeping" techniques that are problem prevention oriented. Due to the extent of constituent levels found in the Caloosahatchee River, controls for all land use types were recommended.

General Development Corporation



G. Patrick Settles
Corporate Counsel

June 15, 1978

Re: Draft 208 Water Quality Management Plan for Southwest Florida

Dear Mr. Chairman and Members of the Southwest Florida Regional Planning Council:

After reviewing the draft 208 Water Quality Management Plan for Southwest Florida and the Water Quality Reports upon which it is based, we wish to submit the following comments and recommendations.

Over the years, the policy of General Development has been, and still is, to support all reasonable regulations. Pursuant to this policy, we have supported the promulgation of such regulations as the Department of Environmental Regulation dredge and fill rule and the federal section 404 dredge and fill program.

However, after considering the proposed Southwest Florida 208 Plan, the data upon which it is based, the lack of scientific knowledge regarding the water quality benefits of nutrient removal, and the possible economic costs resulting from implementation of this plan, General Development must take exception to certain control techniques included within the recommended nonpoint source control program.

Since first presented with the results of the data collection and the recommended percentages of removal for Total Nitrogen and Total Phosphorus, we and others have questioned the validity of the conclusions. However, despite these concerns and questions, the draft plan still recommends the removal of 53% of the existing load of Total Nitrogen and 92% of the existing load of Total Phosphorus from Charlotte Harbor. We do not believe that such high percentages of nutrient removal are justified by the data.

As more fully explained in the Final Draft of the Supplemental Water Quality Presentation to the Charlotte Harbor 208 Advisory Committee (April, 1978), which is attached hereto and made a part of this testimony, the Environmental Quality Laboratory compared

the chlorophyll a model used by the water quality consultants to actual observed values within the Harbor and found it to be of poor predictive value. The standard error of the estimate of chlorophyll a units was found to be almost half the proposed limit. In our opinion, no single nutrient concentration is desirable for an estuary. Important seasonal factors such as light, temperature, salinity, water color, turbidity, trace metals, and various vitamins can strongly influence algal growth in estuaries. Also set forth in this report is a simple, relatively inexpensive alternative method for determining the recommended limits of parameters.

Furthermore, nutrients in rainfall measured by the United States Geological Survey in southern Florida occasionally exceed the recommended water quality standards given in Chapter 5, Page 13 (and elsewhere in the draft plan) for estuaries, and commonly exceed those suggested for freshwater. This data may be found in Waller and Earle (1975) and in Mattraw and Sherwood (1977).

However, even more fundamental than the issue of the accuracy and validity of the recommended loads of Total Nitrogen and Total Phosphorus are the benefits to be derived from removal of high percentages of these nutrients from Charlotte Harbor. We believe that there are too many uncertainties in the state of the scientific art to justify the expenditures required to remove these nutrients. Such doubts were raised by the Comptroller General of the United States in his report to Congress:

Exact scientific knowledge is lacking, however, as to the extent algae can be prevented from growing when varying combinations of the nutrients [nitrogen and phosphorus] are removed . . . While scientists know that phosphorus, nitrogen, light, temperature, and suspended solids affect the growth of algae to some degree, they cannot determine with certainty what the effect will be on preventing or reducing algae if one or more of these elements is increased or decreased. Comptroller General of the United States, Report to the Congress, Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction, at 27, 28 (December, 1976).

Hence, the Comptroller General concluded that EPA is financing some AWT facilities, for removal of nutrients and pollutants, without sufficient water quality data and planning, and that in many instances, these facilities may not be the most effective or efficient means for achieving water quality goals.

To refute this report, EPA retained its own consultant, the Vertex Corporation, which reached the same conclusion, but expressed it in more emphatic terms:

As a temporary measure, there is much to be said for doing away with all planning derived from WQS [Water Quality Standards]. EPA should consider asking Congress to strike section 303 of P.L. 92-500. The WQS we have seen are not a helpful adjunct to planning, and the wasteload allocations derived from them cannot withstand scientific scrutiny. What is to be gained by persisting in a costly, time-consuming method of planning that does not produce credible results? J. Horowitz and L. Bazel, The Vertex Corporation, An Analysis of Planning for Advanced Wastewater Treatment (AWT), at 36, 37 (July, 1977).

We feel that these similar questions raised by the Comptroller General and the EPA consultant as to the scientific uncertainties in this area add further credibility to our concerns.

However, the water quality consultants' own data indicated that approximately 85% of the Total Phosphorus in Charlotte Harbor originated upstream from the Peace River, 10% from the Myakka River, and approximately 5% from urban runoff. For Total Nitrogen, their data indicated that approximately 72% originated from the Peace River, 17% from the Myakka River, and 11% from the urban area surrounding the Harbor.

Based upon these percentages of nutrient contribution, logic would seem to dictate that the urban areas surrounding Charlotte Harbor are not the source of any imagined or real problem concerning nutrients and therefore should not be subject to an extensive regulatory scheme. However, such is not the case, as the draft plan recommends the implementation of a septic tank installation ordinance, septic tank maintenance ordinance, erosion control ordinances, stormwater control ordinances, and a ditch and canal maintenance program.

We believe that such a regulatory program to remove 5% and 11% of the Total Phosphorus and Total Nitrogen, respectively, assuming such action would be beneficial, could not be justified by any cost/benefit study, much less scientific data. This is not to say that possibly at some point in the future one of these proposed ordinances might not be needed, if there was

sound scientific data to support such a regulation. The draft plan proposes a water quality monitoring system to discern such a need, but to implement such a regulatory scheme now is scientifically unsound and economically unjustified.

We sympathize with the plight of the Southwest 208 staff in that the upstream portion of the Peace River, from which the majority of the nutrients originate, lies outside their planning boundaries. Therefore, they could not study and recommend appropriate regulatory measures for the river, and the planning agency within which it is located did not take action.

However, we do not feel that this justified the undue singling out of the community development industry to bear the brunt of these proposed regulations, many of which seem to be directed solely at our industry. If such a scheme is implemented, the cost to the private sector, and ultimately the homeowners, would be thousands of dollars, not to mention the additional time delays from overlapping agency jurisdiction. We question also whether the additional tax dollars required for administrative costs of this program can be adequately justified.

Let's look at a few specific examples of our concern. Although only one storm event was sampled at four of the monitoring stations, this apparently was the basis for an extensive stormwater control ordinance requiring applicants for building permits to submit a development drainage plan for the designated local agency's approval.

Although some aspects of the proposed erosion control ordinance are feasible and practical, other provisions, such as those regarding fees, bonding, and predevelopment procedures, are of questionable use and are costly.

With regard to the proposed septic tank ordinances, no scientific data has been submitted to indicate that septic tanks contribute nitrogen or phosphorus to Charlotte Harbor. Although a previously conducted EPA study indicated that dye placed in some Punta Gorda septic tanks was found in the adjacent canal, it failed to indicate that significant levels of phosphorus and nitrogen in the effluent were not removed by passing through the soils. Absent such data, we see no need for such ordinances.

A specific example of the added cost that would be required by implementation of such ordinance is the requirement for 20 feet of cleaned fill area around a septic tank drainfield.

Allowing for a cover on a drainfield of 24 inches below the ground, one has a depth of 36 inches at the bottom of the field. Assuming a bed requirement of 300 square feet, you would have to excavate about 33 cubic yards for the field and 355 cubic yards for the 20 foot perimeter. Using the cost of \$.60 per yard for excavation and \$1.50 for suitable material, you could have a cost of \$233 for excavation costs and \$566 for suitable material. Therefore this ordinance could add approximately \$800 to the cost of a septic tank system.

The proposed requirement that the drainfield be 36 inches above the water table elevation almost precludes the installation of any septic tanks in southern Florida. The only way of meeting this requirement would be to use elevated fields and pumping units.

We also do not believe that there is a need for a pumpout requirement for every 2-3 years. Our experience has shown that there is only an approximate accumulation of ten gallons of sludge per person per year. Similarly, our studies show that garbage grinders have little effect on sludge accumulation in tanks.

We do support the implementation of a program for septic tank inspection and monitoring. We further recommend that consideration be given to establishing septic tank service districts to properly maintain these systems.

The implementation of this proposed regulatory scheme, based upon questionable interpretation of and unwarranted extrapolation from data, will result in a significant economic cost to the private sector, and ultimately the homeowner, for fees, the use of new, costly, and unproven techniques, and continuing engineering studies followed by maintenance and monitoring costs.

Perhaps this situation is best described by the Vertex Corporations' assessment of the planning provisions of the Federal Water Pollution Control Act amendments in its recommendations to EPA:

In plain words, the Act requires the Nation to plan like mad and build like crazy. And that, we fear, is exactly what has happened. Planners and designers have tried to make the best of an impossible schedule by hastily doing what they can with inadequate data. In consequence, the

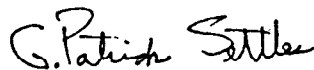
June 15, 1978

Page seven

planning documents are often less ennobled by scientific truth and engineering excellence than by practical expedience, and the planning process is degraded into a bureaucratic exercise undertaken in a race against the clock to comply with Federal requirements and to qualify for Federal subsidies. An Analysis of Planning, at 35.

For the foregoing reasons, General Development must take exception to the Charlotte Harbor Water Quality Reports and the above-mentioned regulations recommended for implementation in this area by the draft 208 Water Quality Management Plan for Southwest Florida. We intend to later supplement this response with specific comments regarding the Caloosahatchee study area. As a developer of large communities, we do share your concern for long-term and integrated planning of water resources. For this reason, we conduct geologic, hydrologic and environmental quality studies to assure the meeting of our commitments. We now, however, face considerable uncertainty due to the items discussed in this reply. We would appreciate any opportunity to discuss this document further.

Sincerely,



G. Patrick Settles
Corporate Counsel

GPS/lm

cc: Mr. Roland Eastwood, Executive Director
Southwest Florida Regional Planning Council
Mr. David Burr, 208 Project Director
Mr. Ron Blackburn, DER
Mr. Gary Exner, DER



July 14, 1978

Re: Draft 208 Water Quality Management Plan for Southwest Florida

Dear Mr. Chairman and Members of the Southwest Florida Regional Planning Council:

Per this letter, we wish to supplement our comments of June 15, 1978 and to provide specific comments upon the Caloosahatchee River portion of the draft Southwest Florida Region 208 Water Quality Management Plan.

After reviewing the proposed Caloosahatchee River Study Area, the data upon which it is based, and the possible economic costs resulting from implementation of this plan, General Development must again take exception to certain control techniques included within the recommended nonpoint source control program.

Assuming that the purpose of the 208 Water Quality Management Program is to identify "substantial water quality control problems" and to attempt to remedy these problems in a manner that is cost efficient, both in public and private funds, we feel that the proposed control alternatives for the study area fail to meet these objectives.

Based upon only two wet season storm events, the water quality report recommends the reduction of Total Nitrogen in the Caloosahatchee River by 69 percent during the wet season and 64 percent during the dry season. The recommended reductions for Total Phosphorus are 64 percent during the wet season and 44 percent during the dry season.

Notwithstanding doubts as to the validity of the chlorophyll a model, we believe that these recommended levels of reduction are too restrictive and unjustified. To give an example, based upon U.S. Geological Survey data, even rainfall in southern Florida and groundwater flowing into the Caloosahatchee River would exceed these recommended nutrient levels.

To achieve these levels of nutrient reduction, the draft 208 Plan recommends, for those urban areas along the Caloosahatchee River, an extensive regulatory scheme consisting of a septic tank installation ordinance, septic tank maintenance ordinance, erosion control ordinance, and stormwater control ordinance.

However, using the data contained in the water quality report, urban non-point sources in the entire watershed containing the City of LaBelle and Port LaBelle contributed only 3% of the Total Phosphorus load and 0.5% of the Total Nitrogen load arriving at the Franklin Locks. These amounts are not anticipated to change in future projections.

Therefore, based upon these percentages of nutrient contribution, we do not believe that such a regulatory program to remove only 3% and 0.5% of the Total Phosphorus and Total Nitrogen, respectively, can justify the required expenditure of public or private funds necessary for implementation. As we stated in our prior letter, this is not to say that at some point in the future one of these proposed ordinances might not be needed, if water quality monitoring revealed such a need.

As these recommended control alternatives are the same as those proposed for the Charlotte Harbor Study Area, we wish to incorporate here specific comments made in our June 15, 1978 letter, copy attached, as to these particular ordinances. Again, to reiterate what was stated in that letter, the implementation of this proposed regulatory scheme, based upon questionable interpretation of and unwarranted extrapolation from data, will result in a significant economic cost to the private sector, and ultimately the homeowner, for fees, the use of new, costly, and unproven techniques, and continuing engineering studies followed by maintenance and monitoring costs.

For the above-stated reasons, General Development must take exception to those regulations recommended for implementation by the Caloosahatchee River portion of the Southwest Florida 208 Water Quality Management Program.

Sincerely,



G. Patrick Settles
Corporate Counsel

GPS/lm

Attachment

cc: Mr. Roland Eastwood, Executive Director
Southwest Florida Regional Planning Council
Mr. David Burr, 208 Project Director
Mr. Ron Blackburn, DER
Mr. Gary Exner, DER

Response to South Florida Water Management District
Letter dated May 23, 1978

1. It is hoped that additional data collected by your agency can be used during the 208 continuing planning process.
2. The recommended nitrogen and phosphorus levels used by the SWFRPC 208 Program are preliminary in nature and, as indicated in Chapter 5, are suggested interim levels. The need for further study concerning these levels is essential and is recommended.

Response to South Florida Water Management District
Letter dated May 25, 1978

Caloosahatchee River

1. The SWFRPC staff agrees that the Chlorophyll a nutrient relationship technique used to recommend nitrogen and phosphorus levels is preliminary as explained in Chapter 6 of the Plan. Further study as to validity of the technique is recommended.
2. Due to this comment and other comments received concerning the Lake Hicpochee Wetland Area, the plan has been amended. The Lake Hicpochee Wetland Retention Area is now only recommended for consideration and its feasibility should be further studied in the continuing planning process before implementation.

Big Cypress Study Area

1. The SWFRPC staff agrees with this comment.



South Florida Water Management District

POST OFFICE BOX V, WEST PALM BEACH, FLORIDA, 33402

TELEPHONE 305-686-8800

IN REPLY REFER TO: 6-106

July 6, 1978

Mr. Roland Eastwood
Executive Director
Southwest Florida Regional Planning Council
2121 First Street
Fort Myers, FL 33901

RE: SWFRPC 208 Plan

Dear Roland:

It is our understanding that the record of the public hearing held on June 15, 1978, dealing with the above subject will be held open for 30 days for additional written comments.

As you know, there has been considerable correspondence and discussion between the District and SWFRPC regarding this matter, the latest of which was two letters dated May 23 and May 25. The District's concerns are summarized in those letters, and it is requested that they be included in the record of the hearing as the District's comments regarding the SWFRPC 208 Plan. Where appropriate, responses to the comments would be appreciated.

Very truly yours,

John R. Maloy
JOHN R. MALOY
Executive Director

JRM:JRG:nj1

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PLANNING COUNCIL

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St. Cloud

John L. Hundley
Pahokee



South Florida Water Management District

JOHN R. MALOY, Executive Director

POST OFFICE BOX V, WEST PALM BEACH, FLORIDA, 33402

TELEPHONE 305-686-8800

IN REPLY REFER TO:

6-C43
x6-106L

May 23, 1978

Mr. Roland Eastwood
Executive Director
Southwest Florida Regional
Planning Council
2121 West First Street
Fort Myers, Florida 33901

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MAY 25 1978

**S.W. FLORIDA REGIONAL
PLANNING COUNCIL**

Dear Roland:

In reviewing the Draft 208 Water Quality Management Plan for Southwest Florida dated April 1978, we have also studied the Environmental Science and Engineering, Inc. (ES&E) responses to our comments on the "Final Water Quality Report for the Caloosahatchee River Study area" as attached to your letter of March 14, 1978.

Although we were pleased to note that several changes in wording and additional references were made to the Caloosahatchee River Report, it is unfortunate that time and financial constraints apparently prevented your consultants from meeting with our staff to discuss some of the basic concerns we had about the report since the responses made by ES&E and the actual changes in the report do not completely address our concerns.

In brief, our major area of concern is the interpretation of the nature and significance of the effects of the S-77 (Moore Haven Locks) discharges on the River. Part of this problem is due to the relative lack of available information and in this regard our recently initiated studies of the River should provide additional insight into this question.

A second concern of our staff is the limited documentation of the basis for the recommended nitrogen and phosphorus criteria proposed for the River. There is the implication in the Reports that these criteria were developed by rigorous scientific methods and have been adopted by the DER. Conversely the reports

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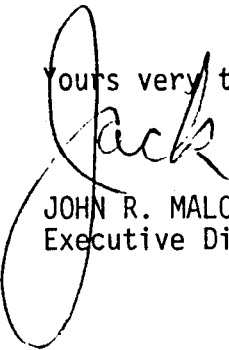
Formerly Central and Southern Florida Flood Control District

Mr. Roland Eastwood
May 23, 1978
Page 2

" also point out that these are only working criteria and considerable additional work needs to be performed prior to an actual commitment to meet these specific numbers. It is hoped that your recommendations will stress the preliminary and uncertain nature of the numbers as currently mentioned in the reports.

Additional comments on the entire Draft 208 Water Quality Management Plan will be forwarded in the near future. Again, our staff is always available to help you in your efforts to meet the difficult responsibilities of the 208 Water Quality Program.

Yours very truly,

A handwritten signature in cursive script that reads "Jack". The signature is written in dark ink and is positioned above the typed name and title.

JOHN R. MALOY
Executive Director

JRM/fdj



JOHN R. MALOY, Executive Director

South Florida Water Management District

POST OFFICE BOX V, WEST PALM BEACH, FLORIDA, 33402

TELEPHONE 305-686-8800

IN REPLY REFER TO: 7-WMD-51

May 25, 1978

Mr. David Burr
208 Project Director
Southwest Fla. Regional Planning Council
2121 West First Street
Fort Myers, FL 33901

RE: Draft 208 Water Quality Management Plan

Dear David:

The District staff has reviewed the above partial draft plan. Comments on chapters 5, 6, 10 and 11 are attached.

An additional concern, which has been raised previously, deals with recommended management agencies. Chapter 15 primarily describes county and municipal agencies and deals primarily in generalities. At some point it will be necessary that the management agency question be further refined. In addition, it appears that very little attention has been given to the viability and effectiveness of existing non-point source regulatory programs of the various agencies, including this District.

The District staff is available to discuss any of the questions raised in this letter and the attachment, if you feel such discussions would be productive. If there are questions, feel free to contact this office.

RECEIVED
MAY 29 1978

S.W. FLORIDA REGIONAL
PLANNING COUNCIL

Very truly yours,

J. Richard Gregg

J. RICHARD GREGG, P.E.
Water Quality Coordinator
Technical Review Division
Resource Control Department

JRG:nj1

Robert L. Clark, Jr.
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COMMENTS ON DRAFT OF 208 WATER QUALITY MANAGEMENT
PLAN FOR SOUTHWEST FLORIDA BY THE SFRPC

This review is for those sections of Chapters 5, 6, 10 and 11 pertaining to the Caloosahatchee River and Big Cypress Study Area only.

Caloosahatchee River Study Area

The assessment of water quality characteristics is based on extremely limited data and, therefore conclusions and recommendations resulting from these data must reflect the nature of the assessment.

Of particular concern are the computations of tributary loadings calculated using estimated flow rates and a diversity of quality data assessed from a variety of sources. These loadings are subsequently evaluated using recommended criteria for maximum total nitrogen and phosphorus concentration within the River which are based on very preliminary work apparently performed in the St. John's River. These criteria are based on a rather simplistic relationship between chlorophyll a concentration as a dependent variable and nitrogen and phosphorus as independent variables. Considerable additional study as to the validity of this relationship and the appropriateness of using it in the Caloosahatchee should be undertaken prior to using these criteria for any substantial long range planning.

As an example of the potential difficulty in using the recommended criteria is the realization that the total nitrogen value of 0.6 mg/l is less than the majority of the published concentrations of total nitrogen in bulk precipitation in South Florida.

The recommendation for a wetlands retention demonstration project within Lake Hicpochee should be subjected to additional evaluation. The ability of wetlands to permanently assimilate nutrients is predicated on the feasibility of managing retention wetlands to maximize gross biomass production and minimize in situ die off and decay of the vegetative communities. The techniques of managing wetlands to accomplish high net assimilation have not been thoroughly investigated, and the cost of such management could be substantial.

A noteworthy item in the preliminary budget for the Lake Hicpochee demonstration project is \$100,000.00 for "revegetation" of the wetland. This indicates that the area proposed for the wetlands retention is not currently suitable for nutrient assimilation. The procedures for restoring wetlands are by no means standard and the entire concept must be considered experimental and subject to failure.

Big Cypress Study Area

The principal recommendation of additional study in the Big Cypress area is thoroughly endorsed.

Main emphasis should be placed on protection and maintenance of the viable estuaries in this area. Since this area is relatively undeveloped it would be appropriate to recommend careful land use planning and controls to prevent excessive shoreline development and major alterations within the watersheds of these estuaries.

Response to Comments Received from
Mr. James R. E. Smith
Dr. Thomas H. Frasier
Mr. Richard W. Cantrell

Due to the complex nature of the comments received by J. R. E. Smith, T. H. Frasier and R. W. Cantrell, the staff offers the following clarifications.

Role of the ad hoc Technical Panel

Controversy over the Charlotte Harbor Water Quality Report has occurred over the past several months primarily based on comments from Messrs. Smith, Frasier and Cantrell. At a technical advisory committee for Charlotte Harbor held on May 19, 1978, several members of the committee informally asked Messrs. Smith, Frasier and Cantrell along with Mr. Rick Drummond of the Sarasota County Planning Department to review the water quality report conclusions that were drafted into the 208 Plan. The purpose was to provide a special sub-panel to the committee with comments and recommendations on the 208 Draft Plan. The sub-panel was to then make recommendations to the full committee based on these comments and responses by 208 staff and consultants.

The following members made up this sub-panel:

Mr. Dave Shaner - Chairman, 208 Advisory Committee

Mr. Terry Hixon - Planning Director, Charlotte County-Punta Gorda
Planning Department

Mr. Joe Roach - Member, 20 Advisory Committee

Dr. James Anderson - Member, 208 Advisory Committee

On June 6, 1978 the ad hoc Technical Committee met with the 208 staff and consultants and officials from the Florida Department of Environmental Regulation to discuss the reports. No action was to be taken at this time.

On June 22, 1978 the ad hoc Technical Committee met with the sub-panel members to discuss preliminary comments. The ad hoc committee then proposed to write detailed comments for final submission to the sub-panel so that some official action could take place before July 15, 1978, the deadline for comments on the 208 Draft Plan. The submission to the sub-panel did not take place as planned; however, their comments were forwarded directly to the Council as comments on the 208 Draft Plan. These comments do not have the endorsement of the sub-panel or the full 208 Advisory Committee.

Mr. Richard Cantrell has also signed his name as a District Biologist for the Department of Environmental Regulation. However, the Department of Environmental Regulation (FDER), Tallahassee Office has informed the staff that Mr. Richard Cantrell's comments do not reflect those of FDER and should not be considered as official comment. (See attached letter).

Because of the above, comments from Messrs. Smith, Frasier and Cantrell will be reviewed as comments from citizens.

208 Staff Responses to the Comments

The 208 staff requested Environmental Science and Engineering, Inc., the Council's Water Quality Consultant to respond to the comments of Messrs. Smith, Frasier and Cantrell due to the technical nature of the comment and the extent of criticism on the water quality reports. (See attached response for the Consultant, ES&E).

After review of the comments and consultants' response, it appears that there is a basic conflict between professionals on scientific approach to water quality and ecosystem study. Both the critics and the consultants present their arguments well; however (even though there is disagreement), conclusions can be drawn from all this study that are useful to the 208 Planning Process. The staff feels that the following conclusions can be drawn:

1. Both the critics and the consultants present methods and data that show that approximately 85% of the total phosphorus loads to Charlotte Harbor are from the Peace River.
2. Both provide methods and data for the recommendation of reductions of phosphate and nitrogen constituents to Charlotte Harbor.
3. Both critics and consultants admit that although large amount of data exist for the harbor, future study is still needed in order to fully understand the complex nature of this and other estuaries.

Basically, these were the conclusions that were used for the design of the pollution control alternatives recommended in the Draft 208 Plan. The programs offered are not extensive "clean up" programs, rather they are problem prevention and planning oriented. The Plan recommends the use of Best Management Practices and ordinances that primarily tend to prevent pollution by new sources. The Plan also recommends that future studies continue to further expand knowledge of Charlotte Harbor.

The staff feels that Environmental Science and Engineering, Inc., has adequately responded to the many criticisms of Messrs. Smith, Frasier and Cantrell. The staff, however, will respond to the summary recommendations of the comments.

- I. This recommendation seems to overlook the primary goal of the 1972 Federal Water Pollution Control Act Amendment, "the discharge of pollutants into navigable waters be eliminated by 1985."

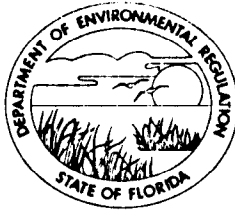
As stated above, the Plan only recommends programs that are problem prevention and planning program oriented.

- II. The standards recommended in the 208 Plan are suggested to be "interim" until further study is done. It is admitted that a different type of standard (i.e., range of values) may be more appropriate, however, a substitute is not recommended by the submitted comment. The standards

recommended will at least provide a starting point for future study.

- III. The staff feels that the consultant has adequately defended the ecosystem technology used in the 208 Plan and has shown it to be a valuable tool. The staff has, however, amended the draft to qualify the results of the technique. Results should be considered preliminary due to assumptions made where data was lacking.
- IV. This comment describes the role of the existing 208 Technical Advisory Committee. It is planned that this committee continue to exist during future phases of the 208 ongoing program. A technical workshop, however, would be valuable before any future study is carried out for the harbor.
- V. The staff agrees with this comment and has recommended this type of study during the continuing planning process.
- VI. This recommendation is unclear. The control alternatives proposed are not site specific but are primarily "common sense" type controls of which cost is difficult to estimate. Appendix 20-1 presents some general cost estimates. Other study has shown that controls of the type recommended are effective controls.

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REUBIN O'D. ASKEW
GOVERNOR

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STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

August 2, 1978

Mr. David Burr
208 Project Director
Southwest Florida Regional
Planning Council
2121 West First St.
Ft. Myers, FL 33902

Dear David:

I would like to clarify a point of potential misunderstanding in regard to comments submitted to your office by a sub-panel of the Charlotte Harbor 208 Citizens Technical Advisory Committee.

In reviewing the July 14, 1978 comments it appears that one of the sub-panel members, Richard Cantrell, signed using his title as District Biologist, South Florida District DER. Mr. Cantrell indicates to me that his participation in the report was as a citizen member of the sub-panel and as such the report does not necessarily represent the position of the DER.

Therefore the July 14, 1978 report by the Charlotte Harbor TAC sub-panel is not to be considered as DER comments.

If you have any further questions please feel free to contact me.

Sincerely,

Robert H. Dunn
208 Agency Coordinator

RHD/saf

Response to: J. R. E. Smith, T. H. Fraser, and R. W. Cnatrell, 1978.
Comments Concerning the Charlotte Harbor Basin Portions
of the Draft 208 Water Quality Management Plan for South-
west Florida. A report submitted to the special sub-panel
of the Charlotte Harbor Basin 208 Citizens Technical Advisory
Committee by the ad hoc Technical Panel.

Prepared: July 27, 1978

By: Environmental Science and Engineering, Inc.

PART I - Response to Summary Recommendations

Recommendation I. The fact that the 208 program planning process is a continuous one inherently makes it problem prevention and planning rather than clean-up. Reduction of nitrogen and phosphorus was only one area out of the entire scope of environmental and water quality parameters sampled that were suggested for clean-up, the bulk of the BMP's, continued monitoring, etc. are all aimed toward prevention and planning. Reduction of nitrogen and phosphorus was not the only conclusion.

Recommendation II. Techniques proposed by EQL for setting interim standards are wrought with gross assumptions. No data was given to equate historical nature of Horse Creek and Peace River. Values for TN and TP obtained by the EQL method are basically the same as for those in the 208 plan when the hypothetical nature of their approach and its simple application is considered.

Recommendation III. The recommendation should correctly read, "the Caloosahatchee River Chlorophyll a Model." It is possible that a limited, but acceptable model similar to the J. Hand, Caloosahatchee Regression Model could be developed for Charlotte Harbor.

In response to the comment that the ecosystem model be stricken because ecosystem technology is highly theoretical and not applicable, the following list of references which show the use and application of systems models is submitted. All of these documents have examples of systems models and application of these models as necessary tools for understanding complex ecosystems:

Boynton, W. R., 1975. Energy Basis of a Coastal Region: Franklin County and Appalachicola Bay, Florida. Ph.D. Dissertation, University of Florida, Gainesville.

Carter, M. R., L. A. Burns, T. R. Covinder, et al., 1973. Ecosystems Analysis of the Big Cypress Swamp and Estuaries. U.S. E.P.A., Atlanta, Georgia, EPA 904/9-74-002.

- *Hall, A.S., and J.W. Day, Jr., 1977. Ecosystem Modeling in Theory and Practice, An Introduction with Case Histories. Wiley-Interscience, New York.
- Lehman, M.E., 1974. Oyster Reefs at Crystal River, Florida and their Adaptation to Thermal Plumes. M.S. Thesis, University of Florida, Gainesville.
- Odum, H.T., A.F. Chestnut, and E.J. Kuenzler, 1970. Studies of Marine Estuarine Ecosystems Developing with Treated Sewage Wastes. Ann. Rep. to NSF and Sea Grant Inst. Marine Science, University of North Carolina, Chapel Hill.
- Odum, H.T., W.M. Kemp, M. Sell, W. Boynton, and M. Lehman, 1977. Energy Analysis and the Coupling of Man and Estuaries. In Environmental Management, Vol. 1, No. 4, Springer-Verlag.
- Odum, W.E., 1970. Pathways of Energy Flow in a South Florida Estuary. Ph.D. Dissertation, University of Miami, Miami, Florida.
- O'Neill, R.V., R.A. Goldstein, H.H. Shugart, and J.B. Maukin, 1972. Terrestrial Ecosystem Energy Model. Eastern deciduous forest biome memo. Rep. 72-19, Oak Ridge National Laboratory, Tennessee.
- *Patten, B.C., 1971, 1972, 1975. Systems Analysis and Simulation in Ecology, Vol. 1, 2, and 3. Academic Press, New York.
- *Odum, H.T., 1972. Use of Energy Diagrams for Environmental Impact Statements. In Marine Technology Society. Tools for Coastal Management. Proc. of the Conf., Washington, D.C.
- *Odum, H.T., 1972. An Energy Circuit Language for Ecological and Social Systems: Its physical basis. In B.C. Patton, editor. System Analysis and Simulation in Ecology. Academic Press, New York.
- Odum, H.T., 1973. Energy, Ecology and Economics. Ambio. 2:220-227.
- Odum, H.T., 1974. Energy Cost-benefit Models for Evaluating Thermal Plumes. In J.W. Gibbons and R.R. Sharize, editors, Thermal Ecology, AEC Sym. Ser. CONF 730505, NTIS, Springfield, Virginia.
- *Odum, H.T., 1976. Systems Ecology. A textbook Introduction to Environmental Systems and General Systems Theory. John Wiley and Sons, New York, (in press).

- Odum, H.T. and K.C. Ewel, ed., 1974. Cypress Wetlands for Water Management, Recycling and Conservation. Ann. Rep. to NSF and Rockefeller Foundation Center for Wetlands, University of Florida, Gainesville.
- Odum, H.T. and S.E. Bayley, ed., 1976. Energy Analysis of Dredge and Fill Operations in Florida. Preliminary Report to FDER. Center for Wetlands, University of Florida, Gainesville.
- Kelly, R.A. 1976. The Delaware Estuary. In. C.S. Russel, editor, Ecological Modeling in a Resource Management Framework. John Hopkins University Press, Baltimore.
- Kylstra, C.D., 1974. Energy Analysis as a Common Basis for Optimally Combining Man's Activities and Nature. Pres. Nat. Symp. on Corp. Social Policy, Chicago, Illinois.
- Lugo, A.E. and S.C. Snedaker, 1974. The Ecology of Mangroves. Ann Rev-Ecol. Systems 5:39-64.
- Mitsch, W. J., 1975. Systems Analysis of Nutrient Disposal in Cypress Wetlands and Lake Ecosystems in Florida. Ph.D. Dissertation, University of Florida, Gainesville.
- Nixon, S.W., C.A. Oviatt, C. Rodgers, and K. Taylor, 1971. Mass and Metabolism of a Mussel Bed. Oecologia 8:21-30.
- Odum, H.T. 1967. Biological Circuits and the Marine Systems of Texas., In T.A. Olson and F.J. Burgess, editors, Pollution and Marine Ecology, Wiley-Interscience, New York.
- *Odum, H.T., 1970. Energy Values of Water Resources. Proc.19th Southeastern Water Res. Poll. Cont. Conf.
- Chem, C.W. and G.T. Orlob., 1975. Ecological Simulation for Aquatic Environments. In B.C. Pattern (editor). Systems Analysis and Simulation in Ecology, Vol. 3, Academic Press.
- *Cooper, C.F., 1969. Ecosystem Models in Watershed Management. In G.M. VanDyne (editor). The ecosystem concept in Natural Resource Management. Academic Press, New York.
- *Day, J.W., W.G. Smith, P.R. Wagner, and W.C. Stowe, 1973. Community Structure and Carbon Budget of a Salt Marsh and Shallow Bay estuarine System in Louisiana. Publ. No. LSU-SG-72-04. Louisiana State University, Baton Rouge.
- Gilliland, M.W., 1973. Man's Impact on the Phosphorus Cycle in Florida. Ph.D. Dissertation, University of Florida, Gainesville.

- Homer, M., 1976. Seasonal Abundance, Biomass, Diversity, and Trophic Structure of Fish in a Salt Marsh Tidal Creek Affected by a Coastal Power Plant. In G.W. Esch and R.W. McFarlane, editors, Thermal Ecology II. Symp. Ser. VONF-750425, NTIS.
- Snedaker, S.C. and A.E. Lugo, 1972. The Role of Mangrove Ecosystems in the Maintenance of Environmental Quality and a High Productivity of Desirable Fisheries. Ann. Report to Bur. Sport Fish. and Wildlife, No. 14-16-008-606. Center for Aquatic Science, University of Florida, Gainesville.
- Kemp, W.M., 1977. Energy Analysis and Ecological Evaluation of a Coastal Power Plant. Ph.D. Dissertation, University of Florida, Gainesville.
- Antonini, G.A., K.C. Ewel, and J.J. Ewel, 1974. Ecological Modeling of a Tropical Watershed: A Guide to Regional Planning. In B. Hoyle, editor, Spatial Aspects of Development. John Wiley and Sons, London.
- Bayley, S.E., H.T. Odum, and W.M. Kemp, 1976. Energy Evaluation and Management Alternatives for Florida's East Coast. Proc. N. Amer. Wildlife Conf. 43:80-96.
- Bayley, S., J. Zuchetto, L. Shapiro, D. Man, and J. Nessel. 1976. Energetics and System Modeling: A Framework Study for Energy Evaluation of Alternative Transportation Modes. Report to U.S. Army Corps of Engineers, Department of Environmental Engineering Science, University of Florida, Gainesville.
- McKellar, H.N., 1975. Metabolism and Models of Estuarine Bay Ecosystems Affected by a Coastal Power Plant. Ph.D. Dissertation, University of Florida, Gainesville.
- Odum, H.T., 1971. Environment, Power and Society. Wiley-Interscience, New York.
- Odum, H.T. and E.C., 1976. Energy Basis for Man and Nature. McGraw-Hill, New York.
- Odum, H.T., C. Littlejohn, and W.C. Huber, 1972. An Environmental Evaluation of the Gordon River Area of Naples, Florida, and the Impact of Developmental Areas. Department of Environmental Engineering Science, University of Florida, Gainesville.
- Smith, W.H.B., 1976. Productivity Measurements and Simulation Models of a Shallow Estuarine Ecosystem Receiving a Thermal Plume at Crystal River, Florida. Ph.D. Dissertation, University of Florida, Gainesville.

Smith W.H.B., H. McKellar, D.L. Young, and M.E. Lehman, 1974. Total Metabolism of Thermally Affected Coastal Systems on the West Coast of Florida. In Thermal Ecology, J.W. Gibbons and R.R. Sharitz, editors. NTIS, U.S. A.E.L., CONF-730505.

*Jansson, B.-O. 1976. Modeling of Baltic Ecosystems. Ambio Spec. Rep. No. 4.

Henderson, G.S., 1974. An Ecosystem Approach to Characterization of the Nitrogen Cycle in a Deciduous Forest Watershed. In Proc. 4th North American Forest Soils Conference, Quebec.

*Kelly, R.A., 1976. Conceptual Ecological Model of the Delaware Estuary. In B.C. Patten, editor. Systems Analysis and Simulation in Ecology, Vol. IV, Academic, New York.

*Cher, C.W., 1970. Concepts and Utilities of Ecologic Modeling. J. Sanitation Engineering Division, ASCE 96 (SA5)

O'Brien, J.J. and J.S. Wroldewski, 1972. A Ecological Model of the Lower Manne Trophic Levels on the Continental Shelf of West Florida. Tech. Rep. Geophysical Fluid Dynamics Inst. Florida State University.

*Russell, C.S., editor, 1976. Ecological Modeling in a Resource Management Framework. John Hopkins University Press, Baltimore.

*Wiegert, R.G., 1975. Simulation Models of Ecosystems. Ann. Rev. Ecol. System 6:311-338.

*Simon, H.A. 1973. The Organization of Complex Systems. In H.H. Pattee (editor) Hierarchy Theory: The Challenge of Complex Systems. Brazillier, New York.

*Shultz, A. 1967. The Ecosystem as a Conceptual Tool in Resource Management. In S.V. Cieriacy-Wantrop, editor, Resource Economics, University of California, Press, Berkeley.

Overton, W.S. 1972. Toward a General Model Structure of a Forest Ecosystem. In J.F. Franklin, L.J. Dempster, and R.H. Warig, editors, Proc: Res. on Coniferous Forest Ecosystems, a Symposium.

Jansson, A.M., 1974. Community Structure, Modeling and Simulation of the Cladophora Ecosystem in the Baltic Sea Contr. Askö Lab., University Stockholm, Sweden, No. 5.

Jansson, B.-O., 1972. Ecosystem Approach to the Baltic Problem. NFR Bulletin No. 6.

It is suggested that the critics of the ecosystem models educate themselves in the theory, application, scope and state-of-the-art of ecosystem modeling by at least reading those references noted with an asterisk. The ecosystem modeling is very applicable to 208 planning and is not just theoretical, but has developed far beyond their conjectured statement of "highly theoretical technology." It is certainly developed beyond the critics hypothetical "functional hypothesis" of Charlotte Harbor described on pages 7-11. Ecosystem models, conceptual, evaluated, or simulated, are useful tools and are being applied in a variety of ways as such. The partial list of references enclosed is offered as beginners list for those interested.

Recommendation IV: This is basically a redundant recommendation. The Charlotte 208 Advisory Committee was created at the start-up of 208 just for this purpose.

Recommendation V: This is agreed.

Recommendation VI: This recommendation is unclear and possibly grossly oversimplified. Substantial concentrations of data of many types are included in the 208 draft plan, all of which is applicable to the continuing planning process, and which contributes at various levels to cost-effective implementation of control alternatives. Many of the control alternatives proposed have been found to be cost effective, not based on data, but based on experience. Many control strategies proposed are operative other places, or in part, already in the county. The fact that they are on-going over the long term is evidence of their cost-effectiveness.

PART II - PAGE BY PAGE RESPONSE - INTRODUCTION

Page 3, second paragraph. First sentence needs to be qualified. Apparently, the authors are offering the functional hypothesis as a substitute for the ecosystem model in the 208 plan. Or at the least, their functional hypothesis is their verbal "model" of Charlotte Harbor.

Page 3, third paragraph, line 8. Data is necessary to make factual observation. Non-point sources may be related to quantity of water flow, but two rivers of different flow could contribute equal amounts of a constituent, and only data will tell you this.

Characteristics of Charlotte Harbor

Page 4 - The significance of the discussion here is unclear.

Page 6 - again significance is unclear, comments relative to 208 document appear arbitrary and capricious, particularly in the absence of hydrodynamic substantiation.

Pages 7-11 represent Smith, Fraser, and Cantrell verbal "model" of Charlotte Harbor.

Page 7, first paragraph - SWFWMD Report (1978) is not given in reference list. Other studies by EQL (?) not referenced - other studies by

DER (?) again, not referenced. The entire paragraph is an uncited (unsubstantiated) justification of the proceeding functional hypothesis. Does this mean the functional hypothesis is based on unpublished, and therefore, unrefereed literature?

Page 7, second paragraph - first sentence based on unreferenced relationship of river flow, nutrients, rainfall, and "colorants."

Page 7, second paragraph - third sentence - No citation for statement that stratification restricts dispersion of nutrients and colorants. No citation or documentation of "high" photosynthetic primary production by Phytoplankton--high compared to what?

Page 7, second paragraph, fourth sentence. EQL data file? Unpublished, therefore, unrefereed data - not accessible by 208 team. C₁₄ technique has many inherent problems due to nutrient uptake and recycle rates by phytoplankton, data can be extremely difficult to interpret.

Page 7 - Remainder of page is hypothetical or refers to unpublished data (EQL data file).

Page 8, first paragraph. Undocumented statement.

Page 8, second paragraph. First sentence, data source?

Page 8, second paragraph. The Cantrell, et al. 1976 report, has been reviewed and it is an unrefereed FDER Interdepartment Report. No sampling was indicated south of Mangrove Point. All stations appear to be within the confluence of the Peace and Myakka Rivers which makes it questionable for extrapolation over the remaining 90 percent of the harbor not sampled.

Page 8, paragraph 2. Remaining sentences on these pages are couched as a hypothesis, or "apparently" that way. Again, unsupported statements.

Page 9, paragraph 1. No citation.

Page 9, paragraph 2. Without reference or data citation, the functional hypothesis or verbal model by Smith, Fraser & Cantrell is reduced to one major forcing function - high flows as a controlling factor (forcing function) in primary and secondary production. They have challenged the 208 ecosystem model as a simplification, however, this is an even greater simplification.

Page 9, paragraph 3. Last sentence is an unsupported statement.

Page 9, paragraph 4. Loads are concentrations times flow. It is just another way to represent a quantity.

Page 9, paragraph 4, line 5-8. Unsupported statements, no data offered, no citation given.

Page 10, line 1. The usefulness of data and how it is presented is relative to the familiarity of the user, and the use for which it is intended. Concentration is another word for "flow-weighted" load.

$$\text{Conc (mg/l)} \times \text{flow (liters/sec)} = \text{load mg/sec}$$

$$\text{Conc (lbs/cubic fee)} \times \text{flow (cubic ft/day)} = \text{load lbs/day}$$

Page 10, paragraph 2. Line 5, Cantrell Study is of questionable applicability to entire harbor. The reference to EQL hydrobiological program (1978) is not given in reference list. Is it published data?

Comments on the Methods Considered by 208 for the Determination of Desired Water Quality

Page 11, paragraph 1. Many other parameters were measured and examined. Nitrogen and phosphorus were emphasized because they were believe to be most important at the time. Implication is that the study overlooked many significant environmental parameters. The 208 study is certainly not complete, however, it is one of the most comprehensive short-term studies ever done on Charlotte Harbor.

Page 11, paragraph 2. The limitations of the chlorophyll regression equation were known before EQL reviewed it. Whether or not it is applicable can only be determined by development of an equation from Charlotte Harbor data. This was a poor application of the equation. The one used was extrapolated from the Caloosahatchee River. A regression equation or any single relationship equation would be seriously limited in its ability to predict as a result of simplifying countless relationships into one equation.

The points made about rainfall and Gulf water concentrations of TN and TP are good ones. However, concentration is only part of the story. If these direct inputs (exclusive of surface runoff where nutrient uptake and absorption may occur through overland flow) are lesser portions of the total quantity of water exchanging in the harbor, then it is their load (concentration times water quantity) that is important. An example for Charlotte Harbor may be:

$$\text{Concentration} \times \text{Flow (volume/time)} = \text{Load (amount/time)}$$

$$\text{Rainfall (mg TP/l)} \times \text{l/day} = \text{mg TP/day}$$

$$\text{Surface Runoff (mg TP/l)} \times \text{(l/day)} = \text{mg TP/day}$$

$$\text{Subsurface Input (mg TP/l)} \times \text{(l/day)} = \text{mg TP/day}$$

$$\text{Tidal Input (mg TP/l)} \times \text{(l/day)} = \text{mg TP/day}$$

$$\text{Exchange due to currents (mg TP/l)} \times \text{(l/day)} = \text{mg TP/day}$$

Total input load = (mg TP/day) into harbor (with volume of $143 \times 10^6 \text{ m}^3$ per avg. day) gives concentration of TP in Harbor (load \div volume/day).

Page 11, paragraph 3. It is assumed that the technique referred to as the EQL/DER Technique is use of Horse Creek as a background for determination of TN and TP concentrations submitted by EQL in May, 1978. This technique has about the same scientific basis for application in this manner as does the nutrient-chlorophyll regression equation. Two gross assumptions here are (1) that Horse Creek is in an undisturbed state, and (2) that in an undisturbed state it is very similar to how the Peace River was in an undisturbed state. The second assumption is perhaps the most difficult to deal with. Differences in flow and geomorphology of the basins could easily make nutrient concentrations, nutrient absorption, and uptake, etc. very different. The "assimilation" approach is better than the "historical" approach because it takes into account the ecosystem dynamics and evolution. However, it would be a toss up as to whether the ESE or EQL/DER approach is more workable at the present level of knowledge (data) that exists for Charlotte Harbor.

Page 12, paragraph 3. The comments about the ecosystem model here are hardly enlightening. A model of anything in nature tends to be a simplification however, a model's usefulness is that it does organize and simplify so that complex ecosystems can be dealt with in a consistent and quantitative manner. The "functional hypothesis" on pages 7-11 of the submitted comment is a verbal model of Charlotte Harbor and tends to be a further simplification. Application of a model of greater complexity is certainly possible, many highly complex estuarine models exist, however, putting a complex model into a layman's 208 document does not serve as an instructional tool and tends to be ignored rather than utilized.

Page 12, paragraph 4. Models are developed for many reasons, not just prediction. The true test of a model's validity is, does it serve the purpose intended, and are the results justifiable. Conceptual models are developed for that purpose only, to get a complex concept or set of concepts across to an investigator, group of students, laypersons, etc. The Charlotte Harbor model is for the most part a conceptual model. As a conceptual model it serves the purposes intended very well; to give a glimpse of ecosystem complexity to the layman, to begin aggregation and summarization of important state variables, forcing functions and pathways (no previous attempts have been made for Charlotte Harbor), and to give a basis for initiation and generation of scientific discussion which is a necessary part of the 208 continuous planning process.

All modeling exercises begin with conceptualizing a model. As stated previously, sometimes this is sufficient and no further use of the model is made. In the 208 study, however, an evaluated model was desired to summarize quantitative literature existing for the Charlotte Harbor area. All too often qualitative speculation of cause-effect relationships are offered by scientists and laymen alike on how they think something operates. Usually these verbal hypotheses are based on a few observations of one or two variables in the ecosystem (most often the variables observed are those within the viewer's area of interest or expertise; i.e., chemists believe chemical relationships most important, ichthyologists think fish play premier roles, etc.). An evaluated model serves as a basis for comparison of quantitative values in constant units so that the actual magnitudes of the numbers reveal the role of

an ecosystem component rather than personal opinion. Evaluated models are not predictive, they are comparative and are often used for static input-output calculations. The validity of an evaluated model is determined by the extent to which the data used in the evaluation is applicable to the model (thus, the area for which the model is being applied), and the extent to which the model (through the process of evaluation) reveals where the data is weak (must be drawn in from literature or outside sources. As part of the continuous planning process, the first-generation evaluated model shows areas of weakness and strength in the data base; relative magnitudes given some indication of which components or processes appear to be most important, so further field study and evaluation has a basis of priority.

Once a conceptual model has been evaluated and the data base is deemed adequate, then a model is simulated. A model is usually not simulated until third or fourth generation of conceptualizing and evaluation because simulation (simultaneous solution of several second order differential equations in the case of the Charlotte Harbor model) will aggregate errors in data base and can lead to misinterpretation of the simulated models capability. Oftentimes a first-generation model such as the Charlotte Harbor one will be simulated as an end result of the quantification (evaluation) process. Simulation at this stage is not for prediction, but to test model stability: a major text of the calculations in the evaluative process is this simulation. If the model does not falter (i.e., state variables are stable over time), it is a good indication that the equations are operative (no mathematical principles violated) and that the numbers used are at least order-of-magnitude. The Charlotte Harbor model was not simulated for predictive purposes because it was first-generation, it was, however, simulated for stability and numerical testing. It was very stable during this first run.

In summary, models are used at many levels. The model building process is a time consuming one at best. The purpose of any model is to satisfy the use for which it was intended; conceptual models, evaluated models, and simulated models can be end results in themselves, or necessary steps in an aggregation toward predictive capability. It is not possible to eliminate or skip a step to reach a higher level of information. The purpose of the 208 ecosystem model was to conceptualize and do a first-round evaluation as a basis for assessing state of knowledge of Charlotte Harbor and for prioritizing future field investigations as part of the continuous planning process. The model was simulated for stability as a test of the order-of-magnitude application of the static input-output calculations and subsequent stated tentative results concerning nutrient recycling, fish production, etc.

Page 13, paragraph 2, item 1:

- a. Assume area of Charlotte Harbor is $41 \times 10^6 \text{ m}^2$
- b. Assume average annual rainfall is 1.397 meters (55 inches) per year.
- c. Then, $(41 \times 10^6 \text{ m}^2) \times (1.397 \text{ m}) = 57.277 \times 10^6$

$m^3/\text{year} = 0.15 \times 10^6 m^3/\text{day}$ from rainfall

d. Compare with:

1. $9.48 \times 10^6 m^3/\text{day}$ surface water flows
2. $65.43 \times 10^6 m^3/\text{day}$ advective water exchange
3. $3.94 \times 10^6 m^3/\text{day}$ tidal water exchange total =
 $68.85 \times 10^6 m^3/\text{day}$ without rainfall

Rainfall = $0.15 \times 10^6 m^3/\text{day}$ should have been included in the total input calculation, however, daily rainfall contribution directly to Charlotte Harbor is less than 0.2 percent of the total. This is not a significant error, even if concentrations of nutrients in rainfall were substantially higher than in other inputs. Rainfall other than that which falls directly on the harbor is accounted for by surface water flows.

Page 13, paragraph 2, item 2. The pathway of phosphorus floc to the sediments was not included in the first generation model. This omission was an oversight, but it is a good example of the value of conceptual modeling in providing a fixed basis for evaluation and discussion, and prioritizing second, third, and so-on generations of field investigation and modeling. Whether or not the omission of this pathway is significant depends on the magnitude of the pathway. The reviewers offered no data to support significance. If indeed, the flocculated phosphorus is lost to the sediments and the suggested reduction in recycling occurs, the preliminary conclusion that the harbor is a net nutrient trap is still valid; the amount trapped would be underestimated, however, until this physical-chemical pathway is quantified, how much is not known. This pathway would be an obvious candidate for measurement in future efforts of the continuing planning process.

Page 13, paragraph 2, item 3.

The use of the label detritus for this forcing function is in the gross sense and to be absolutely accurate should be changed to organic matter. The gross application of the work refers to all organic matter inputting the system, which at any point in time is in a state of degradation and exists as either particulate or dissolved. An organic detritus circuit as used in the model involves the accumulation and decomposition of dead materials, be they particulate or dissolved. It was the intention of the author to encompass both dissolved and particulate matter as TOC. The actual assumption used in the calculation was not to equate TOC to suspended detritus, but to equate $\text{TOC} \times 2 = \text{grams organic matter}$. This is a valid assumption. The model does not overemphasize impact of suspended detritus because values are for organic matter (dissolved and particulate). The confusion here is semantic in nature (as is often the situation where qualitative cases are made), but the calculations are correct.

The reference to bed load detritus is open-ended. No data is provided to support the statement. If one assumes a steady-state approximation for the organic matter (TOC) budget of Charlotte Harbor, it is reasonable to assume that the bed load transported into the harbor (and is not transported out by the same mechanism) remains in the system and is gradually degraded into small particulate and dissolved matter. Thus, it would and is accounted for in the measurement of TOC. If the steady-state assumption is not valid, then one would expect Charlotte Harbor to have filled in over time due to impact of this source.

Emergent halophytic plant material is accounted for in the same way as in bed load in the measurement of TOC. If one desires to investigate wetland systems adjacent of the harbor in more detail an emergent halophytic module similar to phytoplankton and benthic producers can be incorporated into the model. As continuing investigation under 208 goes on and more detailed information is desirable, the level of usage and detail of the model can be expanded. As diagrammed, the emergent plant contributions occur as part of the organic matter (detritus), microbial, and nutrient forcing functions.

Page 15, last paragraph, and continues to first paragraph, page 16. This paragraph serves a direct evidence of the reviewers (Smith, Fraser, and Cantrell's) lack of understanding of modeling and model application. This is in part, possibly due to little or no formal training or experience in modeling, general systems theory, and ecosystem energetics. What makes a model applicable to an ecosystem, in general, are the mathematical equations. The photosynthetic equation for aquatic plants is the same regardless of the estuary; the equation for nutrient uptake, respiration, predator-prey, rainfall-runoff, etc. likewise. Once the appropriate mathematical representations of the state variables and processes have been determined for component parts of an estuary, and once two (or more) estuaries are identified as having similar components and processes, then the same set of equations can be applied. This is the case for a model developed while working on a Crystal River estuary which has subsequently been applied and verified for Appalachicola Bay (Boynton, 1975), and is continuously being upgraded in other applications (Smith, 1976). What does change, and what makes a general model applicable to a specific estuary are the coefficients (or K values) that precede the equations. These values are where the differences between Charlotte Harbor and Crystal River are taken into account. That is the purpose for evaluating each model specific to its location. A analogous application of a model is the EPA STORM model which is used to simulate stormwater runoff. The general model is used throughout the country. The model is made specific by the rainfall/runoff coefficients for each city it is applied in. For obvious reasons, one does not recreate a rainfall/runoff model for each city when a model (of several generations of development) already exists. The same logic exists for use of the general model developed during work at Crystal River. New coefficients needed to be calculated but it would be redundant to regenerate equations. The ecosystem diagram bears credit to McKellar, 1975, because the diagram itself was developed as a modification of one in his Ph.D. thesis; this is similar to giving a picture credit to a photographer or artist.

The reviewers state that Crystal River and Charlotte Harbor are vastly different and cited McNulty et al. (1972) as a reference based on water clarity with subsequent differences in benthic vegetative cover (19 percent for Charlotte Harbor, 86 percent for Crystal River). The reviewers are guilty of accepting gross overview statements without looking at specific study areas and resultant data. Data which was used from the Crystal River area, was not drawn from the area of influence of the river itself, which is the basis for the McNulty reference, but for areas to the north. What McNulty says holds true for the immediate vicinity of the Crystal River, but comparison of data from Crystal River study areas to the north and Charlotte Harbor were as follows:

Light penetration into water columns:

Crystal River Area, June, 1972, (McKellar, 1975)	K, meters ⁻¹ = 0.9 to 1.5 K (annual), meters ⁻¹ = 1.0 ± 0.2
Charlotte Harbor, June 1978 (208 Technical Document)	K, meters ⁻¹ (northern harbor) = 0.8 to 1.1 K, meters ⁻¹ (southern harbor) = 0.5 to 0.9 K (whole harbor), meters ⁻¹ = 0.9 ± 0.1

Water Temperature:

Crystal River Area, June 1972, (McKellar, 1975)	T = 29.6 - 30.9°C
Charlotte Harbor, June 1978,	T = 29.5 - 30.5°C

Salinity:

Crystal River Area, June 1972 (McKellar 1975)	S = 26.9 to 28.2%
Charlotte Harbor, June, 1978 (208 Technical Document)	S = (southern harbor) 33.1 to 34.1% S = (northern harbor) 26.4 to 28.2 %

Total Community Metabolism (net daytime production plus 2x nighttime respiration)

Crystal River Area, 1972 -74 (McKellar, 1975)	Summer = 12.45 b/0 ₂ /m ² /day Spring = 7.54 g/0 ₂ /m ² /day
Charlotte Harbor, June 1978 (208 Technical Document)	Northern harbor = 13.83 g/0 ₂ /m ² /day Southern harbor = 9.30 g/0 ₂ /m ² /day

Plankton Metabolism

Crystal River Area (1973-74) (McKellar, 1978)	Summer = 2.91 g/0 ₂ /m ² /day Spring = 4.01 g/0 ₂ /m ² /day
Charlotte Harbor, June 1978 (208 Technical Document)	northern harbor = 4.67 g/0 ₂ /m ² /day southern harbor = 5.65 g/0 ₂ /m ² /day

Chlorophyll a

Crystal River Area, 1973, summer = 4.02 mg/m³
(McKeelar, 1975) spring = 2.90 mg/m³
annual mean = 2.59 mg/m³

Charlotte Harbor, June 1978 northern harbor = 2.61 mg/m³
(208 Technical Document) southern harbor = 1.30 mg/m³
overall mean = 2.01 mg/m³

Data extrapolated to the Charlotte Harbor model from the Crystal River area was done so only because no satisfactory data existed for Charlotte Harbor. In those cases where extrapolation was done, these cases were where comparative data (coupled with the investigator's personal experience) indicated enough similarity to justify the extrapolation.

These data suggest that certain major components of the estuarine area to the north of Crystal River (referred to as the Crystal River area), from which data was extrapolated for use in evaluating the Charlotte Harbor model, are similar and that the two areas are not vastly differed. Differences exist, but the areas are similar enough in fact to serve as order-of-magnitude values until further field investigation as part of the 208 continuing planning process can provide the appropriate site-specific values. The area of Crystal River referred to by the reviewers (Smith, Fraser, and Cantrell) is not the same area from which the data was extrapolated.

Of course, site specific data is undoubtedly preferred and ultimately the goal of scientific pursuit. The fact that even a relatively simple model of Charlotte Harbor must go unsatisfied for site specific data is indicative of the great data need that exists. The complexity that the reviewers wish to see and ultimately fault the model for (its lack of detail) would only further accentuate the absence of data for evaluating additional levels of model detail.

Page 21, first paragraph. Most of this deals with levels of detail and extrapolated data, the case for which is pretty much exhausted in the preceding comments. Suffice it to say, that simplifying assumptions were made and data were extrapolated consistent with (1) first-cut level of harbor estuary modeling, (2) available and extrapable data base, (3) what is acceptable in ecosystem model development (see reference list), and (4) level of effort needed to portray ecosystem complexity to lay 208 reader. The fish and benthic macrophyte estimates were the best possible based on data at the time of analysis. Reviewers present no Charlotte Harbor data to substitute, and the assumptions that were the basis for extrapolation from the Crystal River Area to Charlotte Harbor hold as explained previously.

Page 21, paragraph 2. This paragraph apparently questions modeling and the motivation for such. As stated previously, the end result of model development is not always predictive. It can be conceptual, for summarizing, dramatizing, and educating. It can be an evaluation for input-output assessment (black-box considerations), further study prioritization, and order-of-magnitude determination of component structure and function for general impact analysis. Further, it can be a simulation, first for

stability (sensitivity testing), second for validation, and third for predictive interpretation. It is important to emphasize that modeling is a process requiring several stages of development before the predictive capability is achieved as an end result. The reviewers are apparently critical of the model because it cannot achieve the end-result, predictive capability, without first progressing through all previous stages. Furthermore, they tend to try to extrapolate much more out of the model in terms of detail than a first generation model (that is developed only to the evaluation stage) can give.

Page 21, last paragraph, to page 22, first paragraph. An investigator works with the data base that is available. Mixing of data bases with different periods of observations are the norm rather than the exception in natural science. Ideally, all parameters in an estuary should be measured simultaneously and continuously for long periods of time. This is not practically possible. The mixing of data with different time bases is not indiscriminate however. The minimum amount of data needed to start is an instantaneous measurement (often referred to in modeling as initial conditions). As the base expands, coefficients are recalculated and the model is upgraded. You start out with one day's worth of data and go from there. If the ultimate goal is to simulate seasonal behavior of an estuary, then your sampling program should measure parameters seasonally. One strength of ecosystem modeling is that of the simulation stage you are able to solve several equations simultaneously each equation (representing each state variable) can, and usually does, have a different time base. For example, in the Charlotte Harbor model (208 plan), phytoplankton as a population have shorter life cycles than benthic producers or benthic invertebrates, so population turnover times may vary. Rainfall records of 30-years are not uncommon, and are necessary, whereas plankton production data for a 30-year period is probably not. The time frame of the data base is determined by the period you wish the model to apply. Where first-cut (what's available) evaluations are done, the longest base is used to summarize the extent of data. Since each forcing function can have its own time variation, in an annual simulation for instance, the stronger pulses of sunlight and water may mask shorter or smaller pulses of nutrients, organic matter, etc. Thus in a 100-year model, daily variations will be insignificant, as in a 50 or 10 year one. In a model giving flows per day as in the 208 Charlotte Harbor model, a per day value is chosen because in many instances the data base consists of a one-time measurement.

PART III - RESPONSE TO CONCLUSIONS

Response to 1: Input-output (blackbox) analysis does not require knowledge of any internal structure of function. All you need to know are inputs and outputs, mass balance calculations can then tell you whether things are amplified or reduced as a result of what happens in the box. Of course, this type of analysis has limited usefulness, but is an important starting point. As more and more internal details become known they can be included and the next level of evaluation and understanding can be achieved. The reviewers (Smith, Fraser, and Cantrell) apparently believe that until everything is known about an ecosystem nothing can be said. Most scientific investigation starts out with a hypothesis, often centralized around a visual, verbal, or "minds eye" conceptual model where complex systems are concerned. The investigators then proceed to collect

data to support or develop the hypothesis, often stopping to evaluate it with data they have accumulated. Many time hypotheses are modified as data is accumulated. Once substantial data exists to support hypothesis it may be used for predictive purposes in similar situations where data may not be available. The reviewers apparently take the position that since the model has not been validated and is not predictive it is useless. The first stage of the 208 program was not designed (nor were sufficient time and monies available) to be carried that far. The ecosystem model serves the purposes for which it was intended:

- A. Provide a conceptual model as a basis for understanding and focusing investigation on Charlotte Harbor as a whole. Other 208 programs tended to ignore biological parameters in their activities altogether.
- B. Use the evaluation procedure of the model to show the data base that exists relative to the harbor so future 208 and related field and planning activities can have an organized framework for data collection. Provide a focal point for scientific discussion of major components and functions in Charlotte Harbor estuary from which to work. Too often, scientific experts sit around a table verbalizing how things work without substantiating and/or collecting their comments into a framework which can be put to an ultimate better use (serving to document the state of knowledge in a qualitative and quantitative way).
- C. Initiate the modeling process which will ultimately lead to a validated simulation model for wasteload and impact prediction.

Response to 2: The reviewers have pointed out three relationships which they feel were left out or are inappropriate in the model: direct rainfall input of nutrients (which calculations show to be insignificant, i.e., less than 0.2 percent of total), flocculation and precipitation of phosphorus directly to sediments (if phosphorus is used as nutrient in model then this may be appropriate, however, no data was presented to indicate significance), and TOC detritus ($2 \times \text{TOC} = \text{organic matter}$, which is a more appropriate title for the forcing function in the diagram, words aside, the calculations equate $2 \times \text{TOC} = \text{organic matter}$ which includes both particulate and dissolved, and is a correct approximation).

The majority of the most important relationships in Charlotte Harbor are represented and the reviewer's statement that most are wrong is over-inflated and unsupported by data.

The fact that TP was chosen as an "example nutrient" is obvious from the label on that particular forcing function. The internal details of the model will change depending on the nutrient, chemical contaminant, or heavy metal chosen. It is possible, of course, to diagram as many different pathways as there are existing nutrients (contaminants, or metals, etc.).

Response to 3: The reviews criticize the model for being both too simple (page 12, Smith, et al.) and too complex which is a paradox to be expected when the modeling process (in this case at the first generation level) is

too little understood and too much over analyzed. They (the reviewers) have tried to get much more detail out of the model than exists. Instead of recognizing this as due to a lack of information about the Charlotte Harbor system, they attribute it to a weakness of the model.

PART IV - RESPONSE TO RECOMMENDATIONS

Recommendations 1: The recommendation indicates the 208 model is worthless, and most probably the reviewers (Smith, et al.) would submit their functional hypothesis of Charlotte Harbor in its place.

The value of the model in the 208 plan should be determined by:

1. Does it succeed in doing what the 208 planning staff wanted it to do. . . .conceptualize, summarize, and provide a framework for the past and future 208 considerations of Charlotte Harbor as a whole?
2. Does it serve as an example of another possible way of calculating assimilative capacity and wasteload determination?
3. Does it provide data, estimates, and projections where none existed before for selected ecosystem parameters?

The 208 model included in the Plan meets these criteria.

Recommendation 2: The reviewers have apparently misunderstood the 208 planning process and the 208 plan as it now exists. Continuous planning decrees continuous change. The ecosystem model, or any other aspect of the plan will undergo many changes over time. The ecosystem model was never offered as the last word on Charlotte Harbor, it was developed as a beginning, not an end. Second, third, fourth, and later generations of the model would undoubtedly be modified, expanded, or contracted, as the data base or the modeling needs change.

Recommendation 3: SWFRPC does need to use stronger qualifications of the ecosystem model in its introductory sections and on pages where preliminary results are presented. The theoretical nature of the model is relative to the evolution of ecological thought, computer technology, and the data base to which it is applied. The model (and its developer) will stand on its merits as being based on the best available data that existed at the time. The conceptual diagram conforms to general systems theory. The differential calculus of the relationships are valid, and the data and subsequent calculations used in the evaluation process are clearly presented in the supporting tables so weaknesses in data are apparent.

The model was not used as a basis for control strategies, standards setting, or future wasteload projections. It was developed under a strict six-month time limitation and was recognized from the beginning as a conceptual tool. Because the overall impact of the model on the plan is relatively insignificant (despite the blow-up given by the reviewers), and because the reviewers have presented little refereed or published data to substitute for that given in the model, it should be retained in the 208 document.

COMMENTS GENERAL TO OVERALL REVIEWERS DOCUMENT AND/OR RELEVANT TO PAST MEETINGS, ETC. WITH REVIEWERS (SMITH, FRASER AND CANTRELL)

It has been the conduct of the reviewers to criticize the Charlotte Harbor portions of the 208 plan from a position of authority and scientific expertise. All public planning activity should be subject to critical review. Several inconsistencies in the manner in which the criticism has evolved, however, leads one to speculate about the nature of the criticism.

On several occasions and in the critical document, Messrs. Smith, Fraser and Cantrell have made statements of "how Charlotte Harbor really is" often alluding to their own personal data of observations as reference. It should be emphasized that much of the data alluded to be Messrs. Fraser and Cantrell was not, and in some instances, is still not available to 208 scientists and planners. Personal experience is not to be discounted, however, unpublished data files, interdepartmental data memos, and unwritten personal experiences are not acceptable documentation for the extent of personal comment they have made in critical review of 208 planning documents. In almost every instance where they have critically reviewed a data set or model, they have predominantly done so based on unpublished or otherwise unrefereed data. Moreover, alternative methods for nutrient standards or functional hypothesis substitutes for ecosystem modeling they propose exhibit as many, if not more, of the characteristics for which they are so critical; i.e., insufficient data bases, unpublished references, over-simplification. They have challenged the 208 documents more often with words than with numbers. Most of the weaknesses of the modeling efforts were known by the 208 technical team and are obvious in most cases to informed readers and reviewing agencies. The fact that more weaknesses are highlighted is acceptable; however, in almost all cases where the data is criticized as unacceptable, no data is offered in substitution.

The 208 planning process is not an end, but the means to an end of conservation of water resources and ecological systems in Charlotte Harbor. Rather than go to great lengths of projecting ones own expertise and disputing others to no constructive end, it is recommended that the technical aspects of the 208 be recognized for the initial effort that they are, and that the continuing planning process keep the 208 planning document intact with certain qualifiers. It is certain that a second generation ecosystem model with Messrs. Cantrell and Fraser's input can achieve a high level of evaluation and qualification toward the ultimate goal of predictive capability.

An effort was made to diagram the "functional hypothesis" or verbal model of Charlotte Harbor that Smith, Fraser, and Cantrell used on pages 7-10 of their document to "summarize existing knowledge about Charlotte Harbor". Since it is not possible to read between the lines only those things specifically referred to as important to the reviewers are diagrammed. (see attached figure)

It is enlightening to compare the diagrammed "functional hypothesis" of Charlotte Harbor as verbalized by Smith, Fraser and Cantrell with the 208

ecosystem model diagram. The translator regrets any meaning lost in the translation from words to ecosystem energetic symbols, however, key words have been added to equate symbols with components as outlined by Smith, et al. Please notice that other than percent composition data, the only pathway evaluated was for phytoplankton production.

On comparison it becomes obvious that the functional hypothesis that Smith et al. chose to substitute for the ecosystem model is an even greater simplification and, therefore, (by their logic) less apt to be correct. When submitted to the validity test of predictive ability, its ability to pass is seriously questioned.

Mr. David Burr, 208 Project Director
Southwest Florida Regional
Planning Council
2121 West First Street
Fort Myers, FL 33901

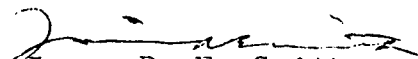
15 July 1978

Dear Mr. Burr:

Enclosed is a copy of comments on the Draft 208 Water Quality Management Plan for Southwest Florida for formal action by your agency.

These comments are being forwarded directly to your office in order to meet the established deadline. Copies are also being sent to the Chairman of the Advisory Committee and to other interested parties for their information and possible action.

Very truly yours,


James R. E. Smith
101 Danforth Drive
Charlotte Harbor, FL 33950


cc: Mr. V. W. Shaner, Chairman

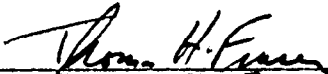
Enclosure

COMMENTS CONCERNING THE CHARLOTTE HARBOR BASIN PORTIONS OF THE
DRAFT 208 WATER QUALITY MANAGEMENT PLAN FOR SOUTHWEST FLORIDA

14 July 1978

A report submitted to the special sub-panel of the Charlotte Harbor Basin 208 Citizens Technical Advisory Committee by the ad hoc Technical Panel


Mr. James R. E. Smith, Act. Chairman,
Technical Panel


Dr. Thomas H. Fraser, Senior Scientist
Environmental Quality Laboratory, Inc.


Mr. Richard W. Cantrell, District Biologist
South Florida District, FDER

COMMENTS

The following consists of six summary recommendations based on detailed comments on the Charlotte Harbor Basin portions of the Draft 208 Water Quality Management Plan and supporting consultants' reports.

SUMMARY RECOMMENDATIONS

- I. The 1972 Federal Water Pollution Control Act Amendments establish the goals that our waters must be safe for fishing and swimming by 1983. The studies completed by the water quality consultants show that the waters of Charlotte Harbor are now essentially in that condition. Studies by other agencies give solid support to that conclusion and show that both the Peace and the Myakka Rivers within this area are also in "fishable and swimmable" condition. The 208 planning should therefore provide a program for maintenance of the present satisfactory conditions, or, as the water quality consultant states on page 208 of his report "...there is opportunity to implement an estuary management program oriented as a problem prevention and planning program rather than a 'clean-up' force". We recommend that the draft 208 plan be reoriented to reflect such an approach.
- II. No interim standards should be proposed for TN and TP concentrations within estuarine waters. Interim standards should be proposed for fresh water entering the harbor only after estimates of natural and man-produced fractions have been made. Consideration should be given to the use of the freshwater techniques reported herein for preparing interim standards.
- III. We recommend that the 208 Chlorophyll a Model not be utilized to generate interim nutrient standards for Charlotte Harbor. We further recommend that the Evaluated Ecosystem Model be stricken from the 208 document and that this highly theoretical technology not be utilized in future studies until such time its direct applicability can be demonstrated and the

necessary local data secured.

- IV. We recommend that the Charlotte Harbor Citizens Advisory Committee establish a committee of local scientific and government representatives to assist in establishing a sound scientific basis for planning future programs.
- V. We recommend that the 208 Draft Plan emphasize for action the concern expressed by the water quality consultants report (page 207) that hydrologic modification of the Peace Basin and reduction in the volume of Peace River flow to Charlotte Harbor "...have great potential for serious, long-term ecological consequences". In our estimation, the potential for deleterious impacts from severe scalping of peak river flow upon the harbor biota cannot be overstated.
- VI. We find that none of the control alternative recommendations for Charlotte Harbor study area were developed directly from quantitative data and therefore none can be analyzed for cost-effectiveness.

INTRODUCTION

Deficiencies exist in the present 208 draft proposal for Charlotte Harbor. These deficiencies still exist in spite of efforts by interested people to point out omissions, corrections, constraints of data and various modeling techniques applied to the data. This review intends to highlight those critical areas that need to be revised and to recommend positions that should be adopted by the Technical Advisory Committee on the existing results and future directions.

We will summarize existing knowledge about Charlotte Harbor within the framework of a functional hypothesis of the estuary. We will assess the methodologies proposed in the draft 208 plan for analyzing existing data, their advantages, limitations and applicability for future use. We will recommend alternative methodologies. General directions for any future 208 work should be made without regard to political boundaries that divide natural units.

The water quality consultants (Nov. 1977) have concluded that 95% of the total phosphorus and 89% of the total nitrogen arrived in Charlotte Harbor via the Peace and Myakka Rivers in 1976. These estimates suggest that major emphasis should be placed on understanding land/water relationships in the Peace and Myakka basins first and then to land areas adjacent to Charlotte Harbor. One of the goals is the identification of major sources of non-point runoff. This may be considered as accomplished in the general sense. No data were actually necessary to make this observation: points of greatest fresh water inflow should produce the largest additions. Together, the rivers provide the largest source of fresh water to the harbor and exert a large effect on the biota. An understanding of how the freshwater flow may affect the biota in the harbor is instructive.

CHARACTERISTICS OF CHARLOTTE HARBOR

Charlotte Harbor shows many seasonal changes each year. Obvious changes occur in the duration and amount of light, direct rainfall and discharge of the Peace and Myakka Rivers. Because this part of Florida lies in a subtropical region, it experiences occasional air temperatures below the freezing point of water during the winter months and tropical air temperatures during the summer months.

It should come as no surprise that the general water quality of fresh, brackish and salt water shows seasonal variation. This seasonal variation is apparent in some naturally occurring parameters. Knowledge of these variations is essential to the task of assessing the water quality in Charlotte Harbor as well as the fresh water it receives from surrounding uplands and the two major rivers.

Two sets of data for Charlotte Harbor and the Peace River, collected by ESE, are presented in Table 1. These stations were selected to illustrate the gradients that exist between gulf waters (sta. B-18) and fresh water (sta. T-12) as well as the seasonal changes.

First, these data may be used to show the kind of problem that all data are susceptible to - lack of proofing to catch odd values. The ortho-phosphorus value for station T-12 is shown as .01, yet the gradient is increasing from B-18 to T-10. This is probably a typo and should read 1.01 for we know of no measurements in the Peace River of ortho-phosphate less than about .50 mg/l. Organic nitrogen is a calculation of the TKN (Total Kjeldahl Nitrogen) minus ammonia. The ammonia value cannot exceed the TKN value, yet that is precisely the case for station T-12 in September. This is also probably a typo and should read .23 mg/l ammonia. One other inconsistency occurs for nitrate-nitrite at station B-4 in January. The value is an order of magnitude higher than stations B2 - 18 and may be a typo.

TABLE 1

COLLECTED BY ESE (NOV. '77) FOR SEPTEMBER 1976 (WET SEASON) AND JANUARY 1977 (DRY SEASON)
 18 (OFF BOCA GRANDE PASS) TO STATION T-12 (PEACE RIVER, UPPER PORTION)

TOTAL °C	TURBIDITY NTU	BOD mg/l	ORTHO- PHOSPHATE mg/l	TOTAL PHOSPHATE mg/l	NITRATE/ NITRITE mg/l	AMMONIA mg/l	ORGANIC NITROGEN mg/l	TKN mg/l
	.6	1.8	.09	.49	<.002	.09	.41	.50
	.5	1.8	.10	.49	.011	.23	.43	.66
	.6	1.7	.11	.37	.007	.34	.39	.73
	.55	1.2	.12	.52	.023	.31	.23	.54
	.90	<1.0	.21	.21	.002	.17	1.69	1.86
	.90	2.1	.25	.44	.002	.42	.80	1.22
	.60	1.9	.38	.68	.028	.24	1.08	1.32
	.9	2.5	.56	1.62	.16	.31	1.38	1.69
	.9	1.7	.01	1.14	.35	2.3	-	1.01
	.1	<1.0	.02	.09	.004	.11	.40	.51
	.4	1.0	.02	.09	.004	.09	.35	.44
	.0	<1.0	.02	.17	.009	.08	.50	.58
	.8	1.1	.04	.07	.006	.09	.34	.43
	.4	1.4	.12	.19	.007	.07	.67	.74
	.4	1.1	.18	.27	.05	.10	.61	.71
	.8	1.1	.19	.43	.004	.10	.90	1.00
	.3	<1.0	1.98	2.19	.33	.14	1.05	1.19
	.1	<1.0	2.10	2.22	.63	.02	.65	.67

Several important observations can be made from the data given in Table 1 that were not presented in the 208 documents, some of which conflicts with statements made therein.

- 1) Some parameters show order of magnitude changes in concentration from fresh water to salt water; for example, color, phosphate, nitrate-nitrite.
- 2) Some parameters show order of magnitude changes at the same station with seasonal changes; for example, color, phosphate, nitrate-nitrite.
- 3) Some parameters show no changes (trends) in concentration from fresh water to salt water; for example, BOD, ammonia, turbidity.
- 4) Some parameters show poor, or no, seasonal changes in concentration; for example, BOD, total organic carbon, turbidity.

The turbidity and BOD data do not support the idea that both have higher values in the upper end of Charlotte Harbor. The data do suggest that color, phosphate and nitrate-nitrite sources occur at the upper end of the harbor. Organic carbon, organic nitrogen and ammonia do not show a clear pattern of having sources at the upper end of the harbor.

The seven-day average flow at Arcadia for the September data was 1679 cubic feet per second (C.F.S.) and for the January data was 377 C.F.S. and are representative of a drier than average wet season and slightly wetter than average dry season. The conductivity values reflect these differing flows and show the effects of increasing salt on conductivity.

Single concentration values, as interim or permanent standards, do not fit the facts of existing water quality variations. This limnological concept has no place in estuarine waters for naturally occurring substances.

The interim SWFWMD report (1978), other studies by EQL and studies by regional DER combine to allow formulation of an hypothesis concerning the role of oxygen in the relationship between physical changes in Charlotte Harbor and biological productivity.

As river flow increases during the rainy season, more fresh water, nutrients and colorants are brought into the harbor. At the same time, vertical mixing of the water column is inhibited by density differences caused mainly by differing salinities and by low, unsustained surface wind speeds (Fraser *et al.*, 1977). The vertical stratification formed restricts the nutrients and colorants brought by the increased freshwater flow to near surface layers and produces there the conditions favorable to high photosynthetic primary production by phytoplankton. Primary production estimates using the C14 technique ranged from about 0.1 - 1.8 grams of carbon per day per cubic meter of water near the surface during June through September 1977 with maximum productivity occurring in September 1977 (EQL unpublished data). Diatoms formed 52-94% of the cell numbers and 53-99% of the cell volume during June through September, with lesser amounts of dinoflagellates and other microalgae. Blue-green algae were not a measurable fraction (less than 1%) of the phytoplankton population during 1976-77. The density stratification also prevents the surface reoxygenation of bottom waters which then gradually become depleted of dissolved oxygen by the respiration or decay of organisms. Very little primary production occurs in bottom waters (EQL data file) during the wet season, apparently because the highly colored surface waters absorb the light necessary for photosynthesis.

Within this stratified zone, however, important and perhaps vital secondary production occurs due to the creation of an apparently favorable environment for the expansion of the harbor benthos.

The benthic infauna of Charlotte Harbor is both rich and abundant. Ecologically the organisms which comprise the estuarine community are either adapted for withstanding the physiological stresses induced by the normal but severe fluxes of the estuarine environment or exhibit life cycles which permit exploitation of available resources during segments of the seasonal cycle. In response to the environmental conditions manifest by the wet season, the benthic infauna undergoes an increase in total population densities and also apparently an increase in the number of species comprising the community (Cantrell, Jones & Dalton, 1976). Fallout of plankton from the seasonally accelerated primary productivity of the upper water layer is hypothesized as the necessary food source. During this same period (wet season), populations of benthic predators (fish and motile macroinvertebrates) experience a sharp drop apparently as the result of the decreased concentration of dissolved oxygen (Fraser 1977). Expansion of the benthos community is thus supported by both an increased food supply and a reduction in direct predation.

In the fall the dissolved oxygen increases with the final breaking of stratification due to decreased freshwater flow and increased wind speed. Juvenile shrimp, crabs and fishes move back into the areas vacated during the wet season to feed on the abundant infauna.

Under this hypothesis, stratification and reduction in dissolved oxygen are necessary preconditions for the harbor to provide high quality, abundant food for juvenile shrimp, crabs and fish in the fall. Because of the large area of Charlotte Harbor influenced by river flow in the wet season, it is possible under this hypothesis that high flows may be the controlling factor in primary and secondary production that causes changes in abundance of the predators (shrimp, crabs, fish) that many of us like to catch and eat.

Since it appears that the higher, wet season flows are associated with higher biological productivity, the assumption that the "worst" water quality in the summer is associated with detrimental effects in the harbor should be of intense interest. The 208 draft plan calls for a 92% reduction in phosphorus and a 54% reduction in nitrogen (Chap. 11, Table 11.2-2). Dragovich et al., 1968, have already shown that the largest loads to the harbor occur during high flow. Therefore, any proposed reductions will probably have a substantial effect during the wet season.

Primary producers and microbes that use nutrients do not perceive "loads" but concentration. Excessive concentration of some nutrients may cause luxury consumption in some plants, or inhibition of growth in others. In the absence of limiting factors, eutrophication due to excessive addition of nutrients may occur. Two large physical sinks exist for excessive nutrients brought into an estuary. One sink is the sediment into which, for example, most of the phosphorus is deposited by flocculation; the other sink is the open coastal waters which usually receive higher concentrations of nutrients from the estuary on ebb tides. Estuarine circulation does slow the transfer of material from

the land and fresh water to open coastal waters. "Loading rates" or "loads" are not very useful concepts in open-ended systems with complex concentration gradients. Most, if not all, biological and chemical-physical processes associated with nutrients are directly related to concentration.

Data provided by ESE (undated appendix, presumably Nov. 1977) show seasonal variation in concentrations of many water quality characteristics. Their data also support the idea that the western side of Charlotte Harbor has lower salinities than the eastern side. Their data also show salinity stratification was occurring in September 1976. Data from DER's study in 1976 (Cantrell et al.) and the hydrobiological program by Environmental Quality Laboratory (1978) confirm that salinity stratification is common during the wet season. These two studies also found low dissolved oxygen values were common and associated with the salinity stratification. The findings concerning the gross circulation of Charlotte Harbor and the seasonality of water quality are very important to the future direction of the proposed 208 program.

COMMENTS ON THE METHODS CONSIDERED BY 208
FOR THE DETERMINATION OF DESIRED WATER QUALITY

From the many water quality parameters that may be measured as indication of ambient conditions, only nitrogen and phosphorus were examined in detail. Interim standards were recommended for total phosphorus and total nitrogen for Charlotte Harbor using a regression analysis of chlorophyll a and the nutrients nitrogen and phosphorus. At least two other methods have been suggested for consideration and will be reviewed here.

The chlorophyll a model has been the subject of a critical review (Environmental Quality Laboratory, 1978) and is not applicable to estuaries. This technique produces standards that are extremely low, so low (.87 mg/l nitrogen and .14 mg/l phosphorus) as to be absurd; for example, rainfall is known to frequently have higher concentrations in southern Florida (see Waller and Earle, 1975). ESE (Feb. 1978), in its technical appendix of the productivity study for the Charlotte Harbor area, on page 118, Table 3.7-1 lists the nutrient concentrations of nitrogen and phosphorus for the Gulf of Mexico as $2.49 \text{ g/m}^3 = 2.49 \text{ mg/l}$ and $0.22 \text{ g/m}^3 = .22 \text{ mg/l}$ respectively, both higher than the standards proposed for Charlotte Harbor. A fatally flawed model can only produce unrealistic predictions. The "208" plan continues to use the values of .87 mg/l total nitrogen and .14 mg/l total phosphorus in spite of all the information SWRPC has received orally and in writing concerning these unrealistic values.

A technique proposed independently by EQL and the local DER but not employed by "208" was to obtain estimates from fresh water conditions that appear to be the least disturbed, thereby obtaining values that could be considered to approximate our best estimate of natural conditions. These estimates could be used as the interim goals as fresh water discharges into the estuary.

An example was given by E.Q.L. (1978) and identified phosphate (both total and ortho) and nitrate-nitrite as being excessive in the Peace River.

In conjunction with this method, estimates of the point source discharge and studies of non-point source runoff of various man-intensive use of land could provide all the necessary estimates to determine if, where, and how severe pollution might be. One example of the estimate of influence for some point sources on the Peace River is given on pages 24 thru 28 of this document. These point sources are not all the sources, but do illustrate how estimates can be made.

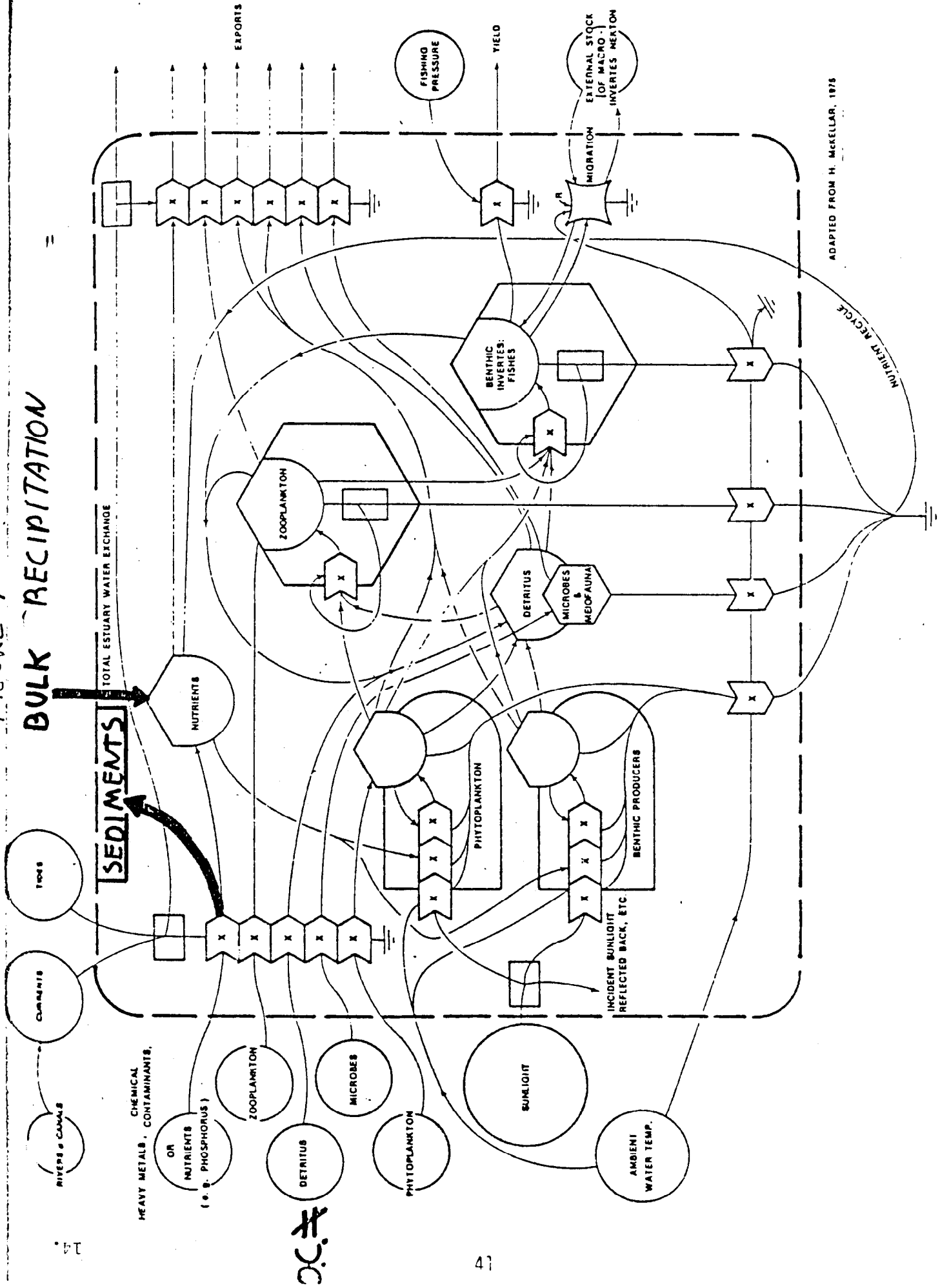
The ecosystem model presented for Charlotte Harbor is developed as a mechanism for the analysis of energy flows and environmental interactions within the estuary. Basic to the concept is the reduction of biological processes to numerical values to which the principles of environmental and systems engineering are then applied. Inherently, this approach also severely simplifies the ecosystem (although the diagrams, symbols and numerous calculations may appear complex).

For any model there exists only one true test of validity; how accurately will it predict actually measured values. This process is termed model verification. Due to a combination of conceptual, physical and monetary limitations, verification and computer simulation were not attempted. Thus assessment of the usefulness of the Charlotte Harbor model as an analytical tool falls to a lower plateau of judgment, one which requires review of the logic concerning the energy flow patterns and the suitability of the data utilized.

Criticism of this specific model will be directed at two distinct levels. First, analysis of the diagrammatic energy pathways including the supporting assumptions and logic utilized in constructing the interactions. Second, a review of the applicability of the data utilized in computing the model values.

Several major errors exist in the model regarding energy flows and basic assumptions (Fig. 1): 1) Nutrient inputs to the harbor are restricted to surface water flows. No consideration is applied to direct nutrient input from bulk precipitation. Waller & Earle (1975) indicate that this source can be highly significant. 2) Nutrient flows within the harbor are shown as being directed either through biological production or as direct export to Gulf water. Not evaluated is the relationship of nutrient species to benthic sediments. Evidence suggests that a portion of the phosphate load of the Peace River is not available to biological production in Charlotte Harbor as the result of flocculation induced by mixing with higher salinity bay water and the complex chemistry of color causing organic acids (Alberts *et al.*, 1970). Further noted is a lack of correlation between open harbor water column phosphate concentration and concentration in the sediments. This suggests a lack of recycling, at least for phosphorus. 3) Detrital inputs into the harbor are an important mechanism in the trophic relationships of the aquatic ecosystem. The model, however, incorrectly equates total organic carbon (T.O.C.) concentrations to suspended detritus. A portion of the measured T.O.C. may indeed be detrital (particulate organic carbon), however, the presence of organic color-producing compounds (100 color units \approx 10-30 ppm carbon) in high concentration negates the assumption of equatability (Christman, 1970). Figure 2 illustrates

FIGURE 1
BULK RECIPITATION

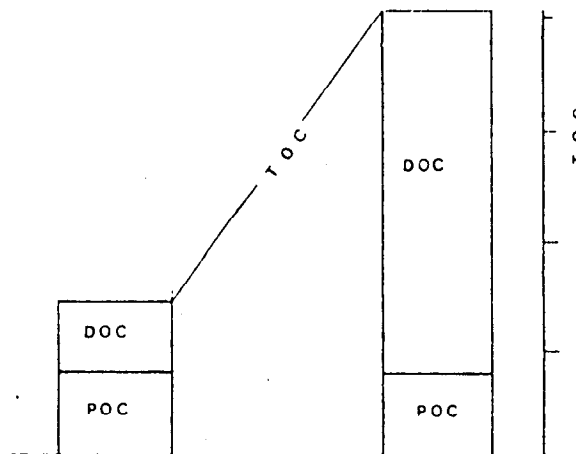


ADAPTED FROM H. MEKELLAR, 1978

FIGURE 2.2-3
AN ENERGY CIRCUIT MODEL OF AN ESTUARINE BAY ECOSYSTEM

how two different T.O.C. values can have the same detrital component (P.O.C.)

FIGURE 2



Thus, the model over-emphasizes the impact of suspended detritus. An additional omission pertains to "bed load" detritus or debris. Simply, this encompasses those large organic particles too bulky to be retained in suspension which are swept into the estuary along the river bottom. One only needs to place a drift net in the Peace River channel to appreciate the potential impact of this source. Finally, we see no mechanism integrating the contribution of the emergent halophytic plant community upon total allochthonous detritus. Most certainly, mangrove debris makes significant contributions to the metabolism of the shallow harbor "littoral zone" prior to its disintegration to the point of becoming suspended detritus (Odum, 1971).

As the 208 document states, "Balance of organic inputs and outputs is an essential assumption for the use of model of this type ...". By not addressing the above inputs and interactions, a true picture of the overall organic input is cloudy, to say the least.

Applicability of a model to a particular system is governed by the similarity exhibited in the model to the natural processes and by the availability of pertinent data to fit into the model. We have just pointed out some failings of the 208 model to correctly mimic the Charlotte Harbor system. A portion of these failings derives from transposing a model designed for one ecosystem upon another. Simple reason dictates that the value of such an approach is limited by the degree of similarity between the two

ecosystems. The model utilized was developed for the Crystal River estuary, an area of many islands opening to a "bay" which is, in fact, an indentation of the Gulf of Mexico (see map). Crystal River itself is a "spring run" characterized by a flow of very clear uncolored water. Partially as a result of the clear water, Crystal Bay supports luxuriant sea grass beds encompassing the majority of the bay bottom. Charlotte Harbor, with its large enclosed bay and seasonally variable flow of highly colored water, is a vastly different ecosystem. Further, McNulty et al. (1972) estimates that only 19% of Charlotte Harbor supports submerged vegetation compared to 86% for Crystal River.

No model, even a perfect one, can improve the quality of the data utilized. While the 208 document does state that some data are less than desirable, the distinct impression is conveyed that such data are in the vast minority. Table 2 categorizes the external driving forces and internal storages of the model as to their data supports. As is readily seen, the majority of these parameters are developed, at least in part, from data other than direct measurement. Tables 3 and 4 present certain aspects of these data which we believe to be inappropriate or lacking in application to Charlotte Harbor. Not wishing to belabor this point, only a few examples will be discussed.

The utilization of biological data is certainly among the weakest areas. Notice should be given to the fact that while benthic invertebrate population and biomass were sampled in the harbor; these same values were

MAP
CRYSTAL RIVER

MAP

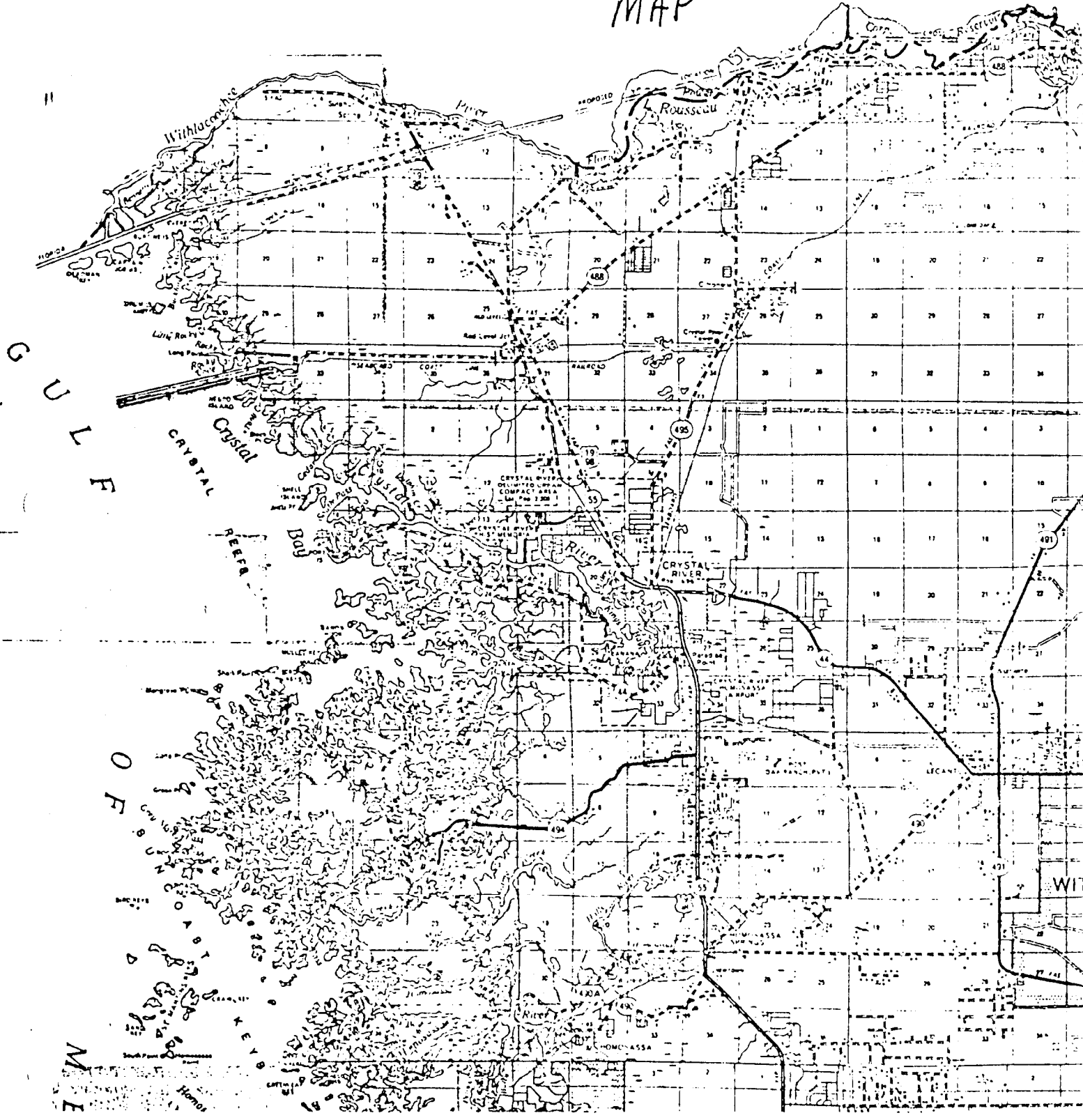


TABLE 2

	Direct Measurement	External References & Assumed Values	Hybrid
External Driving Forces	I_4, I_5, I_{01}	$I_3, I_6, I_{02}, I_{03}, I_{04}^*, I_{06}^*$	I_1, I_2, I_{05}
Internal Storages	Q_5	Q_2, Q_4^*, Q_6^*	Q_1, Q_3
Total	4	9	5
% of Total	22.2	50	27.8
<p>* While portions of each of these parameters may have accurately measured components, either inappropriate usage or combination with assumed values prevent consideration as a direct measurement.</p> <p>Example: T.O.C. values may be accurate; however, T.O.C. is not equivalent to detritus as assumed by the model.</p>			

TABLE 3
EXTERNAL DRIVING FORCES

- I₁ - Uses annual average flow instead of flow during the study period.
- I₂ - A reference for the value of the advective coefficient is not given.
Why is the mixing coefficient so low?
- I₃ - Mixes salinities during study period with average annual flow.
- I₄ - o.k.
- I₅ - o.k.
- I₆ - This is strictly a guess.
- I₀₁ - External Nutrients
Annual averages. Note that Gulf of Mexico data violates interim standard proposed for harbor.
- I₀₂ - External Zooplankton
Concentration of zooplankton is taken from off shore of Crystal Bay, not Charlotte Harbor. Additionally, this datum is for winter. Model incorrectly assumes a uniform distribution through the entire water column.
(J₀₂) - derived from I₀₂ infers only import from the Gulf. Nature of zooplankton import would vary seasonally.
- I₀₃ - External Phytoplankton
Same limitations discussed above for zooplankton. J₀₃ - see J₀₂ in I₀₂.
- I₀₄ - External Detritus
Assumption that T.O.C. = Detritus is incorrect. With the presence of color agents, the majority of the T.O.C. is D.O.C. (dissolved organic carbon) not P.O.C. (particulate organic carbon).
- I₀₅ - External Microbes - Data for Gulf is from Texas.
- I₀₆ - External Density of Invertebrates & Fish
Uses data for harbor invertebrates as Gulf data. Why is meiofauna not included as in Q₆ for harbor benthos. Fish data is based upon Chokoloskee data. 75% assumption for Charlotte Harbor is a guess.
- J₀₆ - Import of Fish & Invertebrates - This value is a guess based upon a guess.

TABLE 4

INTERNAL STORAGEES

- Q₁ Phytoplankton Biomass - Incorrectly applies plankton concentration throughout water column. Correlation between methods for estimation of standing stock (chlorophyll vs. wet weight) is very poor. (+.67 high tide; -.13 low tide).
- Q₂ Benthic Producer Biomass - Model erroneously uses data from Crystal River. (See text.)
- Q₃ Zooplankton Biomass - Same limitations as Q₁ above.
- Q₄ Detritus Stock - T.O.C. is again incorrectly used to estimate suspended detritus. Bottom detritus is an estimate based upon data from Fahkahatchee Bay.
- Q₅ Nutrient Concentration - These data are from May 1977 yet input I₀₁ is based upon annual average data.
- Q₆ Benthic Invertebrate & Fish Biomass - Fish data is same as that used for Gulf (external). Why? Invertebrate populations are high and variable Note standard deviation, (1978, Section 208, Table 2.1-14). Validity of data from a single day sampling is questionable.

presented for Gulf (external) populations. Further, a correction to incorporate an estimate of meiofauna biomass (based on external data) was applied to the harbor data but not to that presented for the Gulf. Both zoo- and phytoplankton populations were sampled in the harbor, however, total biomass was erroneously derived by assumption of a uniform distribution through the entire water column. The layering and vertical migrations of zoo- and phytoplankton with the diel and tidal cycles are well established in the literature. Most inappropriate, however, are the data pertaining to fish and benthic macrophytes. In utilizing macrophyte biomass data from Crystal River for Charlotte Harbor, two major assumptive errors exist; first, that the densities of the grass beds are similar in the two areas, and second, that the areal coverage is likewise similar. As noted earlier, these assumptions simply are wrong (McNulty *et al.*, 1972). The fish data are equally tenuous. As with the benthos, the same values are postulated for both Harbor and Gulf. However, unlike the benthos for which some measured values were secured, the fish data are an unsupported, assumed percentage of data from Fahkahatchee Bay.

With 77.8% of the external driving forces and internal storages firmly mired in data of shaky applicability, it is questionable whether correct prediction could be derived even if an accurate model of Charlotte Harbor could be developed.

Another particularly distressing aspect of the 208 modeling procedure is the indiscriminate mixing of instantaneous observation with data based upon annual averages. How, for instance, does a nutrient loading for the Peace River, constructed from annual average flows and

nutrient concentrations, relate to instantaneous concentrations in May 1977, or to the short-term productivity data which are being utilized to evaluate the effect of the nutrient load? Would not the load closely antecedent to the intensive survey be more relevant?

Conclusions

1) Charlotte Harbor is a highly dynamic estuarine ecosystem exhibiting both vertical and lateral stratification. Basic to any ecosystem model is a detailed understanding of flush patterns and internal currents. To produce such data would require a three dimensional hydrographic model not presently available (Graham, 1977).

2) The energy circuit for the model does not properly represent important relationships of the Charlotte Harbor system, most notably the nutrient and detrital cycles.

3) The data are insufficient for most of the necessary considerations for such a complex and theoretical model.

Recommendations

1) Due to the insufficiency of both the model and the available data, the evaluated ecosystem model for Charlotte Harbor should be stricken from the 208 document.

2) In the event that S.W.R.P.C. still desires to illustrate the model approach, we suggest the inclusion only of an appropriately modified energy circuit diagram.

Recommendations (Cont'd)

3) In the event that S.W.R.P.C. still desires to present the evaluated ecosystem model, we suggest at the very least that the three non-supportable conclusions (Chap. 6, p. 6-58, Draft 208 Plan) be stricken and that the remaining model discussion be first, adequately disclaimed in the text, and second, that each page in the model section be stamped *THEORETICAL* or *NOT TO BE ASSUMED ACCURATE* in a manner similar to the "For Discussion Purposes Only" stamp.

PRELIMINARY ESTIMATE OF SOME POINT SOURCES
ON THE PEACE RIVER

During the generic impact study for the phosphate industry EPA (1977) in February 1977 estimated the amounts of a number of constituents released into the Peace River. These estimates were the result of on-site monitoring by EPA personnel. The Environmental Quality Laboratory, Inc., as part of a monthly study program of the variation of concentration of various constituents in the Peace River, independently obtained data in February 1977. These two sets of data may be used to estimate the approximate magnitude of the phosphate industry's cumulative discharge.

Table 5 provides the water quality data for the Peace River in February 1977. Table 6 gives the estimated load in pounds per day for Zolfo Springs, Charlie Creek and Arcadia. Table 7 gives the estimated percentage of the cumulative phosphate industry's discharge at Zolfo Springs and at Arcadia. These values are valid for the month of February 1977.

The inescapable conclusion is that the phosphate industry's cumulative effect on river water quality is large. For conservative parameters such as phosphate, fluoride and total dissolved solids, about 60-75% of the pounds per day could be attributed to the industry at Zolfo Springs. Approximately 90% or more of the loads measured at Arcadia are established where Charlie Creek joins the Peace River below Zolfo Springs.

Any recommended 208 program must recognize that effective reductions in nutrients or other constituents associated with the phosphate industry's discharge is fundamental to controlling any existing or future problem. It appears that less than 40% of the load at Zolfo Springs is due to other point source discharge and non-point source discharge in February 1977.

This method has obvious limitations based on the assumptions concerning concentration and loads. These limitations do not prevent the conclusion that of the 85% total phosphorus load estimated by ESE for the Peace River into Charlotte Harbor, the phosphate industry's point source contribution was probably in excess of 50%. This means that about 40% or more of all phosphorus entering Charlotte Harbor was probably caused solely by the phosphate industry in February 1977.

There is little reason to believe that much of the dry season should be different in relative loading. However, wet season data should be collected to determine if the industry exerts a similar or different effect as far as loads are concerned. The concentration values are seasonal in the river and load may change.

This technique can be used to estimate concentration reductions for the Peace River. For example, if 76% of the ortho-phosphate is from a cumulative impact by an industry, then .76 times the concentration 3.62 mg/l as P (at Zolfo Springs) could be a recommended reduction goal. Thus, the desired concentration reduction in February 1977 at Zolfo Springs would be about 2.75 mg/l as P. Likewise, nitrate-nitrite would have a concentration reduction of 1.42 mg/l as N. Water concentration would be reduced to 3.62 minus 2.75 or .87 mg/l P. The effect, if any, by NPDES limits could then be examined to determine if these are sufficiently low to reduce the present concentrations.

TABLE 5

PEACE RIVER WATER QUALITY

16 FEBRUARY 1977

LOCATION	O-P mg/l as P	TP mg/l as P	TKN mg/l as N	NH ₃ mg/l as N	ORG N mg/l as N	NO ₂ /NO ₃ mg/l as N	F mg/l	TDS mg/l	FEBRUARY AVERAGE FLOW C.F.S.
Ft. Meade	2.63	3.09	2.64	.44	2.24	2.17	1.58	238	
Whidden Cr.	7.87	8.84	2.11	.06	2.05	.56	3.74	409	
Payne Cr.	.88	.93	2.09	.17	1.92	.90	1.23	166	
Wauchula	3.47	3.95	2.43	.17	2.26	1.82	1.78	288	
Zolfo Springs	3.62	4.28	2.51	.19	2.32	1.87	1.79	290	245.
Charlie Cr.	.31	.43	2.53	.07	2.46	.10	.26	110	36.8
Gardner	3.01	3.55	2.34	.06	2.28	1.28	1.28	216	
Brownville	3.62	4.18	2.47	.06	2.41	1.49	1.44	240	
Arcadia	3.31	3.86	2.24	.01	2.23	1.17	1.43	235	292.

TABLE 6

ESTIMATE OF POUNDS PER DAY OF SELECTED CONSTITUENTS AT ZOLFO SPRINGS, CHARLIE CREEK AND ARCADIA, FLORIDA
IN FEBRUARY 1977, AND FOR CUMULATIVE LOAD OF THE PHOSPHATE INDUSTRY

	Ortho- Phosphate	Total Phosphate	Fluoride	Total Dissolved Solids	Organic Nitrogen	Ammonia	Nitrate/ Nitrite
Zolfo Springs	4,784	5,657	2,366	383,298	3,066	251	2,469
Charlie Creek	61	84	52	21,838	488	14	20
(Zolfo Springs + Charlie Cr.)	(4,845)	(5,741)	(2,418)	(405,126)	(3,554)	(265)	(2,489)
Arcadia	5,213	6,050	2,225	369,940	3,219	15	1,841
Phosphate Industry ¹	3,620	3,930	1,832	239,078	419	615	1,085

¹EPA estimate for February 1977.

TABLE 7

ESTIMATE OF PERCENT COMPOSITION OF SELECTED CONSTITUENTS AT
ZOLFO SPRINGS, ZOLFO SPRINGS PLUS CHARLIE CREEK AND ARCADIA IN FEBRUARY 1977

THAT MAY BE ATTRIBUTED TO POINT SOURCE DISCHARGE FROM
PHOSPHATE MINES AND CHEMICAL PROCESSING PLANTS

Percent Phosphate Industry Load at ^{1, 2}	Ortho- Phosphate	Total Phosphate	Fluoride	Total Dissolved Solids	Organic Nitrogen	Ammonia	Nitrate/ Nitrite
Zolfo Springs	76	70	77	62	14	(Loss) -245	44
Zolfo Springs plus Charlie Creek	76	68	76	59	12	(Loss) -232	44
Arcadia	69	65	82	65	13	(Loss)	59

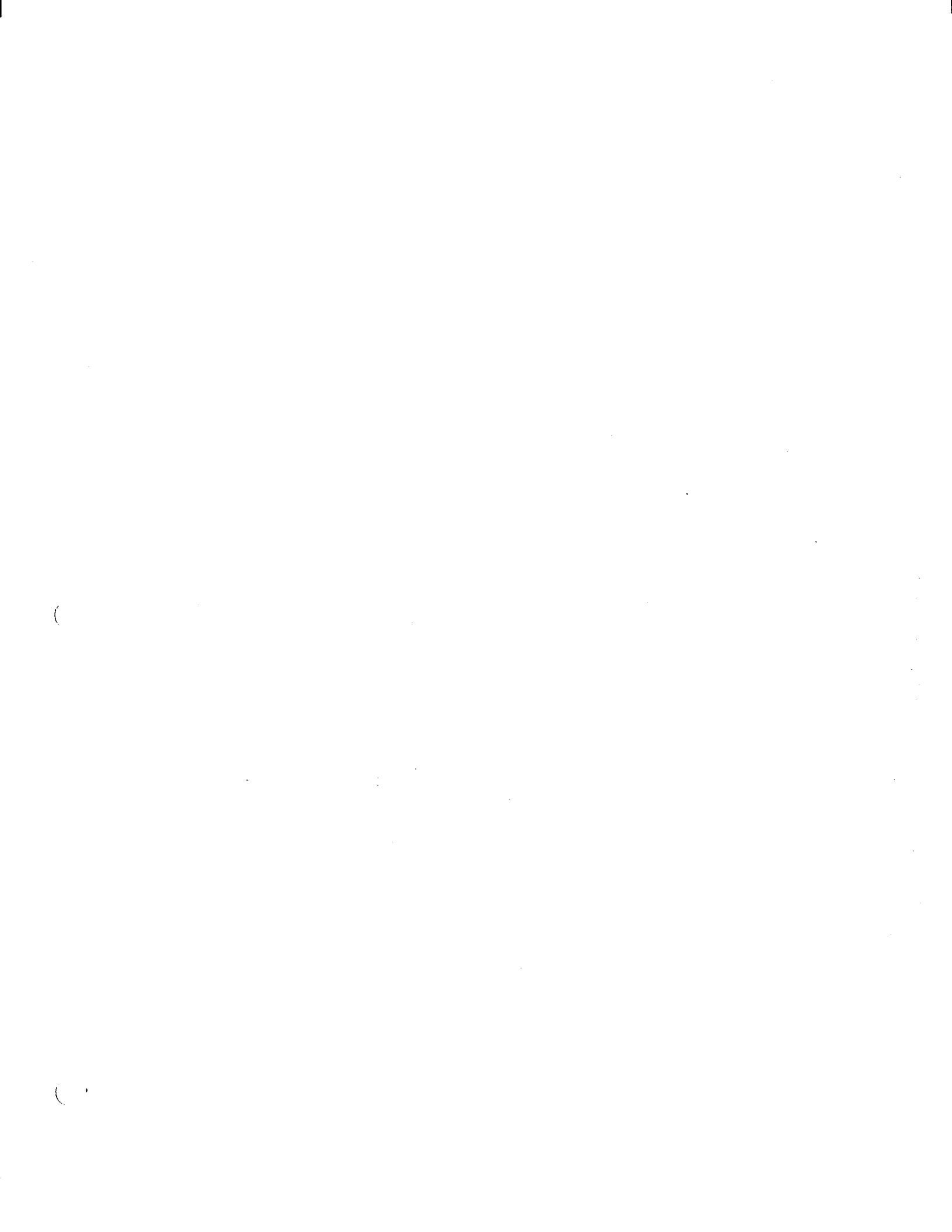
¹Assumes concentrations at Zolfo Springs, Charlie Creek and Arcadia did not vary during February 1977.

²Assumes all point source material discharged into the Peace River passes by each point analyzed.

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Response to Comments Received from
Dr. Jeffrey Lincer, Mr. Douglas James and Mr. Joe Roach

Although the comments received do not seem to require any specific response, the 208 staff appreciate the time and other contributions by these advisory committee members. The staff will also continue to pursue future funding for the Phillippi Creek/Sarasota Area in an effort to eliminate problems found in our initial water quality studies and to resolve potential conflicts which may exist between the 208 and 201 studies.



COUNTY OF SARASOTA

F L O R I D A

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P.O. BOX 8
SARASOTA, FLA. 33578
PHONE: 813/365-1000

July 12, 1978

Mr. Roland Eastwood, Executive Director
Southwest Florida Regional Planning Council
2121 West First Street
Ft. Myers, Florida 33901

Dear Roland:

As per the Council's request for comments and the Sarasota County Administrator's direction, the Sarasota County representatives to the 208 TAC have reviewed the draft 208 report. Please find this review attached for your perusal and action.

In response to my inquiry as to the distribution of these comments, David Burr assured me that the other TACs would receive a copy. We appreciate that service.

Sincerely,

Jeffrey L. Lincer, Ph.D.
Environmental Specialist

JLL:ms
Attachment

Xc: Douglas James, TAC Member and Director, Planning Department
Joseph Roach, Citizen TAC Representative
Ed Maroney, County Administrator

RECEIVED

JUL 13 1978

S.W. FLORIDA REGIONAL
PLANNING COUNCIL

COUNTY OF SARASOTA


INTER OFFICE MEMO

TO : Ed Maroney

FROM: Jeffrey L. Lincer, PhD. Environmental Specialist & TAC Member
Douglas James, Director of Planning & TAC Member
Joe Roach, Citizen TAC Representative

DATE: July 12, 1978

" SUBJ: Comments on Draft 208 Report



As per the request by Mrs. Clay and yourself, Sarasota County's representatives to the 208 Technical Advisory Committee have reviewed the draft 208 report. Please find our comments attached. These comments are also being sent to Mr. Roland Eastwood, Executive Director, Southwest Florida Regional Planning Council, in order that they arrive before the comment deadline date of July 15, 1978.

Although we found some problems with the 208 report, we felt they were not significant enough to reject the total study. In fact, and quite to the contrary, the publication has definite value and the recommendations as reviewed in the attached document should be implemented as soon as possible in order to help maintain or improve the quality of our water. The Sarasota County representatives to the TAC endorse the 208 report and encourage the County to formally do the same.

The second Board action that is necessary, is to give official direction to staff to pursue funding for continuing planning under the 208 program. We have discussed two such projects with the Southwest Florida Regional Planning Council that would likely qualify for seventy five percent funding. Since the County's twenty five percent contribution can be in the form of in-kind services, we are developing the details of that currently. In order that the County and Council staff not unnecessarily spend a great deal of time developing a proposal for EPA funding that might not be suitable to the Board, I recommend that staff be given an opportunity to present a brief outline of the projects we have in mind and the responsibilities and time frames for such a study as soon as possible. Since the Pollution Control Division would play a major role in these continuing studies, Mr. Russell Klier would make the presentation, accompanied by Doug James of the Planning Department and myself. I am sure that David Burr, present Council Co-ordinator for the 208 program, would be happy to be present at that BCC meeting also. With your permission, I will make those arrangements. If you have any questions, I would be happy to address them.

JLL:jy

Attachment

cc: Doug James, TAC Member and Director, Planning Department
Joe Roach, Citizen TAC Representative
Russell Klier, Director, Sarasota Pollution Control Division
Norm Thomas, Director, Sarasota Environmental Services Department
Larry Rhodes, Chairman SWFRPC.
✓ Roland H. Eastwood, SWFRPC. Executive Director
David Y. Burr, SWFRPC. 208 Project Director

AN ANALYSIS OF
THE "208" AREAWIDE WATER QUALITY MANAGEMENT PLAN
OF THE SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Intent & History of the 208 Program

" Authority and funding for the 208 plan were derived primarily from Section 208 of the Federal Water Pollution Control Act of 1972, PL 92-500, and the subsequently promulgated rules and appropriations. The purpose of the plan is to provide help to local units of government in identifying and controlling surface water pollution from non-point as well as point sources. The "208" Plan must incorporate the local "201" Wastewater Facilities Plans and consolidate the existing "303e" plans.

The Federal Act initially provided three hundred million dollars for 100% funding of the original plans which were to be developed in cooperation with the states under United States Environmental Protection Agency auspices. Additional federal funds have since been authorized to carry out the "continuing planning process" requirements under the Act. In addition to assuring continuing eligibility for federal "201" facility grant funds, the "208" plan provides for technical and management programs to be developed for use by local governments relative to urban storm-water drainage, agricultural run-off, and man-made water-system alterations such as canals and dredge-and-fill operations. Pursuant to a petition filed by Southwest Florida Regional Planning Council (SWFRPC), Governor Askew designated the region as a "208" planning area in March, 1975. A preliminary work-plan contemplating a \$949,000 program was prepared by the SWFRPC staff and approved by EPA in June, 1975. The region was divided into four areas: Area I - Sarasota Coastal Zone; Area II - Peace and Myakka River Basins; Area III - Caloosahatchee River Basin; and Area IV - Lower Florida Basin.

The governing bodies of the counties and municipalities within the designated 208 planning areas submitted nominees for appointment by the Council to Technical Advisory Committees (TAC) for each of the four Areas. These TACs met with SWFRPC staff during the fall of 1975 to discuss local water quality problems, goals, and priorities. In November, 1975 the Council contracted with consulting firms to perform specific elements of the plan. During the spring of 1976 the water quality study contractors met with the TACs to select specific water bodies for intensive water quality study. After several meetings, Phillippi Creek and Lemon Bay were selected in Area I and Charlotte Harbor in Area II. Extensive water sampling and land use surveys got under way in late summer of 1976. Due to an unusually dry "wet" season, the water quality study reports were not completed until the fall of 1977.

The Council staff has maintained an on-going public information and participation program during development of the plan. As the various staff and consultant reports became available they were presented and discussed at well-publicized meetings of the TACs. The staff distributed many announcements, press releases and newsletters. Staff also sponsored several public information meetings and made special presentations to public interest and environmental groups. Public hearings have been held during various phases of the plan development, the most recent of which was June 15, 1978, for the purpose of receiving public input into the draft SWFRPC "208" Arcawide Water Quality Management Plan.

General Limitations and Constraints of the Arcawide Water Quality Management Plan

Since November 1977, when the "Final Water Quality Study" reports were made public, there has been continuing discussion between the TAC members and the SWFRPC staff concerning the basis of the findings presented in the reports. These discussions were particularly lengthy in the case of the Phillippi Creek and Charlotte Harbor reports. These two water quality studies were designed to ascertain wet season pollution loadings contributed by specific land uses. Unfortunately, the sampling program was not begun until late summer 1976 and very few storms were encountered during the remainder of the water sampling period. Regardless, valuable data was collected concerning the contribution of various land uses to the pollution regime in area surface waters. Debate has centered, however, around the adequacy of this data to clearly reflect specific relationships between land use types and pollution loading.

Additional discussion has focused on the water quality standards that are presented in Chapter 5 (Water Quality Standards and Segment Classifications) of the 208 Plan. It has been argued that these standards have been developed from models that may not be applicable to local conditions. Based in part upon these arguments, the nutrient concentration standards have been termed "interim" by the SWFRPC staff. In order for the "interim" aspect of these standards to be placed in proper perspective, the limitations of the modeling techniques presently presented in Chapter 6 (Water Quality Assessment) should be presented here (Chapter 5) and in the Executive Summary.

Numerous concerns have been expressed by the TAC members and the general public regarding the water quality report. Although these concerns are not now addressed in the report, it is our understanding that they will be so addressed in an appendix. (We are pleased to find that sections of the draft document dealing with "Control Alternatives" already reflect much of the public comment that has been made)

Comments on the Continuing Planning Process (Phase B)

A continuing 208 program (Phase B) is necessary if the findings of the initial phase of the 208 process are to be implemented. As indicated in Chapter 14 (Regulatory Programs), three priority areas, including Phillippi Creek, are the most ambitious in their recommendations.

For the most part, Sarasota County already has adequate staff and authority to carry out the relevant regulatory requirements of Chapter 14 and it is simply a matter of assigning responsibilities in many cases. For the non-regulatory requirements, these can be addressed, for the most part, in the continuing 208 program.

According to Chapter 14, the recommended areawide nonpoint source control should include a 208 Continuing Program, which would address:

1. An Annual Update;
2. The Administration of a Plan Development, and;
3. Future studies

In addition, and as reflected by Table 14.3-2 of that Chapter, specific recommendations for the Phillippi Creek and similar drainage systems include:

(From Table 14.3-2)

Recommended Phillippi Creek/Sarasota Nonpoint Source Control Programs

- A. Urban Control Techniques
 1. Septic Tank Programs
 - a. Installation Ordinance
 - b. Use - Maintenance Ordinance
 - c. Inventory - Analysis
 - d. User Information
 2. Erosion Control Ordinance
 3. Stormwater Control Ordinance
 4. Maintenance Programs
 - a. Ditch & Canal Maintenance
 - b. Street Sweeping
 - c. Catch Basin and Storm Sewer Cleaning
- B. Agricultural Program
- C. Control Monitoring

We recommend that these techniques be implemented by the Board of County Commissioners as soon as possible.

We are of the opinion that one of the most valuable features of the initial phase of the 208 Program has been the identification of data constraints and associated areas of ignorance. Without a doubt, we have discovered how little we know about Phillippi Creek, a major drainage basin in the County, and how this and similar runoff sources are affecting our bays; bays which are the very foundation for much of our recreation-based economy.

In addition, we have learned how some land-uses (such as phosphate mining) may be major local and regional contributors to the nutrient loads of streams, which originate (and are polluted) outside our County's boundaries. The Charlotte Harbor study has shown how the Peace River has been so impacted. It is reasonable to assume that the Myakka River could also be similarly affected if projected phosphate mining activities are realized.

In order to meet the goals of P.L. 92-500 by 1983, the County Administrator has directed County staff to begin discussing the logistics and planning for Phase B of the 208 Program with the Southwest Florida Regional Planning Council staff. To date, we have identified two projects, the results of which will play major roles in helping Sarasota and the Region to once again have high quality water for man, fish, and wildlife. These two tentative projects are as follows:

I. Sarasota/Roberts Bay Study

This would be aimed at characterizing the health of these bays, as reflected by physical, chemical and biological characteristics. It would also include a more intense examination of the pollution input of septic tanks specifically, and different land uses generally, within and outside of the Phillippi Creek Basin.

II. Myakka River Study

This would be the first concerted effort to provide adequate baseline data for a complex, natural river system that will undoubtedly be the recipient of increasing perturbations caused by upstream phosphate mining and local land use changes including effluent irrigation.

Preliminary discussions have begun on these two projects and the details of management, staff responsibilities, timeframes, and costs will be forthcoming. With Sarasota's existing technical staff and monitoring capabilities, it will not be difficult for the County to provide the necessary resources and carry out a three year, Phase B program aimed at filling identified gaps in our knowledge and

providing specific recommendations for increasing the quality of our water.

Conclusions and Recommendations

The 208 planning effort to date must be viewed within its true context as the first component (Phase A) of an ongoing water quality planning program. The resolution of conflicts which may exist between the 201 and the 208 documents, the elimination of any identified 208 data deficiencies through a rigorous water monitoring program, and the maintenance of the 208 document itself as new monitoring data become available represent three critical steps of an ongoing water quality planning program. These three steps, which would represent Phase B of the water quality planning program, should be initiated and jointly implemented by the SWFRPC and Sarasota County Government immediately upon local acceptance of the concepts embodied in the 208 plan.

The necessity of this ongoing planning effort (Phase B) has been recognized by the United States Environmental Protection Agency (EPA). Indeed, the regional office of the EPA, located in Atlanta, has allocated approximately \$9,000,000 for this fiscal year to assist local governments in carrying out the Phase B planning steps. Application for a share of this \$9,000,000 should occur as soon as possible. If Sarasota County's application is successful, the required twenty-five percent local match can be provided through the provision of in-kind services.

The various constraints and limitations associated with the 208 plan are not sufficient to warrant a rejection of the plan. Such deficiencies are probably not unique with this project since similar water quality planning efforts are being implemented for the first time by a multitude of the regional and local governments throughout the country. In addition, the steps associated with Phase B should be more than adequate to ensure that any Phase A deficiencies are eliminated. Therefore, the Sarasota County representatives to the 208 Technical Advisory Committee recommend that the Board of County Commissioners endorse the proposed 208 water quality plan and initiate steps to immediately develop the Phase B grant proposal.

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Response to Comments Received From
the Charlotte County-Punta Gorda Planning Council

Comments noted. Since the cut-off time for official comments is July 15, 1978, any comments received after that date cannot be responded to in this plan. However, any significant comments received at a later date may be addressed during the continuing planning process.



CHARLOTTE COUNTY-PUNTA GORDA PLANNING COUNCIL

Room 213, Courthouse — Punta Gorda, Fl. 33950
813-639-6633

July 14, 1978

Roland Eastwood, Executive Director
Southwest Florida Regional Planning Council
2121 West First Street
Fort Myers, Florida 33901

Dear Roland:

Presently, I am in the midst of review of your council's 208 Water Quality Plan and, unfortunately, will not be able to comply with the time constraint imposed at the public hearing of June 15, 1978. Hopefully, you will be agreeable to accepting my planning council's comments which should be available in the near future.

Generally, the procedures I planned on following were those established at the Charlotte Harbor Technical Advisory Committee of May 19, 1978. These procedures were:

1. The formation of a technical panel of four (4) persons to review the Charlotte Harbor 208 Water Quality Studies, and
2. The formation of an Area II Advisory Committee, of which I am a member, to review the conclusions and recommendations of the technical panel. We would then report back to the entire Charlotte Harbor Technical Advisory Committee with our recommended changes to the 208 Water Quality Management Plan.

Unfortunately, with vacations and other commitments of the Committee, it has become impossible to meet the time limit. I expect that my review, concurrence by my planning council, the City Council and the Board of County Commissioners will take at least two or three weeks. Hopefully, even at this late date, our recommendations will be of assistance in providing the best available plan for our region.

Finally, you and the 208 staff are to be commended for all

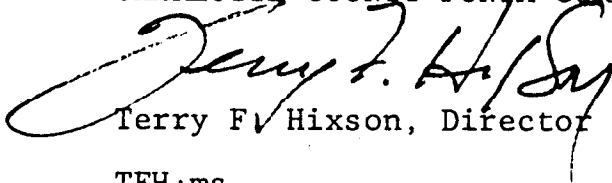
Mr. Roland Eastwood
July 14, 1978
Page 2

the time and effort expended in the long and tedious development of the Water Quality Plan.

If you have any reservations or comments on these procedures or an alternative, please let me know.

Sincerely,

CHARLOTTE COUNTY-PUNTA GORDA PLANNING COUNCIL



Terry F. Hixson, Director

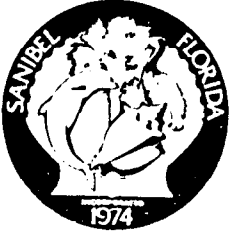
TFH:ms

Response to Comments Received From
the City of Sanibel

The City of Sanibel, for this phase of the 208 Program, was not directly included in any of the Water Quality Study Areas. As outlined in the 208 Plan, the Caloosahatchee River east of the Franklin Locks was only studied. As a result the current 208 Plan does not specify any nonpoint source pollution control programs for the City to implement.

Because of the extent of nonpoint source pollution found in all our study areas, however, an areawide control program, including the City of Sanibel, is recommended for the entire SWFRPC region. The nature of this program is non-regulatory, at present, and is merely suggesting the use of Best Management Practices (BMP').

The inclusion of the City of Sanibel in a regulatory program could take place during the continuing planning process. Chapter 19, The Continuing Planning Process, outlines future water quality study for the Downstream Caloosahatchee River Estuary. This type of study will now be only 75% funded by EPA in the future so the timing of the future study is uncertain at this time.



City of Sanibel

P. O. Drawer 436
Sanibel, Florida 33957
Phone (813) 472-4135

June 21, 1978

Mr. David Burr
Southwest Florida Regional Planning Council
2121 West First Street
Fort Myers, Florida 33901

Dear Mr. Burr:

At yesterday's regular meeting of the City Council, the 208 Program for this area was discussed. The general feeling of the Council was that this program looks good and efforts should continue to adopt it. However, we were a little uncertain as to how this program applies to the City of Sanibel and to the westernmost part of the Caloosahatchee River from the Franklin Locks to Pine Island Sound. We would appreciate having these comments incorporated into the public hearing records.

Thank you for your kind consideration.

Sincerely,

A handwritten signature in cursive script that reads "Zelda P. Butler".

Zelda P. Butler
Mayor

ZPB/gb



JUN 22 1978

S.W. FLORIDA REGIONAL
PLANNING COUNCIL

Response to Comments Received From
the Florida Power and Light Co.

1. The creation of a special committee will be considered. Perhaps this could be incorporated into an interagency advisory committee.
2. The 208 staff agrees with this comment.
3. The 208 staff agrees with this comment.



July 13, 1978

Mr. Roland Eastwood
Executive Director
Southwest Florida
Planning Council
2121 West First Street
Fort Myers, Florida 33901

Subject: Draft 208 Water Quality Management
Plan for Southwest Florida Region

Dear Mr. Eastwood:

Thank you for the opportunity to comment on the Regional Water Quality Management Plan. We have reviewed the Draft Plan and offer the following:

1. To assist local government organizations who will have the responsibility for implementation of the plan, we suggest a special 208 Committee from each local utility liaison group be formed.
2. To minimize or avoid future conflicts in placement of facilities, utility coordination should begin soon after plan adoption by the local government.
3. Where the accomplishment of program objectives is found to require relocation or adjustment of existing utility facilities, the program scheduling should provide adequate lead time for design coordination, and program funding should provide for reimbursement to utilities for relocation costs incurred.

The Florida Power and Light Company will continue to cooperate with local governments and the regional planning council wherever we can be of assistance.

Yours truly,

A handwritten signature in cursive script that reads "John W. Deeds".

John W. Deeds, P. E.
Governmental Services
Division Administrator

JWD:dks