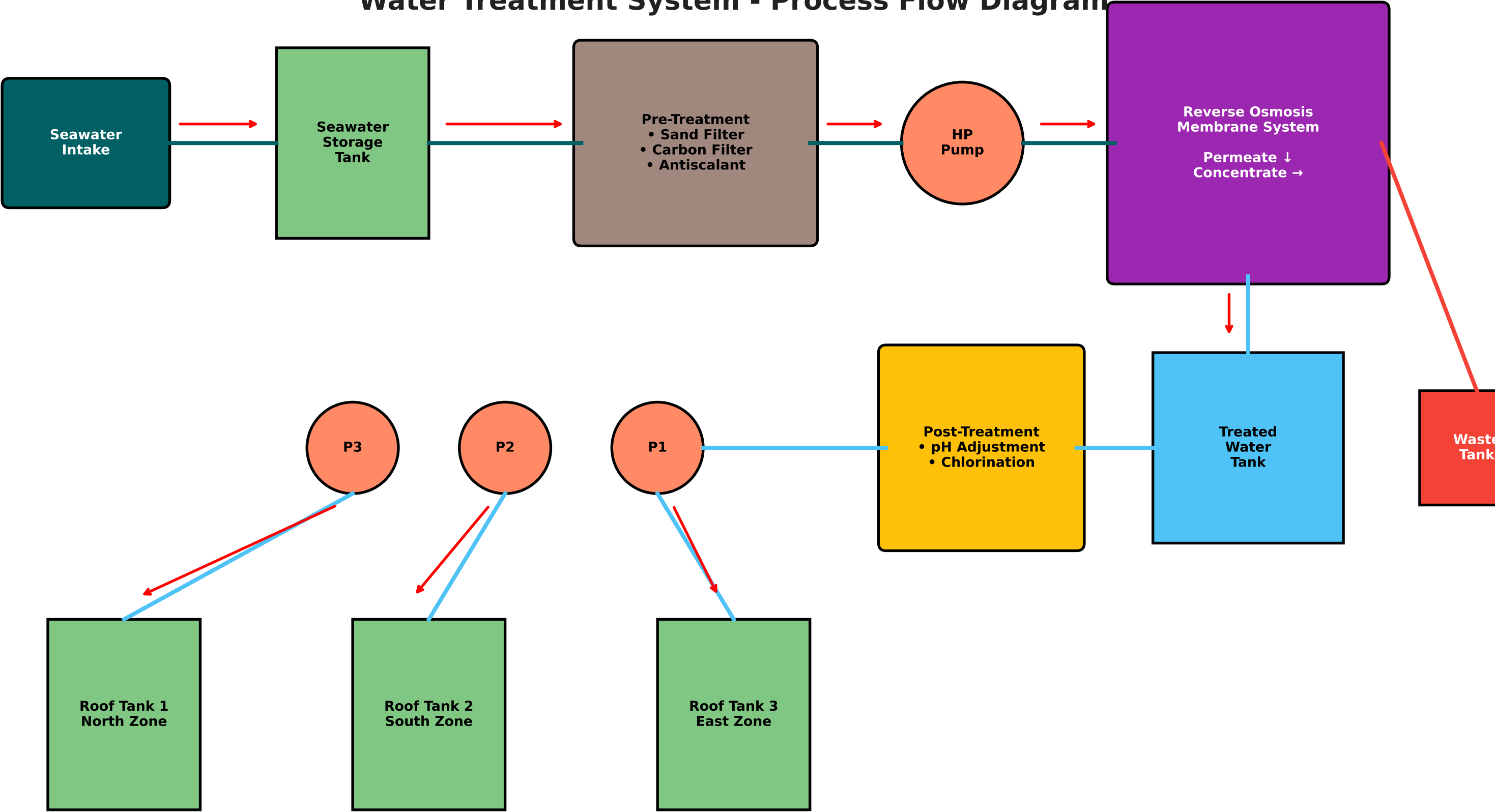


Water Treatment System - Process Flow Diagram



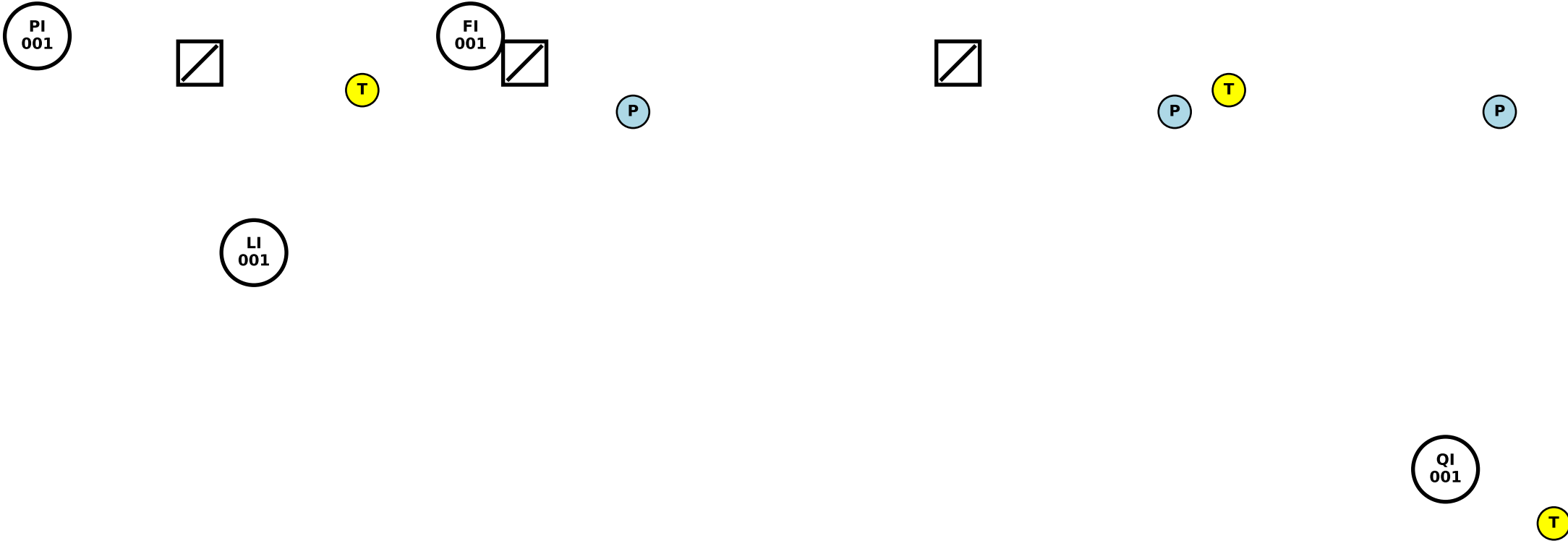
Legend:

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

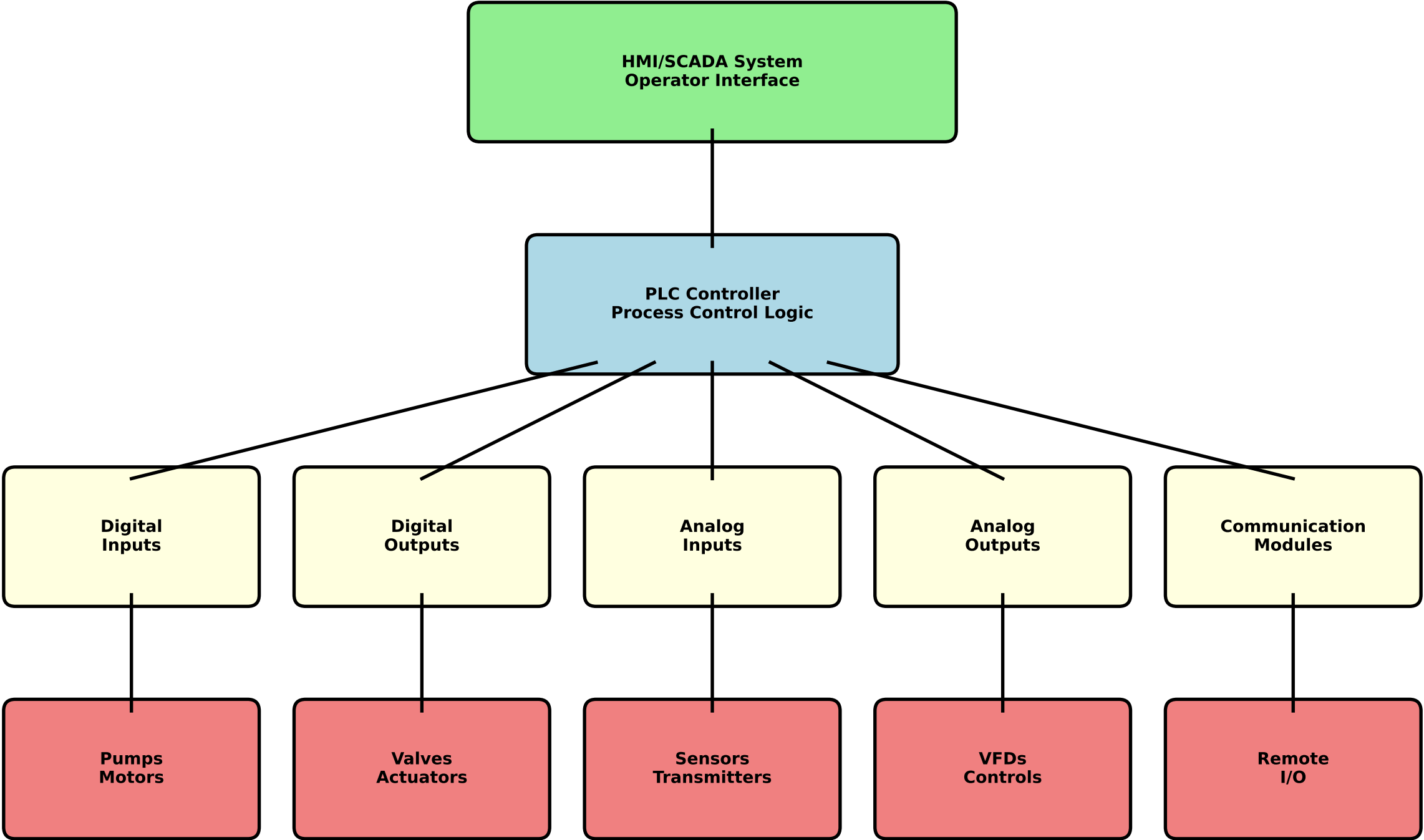
Key Process Parameters:

- 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

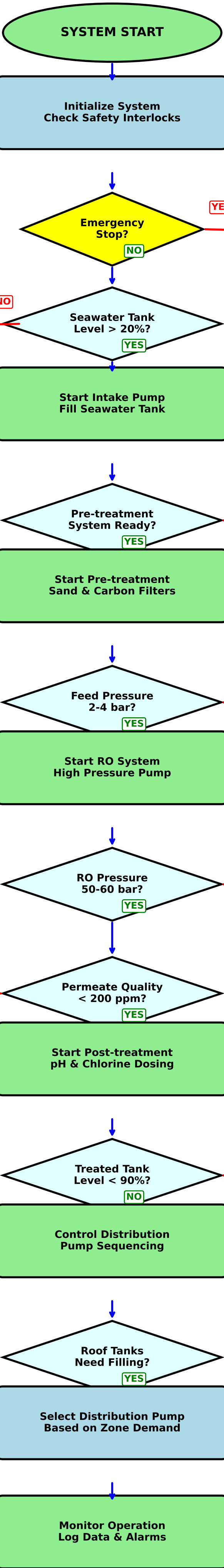
Water Treatment System - P&ID



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

