

A background image of a sunset over a body of water. The sun is low on the horizon, creating a bright orange and yellow glow that reflects on the water's surface. The sky is filled with soft, wispy clouds, and the overall atmosphere is calm and serene.

CHARLOTTE PARK SEPTIC TO SEWER PRELIMINARY DESIGN REPORT

TASK 1.6

PREPARED FOR:

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ABSTRACT

Background and Objectives

The City of Punta Gorda desires to install a new central sewer collection system in the Charlotte Park area to replace aging septic systems. The intent of this report is to evaluate two types of collection systems, gravity and vacuum and to determine which system is the most advantageous for this area.

Methods

A conceptual design for each type of collection system; conventional gravity and conventional vacuum, were developed. Material quantities were estimated from the conceptual layouts, and initial base costs for the key elements and long-term operation and maintenance costs were generated to determine which collection type would best serve Charlotte Park.

Results

A conventional vacuum system, in addition to some existing gravity sewer extensions, was determined to be the most cost effective and least disruptive solution. The advantages of installing a new vacuum sewer system in this area include the minimized depth of installation and dewatering needed, the reduced impacts to the existing roadways, less rock excavation and the fewer number of properties needed for pump stations impacting fewer adjacent residents.

Conclusions

We recommend serving the Charlotte Park area with a mixture of two new vacuum systems to serve the East and West sides of the area as well as extend some of the existing gravity systems to maximize the potential of the existing infrastructure.

TASK 1.4 COST ESTIMATES

Summary of Cost Estimates

As the summary table shows below, overall, the vacuum system is the more cost effective option based on the conceptual layouts and present worth analysis. From a financial perspective, using two vacuum systems is more beneficial than nine gravity systems as the 40-year analysis estimates that a vacuum system will save approximately four million dollars.

This conclusion aligns with the findings of the J-E study which found vacuum technology to be the more cost effective alternative.

Life Cycle Present Worth Analysis Summary - Overall

System Type	Base Cost	Base Cost (\$/ERC)	Uniform Series Present Worth (O&M + R&R)	Present Worth of Salvage Value	Total	\$/ERC
Gravity	\$ 28,486,774	\$ 22,083	\$1,844,291	\$886,306	\$29,444,758	\$ 22,825
Vacuum	\$ 24,534,535	\$ 19,019	\$2,224,114	\$673,766	\$26,084,883	\$ 20,221

RECOMMENDATIONS & NEXT STEPS

Prior to making a final decision on the sewer collection system type, we recommend that the City of Punta Gorda Utilities staff arranges meetings with other utilities, such as Charlotte County Utilities and the Englewood Water District, who have experience with vacuum sewer technology. This would enable the City to gain a better understanding of vacuum sewer by touring vacuum stations, meeting with the operations crews and having the opportunity to discuss concerns and ask questions to other utilities staff.

Regardless of the system type, this flowchart outlines additional steps that must be undertaken prior to final design and construction. Non-engineering aspects include financing and the assessment process.

Key issues that should be considered include total cost, disruption during construction, rock excavation, dewatering, the number of special exception processes, locating sites for the stations and the long term impact to the neighbors at each pump station.

The decision as to which system to use in the Charlotte Harbor area isn't easy.

While gravity will certainly work for the entire area, taking *all of the above factors* into consideration, we recommend the City pursue a vacuum type collection system for the majority of the area in addition to the proposed "Almar Drive" and "Vasco Street" gravity sewer system extensions.

