WASTEWATER SYSTEM IMPROVEMENTS PROJECT

PRELIMINARY ENGINEERING REPORT

In support of

USDA APPLICATION FOR
FEDERAL FINANCIAL ASSISTANCE

Prepared for

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This item has been digitally signed and sealed by Daniel Magro, PE on the indicated date using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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EXECUTIVE SUMMARY

This Preliminary Engineering Report (PER) was prepared to supplement an application by Lakeshore Club of Polk County Homeowners Association, Inc. (Lakeshore Club Villas, LCV, or Owner) to the United States Department of Agriculture, Rural Development (USDA-RD), requesting financial assistance to provide improvements to the LCV wastewater system. The proposed improvements consist of rehabilitating approximately 7,000 feet of existing gravity sewer pipe and manholes, and replacing the existing master pump station (Project).

The improvements are needed to address the deteriorated condition of the 1960s era gravity sewer system which has exceeded its useful life, required multiple repairs, and is allowing sand, grit, dirt, and infiltration into the system. If LCV is unable to restore the collection system to a good condition, the pipes will likely fail with increasing frequency possibly resulting in sanitary sewer overflows to the adjacent lake, sewer backups, and continuous infiltration.

The proposed Project has an opinion of probable cost of $3.5 million. The existing wastewater rates would need to increase from $50/month per connection ($178/month per EDU) to $82/month per connection ($291/month per EDU) without USDA grant funding, or to $224/month per connection ($64/month per EDU) with 75% USDA grant funding.

3.0) NEED FOR PROJECT

3.1) Health, Sanitation, and Security

Sewer Pipes

The condition of the gravity sewer pipes has deteriorated to the point were the system has experienced several failures resulting in expensive repairs. The potential for future pipe failures is high and could block the normal flow of wastewater potentially resulting in a sanitary sewer overflow into the adjacent lake or a wastewater backup into the residential units.

The rehabilitation of the gravity sewers is needed to alleviate the high risk for adverse health and sanitation conditions.

Master Pump Station

The existing pump station poses a significant health and sanitation risk. The temporary pump that was installed is the only operational pump for the pump station as all the other equipment is out-of-service. Should the pump fail for any reason, the water level inside the wet well would increase and will cause sewer to back-up into the gravity system potentially resulting in a sanitary sewer overflow.

Also, the existing dry-pit is a safety hazard as the forced air ventilation system is not operational prohibiting the workers to enter the confined space.

The rehabilitation of the pump station is needed to alleviate the risk for adverse health, sanitation, and safety conditions.

Accordingly, LCV hereby requests the USDA-RD designate this Project as a ***Health and Sanitation Type Project***, with the purpose of alleviating detrimental public health, environmental, sanitation, and safety conditions.

3.2) Aging Infrastructure

The system was originally constructed in 1963 and has exceeded the average service life for these type of facilities. Both the sewer mains and the lift station have aged to the point of failure and are in need of major rehabilitation to continue to operate well into the future.

Figures 2-1A to **2-1F** show pictures of the condition of the sewer pipes. The extensive cracking and deterioration of the clay pipe over the last 60

years has led to pipe failures, excessive infiltration, and has allowed grit/dirt to enter the system. A significant amount of grit/dirt has deposited in the oxidation ditches of the Gold Coast Utilities wastewater treatment facility, which needs to be cleaned out to restore the treatment capacity of the facility.

Table 2-1 summarizes the condition of existing facilities, suitability for continued long term use, adequacy of current facility, capacity for each component, and applicable compliance FDEP rule.

3.3) Reasonable Growth

The future population is not anticipated to increase beyond the current population estimates as the Service Area is not intended to extend from the current boundaries. No growth component is needed for this Project.

5.0) SELECTION OF AN ALTERNATIVE

All four alternatives were considered during the selection of the proposed Project as follows:

- **Alternative 1 (No Action)** – This alternative was deemed not-feasible as the system would continue to deteriorate likely resulting in sanitary sewer overflows into the lake, sewer backups, and/or costly repairs. Also, sand, dirt, and water would continue to enter the system. The potential health, sanitation and environmental impacts components would remain.

- **Alternative 2 (New Force Main System)** – This alternative is not-feasible. The difficulty in maintaining this large number of pump stations operational during a power failure event could result in a sanitary sewer overflow. For this reason, this alternative was not further considered.

- **Alternative 3 (Gravity Sewer Replacement)** – This alternative is considered feasible as it would result in a new wastewater collection and transmission system that would likely remain in-service for more than 40 years without needed major improvements.

- **Alternative 4 (Gravity Sewer Rehabilitation)** – This alternative is considered feasible at it would restore the functionality of the wastewater collection and transmission system. Most components of the system would be either replaced or repaired likely extending the system's service life for another 40 years.

In summary, Alternatives 1, and 2 were considered not-viable/not-feasible, and Alternatives 3 and 4 were considered viable/feasible. Accordingly, a life cycle cost analysis and triple bottom line considerations were evaluated for Alternatives 3 and 4 as part of the alternative selection process.

Life Cycle Cost Analysis:

A life cycle cost analysis was performed based on Appendix C of OMB circular A-94, a 20-year "real" federal discount rate of 2.0% was used in this analysis. A summary is presented in the table below:

Life Cycle Cost Analysis	
Alternative 3 - Gravity Sewer Replacement	$3.7 million
Alternative 4 - Gravity Sewer Rehabilitation	$3.0 million

Table 5-1 and **5-2** show the life cycle analysis calculation for Alternatives 3 and 4, respectively.

Non-Monetary Factors:

Alternative 3 has the non-monetary factor advantage of having an entirely new sewer system instead of Alternative 4 which would result in a repaired system. A new system is arguably less likely to fail in the long term as repairs associated with CIPP liners, joints between spot repairs, or other factors could develop in the future.

Alternative 4 has the non-monetary factor advantage that the sections of sewer selected for CIPP lining would not need to be excavated and the construction period can be shorter resulting in a lower disruption to the community during construction.

Table 2-1
Condition of Existing Facilities

Facility	Present Condition [1]	Suitability for Continued Long Term Use	Adequacy of Current Facility	Capacity	Compliance Reference
Gravity Sewer Pipes	Poor / Very Poor	Not suitable. Must be repaired or replaced.	Adequate	Supports existing development.	62-604 F.A.C. and Ten State Standards
Manholes	Fair / Very Pool	Not suitable.	Adequate	Supports existing development.	62-604 F.A.C. and Ten State Standards
Master Pump Station	Very Poor	Not suitable. Must be replaced.	Adequate	Supports existing development.	62-604 F.A.C. and Ten State Standards

Notes:

(1) Conditions:

Excellent	New or perfect condition
Good	No improvements recommended to maintain function.
Fair	Improvements recommended to improve performance or efficiency
Poor	Improvements recommended to maintain reliability
Very Poor	Rehabilitation or replacement required