# Money From Nothing: Value-Engineering Utility Regulatory Burden to Substantially Lower Costs

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Pasco County operates water, wastewater, and water reuse utilities. The County's service area of approximately 352 sq mi includes the unincorporated area of the County, as well as some city areas. To operate these utilities, the County historically has maintained numerous permits with the Southwest Florida Water Management District (SWFWMD) and the Florida Department of Environmental Protection (FDEP). These permits required renewals, as well as compliance monitoring, sampling, and reporting. The County has implemented a strategy to reduce the costs associated with these permits in its utility systems. Significant savings have been realized through permit consolidations, reductions in monitoring, and extension of permit terms to maintain compliance, which lessen the overall cost of regulatory requirements.

Similarly, with construction projects, the County is mindful of regulatory costs when approaching permitting and compliance issues, as they are aware of how a restrictive or difficult permit for the contractor will ultimately result in costs to the County. For the new Boyette Reservoir, the County proactively worked with FDEP in the issuance of the environmental resource permit (ERP) to ensure water quality that was sufficient for offsite dewatering, which was incorporated into the permit issued October 2012.

This innovative value-engineering review of the County's regulatory obligations has resulted in a successful reduction of work and fees associated with maintaining the required permits for the County's utility systems. Ten-year savings (in 2011 dollars) through this approach are estimated to be $5.3 million. Savings are identified as follows:

- $225,000 in permit renewal and associated engineering costs, not including a possible additional $50,000 for extending the permit time of Wesley Center and Southeast Pasco Wastewater Treatment Facilities (WWTF).
- $300,920 in analytical costs.
- 24,000 man-hours, for labor savings of approximately $672,000, assuming $28/hr fully burdened labor.
- $4.1 million in estimated construction costs for the Boyette Road Reservoir.

This article explores the techniques and existing rules that allowed the County to recognize these savings, without decreasing environmental protection and maintaining full compliance.

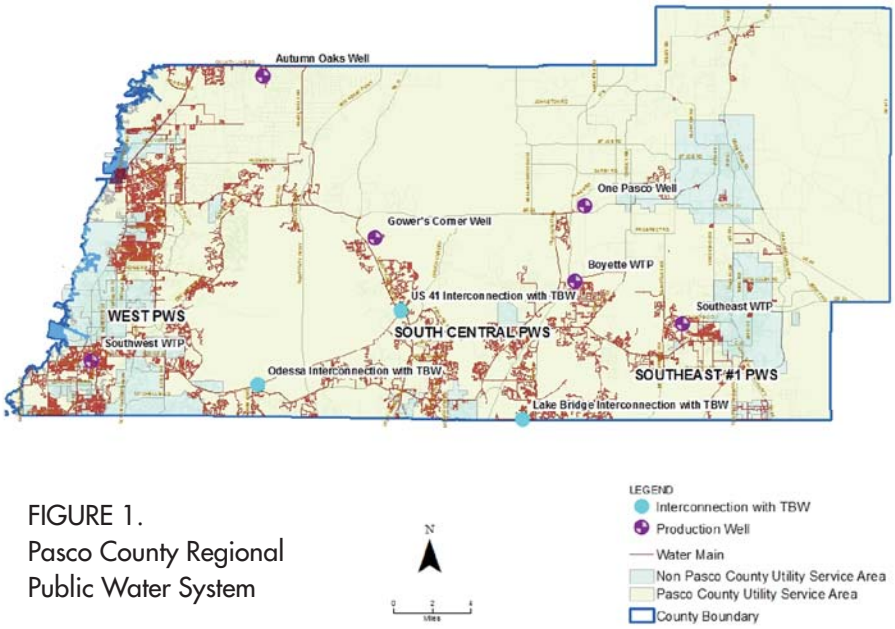


FIGURE 1.
Pasco County Regional Public Water System

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## Water Use Permitting

The County's first cost savings began when the County renewed a water use permit (WUP) that had exceeded its per-capita requirements. The consolidation of several water use permits allowed the calculated per-capita water use to decrease. Additionally, the consolidation of 11 different WUPs into one permit now allows pumping to be distributed among more wells and eliminated the renewal costs for 10 of the 11 permits. The estimated savings is about $150,000 (in 2011 dollars) every 10 years. In addition, administrative costs to the County have been decreased, as there is only one permit to track and maintain, as compared to 11.

At the same time during this permit renewal and consolidation, the County requested reduced monitoring at its 13 public supply wells (see figure 1). The previous permit required that each well be sampled quarterly for chloride, sulfate, and total dissolved solids. Eight of the 13 public supply wells now only have to perform this work annually. Monitoring has been reduced by 75 percent, resulting in a savings of $672 and 24 man-hours per quarter, or $2688 and 96 man-hours per year for the duration of the permit.

## Public Water System Consolidation

Continuing with this theme, the County decided to consolidate the public drinking water systems (PWSs) in anticipation of the Stage 2 Disinfection Byproduct Rule (DBPR). The County originally operated a total of 14 PWSs to supply drinking water to more than 100,000 customers; eleven of these 14 systems

are small and isolated. However, the three remainder large systems (West, South Central, and Southeast #1) are interconnected and provide service to 97 percent of the population. Because these three systems were constructed and permitted separately with unique PWS identifications, compliance monitoring was required independently for each area.

The Pasco County Regional PWS and the points of entry of each system are presented in Figure 1. Water sources for the West, South Central, and Southeast #1, are a blend of groundwater owned and operated by the County and interconnections to Tampa Bay Water, which provides water from regional well fields, treated surface water, and desalinated seawater. Because the supply sources utilized in these three Pasco County PWSs include treated surface water, they are a Subpart H system. As these three systems are interconnected, and receive water from the same sources, FDEP determined that they were eligible for consolidation. The consolidation of the West PWS, the South Central PWS, and the Southeast #1 PWS, resulted in a single Pasco County Regional PWS.

A number of monitoring reductions were achieved through the consolidation. The largest reduction was in the number of bacteriological samples required for distribution system monitoring. Prior to consolidation, the County had been taking 278 monthly samples in the three distribution systems. Bacteriological sample numbers are determined by population served and the proportional number of samples required decreases with increasing population. The final number of samples required by the consolidated Pasco County Regional PWS is only 120 per month. This is a decrease of approximately 1,900 samples per year. Savings related to bacteriological sampling reduction include approximately 1,500

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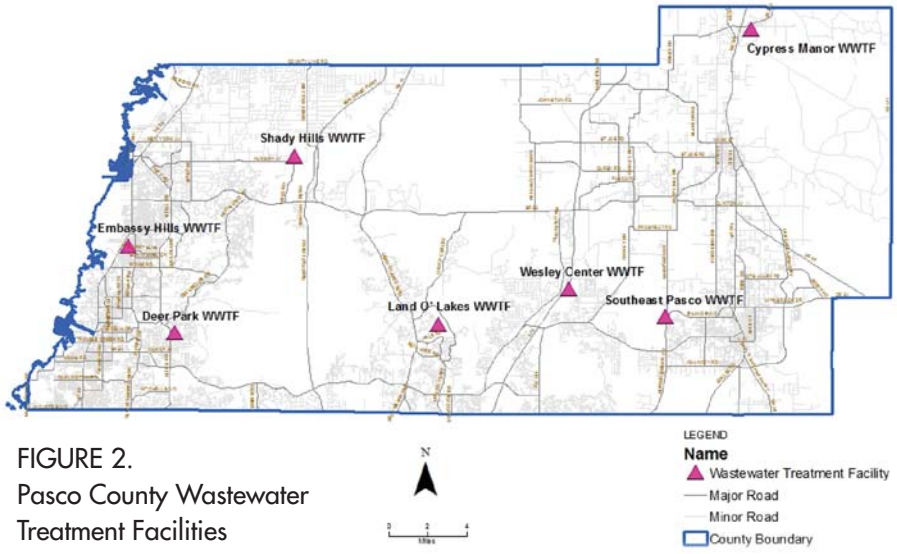


FIGURE 2.
Pasco County Wastewater Treatment Facilities

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man-hours and $13,300 in analytical costs per year.

During this consolidation, the transition from Stage 1 to Stage 2 of the DBPR was made. For the three PWSs to comply separately, eight samples for each system would have been required quarterly (96 samples annually). Presently, the consolidated Pasco County Regional PWS is required to submit eight samples quarterly. This is a reduction of 64 samples per year, which saves the County approximately $4,200 in analytical costs and approximately 64 man-hours annually.

Lead and copper monitoring requirements were also reduced. Like bacteriological sampling, lead and copper monitoring is based on population served and the number of samples required is proportionally reduced with increasing population. For the independent PWS to comply separately, a total of 110 lead and copper samples were required every six months. The Pasco County Regional PWS compliance is now 50 samples twice per year. This represents a reduction of 120 samples per year, which results in savings of approximately $2,500 in analytical costs and approximately 100 man-hours.

The consolidation of the three PWSs into the Pasco County Regional PWS is projected to save approximately $20,000 per year in analytical costs, and up to 1,664 man-hours per year.

## Wastewater Treatment Plant Permit Extension

The County also maintains permits for seven wastewater treatment facilities (WWTF) under F.A.C. 62-600. While a National Pollutant Discharge Elimination System (NPDES) permit typically is renewed every five years, permitted under Florida Statutes (FS) 403.00885, there is some flexibility allowed under F.A.C. 62-610. The requirements are laid out in 403.087, F.S., and include:

- The facility is not regulated under the NPDES program under Section 403.00885, F.S.
- The permittee requests that a permit for a term exceeding five years be issued.
- The permit application is for permit renewal.
- The waters from the treatment facility are not discharged to an injection well, which is required to comply with federal standards under the Underground Injection Control Program under Chapter 62-528 of the Florida Administrative Code (F.A.C.)
- The treatment facility is not operating under a temporary permit or a permit with an accompanying administrative order.
- The treatment facility does not have any enforcement actions pending against it by the U.S. Environmental Protection Agency (EPA), the department, or a delegated local program approved under Section 403.182, F.S.
- The treatment facility has operated under an operation permit for five years and, for at least the preceding two years, has "generally operated in conformance with the limits of permitted flows and other conditions specified in the permit."
- The department has reviewed the self-monitoring reports required under department rule and is satisfied that the reports are accurate.
- The treatment facility has "generally met all water quality standards in the preceding two years, except for violations attributable to events beyond the control of the treatment plant or its operator, such as destruction of equipment by fire, wind, or other abnormal events that could not reasonably be expected to occur."
- The department, or a local program approved under Section 403.182, F.S., has conducted, in the preceding 12 months, an inspection of the facility and has verified in writing to the operator (permittee) of the facility that it is not exceeding the permitted capacity and is in substantial compliance.

Six of the County's facilities discharge into the Pasco County Master Reuse System (PCMRS), so they do not have NPDES permits for surface water discharges, and they also meet the remaining conditions, making them eligible for a permit term of up to 10 years. The County's seven WWTF are shown in figure 2; Cypress Manor was not eligible for a 10-year permit at the time of consolidation due to previous operational issues. Four of the County's facilities (Embassy Hills, Shady Hills, Deer Park, and Land O' Lakes WWTF) requested 10-year permits at renewal, and the FDEP granted the request. This cuts permitting fees in half over the next 10 years, saving not only the $5,000 renewal fee, but engineering costs associated with the renewals. Total estimated savings is about $100,000 every five years (in 2011 dollars). In addition, the County has two additional plants that are eligible for 10-year permits, Wesley Center and Southeast Pasco WWTF, which will be requested at their renewal time.

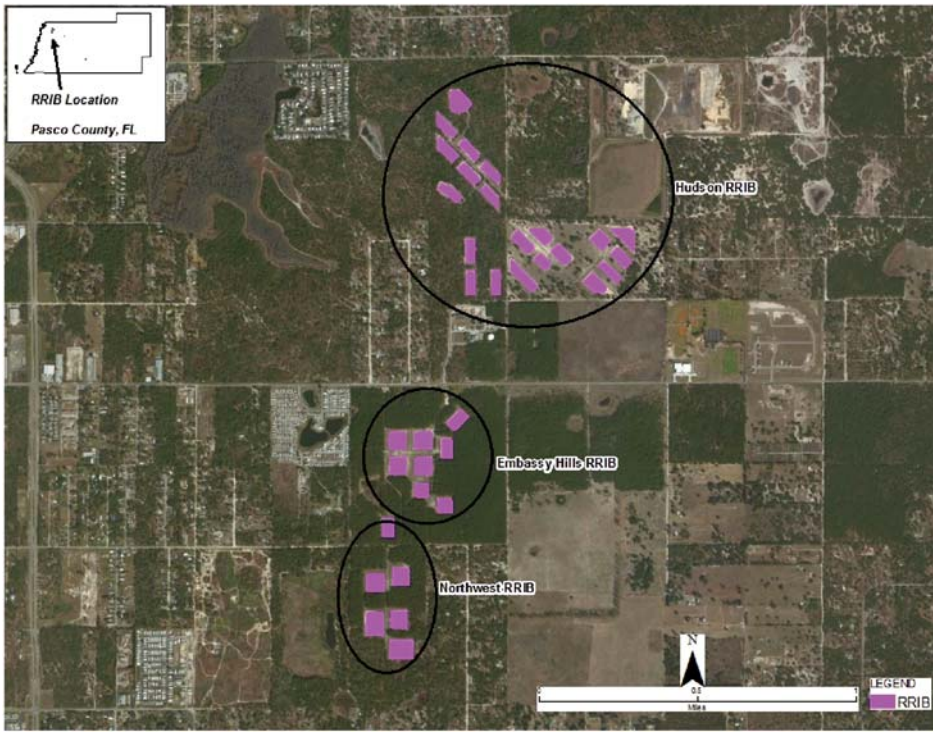


FIGURE 3. Hudson, Northwest, and Embassy Hills RRIB Systems

## Reduced Monitoring in the Pasco County Master Reuse System

In 2012, the County renewed the permit for the PCMRS, which reuses about 20 mil gal a day (mgd) of water throughout Pasco County through Part III irrigation and Part IV rapid-rate infiltration basins (RRIB). The RRIBs are located in four areas of the County, with the majority of the basins located in the northwest corner of the County.

It was proposed by CH2M HILL, on behalf of the County, to reduce monitoring wells

for existing RRIB systems and golf course ponds within the PCMRS. For the RRIBs, the County had three adjacent systems that are treated as independent RRIBs (Hudson, Embassy Hills, and Northwest), as shown in figure 3. In the renewal, the Embassy Hills and Northwest RRIBs were combined into a single system with reduced monitoring wells; in addition, reduced monitoring for the system as a whole was requested. The original permit required monitoring for every golf course pond, instead of requiring representative groundwater monitoring. The final permit required monitoring at 25 fewer locations than the previous permit, eliminating monitoring at four golf courses and reduced monitoring at the combined Embassy Hills RRIB system. Sampling for these wells is now quarterly. Total savings is estimated to be $8,600 in analytical costs and 120 man-hours annually.

## Boyette Reservoir Environmental Resource Permit Dewatering Conditions

Reducing monitoring requirements or deferring permit renewals through longer permit issuance times are not the only ways to value-engineer a regulatory obligation. One often overlooked area is working to reduce or eliminate project permitting conditions that adversely affect construction prices.

An example of this is the Boyette Reservoir Environmental Resource Permit (ERP). The Boyette Reservoir is an 82-acre, 500 mil gal (MG) earthen embankment reclaimed water reservoir being constructed on the site of a former borrow pit. It is estimated that the on-site excavated areas hold about 100 MG of water; this is in addition to any stormwater that may be collected in the reservoir footprint during the 18-month construction period. All of the material for the earthen embankment is to come from the site.

When originally issued, the construction permit required that water in the on-site ponds and any stormwater collected had to be managed on-site or diverted to the Pasco County Wastewater Collection System. However, the additional water from these ponds and storms could not be handled by their effluent disposal system, which left the only viable option as on-site management. This is difficult for a contractor in any situation; however, as the on-site soils are the embankment construction materials, this requirement would dramatically increase construction costs. Dry soil is easier and less expensive to work with than wet soil; staging the soil to dewater it before use is double handling. Other options, including the construction of temporary coffer dams and on-site pumping, would add to the cost.

Pasco County asked FDEP to revisit this permit condition. During the initial permit issuance, FDEP included this condition because it was assumed that the water captured within the borrow pits was contaminated with copper from legacy orange groves, based upon a single sampling event done six years earlier. During the modification process, an opportunity to present a comprehensive clean-metals sampling plan was proposed so that the County could gather data to more accurately determine the level of contamination in the ponds. The FDEP agreed to consider a comprehensive sampling plan that included sampling various locations across the footprint of the borrow pits, and subsequently approved the submitted plan. Samples were taken and the analysis showed that copper was found to be non-detectable across the footprint of the borrow pit. Subsequent to this, FDEP agreed to modify the permit condition to allow for off-site dewatering. While the on-site ponds were limited in that they could not be drained completely due to sediment and turbidity concerns, they were able to be drained below the reservoir's designed bottom elevation of 114-ft National Geodetic Vertical Datum (NGVD), which will allow for the majority of soils onsite to be dewatered. The dewatering pathway is shown in Figure 4.

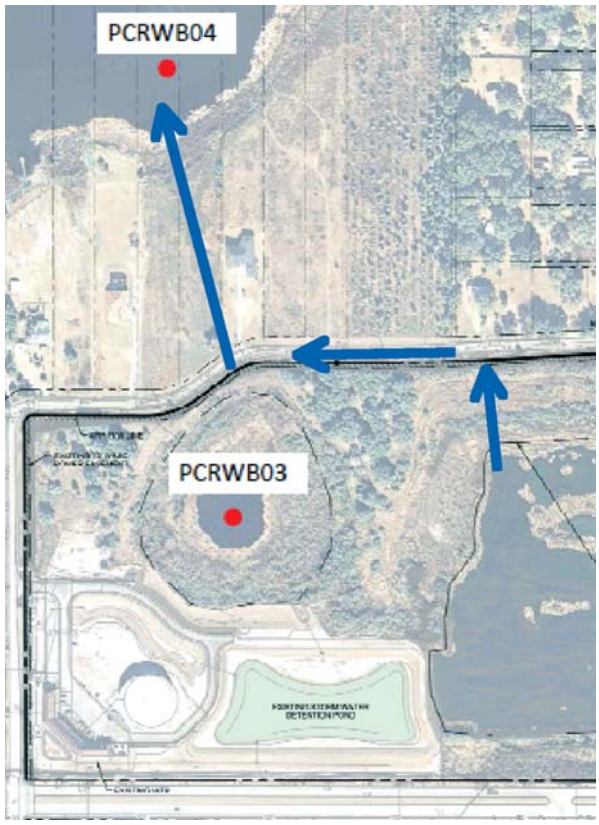

FIGURE 4. Boyette Dewatering Flow Path

In-house estimating showed that when off-site dewatering was allowed, the soil handling costs came down about 30 percent, or $4.1 million. This is a significant cost savings, which was realized for the cost of a few meetings with the FDEP and some on-site sampling.

This shows the value of performing a constructability review by a team familiar with building the type of construction present on a project.

During construction, the contractor took advantage of the dewatering flexibility and was able to dewater the site to a greater degree than anticipated. This eliminated much of the anticipated "wet construction" of the embankment within areas that were unable to be dried. Because of the contractor's innovative methods in this area, the County's cost was lowered even more by minimizing the amount of subgrade soils that would have to be removed and either dried and replaced, or replaced with new material. The additional time and efforts required to prepare the wet subgrade to specified requirements are not necessary, streamlining the reservoir construction.

## Conclusion

Taking an innovative approach to value engineering, Pasco County comprehensively reviewed its regulatory requirements to determine what activities could be decreased or eliminated to provide ongoing savings to the utility. As a result, the County has successfully reduced the workload and fees associated with maintaining the required permits for all three systems. To realize these savings, Pasco County has reviewed its permits, sampling requirements and proposed consolidations, reductions in monitoring, extension of permit terms, and permit modifications to maintain compliance and lessen the overall cost of the regulatory requirements.

In addition, the County recognized that permit conditions can limit contractor means and methods, thereby driving up bid prices for capital infrastructure projects. In the example of the Boyette Reservoir, one construction permit condition had the potential to affect bid prices. The County worked with FDEP to negotiate a more favorable permit condition to ultimately result in lower bid prices and easier construction overall.