EXHIBIT A

SCOPE OF SERVICES

KIMLEY-HORN AND ASSOCIATES, INC.

for

SARASOTA COUNTY

DONA BAY WATERSHED MANAGEMENT PLAN

This SCOPE OF SERVICES (Exhibit A) is attached to and made a part of the Agreement for Professional Consulting Services, dated _____, 2005, (AGREEMENT) between Sarasota County (COUNTY) and Kimley-Horn and Associates, Inc. A.K.A. Kimley-Horn (ENGINEER), to provide professional engineering, environmental sciences, hydrogeology, surveying, land planning and communications services in connection with the planning, design and implementation of the Dona Bay Watershed Management Plan (PROJECT). ENGINEER services broadly described in the AGREEMENT are supplemented as detailed below. Exhibit A, SCOPE OF SERVICES is supported by the following supplemental documents:

1. Exhibit B, PROJECT TIMELINE lists the incremental times stipulated for ENGINEER performance of PROFESSIONAL services.

2. Exhibit C, FEE SCHEDULE is the basis for the negotiated Not to Exceed Total ENGINEER Fees and Reimbursements.

3. Exhibit D, ACTIVITY AND FEE SUMMARY/REQUEST FOR PAYMENT lists the various lump sum and not-to-exceed ENGINEER Fees and Reimbursable Expenses of the PROJECT apportioned among the tasks needed to complete the PROJECT.

SECTION I – PROJECT HISTORY

The PROJECT is a regional initiative that promotes and furthers the implementation of the Sarasota County Comprehensive Plan, the Charlotte Harbor National Estuary Program's (CHNEP) Comprehensive Conservation Management Plan (CCMP), and the Southwest Florida Water Management District's (SWFWMD) Southern Coastal Comprehensive Watershed Management (CWM) Plan. Specifically, this initiative is to plan, design, and implement a comprehensive watershed management plan and projects for the Dona Bay watershed to achieve the following general objectives:

1. Provide a more natural freshwater/saltwater regime in the tidal portions of Dona Bay.
2. Provide a more natural system hydrologic regime for the Dona Bay watershed.
3. Protect existing and future property owners from flood damage.
4. Protect and/or improve existing water quality.
5. Develop ecosystem goals and targets based on the requirements of environmental and biological indicators.
6. Develop potential alternative surface water supply options that are consistent with, and support other plan objectives.

Due to the lack of historic hydrologic and biologic data, SWFWMD has postponed the determination of a Minimum Flow and Level (MFL) for Cow Pen Slough until 2007. This provides an opportunity for SWFWMD and the COUNTY to cooperatively work together to develop the necessary data and establish a

more holistic and sustainable water resources plan for the restoration of Dona Bay and its watershed. An initial meeting was held on July 23, 2004 between SWFWMD and County staff to begin to frame the process for this effort. Successful implementation of this task would include the framework for a future water supply project(s) by estimation of the historical water budget for Dona Bay, determination of the existing water budget for Dona Bay, and the identification, prioritization, and implementation of hydrologic restoration and water resource projects based upon their ability to restore a more historic or natural water budget for both the Dona Bay estuary and watershed. Further success would be the recognition by stakeholders of the watershed that protection and restoration of natural systems may be well served by the development of a comprehensive watershed management plan for Dona Bay. It has long been suspected that the Dona Bay estuary likely suffers from too much, not too little freshwater.

SECTION II – PROJECT DESCRIPTION AND BACKGROUND

The right mix of salt and freshwater in estuaries is critical to their sustainable productivity. Natural system responses to major hydrologic alterations such as those that have occurred in the Dona (and Roberts) Bay watersheds have resulted in lowered salinities and likely, increased sediment and nutrient loads in the downstream estuaries. The productivity, population dynamics, community composition, predator-prey relationships, and food web structure within the estuarine system are significantly impacted by changes in salinity. These impacts may manifest themselves as loss of seagrasses, reduction in live oysters, shifts in benthic community structure, reduced larval recruitment and survival of fisheries species, and increased frequencies of anoxic conditions.

The current Dona Bay watershed has been significantly impacted by man-made drainage activities, which increased the efficiency and volume of freshwater being discharged to its tidal estuary. Historical maps indicate that a significant portion of the current watershed has been diverted to the Dona Bay watershed by the man-made Cow Pen Slough canal. Sarasota County has embarked on a proactive approach to develop the proper science and community-based vision as a foundation for formulating, evaluating, prioritizing, and implementing watershed management projects. Towards this goal, Sarasota County has recently acquired lands that are strategically located in the watershed and initiated monitoring of freshwater flows to, and natural system and water quality indicators in, the tidal portions of Dona Bay. Implementation of this plan will provide a model in watershed management and involve several state, regional, and federal partners, including, in the event of ultimate water supply development, the Regional Water Planning Alliance.

SECTION III – PROFESSIONAL SERVICES TO BE PROVIDED BY ENGINEER

The ENGINEER will complete professional services as generally described in the following paragraphs:

A. ENGINEER services for the Project will include project coordination and management; literature search; development of watershed goals, preparation of a comprehensive watershed management plan report for the Dona Bay Watershed, and to the extent that it is relevant, Roberts Bay watershed; interagency coordination; establishment of watershed stakeholders group and public outreach; development of preliminary plan concepts, drawings, and cost estimates; pursuit of funding assistance; and, if authorized, miscellaneous activities including final design and permitting of water resource and watershed enhancement projects.

The ENGINEER will use relevant existing data and reports provided by the COUNTY in developing the PROJECT. A detailed description of the professional services to be provided by the ENGINEER is included in the following Sections.

SECTION IV – GENERAL DESCRIPTION OF PROJECT DEVELOPMENT AND DELIVERY PROCESS

The PROJECT includes the development of a comprehensive watershed management plan including the research and science for natural system protection and restoration/enhancement as well as future alternative surface water supply, while addressing any potential adverse impacts to floodplain elevations and pollutant loadings. Throughout this process, quality control will be exercised by those responsible for the reports and plans.

CONSULTING services will be required to develop the project categories listed and generally described below. Specific services to be provided by the ENGINEER for this project are described in Section VII.

1. Project Administration and Management; the ENGINEER provides a Project Manager and staff to administer the professional services described in this Scope of Services, generally including: scheduling, a monthly written report describing work completed during the period and work to be completed in the upcoming period, other status reports, budgeting, and invoicing. The services include an engineering quality assurance program that is functional and adequate for all professional services included in this AGREEMENT.

2. Literature Search and Creation of Watershed Bibliography.

3. Development of Watershed Goals.

4. Development of Dona Bay Comprehensive Watershed Management Plan.

5. Interagency Coordination.

6. Watershed Stakeholder Group and Public Outreach.

7. Pursuit of Funding Assistance.

8. Additional Services; if authorized by the COUNTY, the ENGINEER shall furnish or obtain from others, Additional Services of the types listed hereinafter. These services are not included as part of the Basic Professional Services. Compensation will be determined as the COUNTY and the ENGINEER mutually agree at the time the service is requested by the COUNTY.

SECTION V – COMPUTER AUTOMATION

In addition to the number of copies of each submittal, the ENGINEER will provide electronic files of plans, reports, maps, and GIS shapefiles. Drawings will be in AutoCAD Release 14 format or higher. Reports, specifications and other written material shall be prepared in MS Word, Microsoft Excel and Primavera. County Watershed Models for the revised – existing condition and proposed condition will be provided in ADICPR. County GIS drainage updates will be provided by shape file for ARC GIS. All electronic files will be furnished on CD-ROM.

The COUNTY is aware that differences may exist between the electronic files delivered and the printed hard-copy construction documents. In the event of a conflict between the signed and sealed construction documents prepared by the ENGINEER and electronic files, the signed and sealed hard-copy construction documents shall govern.

SECTION VI – BASIC PROFESSIONAL SERVICES

The COUNTY and the ENGINEER have agreed, that upon receipt of the COUNTY's purchase order, the ENGINEER shall begin performance of the basic services. The various basic-service tasks to be performed are detailed in the following section titled, "Tasks and Deliverables Summary" with performance products titled, "Deliverables".

TASKS AND DELIVERABLES SUMMARY

PHASE 1 – PREPARATION OF WATERSHED MANAGEMENT PLAN

TASK 1 – PROJECT ADMINISTRATION AND MANAGEMENT

This task includes scheduling and conducting monthly coordination meetings. As needed, these monthly coordination meetings will include County representatives of solid waste, stormwater, parks and recreation, fiscal, utilities, natural resources, and water resources, as well as applicable members of the consulting team. These meetings will provide status reports, assure coordination, identify project constraints, and develop strategies and plans of action. The ENGINEER will provide a Project Manager and staff to administer the professional services described in this Scope of Services, including scheduling, budgeting and invoicing, quality assurance program and sub ENGINEER services. In addition to general administration and coordination of the project, project management services include:

TASK 1.1 MONTHLY COORDINATION MEETINGS

The ENGINEER shall attend monthly project coordination meetings, including preparation of meeting agendas, coordination with attendees, and assist the COUNTY in the preparation of meeting summaries.

TASK 1.2 PROGRESS REPORTING

Written monthly Progress Reports and Progress Schedule, which describe the work performed on each task. The Progress Reports and Schedule will be submitted with each invoice for services.

TASK 1.3 CORRESPONDENCE

Copies of all written correspondence between the ENGINEER and any party pertaining specifically to this Project will be provided, in electronic format if available and hardcopy, to the COUNTY within one week of receipt or mailing of said correspondence. Routine telephone conversations will be logged by the ENGINEER and maintained for future reference. Telephone conversations of more specific project needs will be recorded and routed via email to the COUNTY and the project team within two days of said conversation.

TASK 1.4 METHOD OF DISTRIBUTION

Distribution of meeting summaries, schedules, correspondence, etc., may be via e-mail, fax or U.S. Mail at the ENGINEER's discretion or as specifically directed by the COUNTY.

TASK 1.5 DIRECT COSTS

Reimbursable direct costs are defined as copies, graphics, plans printing and other similar items that are not included as a task deliverable, and have been specifically requested by the COUNTY.

Deliverables: Minutes of each meeting will be distributed to each attendee and others within seven (7) calendar days from the actual meeting date. Proposed progress schedule updates will be submitted monthly or as requested by the COUNTY.

TASK 2 – LITERATURE SEARCH AND CREATION OF WATERSHED BIBLIOGRAPHY

This task involves conducting a literature search of documents relative to natural systems, water supply, water quality and flood protection in Dona Bay watershed, and as applicable the Dona and Roberts Bay estuaries. Copies of documents not already posted in the Sarasota County Water Atlas library will be provided to the County.

Deliverables: Bibliography of relevant references to be included in the Watershed Management Plan Report.

TASK 3 – DEVELOPMENT OF WATERSHED GOALS

This task involves developing and balancing watershed management goals for natural system enhancement and/or restoration, sustainable water supply, water quality enhancement, and flood protection, and as well as satisfying landfill cover needs and coordinating with potential recreational opportunities.

Sarasota County held an initial goalsetting meeting on November 17, 2004. This meeting included representatives of County Administration, Solid Waste, Watershed Management, GIS, Utilities, Water Resources, Navigational Waterways, Resource Protection, Mitigation and Restoration, Hydrologic Initiatives, and Land Use Planning. In preparation for this meeting, relevant Sarasota Comprehensive Plan Goals, Objectives and Policies were inventoried along with those contained in the SWFWMD Comprehensive Watershed Management Plan and the CHNEP Comprehensive Conservation Plan. The goals established through this initial effort will be further work-shopped and refined with the community and other partners including, SWFWMD, CHNEP, the Peace River Regional Water Planning Alliance (PRRWPA) and the Dona Bay watershed stakeholders group proposed under a separate task. Development of goals for the watershed will also be coordinated with grant funding requests.

Deliverables: Watershed Goals to be provided as part of the Watershed Management Plan Report

TASK 4 – DEVELOPMENT OF DONA BAY WATERSHED MANAGEMENT PLAN

TASK 4.1 NATURAL SYSTEMS

This scope element consists of developing a natural systems chapter for the plan and related natural systems evaluations. Specific issues that will be addressed in this chapter will be a mapping of existing shoreline habitats within the Dona and Roberts Bay estuaries, evaluation of existing biological and habitat data (for Dona and Roberts Bays, Shakett Creek, Curry Creek, and Fox Creek), assessment of potential watershed stressors on biological communities, assessment of sediment characteristics and sedimentation

rates, development of biological indicators and life history requirements associated with various estuarine salinity regimes, evaluation of Minimum Flows and Levels data collected by the SWFWMD, and an assessment of potential restoration/enhancement sites for the study area. Since one of the alternatives for watershed restoration/enhancement includes surface water withdrawal or diversion from Dona and Roberts Bays, a hydro biological monitoring plan will be drafted to address the SWFWMD's Water Use Permit (WUP) requirements. The information gathered and assessed during this task will be used to develop natural systems restoration/enhancement targets for both the freshwater and estuarine portions of the watershed.

A critical concept for natural systems enhancement and/or restoration is the restoration of historical freshwater flow regimes to Dona Bay. Man-made drainage activities have resulted in the reduction in the amount of freshwater retained within the watershed and an associated increase in the amount of water discharged to Dona Bay. This freshwater imbalance is reflected in the existing water budget. Therefore, an objective of the Dona Bay Watershed Management Plan should be to "re-balance" the water budget to reflect conditions more indicative of pre-drainage activity in order to restore seasonal salinity regimes in the estuary. This restoration would also result in retaining freshwater in the watershed or re-cycling or re-using this freshwater, so that Dona Bay can be restored to a more historical condition. This Task includes providing much of the scientific basis needed to quantify various scenarios and benefits for natural system restoration. However, some restoration activities are also intuitive. These would include directing and storing more water in historical low-lying and former freshwater wetland areas such as the County's Albritton site. Historical aerials and surveys can also provide a template for freshwater balance and watershed restoration. Important to this task, will be the development of a restoration phasing plan.

Task 4.1.1 – Data Collection and Review

This task includes assessing, and if necessary, developing background water quality and biological data within the Dona Bay watershed and the estuaries of Dona and Roberts Bays. Sarasota County in coordination with SWFWMD and Mote Marine has been collecting water quality, quantity and biological data over the past two years. Mike Jones with the Hydrologic Initiatives team of Sarasota County has prepared annual reports for the monitoring of Dona and Roberts Bay for 2003 and 2004. Sarasota County has already contracted with Mote Marine to assist staff with the development of water quality indicators for Dona/Roberts Bays. This data includes salinity as well as historical seagrass and oyster bed mapping. It is anticipated that salinity regime targets for different segments of the estuaries and tidal creeks would be established as an outcome.

Sarasota County has also monitored and prepared a report on water quality in the Cow Pen Slough canal. Existing water quality and natural systems monitoring reports are extremely relevant to the DBWMP effort. Therefore, this task includes assisting Sarasota County with the evaluation and integration of existing monitoring activities into the watershed goal setting and management components of the plan.

The COUNTY will provide digital GIS files of historical and existing land use. The COUNTY will also provide existing GIS Land Use analyses using 1999 SWFWMD FLUICCs code. Historical, existing, and future land use data will be evaluated and tabulated to characterize natural systems conditions throughout the watershed. Other data that will be evaluated includes soils maps, historical and current aerial photography, historical surveys, previous reports and studies, land acquisition plans (ESLPP), and existing natural resource management plans (Land Management Master Plan of Sarasota County, SWIM, CHNEP) for the area. Literature reviews will be conducted for estuarine-dependent species expected or known to have occurred in Dona and Roberts Bays to determine life history requirements.

Ongoing data collection in Dona and Roberts Bays conducted by Sarasota County staff will also be acquired and evaluated within the context of developing restoration targets. A shoreline map for the areas downstream of the lower Cow Pen Slough weir structure will be created in GIS based on aerial photo-interpretation and field surveys. This map will follow the same methodology as the recent Sarasota Bay Estuary Program (SBEP) shoreline mapping effort and will extend this data set further south to the northern extent of Lemon Bay. A historical shoreline map will also be created based on the 1940s era black and white photography and soils maps. A survey and analysis of relict oyster beds will also be conducted by Mote Marine Laboratory to develop timelines and historical salinity regimes. Known relict reefs, and others located by new surveys, will be sampled along RK gradients in both waterways. Shells buried by recent sedimentation will be excavated and scored with respect to incidence and severity of epibionts, parasites, and predators indicative of particular salinities or salinity ranges. The feasibility of dating shells will be evaluated. A sediment characterization and analysis will also be performed to determine sources and rates of sedimentation within the estuary. Sediment cores will be taken from areas of interest in the stream and watershed. Granulometric and chemical analyses will be used to determine sediment provenance where possible. Sedimentation rates will be established by reference to known historical events or horizons, and/or newly determined ones. This information will assist in the identification of sediment abatement projects and the potential improvements that may be gained by diversion of freshwater flows.

Deliverables:

- Digital GIS files of any relevant existing natural systems features related to natural systems in the watershed. Maps will be produced for future land uses and other relevant data (e.g., locations of protected wildlife species, publicly owned conservation lands, etc.) suitable for inclusion in appropriate sections of the Natural Systems chapter
- Digital GIS files of the existing and historical shoreline habitat maps for Dona and Roberts Bays (from Blackburn Bay to northern Lemon Bay)
- A summary of life history requirements for key biological indicator species in freshwater and estuarine portions of the watershed
- A summary of findings from the relict oyster study, describing evidence for historic salinity regimes in the tidal reaches of the study area. A summary of findings from the sedimentation study, describing evidence for the origin, transport, and fate of sediment to tidal waters; including estimates of sedimentation rate
- A summary of findings from the sedimentation study, describing evidence for the origin, transport, and fate of sediment to tidal waters; including estimates of sediment rates
- A draft hydrobiological monitoring plan, including relevant maps and tables and linkages to ongoing SWFWMD MFL data collection and analysis
- A technical memorandum summarizing the Task 4.1.1 work effort, including all relevant documentation. The technical memorandum will describe the procedures used to access literature and data, the sources of acquired data, and all appropriate metadata and documentation

Task 4.1.2 – Development of Natural System Water Budget

Sarasota County is fortunate to have a relatively natural watershed that is indicative of the historic hydrologic setting of other watersheds. The Deer Prairie Slough watershed has been identified as a potential natural system baseline watershed for hydrology, water quality, and biology (flora and fauna). Relative to hydrology, there is a history of USGS and more recently, Sarasota County (SCG), continuous stage and discharge monitoring sites. Specifically, these sites and their period of record include:

USGS Site 02299060, Downstream of SR 72, Period of Record 10/01/93 to 01/27/03

USGS Site 02299120, FP&L Easement, Period of Record 10/01/93 to 01/29/03
USGS Site 02299160, Upstream of I-75, Period of Record 04/01/81 to 09/30/92
SCG ARMS Site, FP&L Easement, Period of Record 02/06/01 to Present

This Task includes reducing data from all of these sites for their respective periods of record to determine monthly runoff volumes. For the ARMS site, it is assumed that there are no more than 6 gaps in the data base and no gap is of a duration longer than 10 hours. In addition, local monthly rainfall will be used to develop monthly water budgets at each site for their period of record. These monthly runoff volumes and their ratio to the corresponding monthly rainfall volumes can then be used as a basis of comparison to other watersheds during the same period of record. Further, the entire work effort for Deer Prairie Slough watershed will be statistically evaluated for average and percent exceedance of monthly runoff volumes and runoff to rainfall ratios.

With respect to the Dona and Roberts Bay watersheds, the results of the Deer Prairie Slough hydrologic data analyses will be applied to the historical watershed area to estimate historical monthly runoff and watershed budgets. The COUNTY will provide existing digital GIS and, if available, hard copies of topographic aerials of the Deer Prairie Creek subbasin delineations.

Deliverables:

- Summary of the Deer Prairie Slough hydrologic data reduction approach and results, with results divided into pre- and post- restoration periods based upon July 1, 2001 as completion of restoration.
- Results of water budget application to historical Dona and Roberts Bay watersheds.

Task 4.1.3 – Data Analysis

This task includes analyzing all relevant and available natural systems information for the Dona Bay watershed to determine the status and trends of ecologically important habitats, changes or alterations in natural communities (e.g., habitat loss, fragmentation, and exotic species invasions). A detailed assessment of existing lands utilizing a wide variety of existing public databases will be conducted in order to identify potential areas in need of activities to restore/enhance the hydrologic, hydraulic, or water quality functions of the regional water resources. Preliminary field assessments to collect qualitative data for potential restoration areas will be conducted. Data anticipated to be collected will include vegetative species composition, existing and historic hydrologic conditions, perturbations affecting habitat functions and values and apparent wildlife utilization including threatened and endangered species. The ENGINEER team will participate in interviews with major (both public and private) landowners to assess potential restoration needs or cooperative projects that would benefit natural systems health in the watershed. A UMAM analysis of existing conditions comparing potential lift values associated with potential restoration activities will be prepared. A preliminary estimate of cost to perform restoration/enhancement will also be provided.

Flow data sets developed in association with Tasks 4.1.2 and 4.2.2 and 4.2.3 will be analyzed based on the Indicators of Hydrologic Alteration (IHA) developed by Richter *et al.* (1996) to evaluate changes in stream flow patterns on ecosystem response in Dona/Roberts Bays. The IHA is used to develop a statistical description of a daily record of stream flow and to measure changes in various hydrologic parameters over time. The result is a suite of ecologically-relevant statistics including average monthly/seasonal streamflow, minimum and maximum flows for various durations, period of occurrence of maximum and minimum flows, and frequency and duration of high and low pulses. Various statistics are calculated for the parameters including the mean and variance over specified time periods. For this

project, the IHA will be calculated based on existing flow data and a simulated annual flow record based on our knowledge of the contributing Dona Bay and Roberts Bay watershed as well as the Deer Prairie Slough watershed area and rainfall/runoff characteristics for the region. Differences in monthly and seasonal characteristics will be compared using appropriate statistical methods. A Range of Variability Approach (RVA) will be used to develop management targets for various flow regimes and to evaluate ecologically based management targets for the Dona and Roberts Bay system. Using the RVA, it will be possible to propose a range of variability for each IHA parameter as a management target that resembles the historical conditions of the basin during the data period.

Deliverables:

- Historical and existing condition maps to be provided by the COUNTY will be compared to each other as well as field verified. A discussion of the extent of hydrologic modification will be developed and presented in the IHA summary report (below).
- Maps of potential restoration/enhancement sites. Field assessments, landowner interviews, and analyses of historical changes in habitat or hydrologic conditions will be performed. Following the assessment, the tracts will be ranked and prioritized based on project cost benefit and overall enhancement to water resources subsequent to restoration.
- Summary of the IHA analyses for Dona /Roberts Bays and Deer Prairie Slough and associated data output, graphics, and tables
- UMAM analysis summary as well as all associated data sheets for existing conditions in hardcopy and electronic format if available.

Task 4.1.4 - Evaluation of Restoration/Enhancement Value

The Albritton site and Cow Pen Slough corridor within public ownership may provide an opportunity to leverage habitat restoration value for County infrastructure and private property habitat impacts within the Southern Coastal Watershed. This task proposes to evaluate the feasibility of leveraging mitigation credits created by potential restoration and enhancement in the ideas identified above, pursuant to state rule and credits for upland mesic hammocks to satisfy local requirements. The work from this task will allow the COUNTY to consider the feasibility of such a mitigation credit proposal. The task includes the following elements:

- Estimate ranges of credit generation for up to (5) alternatives using the State's Unified Mitigation Assessment Methodology (UMAM) rule for wetlands and acreage ratios for uplands
- Provide recommendations to help optimize credit generation with preliminary cost estimates of restoration
- Evaluate the potential for establishing a wetland mitigation bank for the Southern Coastal Basin of SWFWMD

Deliverables:

- Description of restoration activities generating credits and a summary explanation of the application of the UMAM rule to determine credit potential for each alternative
- Table of estimated ranges of credits potentially available for each alternative
- Discussion of cost of credit generation and ways to optimize
- Evaluation of wetland mitigation credit potential within the Southern Coastal Basin of SWFWMD
- Report summarizing evaluations and providing recommendations

- All associated data sheets for each of the five alternatives in hardcopy and electronic format if available.

Task 4.1.5 – Alternative Impact Analysis

This Task includes analyzing various watershed restoration and modification alternatives proposed to determine their impact on freshwater and estuarine ecological processes and health. Alternatives will be evaluated for both freshwater and estuarine systems, if applicable. For the purpose of this Task, up to eighteen (18) individual alternatives are anticipated:

- Albritton site, up to (3) alternatives
- Venice Minerals, up to (3) alternatives
- Fox Creek site, up to (3) alternatives
- Blackburn Canal, salinity weir
- Existing borrow areas and Cow Pen Slough floodplain and historical flow-way between Cow Pen Slough Canal and Myakka River, up to (3) alternatives
- Miscellaneous, evaluate up to (3) additional storage facilities

Deliverables:

- Table comparing existing and proposed natural systems conditions within the freshwater and estuarine segments of the watershed
- Summary and graphical representation of any natural systems improvements or degradation that would occur as a result of implementing any of the various alternatives.
- Description of permitting issues/constraints related to each alternative.

TASK 4.2 SUSTAINABLE WATER SUPPLY

Re-balancing the freshwater water budget in the Dona Bay watershed could provide opportunities not just for ecological restoration, but sustainable water supply uses that are consistent with natural system restoration/enhancement. This Task includes the continued development and analyses of applicable data needed to determine sustainable yields, integrated water supply scenarios, and preliminary design options.

Scenarios for a potential new integrated and regional potable surface water supply source will be evaluated. This evaluation will require a broad evaluation that includes a configuration of various storage locations, capacities, and methods. Surface water storage methods to be considered include the Albritton site, the Venice Minerals site, and possibly expansion or utilization of an existing surface water facility located along Cow Pen Slough canal within the County owned Fox Creek site. Potential sub-surface storage (aquifer storage and recovery) sites to be considered might include the Albritton tract area, the Venice Minerals area, the Fox Creek site area, and/or the Carlton tract. Configurations will also consider water treatment plant locations: possibly a new plant in the vicinity of Venice Minerals, the Albritton tract, the Fox Creek site or another strategic location. Preliminary estimates of probable cost for each option would be developed as well as phasing plans.

Determination of sustainable yields for each scenario will consider two alternatives. The first alternative will consider yields based on a set of flow diversions (i.e. 5%, 10%, 20%) at various yields (i.e. 5 mgd, 10, mgd, 15 mgd, 20 mgd) and storage needs. Storage requirements will be configured through up to 3 different surface (reservoir) and subsurface (aquifer storage and recovery well) combinations. A second alternative will be performed based upon the water budget approach. Scenarios of sustainable yield will be developed based upon the difference in existing and historic water budget estimates. Storage

requirements will similarly be configured through up to three (3) different surface and subsurface combinations. Possible reallocations of excess surface water back to the Myakka River will also be considered in this evaluation. However, since a portion of any flow reallocated back to the Myakka River from Cow Pen Slough could be diverted to Roberts Bay via the Blackburn Canal, this evaluation would also need to consider addressing the excess surface water being added to the water budget of Roberts Bay.

Preliminary estimates of probable cost for each option would be developed. Within this frame, various surface storage capacities (and weir operations) will be developed for the Albritton site.

Task 4.2.1 – Water Quality Analysis and Water Treatment Option Evaluation

Surface water falls under stringent regulations imposed by the Florida Department of Environmental Regulation (FDEP) intended to prevent waterborne microbiological pathogens from reaching drinking water supply. In general, surface water can be classified as very high in color, hardness but fresh as evidenced by low chloride levels. Surface water is also typically very high in total organic carbon (TOC) which must be significantly reduced based upon FDEP regulations. It is believed that the regulations will ultimately require TOC levels to be less than 2 mg/l in the future. A high level in hardness will require treatment since water of this hardness would not be acceptable as drinking water. Although not specifically measured, surface water is expected to be relatively high in suspended solids which must be removed for both drinking water purposes as well as prior to most other treatment processes.

This Task includes reviewing existing and historical surface water quality data collected for the Cow Pen Slough canal as well as adjacent waterways including Copper Creek and the Myakka River (Blackburn Canal) for the following parameters.

> Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chloride, Chromium, Copper, Cyanide, Fluoride, Iron, Lead, Manganese, Mercury, Nickel, Nitrate (as N), Nitrite (as N), Total Nox, Selenium, Silver, Sodium, Sulfate, Thallium, Zinc, Color, Odor, pH, TDS, Hardness, Total Coliforms, Fecal Coliforms, *Giardia*, *Crytosporium*, Total Organic Carbon

If necessary, additional surface water monitoring will be recommended and performed under a separate task assignment. The COUNTY will request and provide water quality data available from the City of Bradenton.

This Task will also involve identifying and evaluating water treatment processes most suitable to produce irrigation and potable drinking water. Each process deemed as a viable treatment technique will be described and evaluated relative to their effectiveness, cost of operation, capital cost, and ease of operation. All treatment processes generate a byproduct which requires disposal. Byproducts generated by each treatment process will also be identified and evaluated for disposal.

Up to eight (8) treatment processes will be considered in up to four (4) treatment schemes. Treatment processes to be evaluated include: (1) rapid rate mixed media filtration, (2) coagulation/precipitation (lime softening), (3) ion exchange, (4) granular-activated carbon, (5) membrane treatment, (6) ACTIFLO, (7) ozone treatment, (8) disinfection. The ENGINEER will provide a matrix evaluation of treatment schemes including preliminary estimates of probable capital and operating costs, and recommendations of preferred scheme(s).

Preliminary designs for the recommended treatment scheme as well as other water infrastructure as needed to manage and treat surface waters will be developed.

Deliverables:

- If necessary, recommendations for additional water quality monitoring.
- Interim report presenting the results of the analyses identified in this Task.

Task 4.2.2 – Water Quantity | Water Budget Approach

This Task includes determination of "excess" surface water that has been diverted to Dona and Roberts Bay via Cow Pen Slough and Blackburn Canals. The approach for Dona Bay will be as initiated and presented in the report prepared by KHA entitled "*Dona Bay Watershed Management Plan - Determination of Excess Runoff and Development of Water Budgets for 2003 and 2004"*. Additional activities relative to the Dona Bay watershed in this Task include:

- Continue to determine monthly excess surface water to Dona Bay and prepare existing monthly water budgets for 2005.
- Transfer Myakka River data base to Cow Pen Slough (1978 to present)
- Determine monthly runoff volumes for transferred data
- Compare transferred monthly runoff data to observations (2003 to 2005)
- Estimate Excess Runoff for period of record
- Compare runoff/rainfall relationships between Cow Pen Slough and Deer Prairie Slough
- Conduct additional model simulations at both weirs for a total up to ten (6) discrete storm events in 2004 and 2005 to fine tune the predictive ability of a rainfall/runoff model for the Dona Bay Watershed.
- Incorporate all hourly rainfall data form January 1, 2003 to present, into the data base.
- Based upon the above data analyses, a statistical analysis of monthly runoff volumes will also be performed to determine sustainable yields and design drought conditions.

For Roberts Bay, activities in this Task include:

- Monthly excess runoff to Roberts Bay from the Blackburn Canal based upon a 7% of flow diversion of Myakka River flows will be determined. Monthly flow data will be reduced for the entire period of record based upon flows measured at USGS gauge 02298830. A statistical analysis of monthly runoff volumes will also be performed.
- Using runoff data at USGS gauge 022988309 and regional rainfall data, rainfall to runoff conversion factors for each month based upon a dry and wet season antecedent condition will be determined. This will be conducted for the entire period of record, for the period between 1940 and 1969, and for the period between 1970 and 2000.
- Compute actual monthly runoff volumes in Blackburn Canal based upon stage-discharge measurements available from Sarasota County and/or the Southwest Florida Water Management District (USGS). Compare actual discharge measurements with estimates based upon 7% of the flow at USGS Gauge 02298830.
- A series of curves relating excess surface water (inflow), demands (outflow), and storage will be developed for the entire period of record.

The COUNTY will provide digital copies of all hourly rainfall, stage and discharge information available from the Automated Rainfall Monitoring System (ARMS).

Deliverables:

- Update to the "*Dona Bay Watershed Management Plan - Determination of Excess Runoff and Development of Water Budgets for 2003 and 2004"* report to include additional evaluations and 2005 data.
- Inclusions of Roberts Bay watershed analyses in the updated report.

Task 4.2.3 – Water Quantity | Flow Diversion Approach

This Task includes developing a correlation between available flow measurements for Cow Pen Slough and the USGS Gauge 02298830. A previous study entitled *Preliminary Evaluation of the Surface-Water Supplies in the Cow Pen Slough Area*, prepared by Hydroscience Research Group, Inc. for the Manasota Basin Board of the SWFWMD in 1980 was able to successfully establish such a correlation and a flow transfer relationship for the Myakka River to Cow Pen Slough. This previous study will be reviewed and if applicable the flow analyses will be expanded to transfer flow from the Myakka River to Cow Pen Slough since 1978. Monthly and annual average flows along with statistics will be developed for the entire transferred data base. To verify the transfer analysis, transferred flows for 2003 and 2004 will be compared those measured during this time period.

Monthly and annual average flows along with statistics will also be developed for the 7% of the Myakka River flows estimated to be diverted to Roberts Bay by Blackburn Canal.

Flow diversions of 10%, 30% and 50% from Cow Pen Slough and Blackburn Canal will be computed for pump capacities between 0 and 500 cfs.

A series of curves relating water available through flow diversion (inflow), demands (outflow), and storage will be developed for the entire period of record.

Deliverables:

- Interim report presenting the results of the analyses identified in this Task.
- All associated excel files and GIS shapefiles.

Task 4.2.4 – Evaluation of Surface and Subsurface Storage Options

Sarasota County has acquired several strategic water resource sites within and adjacent to the Dona and Roberts Bay watersheds including the Venice Minerals site, the Albritton site, the Fox Creek site, the Celery Fields and the North Metro Park site. Each site will be reviewed to optimize surface storage both above and below existing grade. Combinations of surface and subsurface storage to provide sustainable yields of 5 to 30 mgd, in 5 mgd increments for the design period of drought will be developed. Preliminary estimates of probable cost for each storage option will be developed. Digital topographic information will be provided by the COUNTY.

Preliminary designs for each conceptual storage facility as well as other water infrastructure as needed to manage and store surface waters will be developed. If a storage facility is selected for implementation, and if directed by the COUNTY, the ENGINEER will prepare final plans and permits for the construction of the storage facility and supplemental water management facilities. Final design consulting services

will include surveying, hydro-geotechnical analyses, civil and structural engineering, and environmental science. Such final design work may be authorized under a subsequent work order of this contract.

Evaluation of subsurface storage options will be conducted by the ENGINEER as stated in additional task 8.1 and will commence when the ENGINEER receives written authorization from the County. It is expected that the cost for this task will be covered under the additional services budget for this contract.

Deliverables:

- Interim report presenting the results of the analyses identified in this Task

Task 4.2.5 – Determination of Surface Water Treatment Plant Location(s)

This Task will involve identifying and evaluating the location of a surface water treatment plant or a combination of surface water treatment plants for both long term potable and irrigation water needs. Each plant location will be evaluated relative to their effectiveness, cost of operation, capital cost, and ease of operation and impacts to natural systems.

Preliminary designs for a surface water treatment plant will be conceptualized to estimate space and supporting infrastructure needs. If a water treatment plant is selected for implementation, and if directed by the COUNTY, the ENGINEER will prepare final plans and permits for the construction of the surface water treatment plant and supplemental water management facilities. Final design consulting services will include surveying, hydro-geotechnical analyses, civil and structural engineering, and environmental science. The final design work may be authorized under a subsequent work order of this contract.

Deliverables:

- Interim report presenting the results of the analyses identified in this Task.

Task 4.2.6 – Coordination with Sarasota County Water Supply Master Plan

This Task will involve coordination with the COUNTY in their efforts to update their Water Supply Master Plan. Specifically, to the extent that the PROJECT would provide for future water supply, the ENGINEER will coordinate plan and infrastructure needs with the COUNTY. It is anticipated that the ENGINEER will need to prepare for, attend, and follow up on up to 4 annual coordination meetings.

Deliverables:

- None

Task 4.2.7 – Development of Phasing Plan

The Task will include putting all of the pieces together to develop a long term sustainable water supply plan. The development of this plan will consider capital and operating costs, short and long term water supply demands in coordination with the County's WATER SUPPLY MASTER PLAN, local and regional demands, sustainable yields based upon enhancement and restoration of the Dona and Roberts estuaries and possibly the Myakka River flows, available storage in and below the watershed, existing and proposed infrastructure, existing and future land uses in the watershed, design drought conditions, interconnect opportunities, reuse of excavated material, use of renewable energies, reuse and/or disposal of treatment byproducts, and rotation with other sources. To work with the natural systems enhancement

component of the watershed plan, it is envisioned that a phasing plan will be developed to implement storage, treatment and distribution infrastructure in advance of, and as demands warrant new water sources. This phasing plan will also address a methodical enhancement of the Dona and Roberts Bay watersheds and their associated estuaries through the reduction of strormwater runoff.

Deliverables:

- Interim report presenting the results of the analyses identified in this Task.

Task 4.2.8 – Water Supply Watershed Protection Plan

This Task includes reviewing watershed goals relative to water supply. Current regulations that address these goals will be identified. For those goals not currently regulated, incentive based protection mechanisms will be developed through the watershed stakeholders group and public outreach activities.

Deliverables:

- Draft Water Supply Watershed Protection Plan narrative to be included in the Dona Bay Comprehensive Watershed Management Plan.

TASK 4.3 WATER QUALITY

This scope element includes the development of a water quality chapter for the plan and related water quality evaluations and as-needed sampling and analysis. Specific items that will be addressed in this chapter will be a summary of existing water quality conditions for various water uses (potable, irrigation, reservoir storage), review of pollutant loading estimates from future County water quality modeling efforts (if available), evaluation of existing salinity data (for Dona and Roberts Bays, Shakett Creek, Curry Creek, and Fox Creek), assistance with the development of a salinity model, and an assessment of TMDL-related issues for the study area. The information gathered and assessed during this task will be used to develop water quality targets for both the freshwater and estuarine portions of the watershed.

Based on existing but limited data collected by Sarasota County, water quality within the Cow Pen Slough canal is generally considered “good”. Since future development is likely to occur within the watershed, and Cow Pen Slough is being considered as a potential water supply source, this chapter will also focus on the development of a Watershed Water Quality/Resource Protection Plan. The plan will focus on preservation and enhancement of existing water quality within the freshwater portions of the watershed and improving estuarine water quality in Dona Bay.

Task 4.3.1 - Data Collection and Review

This task will include a thorough search and review of existing data sources including EPA and FDEP STORET/IWR databases, Sarasota County, Manatee County, NRCS, Charlotte Harbor NEP, SWFWMD, and other relevant agencies.

Deliverables:

- Digital files of existing water quality data in a single Access database.
- Digital GIS files of any relevant features (e.g., sampling locations) related to water quality for the watershed.
- Digital and/or hardcopy files of previous reports or studies related to water quality in the watershed.

Task 4.3.2 – Data Analysis

This task includes analyzing all relevant and available water quality for the watershed to determine the status and trends of important parameters that may affect ecological processes. Activities in this Task include:

- Review of available water quality data and cross referencing with existing state water quality standards for Class I and III water bodies.
- Producing plots and summary tables of important water quality parameters.
- Performing regression analyses on salinity and flow data to determine existing and historical salinity targets by river reach within Shakett Creek and Curry Creek.

Deliverables:

- Plots of water quality data.
- Output of statistical analysis on salinity and flow data
- Relevant tabular data for inclusion in appropriate sections of the Water Quality chapter

Task 4.3.3 – Alternative Impact Analysis

This Task includes performing model simulations for various watershed restoration and modification alternatives proposed to determine their impact on pollutant load reductions. This Task also includes performing pollutant loading model simulations for various watershed restoration and modification alternatives proposed to determine their impact on wet season, dry season and annual loads. The initiation and completion of this task is dependent upon the COUNTY providing the ENGINEER with a working copy of the pollutant loading model being developed by others, for the COUNTY. For the purpose of this Task, up to fifteen (15) individual alternatives are anticipated:

- Albritton site, up to (3) alternatives
- Fox Creek site, up to (3) alternatives
- Blackburn Canal, salinity weir
- Existing borrow areas and Cow Pen Slough floodplain and historical flow-way between Cow Pen Slough Canal and Myakka River, up to (3) alternatives
- Miscellaneous, evaluate up to (3) additional storage facilities

Deliverables for this task include:

- Table comparing existing and proposed pollutant loads to estuarine segments of the watershed
- Identification of any water quality improvements or impairments that would occur as a result of implementing the alternative
- Table comparing existing and proposed wet season, dry season and annual pollutant loads for each affected subbasin and the entire Doan and Roberts Bay watershed. The table will also reflect the relative increase or decrease in existing and proposed pollutant load for the watershed.

TASK 4.4 - FLOODPLAIN MANAGEMENT

Task 4.4.1 – Inclusion of Watershed Connections

Because of the relatively flat topography of the region, several hydraulic connections between the Dona and Roberts Bay watershed and adjacent watersheds exist during major flood events. This Task includes developing strategies and model adjustments to consider these hydraulic connections. Any field surveying needed to complete this task will be certified and provided by the COUNTY. A brief summary of the number of connections and approach to address each are provided below:

- Myakka River – Up to 15 connections between the Dona and Roberts Bay watershed and the Myakka River watershed will be considered from Center Road to State Road 72. Connections between adjacent subbasins will be addressed by inclusion of up to 3 adjacent subbasins in the Myakka River watershed into the Dona and Roberts Bay watershed model. In addition, to address known overflows and diversions from the Myakka River itself, hydrographs will be developed at up to 15 Myakka River nodes and used with available stage/discharge information from the 1978 USGS report to develop time-stage rating curves at each node along the Myakka River between I-75/Blackburn canal and the Pinelands Reserve.

Deliverables:

- Digital ICPR input file for the updated Dona and Roberts Bay watershed model
- Digital ICPR output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS map of 100-year floodplain file for the Dona and Roberts Bay watershed update
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format summarizing the modeling approach and results.

Task 4.4.2 – Continue Model Validation

This Task includes utilizing the County's Automated Rainfall Monitoring System (ARMS) data as available for 2003 to present as well as stage-discharge measurements available within the Dona and Roberts Bay watershed to perform the following model verification activities:

- Simulated stage-discharge curves will be compared to stage-discharge measurements at both water level control structures in Cow Pen Slough. Weir coefficients at both structures will be adjusted if necessary to more accurately reflect measured stages and discharges.
- Up to 3 discrete major storms events that occurred from January, 2003 to present will be simulated for the entire Dona and Roberts Bay watershed. Simulated stages and flows will be compared measured stages and flows at all ARMS sites for each storm simulation.

Deliverables:

- Digital ICPR output file for the Dona and Roberts Bay watershed model storm simulations.
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format presenting the results of the simulated and measured rating curves and the storm simulations. A discussion of recommended modifications to weir coefficients and model input to more accurately reflect measured stages and flows will be included in the report.

Task 4.4.3 – Regional Stormwater Feasibility Study

This Task includes evaluating the operation of the following four (4) sites to provide regional "excess" floodplain storage.

- Albritton Grove
- Venice Minerals
- Grove at Hi-Hat Ranch
- Pasture at Hi Hat Ranch

Excess storage created in each of these sites will be quantified and its radius of effective storage influence (i.e. potential service or benefit areas) will be determined. The ENGINEER will provide potential land uses within each potential benefit area to the COUNTY. The COUNTY will provide comparable property values for each land use to the ENGINEER.

Deliverables:

- Brief report in hard (3 copies) and digital format presenting the excess storage and map of the potential benefit area for each storage area. An estimate of the amount of off-site flood storage and its associated value to the respective property owner for each benefit area will be summarized. The report will also provide recommendations for the implementation of each facility.

Task 4.4.4 – Development of SCS Drainage Plan for Pinelands Area

This Task includes creating a digital GIS layer of the original SCS drainage plan for the Pinelands area, preparing an overlay of this plan on a current aerial, reviewing the results with the COUNTY and attending a meeting with the COUNTY and adjacent property owners to discuss possible drainage alterations resulting from the Central County Solid Waste Facility and potential corrective actions, if necessary. The COUNTY will provide a copy of the original SCS drainage plan for the Pinelands area.

Deliverables:

- Digital GIS map of original SCS drainage plan and all associated GIS shapefiles.

Task 4.4.5 – Alternative Impact Analysis

This Task includes performing model simulations for various watershed restoration and modification alternatives proposed to determine their impact on flood stages. For the purpose of this Task, the following alternatives are anticipated:

- Albritton site, up to (3) alternatives
- Venice Minerals, up to (3) alternatives
- Fox Creek site, up to (3) alternatives
- Blackburn Canal, salinity weir
- Existing borrow areas and Cow Pen Slough floodplain and historical flow-way between Cow Pen Slough Canal and Myakka River, up to (3) alternatives
- Miscellaneous, evaluate up to (3) additional storage facilities

Deliverables:

- Table comparing existing and proposed flood staged at each node, for each alternative. The table will also reflect the relative increase or decrease in existing and proposed flood stages at each node

- Identification of additional level of services deficiencies created (and/or) addressed by the alternative

TASK 4.5 – WATERSHED MANAGEMENT PLAN REPORT

This Plan will present an analysis to the degree in which watershed goals will be accomplished. The Plan will summarize the recommended components in regard to:

- Natural Systems
- Sustainable Water Supply
- Water Quality
- Floodplain Management

Task 4.5.1 – Natural Systems Chapter

For consistency, the specific chapter elements that will be developed in this section will generally follow the SWFWMD Comprehensive Watershed Management Plan elements and include the following sections:

- Introduction
- Natural Systems Overview
- Regulatory Framework
- Resource Protection Initiatives
- Land Acquisition Programs
- Natural Systems Issues
- Establishment of Minimum Flows and Levels (MFLs)
- Identification of Natural Systems Restoration Projects
- Natural Systems Management Water Resource Protection Plan

This chapter will also include a summary of potential projects and management recommendations to protect and/or enhance natural systems within the watershed.

Deliverables:

- A draft natural systems chapter that will be integrated with the water supply, flood protection, and water quality chapters once these other chapters are in draft form. The report will be delivered in hardcopy (3 copies) and digital format summarizing the data analysis approach and results.

Task 4.5.2 – Water Supply Chapter

For consistency, the specific chapter elements that will be developed in this section will generally follow the SWFWMD Comprehensive Watershed Management Plan elements and include the following sections:

- Introduction
- Studies, Reports and Data
- Regulatory Framework
- Other Resource Protection Initiatives

- Water Quality Issues
- Identification of Water Supply Projects
- Water Supply Watershed Protection Plan

This chapter will also include a summary of potential projects and management recommendations for water supply within the watershed.

Deliverables:

- A draft water supply chapter that will be integrated with the water quality, flood protection, and natural systems chapters once these other chapters are in draft form. The report will be delivered in hardcopy (3 copies) and digital format summarizing the data analysis approach and results.

Task 4.5.3 – Water Quality Chapter

For consistency, the specific chapter elements that will be developed in this section will generally follow the SWFWMD Comprehensive Watershed Management Plan elements and include the following sections:

- Introduction
- Water Quality Overview
- Regulatory Framework
- Surface Water Classifications
- State Water Quality Goals and Criteria
- Pollutant Loading/Total Maximum Daily Loads
- Domestic and Industrial Point Source Discharges
- Resource Protection Initiatives
- Water Quality Issues
- Coordination of ongoing Water Quality Monitoring Programs
- Identification of Water Quality Improvement Projects
- Water Quality Protection Plan

This chapter will also include a summary of potential projects and management recommendations to protect or enhance water quality within the watershed.

Deliverables:

- A draft water quality chapter that will be integrated with the water supply, flood protection, and natural systems chapters once these other chapters are in draft form. The report will be delivered in hardcopy (3 copies) and digital format summarizing the data analysis approach and results.

Task 4.5.4 – Floodplain Management

For consistency, the specific chapter elements that will be developed in this section will generally follow the SWFWMD Comprehensive Watershed Management Plan elements and include the following sections:

- Introduction
- Studies, Reports and Data

- Regulatory Framework
- Resource Protection Initiatives
- Flood Protection Issues
- Identification of Flood Protection Projects
- Floodplain Management Protection Plan

This chapter will also include a summary of potential projects or management recommendations to protect and enhance floodplain management and/or flood protection within the watershed.

Deliverables:

- A draft water quality chapter that will be integrated with the water supply, flood protection, and natural systems chapters once these other chapters are in draft form. The report will be delivered in hardcopy (3 copies) and digital format summarizing the data analysis approach and results.

Task 4.5.5 – Final Report

This task includes the preparation of the final report for the Dona Bay Watershed Management Plan. This Plan will incorporate comments from the COUNTY from their review of draft chapters as previously defined.

For each component the Plan will indicate potential funding sources and anticipated costs and benefits; prioritize the components and present a phasing plan; present a regulatory strategy; and identify any additional data collections and analysis needed.

Deliverables:

- Dona Bay Watershed Management Plan – Final Report

TASK 5 – INTERAGENCY COORDINATION

Because this PROJECT includes such comprehensive water management objectives, it will be essential to proactively coordinate with numerous water management agencies. In addition, many of these agencies are either presently co-funding portions of the PROJECT efforts or will likely become funding partners as the PROJECT develops. These partnering agencies include:

- Southwest Florida Water Management District (SWFWMD)
- Charlotte Harbor National Estuary Program (CHNEP)
- Peace River/Manasota Regional Water Supply Authority (PRMRWSA)
- Florida Department of Environmental Protection (FDEP)
- Environmental Protection Agency (EPA)
- Natural Resources Conservation Services (NRCS)
- Army Corps of Engineers (ACOE)

The effort required under this Task is difficult to quantify and therefore will be paid for on an hourly basis. The anticipated effort is estimated as shown in Exhibit D. Should the COUNTY request services in excess of the estimated amount, that would be an Additional Service.

This Task could include the following coordination efforts:

Task 5.1 – Southwest Florida Water Management District (SWFWMD)

The Dona and Roberts Bay watersheds are located within the Southern Coastal Watershed of the SWFWMD. SWFWMD is a funding partner and has been delegated the implementation of several State statutes relative to water management. The SWFWMD also oversees the planning and permitting of water supply within their district. Cow Pen Slough has been identified as a potential future surface water supply source by SWFWMD in their future water supply plan. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Updates and presentations to the SWFWMD staff at the regulatory field office located in Sarasota County.
- Technical meetings with SFWFMD staff in Brooksville and Tampa relative to minimum flows and levels (mfls) for Cow Pen Slough.
- Attendance at meetings with Governing Board Members.
- Attendance at Basin Board meetings and Governing Board meetings.

Deliverables:

- Minutes of meetings

Task 5.2 – Charlotte Harbor National Estuary Program (CHNEP)

The Dona and Roberts Bay watersheds are located within the Charlotte Harbor National Estuary Program management area. CHNEP is a federal management partner and facilitates citizen interest and technical expertise to formulate management policy through its Comprehensive Conservation Management Plan. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Updates and presentations to the CHNEP staff located in Fort Myers.
- Attendance at management committee meetings.
- Attendance at policy committee meetings.
- Attendance at technical and/or citizen advisory committee meetings.

Deliverables:

- Minutes of meetings

Task 5.3 – Peace River/Manasota Regional Water Supply Authority (PRMRWSA)

The PRMRWSA also provides regional planning coordination for future water supply development. Cow Pen Slough is currently listed by the Planning Alliance as a potential future water supply source. Therefore, if as part of this PROJECT, Cow Pen Slough develops into a water supply opportunity, the PRMBRWSA may become the implementing and permitting agency. To prepare for this potential eventuality, the following coordination efforts could be included in this task, if requested by the COUNTY:

- Updates and presentations to the PRMRWSA staff.
- Attendance at 6 PRMRWSA meetings.

Deliverables:

- Minutes of meetings

Task 5.4 – Florida Department of Environmental Protection (FDEP)

The FDEP administers several federal water quality related programs including the National Pollutant Discharge Elimination System (NPDES) and Total Maximum Daily Load (TMDL) programs. FDEP also assists the Governor in evaluating grant applications for the nomination to EPA under the Targeted Watershed Program. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Meeting with FDEP in Tallahassee to discuss application for the Targeted Wetlands Program
- Attendance at meetings with FDEP

Deliverables:

- Minutes of meetings

Task 5.5 – Environmental Protection Agency (EPA)

The EPA is responsible for several federal water management programs including the National Pollutant Discharge Elimination System (NPDES), Total Maximum Daily Load (TMDL), and the National Estuary Programs (NEP). EPA also administers the Targeted Watershed Grant Program. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Meeting with EPA in Atlanta to discuss the Targeted Wetlands Program

Deliverables:

- Minutes of meetings

Task 5.6 – Natural Resources Conservation Service (NRCS)

The NRCS is responsible for several federal water management programs including determination of federal wetland limits for agricultural lands. NRCS also administers the Wetlands Reserve Program. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Updates and presentations to the NRCS staff located in Sarasota.
- Attendance at meetings with NRCS to discuss certified wetland limits for the Albritton site.

Deliverables:

- Minutes of meetings

Task 5.7 – Army Corps of Engineers (ACOE)

The ACOE is responsible for several federal water management programs including determination of federal wetland limits for non-agricultural lands. The following coordination efforts could be included in this task, if requested by the COUNTY:

- Attendance at meetings with the ACOE and/or the NRCS to discuss certified wetland limits for the Venice Minerals and Albritton sites.
- Attendance at meetings with the ACOE and/or the NRCS to discuss potential natural system restoration/enhancement opportunities.

Deliverables:

- Minutes of meetings

TASK 6 – WATERSHED STAKEHOLDER GROUP & PUBLIC OUTREACH

Within the Dona Bay, four (4) distinct but related audiences have generally been identified including:

1. Dona Bay/Coastal Community – Nokomis Area
2. Cow Pen Slough – Large Property Owners
3. Rural Lot Subdivisions
4. Other Municipalities – City of Venice & Manatee County

The public outreach process should be designed to inform and engage these stakeholders in understanding watershed issues and advocating policies and management strategies to improve the watershed. The process could begin with informal discussions with the various stakeholder groups to inform them of the process and seek their participation. Concurrently, a watershed story handout and related PowerPoint presentation should be produced for use at the first stakeholder "summit", to which the public and particularly the stakeholder groups should be invited. A project web site linked through the county's site and the Water Atlas also should be produced and maintained to facilitate outreach. It is envisioned that the stakeholder summit could be facilitated by the ENGINEER team and hosted by the Sarasota County, SWFWMD, CHNEP and possibly the PRRWPA. The format of the initial meeting should be to first create a common understanding of the watershed and its history. It is anticipated that telling the watershed story could stimulate a sharing of history by many of the watershed property owners, generating a shared awareness and appreciation for the environment among existing and recent residents. Next, the stakeholders could be engaged to discuss water related concerns and interests at the individual, neighborhood, and watershed scales. These concerns and interests may range from nuisance flooding, to the maintenance of lake littoral zones, to the restoration of Dona Bay.

Finally, the stakeholders could be engaged to help identify goals for the sustainability of water and land resources in the watershed. The CHNEP/District/County developed watershed management goals should be shared with the stakeholder group and adjusted/expanded, as appropriate based upon the stakeholder input.

Following any initial stakeholder summit, the ENGINEER team could conduct informal group meetings with individual stakeholder groups to discuss policy and management implications that result from the summit. Concurrently, the watershed story handout, PowerPoint and web site should be updated to include policy and management approaches. This information could roll out at a second stakeholder summit. Results of this discussion with stakeholders and other interested parties should form the basis of recommendations regarding future outreach and communications in the watershed. These recommendations could be included in the Watershed Management Plan.

Relationships with homeowners associations as well as major property owners such as the Palmer Ranch, LT Ranch, Hawkins Ranch, Chuck Downs, and Hi-Hat Ranch can be strengthened through these periodic

stakeholder meetings. Stakeholder meetings should continue through the course of the project as needed to strengthen relationships and share information.

The following specific tasks will be completed by the team's Communication ENGINEER within the project's lump sum budget:

1. Write, edit and direct production of Dona Bay Watershed Story handout – original four-page version and subsequent eight-page version.

2. Assist with preparation and attend small group meetings with various stakeholders.

3. Assist with preparation and attend two stakeholder summit meetings

4. Provide media releases and background information to county staff to facilitate media roll-out and up to two subsequent updates. Advise in the coordination of media relations as required.

5. Provide content for project web site and advise on updates.

6. Provide public outreach content for Watershed Management Plan and review/edit the document before final submittal

Additional effort by other team members is difficult to quantify and therefore will be paid on an hourly basis. The anticipated effort is estimated as shown in Exhibit D. Should the COUNTY request services in excess of the estimated amount, that would be Additional Service. Key activities in this Task that the other team members could participate in, if requested by the COUNTY, include:

- Preparation and initial presentation to Sarasota County Board of Commissioners
- Initial informal meeting with coastal/Nokomis community regarding process, schedule and potential outcomes
- Initial informal meeting with major landowners regarding process, schedule and potential outcomes
- Initial informal meeting with the City of Venice staff regarding process, schedule and potential outcomes
- Initial informal meeting with Manatee County staff regarding process, schedule and potential outcomes
- Preparation and update of Dona Bay watershed story and Power Point Presentation
- Media roll-out and updates
- Conduct initial watershed stakeholder summit
- Attend Nokomis community meetings
- Attend rural subdivision homeowners association meetings
- Conduct meetings with major landowners
- Conduct watershed stakeholder summit to present Watershed Management Plan

Deliverables:

- Digital copies of presentation materials
- Digital copies of public relations materials
- Minutes of meetings

TASK 7 – PURSUIT OF FUNDING ASSISTANCE

Because of the alignment of its general objectives with those of state, regional and national agencies, the PROJECT has the potential for several funding assistance partnerships. This task includes assisting the COUNTY to identify and secure short term and long term funding assistance and grant opportunities for the PROJECT. Some of the key funding assistance and grant opportunities are identified below:

1. Florida Forever Program - this state grant trust is accessible through SWFWMD. Sarasota County has successfully secured funding from this source for the acquisition of Environmentally Significant Lands. In a meeting on November 21, 2004, District staff indicated that land acquisitions with water resource potential may be given a preference relative to the Florida Forever Program. In December of 2004, Sarasota County submitted a request to SWFWMD for a 50% reimbursement for the acquisition of the Albritton and Venice Minerals sites, located in the Dona Bay watershed.

2. NRCS Wetland Reserve Program – this federal grant program is primarily intended to provide funding assistance to restore agricultural lands that are former wetland areas. Contact has been made with the regional NRCS representative and a non-binding application was submitted by Sarasota County in December of 2004. To the extent that the PROJECT will involve wetland restoration, this program could provide funding assistance for construction. Criteria for this program has been reviewed and to the extent that the Albritton tract would be restored as a wetland system, it is expected to score high in areas of habitat restoration and protection, location, hydrology, and wildlife species benefits. Sarasota County has held several preliminary meetings with the NRCS. The NRCS has visited the site and indicated that the site potential would result in a very high ranking but that a concept or preliminary plan and cost estimate would be needed to complete their evaluation.

3. SWFWMD Cooperative Grant Funding – this state funding assistance program is administered by SWFWMD and is primarily for the planning, design and construction of watershed management projects. Applications for projects are ranked favorably if they contain one or more of the following components: water supply, water quality enhancement, flood protection, or natural system restoration. The PROJECT has the potential to include all of these components as well as recreational opportunities. The County submitted a grant application to the District in December of 2004, for fiscal year 2006. This grant application will be ranked and presented to the Manasota Basin Board for consideration in April of 2005.

4. SWFWMD Surface Water Improvement and Management (SWIM) Funding – this state funding assistance program is administered by SWFWMD and is primarily for natural system restoration projects. Preliminary discussions with SWFWMD staff overseeing this program indicate that the PROJECT may be eligible for grant funding for both restoring Dona Bay and possibly reallocation of freshwater flows back to the Myakka River.

5. SWFWMD New Water Source Initiatives Grant Funding – this state funding assistance program is specifically for the development of new water sources. The Cow Pen Slough watershed is identified by both the SWFWMD and the Peace River Water Planning Alliance as a potential future water supply source. Any water supply development in the Cow Pen Slough watershed would therefore be eligible for funding assistance from this source.

6. EPA Targeted Watersheds Grant Program – this federal funding assistance program is being researched by Sarasota County. Preliminary research into this grant program indicates that the Governor's endorsement is required prior to approval by EPA. Contacts in Tallahassee and Atlanta will be engaged to further explore this funding opportunity.

7. Other Funding Assistance and Grant Opportunities – an extensive web search will be conducted for other potential funding assistance and grant opportunities. Other potential funding opportunities include USFWS and NOAA wetland restoration grants, EPA National Estuary Program funding, Florida Communities Trust (FCT) funding for land acquisition, SWFWMD FDOT Mitigation funding (if a regional wetland mitigation project were developed through the plan).

Deliverables:

- Meeting minutes for up to 9 follow-up meetings relative to Florida Forever, SWFWMD Cooperative Grant, NRCS Wetland Reserve funding requests.
- Draft grant request packages for New Water Resource Initiative, Targeted Wetland, and/or up 2 additional grant applications.

TASK 8 – MISCELLANEOUS CONSULTING AND ANALYSES ACTIVITIES

This task includes miscellaneous and support CONSULTING and analyses activities, as needed. For example, it is envisioned that the existing control structure on Cow Pen Slough located south of state Road 72 might be reconfigured or relocated to redirect freshwater through the historical slough system. This would assist in the restoration of wetland habitat, water quality, and floodplain functions and values in the watershed. It would also help to address the timing of freshwater pulses from the canal to Dona Bay by filtering and attenuating them back through the watershed. Specific tasks that may be included in this Phase or subsequent phases, subject to special authorization by the COUNTY include:

Task 8.1.1 – Evaluation of Sub-Surface Storage Options

To augment surface storage during prolonged periods of drought, sub-surface storage sites will be investigated. Previous feasibility studies for Aquifer Storage and Recovery (ASR) well sites will be provided by the COUNTY and reviewed by the ENGINEER for applicability to the Dona Watershed Management Plan by the ENGINEER as part of this Task. Preliminary estimates of probable cost for each storage option will be developed. Additional investigations if needed will be recommended and if authorized, will be performed by the ENGINEER. Potential ASR well sites will be recommended to augment surface storage needs.

Preliminary designs for each ASR well site as well as other water infrastructure as needed to manage and store surface waters may be developed. If an ASR well is selected for implementation, and if directed by the COUNTY, the ENGINEER will conduct necessary well pumping tests as well as final plans and permits for the construction of the ASR wells and supplemental water management facilities. Final design consulting services will include surveying, hydro-geotechnical analyses, civil and structural engineering, and environmental science. These activities may be authorized under a subsequent work order of this contract.

Deliverables:

- Interim report presenting the results of the review identified in this Task.

Task 8.2.1 – Development of Historical Dona and Roberts Bay Pollutant Loading Model

This Task includes developing an estimate of historical wet season, dry season, and annual pollutant loads for the Dona and Roberts Bay watershed based upon watershed boundaries developed from the 1847 land survey and available topographic maps and aerials. Historic/natural system land uses will be based upon historic NRCS soils associations. The ENGINEER will utilize the pollutant loading model being developed and provided by the COUNTY.

Deliverables:

- Digital GIS map of estimated historic watershed boundary and natural system land uses
- Report summarizing the approach and results of the pollutant loading analysis for the historical Dona and Roberts bay watershed

- Additional flood model updates for the Dona and Roberts Bay watershed models.
- Additional pollutant loading model development and/or updates for the Dona and Roberts Bay watersheds.
- Aquifer Storage and Recovery (ASR) well feasibility, design, permitting and implementation.
- Water treatment plant feasibility, design, and permitting.
- Water transmission line planning, modeling, and design.
- Wetland restoration design, permitting and monitoring.
- Reservoir design and permitting.
- Evaluation of impacts and mitigation of Blackburn Canal on Dona and Roberts bays.
- Incorporation of other water resource projects currently under contract by members of our ENGINEER team such as the Celery Fields, the Atlantic treatment plant conversion, and the Sarasota/Manatee County regional water interconnect.
- Preliminary estimates of probable construction costs.
- Additional evaluations of potential for mitigation banking.

Task 8.2.2 – Regional Stormwater Treatment Feasibility Study

This Task includes evaluating four (4) options consisting of operation of the following sites to provide regional stormwater treatment.

- Albritton Grove
- Venice Minerals
- Grove at Hi-Hat Ranch
- Pasture at Hi Hat Ranch

Stormwater treatment capacity and pollutant removal efficiency provided by each of these sites will be quantified and the upstream area potentially serviced (i.e. benefit area) by each facility will be determined. Alternatively, the "added" pollutant removal capacity will be quantified and evaluated as providing water quality "credits".

Deliverables:

- Brief report in hard (3 copies) and digital format presenting the stormwater treatment capacity and pollutant removal efficiency provided and map of the potential benefit area for each treatment facility. An estimate of the amount of treatment and pollutant removal capacity will be summarized. The report will also provide recommendations for the implementation of each facility.

Task 8.3.1 – Update Dona and Roberts Bay Watershed Model

This Task includes performing an update to Dona and Roberts Bay models and maps to reflect up to 10 (ten) new developments that have occurred in the unincorporated portion of Sarasota County since the completion of the original basin master plans. All model updates will be performed in accordance with the *Sarasota County Model Maintenance Procedure Manual* dated October, 2002. Any field surveying needed to complete this task will be certified and provided by the COUNTY.

If available, the COUNTY will provide the ENGINEER with electronic copies of engineering plans in AutoCADD and ICPR input. In addition, the COUNTY will provide the ENGINEER with hard copies of certified engineering plans and stormwater management reports and calculations. For projects approved after January, 2004, the COUNTY will also provide hard copies of the standard data modification/addition/deletion forms for each project to be included in the model update. For the purpose of this Task it is assumed that the ENGINEER will need to develop standard data modification/addition/deletion forms for up to four (4) projects.

Deliverables:

- Digital ICPR input file for the updated Dona and Roberts Bay watershed model
- Copies of completed standard data modification/addition/deletion forms for each project (electronic and hard copy), if developed by the ENGINEER
- Digital ICPR output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS maps of updated subbasin, node/reach and 100-year floodplain for the Dona and Roberts Bay watershed
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format summarizing the modeling approach and results.

Task 8.3.2 – City of Venice Watershed Model Updates

This Task includes performing up to seventeen (17) model updates to reflect developments over 35 acres in total area or 8 acres of total impervious areas and approved within the City of Venice since the completion of the Dona and Roberts Bay watershed models. All model updates will be performed in accordance with the *Sarasota County Model Maintenance Procedure Manual* dated October, 2002. Specifically, these activities include expanding the Dona and Roberts Bay watershed model and floodplain maps pursuant to the Joint Project Agreement (JPA) with the City of Venice to include the following approved projects:

- Venetian Golf & River Club
- Triple Diamond
- Pinebrook Road Extension
- Sawgrass
- Amora
- Auburn Lakes
- Fountain View
- Gondola
- Golf Vista

- Golf Green
- Bellagio
- Aston Gardens
- Auburn Woods
- Bridle Oaks
- Eagle Point Club
- Lakeside Woods
- Caribbean Bay Club (formerly Lake Awesome)

If available, the COUNTY will provide the ENGINEER with electronic copies of engineering plans in AutoCADD and ICPR input. In addition, the COUNTY will provide the ENGINEER with hard copies of certified engineering plans and stormwater management reports and calculations. The ENGINEER will prepare standard data modification/addition/deletion forms for each project to be included in the model update. Any field surveying needed to complete this task will be certified and provided by the COUNTY. In the event that the effort for this task exceeds the balance of the funds remaining in the current JPA, the actual number of projects to be incorporated into the model under this task will be limited to balance of funds remaining in the current JPA, unless the City of Venice agrees to provide additional funds to include the effort required to complete any or all of the outstanding projects.

Deliverables:

- Digital ICPR updated input file for the updated Dona and Roberts Bay watershed model
- Digital ICPR updated output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS maps of updated subbasin, node/reach and 100-year floodplain for the Dona and Roberts Bay watershed.
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (5 copies) and digital format summarizing the modeling approach and results.

Task 8.3.3 – Connect Dona & Roberts Bay Watershed Models

At present, the Shakett Creek, Fox Creek, Salt Creek and Cow Pen Slough drainage basins are contained within a single ICPR model, known as the Dona Bay watershed model. Hatchett Creek and Curry Creek are also contained within a single ICPR model known as the Roberts Bay watershed model.

Since it has been determined to be advantageous to consider the Dona and Roberts Bay watersheds together, this Task includes combing these separate ICPR models into a single model, to be called the Dona Bay watershed model. Upon completion of combining these models, a floodplain QA/QC will be performed to determine and if necessary reconcile the areas shown as flooded on the maps and the areas calculated in the model. Any field surveying needed to complete this task will be certified and provided by the COUNTY.

Deliverables:

- Digital ICPR input and output files for the combined Dona and Roberts Bay model
- Digital ICPR output files will include the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS file of the revised subbasin map for the Dona and Roberts Bay watershed

- Digital GIS file of the revised node/reach map for the Dona and Roberts Bay watershed
- Digital GIS file of the revised 100-year floodplain map for the Dona and Roberts Bay watershed

Task 8.3.4 – Upper Cow Pen Slough Watershed Model Development

When the Cow Pen Slough/Shakett Creek flood study update was prepared, topographic maps for approximately 11,551.88 acres located at the headwaters of the watershed (including the portion in Manatee County) were not available. Although the contributing flow from this area was considered in the flood study update, this portion of the watershed was not modeled in detailed. However, since that time of the completion of the Cow Pen Slough/Shakett Creek flood study update, digital topographic maps for this upstream area have become available from SWFWMD. In addition, preliminary subbasins, nodes and reaches have been developed for this area. This Task includes the development of a detailed flood model for this portion of the watershed consistent with the level of detail and methodology used for the Cow Pen Slough/Shakett Creek flood study update and will be performed under the direct supervision of Steve Suau, J.P.Marchand, Eric Bilik and/or Ben Quartermiane. Any field surveying needed to complete this task will be certified and provided by the COUNTY. Activities in this Task include:

- Verification, and if necessary, adjustment of the preliminary subbasin boundaries
- Development of hydrologic parameters for each subbasin consistent with previous Sarasota County model methodology
- Identification and collection of field survey needs
- Development of stage-area relationships for each subbasin/node based upon NGVD 1929 digital topography (Woolpert Data Series).
- Development of hydraulic parameters for each subbasin based upon NGVD 1929 digital topography (Woolpert Data Series) & collected field survey data.
- Addition of hydrologic and hydraulic input parameters for the study area into the Dona and Roberts Bay watershed model
- Simulation and debugging of model for the study area. In general this will be done by simulating the 100-year design storm and making sure that computed flood stages are "captured" with in either top of bank or maximum storage elevations specified in the model. It is expected that this activity will require the adjustment of the maximum elevations specified and the inclusion of additional overflow weirs.
- Delineation of the 100-year floodplain for Upper Cow Pen Slough study area
- Coordinate field surveying of up to 12 structures and 12 roadway segments to determine if they constitute level of service deficiencies
- Revise floodplain map as applicable to "island out" structures that are not level of service deficiencies

Deliverables:

- Digital ICPR input file for the updated Dona and Roberts Bay watershed model
- Digital ICPR output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS maps of subbasin, node/reach and 100-year floodplain for the Upper Cow Pen Slough study area as well as for areas downstream that may visibly need to be updated (as part of the QA/QC)
- Identification of existing structure and roadway flood protection level of service (as defined by the Sarasota County Comprehensive Plan and Cow Pen Slough/Shackett Creek study area) deficiencies in the Upper Cow Pen Slough study area. Flood protection level of service

deficiencies will be identified in tabular and graphical form and provided in digital and hard copy formats
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format summarizing the modeling approach and results

Task 8.3.5 – Dona and Roberts Bay Coastal (including Lyon's Bay) Model Development

This Task includes preparing a detailed watershed model for the area identified as the Dona/Roberts Bay Coastal basin (including Lyons Bay). Development of a detailed model for this portion of the watershed will be consistent with the level of detail and methodology used in the adopted Cow Pen Slough/Shakett Creek flood study update and will be performed under the direct supervision of Steve Suau, J.P.Marchand, Eric Bilik and/or Ben Quartermiane. Any field surveying needed to complete this task will be certified and provided by the COUNTY. The Activities included in this Task are:

- Delineation of the subbasin boundaries
- Development of hydrologic parameters for each subbasin consistent with previous Sarasota County model methodology
- Identification and collection of fields survey needs
- Development of stage-area relationships for each subbasin/node based upon NGVD 1929 digital topography (Woolpert Data Series) if available or SWFWMD 1:200 Aerials.
- Development of hydraulic parameters for each subbasin based upon NGVD 1929 digital topography (Woolpert Data Series) if available or SWFWMD 1:200 Aerials & collected field survey data.
- Addition of hydrologic and hydraulic input parameters for the study area into the Dona and Roberts Bay watershed model
- Simulation and debugging of model for the study area. In general this will be done by simulating the 100-year design storm and making sure that computed flood stages are "captured" with in either top of bank or maximum storage elevations specified in the model. It is expected that this activity will require the adjustment of the maximum elevations specified and the inclusion of additional overflow weirs.
- Delineation of the 100-year floodplain for Dona and Roberts Bay Coastal study area
- Field surveying of up to 24 structures and 24 roadway segments to determine if they constitute level of service deficiencies
- Revise floodplain map as applicable to "island out" structures that are not level of service deficiencies

Deliverables:

- Digital ICPR input file for the updated Dona and Roberts Bay Coastal study area
- Digital ICPR output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS maps of subbasin, node/reach and 100-year floodplain files for the Dona and Roberts Bay Coastal study area (as part of the QA/QC)
- Identification of existing structure and roadway flood protection level of service (as defined by the Sarasota County Comprehensive Plan and Cow Pen Slough/Shackett Creek study area) deficiencies in the Dona and Roberts Bay Coastal study area. Flood protection level of service deficiencies will be identified in tabular and graphical form and provided in digital and hard copy formats

- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format summarizing the modeling approach and results

Task 8.3.6 – Inclusion of Additional Watershed Connections

Because of the relatively flat topography of the region, several hydraulic connections between the Dona and Roberts Bay watershed and adjacent watersheds exist during major flood events. This Task includes developing strategies and model adjustments to consider these hydraulic connections. Any field surveying needed to complete this task will be certified and provided by the COUNTY. A brief summary of the number of connections and approach to address each are provided below:

- South Creek – Up to 20 connections between the Dona Bay and Roberts Bay watershed and the South Creek watershed will be considered from State Road 72 to I-75. Connections between adjacent subbasins will be addressed by inclusion of up to 3 adjacent subbasins in the South Creek watershed into the Dona and Roberts Bay watershed model.
- Phillippi Creek – Up to 6 connections between the Dona Bay and Roberts Bay watershed and the Phillippi Creek watershed will be considered north of Fruitville Road (no connections are believed to exist south of Fruitville Road). Connections between adjacent subbasins will be addressed by inclusion of up to 3 adjacent subbasins in the Phillippi Creek watershed into the Dona and Roberts Bay watershed model.

Deliverables:

- Digital ICPR input file for the updated Dona and Roberts Bay watershed model
- Digital ICPR output files for the 2-year, 5-year, 10-year, 25-year and 100-year design storm simulations
- Digital GIS map of 100-year floodplain file for the Dona and Roberts Bay watershed update
- Brief report, consistent with the Cow Pen Slough/Shakett Creek Basin Master Plan Update, as applicable, in hard (3 copies) and digital format summarizing the modeling approach and results.

Task 8.3.7 – Cow Pen Slough Canal | Sediment Removal Plan

This Task includes preparing a phasing plan for the removal of sediment in the Cow Pen Slough Canal. The amount of sediment to be removed, limits of removal, methodology for removal and disposal location(s) will be coordinated for each phase with the COUNTY. Cross section and sediment accumulation quantities developed as part of the Cow Pen Slough/Shakett Creek Flood Study Update will be utilized to estimate the quantity and location of existing sediment accumulation. The ENGINEER will meet with the SWFWMD to review the proposed sediment removal plan and request an exemption for maintenance. The COUNTY will provide copies of the original as-built plans for Cow Pen Slough canal.

Deliverables:

- Exemption request package for maintenance to the SWFWMD
- Analysis of alternatives for sediment removal (i.e. excavator vs. suction dredge, etc.) and recommendations
- Report summarizing the phasing plan for the removal of sediment accumulation in the Canal

Miscellaneous consulting and analyses activities also subject to special authorization by the COUNTY might

also include:

- Additional flood model updates for the Dona and Roberts Bay watershed models.
- Additional pollutant loading model development and/or updates for the Dona and Roberts Bay watersheds.
- Aquifer Storage and Recovery (ASR) well feasibility, design, permitting and implementation.
- Water treatment plant feasibility, design, and permitting.
- Water transmission line planning, modeling, and design.
- Wetland restoration design, permitting and monitoring.
- Reservoir design and permitting.
- Evaluation of impacts and mitigation of Blackburn Canal on Dona and Roberts bays.
- Incorporation of other water resource projects currently under contract by members of our ENGINEER team such as the Celery Fields, the Atlantic treatment plant conversion, and the Sarasota/Manatee County regional water interconnect.
- Preliminary estimates of probable construction costs.
- Additional evaluations of potential for mitigation banking.

PHASE 2 – PREPARATION OF WATERSHED IMPLEMENTATION PLAN

Based upon the recommendations of the Watershed Management Plan, the ENGINEER will develop preliminary design plans to implement the Plan objectives. The Scope of Services and Fee for this Phase of the PROJECT will be negotiated at a later date.

PHASE 3 – PREPARATION OF FINAL PLANS AND PERMITS

The ENGINEER will prepare final plans and permits for individual projects or the entire implementation plan as directed by the COUNTY. The Scope of Services and Fee for this Phase of the PROJECT will be negotiated at a later date.

SECTION VIII AGREEMENT TIME

AGREEMENT time shall be as shown in the PROJECT MILESTONE COMPLETION SCHEDULE (Exhibit C of the AGREEMENT). It lists the incremental times stipulated for ENGINEER's performance of professional services. ENGINEER's receipt of the COUNTY's Purchase Order covering work of this AGREEMENT shall serve as the Notice to Proceed. The Phase 1 Scope of Services shall be completed within 365 days. The ENGINEER will not be responsible for delays caused by: acts of GOD impacting the ENGINEER or its sub ENGINEERs; delays in receiving information from others (i.e. utility companies, regulatory agencies); and in obtaining subsequent authorization, approvals, and review comments from the COUNTY and other governmental agencies. If this should occur, the schedule will be updated and adjusted as mutually agreed upon by the ENGINEER and the COUNTY.

END SCOPE OF SERVICES