REINHOLD ENVIRONMENTAL ®

2026 Reinhold/PCUG Round Table Presentation

Hosted by TVA, Southern Company and Vistra

in the Sonesta Nashville Airport Hotel, Nashville, TN

on June 22-23, 2026

Renewing Water,

Helping Communities Thrive

Closed Ash Pond Cross-Section

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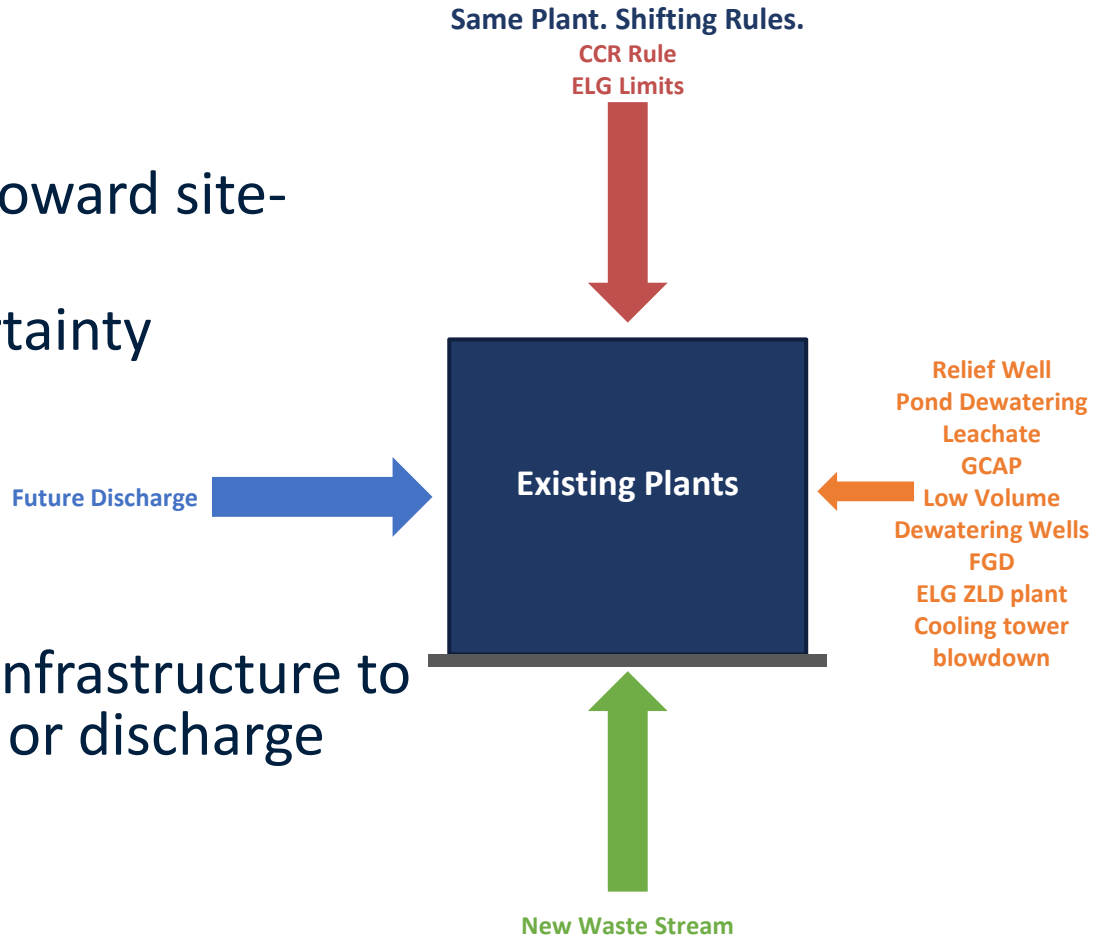
The Operator's Handbook:
Real-World Wastewater Challenges and Solutions in Coal Country

Presented By: Carson Judy

Alan Daza

Creative Reconfiguration Turned Existing Assets Into Multimillion-Dollar Solutions

- Why This Matters Now
  - New ELG Proposal signals movement toward site-specific compliance decisions
  - CCR / ELG direction = Consistent uncertainty
  - Plant needs change
    - New/changing process streams
    - Changing regulation
    - Project Phases
  - Look for opportunities to use existing infrastructure to deal with additional or changing flows or discharge requirements



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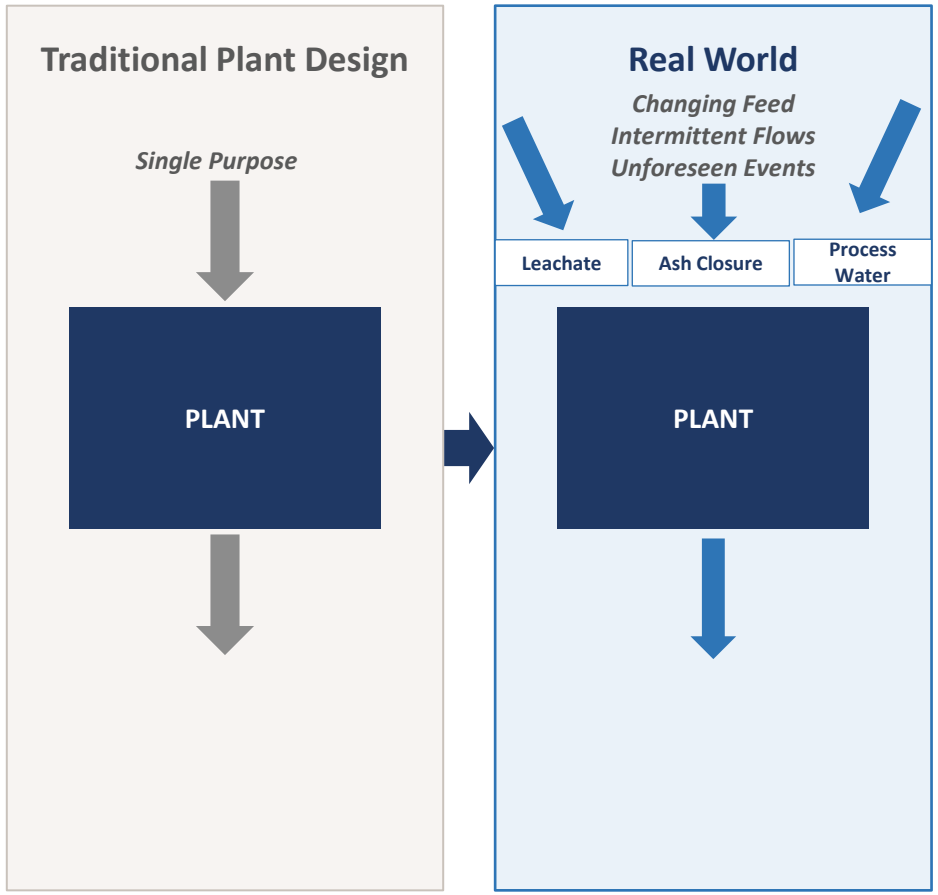
Traditional Plant Design Challenges

- Rigid, linear treatment trains
- Designed for one purpose
- Hard to adapt to new or changing waste streams
- Changing phases in plant lifecycle necessitate different types of treatment



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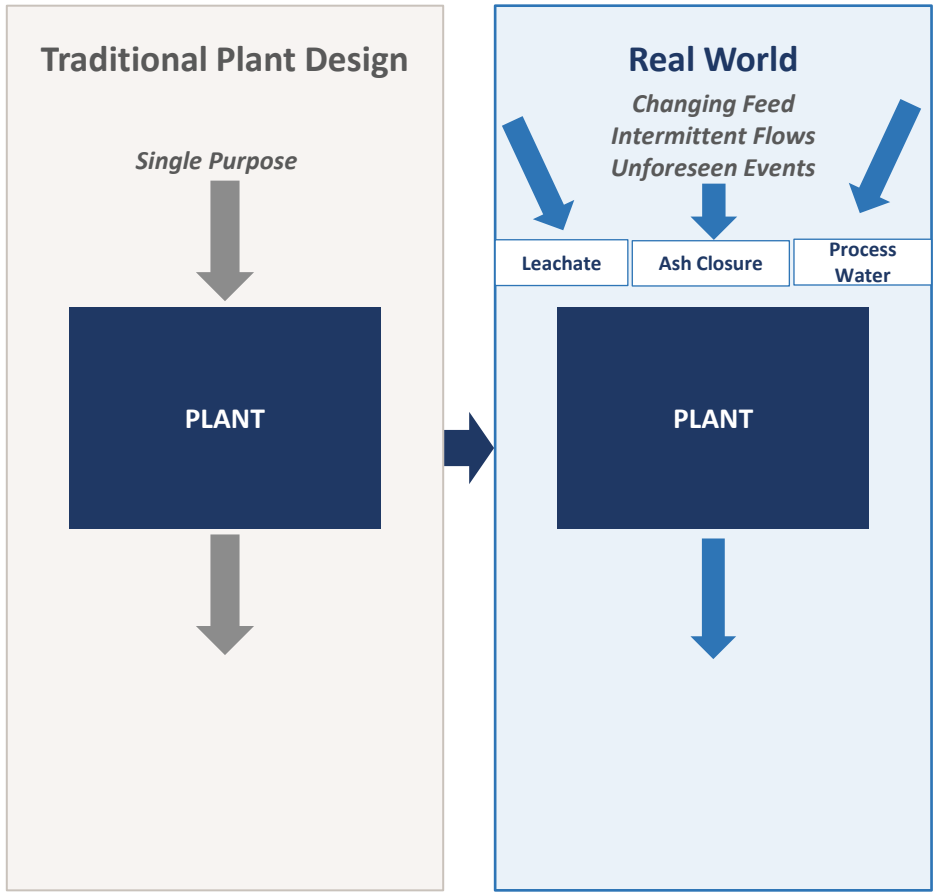
What Operators Actually Face

- Flows change daily
- Chemistry changes faster than design allows
- Permits evolve mid-project
- Systems rarely operate at design conditions
- New waste streams appear



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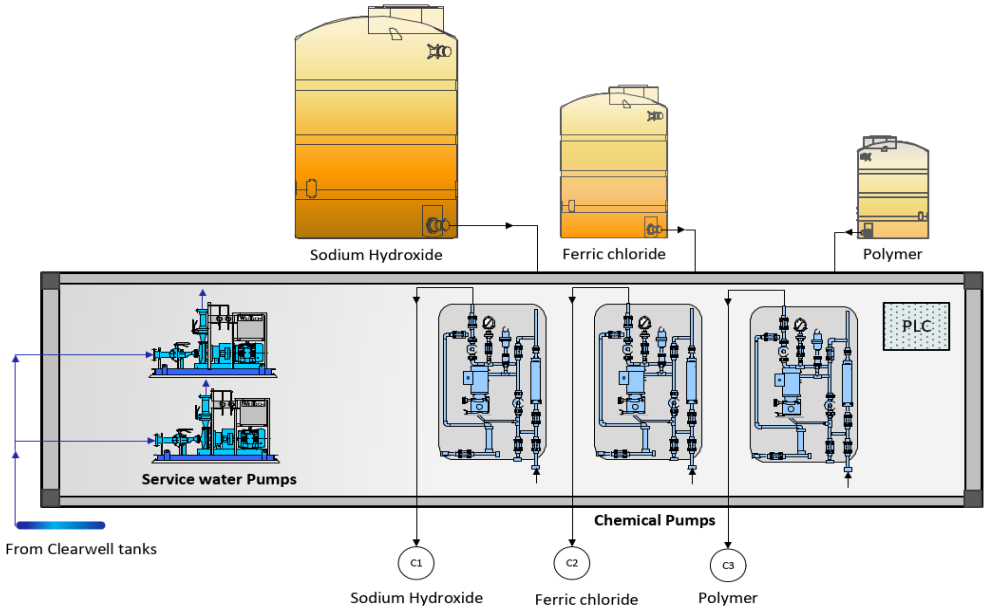
Case 1: Using an Ash Pond System to Solve GCAP and Leachate Challenges

At a site in the Carolinas, an Ash Pond dewatering started operating in 2022

- Treatment goals of initial design:
  - Easy Startup and Shutdown – Intermittent Flows
  - Total Suspended Solids (TSS) Removal
  - pH Adjustment
  - Limited Metals Removal
  - Flow Rate: 2084 GPM (3MGD)

ASH Pond Closure Water Treatment System

pH control and Flocculation



Initial system very simple

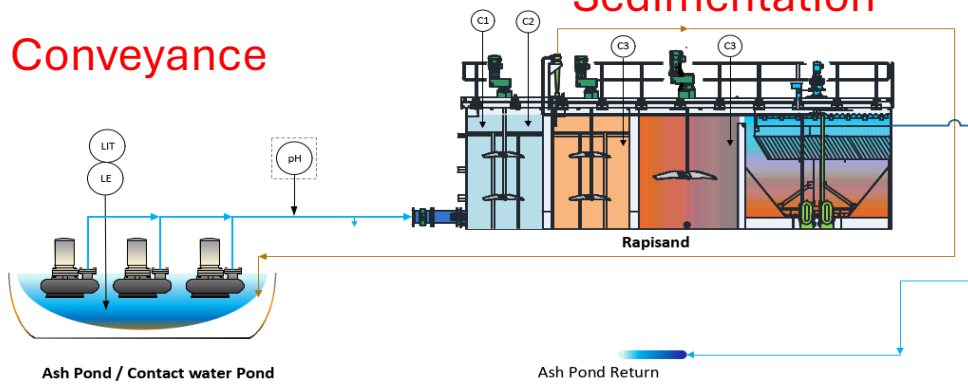
- Goals of Plant
- Control pH
- Lower Total Suspended Solids (TSS)
- Intermittent flows – easy startup and shutdown
- Limited Metals Removal

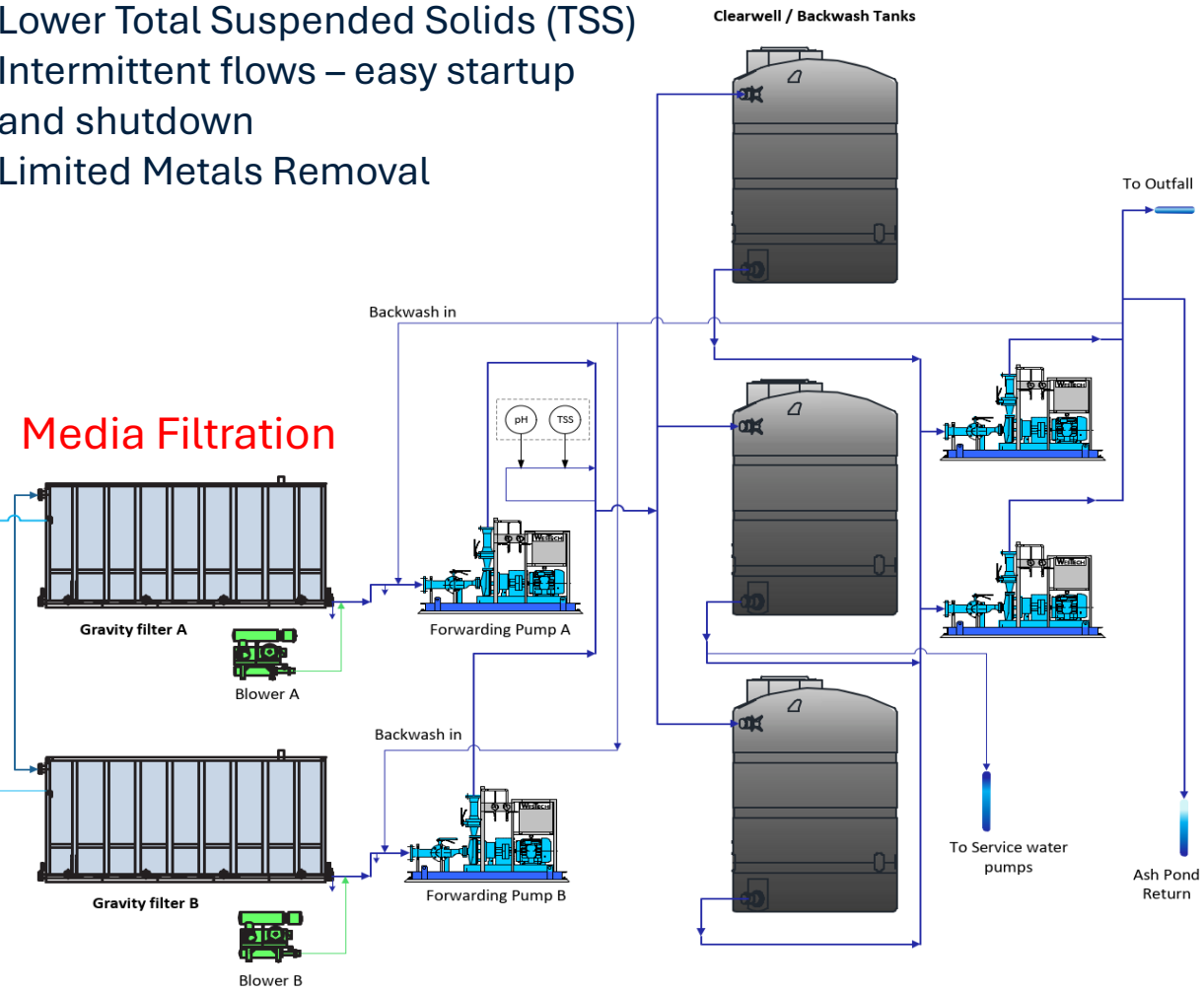
Discharge

Media Filtration

Sedimentation

Conveyance





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Retrofit of a Coal-Fired Power Plant in the Southeast

- In 2024 the station had the need to deal with two additional relatively smaller flows. Groundwater Collection Action Program (GCAP) flows and leachate flows
- Design Parameters and challenges
  - Flow: Leachate 250 gpm (800 max), GCAP 325 gpm (900 max)
  - Some Metals Removal
  - GCAP/Leachate flows needed to be prioritized over Ash pond limited storage
  - Flows from GCAP/Leachate could not be returned to Ash pond no comingling
  - To accomplish this flow equalization, solids handling, additional chemistry, and control logic to manage changing water quality and ensure stream isolation

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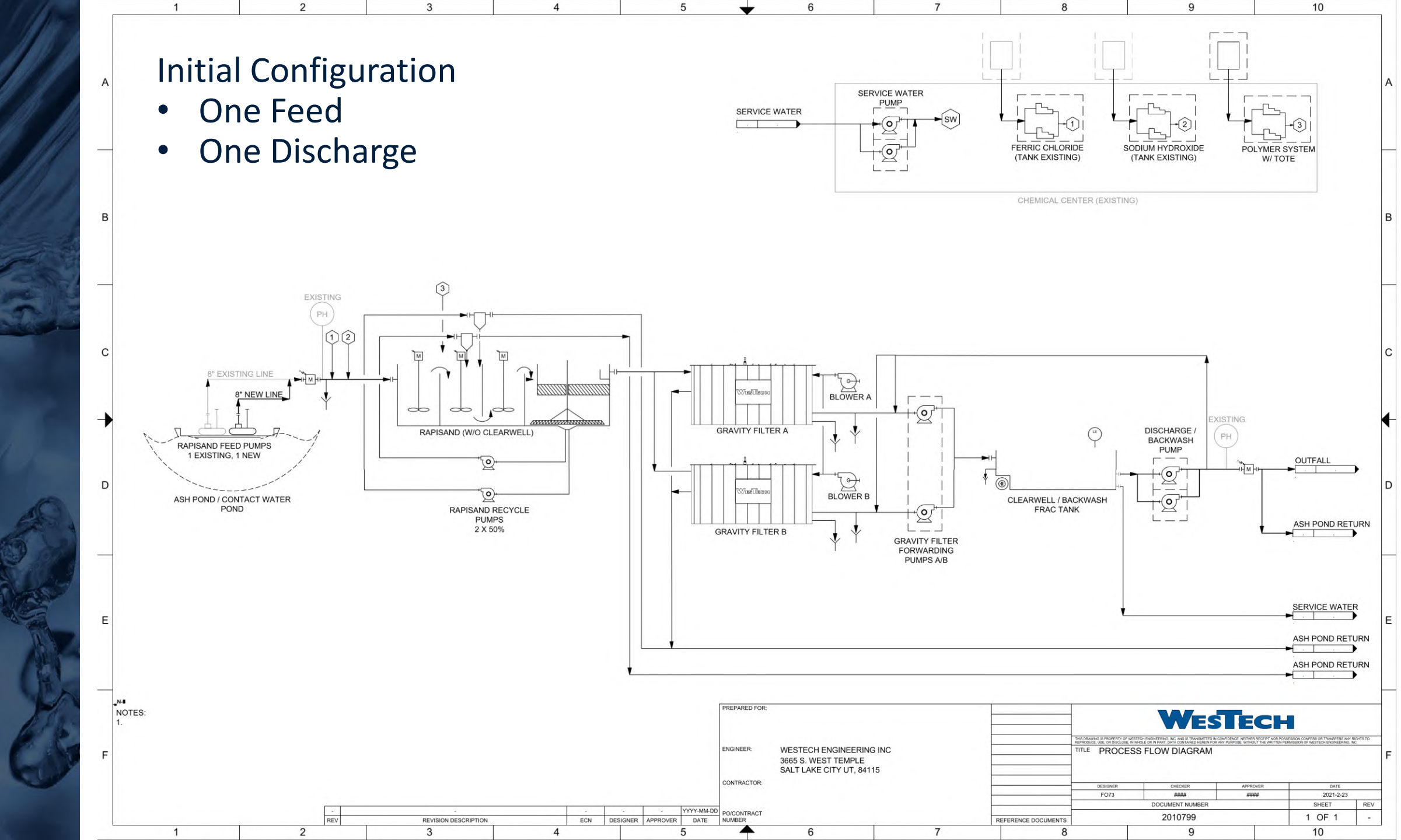
Initial Configuration

- One Feed
- One Discharge



NOTES:
1.

PREPARED FOR:

ENGINEER: WESTECH ENGINEERING INC
3665 S. WEST TEMPLE
SALT LAKE CITY UT, 84115

CONTRACTOR:

PO/CONTRACT NUMBER

REFERENCE DOCUMENTS

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	YYYY-MM-DD DATE
-	-	-	-	-	-

WESTECH

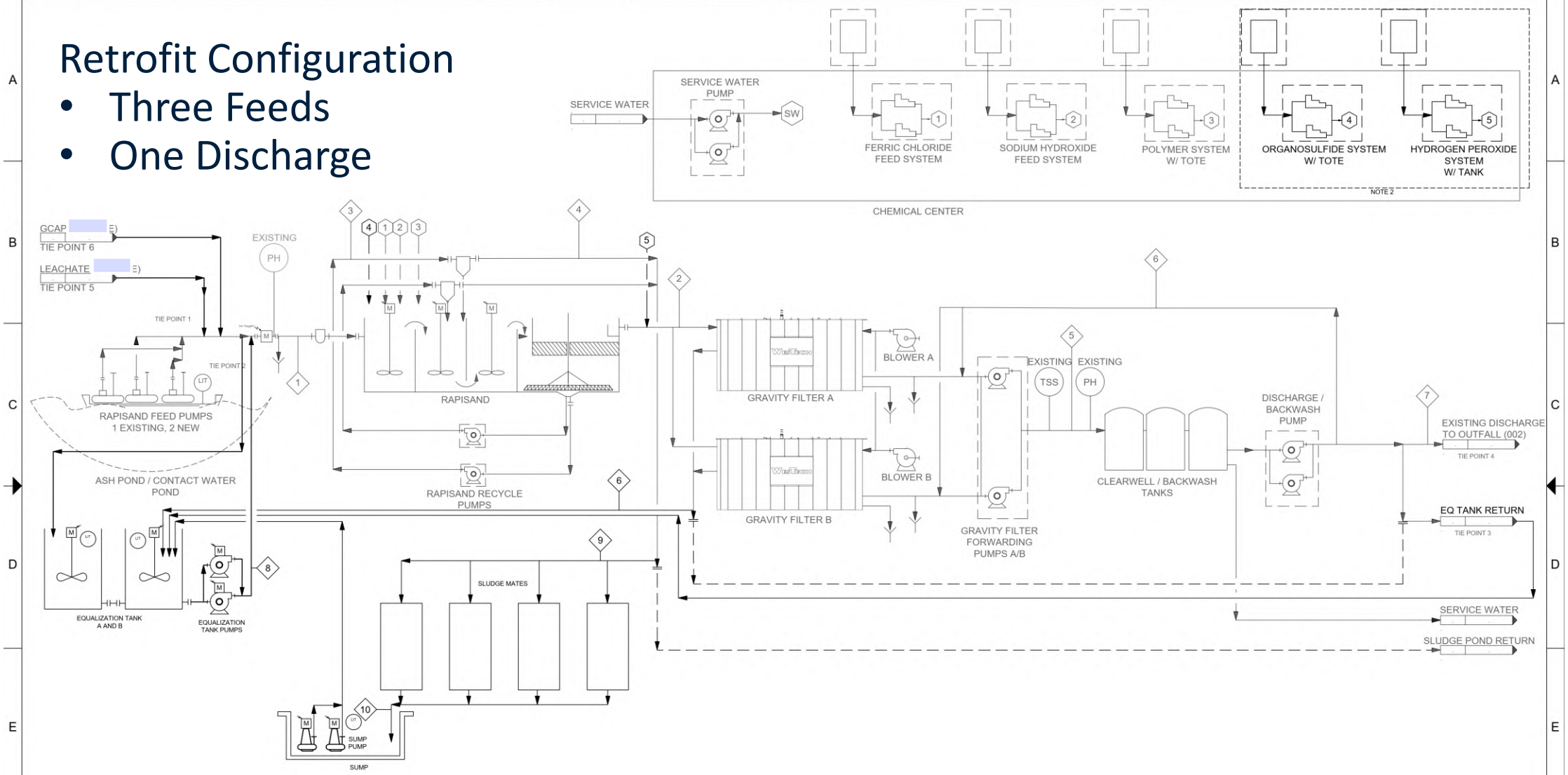
TITLE PROCESS FLOW DIAGRAM

DESIGNER	CHECKER	APPROVER	DATE
FO73	####	####	2021-2-23

DOCUMENT NUMBER	SHEET	REV
2010799	1 OF 1	-

Retrofit Configuration

- Three Feeds
- One Discharge



NOTES:

1. OLD PIPE WILL BE BLIND FLANGED AND REMOVED
2. CHEMICAL SKIDS AND STORAGE TANK CAN BE AN ADDER TO MEET FUTURE ELG REQUIREMENTS

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE	REFERENCE DOCUMENTS
A	INFORMATION ONLY	-	SO74		2023-03-15	

PREPARED FOR

ENGINEER: WESTECH ENGINEERING, LLC, SALT LAKE CITY, UTAH

CONTRACTOR

PO/CONTRACT NUMBER

WESTECH®

TITLE: **PROCESS FLOW DIAGRAM**

CLIENT DOCUMENT NUMBER			
DESIGNER	CHECKER	APPROVER	DATE
SO74			2023-03-15

JOB NUMBER	DOCUMENT NUMBER	SHEET	REV
2310087		1 OF 1	A

Control Logic of New Plant

GCAP and Leachate have limited storage but produce continuously.

The plant prioritizes GCAP and Leachate flows, then dynamically fills remaining capacity with ash pond water.

Eg.

- Leachate 350 gpm
- GCAP 450 gpm
- Ash Pond 1500 gpm
- Plant Capacity 2300 gpm

Table 1 - Influent Maximum Flow Rates*

Parameter	Units	Leachate	GCAP	Ash Pond	Total Flow
Flow	gpm	800	900	2,054	2,300

*Influent flow rates will vary depending on feed from the plant, ash pond, and process stage for a total of 2,300 gpm.

Table 2 - Influent Concentrations Long Term Flows

Parameter	Units	Leachate		GCAP		Ash Pond	
		Average	Max	Average	Max	Min	Max
Influent Flow	gpm	250	800	325	900	485	2,084
Total Suspended Solids (TSS)	mg/L	9.00	90.00	<2.50	20.00	<250	1,000
pH	-	4.3	6	6.7	9	4	10

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Plant Before and After Retrofit

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Plant Before and After Retrofit

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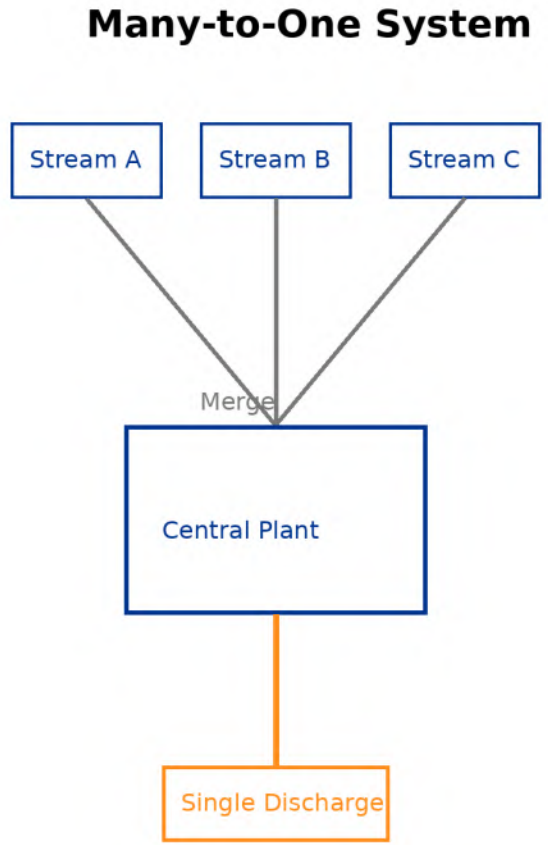
Key Challenges Overcome

- Logistics & Conveyance
  - Routed piping to a single plant
    - Enabled remote pump control via fiber connections, with prioritized logic and system interlocks
    - Recirculation loop also installed for off spec water retreatment
    - Recycle made flocculation needs change, added a cationic polymer at dewatering
- Commingling Constraints
  - Prevented return of new source flows to ash pond
  - Redirected flows to backwash/solids filtrate and new equalization tanks
  - Added recirculation loop for off-spec water retreatment
- Uptime Improvements
  - Reworked sparing philosophy to reduce downtime and improve reliability
- Footprint Constraints
  - Limited space and gravity flow requirements drove construction of a second, lower-elevation lined pad within the ash basin



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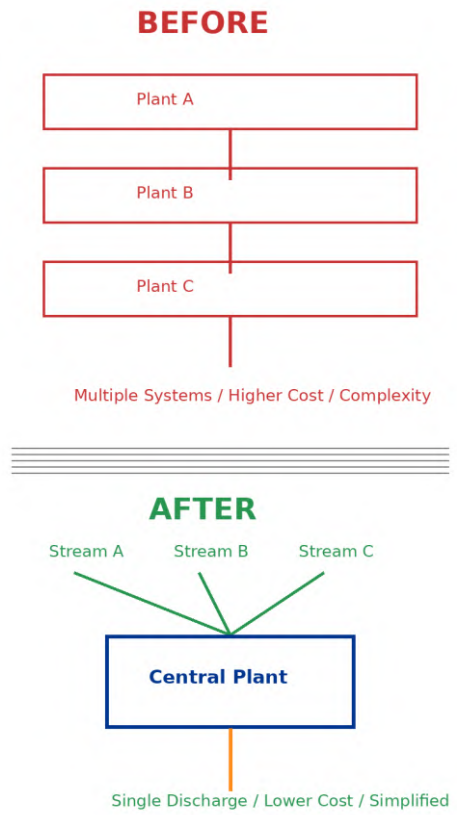
Retrofitting and Repurposing Benefits



- Operations
  - Single plant to operate and manage
  - One operator, one chemical system, one control platform
  - Flexible capacity to manage fluctuations and serve three waste streams
  - Reduced maintenance through centralized operations
- Capital Cost
  - Avoided duplicative infrastructure (programs, electrical, redundancy, spares)
  - Lower overall capital investment with a multi-stream solution
- Regulatory
  - Single discharge point simplifies monitoring and compliance

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Why This Worked

PRIORITIZED FLOWS (GCAP/LEACHATE)

DYNAMIC CAPACITY UTILIZATION

ISOLATION OF STREAMS

TESTING CONFIRMED SIZING, CHEMISTRY, DEWATERING ASSUMPTION

SMART CONTROL LOGIC

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Case 2: Use the Same Equipment, to Solve a Different Problem

From Tight Compliance to High Throughput Flexibility

- Original system: Designed for **very tight metals removal**
- Second System: **4x flow increase (250 → 1000 gpm)**
- Treatment requirement **significantly reduced**
- Challenge: “How do you increase capacity without rebuilding?”

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Original Design Constraints (Plant #1)

- Flow: 250 gpm
- TSS: <20 ppm
- pH: 6-9
- Selenium: <7 ppb
- Mercury: <47 ppt
- Arsenic: <5 ppb
- Nitrate: <2 ppb
- Iron: <1 ppm
- Aluminum < 87 ppm
- Multi-stage metals removal

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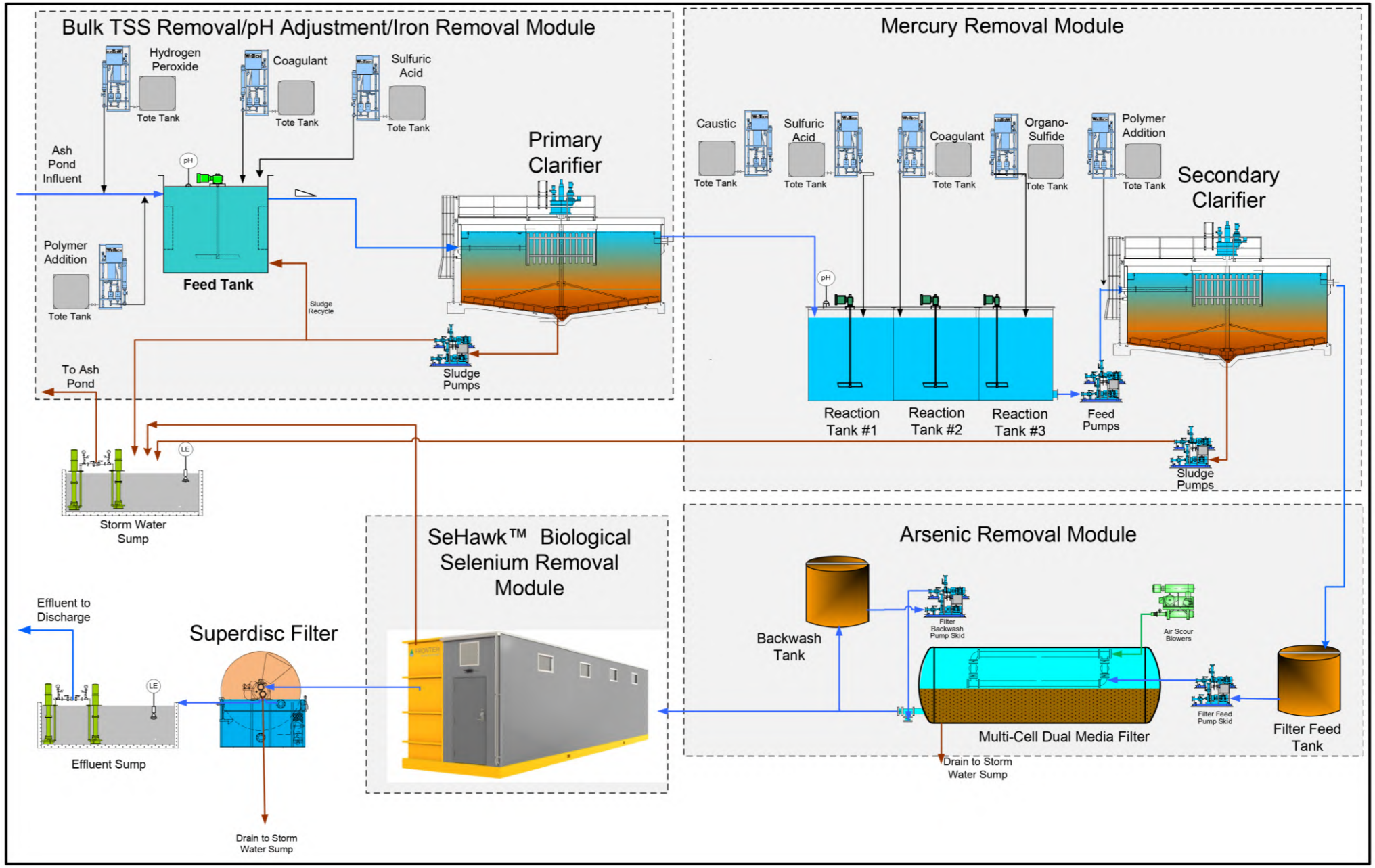

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New Site Requirements (Plant #2)

- Flow: up to **1000 gpm**
- pH: 4–9 → 6–9
- TSS: <500 → <24 ppm
- No metals removal requirement

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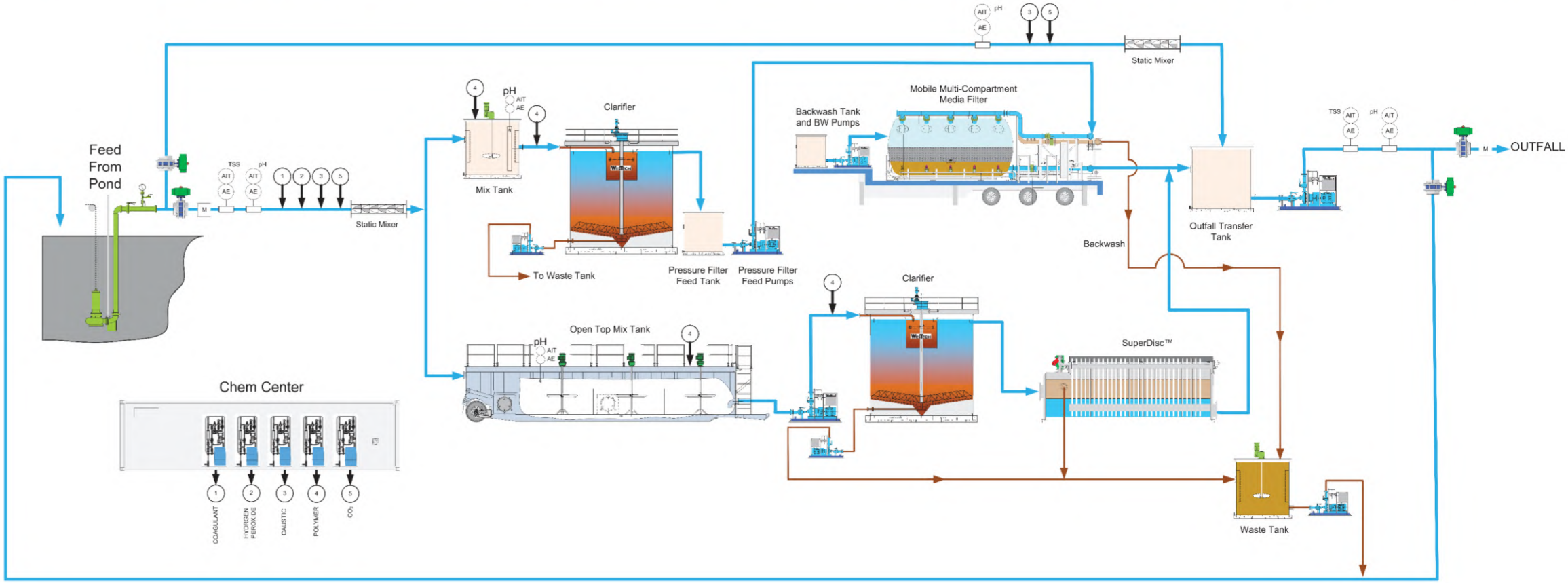
Reconfigured Water Treatment System



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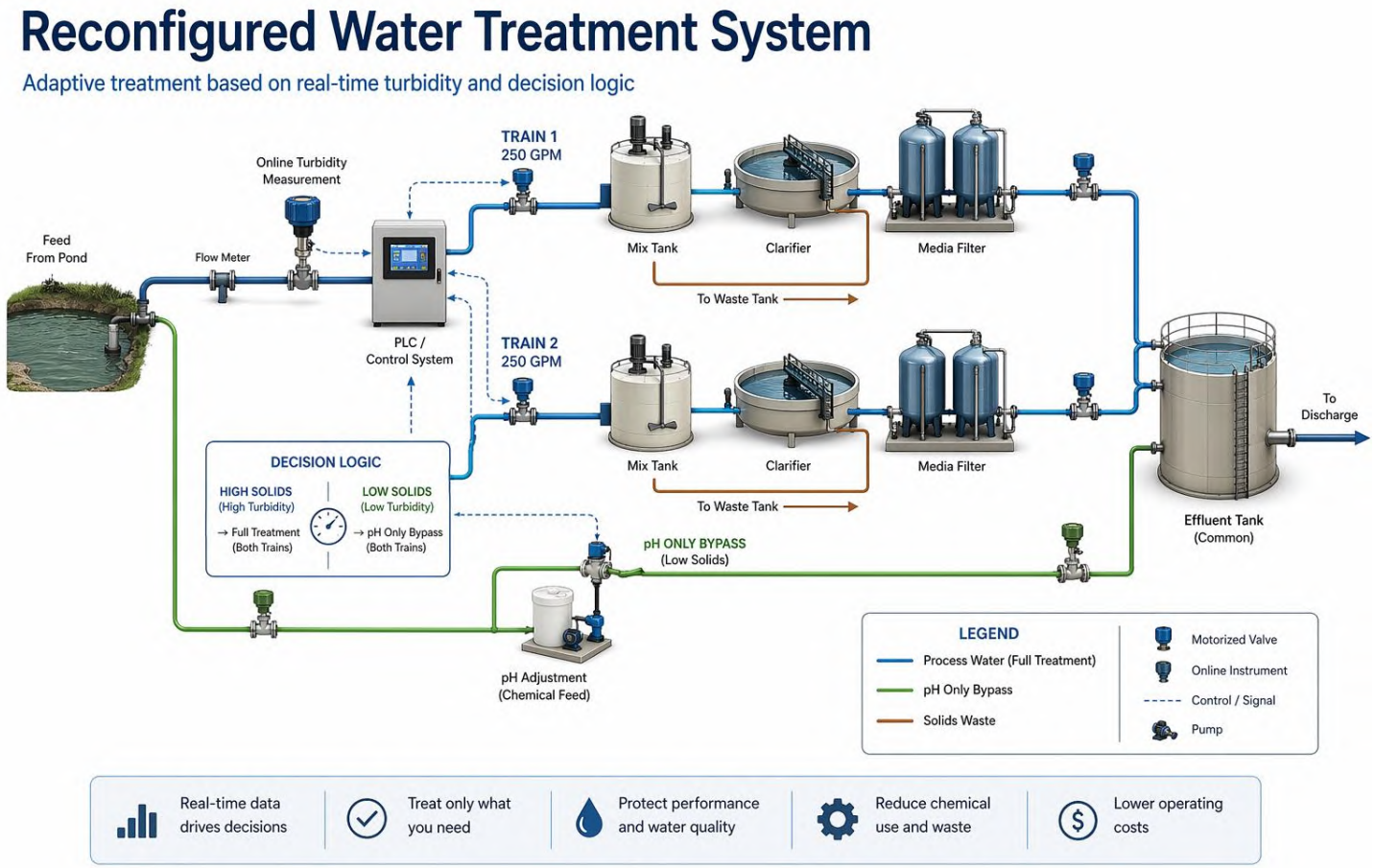
The Core Problem

Existing system = bottlenecked by:

- Reaction time
- Clarification capacity
- Filtration rates

Full treatment at 1000 gpm = **not possible?**

- Parallel processing approach
- Maintain chemistry where needed
- Increase total throughput



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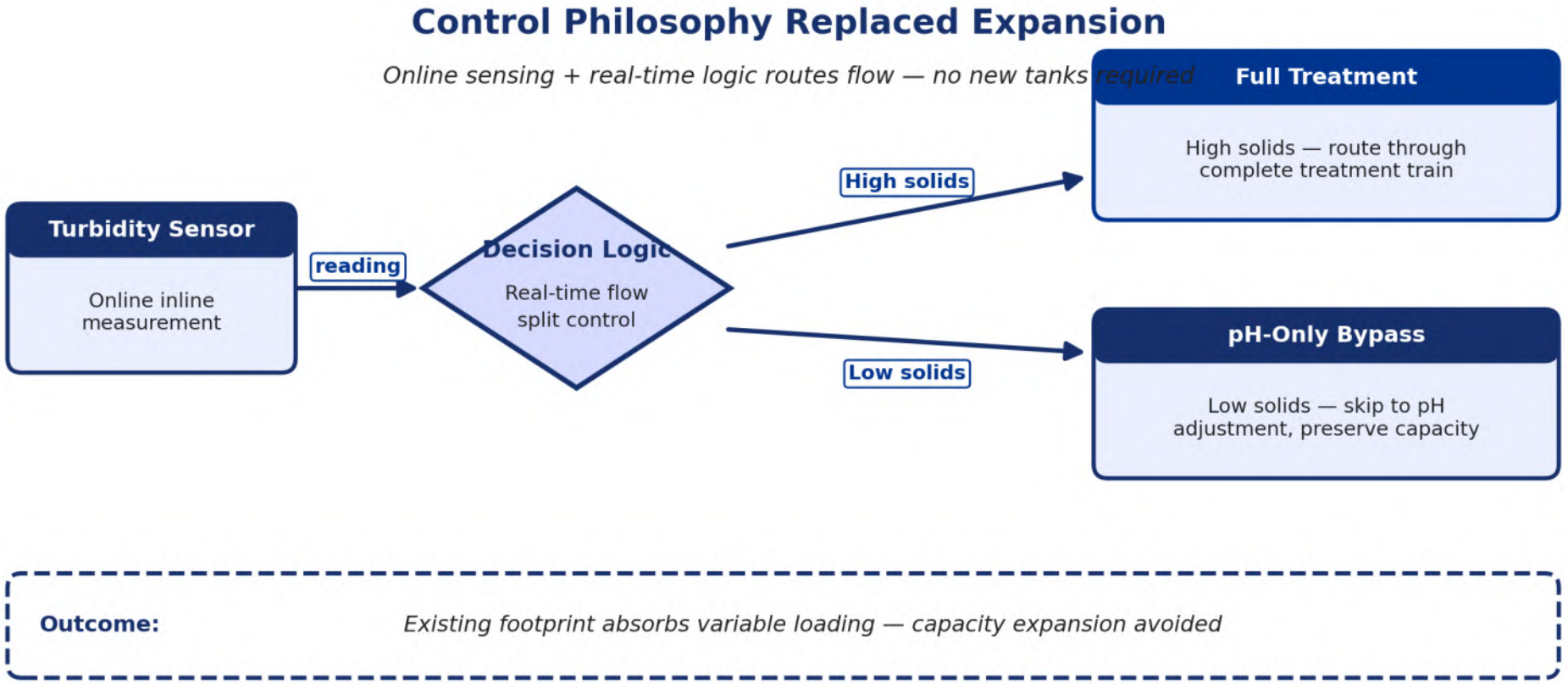
Control Philosophy Replaced Expansion



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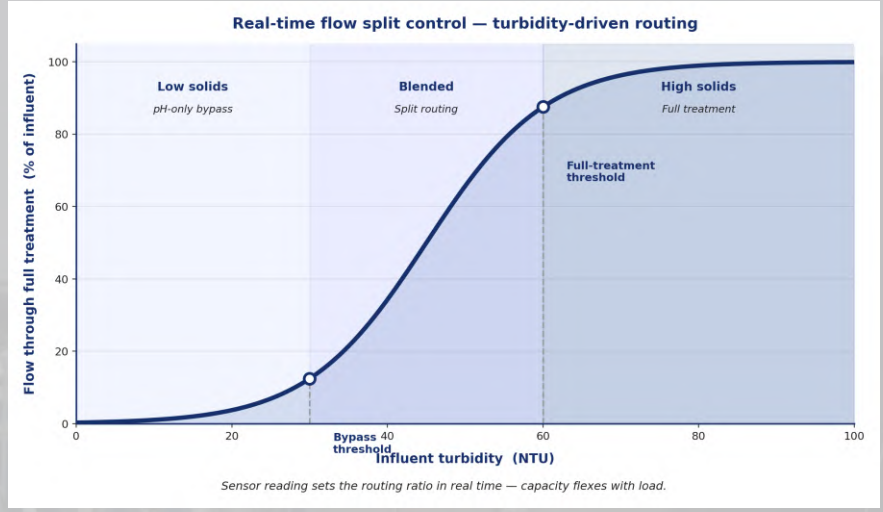
Operating Envelope

- High solids case → ~500 gpm
- Low solids case → ~1000 gpm
- Continuous adjustment



Condition	Low Solids	Moderate Solids	Higher Solids
Feed TSS (mg/L)	20	35	50
TSS After pH Adjustment (mg/L)	22.5	37.5	52.5
Bypass Flow (gpm)	**500**	**390**	**210**
Total Plant Flow (gpm)	**1,000**	**890**	**710**
Final Discharge TSS (mg/L)	**13.8** ✅	**19.2** ✅	**19.2** ✅

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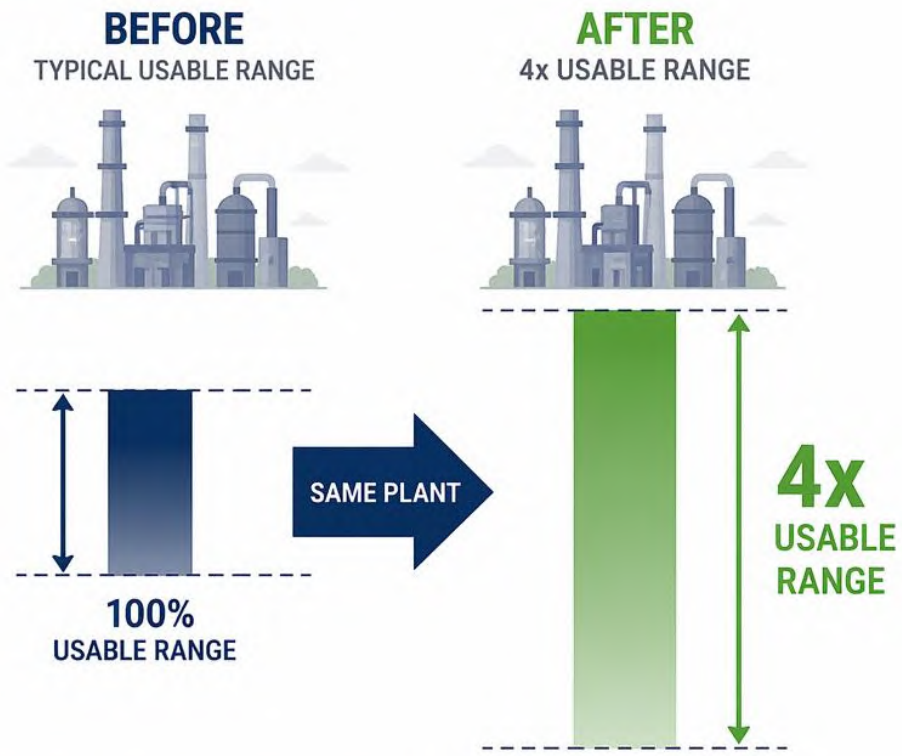
RESULTS –
SAME PLANT 4x USABLE RANGE

1. **DOUBLED CAPACITY**
   WITHOUT MAJOR CAPEX
2. **MAINTAINED**
   COMPLIANCE
3. **PRESERVED**
   ASSET LIFE
4. **FLEXIBLE FOR**
   FUTURE CHANGES



MORE PERFORMANCE. SAME PLANT. SMARTER OPERATION.

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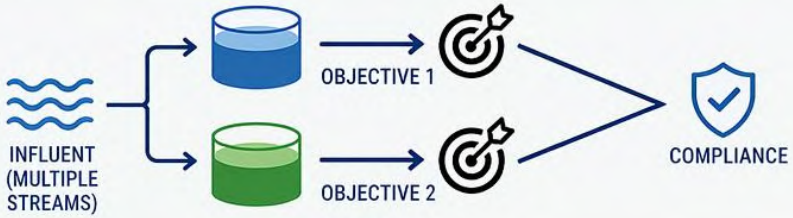
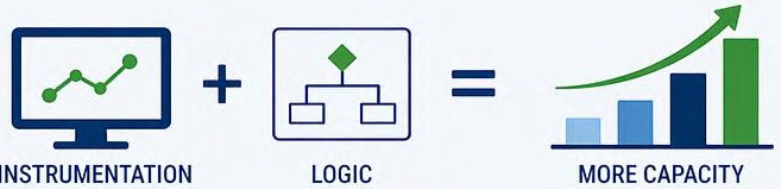
LESSONS LEARNED

1 **OVERDESIGN CAN BECOME AN ASSET**

2 **SEPARATION OF TREATMENT OBJECTIVES WHILE MAINTAINING COMPLIANCE IS POWERFUL**



3 **INSTRUMENTATION + LOGIC = CAPACITY MULTIPLIER**



4 **DON'T TREAT ALL WATER THE SAME**

SMART DESIGN. | SMART OPERATION. | STRONGER RESULTS.

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WATER TREATMENT PLANT FLEXIBILITY

Design for averages, plan for variability

DESIGN FOR AVERAGES, PLAN FOR VARIABILITY

Account for flow and water quality variability in design and operations.

CONTROL SYSTEMS ARE AS IMPORTANT AS EQUIPMENT

Smart controls optimize performance, adapt to change, and protect your investment.

FLEXIBILITY TODAY

RELIABILITY TOMORROW

FLEXIBILITY EXTENDS ASSET LIFE

Adaptable plants experience less stress, fewer disruptions, and longer useful life.

TEMPORARY OFF THE SHELF SOLUTIONS

Use proven, temporary solutions to augment existing infrastructure quickly and effectively.

OPERATORS, ALIGNED WITH ENGINEERS, DETERMINE SUCCESS

Collaboration between operations and engineering ensures practical solutions and lasting outcomes.

BUILT FOR CHANGE | OPTIMIZED PERFORMANCE | EXTENDED ASSET LIFE | SMARTER INVESTMENTS | STRONGER TOGETHER

The systems that succeed aren't the ones designed perfectly…

they're the ones that adapt to needs with input from operators, engineers and system owners.

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