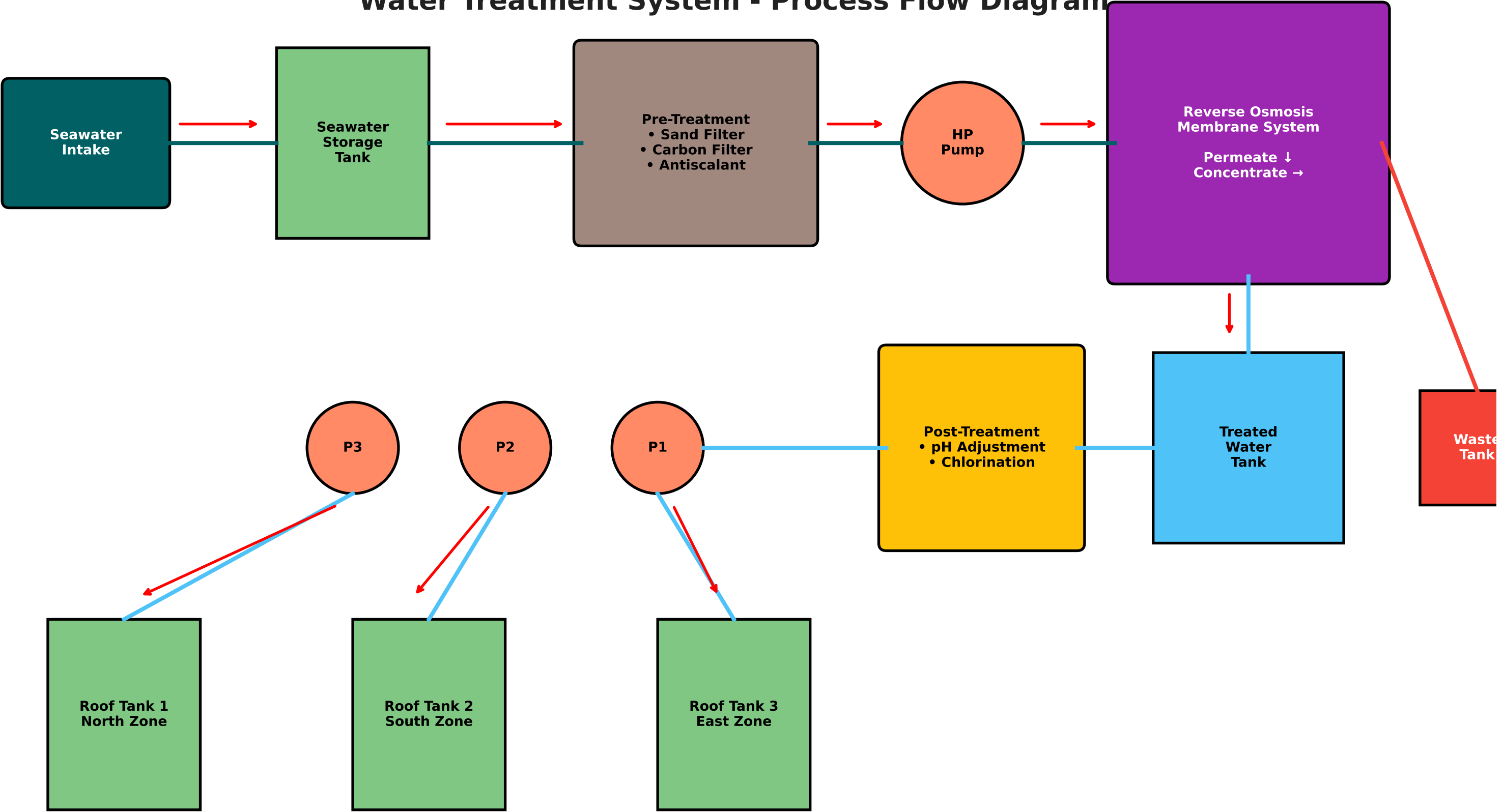


# Water Treatment System - Process Flow Diagram



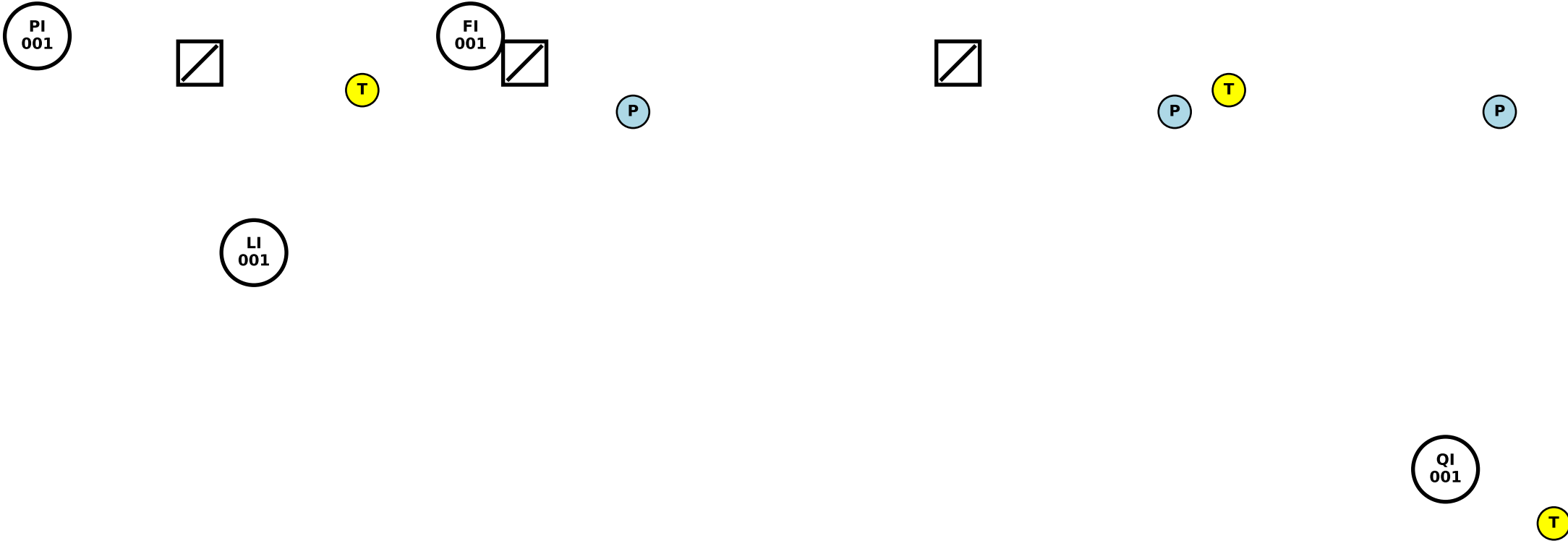
## Legend:

- Seawater
- Treated Water
- Equipment
- Storage Tank
- Pump
- Waste

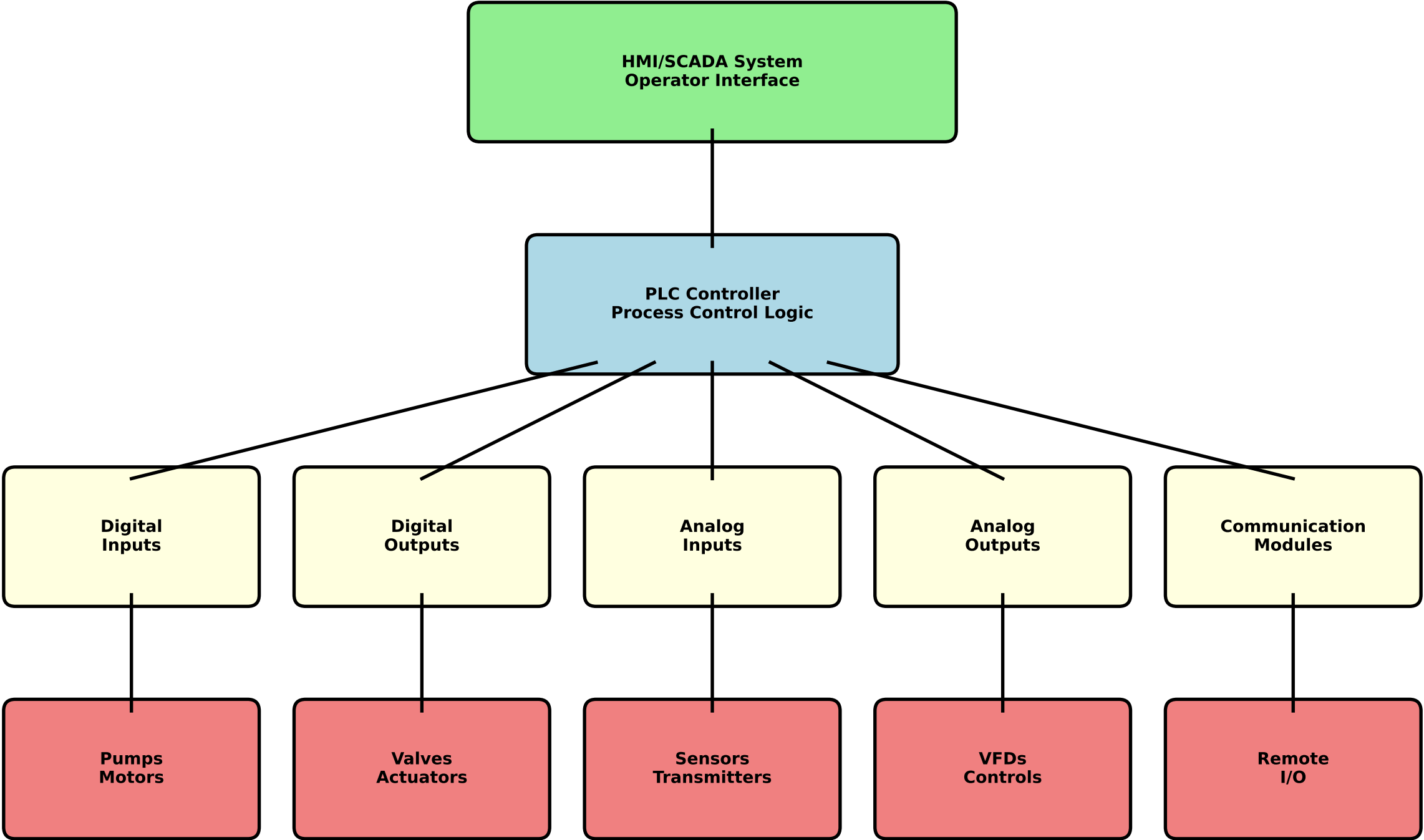
## Key Process Parameters:

- Production Capacity: 10,000 L/hour
- RO Recovery Rate: 45%
- Operating Pressure: 55 bar
- Energy Consumption: ~125 kW
- Water Quality: <200 ppm TDS
- Distribution Zones: 3
- Storage Capacity: 30,000 L

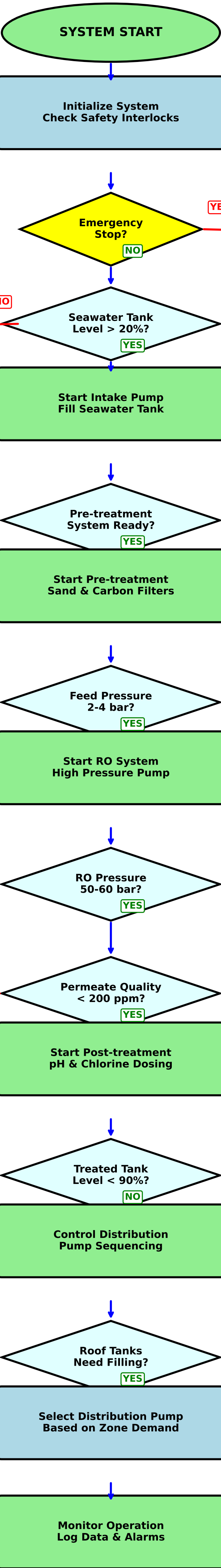
Water Treatment System - P&ID



# Control System Architecture



Water Treatment System - Process Control Flowchart



SYSTEM START

Initialize System  
Check Safety Interlocks

Emergency Stop?

YES

EMERGENCY STOP  
Shutdown All Systems

NO

Seawater Tank  
Level > 20%?

NO

YES

Start Intake Pump  
Fill Seawater Tank

Pre-treatment  
System Ready?

NO

YES

MAINTENANCE REQUIRED  
Check Filters & Antiscalant

Start Pre-treatment  
Sand & Carbon Filters

Feed Pressure  
2-4 bar?

NO

YES

ADJUST PRESSURE  
Control Feed Pump VFD

Start RO System  
High Pressure Pump

RO Pressure  
50-60 bar?

NO

YES

ADJUST RO PRESSURE  
PID Control HP Pump

Permeate Quality  
< 200 ppm?

NO

YES

Start Post-treatment  
pH & Chlorine Dosing

Treated Tank  
Level < 90%?

YES

NO

TANK FULL  
Stop RO Production

Control Distribution  
Pump Sequencing

Roof Tanks  
Need Filling?

YES

Select Distribution Pump  
Based on Zone Demand

Monitor Operation  
Log Data & Alarms

LOW LEVEL ALARM  
Wait for Fill

QUALITY ALARM  
Check Membrane Integrity

Water Treatment System - State Diagram

