

Introductions



Municipal Lift Stations

SCADA (Supervisory Control and Data Acquisition)
Utilized in lift station remote monitoring and
troubleshooting.

March 26th, 2024

Building beyond.

Lift Station Survey

- Look familiar? How many?
- Top 3 Issues?
- When do you find out?
 - Routine Inspection?
 - Beacon?
 - Phone call?
 - Text message?
- Troubleshooting?
 - Screen?
 - Trends?
 - Reports?
 - Remote connectivity?



Lift Station Overview

2 (or 3) variations of lift stations deployed in NL:

1. Basic Panel –
No Remote Monitoring
2. RTU (SCADA Ready) –
Equipment exists to facilitate SCADA (Not connected)
- 2+. SCADA – Remote monitoring installed and integrated.



SCADA

Supervisory

Control

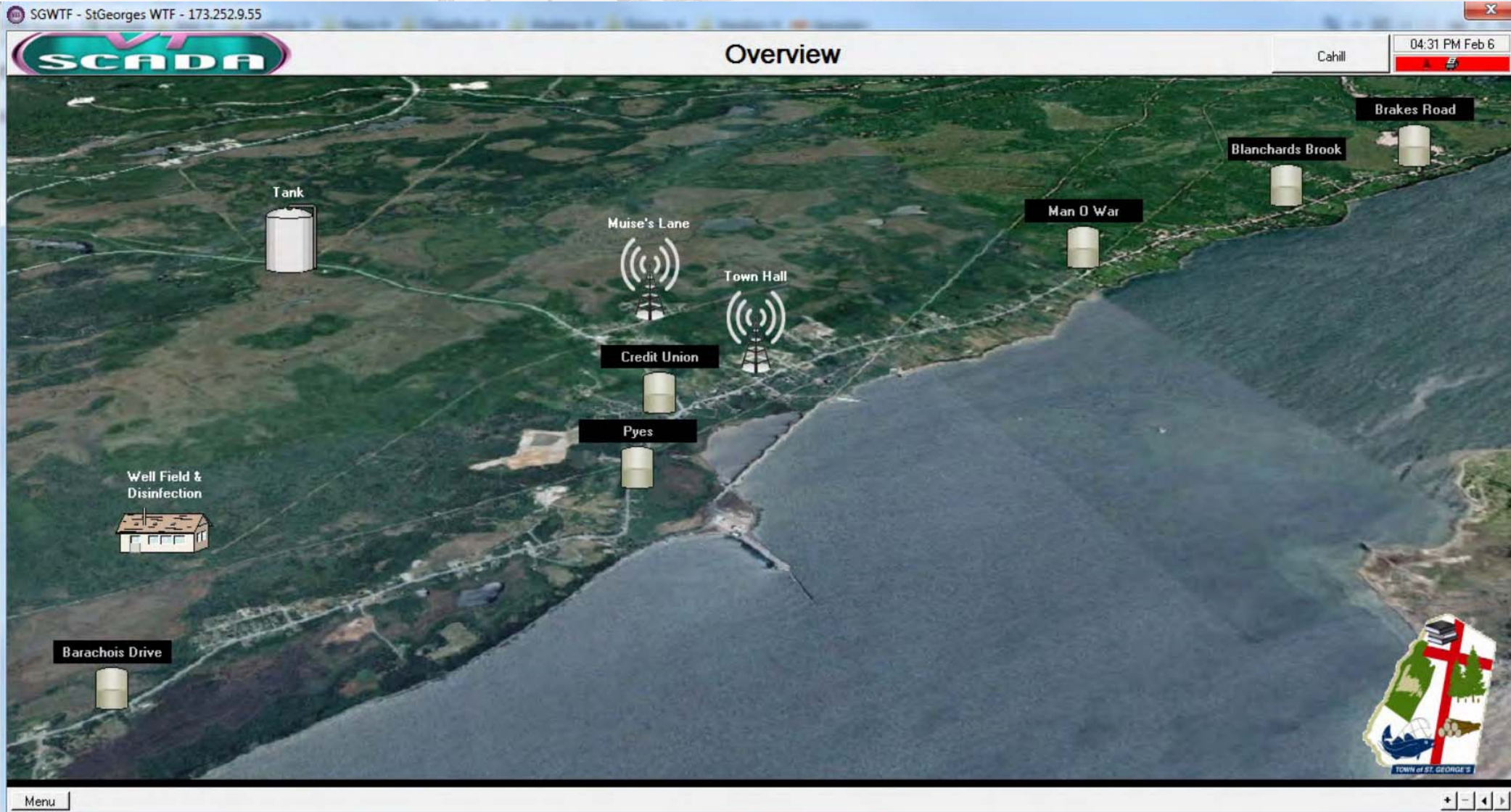
And

Data

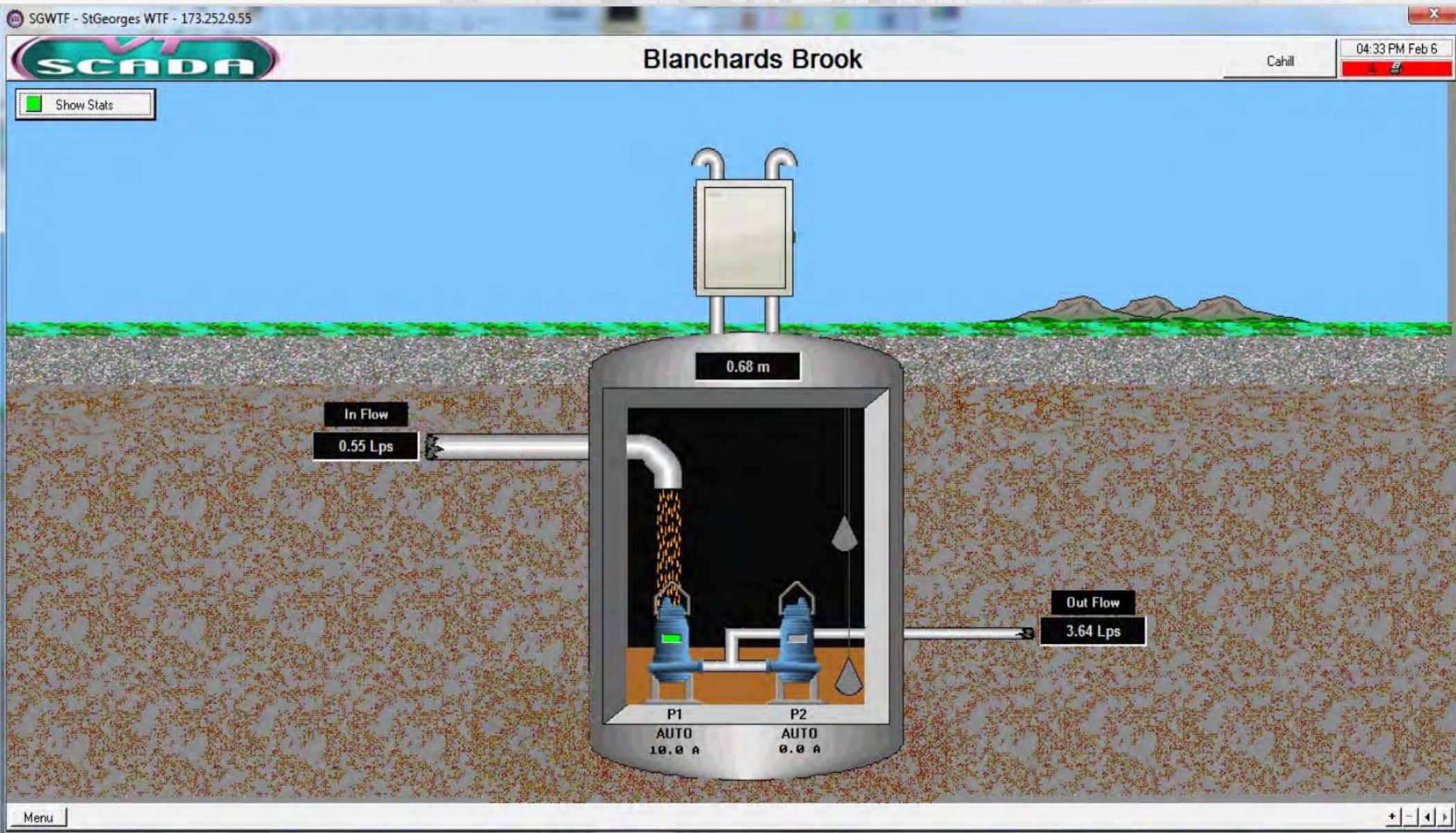
Acquisition



SCADA – Map

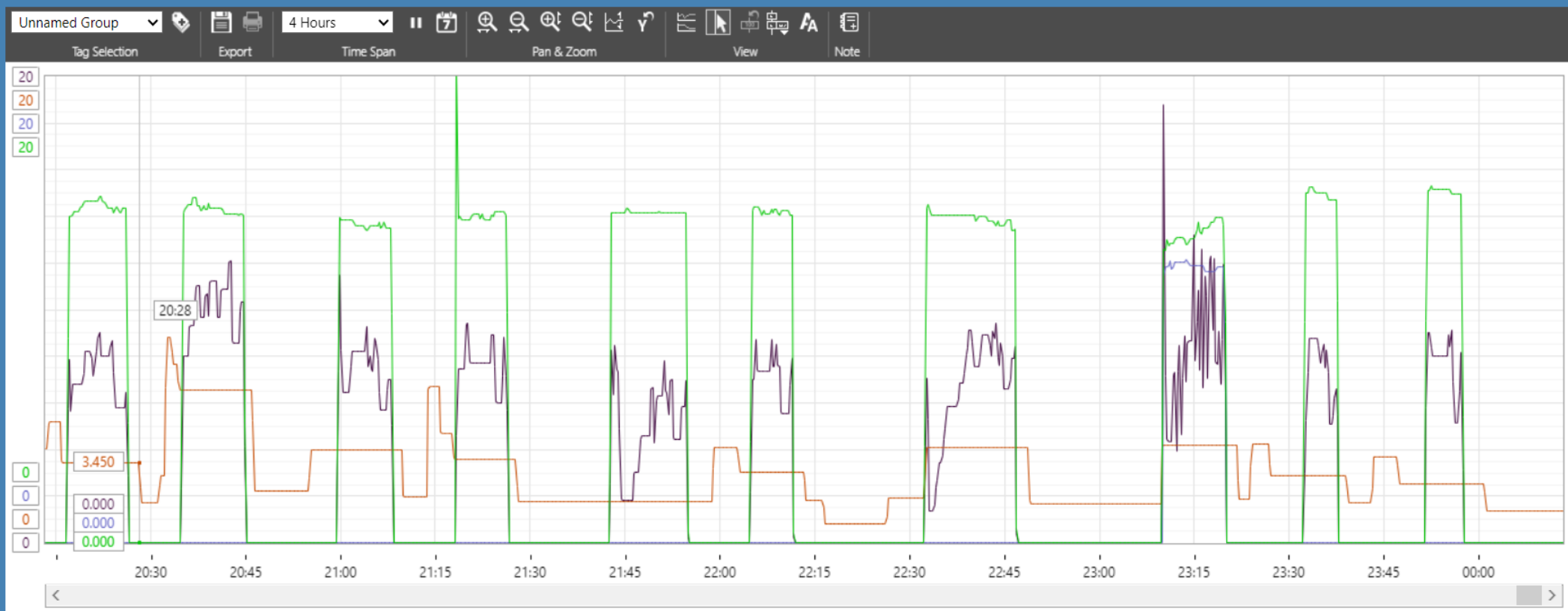


SCADA – Operator Interface



SCADA – Trends

Historical Data Viewer



	Pen	Name	Description	Value	Minimum	Maximum	Average	Starts	On Time
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CreditUnion_OutFlow	Credit Union OutFlow	0 Lps	0 Lps	19 Lps	2.78 Lps		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CreditUnion_InFlow	Credit Union Road InFlow	3.45 Lps	0.792 Lps	8.8 Lps	2.95 Lps		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CreditUnion_P1_Amp	Credit Union Pump 1 Amperage	0 A	0 A	12.4 A	0.49 A		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CreditUnion_P2_Amp	Credit Union Pump 2 Amperage	0 A	0 A	52.5 A	5.31 A		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	System Notes	System Notebook						

Plot Grid Notes

SCADA – Alarms

All Database Alarm Actions Reports & Analysis History Filtering View Sounds

History Active Unacked Current Shelved Disabled Suppressed Configured

Time	Event	Area	Name	Description	Value	Setpoint	Units	Workstation	Device	User
2024-03-26 00:13:30	Active	Man O War	ManOWar_P2FlowLo	Man O War Pump 2 Low Flow (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-26 00:12:01	Event	System	Application	Alarms muted until 2024-03-26 00:17:01				WINDOWS-H5LVTJ6	192.168.255.8	Cahill
2024-03-26 00:11:50	Event	Security	Security Manager	Signed in				WINDOWS-H5LVTJ6	192.168.255.8	Cahill
2024-03-26 00:08:10	Normal	Pyes	Pyes_P1FlowHi	Pyes Pump 1 High Flow (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-26 00:06:45	Active	Pyes	Pyes_P1FlowHi	Pyes Pump 1 High Flow (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-26 00:00:10	Normal	Barachois Drive	BarachoisDrive_P1CurrentLo	Barachois Drive Pump 1 Low Current (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:58:25	Active	Barachois Drive	BarachoisDrive_P1CurrentLo	Barachois Drive Pump 1 Low Current (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:53:09	Acknowledge	Credit Union	CreditUnion_P2FlowLo	Credit Union Pump 2 Low Flow	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Credit Union	CreditUnion_P1CurrentLo	Credit Union Pump 1 Low Current	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Man O War	ManOWar_P2FlowLo	Man O War Pump 2 Low Flow	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Man O War	ManOWar_P1FlowLo	Man O War Pump 1 Low Flow	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Barachois Drive	BarachoisDrive_P1CurrentLo	Barachois Drive Pump 1 Low Current	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Barachois Drive	BarachoisDrive_P2CurrentLo	Barachois Drive Pump 2 Low Current	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:53:09	Acknowledge	Man O War	ManOWar_P1CurrentLo	Man O War Pump 1 Low Current	OK	ALARM		WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:50:29	Event	Security	Security Manager	Signed in				WINDOWS-H5LVTJ6	192.168.255.7	Claude
2024-03-25 23:49:10	Normal	Man O War	ManOWar_P1CurrentLo	Man O War Pump 1 Low Current (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:22:30	Normal	Barachois Drive	BarachoisDrive_P2CurrentLo	Barachois Drive Pump 2 Low Current (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:17:30	Active	Man O War	ManOWar_P1CurrentLo	Man O War Pump 1 Low Current (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:15:45	Active	Barachois Drive	BarachoisDrive_P2CurrentLo	Barachois Drive Pump 2 Low Current (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:14:05	Normal	Pyes	Pyes_P1FlowHi	Pyes Pump 1 High Flow (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:13:51	Active	Pyes	Pyes_P1FlowHi	Pyes Pump 1 High Flow (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:06:16	Normal	Man O War	ManOWar_P2FlowLo	Man O War Pump 2 Low Flow (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:06:16	Normal	Man O War	ManOWar_P1FlowLo	Man O War Pump 1 Low Flow (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 23:06:16	Normal	Man O War	ManOWar_P1CurrentLo	Man O War Pump 1 Low Current (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 22:58:00	Normal	Barachois Drive	BarachoisDrive_P1CurrentLo	Barachois Drive Pump 1 Low Current (OK)	OK	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 22:53:46	Active	Barachois Drive	BarachoisDrive_P1CurrentLo	Barachois Drive Pump 1 Low Current (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 22:39:15	Active	Man O War	ManOWar_P1FlowLo	Man O War Pump 1 Low Flow (ALARM)	ALARM	ALARM		WINDOWS-H5LVTJ6		
2024-03-25 22:27:00	Normal	Pyes	Pyes_P1FlowHi	Pyes Pump 1 High Flow (OK)	OK	ALARM		WINDOWS-H5LVTJ6		

History: 1000 records. History has been limited to 1000 records.

Overview Alarm Page



SCADA – Connectivity

1. Alarm Dialer (Notification only)
2. Leased Line
3. Dial-Up Modem
4. Radios
 - Licensed/Unlicensed
 - Serial (UHF, VHF)
 - Ethernet (900Mhz, 2.4GHz, 5Ghz)
5. Internet
 - DSL
 - Wifi/LAN
 - Cellular
 - Satellite



SCADA – Radio Modelling

Radio Link

Edit View Swap

Azimuth=60.71°	Elev. angle=0.127°	Clearance at 2.01km	Worst Fresnel=0.8F1	Distance=2.82km
PathLoss=119.9dB	E field=55.7dB μ V/m	Rx level=-69.7dBm	Rx level=72.95 μ V	Rx Relative=27.3dB

Transmitter

Town Hall

Role: Master

Tx system name: 9 dBi Omni

Tx power: 1 W 30 dBm

Line loss: 2 dB

Antenna gain: 11.1 dBi 9 dBd +

Radiated power: EIRP=8.22 W ERP=5.01 W

Antenna height (m): 11 - + Undo

Receiver

Barachois Drive

Role: Slave

Rx system name: 13dBi Yagi

Required E Field: 28.44 dB μ V/m

Antenna gain: 13 dBi 10.8 dBd +

Line loss: 2 dB

Rx sensitivity: 3.1623 μ V -97 dBm

Antenna height (m): 12 - + Undo

Net: St. Georges

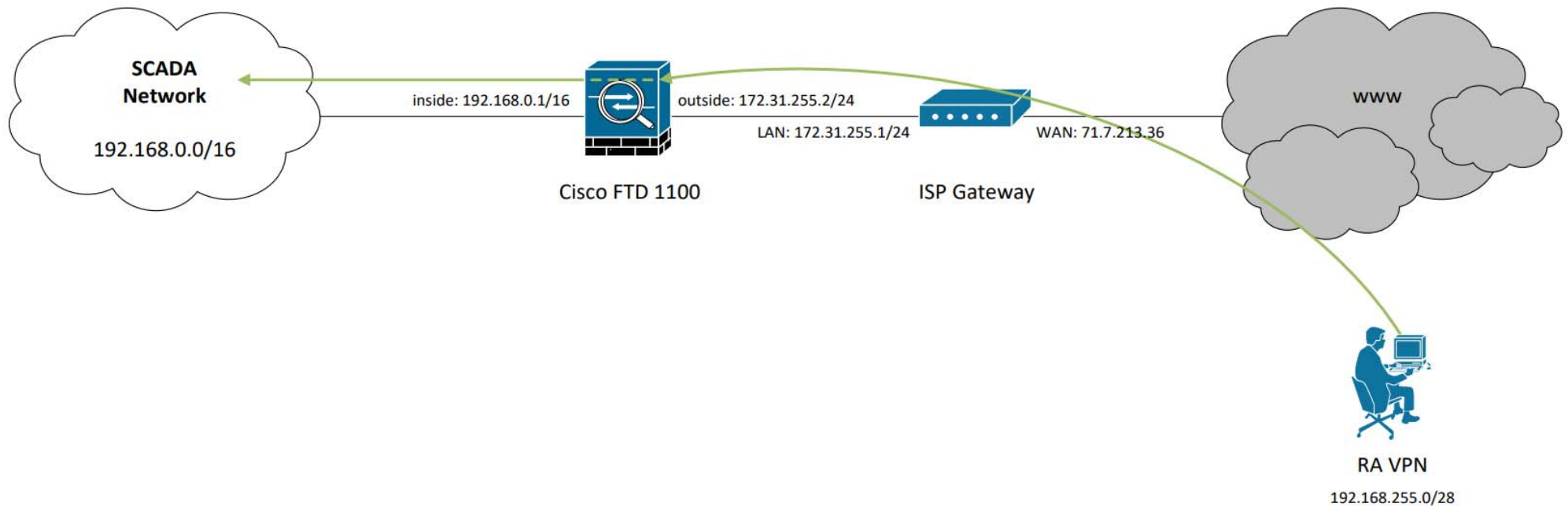
Frequency (MHz): Minimum 900 Maximum 930

Cyber Security

- Username/Password
- http:// vs https://
- Firewalls
- VPNs (Virtual Private Networks)
- APNs (Access Point Name)
- 2FA (2 Factor Authentication)



Town of St. George's VPN



SCADA – Remote Connectivity

Advantages:

- Instant (and sometimes advanced) notification in real time, anywhere in the world.
- Reports, Trending, historical data and audit trail.
- Remote support to troubleshoot issues.
- Reduce 3rd party service visits and mobilization costs.

Cahill Technical Services



- Established in 1998
- CTS is the technical services entity within the Cahill Group of Companies.
- Cahill Technical Services currently has a technical staff comprising 40+ engineers and technologists.
- CSA Certified Panel Shop

Thank you.

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