Key Largo Wastewater Treatment District
Board of Commissioners Meeting
Agenda Item Summary

Meeting Date:

November 17, 2026

Agenda Item Number: O-2

Action Required:

No

Department:

Capital Projects

Sponsor:

Robert Mather

Subject:

Cost Comparison for KLWTD EQ Tanks and Headworks Project - Separate vs Combined Influent Screening

Summary of Discussion:

This item is intended to provide a basis for discussion regarding the capital costs, O&M costs, and R&R costs associated with the KLWTD EQ Tanks and Headworks project when considering separated vs combined influent screening for the Village of Islamorada's influent.

Reviewed / Approved		Financial Impact	Attachments
Operations:	_____	$ 0.00	1. KLWTD EQ Tanks Cost Comparison Memo
Administration:	_____		
Finance:	_____	Funding Source:	
District Counsel:	_____	N/A	
District Clerk:	_____	Budgeted:	
Engineering:	_____	N/A	

Approved By: _____ **Date:** 11-12-26

General Manager

Memorandum

Date: November 11, 2026

To: Peter Rosasco, General Manager

From: Robert Mather, P.E., Project Manager

Regarding: Cost Comparison for KLWTD EQ Tanks and Headworks Project – Separated vs Combined Influent Screening

This memorandum summarizes the basis for the proposed change from separate to combined influent screening and the cost comparison in response to Board questions.

Executive Summary

In terms of capital project costs, changing to a combined influent screening approach would reduce the estimated EQ Tanks and Headworks cost from $16.67 million to $15.75 million, providing approximately $919,120 in total project savings. The cost savings to Islamorada is roughly $461,000, while the cost savings to the District is roughly $458,000.

Estimated Project Cost			
Cost measure	**Option 1 (Combined Screening)**	**Option 2 (Separate Screening)**	**Savings with combined screening**
Total project cost	$15,753,585	$16,672,705	$919,120
IVOI share of total project cost	$4,372,740	$4,834,212	$461,472

Combined screening reduces the estimated average annual headworks O&M and R&R costs from $196,412 to $136,961. The resulting annual savings are approximately $34,963 for KLWTD and $24,488 for IVOI. The principal tradeoff is reduced flexibility to address future changes in IVOI's influent characteristics. If IVOI delivers finer solids requiring smaller screen openings, combined screening would require those changes to apply to the shared equipment handling both entities' flows.

15-Year Average Annual Headworks O&M Cost and Capital R&R Costs						
Cost per year	**Option 1 · Combined Screening**			**Option 2 · Separate Screening**		
	KLWTD	**Islamorada**	**Total**	**KLWTD**	**Islamorada**	**Total**
Equipment maintenance	$11,983.11	$5,639.11	$17,622.22	$17,622.22	$8,811.11	$26,433.33
Operator labor	$5,584.50	$2,628.00	$8,212.50	$8,376.75	$3,942.00	$12,318.75
Hauling and disposal	$18,418.67	$8,667.61	$27,086.28	$18,057.60	$13,542.84	$31,600.44
Annual Average O&M	**$35,986.28**	**$16,934.72**	**$52,921.00**	**$44,056.57**	**$26,295.95**	**$70,352.52**
Capital R&R	$57,146.89	$26,892.65	$84,039.54	$84,039.54	$42,019.77	$126,059.31
Total O&M + R&R	**$93,133.17**	**$43,827.37**	**$136,960.54**	**$128,096.11**	**$68,315.72**	**$196,411.83**

Background

On October 6th, 2026, Apex held a project design meeting attended by Peter Rosasco, Commissioner Schwartz, Ryan Dempsey, and Apex staff. The discussion included the original basis for providing separate screening facilities for Islamorada, Village of Islands (IVOI), and whether that arrangement remained warranted given the current understanding of IVOI's North Plantation Key Booster Pump Station improvements.

The original headworks design included a dedicated IVOI influent line, screen, compactor, conveyor, and dumpster to keep IVOI screenings separate from KLWTD screenings. This arrangement was developed with the understanding that IVOI would no longer utilize its existing equalization tank and associated screening facilities, and would be installing macerators and grinder pumps as part of its booster pump station project. The anticipated use of macerators influenced the proposed fine-screening approach and raised concerns regarding increased screenings handling and disposal costs. Maintaining separate screenings streams would allow those costs to be assigned to each entity based on its actual disposal quantities and expenses. It also addresses the issue of if IVOI decides to grind influent up to very fine particles.

At the October 6th project meeting, the project team discussed the current status of IVOI's project, which no longer includes macerators. With that change, combining the influent streams upstream of the headworks was considered as an opportunity to simplify the yard piping, reduce the amount of screening related equipment, and overall O&M efforts and costs. Potential reductions in costs were discussed as a factor that could benefit both KLWTD and IVOI. From an engineering standpoint, the design is feasible using either arrangement. Apex received direction to proceed with revisions removing the separated influent line and screening components.

At the October 20th, 2026 KLWTD Board Meeting, Apex reported on the progress of the EQ Tanks and Headworks project design, including discussion regarding revisions that are in progress due to the requested change to the influent yard piping and screening. Chairman Rodriguez requested to see a breakdown of the capital costs associated with retaining separated influent screening, versus combining influent streams and removing the separated equipment.

The attachment to this memorandum contains the cost comparison associated with the requested revisions to the project design.

Construction Cost Comparison

As described above, there are two proposed influent conveyance and screening configurations being evaluated. For this memorandum we will be addressing the different configurations as Option 1 and Option 2. Option 1 combines the influent streams prior to the proposed headworks and uses two shared screening trains and a shared conveyor system to dispose of collected waste, while Option 2 separates IVOI's influent and disposal completely from Key Largos influent.

Table 1 below shows the total project cost for each screening configuration, including IVOI's share and the estimated savings from combined screening. The totals include engineering and contingency.

Table 1. Estimated Project Cost			
Cost measure	**Option 1 (Combined Screening)**	**Option 2 (Separate Screening)**	**Savings with combined screening**
Total project cost	$15,753,585	$16,672,705	$919,120
IVOI share of total project cost	$4,372,740	$4,834,212	$461,472

The difference between the two options costs is primarily driven by the dedicated infrastructure required to keep IVOI's influent separate through screening. Option 2 includes a separate 12-inch influent line, associated isolation valves and headworks slide gates, and a third center-flow screen with an integral washer-compactor and dedicated conveyor. Option 1 combines the influent streams upstream of the headworks, allowing both entities to share two screening trains and a common conveyor. This reduces the quantities of piping, valves, and screening equipment. IVOI's allocated cost is higher under Option 2 because it pays the full cost of the infrastructure dedicated to its flow. Under Option 1, IVOI pays 32% of the shared influent and screening components. Refer to Attachment A for the detailed construction estimate and cost allocations.

Headworks Operation & Maintenance Cost

To determine the estimated annual operation and maintenance (O&M) costs associated with the headworks equipment, the Hydro-Dyne budgetary proposal was used as the equipment cost basis. The proposal includes three center-flow screens with integral washer-compactors and two conveyors at a total budget cost of $1,525,000. For this comparison, a 15-year equipment service life was assumed, and the package cost was divided equally among the three screening trains, resulting in an estimated cost of approximately $508,333 per train.

Equipment Maintenance

The maintenance allowance covers labor and parts for routine inspections, cleaning, drive servicing, and replacement of worn components. The estimate assumes annual maintenance rates of 0% of equipment cost in Years 1–3, 0.5% in Years 4–5, 1% in Years 6–8, 1.5% in Years 9–10, 3% in Years 11–13, and 5% in Years 14–15. Over 15 years, the allowance averages 1.733% of equipment cost, or $8,811.11 per train per year.
Under Option 1, KLWTD and IVOI pay 68% and 32% of the two shared trains' maintenance costs, respectively. Under Option 2, KLWTD pays for maintenance of its two trains and IVOI pays for maintenance of its dedicated train. Refer to Table 2 for the 15-year estimated average annual maintenance costs under both scenarios.

Table 2. 15-Year Estimated Average Annual Headworks Maintenance Cost						
Cost per year	**Option 1 · Combined Screening**			**Option 2 · Separate Screening**		
	KLWTD	**Islamorada**	**Total**	**KLWTD**	**Islamorada**	**Total**
Equipment maintenance	$11,983.11	$5,639.11	$17,622.22	$17,622.22	$8,811.11	$26,433.33

Operator Labor

Daily operator checks are budgeted at 30 minutes for Option 1 and 45 minutes for Option 2. At $45 per hour for 365 days, annual labor is estimated at $8,212.50 and $12,318.75, respectively. KLWTD and IVOI pay 68% and 32% of labor under both options. Refer to Table 3 for the estimated labor costs associated with operations and maintenance under each scenario.

Table 3. 15-Year Estimated Average Annual Headworks Labor Cost						
Cost per year	Option 1 · Combined Screening			Option 2 · Separate Screening		
	KLWTD	Islamorada	Total	KLWTD	Islamorada	Total
Operator labor	$5,584.50	$2,628.00	$8,212.50	$8,376.75	$3,942.00	$12,318.75

Dumpster Hauling Costs

The hauling and disposal estimates were developed using the Keys Sanitary Service commercial rates (effective October 1, 2026, through September 30, 2027) for scheduled service at three (3) pickups per week. The monthly rate depends on dumpster size, so the dumpsters were sized to hold the screenings expected to accumulate during a three-day interval between pickups. Under Option 1, KLWTD's permitted flow of 3.45 MGD was used. Under Option 2, the highest observed daily flow from the past year of flow data was used for both KLWTD and IVOI. Using these assumed influent flows, screenings volumes for the proposed 3 mm screens were estimated at 35 cubic feet per million gallons under high loading. The calculated volumes were reduced by 60% to account for compaction and converted to cubic yards. The cost for each service is based on the smallest dumpster listed in the Keys Sanitary Services' rate schedule that can hold the compacted screenings under higher loading. Table 4 below summarizes the estimated hauling and disposals costs basis between the two screening configurations for both KLWTD and IVOI.

Table 4. Headworks Hauling & Disposal Cost Basis						
Sizing & Cost Basis	Option 1 · Combined Screening*			Option 2 · Separate Screening		
	KLWTD	Islamorada	Total	KLWTD	Islamorada	Total
Assumed influent flow (MGD)	-	-	3.45	2.20	1.25	3.45
High compacted volume over three-days (CY)	-	-	5.37	3.42	1.95	5.37
Selected dumpster capacity (CY)	-	-	6	4	3	-
Scheduled pickups per week	-	-	3	3	3	-
Monthly service charge	$1,534.89	$722.30	$2,257.19	$1,504.80	$1,128.57	$2,633.37
Annual Service Charge	**$18,418.67**	**$8,667.61**	**$27,086.28**	**$18,057.60**	**$13,542.84**	**$31,600.44**

Under Option 1, the monthly charge for the shared dumpster is allocated 68% to KLWTD and 32% to IVOI, and each share is annualized over 12 months. The District also may consider billing Islamorada for their screenings based on actual flow proportion. Under Option 2, each party pays for its dedicated dumpster.

Overall O&M and Capital R&R Estimated Costs

The capital repair and replacement (R&R) reserve is a budgeting allowance for future equipment replacement, separate from routine O&M costs. The first-year contribution is calculated by dividing the estimated equipment cost of $508,333 per screening train by the assumed 15-year service life, resulting in $33,889 per train. Annual contributions then increase by 3% each year. Over the 15-year period, the reserve contribution averages $42,019.77 per train annually, totaling $84,039.54 for the two-train combined screening option and $126,059.31 for the three-train separate screening option. Table 5 below combines the cost estimates above and incorporates a capital R&R reserve funding component.

Table 5. 15-Year Average Annual Headworks O&M Cost and Capital R&R Costs

Cost per year	Option 1 · Combined Screening			Option 2 · Separate Screening		
	KLWTD	Islamorada	Total	KLWTD	Islamorada	Total
Equipment maintenance	$11,983.11	$5,639.11	$17,622.22	$17,622.22	$8,811.11	$26,433.33
Operator labor	$5,584.50	$2,628.00	$8,212.50	$8,376.75	$3,942.00	$12,318.75
Hauling and disposal	$18,418.67	$8,667.61	$27,086.28	$18,057.60	$13,542.84	$31,600.44
Annual Average O&M	**$35,986.28**	**$16,934.72**	**$52,921.00**	**$44,056.57**	**$26,295.95**	**$70,352.52**
Capital R&R	$57,146.89	$26,892.65	$84,039.54	$84,039.54	$42,019.77	$126,059.31
Total O&M + R&R	**$93,133.17**	**$43,827.37**	**$136,960.54**	**$128,096.11**	**$68,315.72**	**$196,411.83**

The combined screening option reduces estimated average annual O&M and R&R by $59,451.29, including $34,962.94 for KLWTD and $24,488.35 for IVOI. The savings reflect one fewer train to maintain and less time for daily operator checks.

Attachment(s):

- KLWTD EQ Tanks and Headworks Cost Estimate Comparison

Attachment A - Cost Comparison

Option Descriptions

OPTION 1 — COMBINED INFLUENT / TWO SCREENS:

KLWTD and Islamorada influent flows are combined upstream of the proposed headworks and conveyed through a common 18-inch influent pipeline. The combined flow enters two influent channels, each with a mechanical screen. The designated cost-sharing percentage is applied to applicable common project components, including shared influent piping, valves, screening, equalization tanks, blowers, pumps, odor control, and other shared infrastructure.

OPTION 2 — SEPARATE ISLAMORADA INFLUENT / THREE SCREENS:

Islamorada influent is conveyed through its own 12-inch pipeline into a dedicated influent channel with a separate mechanical screen and washer-compactor. KLWTD influent is conveyed to the other two screening channels. Islamorada pays 100% of infrastructure dedicated exclusively to its influent system (including associated piping, valves, screening and washer-compactor). The designated cost-sharing percentage applies only to common downstream/shared project components such as equalization tanks, blowers, pumps, odor control and other shared facilities.

Overall Estimated Project Cost

	Option 1	Option 2	Difference
Total Project Cost	**$ 15,753,585.20**	**$ 16,672,705.20**	**$ 919,120.00**
IVOI Cost Share	**$ 4,372,739.58**	**$ 4,834,211.58**	**$ 461,472.00**

Total Project Cost - All Project Components

Project Section	Option 1	Option 2	Difference
Yard Piping	$ 1,780,845.00	$ 2,023,445.00	$ 242,600.00
Headworks	$ 1,531,666.67	$ 2,055,000.00	$ 523,333.33
Tanks	$ 5,490,000.00	$ 5,490,000.00	$ -
Pump System	$ 604,600.00	$ 604,600.00	$ -
Aeration	$ 1,596,876.00	$ 1,596,876.00	$ -
Odor Control	$ 961,900.00	$ 961,900.00	$ -
Mechanical Building & Electrical	$ 622,500.00	$ 622,500.00	$ -
Civil Site Work	$ 539,600.00	$ 539,600.00	$ -
Construction Subtotal	**$ 13,127,987.67**	**$ 13,893,921.00**	**$ 765,933.33**
Total Project Cost (Including E&C)	**$ 15,753,585.20**	**$ 16,672,705.20**	**$ 919,120.00**

Islamorada Village of Islands Allocated Costs

Project Section	Option 1	Option 2	Difference
Yard Piping	$ 448,736.00	$ 644,296.00	$ 195,560.00
Headworks	$ 490,133.33	$ 679,133.33	$ 189,000.00
Tanks	$ 1,660,800.00	$ 1,660,800.00	$ -
Pump System	$ 193,472.00	$ 193,472.00	$ -
Aeration	$ 511,000.32	$ 511,000.32	$ -
Odor Control	$ 307,808.00	$ 307,808.00	$ -
Mechanical Building & Electrical	Not Allocated	Not Allocated	$ -
Civil Site Work	$ 32,000.00	$ 32,000.00	$ -
Construction Subtotal	**$ 3,643,949.65**	**$ 4,028,509.65**	**$ 384,560.00**
Total Project Cost (Including E&C)	**$ 4,372,739.58**	**$ 4,834,211.58**	**$ 461,472.00**