



SCADA UPGRADE WATER TREATMENT PLANT

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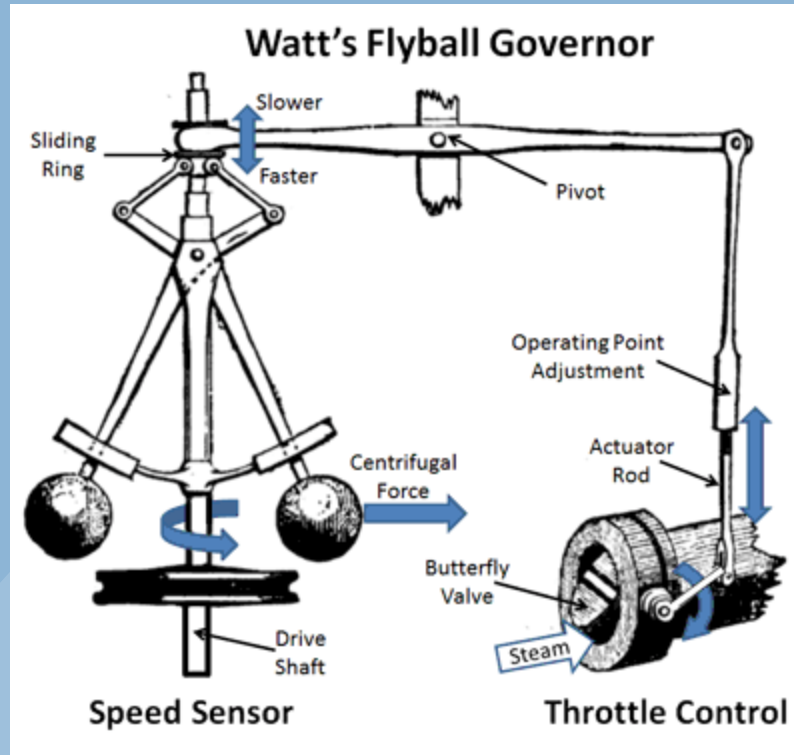
Dmytryka Jacobs Engineers, Inc.
Toledo, Ohio

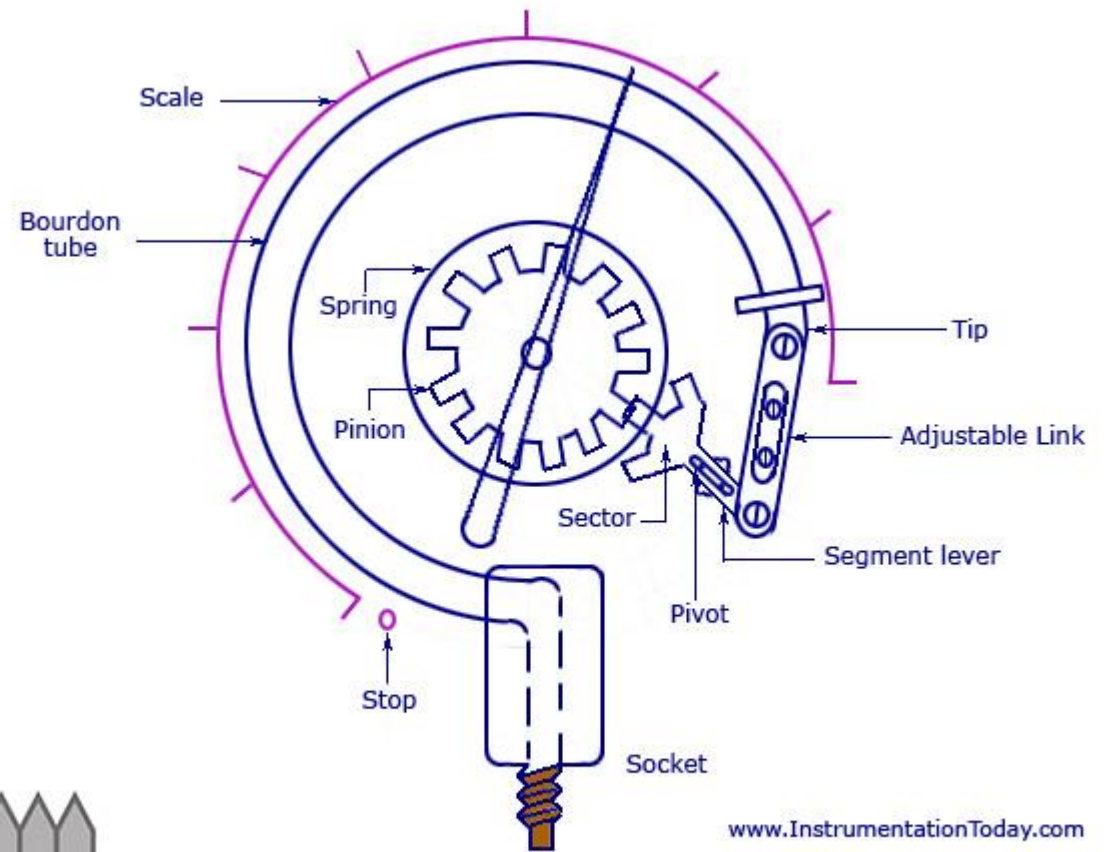
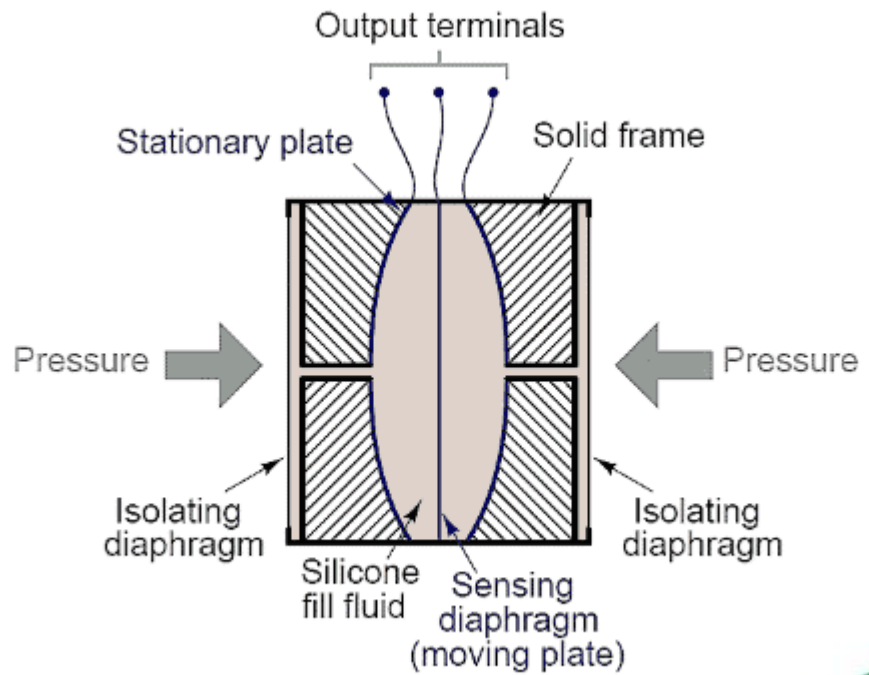
HISTORY OF THE SYSTEM

- Plant constructed in 1931
 - Combination Zeolite and Lime Softening
- Converted to blending surface and groundwater plant in 1948
 - Construction of reservoir #1
 - 1.4 Billion gallon reservoir
- Added second reservoir in 1965
 - 5.0 Billion gallon reservoir
- 1986 converted into all surface water
 - Two 8.0 MGD Solids contact units



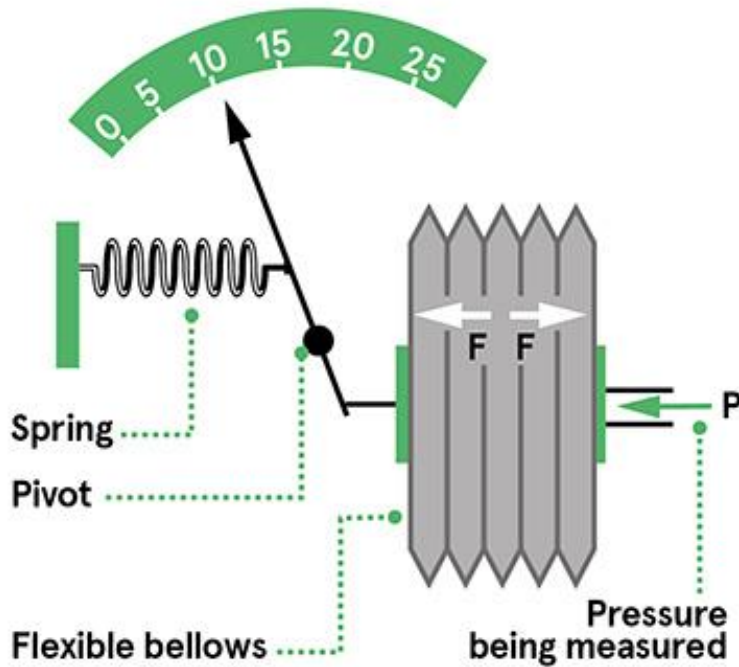
CONTROLS





www.InstrumentationToday.com

Bourdon Tube Pressure Gauge



1980-1990 CONTROL SYSTEMS



CHART RECORDERS





WHAT WAS IN THE PLANT

Hardware

- 1. Allen-Bradley ControlLogix and Compact Logix
- 2. Panelview
- 3. Workstations
 - 1. RSView32 HMI Server #1
 - 2. RSView32 HMI Server #2
 - 3. RSView32 Clients

PLC 5



SLC500



MicroLogix 1400



MicroLogix 1500



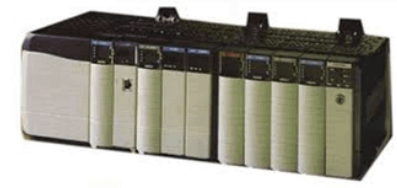
MicroLogix 1100



CompactLogix

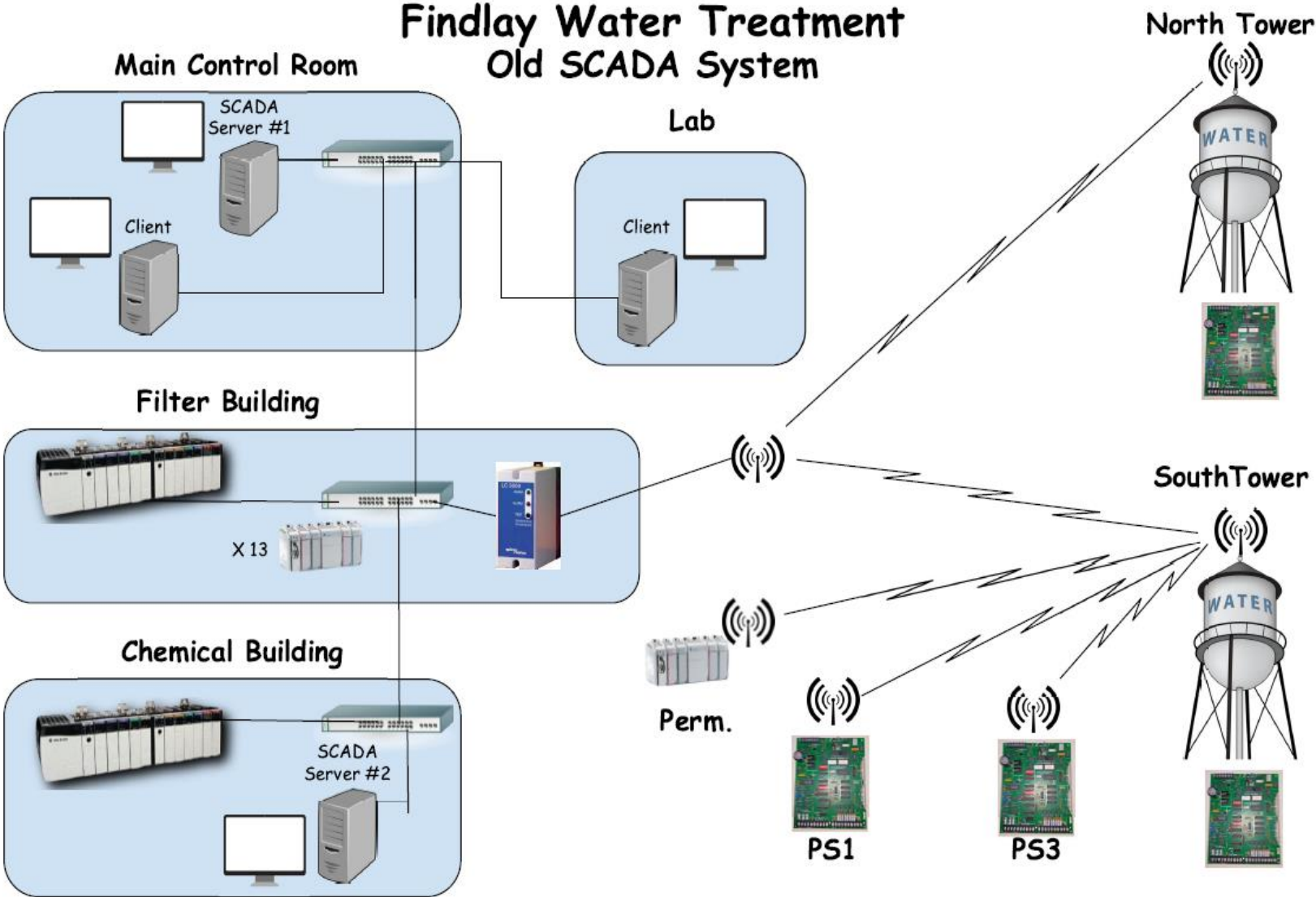


ControlLogix



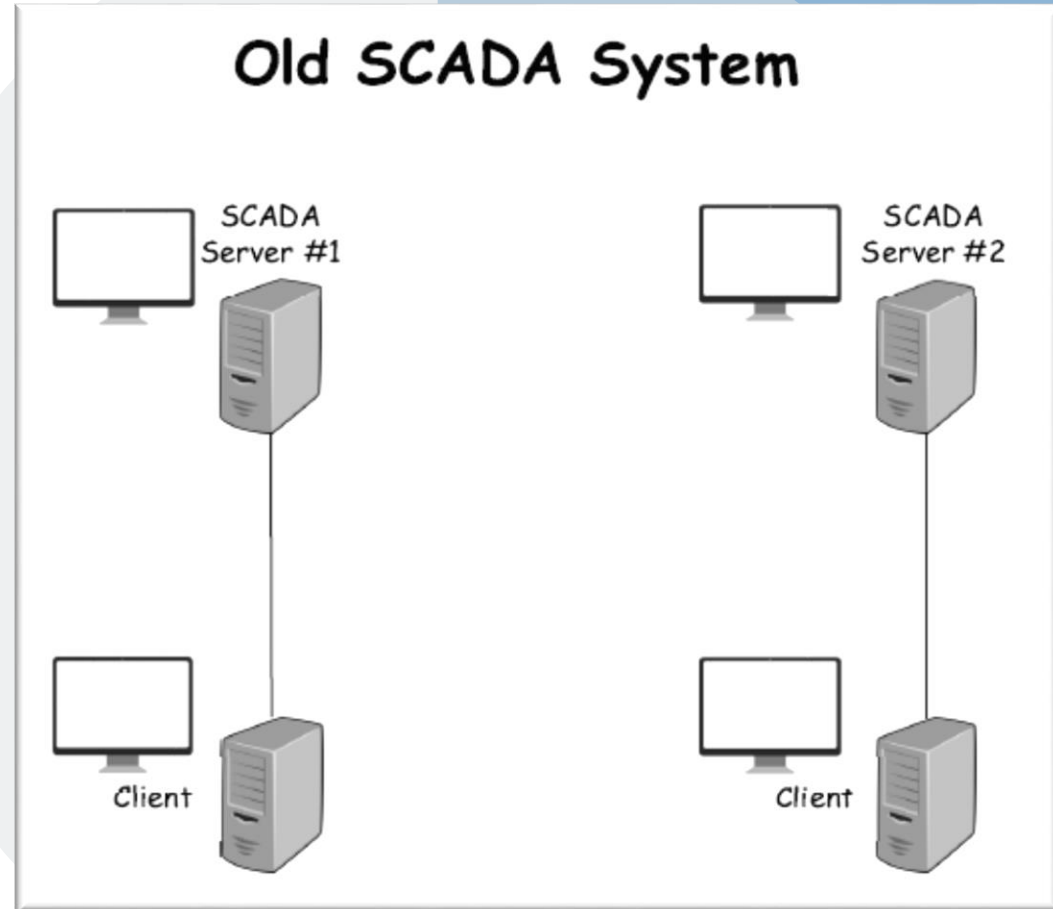
SOFTWARE

- A. RSView32 Active Display System
- B. RSView32 Clients
- C. XLReporter

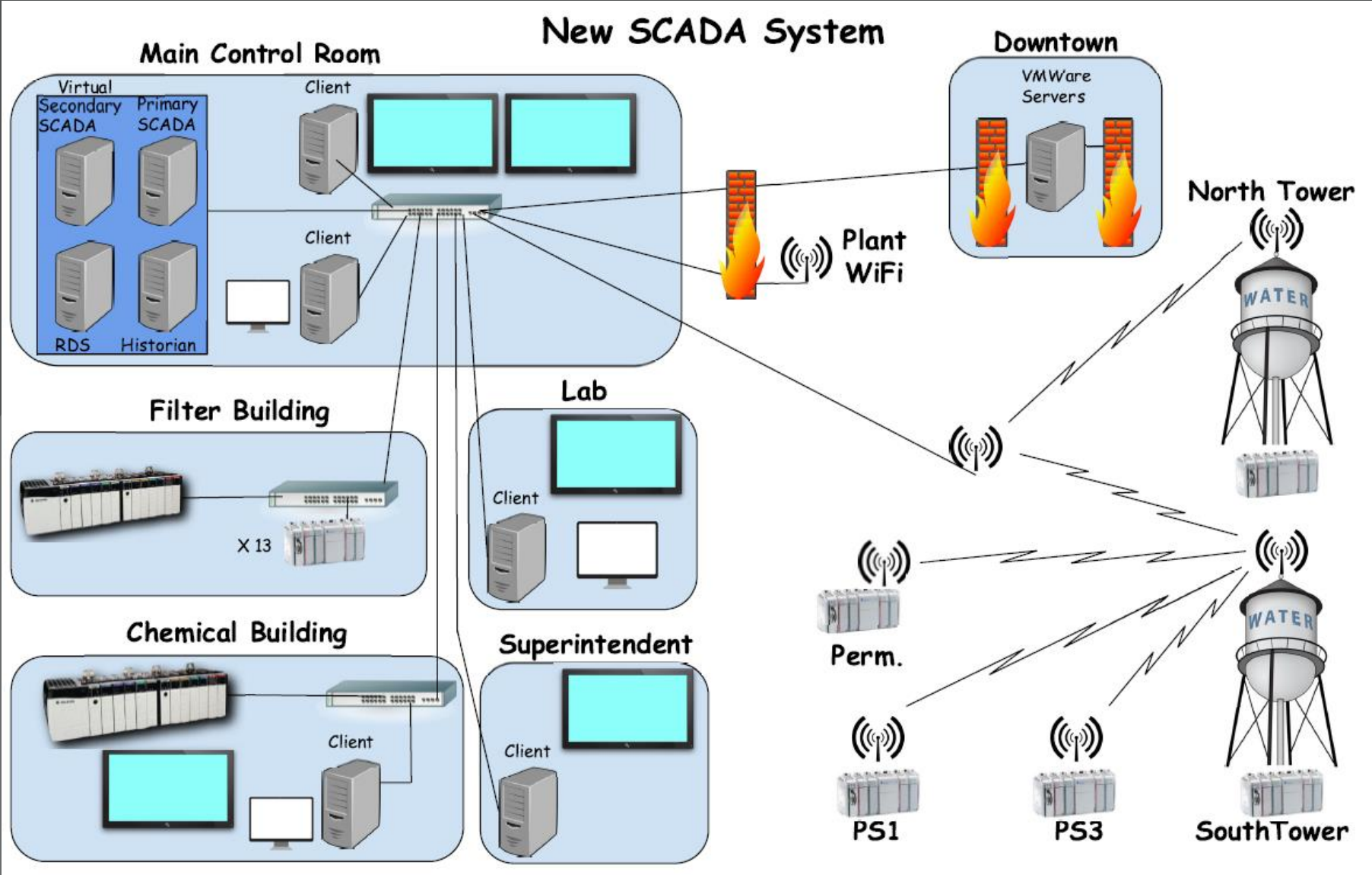


DESCRIPTION OF OLD SYSTEM

- RSView32 had two HMI servers
- Data was stand alone
 - Both servers
 - Hitting the PLCs live data
 - Collecting their own alarms
 - Storing own historical data
 - Own copy of the HMI screens
 - Clients chose which HMI server to look at for data

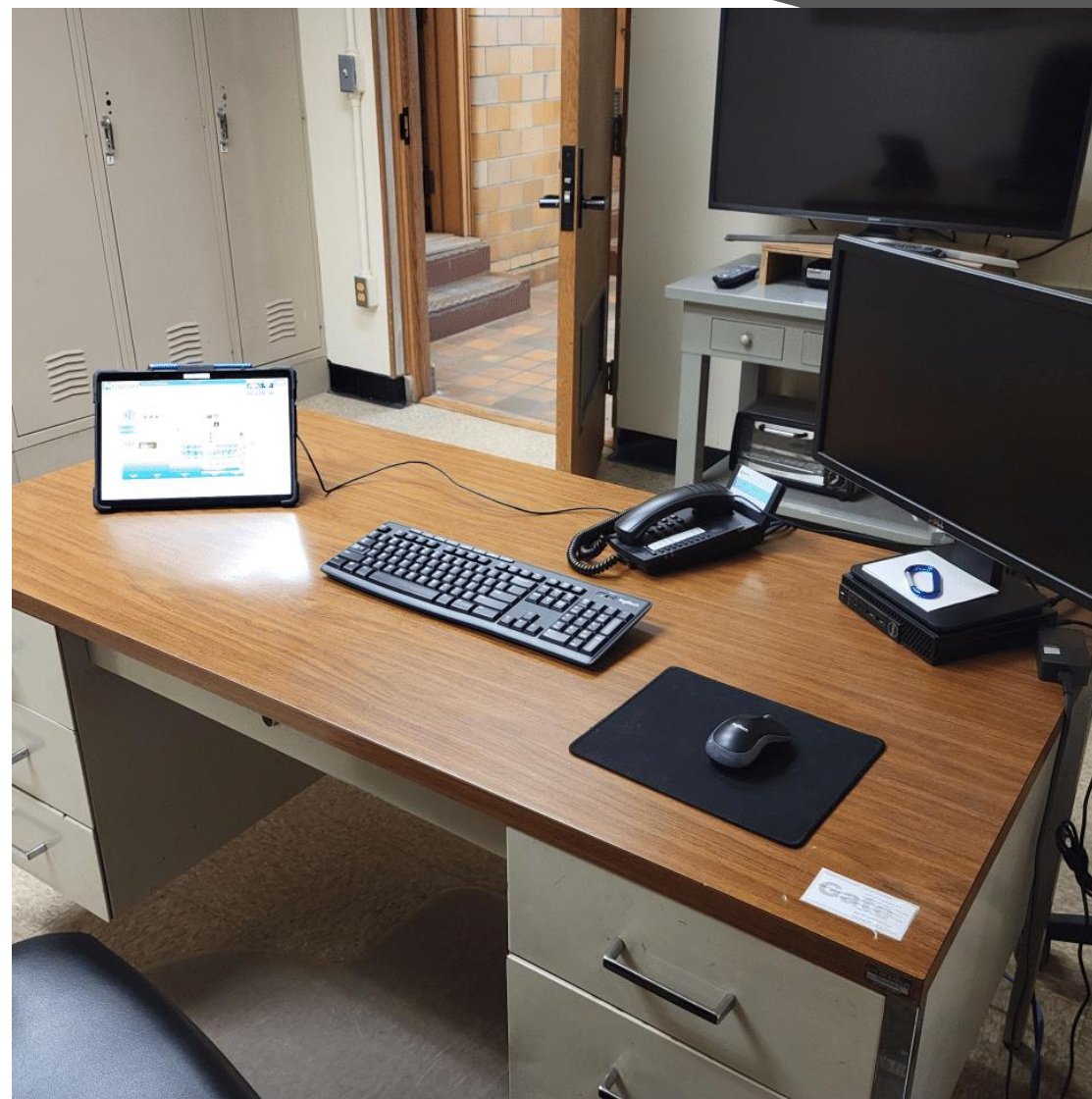


THE UPGRADED CONTROL SYSTEM



HARDWARE

- ❖ Allen-Bradley ControlLogix and CompactLogix
- ❖ PanelView Plus
- ❖ Large, Dual Monitors (50",27")
- ❖ Virtual Server at Plant connected to City's Virtual servers
 - ❖ Primary HMI
 - ❖ Secondary HMI
 - ❖ Historian
 - ❖ Remote Desktop Services
 - ❖ Domain Controller
- ❖ Dell Workstations
- ❖ Surface Tablets



NEW SOFTWARE

- FactoryTalk View SE
 - HMI Server- Redundant
 - Alarm Server- Redundant
 - Data Server-Redundant
- FactoryTalk Historian
- FactoryTalk SE Clients
- XLReporter



WHAT THE NEW SYSTEM DOES

Upgrade from RSview32 Active display to Factory Talk View SE

- Factory Talk SE has two HMI servers with Clients
- But the two servers work together

orks, Findlay, Ohio



WHY IS THIS IMPORTANT

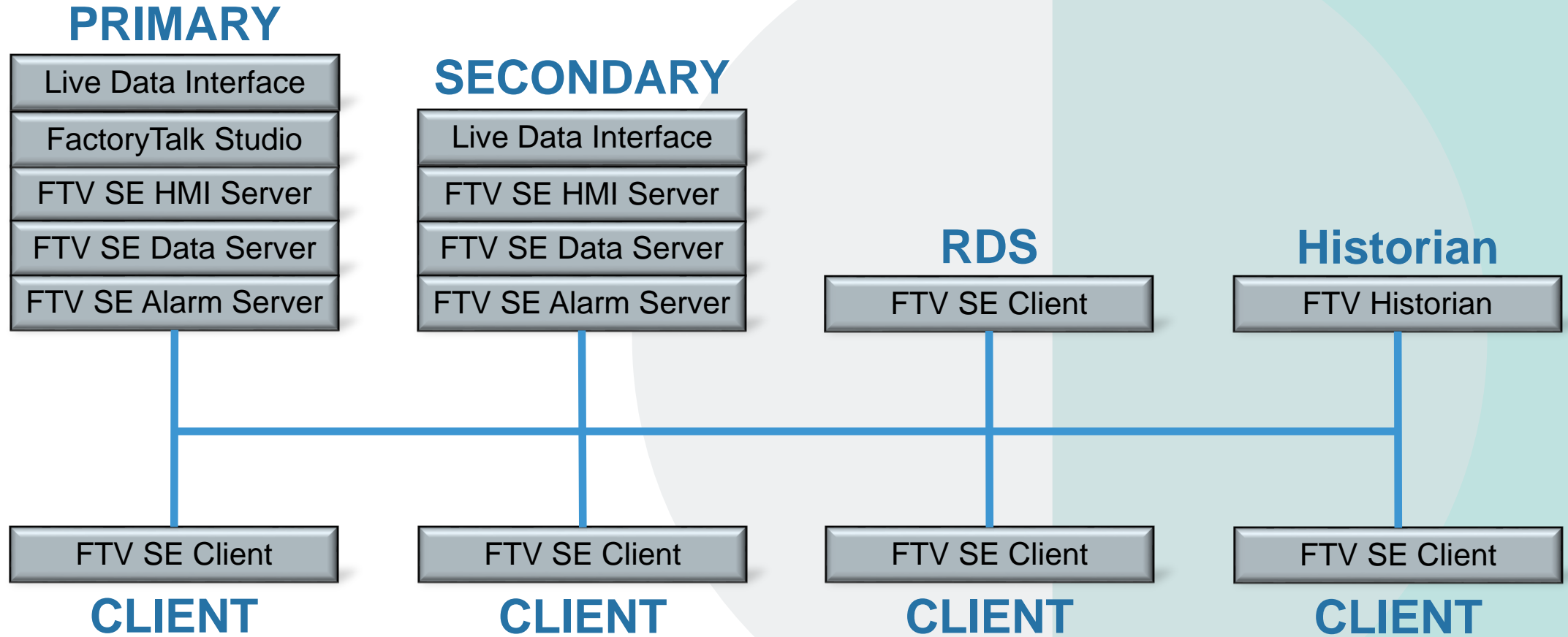
- I. Only the primary server will ask for the data from the PLCs
 - I. This limits traffic on the network
 - II. The PLCs don't have to work as hard answering requests for data
- II. Alarms are collected
 - I. Stored by primary server
 - II. Passed to the secondary computer's local database



- i. Primary Server collects historical data
- ii. Forwards it onto a centralized historian
- iii. Secondary server takes over if primary goes down
- iv. No holes in trends
- v. HMI server buffers the data if the historian goes down
- vi. They send the data when Historian is back up
- vii. NO DATA IS EVER LOST



FactoryTalk View SE Architecture



- a. Changes made to the HMI screens on the primary server
 - a. Automatically sent over to secondary HMI server
 - b. No need to manually copy
- b. Clients automatically switch to the secondary server whenever there is anything wrong with the primary server



XLREPORTER

- ❖ Retrieves data from FactoryTalk Historian
 - ❖ Reports can be generated on demand
 - ❖ Data comes from a database
 - ❖ Not from live data that can be missed
- ❖ NEVER A PROBLEM WITH LOSING A REPORT
- ❖ Upgraded from a stand-alone installation
 - ❖ New version can be accessed via web browser
 - ❖ By any computer on the control network



MOBILE CLIENTS

- WIFI Access points were added throughout the plant including tunnels
- Microsoft Surface and Samsung tablets running remote desktop were used to run a Factory Talk SE Client
- When using remote desktop
 - Factory Talk SE Client is actually running on the Remote Desktop Server and not on the tablet
 - Enables almost any device to run the software regardless of the power of the device



HOW DOES THIS WORK

- ❖ Propagation Study
 - ❖ Best places to access points
 - ❖ Not worrying about stairwells
- ❖ No coverage outside the plant
 - ❖ Due to the proximity to major road
 - ❖ Bike path



THE WIFI NETWORK

- Firewalled from the plant control network
- Limited access to only the tablets and remote desktop server
- Guard against potential intrusions from people outside the plant



WHAT NEXT

1. Continue to improve the system
2. Connect the SCADA system with Cameras
3. Connect system with Asset Management inventory
4. 3D virtual tour of the facility

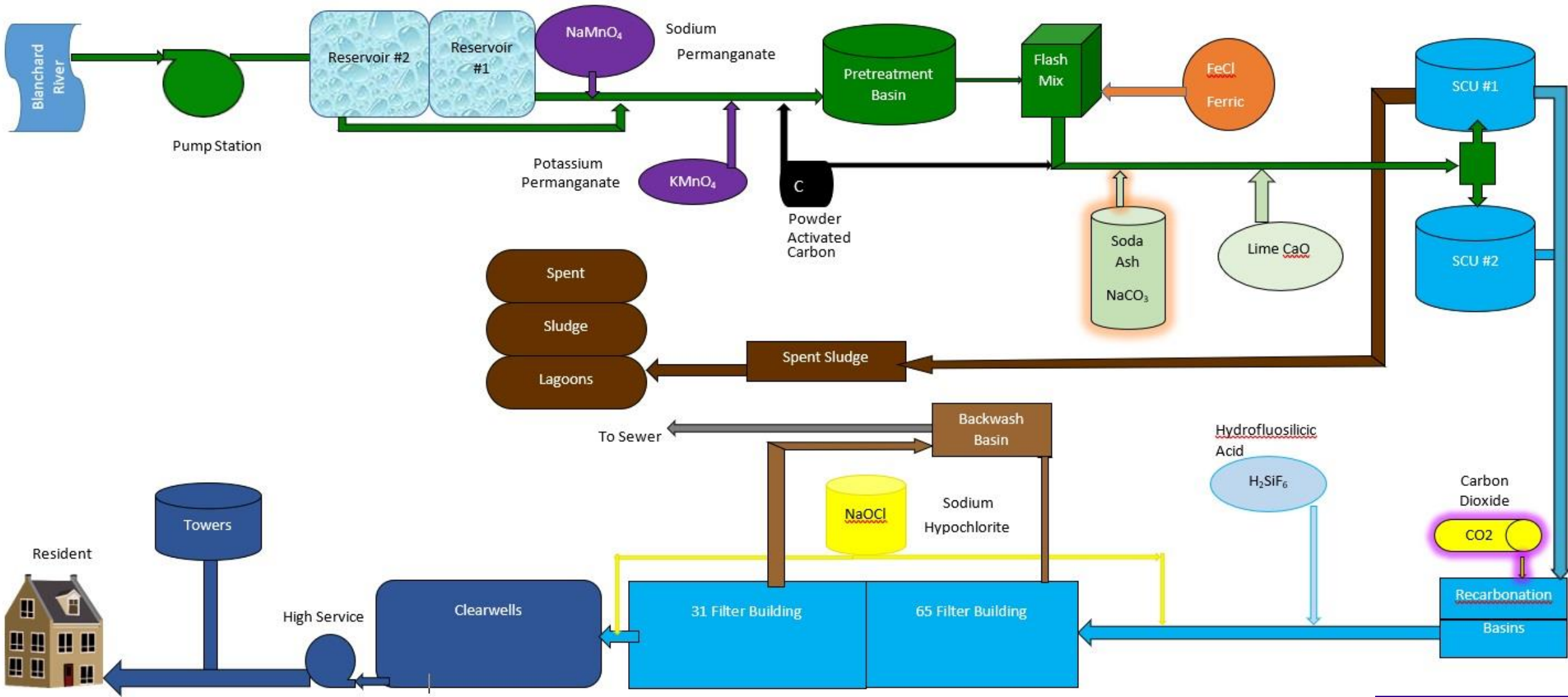


CONTINUE WORK

Continue to improve communication with the reservoir

Added additional controls and integration with raw pump station







QUESTIONS?

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