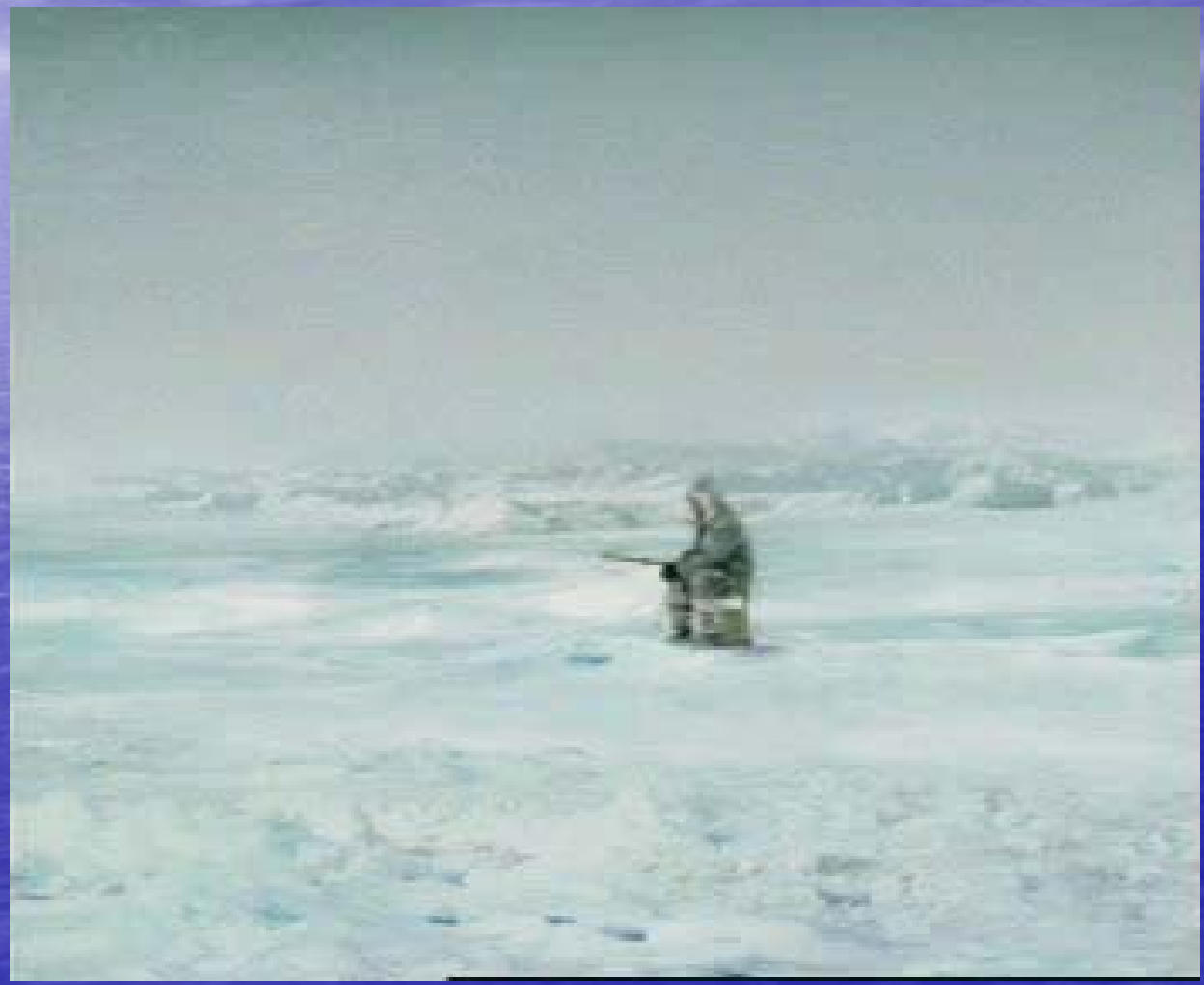
Operation and Maintenance of Drilled Wells

Ben Pitman



Not Rex Murphy!

Where is Amherst anyway?

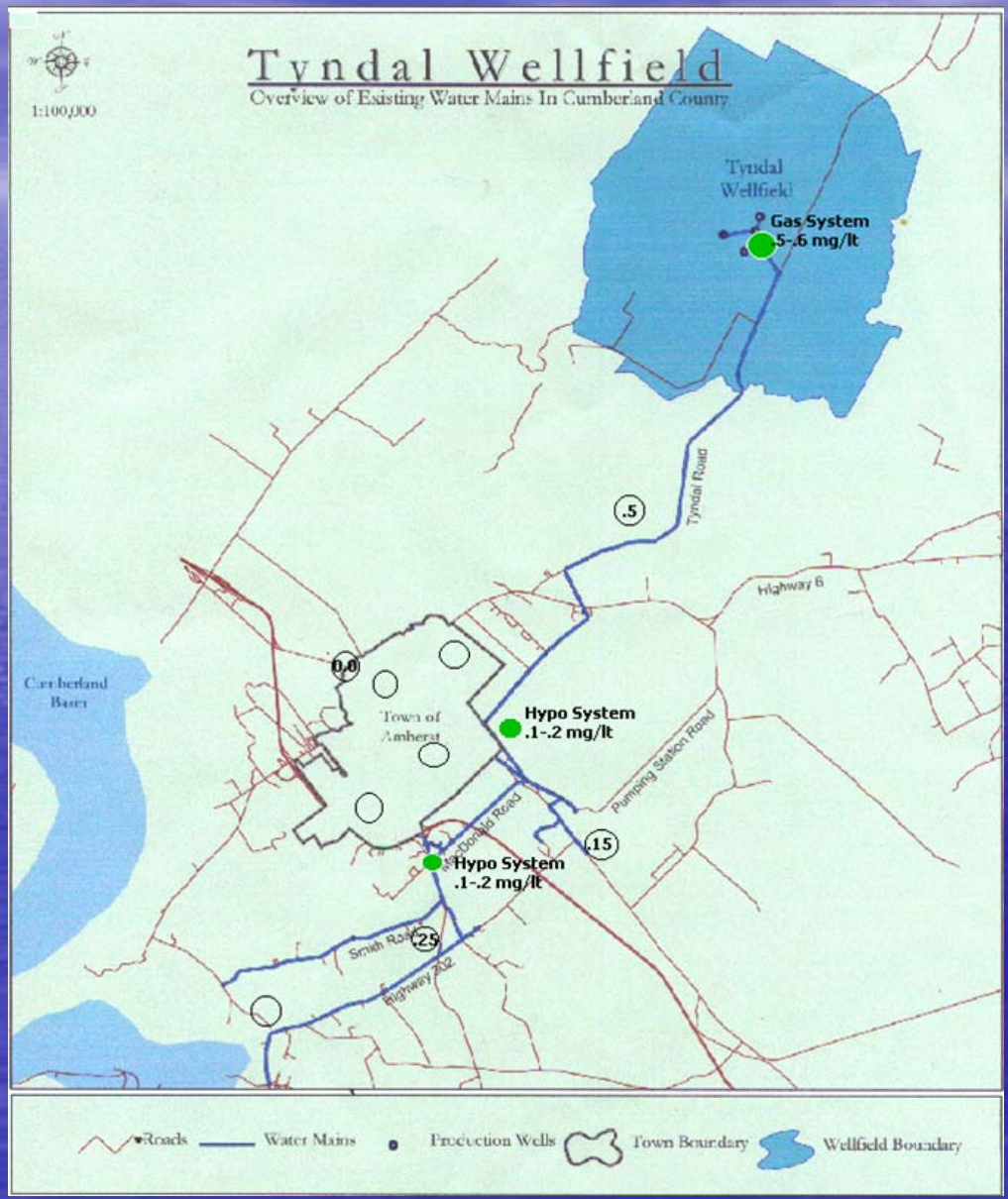
Home of the Self Propelled Sidewalk Plow

History of Amherst Water Supply

- 1885 First Public Water Supply in Amherst,
- 1900 Nappan River Surface Supply

History Continued

- 1949 First Drilled Well
- 1983 Town abandon three wells due to Contamination
- 1985 -87 Groundwater Exploration Program
- 1991-93 Construction of New Wellfield

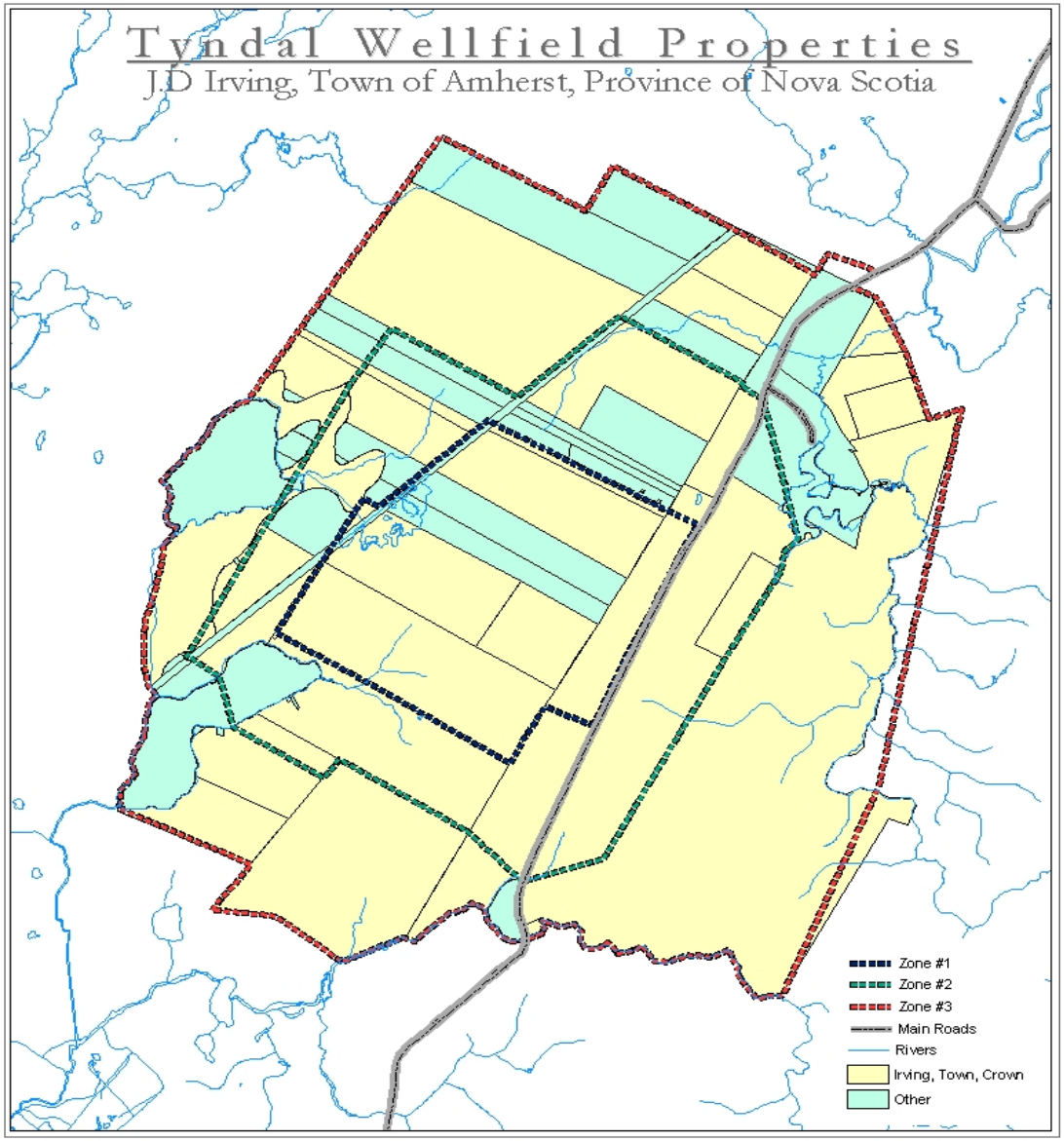

Tyndal Wellfield
Overview of Existing Water Mains In Cumberland County
1:100,000
Tyndal Wellfield
Gas System
.5-.6 mg/lt
Tyndal Road
.5
Highway 6
Cumberland Basin
0.0
Town of Amherst
Hypo System
.1-.2 mg/lt
Pumping Station Road
McDonald Road
.15
Hypo System
.1-.2 mg/lt
Smith Road
.25
Highway 302
Roads
Water Mains
Production Wells
Town Boundary
Wellfield Boundary


10. 5. 2000


CAUTION
SANDING ONLY
NEXT km

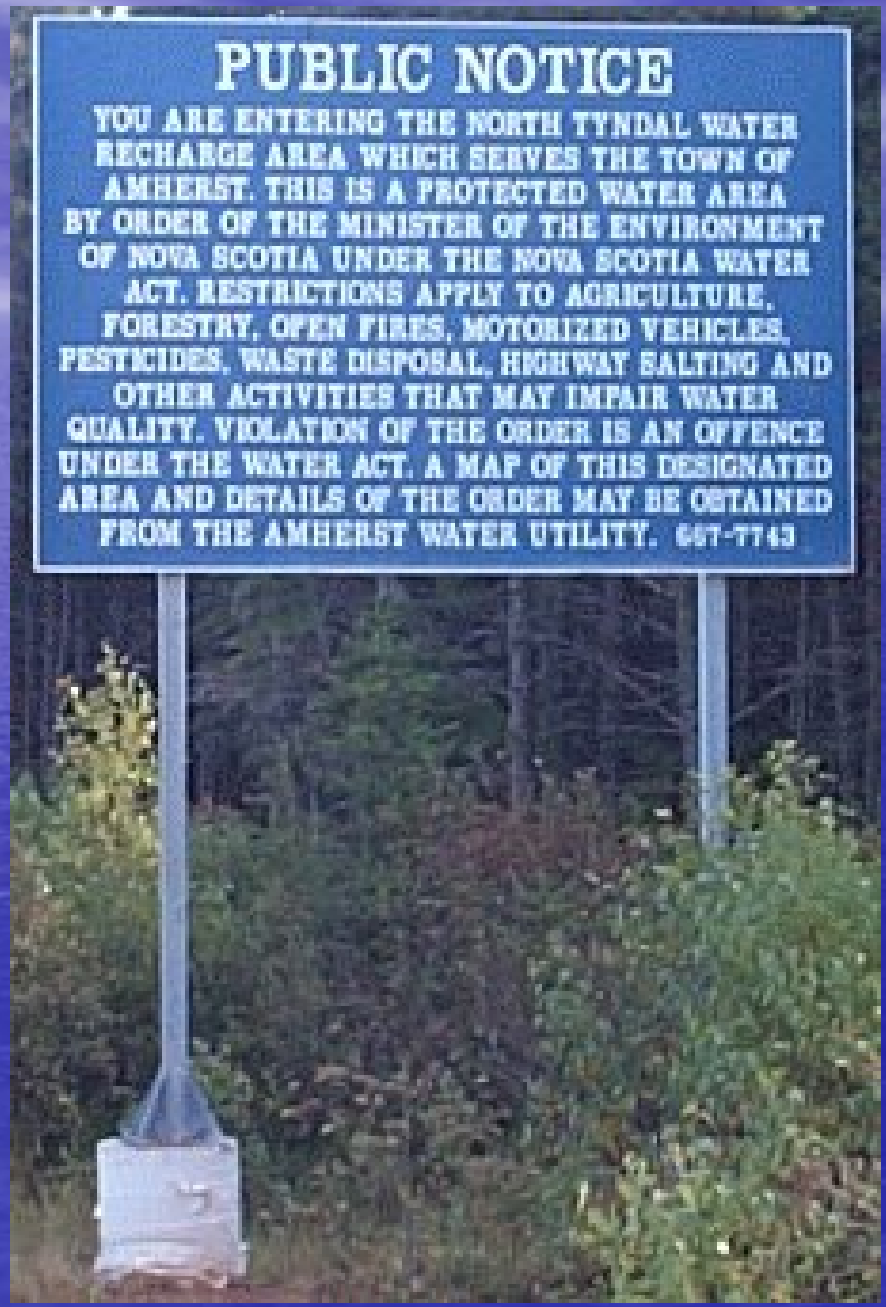
Ground Water Protection Plan

- The main premise for our Protection Plan is the definition of protection zones established in accordance with delay times or travel times for groundwater in roughly concentric circles around the pumping wells.

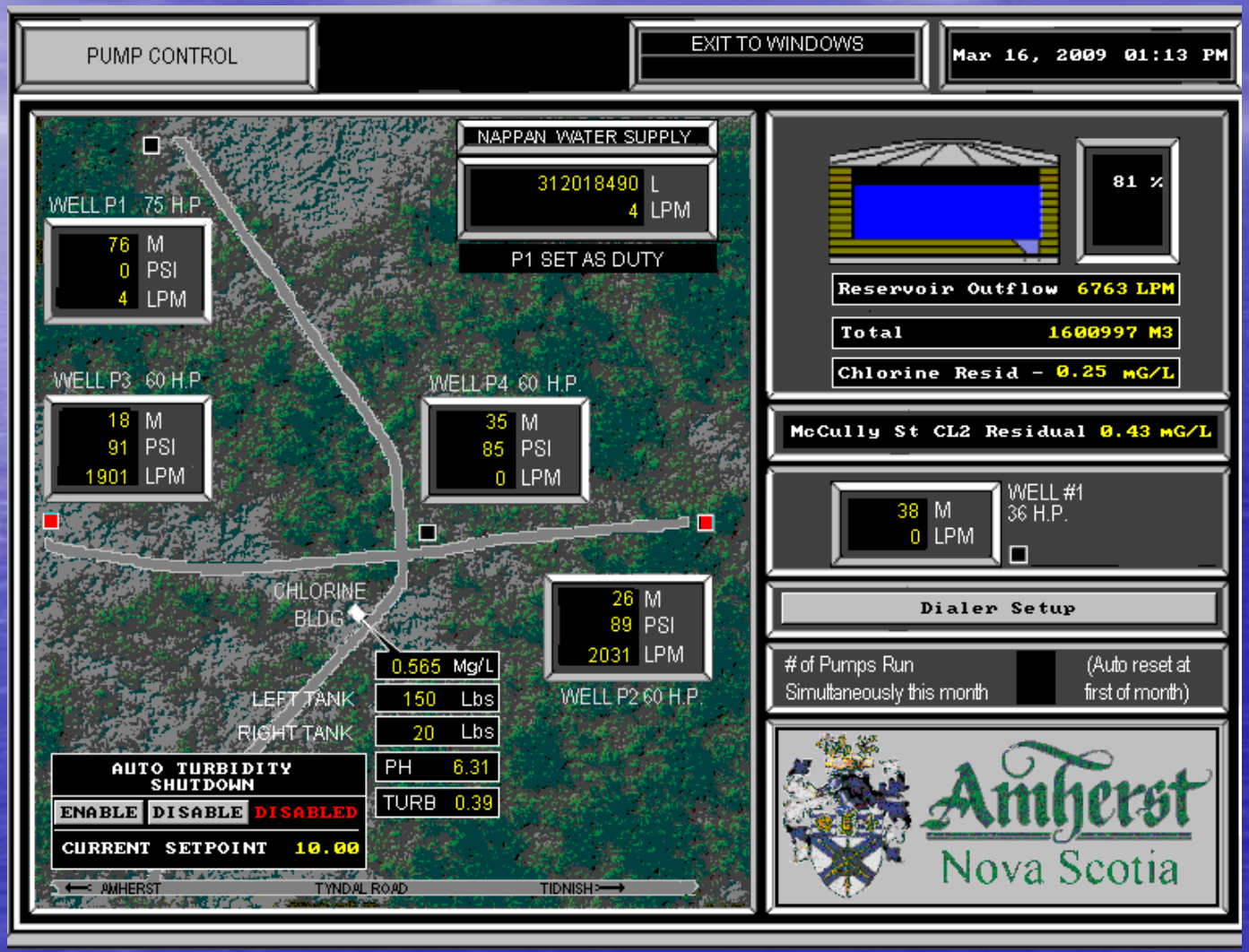

Tyndal Wellfield Properties
J.D Irving, Town of Amherst, Province of Nova Scotia
Zone #1
Zone #2
Zone #3
Main Roads
Rivers
Irving, Town, Crown
Other

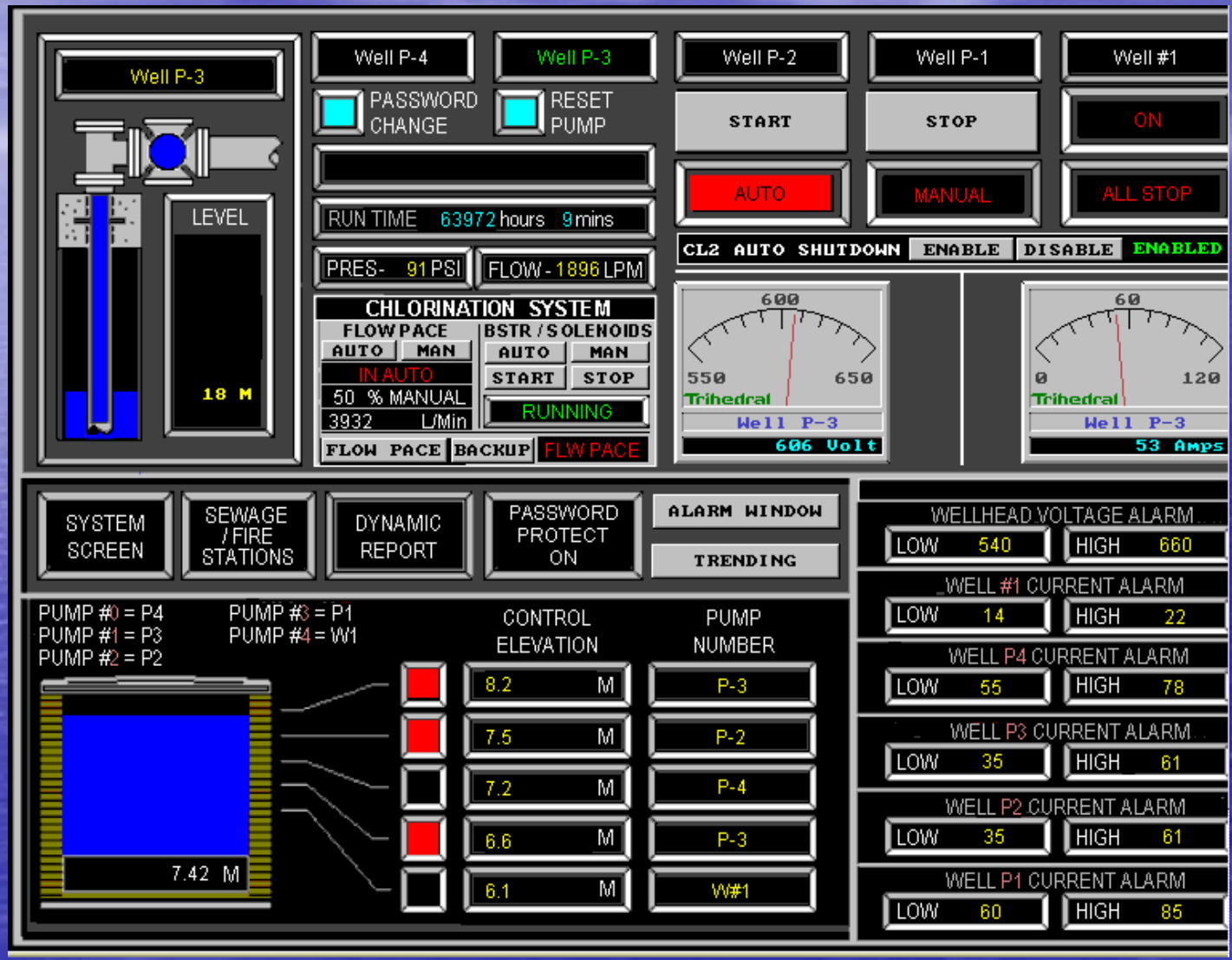
Three Zones of Protection

- Zone I- 10 Year Delay- this is the innermost Zone-only activities associated with water production and forest management allowed.- 600ha
- Zone II- 50 Year Delay- 1000ha
- Zone III- Total Recharge-2100ha


PUBLIC NOTICE
YOU ARE ENTERING THE NORTH TYNDAL WATER RECHARGE AREA WHICH SERVES THE TOWN OF AMHERST. THIS IS A PROTECTED WATER AREA BY ORDER OF THE MINISTER OF THE ENVIRONMENT OF NOVA SCOTIA UNDER THE NOVA SCOTIA WATER ACT. RESTRICTIONS APPLY TO AGRICULTURE, FORESTRY, OPEN FIRES, MOTORIZED VEHICLES, PESTICIDES, WASTE DISPOSAL, HIGHWAY SALTING AND OTHER ACTIVITIES THAT MAY IMPAIR WATER QUALITY. VIOLATION OF THE ORDER IS AN OFFENCE UNDER THE WATER ACT. A MAP OF THIS DESIGNATED AREA AND DETAILS OF THE ORDER MAY BE OBTAINED FROM THE AMHERST WATER UTILITY. 667-7743

Most Hunters Do Not Like To Walk


PUMP CONTROL
EXIT TO WINDOWS
Mar 16, 2009 01:13 PM
NAPPAN WATER SUPPLY
312018490 L
4 LPM
P1 SET AS DUTY
WELL P1 75 H.P.
76 M
0 PSI
4 LPM
WELL P3 60 H.P.
18 M
91 PSI
1901 LPM
WELL P4 60 H.P.
35 M
85 PSI
0 LPM
CHLORINE BLDG
0.565 Mg/L
LEFT TANK 150 Lbs
RIGHT TANK 20 Lbs
PH 6.31
TURB 0.39
26 M
89 PSI
2031 LPM
WELL P2 60 H.P.
AUTO TURBIDITY SHUTDOWN
ENABLE DISABLE DISABLED
CURRENT SETPOINT 10.00
AMHERST TYNDAL ROAD TIDNISH
81 %
Reservoir Outflow 6763 LPM
Total 1600997 M3
Chlorine Resid - 0.25 mG/L
McCully St CL2 Residual 0.43 mG/L
38 M
0 LPM
WELL #1
36 H.P.
Dialer Setup
# of Pumps Run Simultaneously this month
(Auto reset at first of month)
Amherst
Nova Scotia


Well P-3
LEVEL
18 M
Well P-4
Well P-3
PASSWORD CHANGE
RESET PUMP
RUN TIME 63972 hours 9 mins
PRES- 91 PSI
FLOW - 1896 LPM
CHLORINATION SYSTEM
FLOW PACE
AUTO MAN
IN AUTO
50 % MANUAL
3932 L/Min
BSTR / SOLENOIDS
AUTO MAN
START STOP
RUNNING
FLOW PACE BACKUP FLW PACE
Well P-2
Well P-1
Well #1
START
STOP
ON
AUTO
MANUAL
ALL STOP
CL2 AUTO SHUTDOWN ENABLE DISABLE ENABLED
600
550
650
Trihedral
Well P-3
606 Volt
60
0
120
Trihedral
Well P-3
53 Amps
SYSTEM SCREEN
SEWAGE / FIRE STATIONS
DYNAMIC REPORT
PASSWORD PROTECT ON
ALARM WINDOW
TRENDING
PUMP #0 = P4
PUMP #1 = P3
PUMP #2 = P2
PUMP #3 = P1
PUMP #4 = W1
7.42 M
CONTROL ELEVATION
PUMP NUMBER
8.2 M P-3
7.5 M P-2
7.2 M P-4
6.6 M P-3
6.1 M W#1
WELLHEAD VOLTAGE ALARM
LOW 540 HIGH 660
WELL #1 CURRENT ALARM
LOW 14 HIGH 22
WELL P4 CURRENT ALARM
LOW 55 HIGH 78
WELL P3 CURRENT ALARM
LOW 35 HIGH 61
WELL P2 CURRENT ALARM
LOW 35 HIGH 61
WELL P1 CURRENT ALARM
LOW 60 HIGH 85

Record Keeping

- Construction Information
- Historical Data
- Specific Capacity

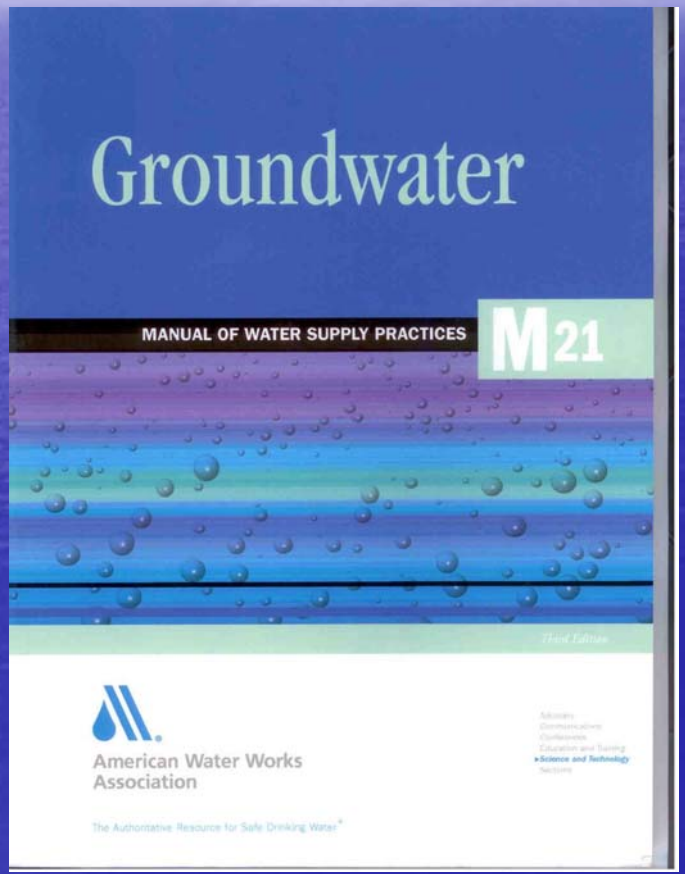
Construction Information

Pump Type, specifications, HP, Pump Curves

Well Diameter, Depth, Well logs, casing depth

- Document your Problems!!!

AWWA Manual of Water Supply Practices M21



Historical Data

- Water Level – During and after Pumping
- Water production
- Electrical Info (amps, volts, phase)
- Document your problems

Operational Problems

- Decline in Well Performance
- Contamination
- Electrical Problems – Phase drop outs – lighting strikes – overheating – motor burn out
- Water Hammer

As always safety first

Maintenance

- Yearly – Procedure every new budget year
- Monthly -
- Weekly -
- Daily - Automate

Recent Problem in Amherst

- Operator is replacing gasket, riser pipe breaks off and falls to bottom of well
- Riser Pipe is Plastic
- Video Inspection – to locate top of riser pipe
- Rented a tool (“Over Shot”) from the Oil industry to retrieve the riser pipe and pump

Video Inspection


RON WHITE
WELL DRILLING
6" - 24" ROTARY DRILL
667 - 3291

Cheers!!