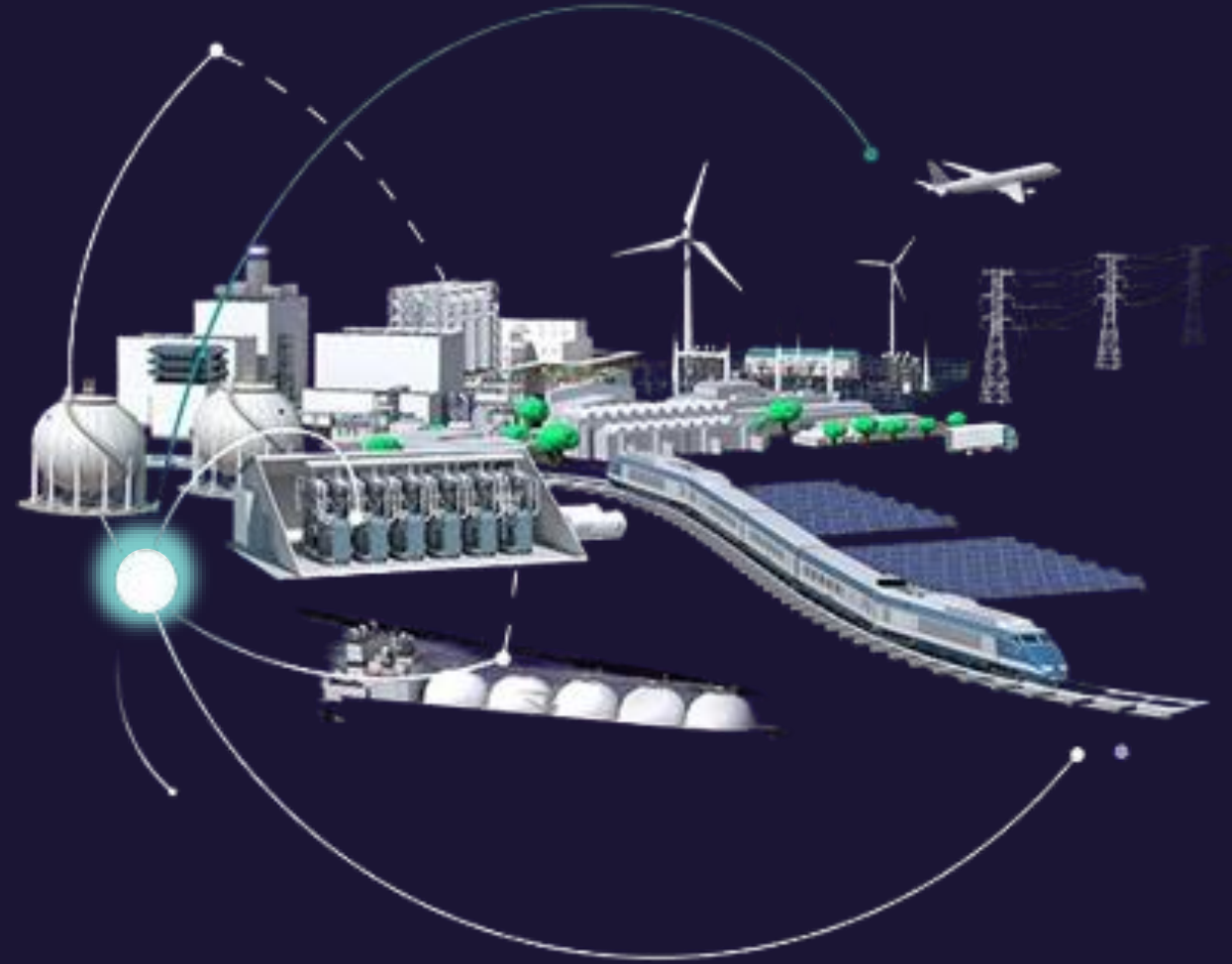


Turning Waste into Wealth: The Potassium Hydroxide Revolution

Saving Our Waterways and Our Budget



THE CHALLENGE: MANAGING KOH WASTE

In our manufacturing process, the Autoclave utilizes potassium hydroxide (KOH) to dissolve the ceramic core within a metal casting to create the cooling passages.

After each cycle, all liquid waste was sent to a waste stream where it was treated with sulfuric acid to neutralize then sent to a municipal facility for disposal which presents environmental concerns and substantial cost



THE CHALLENGE: MANAGING KOH WASTE

The waste liquid was still potent and required a significant amount of sulfuric acid to neutralize therefore we started asking “why are we throwing this away”?

The process generates 876,000 gallons of KOH waste annually.

*To put in perspective...this would be equivalent to **filling a basketball court 25 feet high***

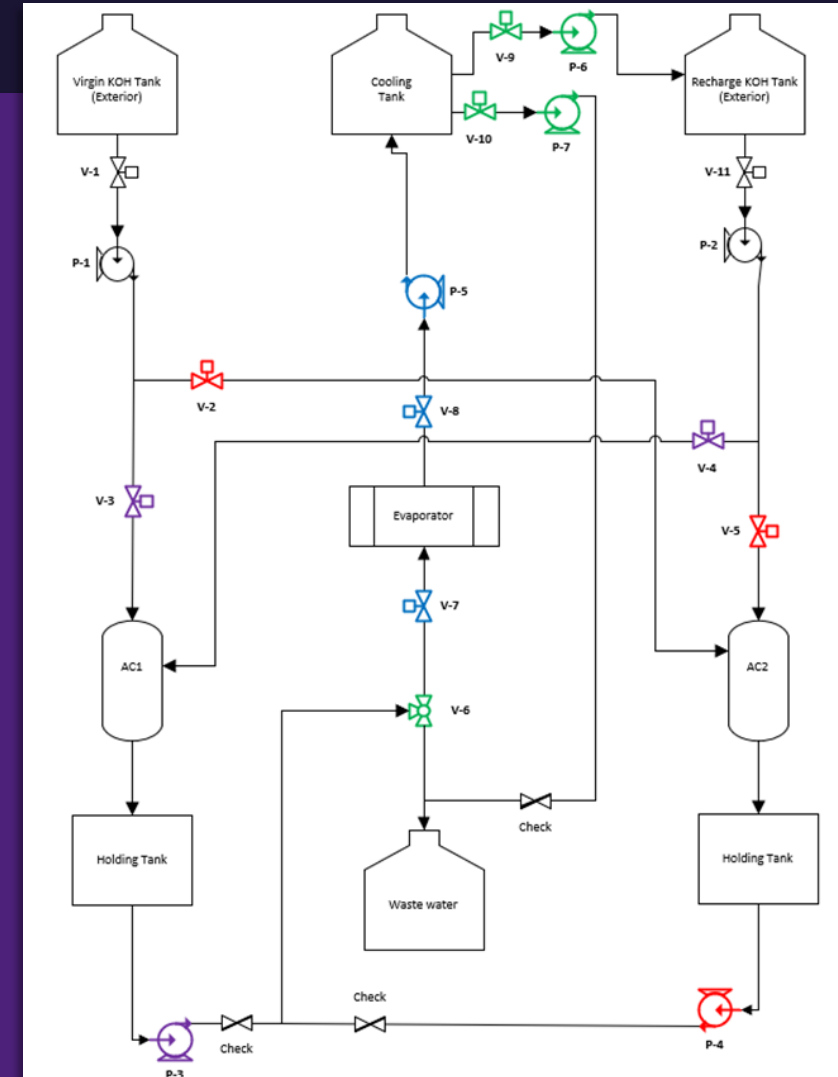




THE SOLUTION: AUTOCLAVE EVAPORATOR

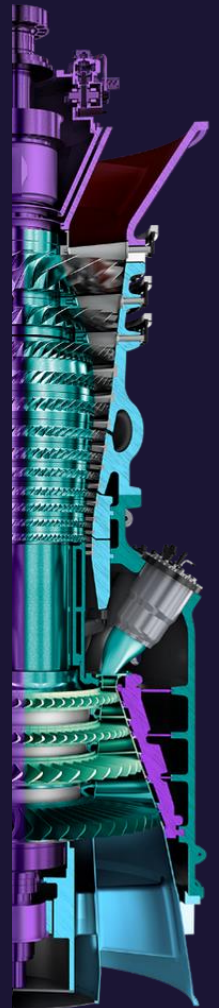
Instead of sending the waste to be processed for disposal:

- 01 *Waste liquid is boiled in an evaporator to remove excess liquid from the rinsing process to achieve 45% concentration*
- 02 *Liquid is sent to a cone bottom cooling tank to allow the sediment (ceramic) to settle for disposal*



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The diagram illustrates a water treatment process. Virgin KOH Tank (Exterior) feeds into a system via valve V-1 and pump P-1. The flow continues through valve V-3 to AC1, then to a Holding Tank. From the Holding Tank, pump P-3 moves the liquid through a check valve to a Waste Water tank. Another path from the Holding Tank goes through valve V-2 to a central junction. This junction also receives input from the Cooling Tank via pump P-5 and valve V-8. The central junction then feeds into the Evaporator via valve V-7. The Evaporator output goes through valve V-6 to the Waste Water tank. A third path from the central junction goes through valve V-4 to AC2, then to another Holding Tank. From this Holding Tank, pump P-4 moves the liquid through a check valve to the Waste Water tank. The Recharge KOH Tank (Exterior) feeds into the system via valve V-11 and pump P-2. The output of P-2 goes through valve V-5 to the central junction. The Cooling Tank also has a direct path to the central junction via pump P-6 and valve V-9. The Cooling Tank is fed by pump P-7 and valve V-10 from the Recharge KOH Tank.



THE IMPACT: COST SAVINGS AND ENVIRONMENTAL BENEFITS



Cost Savings:

- *\$1.5 million annually by recycling KOH*
- *\$0.5 million annually by reducing sulfuric acid usage.*



THE IMPACT: COST SAVINGS AND ENVIRONMENTAL BENEFITS



Environmental Impact:

- *80% reduction in KOH usage.*
- *50% reduction in sulfuric acid usage.*
- *80% reduction in KOH wastewater processing.*

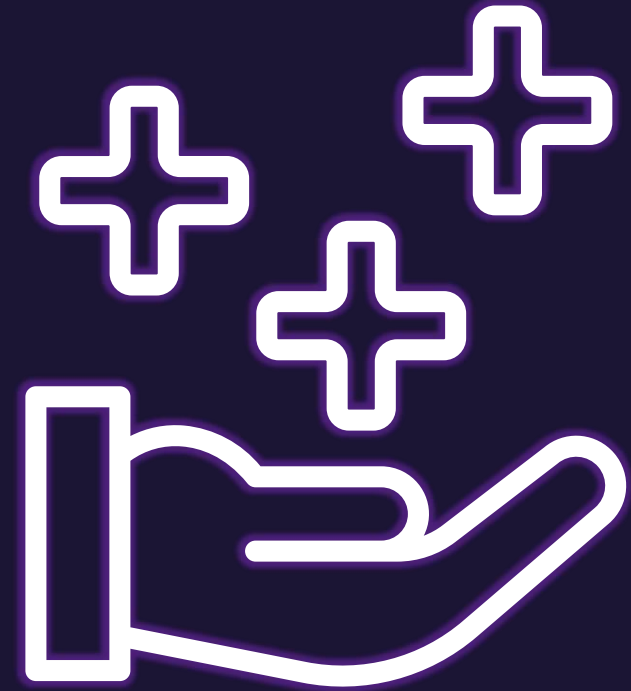


THE IMPACT: COST SAVINGS AND ENVIRONMENTAL BENEFITS

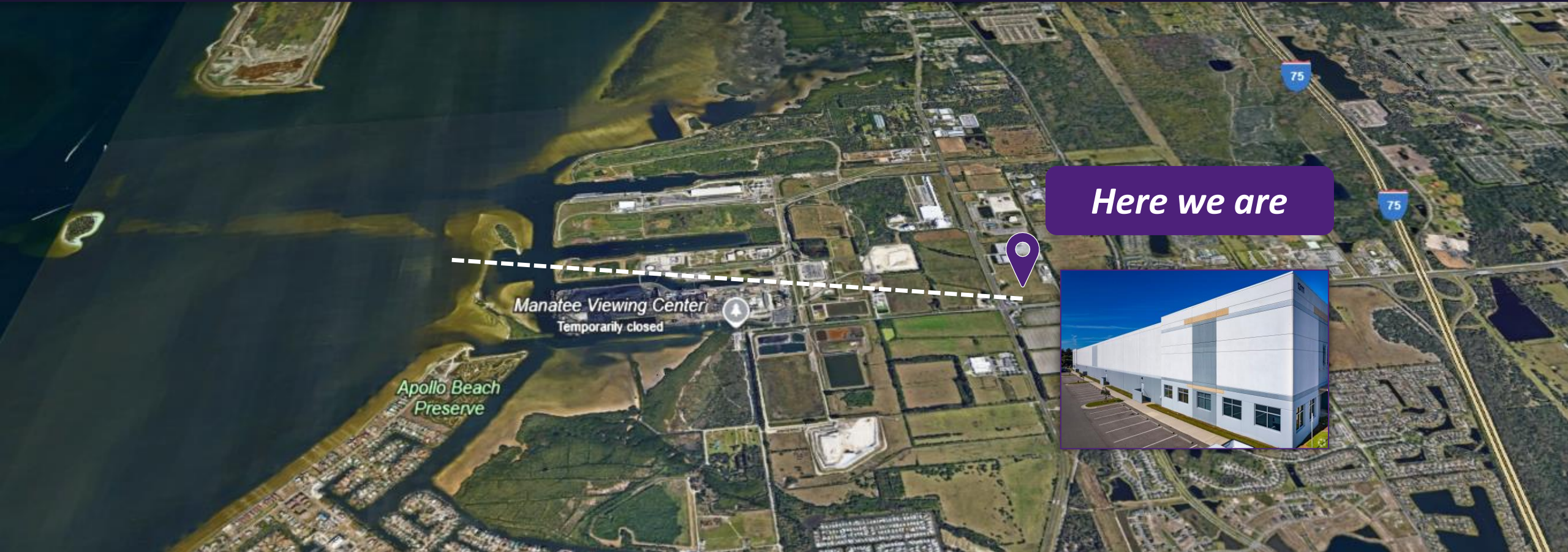


Additional Benefits:

- *Mitigates raw material price increases.*
- *Minimizes chemical waste and environmental risks.*
- *Strengthens partnerships with regulatory agencies.*



WHERE WE ARE



Here we are



*That's Why its Very Important Because we don't want
this waste to go in our Water*



ANY QUESTIONS?



THANK YOU?

