JANUARY 30, 2008 DRAFT MINUTES

FLORIDA KEYS NATIONAL MARINE SANCTUARY
WATER QUALIRY PROTECTION PROGRAM

STEERING COMMITTEE MEETING

Members Present:
Shelly Trulock – South Florida Restoration Branch, U.S. Army Corps of Engineers/Jacksonville District
Cecelia Weaver – South Florida Water Management District
Jody Thomas – South Florida/Florida Keys Program, The Nature Conservancy
Gerald Briggs – Bureau of Onsite Sewage Programs Florida Department of Health
Greg May – Executive Director, South Florida Ecosystem Restoration Task Force, Intergovernmental Coordination Group
Sandy Walters – SWC, Inc., local environmental consultant, representing maritime interests of the Florida Keys
Charles Causey – Florida Keys Environmental Fund
Clyde Burnett – Mayor and City Manager, City of Key Colony Beach
Bruce Popham – Chairman, FKNMS Advisory Council
Bob Johnson – Research Director Everglades & Dry Tortugas National Parks
Jim Reynolds – Executive Director, Florida Keys Aqueduct Authority
Pete Worthington – Mayor, City of Marathon, representing city of Marathon and welcome to the Committee and all the members of the public to our great meeting facility.
Billy Causey – Southeast Regional Director, NOAA's Office of National Marine Sanctuaries
Gary Bauman – Chairman, Key Largo Wastewater Treatment District

I. **Opening Remarks:** Mr. Richard Harvey - Director, South Florida Office, U.S. Environmental Protection Agency, Region 4 and Mr. Jon Iglehart - Director, South Florida District, Florida Department of Environmental Protection

Mr. Harvey welcomed everyone. Members introduced themselves.

A. **Review Agenda:** Richard Harvey

B. **Discussion and Approval of Minutes:** Richard Harvey - Steering Committee Vote

Mr. Harvey requested that approval of minutes of last meeting be deferred until after lunch.

Mr. Harvey summarized the major accomplishments of the WQPP during the past 13 years. They are as follows:
1. Monitoring of the water quality, seagrass habitats and coral reefs of the Florida Keys has been underway for 13 years. The funding for this effort has been sustained during this time and the principal investigators have remained basically the same. The monitoring program is one of the pre-eminent programs in the world.

2. Phase II of the Little Venice Monitoring project to document changes in water quality with the implementation of the upgrades is continuing under the guidance of Dr. Joe Boyer.
3. A working group consisting of members of the Steering Committee, Management Committee and others was formed to finalize a Water Quality Communications Plan. This plan was used in implementing Water Quality Awareness Month (WQAM) for February 2008. This is the second year for WQAM.
4. The overall comprehensive evaluation of the Water Quality Protection Program and Science Program for the Florida Keys National Marine Sanctuary was completed (cost = $125,000).
5. EPA has provided $40,000 to the University of North Carolina Environmental Finance Center to help provide environmental financial recommendations and assistance to communities and local government of the Florida Keys.
6. Dr. Bill Kruczynski has been working on a book titled "State of Knowledge of the South Florida Marine Ecosystem" that will provide valuable information to people in the future.
7. Two additional scientific papers were published in 2007, and to date, over 50 papers have been published on water quality, seagrass, coral reef ecosystem here in the South Florida and the Keys.

Dr. Billy Causey congratulated EPA because the long-term monitoring program is world class and is recognized because of its comprehensiveness and the way that it is integrated. Dr. Causey also recognized the State, the County and cities for their efforts in supporting the program.

II. Review and take Action on the Proposed FY 2009 Budget for the Water Quality Protection Program: Mr. Fred McManus – U.S. EPA, Region 4

Mr. McManus explained that EPA submits budget requests well in advance to increase the chances of securing the required funds.
The proposed FY 09 budget is similar to proposed budgets for past fiscal years:

- EPA plans to continue to provide funds for comprehensive long-term status and monitoring projects: water quality, coral reef and seagrass monitoring projects.
- Continue funding Fish and Wildlife Research Institute to manage the data from the programs.
- Continue to fund co-location of Dr. Bill Kruczynski's office with the Sanctuary at the $5,000 level.
- Continue to support public education and outreach. We recognize the great job that Billy, Dave and their staff do with public education and outreach, especially associated with our new communications plan that was finalized last year.
- SEAKEYS Project was provided funds for FY 08 & FY09. This is done two years at a time.
- Continue to provide funding for the Little Venice Water Quality Monitoring Project
- Provide $100,000 for "The State of Knowledge" document being developed by Dr. Bill Kruczynski.
- Funding has been increased for Water Quality Monitoring and the seagrass monitoring projects. This is necessary because in 1995 at the initiation of these projects, FIU reduced their indirect cost rate. However, FIU is no longer going to be able to give us that reduced rate and EPA is now at the same rate as other agencies.
- EPA has secured funding for the Little Venice Project, but the $100,000 from FDEP is subject to approval by the Florida legislature. EPA trusts that it will be forthcoming because it is one of the most critical, targeted monitoring projects in Florida Keys and there is a need to demonstrate the

water quality improvements as a result of the building, construction and implementation of the Little Venice wastewater system.

One question was asked regarding what will be done with the $5,000 when Dr. Kruczynski retires. Mr. McManus stated that he had not discussed that matter with Atlanta, Another question was asked concerning what funds will be given by NOAA for the coral reef and seagrass monitoring programs. Mr. McManus stated that the NOAA funding level is uncertain at this time. Dr. Causey added that the Sanctuary is under a continuing resolution and the new budget has not been determined yet, but they are trying to secure funds for these programs. Mr. McManus explained that if the funds from NOAA did not become available that he might be able to fill in the gap, but he needed to know soon about the funds. Mr. McManus noted that EPA's funding is a line item in the President's budget. As mentioned in the last Steering Committee meeting, the South Florida Geographic Initiative is in the EPA's new strategic plan for 2006-2011 and that helped us secure funding for this year and future years, but the exact budget is not really known in advance.

Another question concerned what NOAA had planned for public education and outreach with the $30,000 that is coming from EPA. Dr. Causey stated that the Sanctuary's education team is large and can do the outreach needed. He then thanked everyone for their hard work. He also thanked the U.S. Army Corps of Engineers for their contribution of $180,000 for monitoring when NOAA didn't have the funds.

Dr. Boyer inquired as to how many more years the Little Venice monitoring will continue and whether the collected information was readily available on web. Mr. McManus responded the data is readily available. EPA funds should carry the project through January 2009 and hopefully DEP funds will kick in to carry the project through June 2009. Dr. Boyer explained that at this time, nutrients are still being analyzed, but fecal coliform is not since it is not a very good indicator in sea water. Microbial source tracking has been added with the idea of looking toward more specific human bacteria versus those from birds, dogs, etc. The annual report will be sent to Mr. McManus and then added to the web page after review. Individuals can also be added to the distribution list. Mr. Reynolds pointed out that he gets asked a lot about Little Venice and it would be nice to refer them to the web page. Almost 100% of the homes in Little Venice have been hooked up to the central collection system at this time.

Mr. McManus explained that the water quality monitoring results from the Little Venice are not a "slam dunk", but there are some encouraging results; things are moving in the right direction with some of the parameters. Mr. McManus opined that the human pathogens may be the "slam dunk" to demonstrate definite improvements are being seen because of the Little Venice wastewater management system.

<u>Review of total contributions from various agencies:</u> (see chart/slide)

- EPA Total $1,195,000 - 74.4 %
- NOAA Total $310,000? -19% and hopefully that question mark will disappear.
- SFWMD Total $0 (Cecelia) - hopefully will come back to the table since the comprehensive evaluation of the WQPP and Sanctuary's Science Plan has been completed and specific recommendations have been made.
- FDEP TOTAL $100,000** 6.2% (subject to approval by Florida Legislature)
- Monroe County was not able to provide funding for 2009 budget.

Total Funding South Florida Geographic Initiative:

FY 2008 funds available - $1,565,000
WQPP scheduled to receive about 76.3%

SFGI is a part of EPA's Strategic Plan for 2006-2011 and that should assist in securing continued funding. However, EPA thinks that they will receive $1.565 million, with 76% of those total funds going to WQPP. For the last 3 or 4 years, funds for the WQPP have been about 70-75% of all the funds available to the South Florida Geographic Initiative. The EPA is dedicated to this program and wants to continue to support to the critical program and projects associated with it.

Ms. Thomas noted that this program has been extraordinarily successful and thanked EPA for their stewardship of it. Ms. Thomas pointed out that there is a renewed urgency about climate change and that this topic should be addressed and discussed as this program moves forward. Ms. Thomas supports this budget.

Mr. Harvey addressed the climate change question stating that climate change could be incorporated into the ongoing evaluation of the water quality program and science programs. Other agencies that have ongoing efforts also have a responsibility to address climate change and its impacts on biological resources. EPA recently completed a document addressing climate change and global warming but has not yet been released yet to the public. This document should be released fairly soon.
Dr. Causey added that there are some very important things that should be done to help protect coral reefs and some of these will be discussed later today. Some of these actions include:

1. Reducing pollution, sedimentation and over exploitation of coral reefs
2. Managing island catchment areas better, (Australian way of saying storm water runoff)
3. Putting more reefs in marine protected areas

Land-based sources of pollution should continue to be addressed.

Mr. Harvey added that Region 4 has an independent exercise underway. They have developed a regional plan to address global warming and climate change and, as an integral part and a significant part of that, clean energy is addressed. The two cannot be separated if greenhouse gases are to be reduced. This plan has not been released yet, but it does contain some comments about the Florida Keys National Marine Sanctuary's third largest coral reef ecosystem in the world and the WQPP.

Ms. Thomas agrees with Dr. Causey: the way to make our reefs most resistant or resilient to climate change is to manage them as best we can and that means getting a handle on all this so that the reefs are not disconnected. Ms. Thomas would like the committee to acknowledge that and discuss this topic further.

Ms. Weaver addressed Mr. McManus' comments on the contribution to the overall budget made by SFWMD and expanded on Dr. Causey's comments on storm water runoff being really important. The SFWMD is focusing on its core mission, namely storm water quality improvement. The District provided $2.565 million to the Florida Keys in FY 08 for storm water quality improvement programs primarily with the municipal governments. Although the District is not contributing to specific Water

Quality Protection Program projects, they are actually funding improvements on a huge scale with millions of dollars each year.

Mr. Harvey added that another EPA program that is not represented in the proposed budget is the South East Florida Coral Reef Initiative, which deals with coral reef issues in Dade, Broward, Palm Beach and Martin Counties. That group also deals with land-based sources of pollution and their impacts on the coral reefs, as well as impacts of the marine industry, fishing, and other types of activities that impact the corals. The SFWMD representative participates in that effort as well.

Mr. Bob Johnson pointed out that the South Florida Ecosystem Restoration Task Force has a science coordination group. A two-day workshop on climate change and how it relates to the South Florida restoration initiative is planned for mid-February (February 6-7). The plan is to review all research that has been done that ties climate change and restoration together, including how the freshwater is managed. This will be a good review of all the work that has been done, primarily from the federal government side. The U.S. Geological Survey is the lead.

Mr. Harvey is hopeful that the next administration about a year or so away will have more emphasis and financial support for dealing with these types of issues.

Mayor Worthington asked if there is line item about the black water issue, i.e. the bloom that's been going on in South Florida Bay for a year and half now? Mr. Harvey pointed out that such bloom events are indirectly monitored through Boyer's work, but there is nothing specific to address bloom issues.

Ms. Weaver pointed out that the SFWMD is one of the players that is involved in planning an algae bloom workshop for March 14th and a public workshop on March 13th. This is being headed by FKNMS scientist Scott Donahue. She added that the SFWMD has spent over a million dollars in in-kind and analytical services since the persistent bloom in southern Biscayne Bay and northeast Florida Bay started a couple of years ago.

Ms. Walters moved to approve the budget and Mr. Bauman seconded the motion. The budget was approved without objection.

III. Update on the Development of the Comprehensive Report Summarizing the State of Knowledge on the Florida Keys Ecosystem: Dr. Bill Kruczynski – U.S. EPA

Dr. Kruczynski explained that the purpose of his presentation is to update the Committee on the progress of a book that is planned to communicate what is known about water quality and other related topics pertaining to the ecology of the area to mangers and citizens. This book will hopefully address some of the recent miscommunication problems that arise when disseminating the scientific results of various projects.

The original idea of the book was very manageable, and involved summarizing what has been learned over the past ten years in the FKNMS. Since that time, other entities have asked to be part of the book, including the Florida Bay Program Management Committee (PMC). They would like to achieve better communication to the public about results from Florida Bay and Biscayne Bay projects. So, the book "mushroomed" into a summary of the south Florida marine ecosystem. The title will be changed to

reflect that broadening of the topic. It may be something like “Some Interesting Facts about the South Florida Marine Ecosystem” or “Everything you wanted to know and didn’t know who to ask about the SFME.”

The book is designed to be a collection of fact pages authored by scientists. The pages can be reorganized as needed to customize fact sheets/handouts for different people. The scientific experts have been brought together to draft the fact pages through a series of workshops. Several workshops have been held covering the topics of coral, water quality, seagrass, lobster, etc. Dr. Kruczynski provided some draft pages of the book for everyone to view. Mr. McManus will be writing about the establishment of the Florida Keys National Marine Sanctuary and the WQPP. About 15 experts are drafting the oceanography pages, 12 experts on the coral reef pages, 10 experts on the seagrass pages. Spiny lobster and queen conch biology are also being written. There will also be pages on manatees, turtles, big sharks, bonefish, the economy, health of the ecosystem, fisheries and effects of hurricanes, everglades restoration, mosquito control operations, pollution, canals, shallow injection wells, and other related topics.

Completion of the draft is expected in early 2009. Sea Grant and Island Press have expressed an interest in publishing the book. Dr. Kruczynski indicated that he would provide the first draft to the Technical Advisory Committee (TAC) for their review. When approved by the TAC it will be given to the Steering Committee for review. When approved members of the Steering Committee can add their logos on the cover. If it is available for sale in the Eco-Discovery Center and other places, the Sanctuary Friends Foundation of the Florida Keys will receive the funds, which will then be made available for scientific research.

Ms. Walters offered to discuss printing with Dr. Kruczynski. She used to own a printing company and is knowledgeable about the technical aspects of printing.

Dr. Kruczynski mentioned that he had submitted a proposal to the Mote Licence Plate fund for Sea Grant person who has been helping with the project for another two years. He added that he had shown the WQSC a copy of the Moreton Bay book, an illustrated book produced in Australia about the Great Barrier Reef and related topics. Some of the Moreton Bay Book illustrators have moved to the states and may be available for working on illustrations. They would be paid out of the $100,000 of EPA funds.

Mr. Greg May thanked Dr. Kruczynski for his good work in communicating these really complex scientific issues. The Task Force has a duty every two years to report the activities and status of the restoration to Congress or the Legislature and Tribes. Part of the way this will be done in 2008 is using a very small set of system wide indicators that have been developed by working with the scientists. This will be a 3-tiered approach, with all information available at the lowest tier. By the simplest level 1, symbols like a stoplight will be used along with quick narrative. This approach will be presented to the Task Force at the February meeting.

Mr. Iglehart made the suggestion to make sure that the metrics are translated to those that are understandable by more of the population. He also suggested that Dr. Kruczynski consider a loose-leaf type of book so that it could be updated easily and it could then be printed on demand and customized for the reader.

Mr. Johnson added that the Park Service can get involved with this book and has funding to put toward this and the science preview that we never closed the loop on. The Park Service has a 5-persons communications staff and does a lot of similar graphics.

IV. Review Task 7 Final Report on the Evaluation of the Long-Term Monitoring and Special Studies Projects of the Water Quality Protection Program and Florida Keys National Marine Sanctuary Science Program: Fred McManus/Bill Kruczynski/Richard Harvey – U.S. EPA, Region 4 and John Hunt – Florida Fish and Wildlife Research Institute.

Mr. McManus explained that each member should have received a copy of the Task 7 Report which is the independent evaluation of the Water Quality Protection Program and the Sanctuary's Science Plan. The report was made available to all the Steering Committee members for review. For this agenda item, Mr. McManus provided background information. Dr. Kruczynski then reviewed the recommendations made by the contractor Battelle in the Task 5 Report and Mr. Hunt summarized the recommendations and comments of the FY07 Science Advisory Panel (SAP).

Mr. Mc Manus explained that the WQSC recommended that we perform an objective independent review of the Florida Keys science program, including the comprehensive long term monitoring and special studies projects associated with that program. EPA provided the funding from the South Florida Geographic Initiative. The final cost was about $110,000 (and not $125,000 as originally predicted).

The statement of work included developing a work plan and an associated budget. These were provided to EPA in April 2007. Task 2 was a compilation, review, and summary of the annual reports and final reports of the monitoring projects and special studies. The contractor was also asked to review and be familiar with the 1998 "white" paper that was developed by Dr. Kruczynski.

Task 4 involved reviewing the recommendations of the 2007 Science Advisory Panel and examining the 2002 Sanctuary Science Plan. The Task 5 Report summarized the science program, including Battelle's recommendations.

Task 6 concerned conducting a workshop consisting of the Science Advisory Panel (SAP), a group of independent scientists, to provide an objective review of the program.. Some of the members in 2007 SAP were also on the 2000 SAP. Task 7 was to prepare a final report based on the comments and recommendations of the science advisory panel members and others in attendance at that meeting.

The Task 5 Report included suggestions and recommendation on revisions and updates to the various programs and project associated with the WQPP and the Sanctuary's science plan. The reviewers looked at things like duplications of effort and whether or not there were opportunities to streamline the work being conducted, integration and correlation of data sets as a result of all the work has been done to date. They were also asked to look at any practical special studies on wastewater and storm water in the Florida Keys and suggest methods to improve networking. Effectively communicating scientific results is critical to being successful in any of our efforts. Good communication allows the stakeholders to take action to reduce land based sources of pollution and other things that are negatively impacting the environment. Finally, analysis of whether or not the data collected to date has been useful for the

managers and elected officials in the Florida Keys. The Task 5 Draft Report was delivered to EPA on August 28, 2007.

The SAP meet on September 20, 2007 at Key Colony Beach City Hall. The following topics were reviewed: the Water Quality Protection Program monitoring and special studies projects, the Sanctuary's Science Plan and the Task 5 draft report, which included the recommendations from Battelle. Discussions took place with elected officials and managers who were able to attend the meeting and with the Science Advisory Panel. At the end of the meeting, the Science Advisory Panel formulated a list of comments on the Battelle recommendations and the WQPP in general. Their specific recommendations were to be included in the Task 7 Report.

The members of the Science Advisory Panel for 2007 are:
Dr. Jane Caffrey – University of West Florida
Mr. John Hunt – Florida Fish and Wildlife Conservation Commission/FWRI
Dr. Ron Kneib – University of GA Marine Institute, Sapelo Island
Dr. Marguerite Koch – Florida Atlantic University
Dr. Ester Peters – Tetra Tech, Inc.
Dr. Rob Van Woesik – Florida Institute of Technology

Representatives from NOAA and the Sanctuary, EPA, FDEP, FWRI, SFWMD and the Army Corps of Engineers, Battelle, Monroe County, and members of the WQSC (Ms. Thomas, Mr. Reynolds, Mr. Popham and Mr. Burnette) also attended the workshop.

The Task 7 Final Report includes revisions to the Task 5 Draft Report, recommendations of the Science Advisory Panel, comments from elected officials and managers, and other work group attendees were included. That document was delivered to EPA on November 21, 2007.

Dr. Kruczynski summarized the comments made by Battelle, the contractor:

Generally, there has been minimal coordination (except WQMP/SMP). The CREMP has not integrated WQM data into their annual reports (report scheduled for FY 08 and PI meeting in 12/07). However, there is a current effort to link water quality to the coral reef monitoring data. It is imperative that all projects share/transfer information and ideas on a regular/continuing basis.

An adaptive approach to ecosystem studies by projects (WQMP,CREMP, SGMP) has occurred, but this approach has not been utilized overall by the WQMP.

The contractors recommended that all data be housed on one website. That does not seem to be practical since scientists do not want to give up their own websites. However, all data is provided to the FWRI lab in St. Petersburg and is available on a website that they maintain. The three main projects in the Water Quality Monitoring Program did agree to consider having cross references for the three websites., Mr. McManus pointed out that he could find no one who agreed with eliminating the individual project websites.

The report recommended holding a conference on a regular basis to improve sharing and information transfer.

Battelle also recommends the following:

*Improved collaboration between all stakeholders
*Monitoring optimization efforts conducted
*Additional statistical reviews of data sets to determine if/how monitoring projects could be streamlined spatially/temporally
*Comprehensive cost-benefit analysis to determine any cost savings associated with reducing sites/frequency of sampling
*Evaluate use of remotely sensed data being incorporated into projects (cost savings)

Dr. Kruczynski explained that historically the PIs have done optimization studies on a regular basis and that will continue to be done in the future. They will also continue to work on streamlining sampling efforts, data analysis, and regularly conduct cost-benefit analyses. The use of remotely sensed data might result in a cost savings. It is important that the seagrass and coral reef monitoring remain consistent with past efforts so that data are comparable. However, remote sensing might be used as a supplement to that work.

An important recommendation is that the sanctuary and EPA host a technical transfer conference like the one on *Connectivity* or the one held by the Florida Bay Program Management Committee. The goal of this kind of workshop, to be held about every two years, is to set adaptive management goals. This will bring the scientists together in a structured way and that will aid in integrating data sets. They will also serve to educate the public. Dr. Kruczynski added that it is time for the Management Committee of WQPP and Sanctuary staff to start thinking about and discussing this in some detail.

Mr. Popham informed the group that the SAC has conducted workshops in the past for the public and could be involved in this effort, too. Dr. Kruczynski replied that the Management Committee needs to meet and talk about and learn more about the best method of transferring information.

Mr. May commented that the results from the February meeting will be available on the internet (www.sfrestore.org). Dr. Boyer pointed out that there is an important paper on ecological indicators (animals) that will available on that site as well.

Ms. Pat Bradley added that the EPA Science Board has been trying to get science out and has given presentations and demonstrations and have actually worked pretty well in the past.

Mr. Hunt was the local representative on the SAP. He began by addressing the first general recommendation. It it is absolutely necessary to continue the monitoring projects that are on the funding list. This monitoring has been useful in many ways and will continue to be so. Support for the special studies also needs to continue. Special studies have helped in understanding the processes that drive change in this ecosystem and have assisted with the interpretation of the monitoring data. They could be very important in the future, too. They agreed that communication is the key to bringing this information to the public and the use of communication tools like cartoons/symbols could be very useful, even at scientific conferences.

Some integration of the monitoring projects still needs to be pushed forward and the SAP was glad to hear that some efforts have already started in this area. The capacity to respond to events is needed to track changes and is currently missing in the Water Quality Monitoring Program. Maybe instrumentation in the field could assist with this task, along with funds that can be used when needed to respond to field events.

The coral program still needs some rethinking. In addition to focusing on percent cover, they need to address species composition changes over time, size, frequency, functional forms, etc. In the science arena, the existing data could be synthesized and used to formulate a hypothesis as to what is happening down here that could be tested through special studies.

Suggestions for special studies are as follows: link water quality monitoring information with remote sensing data to associate processes with water quality standards and events; integrate the hydrodynamic models that are fairly well-developed for south Florida, both on a small scale and larger scale, to interpret water quality data. Another possible special study would involve integrating the various projects to synthesize these long term data monitoring and mechanistic results and use that data to develop hypotheses. This approach is effort intensive. It is important to try to better and more completely understand why the hatchery communities and hardbottom communities are responding differently to the changes in the ecosystem, whether they are the result of climate changes or local events. This relates to the resiliency concept. And finally, the source tracking of pathogenic microorganisms in the system, and all that goes with that, should be continued.

Mr. Johnson inquired as to whether or not the idea of integrating information that is not funded through the Sanctuary WQPP, because some of the same researchers are doing those projects in adjacent areas. Mr. Hunt replied that the panel recommendation would be “yes” to that question. Dr. Causey added that NOAA AOML has been accumulating a huge database from throughout the area and that research has been largely funded through South Florida ecosystem restoration funding sources and that has been NOAA’s segue into keeping a pulse on the system as changes take place upstream. Mr. Johnson commented that there are new modeling approaches that NOAA is moving forward on that links marine systems to upland areas. Dr. Causey replied that even though the money may not be there for that project, they may have enough data to move forward on making the linkages.

Mr. Hunt continued by explaining that there is a substantial amount of long-term data about the coastal marine ecosystem in south Florida. Scientists and managers have a real opportunity to take a good hard look at all of that information and actually try to take it to a next level of looking at mechanistic results. This has been done at a certain level by the various research teams within the Florida Bay Science Program which resulted in a very complete synthesis document. This synthesis effort would be different though, since it would combine modeling and other kinds of things to try and build our understanding, and make connections back to Everglades’s runoff issues and move forward into climate change.

Ms. Thomas pointed out that The Nature Conservancy is leading a Reef Resilience Program, in collaboration with NOAA, FDEP, FIT, USF non-profits WWF. The program will host a conference in April 2008 to report on the results of research being conducted in this area.

Mr. Hunt added that those kinds of workshops are great ways to reach the public. If they are issue-driven, the public can get their hands around it. From a panel perspective, we are simply saying that this is very important area of emphasis.

Dr. Boyer commented that the PIs and other people in the field have recognized these deficiencies for a long time. Getting funding to fill these gaps has been a problem. The Coastal Ocean Observing System just issued a Request for Proposals. Ideas that involve SeaKeys, nutrient sensors and extending the Hicom model are some ideas that are being proposed.

Mr. Hunt pointed out that at least one member of the WQSC is on the Florida Oceans Council so that kind of connectivity does occur across different groups, but still the panel felt that it should be an emphasis within the WQPP. Mr. Hunt added that they also evaluated the Battelle document:

1. The SAP agreed that updating the webpage data repository for manager, scientists and the public makes sense and agreed that collaboration is critical.
2. The Battelle report recommends remote sensing become a primary tool, but the reviewers did not feel that certain aspects of remote sensing would be useful as a primary tool. Remote sensing capacities have not reached enough resolution to replace field sampling. On the other hand, they do agree that integrating remote sensing data into interpretation makes sense and it needs to be explored in special studies.
3. There was discussion about demonstration projects for wastewater and storm water and it was concluded that they are not necessary. Demonstration projects at this point are not needed because wastewater and storm water projects are moving forward. If they are considered, they should be funded from a separate pot of money from research money.
4. The reviewers thought the technology transfer conference recommended may be useful, but offered some cautions because if the conference tries to cover too much, it may not get the results that are being sought. Meetings that focus on one issue are worth considering.
5. Finally, focusing the goals of the Science Plan towards management was one of the recommendations from the Battelle product that would be useful.

Mr. McManus commented that it was very helpful having decision makers and elected officials at the workshop. Several bullets were captured about the WQPP and the science plan based on the comments from the elected officials. There was consensus that the long term monitoring and special studies have been useful to decision makers and elected officials over time in helping convince the public that “yes” we do need to spend the hundreds of millions of dollars to upgrade wastewater and storm water infrastructure in the Florida Keys. They also thought that communicating science to public managers and decision makers can be difficult; additional or other appropriate mechanisms need to be developed. They supported continuing the long-term monitoring projects. Several people mentioned the changes in the Sanctuary due to climate change. Comments from other attendees are in the report. As a follow-up action, the WQSC and Management Committee and other stakeholders need to work together to implement the recommendation given in the Task 7 Report.

Ms. Weaver commented that one of the points made by Mr. McManus is that science must be presented to the management. One of Mike Collin’s concerns is not that science is effectively communicated to management, but that the next steps are lackig. Using science to identify the problem and making

recommendations on how the problem can be solved needs to be communicated to management. The real interest lies in identifying the actions that need to be taken to address root causes of the problem.

Dr. Causey added that when scientists try to communicate to managers and make policy recommendations, it is not well-received by certain managers. Mr. May agreed with Dr. Causey and added that it is really a challenge because managers and scientists think and approach things differently. There is a very fine line between scientific recommendations and policy decisions. Ms. Thomas added that the real question might revolve around whether or not anything was done differently because of the scientific results.

Mr. Iglehart commented that the SAP's recommendation that special studies need to be more closely related to long term monitoring events was a critical issue for FDEP and he thinks that has been resolved with these recommendations.

V. Status of Federal and State Funds (Previously Appropriated and New) to Support Wastewater and Storm Water Infrastructure Upgrades in the Florida Keys:
Shelley Trulock - South Florida Restoration Branch, U.S. Army Corps of Engineers/Jacksonville District and Jon Iglehart – Florida Department of Environmental Protection

Ms. Trulock provided a quick overview and an update about Keys projects. The Federal government is authorized to provide up to $100 million to support the construction of storm water and wastewater projects. The distribution of this funding for the six municipalities that are involved was made in 2001 at the time when the intergovernmental task force was ending. The split for this program is a 65/35 split, so the non-Federal funding should be about $53.8 million for a total program cost of $153.8 million. This amount is obviously much less than the total need, but it's a really good start. Some documentation needed to be in place before federal funds could become available, including a Programmatic Environmental Impact Statement and a Program Management Plan that were both completed. Currently, the Management Plan is being updated since it is a "living" document. The NEPA documents for all the six communities have been completed. Decision documents for all six communities have also been completed. These are used to support the Programmatic Cooperation Agreements (PCAs) that are essentially contracts between the Federal government and the local municipalities on how the money will be used.

The good news is that on January 11, 2008 the PCAs were signed for Key West, Key Largo, and Key Colony Beach. This is very important because it is the mechanism that allows for the distribution of these funds. We are currently working on the three remaining PCAs for Layton, Marathon and Islamorada.

Ms. Trulock showed a chart with the appropriations and the amount spent in each column. She pointed out that from the 2008 appropriations, we're expected to receive two million and seventeen thousand dollars, so that should go far toward implementing some of these projects.

A summary of what we have done so far is as follows: The appropriations to date were $7.158 million. The Program Delivery Team decided to fund all the needed documentation up front so that things could move smoothly when the appropriations were finally in place. Basically, there is about $5.5 million

dollars that needs to be distributed. The committee meets to determine how that money is divided using "readiness to proceed" as a main evaluation criterion.

The distribution is as follows: $200,000 to Key Colony Beach and $800,000 for Layton. This is the full amount for both municipalities, so they will be complete. In 2006, the PDT decided to give all the funding to Key West because they were ready to implement storm water projects that would show a lot of progress. Demonstrating progress is critical when we start getting a lot of correspondence from the Congresswoman's office and so forth. The team thought this was a very efficient way to use the $2 million.

Ms. Trulock pointed out that the percent allocated of the total allotment will be determined by the Intergovernmental Task Force. Key West is allotted about 25% of the total and then Islamorada, Marathon and Key Largo need to be considered. They are going to try to meet in February to determine the distribution of this new $2.17 million and a little extra money that has not been allocated to date.

Ms. Trulock will update the Program Management Plan to provide checks and balances for the Federal government and explain how these projects plan to meet the 2010 mandate.

Marathon's scope of work was just completed and no additional NEPA is needed. It is hoped that in the April time frame the PCA for Marathon will be executed. This is much faster than the first three because we've learned a lot. For Islamorada, Ms. Trulock is verifying their scope of work and plans to follow the same process as Marathon, including updating the old PCA and then sending it back for review before it is submitted to COE Headquarters and the Division. This will hopefully take place in April. Layton is being reimbursed for engineering and design costs ($800,000). Hopefully, the Layton PCA because will be executed by April too.

A PDT meeting has been tentatively set for February 27 at Key Colony Beach. Meeting details will follow. The task will be to allocate the remaining funds (about $469,000) and will start looking at the $2.17 million.

Dr. Causey thanked the Corps for its tremendous work and leadership for the Keys and congratulated them on the passage of the Water Resource Development Act. Ms. Trulock stated that unfortunately that this kind of work is not a Corps mission because it's not flood control, navigation or environmental restoration. It doesn't fit into the regular Corps categories.

Dr. Causey explained he sees the delivery of clean water to coastal areas as directly linked to a lot of the Corps' mission, especially the ecosystem restoration mission. Ms. Trulock stated that they are now working on the 2009 budget, so it is too late for that one, but 2010 is still being proposed. The CERP budget can not be increased because it is not in that legislation, but maybe there are other things that can be done. Mayor Burnett stated that he was appreciative of the work that Ms. Trulock does for the Keys.

Mr. Jon Iglehart informed everyone that the funding status for the State has remained unchanged since the last meeting. There were no monies from the last budget session. Representatives Saunders and Mayfield are working on mechanisms to get funding in this upcoming session, but it is predicated on Monroe County developing a priority list. The SRF loans are already prioritized.

Ms. Jody Thomas stated that Representative Mayfield's proposal is wonderful. She would like to make a plea that the Florida Forever program be increased.

VI. Report on Key Largo Wastewater Treatment District's Activities to Secure Federal Funds for Wastewater Infrastructure Improvements in the Florida Keys: Whit Van Cott – Key Largo Wastewater Treatment District.

Mr. Van Cott informed everyone that Key Largo is working on this large project to sewer and treat wastewater in the Keys. Federal dollars are pretty slim right now. He did meet with OMB in October to show them that this is definitely an environmental restoration project. The Keys has the third largest coral reef and in 1990 the FKNMS process began when the law was passed. There are numerous studies that have found pollution indicators at Molasses reef, and the key culprit is nutrients from wastewater Four million people visit the Keys annually, about 85% of them are from the United States. This creates billions of dollars in jobs and it's critical to the Keys. Interestingly, 70% of the visitors do water related sports. In July 2007, a University of Georgia study showed that pollution indicators were found six miles offshore. The National Marine Sanctuary Program Act in 1992 created the partnership with the State of Florida, EPA and NOAA. Thanks to Fred McManus, he and his team were able to show OMB that this is a national, not a State, program that involves partnerships between the federal and State entities.

In 1998, the Governor issued the Executive Order that requires Monroe County is to implement the 2010 Comprehensive Plan. There are handouts with this Order on the back tables. Basically, by July 2010 all properties in the Keys are required to have some kind of improved treatment for wastewater. The hot spots are fairly evenly distributed throughout Monroe County. The new required standards are different from those required on the mainland. There are some 240-250 package plants that are treating 2.5 million gallons a day in the Keys right now that are meeting old standards for the most part. These plants are going to have to be abandoned or upgraded to meet the new standards by 2010. This law is interesting because it ties the property owners directly to meeting those standards. This is something that Mr. Van Cott has never seen in his 40 years of experience.

Mr. Van Cott tried to quantify some of the costs to the Federal government. Basically, it will cost between $10,000-$20,000 per home on the average for the capital cost to build the sewer systems, $2000-8000 per home to abandon the current septic system/cesspool and to connect their home to a central collection system. The house connection cost was not accounted for originally. The number of around $600 million in capital cost has been bounced around. If you take the average of that, about $6000 per home and say there are 40,000 homes, that's $240 million that needs to be spent making these connections within the next two years to make the 2010 date. This is private money and is done by the property owner and needs to be done immediately. A 20-year SRF loan or a five year loan could help distribute that cost and the average monthly bill is going to be between $40 -$80. The best place for federal dollars to help is in capital costs, but the local Keys people will pay for improved wastewater treatment forever.

Ms. Trulock brought up that the federal government has had a continuing resolution for the entire year and that has created a problem for all of the Federal agencies. The Corps submitted a work plan with $3 million for the Keys, but that money was either redirected at headquarters or it was redirected by OMB.

Ms. Trulock explained that the Corps did have $2 million in 2008. It went through the House as $3 million; it went through the Senate at $3 million; the President threatened to veto the appropriations bill and therefore it was pared down by a $1 million in order to come to an agreement in Washington

The resolution that was passed last year by the Sanctuary Advisory Council was a big help. We presented it to our Congresswoman and two Senators. The resolution stated that more federal and State funds were needed to meet the 2010 deadline. The cost to meet the deadline is estimated now at $937.6 million, based on a chart that was recently put out by Monroe County. Locally there has been a commitment of about $531 million fror taxes, the State revolving load fund, and so on and so forth. The coast per household is expected to average about $25,000 for every home in the Keys. This has to be spent in the next 2 years to meet the State mandate. Mr. Van Cott believes this is literally impossible.

Mr. Van Cott did attend the signing of the cooperative agreement that Shelley mentioned. Tremendous credit for this goes to Congresswoman Ros-Lehtinen and her staff. These funds are authorized, not budgeted (appropriated), funds that Congress and the Senate want to give to the Keys. There has been no money budgeted in the President's or Corps' budgets for the project. The statement, "Use of Federal funds to assist in the construction of wastewater treatment facilities is the best means to reduce the nutrient source to protect the marine sanctuary", is in every one of the environmental impact Statements that was prepared by the Corps. Meaningful funds need to be "appropriated" in the FY 2009 budget and placed in the FY 2010 President's budget.

Mr. Van Cott provided some history on why this project has been so difficult. When the project was authorized back in 2000, it was authorized as an infrastructure project. The Corps does the budget for infrastructure projects. They do bridges, dams, dredging; and environmental restoration. This project was never designated as an environmental restoration project. We met with Dan Basta, Director of the National Marine Sanctuary Program, and other top level people to say that this is an environmental restoration program and it should be in the President's budget. There was a unified presence from the Keys at the October meeting in trying to convince OMB that funds were needed. The group that went from the Keys was united in their message. This group asked for $330 million, but were told that there are equally as important programs in other states and just not enough funds to go around.

OMB said that the representatives from the Keys made a very convincing argument. They believe there is a Federal component, but they didn't know whether the lead agency should be the Corps of Engineers. The question is "Do we look at changing this horse in the middle of the stream now that the PCAs are almost done?" Do we leave the Corps and go to EPA? NOAA has their share of problems with their budget. This year they are going to be going back up to Washington and go back through the appropriations process again. There are four lobbying firms in Washington working on this effort. They believe through the appropriations process we will get between maybe $3-5 million and that's what you have seen in the past. That is not enough and will take too long. So the next question is how can this project be changed to an ecosystem restoration project. This is being worked on now. The best way to get the change made is to put it in the Water Resources Bill, if there is one for 08. If not, there might be a way to tag it onto some other bill.

The group was successful in convincing people in Washington that there are additional capital costs to build wastewater treatment plants to meet AWT. There are additional capital costs to build package plants to meet the 2010 requirement and that this effort is to protect our nation's resource – the National

Marine Sanctuary and the near shore waters. They believe we will still get money appropriated in the future. The respect that Congresswoman Ros-Lehtinen has is substantial. She is using her political capital to try and help us get money down here. Sen. Nelson and Sen. Martinez are doing the same.

Richard Harvey added that a couple of years ago he discussed with Congresswoman Lehtinen's staff about whether or not EPA was interested in taking over the process for the Corps. EPA thought they were making good progress and did not want to interfere. As far as he knows the official EPA position is to let the Corps handle this and get the money appropriated.

Mr. Van Cott commented that his opinion is the same. EPA would have had to do the environmental impact statements. They are now getting to the point where we're getting the PCAs signed. If we could get the Corps to budget $10-15 million, that would be great. Mr.Van Cott stated that he knows of no other place where there is a law saying everyone in the Keys, every property owner, every package plant, every community has to meet these standards by July of 2010.

Mr. Harvey introduced Representative Saunders, who will be having a meeting later in the day to address these issues from a State perspective. He thanked Rep Saunders for coming by and listening to some of the discussion by the Steering Committee.

The package plants in the Keys are only meeting secondary treatment, not AWT. Mr. Charlie Causey asked if any plants did not meet the secondary level of treatment at this time. Mr. Rios stated that they are being examined. Mr. Causey wants to know how many gallons are treated currently per day in the Keys. Mr. Rios doesn't have the exact numbers, but 15-16 million gallons, up to 20 million, per day, but not all goes through sewage treatment. About 15-20% of water in the Keys is being used for package plants.

Mr. Van Cott stated that this issue turned their heads at OMB. It was important to show that efforts to improve sewage treatment are being done. The Keys are already meeting current standards and those plants will have to be upgraded in the next two and half years. That counters the criticism that the Keys are not doing their share toward solving the problem. Mr. Van Cott is working with a person who handles the appropriations for Senators Martinez and Nelson. Everglades restoration is first on the Senators' list, but we will try again to get them to prioritize Keys issues. The UGA study may help since it shows that there are pollution indicators six milesoff shore.

Dr. Billy Causey stated that he and Superintendent Dave Score will be doing "Hill" visits in March. They will be meeting with Congresswoman Ros-Lehtinen, and Senators Martinez and Nelson. We always carry them messages about continuing to support South Florida ecosystem effort and they always thank them. There is a lot of interest in the sanctuaries and the coasts right now. Mr. Van Cott talked with Secretary Woodley when he was here in January and he said that there was no chance of getting the project funds authorized since there is not enough money to fund authorized projects, so how can they fund something that is not within the Corps mission.

Mr. Briggs pointed out that people tend to concentrate on the big projects, but he doesn't want to lose sight of the fact there are about 1,200 individual owners out there who are going to have to upgrade their onsite systems by the same 2010 deadline and the financial impact on them, $25,000, is exactly the same.

Islamorada received a grant for approximately $3.8 million for Lower Matecumbe to look at upgrading onsite systems with central management of those systems.

Richard Harvey asked Representative Saunders if there was anything that he would like to share with the group relative to his efforts in this area.

Rep. Saunders commented that it seems that we can't get enough funds directed toward wastewater, but it is an important issue. Representative Saunders stated that Sen. Nelson was in Key West a couple weeks ago and they had lunch and he mentioned to them about the need for federal funding. He has also spoken to Congresswoman Ros-Lehtinen and Congresswoman Debbie Wasserman-Schultz. Everglades is the hot topic right now, so it might work to get money to the Keys through the Everglades project. People need to be reminded that the Keys are part of the Everglades ecosystem.

From the Federal level, and even on the State level, Representative Saunders is going to do whatever he can do to obtain funding. This involves showing the State's contribution and reminding them that the State has already kicked in over $48 million, although this is actually a small percentage of the overall cost.

He also stated that in a recent meeting with Monroe County, Representative Mayfield, Chairman of the House Natural Resource Environmental Protection Council, and DEP Secretary Mike Sole, they agreed that there is a need for Monroe County to provide a sequencing plan with details on what projects have not been completed and how are they prioritized. They also requested information about what kind of financing plan is in place to finish these projects. This will be a discussion topic at a meeting that is being held at 6:30 tonight in Marathon. He will then take this information to Tallahassee. It is a very tough budget year. The state has a $70 billion budget total and the Keys are asking for $2 billion out of it.

Tomorrow, Representative Saunders will visit Venture Out on Cudjoe Key and look at their package plant. They have expended a lot of money to have their own package plant upgraded to meet certain standards and they are concerned they eventually will be forced to connect to a central treatment plant. This concern will probably arise with others. Representative Saunders explained that the idea of an extension has been brought up several times. He does not support a blanket extension, but thinks it is important to prioritize so that the most important things have been funded. Then, when the money runs out, the most important things have been funded. We can possibly get an extension for the things that are not done because there is a reason why they were a low priority-either they are not close to completion or are not a hot spot. Those are all issues we need to talk about and the package plant issue is a very big one. Individual owners who live in remote areas, like Port Pine Heights, No Name Key, and others have asked me why they are not included in plans for central collection and treatment. He offered to take questions at that time, but none were posed.

VII. Status of Implementation of Monroe County Wastewater Master Plan and Wastewater Upgrades by Municipalities and Key Largo Wastewater Treatment District: Ms. Liz Wood – Monroe County and Representatives of Municipalities and Key Largo Wastewater Treatment Distract.

Ms. Wood stated that the County submitted a plan in November 2007 to the Florida Department of Community Affairs. The County was asked to develop a single comprehensive plan and identify existing

proposed projects. They also developed a list of costs associated with the projects that will be completed and those to be completed. To develop that spreadsheet, the Florida Keys were divided into upper, middle, and lower Keys service areas. In the Wastewater Plan, she pointed out that currently $264 million worth of work is under contract which leaves about $675 million work to do. That $264 million includes the $64 million that Key West actually spent for their wastewater management system.

This is a very dynamic situation. When these systems are being designed, pulling in the cold spots whenever possible should be a consideration. To achieve the task of presenting the status of projects, the following classifications were established and these are typical of what you would see. Where is service available? Presently, AWT compliant service is available for 28,386 EDUs in the County, that's 38%. It includes Key West. Actual construction under contract, shovels in the ground, is underway for 8,282 EDUs or 11%. Design is underway for another 20,220 EDUs or 27%, and planning is still underway for about 18,000 EDUs or 24%. I suspect after today we are going to see that planning number start moving into design very quickly. When Ocean Reef goes to construction and we move those 1,800 EDUs into construction, our percentage in construction will rise from 11% to 15%.

The information on the Key Largo Wastewater Treatment District is as of November 2007. Phase 1 Basin A is 50% complete in construction. The goal is to be able to provide quarterly snapshots of the projects. However, it is very difficult for me to administer the projects under the Aqueduct Authority and County inter-local agreement and close $21 million in loans while managing these very technical spreadsheets. So, Ms. Wood and each of the utilities will be working together to create the correct communication stream. This will help get the information to the right people to meet the deliverables as needed. To communicate this information, Ms. Wood anticipates some type of web based database where each utility can go in and as they move from planning to design to construction to connections, they can update this information.

Monroe County Engineering Department is charged with moving money from the County to the Aqueduct Authority to build projects. They have been asked to take on loads of additional responsibilities over the last six months and are dedicated to these projects, but this needs to become more autonomous.

The Big Coppitt collection system represents a 1,700 equivalent dwelling unit system, with 1,341 EDUs currently in compliance. When tracking the connections, sometimes there are about 1,500 connections in the standard vacuum system, but only 1,000 of them actually exist. The goal of 100% can not be met unless the connections are actually in place.

It might be best to use the Keys Wastewater Plan as a template. These spreadsheets can be used to track projects as they go from planning to design to construction and to connection. They can then add this up as a quarterly update that shows the move toward compliance for 2010.

Mr. Iglehart asked if Ms. Wood needed help tracking the projects. She answered "yes" and added that she liked tracking the projects, but that it is difficult being a project manager and file documents with DEP about our grant programs and still do the coordination for an entire Keys-wide project. When the Aqueduct Authority sets up a request for $3 million and the money is not in the bank, that has to be her priority. Her job's priority in Monroe County is to fund the projects that aren't funded and to construct those projects. This information is incredibly important, knowing that we have a $336 million funding

gap, whether or not private construction should or should not be included. Personally, she feels that the cost the homeowner is paying on private property is part of the cost of completing this project.

Mr. Iglehart offered to further discuss with Ms. Wood the idea of getting someone on a temporary basis to help with compiling the information on the projects. Ms. Wood stated that there are lots of great consulting firms who could easily enter into a contract to help manage this task. She the added that the best approach would not be to hire someone, but rather to involve someone who already has knowledge of the project and ask them to take over. Mr. Harvey pointed out that this information is important to everyone to document progress made and come up with priorities.

Ms. Jody Thomas underscored that Ms. Wood presented the information in a very well organized manner and thanked her for her efforts and level of excellence.

Mr. Harvey added that a possible solution is to add this duty to an existing contract with the FKAA. Then maybe people can collectively work together on finding the funds to accomplish that task. Ms. Wood suggested that some of the other municipalities might have someone in mind, too, and added that the City of Marathon and Cindy Lawson were incredibly helpful to make sure that we met the deadline. There is a team; everyone deserves acknowledgment including Key Largo.

Mr. Harvey stated that let's just conclude that he and Mr. Iglehart are both interested in finding the funds and the right person to take on this task.

Mr. Van Cott added that Key Largo Wastewater District has 17 employees and 3 or 4 outside engineering firms. This isn't a temporary assignment; it should be permanent. In his opinion, it should be a County employee's responsibility. Mr. Harvey added that people need to decide together what is needed so that the funds can be found.

Ms. Thomas reminded everyone that she has mentioned before that that Federal law allows the Florida Dept. of Environmental Protection to offer State revolving home loans and funds loans at 0% interest. If ever there was a case where 0% interest would be justified, it's Monroe County. It's an area of critical State concern. This community has this wonderful reef resource that lies in this area of critical concern and she would like to see a real discussion in this forum on the plusses and minuses for doing that and move toward the same kind of action you just initiated to support Ms. Wood's effort. On a $600 million effort, a reduction of the 3% would be about $18 million you could save if we were going to borrow all that money. She would like this Steering Committee to discusss this some more. She did not offer a formal resolution, because she needs the facts, but would like to have some serious conversations.

Mr. Harvey suggested that maybe this can be addressed at the forum held by Representative Saunders, since Tim Banks from DEP is planning to attend.

Mr. Van Cott commented to forget applying for grants because it could lead to fighting between municipalities. The State Revolving Fund is the best thing that happened to his district.

Ms. Wood agreed that borrowing money from the State, at a low percent interst is one of the biggest things that can be done. The focus needs to be to fund the plan. By using SRF for Big Coppitt, we saved

$3 million, and that's the amount of money we need to expand the Duck Key Plant. Every chunk of money that we spend in interest is less construction we can do.

Mr. Causey reiterated how difficult funding is right now and that there may be virtually nothing coming from the State this year. The State's contribution could be to fund SRF at 0%. It looks like the citizens of the County are funding the entire program, if the rate of interest went from 2.5% to 0%, that's not $15 million overall, that's $15 million per year. And if the project is a 25 year plan, you save $375 million. That in effect would be the State's capital contribution. Since you are in a position to capitalize, fund $15 million per year through a reduction of interest from 2.5% to 0%. That takes the State off the hook, it doesn't cost anything in State funding since the money's coming from the Federal government. That would be a way to satisfy the State's commitment to keep the program going.

Mr. Richard Harvey asked if there were any questions or comments on this particular issue.

Meeting reconvened after lunch and the minutes from the July 24, 2007 meeting were approved unanimously.

Cindy Lawson, City of Marathon explained that she was a member of the finance team for Marathon's wastewater improvements. There are a lot of actions that need to take place in the course of the next six or seven months with regard to contract rewards and the start of construction in order for us to have the opportunity to meet the 2010 deadline. Charge assessments will begin in the Fall for Marathon's first couple of service areas, 4 and possibly in 6. The City is currently working with Aqueduct Authority staff to affect the turnover of the Little Venice project. They then plan to expand service to customers in the Area 5. Marathon has taken this opportunity to combine sewage treatment improvements with concurrent implementation of our storm water management plans and our 5 year CIP for road overlay. So this is a complete project that includes wastewater, storm water and road resurfacing.

Marathon is implementing this project in seven separate service areas, or service basins, each with a slightly different technical approach depending on the needs of the individual areas. On Knights Key, the design is 60% complete. The approach on Knights Key depends on partnering with one of the developers there who actually just increased the size of their plant to serve the remaining customers. The developer is a little behind schedule because of the current economic conditions, so we are kind of on a "wait and see what's going to happen" with that.

Service Area 2 is Boot Key. The problem there is that the Boot Key bridge is no longer usable and so the Marathon City Council is addressing the problem of how to regain access to Boot Key. That has to be solved before anything significant can be done out there in terms of installing a plant.

The collection system for Service Area 3 has been designed and our permit application through the DEP is in process. In Service Area 4, construction is scheduled to begin in February 2008. They have completed the collection system design in Service Area 5 and have the permit in hand. They have a contract that has been executed for Service Area 6. It was done as part of the Service Area 4, but they are simply waiting on a notice to proceed to be issued and that needs to be done by April 1st. And finally on Grassy Key, the design is underway and our "geo tech" is completed.

The City's projected total capital costs include a contingency of about a 3% for construction cost growth. Right now, they have both Service area 4 and Service area 6. That represents around 30-40% of the total construction costs. At this point those numbers are coming in just under the original estimates from the master plan, so at this point they are feeling fairly comfortable with the numbers. The storm water improvements are not included in the cost at this point, but the road resurfacing is included and water will be reclaimed where appropriate. The project is expected to be completed by December 2010.

She added that the County has asked her firm to help them with the next round of activities and respond to a letter regarding the additional information that's needed for the plan. They stand ready to help continue in that effort as it moves forward.

Councilman Neugent asked if Ms. Lawson was saying that they are moving these projects forward in an uninterrupted manner where 2010 deadlines will not come into play and from the standpoint of compliance. Cindy responded that from the point of getting there from here, this is the schedule that will be required to meet the 2010 deadline. At this point, the City is moving forward with bid documents and release of bid documents, but the actual decision-making as to awarding contracts in this timeframe will be the City Council's decision and with that perhaps Mayor Worthington would like to weigh in.

Mayor Worthington explained that it is a similar situation with all municipalities in the County in terms of meeting the July 2010 deadline. The City of Marathon is certainly well on its way, but there are a lot of decisions to make in the next 4-6 months to meet this scheduled timeframe. The City had a resolution come before them to approve a funding mechanism that would allow Marathon to go forward not counting on any other grant money and that resolution failed. However, the City Council has made another motion to move forward on putting out an RFP on all the sewage treatment plants and collection systems throughout the entire City, so we are moving forward on it. How Marathon deals with coming in six months behind schedule in the 2010 is going to be the same way everyone else in the County deals with it.

IX. Report on Environmental Finance Assistance to Communities and Local Governments of the Florida Keys for Wastewater/Storm Water Infrastructure Upgrades: Jeff Hughes – University of North Carolina Environmental Finance Center.

Mr. Hughes introduced his colleague and explained that it was fascinating for him to hear the discussion this morning about communication of science because he lives that same challenge; just replace the word "science" with "finance!" Mr. Hughes pointed out that Ms. Wood showed some good summaries of the progress being made. His team used some of the same data and presented it in a different way. They developed a first cut using speedometers to show progress made because it is easier than a graph or spreadsheet. Green is good, red is bad. And we incorporate finance into this kind of model using proprietary software, a "third party" software, that can be applied to Excel files. If you have a finance plan in Excel, we can work with you to produce this kind of visual summary. In this example, there are close to 5,000 bits of data incorporated into this visual presentation, but it does not confuse people the way that spreadsheets do.

They have the EDU model for every community in the Keys and are going to continue to update that model. Next to the speedometers, they can add information as needed, something that might be part of

the plan. They don't have the knowledge to collect and generate that data on the ground here, but once that has been done, for a relative small amount of effort, they can give a lot of value added in that area.

They do like spreadsheets and can generate them and show what type of expenses households will pay under all sorts of scenarios. They can plug in project costs and quickly show things. They can certainly quickly show what 1%, 2% loans or different sources would mean. The other non-financial task they will be working on with a new foundation that is being created is to try to address the on-site expenses for lateral hookups. They are working behind the scenes on that as well.

Mr. May asked whether or not you can drill down to the data from the models. The answer was "yes". That usually means going back to the Excel files. He then asked how they determine what is green versus red and how do you draw the boundaries. Mr. Hughes responded by stating that this is a great point because it is important to consider the message that is being sent when red is selected, versus yellow, versus green. There are a lot of factors to consider with this approach.

X. Update on the Total Maximum Daily Load (TDML) Reasonable Assurance Process for the Florida Keys: Scott McClelland – CDM, Inc.

Mr. McClelland gave an update on the Florida Keys Reasonable Assurance Document (RAD). The RAD involves using WBIDS. A WBID is water body identification. It is the segment of the river or estuary that is impaired; the segment that you're trying to improve. In 1998, the Florida Keys were listed as impaired for nutrients. Various groups were involved in this process of developing the WBIDs and the 100 meter boundaries from each island that are included in the WBIDs. There are two sources of nutrients—local sources and far field sources. The Keys are different from any other place that the team has encountered because the far field sources dominate over the near shore sources. If TMDLs are developed for the Keys, the determination that the water is impaired would not be that easy. One of the things people may want to do over the next couple of years is look for a nutrient target, or some kind of target related to living resources and do some studies in that regard. This has not been done in the Keys at this time. There are some folks who could probably do it, though.

The biggest issue is that the Keys are a very small land mass with huge receiving water. Because of the small size of the islands, Mr. McClelland is convinced that storm water best management practices don't work here like they do in the mainland of Florida. The soils are not there; the tides are different; everything is different. So, the common, conventional approaches don't apply here. His team focused on controlling the things that can be addressed. They retro-cast land uses to 1500s and called that the natural land use and based the target on natural conditions, which some people may not like because that's pretty stringent, but nevertheless, that's what was done. They established 1999 as the baseline, which turns out to be the worst case, and then looked at 2010. The 2020 prediction is the one where all wastewater improvements are completed and most of the storm water elements were done, too. This model compares natural conditions to the baseline to 2020. Since they could not find nutrient targets, they said the concentration of nutrients above the natural condition within 500 meters of the coastline was limited to a 10 microgram per liter increase of nitrogen above natural conditions, and 2 micrograms per liter increase of phosphorus above natural conditions. To put this in perspective, these are extremely stringent limits, even stronger than those in Hawaii.

Mr. McClelland explained that not only did they come up with what they think are conservative targets, but they also looked at the issues related to the constraints, including the management activities that are going to be done. They also worked with all of the cities, the County, U.S. Navy, the Florida Parks Program, and FDOT. The good news is that there is some outside regulation as well as local regulation that makes you do certain things. One of the things that is going to help is the designation of these waters as Outstanding Florida Waters and State Law 99-395, which is complicated. It is difficult to understand and has a compliance date of July 2010. If it's not done by regional systems, then we assumed that ATUs were being put in place. His team also considered other things about treatment methods, and effluent disposal methods and assumed that 100% of the treated water going into shallow wells enters the shallow water zone. They also assumed that deep well injection disappears.

They created models for the bubble WBIDS and for 10 examples of canals to see the effect of better treatment on nutrients found in canal waters. This diagram shows how wastewater and storm water discharges affect waters out to about 6,000 meters in this particular place. Beyond a certain point there is no effect. In 2020, there is a significant drop in the effect of the nutrients caused by the Keys. Some scientists state that these numbers are very small, even smaller than what is expected in the Pacific Ocean off of Hawaii.

Mr. McClelland stated that at federal level they need to show the difference between what it's like in the continent and what's it like in the Keys. The mindset is that the Keys are just part of the United States. He added that the standard that the Keys must meet is more stringent than any other they have seen in the country.

George Neugent asked "Can a cost for that significant improvement over what's required in the rest of the real world be calculated?" and Mr. McClelland replied that he thought it could be done.

Mr. Van Cott stated that he had found that somewhere around 40% additional cost in capital for an advanced wastewater treatment plant over 100,000 GPD. It is somewhere between 28-37% for the smaller plants – the package plants that are under 100,000 GPD – and even higher percentage as you go to smaller treatment systems because of trying to get down to those numbers. These numbers have been calculated and made available to Washington. That's the difference between the Clean Water Act secondary wastewater treatment standards and the standards for the Keys based on the State law. And there are additional costs related to operations. After the plant is running, costs will be 50% more for operations than the mainland in order to treat the water to that quality.

Commissioner Neugent asked whether or not they could document that extra 30-40% to help make the point that the Feds should be making up the difference financially and asked what responsibility lies with the residents and what lies with those who are mandating this change. Mr. McClelland stated that they presented this information to OMB in October. They then refined it and presented very specific numbers in December. The additional costs are somewhere in the area of 40% per capital and another 40-50% for the monthly operating bill.

The model results for the 1999 condition and the 2020 condition show that there is reasonable assurance that water quality targets are going to be met by the 2020 deadline. These numbers will be shown to EPA.

Mr. Charlie Causey stated that he would be very curious to see if there is a way to measure the difference between what it is going to cost to treat to current State water quality standards and AWT. That number could be useful to show to federal authorities. Mr. McClelland explained that this could be done.

Mr. McClelland added that by complying with S.L. 99-395 from a nutrient point of view, they have shown there is significant improvement or reduction in nutrient loading from the Florida Keys. They have not included, though, the other ancillary improvements in the model.

Mr. Harvey pointed out that, at this time, the models are uncalibrated and unverified. Mr. McClelland has done a great job, but EPA will take a closer look and someone else will make the decision as to whether the RAD document is acceptable.
Mr. Bob Johnson pointed out that the problem is that there are no numeric State standards for these waters, just narrative criteria. For the Everglades, we have spent tens of millions of dollars trying to develop a numeric standard. So there is a line there where you do have to say are you doing everything we can within the technology to get the benefits, versus are we just getting it as clean as it was in the past.

Dr. Boyer expressed that his main concern is with the "natural system." Here we have a comparison with existing data and models and OFW, but in reality your targets are set on a natural system, i.e. what it would have been like in 1500s. That target is lower than would be found in the middle of the ocean gyres, which are desserts and yet, the Keys are being held to that standard. Mr. Van Cott added that the debate is how much of this effort is for the Marine Sanctuary and the ecosystem in the Marine Sanctuary and how much is for a healthy environment for people who live in the Keys? Who is reasonable for that cost and that's the subject that keeps getting brought up and it's going to keep happening more and more as Chamber of Commerces come to grips with the cost of this.

Mr. Harvey stated that the State declared the waters of the Keys as Outstanding Coral Waters and EPA approved the process. All this is for the good of the folks that live here I believe, and we have to make a determination that this process provides a reasonable assurance that those designated uses are maintained. EPA is trying real hard to say "yes", but there are some legitimate questions we are asking about the model and about the OFW language that Scott acknowledged that previously had not been addressed. They are now addressing them and hopefully we can get to "yes"; but like I said, I am not the decision-maker on this issue.

Commissioner Neugent added that to put this in perspective from the standpoint of the costs and the overall good, that he feels that the costs of treating our effluent wastewater to these standards is less than what a real estate agent would charge to sell a house. Those transactions are made on a daily basis, but yet for 15 or 20 years the Keys have not moved forward on this issue.

Mr. McClelland explained that according to the model they expect to see a 40-50% decrease in nutrient content in the canals, not immediately after treatment is implemented, but after some time. They are now producing four documents that include the entire Keys. Everybody has verbally agreed, some have done resolutions to say that they have agreed to the program. The documents will probably be produced within the next month and be provided to the locals to agree and review, then submitted to the State for review. Each RAD report has the elements required by State and Federal guidelines on things that have

to be dealt with in order to have it approved. Mr. McClelland stated that they have had seven meetings over the last year for EPA, State, and the local scientists and all the local governments have been invited to talk about these issues. Once the agreements with the local municipalities are signed, they hope to get letters from the U.S. Navy and the Florida Parks Department. FDOT will hopefully send letters of approval; and then all the State and local governments involved will also have reasonable assurance agreements.

Mr. Harvey explained that they haven't received an official submittal from the State, but have provided some feedback to the State regarding concerns that need to be addressed before they submit anything official.

The document will not commit local governments to anything unexpected. They are not being asked to do anything more than what they told us and with what is consistent with the Keys wastewater plan. Mr. McClelland believes that the State is going to approve it at this point; followed by the EPA.

Mr. Harvey added that the EPA has provided them with 4 or 5 questions or issues to address, and that Mr. McClelland will provide responses soon.

Mr. McClelland explained that the RAD is not based on achieving the water quality target in the model the day the project is finished. It will probably take 10 to 15 years. The RAD does have to commit to continued monitoring which you are all doing already, in the hopes that it will start showing that the water quality will improve over time. But non-compliance is not based on water quality monitoring; it's based on not doing the management activities.

Mr. Harvey pointed out that they will need to have everything done just right since there are a lot of entities that might sue if things are not done correctly.

Dr. Billy Causey introduced the next speaker. He began by recognizing that 2008 is the International Year of the Reef. The International Year of the Reef, as designated by the Coral Reef Initiative, is a worldwide campaign to raise awareness about the value of coral reefs and the threats that they face. It's also aimed to motivate people to take action to protect them. It's very timely today with the Water Quality Protection Program's Steering Committee meeting that we have a colleague, Dr. David Souter, here from Australia. He was in Washington last week and they "rolled out" a document entitled "The Status of Caribbean Coral Reefs After Bleaching and Hurricanes in 2005". It's a very sobering account. David is with the Global Coral Reef Monitoring Network in Townsville, Australia. He and Dr. Clyde Wilkinson were the editors who compiled various chapters that focuses on water in the Caribbean, including Florida.

XI. Report on Global Coral Reef Monitoring Network: Dr. David Souter, Reef and Rainforest Research Centre, Townsville, Australia.

Dr. Souter thanked everyone for allowing him this opportunity. He explained that the Global Coral Reef Monitoring Network (GCRMN) is a fairly loosely associated group of several hundred scientists and institutions around the world. Dr. Wilkinson and I edit contributions by many of these scientists. Probably the most famous product is the Global Status report which comes out roughly every two to four years. He provided a few CD copies for the audience. After the tsunami, the ICRI (International

Coral Reef Institute) asked GCRMN if they would do a summary report. One hard copy is available and some CDs. But, there are many copies of the book containing the report on the effects after the hurricanes of 2005 on coral reefs. That report is written in very simple language to deliver that message as efficiently as possible. It comes in two forms: the book and a brochure developed specifically for media. Finally, Dr. Souter made available some special editions of International Year of the Reef calendars that are produced by the Australian government as part of their contribution.

The Status of Caribbean Coral Reefs After Bleaching and Hurricanes in 2005 is notable for three reasons. In the northern hemisphere, it was the hottest year on record, ever since records were being kept, and that's something like since 1880. It was the most severe bleaching event ever recorded in the Caribbean; it easily surpassed 1998, which still holds records elsewhere in the world. 3) It was the most active hurricane year ever recorded. We had 26 named storms, including five severe ones.

The report basically documents the impacts of bleaching and hurricanes on reefs throughout the Caribbean. There are contributions from approximately 80 reef scientists and managers in this book, with the Florida Keys Chapter being written by an esteemed colleague, Billy Causey. He is very grateful for his contribution and also thanked NOAA for the hot spot images and a number of other images that appear in the book.

The first hot spots in the Caribbean were evident in the early May, but the first really large ones turned up in July and affected Central America. And places like Belize and Mexico had coral bleaching of approximately 20-45% of corals. By mid August hot spots had started developing fairly seriously around Florida and the Keys, but another hot spot had developed around the Lesser Antilles. Bleaching was recorded in Florida, Flower Garden Banks, and Cuba, particularly the Lesser Antilles and still a little bit in Columbia. You can see that little yellow spot. These hot spots were 2-3 degrees Centigrade higher than long term average summer maximums, so this is really quite hot water. Bleaching affected 50-90% of corals in virtually all of these countries, particularly the countries of the Lesser Antilles, the Dutch and the French West Indies. At this point, Florida was also suffering fairly severe bleaching.

Then coral mortality was starting to be recorded. Barbados experienced 17-20% coral deaths and that's the worst it has ever affected Barbados. The French Caribbean and the Dutch Caribbean also saw similar losses of coral by August. By September, another hot spot had started to develop around the Greater Antilles, Jamaica, Cuba, Puerto Rico and the Virgin Islands, and still that hot spot centered around the Lesser Antilles. At this time, temperatures in Florida had cooled, probably because hurricanes Katrina, Wilma and Rita dissipated all the hot water. So, the reefs of Florida in a way got lucky. However, that was not the case in other locales.

Bleaching at this point affected up to 68% of corals throughout the Greater Antilles. Fortunately the Greater Antilles didn't suffer too much mortality. The only real exception to that was the Dominican Republic, which suffered quite a lot of mortality, up to almost 40%. By October, the hot spots around the Lesser Antilles were still hanging around. The reason for that is there were no hurricanes that passed through that area in 2005.

It was such an active hurricane year, but none went anywhere near the Lesser Antilles, so that hot water stayed there, cooking the corals. It was evident that the remainder of the Gulf of Mexico and the Greater Antilles started to cool down. Bleaching continued throughout the Lesser Antilles as the hot spots started

to move toward Central America and places like Bonaire and southern Dutch Antilles, Curacao, Bonaire, Venezuela and Columbus started to suffer. Trinidad and Tobago suffered serious coral bleaching in some sites up to 100%. Particularly worrisome is that 73% of all colonies of *Colpophyllia* and *Diploria*, which are major reef builders, are now dead.

In the French West Indies – Guadalupe, Martinique, and Barbados, serious bleaching continued.; it didn't dissipate with the onset of winter in November and December. It continued on into mid 2006 and in the worse case scenario, St. Bartholomew, bleaching continued into 2007. So the corals simply didn't have any rest. In most places by November/December, winter started to take over and the waters began to cool.

Bleaching basically weakens the immune response of the corals and in many places, particularly in the Lesser Antilles, many corals started to succumb to secondary infections of coral disease. Dr. Souter highlighted the U.S. Virgin Islands, which really suffered quite severe mortality. Initially weakened by bleaching, a lot of corals, up to 50% in some places, died of secondary infection of coral diseases.

In Florida, the 2005 event is the last of a long line of impacts. In 1977, we saw massive die-off of elkhorn and staghorn corals, through a severe cold front that came through the Keys. In 1979, there was a barrel sponge die-off. In 1980, there was a huge die off angelfish, surgeon fish and butterfly fish linked to increasing hot waters and stress. In 1983, people began to see a Caribbean-wide die off of an important algal grazers, the *Diadema* sea urchin, which has never recovered in a lot of places. The year 1983 marked a wake up call in the Caribbean and in Florida. It was the first real mass bleaching event that was witnessed. Most people who spend a lot of time working on the bleaching data will mark that as the landmark event. Mass bleaching was observed in the Florida Keys affecting reefs from Big Pine Key to Sand Key Reef. In 1986, the first obvious outbreak of blackband disease was observed;,that disease killed corals at Looe Key. The next mass bleaching event took place in 1987. This was the time when bleaching became a global phenomena. It didn't only affect the Caribbean and the area around Panama; it affected reefs in the Indo-Pacific as well.

A trend that coral bleaching is linked to large scale climatic fluctuations that tend to produce hot water is now being noted. In 1989 there was another minor bleaching event in Florida. In 1990 more bleaching took place, 65% of fire coral died at Looe Key. Then events of 1997 and 1998 took place and this period has gone down in record books as possibly the worst bleaching event on a global scale. In Florida in particular, there has still been very little recovery from that particular bleaching event.

So the take home message is really very simple. Coral bleaching is strongly linked with increasing sea temperatures. Many things cause coral bleaching, but coral bleaching on this scale is a sea temperature thing. Coral bleaching is becoming more frequent and it is becoming more intense. The best predictions we have so far are basically that coral bleaching will be a very common thing by 2030, and will probably be an annual thing by 2100 if we don't manage to improve our climate, or the way we manage our climate.

So what can be done? The lessons from 1998 in particular are that healthy reefs are more resilient. They bounce back faster, they recover quicker, and they don't suffer as great of stress because they are healthier. So basically what we have to do as managers and as custodians of coral reefs is we have to reduce as much as possible the human impacts on coral reefs. That includes things like over exploitation

through too much diving, too much fishing – both commercial and recreational, reducing sedimentation rates on reefs, and particularly relevant to this meeting, reducing water pollution on reefs.

If the human impacts on coral reefs are managed, that will give the coral reefs the best chance to withstand any impacts that come from climate change and it will give them the best opportunity to adapt. There is some new evidence coming out of research from Australia that corals do have the capacity to adapt. The question is really "Can people give them enough time to adapt?" Some reefs are more resilient than others just by the way that they are situated, where they are in current, or depending on the particular corals that actually make up the coral community on those reefs. Those are the reefs that are going to be the important ones for reseeding damaged reefs in the future, so if these can be incorporated into marine managed areas, they may have enough time to adapt. Thanks for the opportunity and enjoy the book.

Dr. Causey commented that just in the past few years, the scientists along Florida's south east coast have noted two new colonies of *Acropora palmata* that are doing quite well. . These branching corals have not been there from 6,000 to 10,000 years. This is something to watch, even though the scientific data are not there at this point. Mr. Harvey added that as the corals move up the coast of Florida, they will encounter river discharge water and that may affect their light levels and growth rate. That September 2005 in the Caribbean and in the Lesser Antilles and all that area that was the warmest September in 100 years.

XII. Report on Water Quality Awareness Month (February 2008) Nancy Diersing, Florida Keys Sanctuary, Key Largo Education Office

Ms. Diersing explained that last year members or representatives of the Water Quality Steering Committee convened to develop a communications plan for getting the word out about water quality and water quality related issues. This plan was the basis of the first Water Quality Awareness Month (WQAM), held in February 2007. A WQAM was also held this year in February 2008. The proclamations made by local communities and municipalities are important aspects of the WQAM. Ms. Diersing noted that the Monroe County Commission and the City of Key Colony Beach both issued WQAM proclamations in January. In February proclamations will be issued from the Village of Islamorada, Key West, Layton and Marathon. All the contributions everyone has made have been extremely important. The "Frequently Asked Question" document about water quality was updated and is being distributed again during WQAM and a slide program is being broadcast on the county's public access television channel.

XIII. Public Comments.

Dr. Susan Hammaker founded the Florida Wastewater Assistance Foundation, a 501(c)(3) organization. Its mission is twofold: to communicate to Keys homeowners, businesses and policymakers that challenges associated with wastewater and fulfilling our July 2010 mandate and to generate resources of all sorts, partnerships, in-kind supplies and funds for the private portion, and the lateral connections. There are approximately 46,000 plus lateral connections and 15% of those would be in the foundation's mission. The Marine Sciences class, taught by Dave Makepeace of Coral Shores High School, has taken the photographs that will appear on the foundation's website. The leadership class at the High School has developed a presentation they will give to civic groups and social groups. These are young people

who are interested in our problem. There is also the IT class that is working on maintaining the website which is about $12,000 of in-kind help. The foundation is in the process of finalizing $100,000 long term low interest SRF loan thanks to working with the FKAA. The foundation is also involved in writing grants and hopes to have some gifts and put together a network of plumbers, excavators, permit inspectors who will also volunteer their time in the neighborhoods. The foundation seeks to be a clearinghouse for information. Dr. Hammaker thanked everyone for their help and stated that she would be calling on the committee for information. Development of the foundation's website (www.goodwaterpeople.org) is in progress.

Ms. Thomas stated that Sen. Nelson raised something with her last week that she wanted to put in front of this group. He inquired as to why no one in the Keys is upset about this new situation with the Cuban oil drilling in international waters. She explained that she had not heard about that and wondered if anyone else had any information. Dr. Causey stated that they are watching this closely. One of the largest drilling platforms in the World is on the northern coast of Cuba. So far, it has been to the east, where it is not a threat to Florida. But word is through the industry that they have made some huge discoveries to the west and that means it connects to the Loop Current and to this area. It's something that needs to be watched, but is hard to get information, except some that comes from Cuba.

Mr. McClelland will send the Excel spreadsheets that will include the comparison of the engineering between a secondary treatment plant and the BAT and AWT treatment. Fred McManus can distribute those to the whole group.

Mr. Harvey inquired as to whether the committee wants to have its next meeting in July, early August and if they want a teleconference call in-between now and then to for updating purposes. If anyone thinks that the committee needs to have a conference call, let Mr. Harvey know and that can be arranged.

Mr. Harvey thanked the City of Marathon for hosting us at this facility. The Fire department helped us set up yesterday. He also thanked Joy and Nancy for their help with the meeting. The meeting was adjourned.