RESTORE Act Ecosystem Restoration Project Proposals
for consideration in the Gulf Coast Ecosystem Restoration Council's Comprehensive Plan 2012

Contact Information: Roland Ottolini	**Date of Submittal:** 1/07/2013
Name of Project: Conversion of Septic Systems to Sewer	**Org and Rank**: 7

Background: There are many sources of nutrient inputs to watersheds. Some are naturally occurring and some are a result of human activity. Examples of significant sources of naturally occurring nutrients include bird rookeries and breakdown products of vegetative detritus from tree litter. Significant sources of nutrients that occur resulting from human activity include fertilizer use in both the urban and agricultural settings, unmanaged animal waste in stormwater run-off, and septic tank drainage systems. The issue of nutrient pollution abatement must be addressed from many perspectives and this proposal focuses on managing pollution from septic drainage system failure.

Lee County has experienced a general decline in the quality of its surface water. An example of this decline has been exhibited in high nutrient and *Chlorophyll-a* concentrations in the Tidal Caloosahatchee and Estero Bay tributaries that have resulted in negative impacts to human health and our economy and has limited the recreational use of our water resources as evidenced by beach closures and illness due to seafood consumption. This may be attributed to the fact that the tributaries to the Estero Bay and the Caloosahatchee have surpassed their capacity to assimilate nutrients. The Estero Bay tributaries have a TMDL for nutrients and fecal coliform and a Basin Management Action Plan (BMAP) has recently been finalized. Similarly, this problem is occurring in tributaries to the Caloosahatchee, which also has a TMDL for nutrients and is subject to the Tidal Caloosahatchee BMAP.

Lee County has maintained a water quality monitoring program for more than 20 years. This program monitors surface water quality at approximately 142 locations in 31 tributaries on a monthly basis. The key parameters measured are fecal coliform, enterococci bacteria (bacteria present in the digestive tract of warm blooded animals) and nutrients. Environmental agencies use fecal coliform and enterococci as an indicator of human sewage entering the waterways. Increasing nutrient concentrations have been evident in Lee County's monitoring data for the last several years and more recently Lee County funded a study conducted by Drs. Brand and Lapointe (draft - 2006) that indicate nutrients from waste water effluent are commonly found in red drift algae tissue as confirmed by the ratio of organic to inorganic nitrogen isotopes present.

There are many sources of nutrients entering our watershed; among the contributors are on-site treatment and disposal systems (OSTDS). The Department of Health has published statistical data on the installation of OSTDS in Florida by County (geographical area, not service area). Lee County ranks in the top five in the State for highest number of overall septic tank installations from 1970-2011 and ranks first for increasing number of septic tanks installed each year since 2000. To date the total number of septic tanks in Lee County numbers 104,821 with approximately 65,000 of those being in the Lee County Utilities Future Sewer Service Area (LCFSA), the Lee County government service area that is not currently sewered but may be subject to sewering in the future. Given the State and federal mandates discussed above, Lee County has considered implementing an OSTDS management ordinance in areas that are not within sewer utility service areas and possibly expanding sewer service to accommodate high density areas that still utilize septic tanks.

Project Description: The proposed project would include the highest density areas in Lee County that have existing near-by sewer facilities that could be extended provided additional wastewater treatment plant capacity is also obtained. These areas include the urban Lehigh Acres corridor, San Carlos Park, San Carlos Estates, and the Hendry Creek watershed. Just to note that urban Lehigh Acres corridor is not included in Lee County Utilities future service area, it is in FGUA's franchise area. The total number of septic tanks proposed for conversion to sewer is 21,000.

Lee County estimates the combined load reduction for conversion of septic tanks to sewer between 79,686 lb TN/yr – 143,435 lb TN/yr (J. Hearn, ATM 2012). The methodology employed utilized the loading rates developed in the Toor et al study (2012), the University of Florida, *Onsite Sewage Treatment and Disposal Systems: Nitrogen.* Septic systems do not have direct effects on surface water uniformly due to attenuation, denitrification and plant uptake that occurs in situ. There are effects to surface water when there is limited opportunity for attenuation due to a surface water interception with groundwater. When calculating loading to surface waters for this exercise, the assumption is made that homes that are within 50 meters of a surface water body deliver some TN loading directly to surface water. Using GIS, the number of homes estimated to be within 50 meters of surface water bodies were identified and the calculation was applied to these areas to estimate TN loading to surface water, with drainfield reductions of TN between 10% and 50%.

Project Location: Caloosahatchee Watershed, Estero Bay Watershed

Responsible Party: Lee County		**Partners**: Bonita Springs Utilities, Florida Governmental Utility Authority
NEP: CHNEP	**Project Cost**: $323,000,000	**Dollars Needed**: $323,000,000
Start: 2014		**Completion**: 2020

Status of Project Design and Permitting: Project in planning.

What Date or Year could Construction Feasibly Begin: TBD

Your Proposed Timing of Funding (given permits, phasing, staging, etc.)

FY	12/13	13/14	14/15	15/16	16/17	17/18	Total

Quantify Environmental Results and How to Measure Them: Water quality improvement by nutrient and bacterial load reduction. Can be evaluated through the BMAP water quality monitoring program.

Economic Benefits (including ecosystem services): Improved water quality, improved fisheries and rookery habitats.

Estimated number of Jobs Created or Preserved: 3,588

How much Habitat will be restored and conserved?: 44,000 acres

Quantify pollutant reductions: 79,686 lb TN/yr – 143,435 lb TN/yr

What living coastal/marine resources will be improved and by how much?: Tidal Caloosahatchee, San Carlos Bay, Pine Island Sound and Matlacha Pass.

How will community resilience be enhanced? Improved freshwater wetland habitat in the current landscape will prolong the period of habitability in the tributaries of the Caloosahatchee, Imperial River and Estero Bay as climate change and sea level rise occur. Habitat improvements due to restored historical flows will also mitigate the current effects of degradation on fisheries and improve the period of time these fisheries can be sustained during the onset of sea level rise.

Additional Justification: Lee County has entered into a Basin Management Action Plan (BMAP) with the Florida Department of Environmental Protection in 2012. The BMAP was

promulgated due to TMDLs for total nitrogen in the Tidal Caloosahatchee, Imperial River and Hendry Creek. The County is required to restore and protect water quality under this watershed restoration plan. The Tidal Caloosahatchee is part of a system that has been designated an Estuary of National Significance as well as discharging into State Aquatic Preserve and National Wildlife Refuges. Hendry Creek and the Imperial River are part of the Estero Bay Watershed. The Estero Watershed is part of a system that has been designated Outstanding Florida Waters as well as discharging into State Aquatic Preserve and National Wildlife Refuges. The Estero Bay Watershed has been identified by numerous local, state and federal studies as an area of critical concern due to hydrologic disconnection resulting from development pressure in the region.

Add any photos or maps that explain project: