Are Cost Effective Low Pressure Sewers in Your Future?

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Presentation Outline

- Typical community needs & project drivers
- Engineering evaluation
- Low Pressure Sewer (LPS) system components & operation
- Funding

Community Needs & Drivers

Failing Septic Systems

- Increased Load
  - Congested hamlet areas
  - Camps converting to year-around homes
  - Overloaded & sub-par systems the norm

- Regulations, Stricter Enforcement
  - 100’ Separation
  - Neighbor complaints → enforcement
  - Environmental

- Many lots are too small for a new septic system
- Cost prohibitive with few individual grant / assistance options
- Home value “held hostage” as many banks refuse to lend on homes with septic issues → downward spiral

Engineering Evaluation

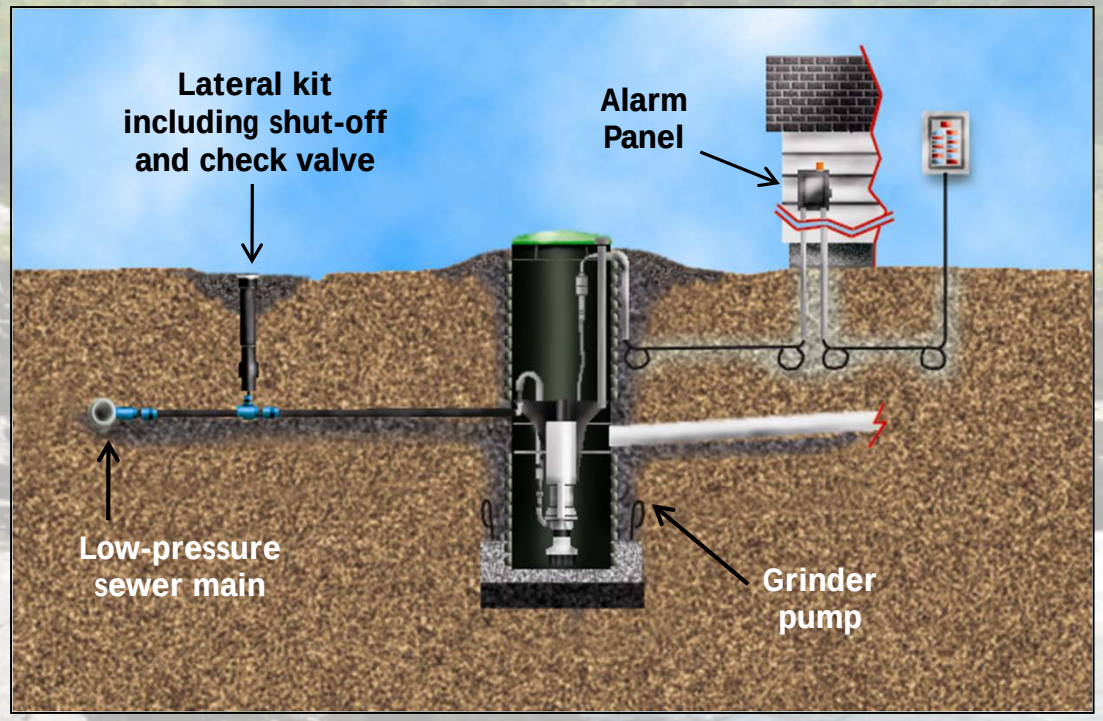
- Feasibility Study
  - Low cost, big picture engineering evaluation
  - Public interest surveys
  - Screening for potential grants / funding
- Preliminary Engineering Report (PER)
  - Foundation of the Project
    - ✓ Technical Evaluations, Recommendations
    - ✓ Funding, User Cost Estimates
  - Necessary for EFC & USDA RD Funding

Engineering Evaluation

- Alternative Analysis
  - Do nothing
  - Conventional gravity sewers
  - Grinder pumps & low pressure sewers
- Low Pressure Sewer Key Advantages
  - Flexible alignment & profile
    - ✓ Flexible pipe - can snake around congested sites
    - ✓ Pressure flow – shallow, goes up and down hills
  - Reduced Inflow & Infiltration
    - ✓ High groundwater table situations (e.g. waterfront)

Grinder Pumps

Typical Grinder Pump and Sewer Lateral Installation

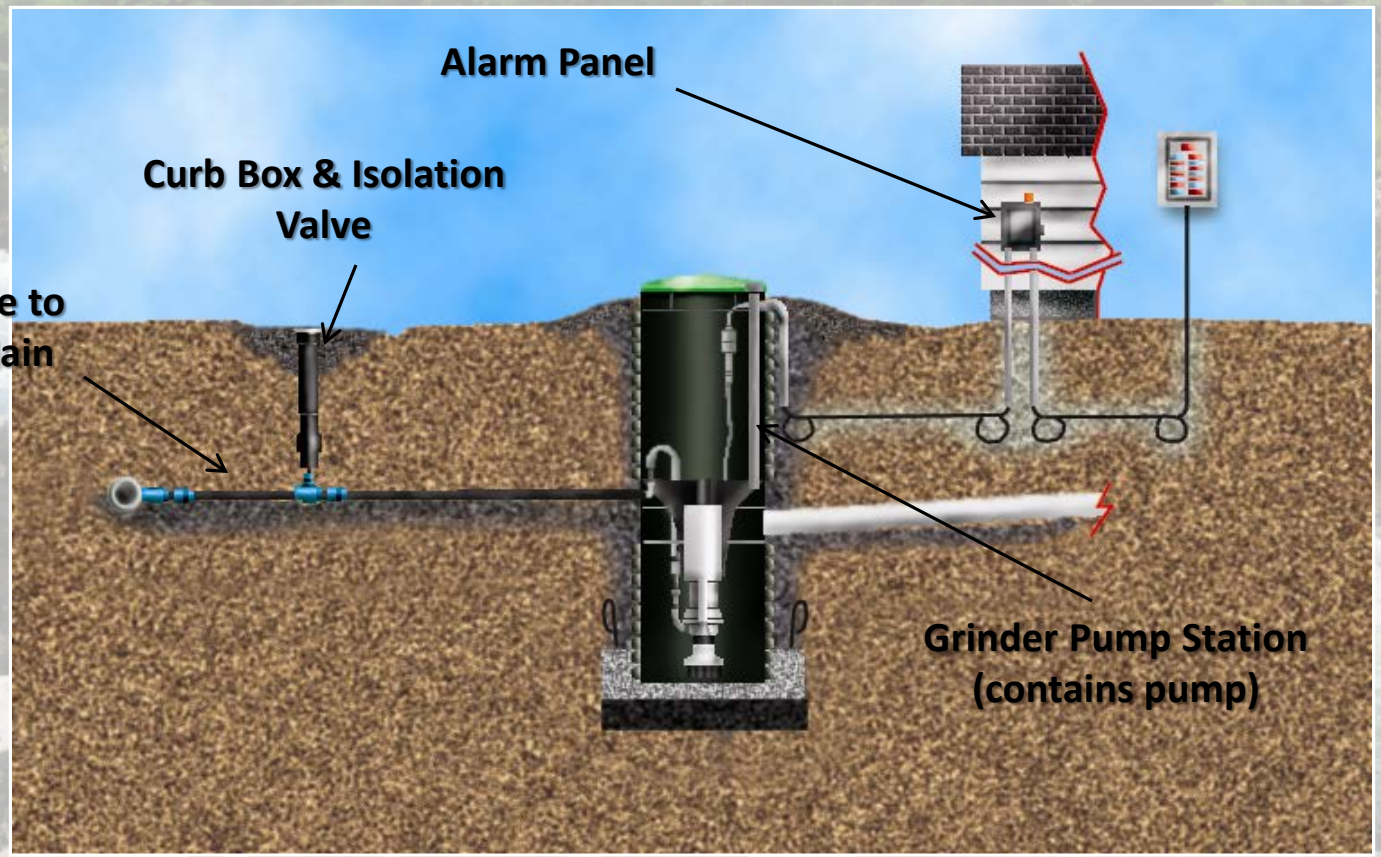


Typical Grinder Pump

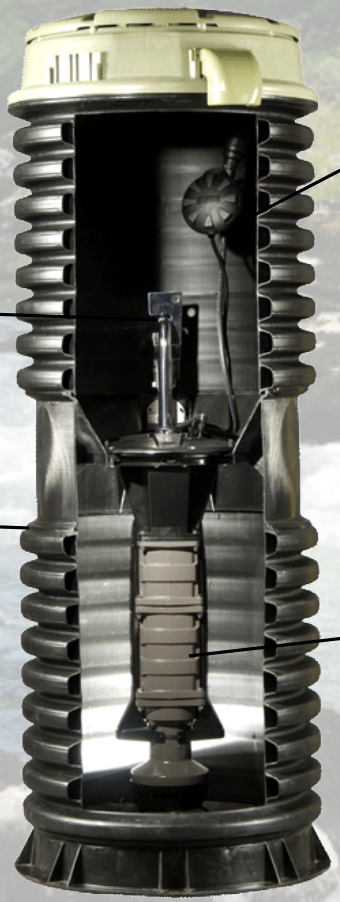
Typical Pump Alarm Panel

Grinder Pumps

Typical Residential Grinder Pump Site Components



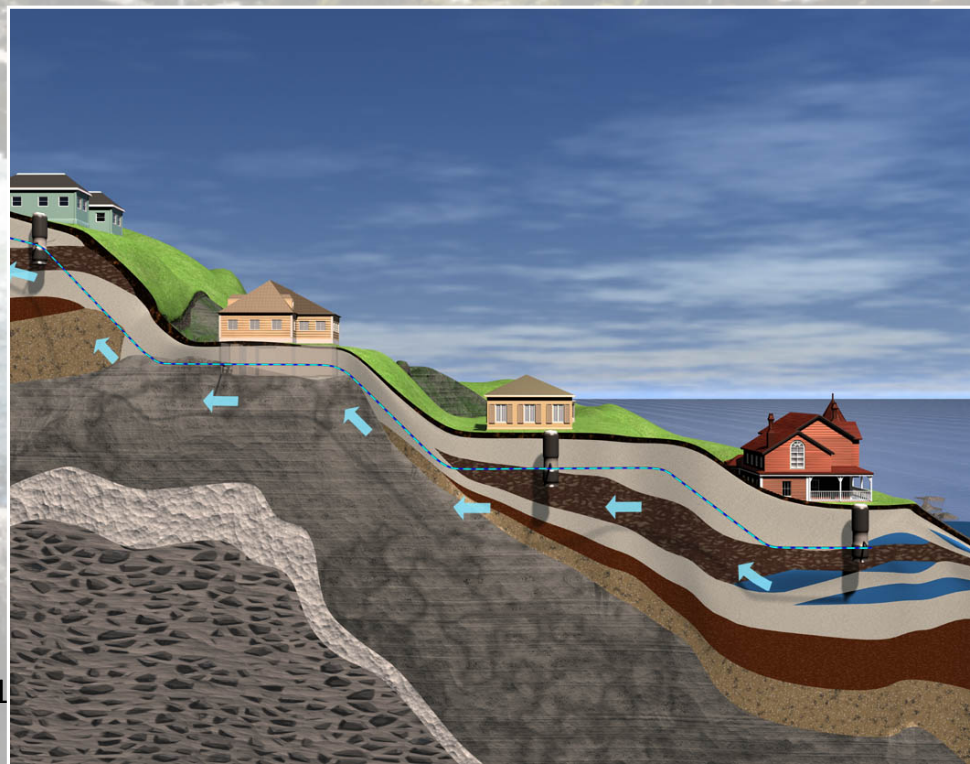
Residential Grinder Pump Package



eone SEWER SYSTEMS

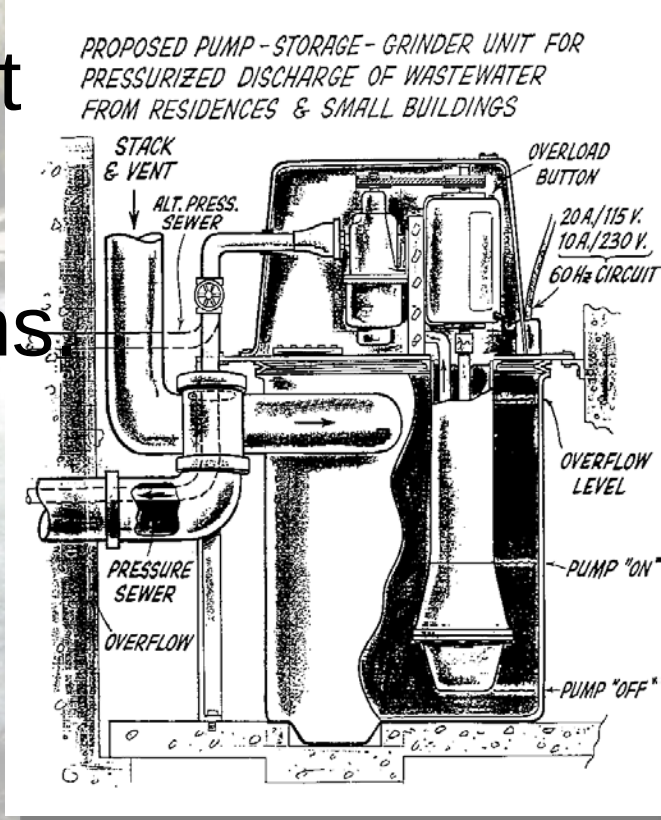
Where is LPS traditionally used?

- Lakefront homes
  - Usually below the sewer main
- Replacing failing septic tanks
- Instead of septic tanks
- Rocky soil
- Hilly Terrain
- High Water tables
- Difficult to sewer lots
  - Odd lot geometry
  - Existing structures

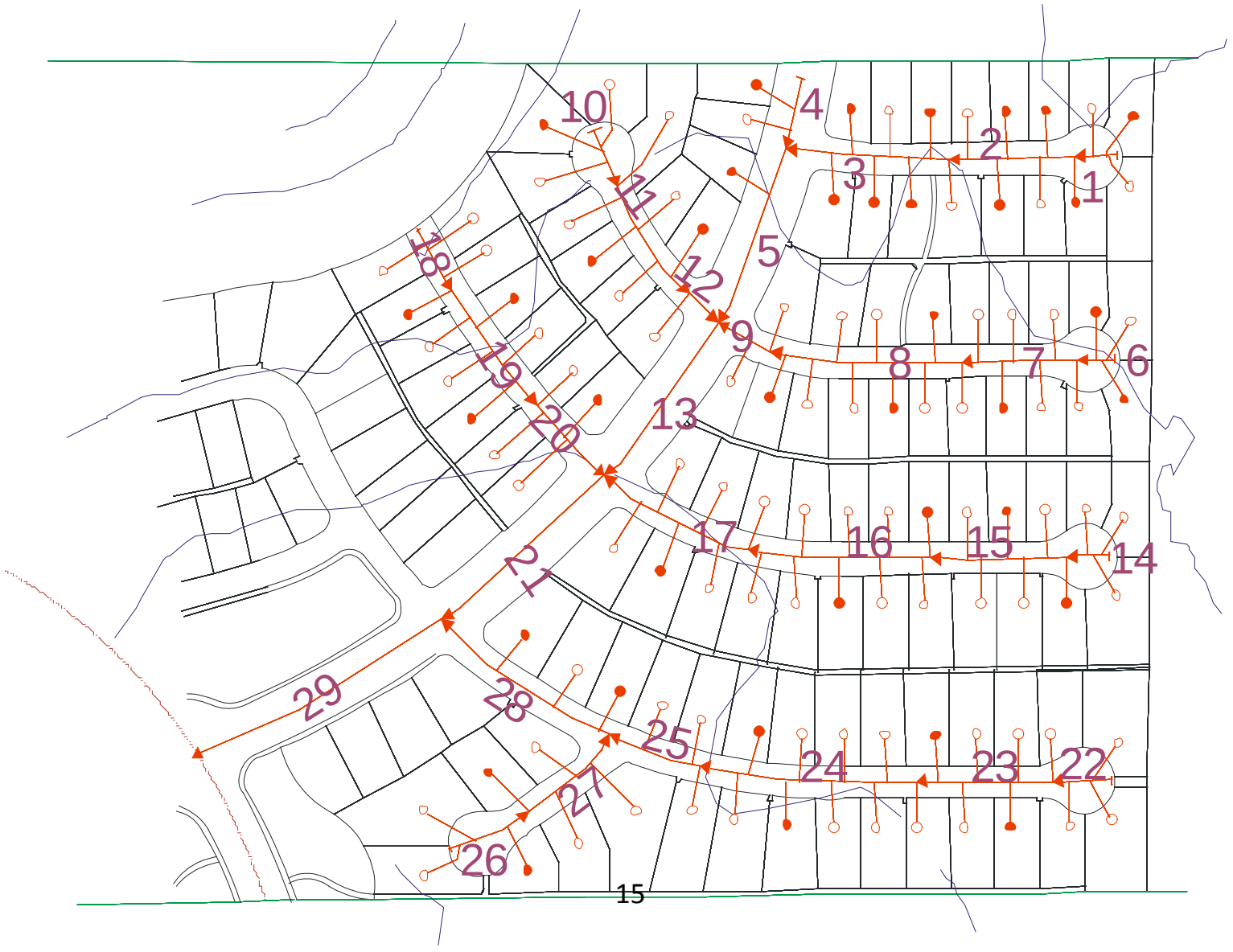


New Technology?...No

- 1965: GE subcontracted to develop a new household appliance.
- 1970: Original engineers start Environment One
- 47 years, 650,000 installations
- 125 new hook-ups every day



LPS System

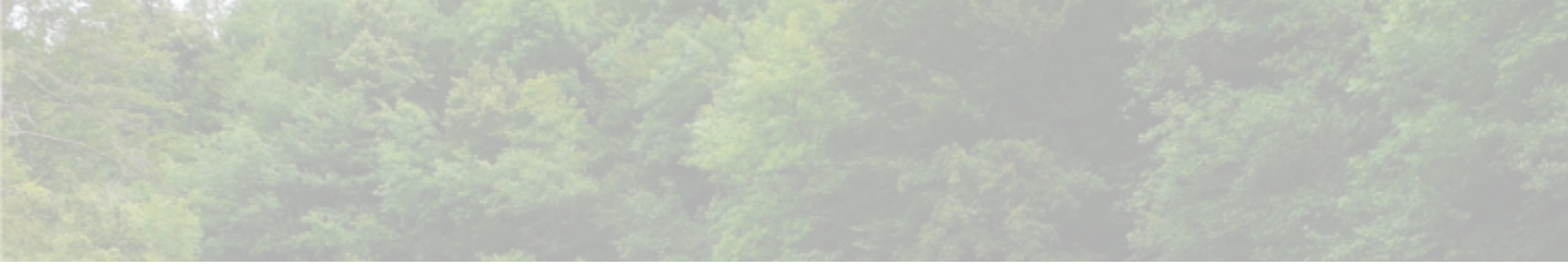


Maintenance?

- Periodic maintenance is NOT required.
- All pump components are designed for years of trouble-free service without maintenance
- Unlike the septic tank, no scheduled tank cleaning is required. Wastewater is automatically pumped out multiple times/day.

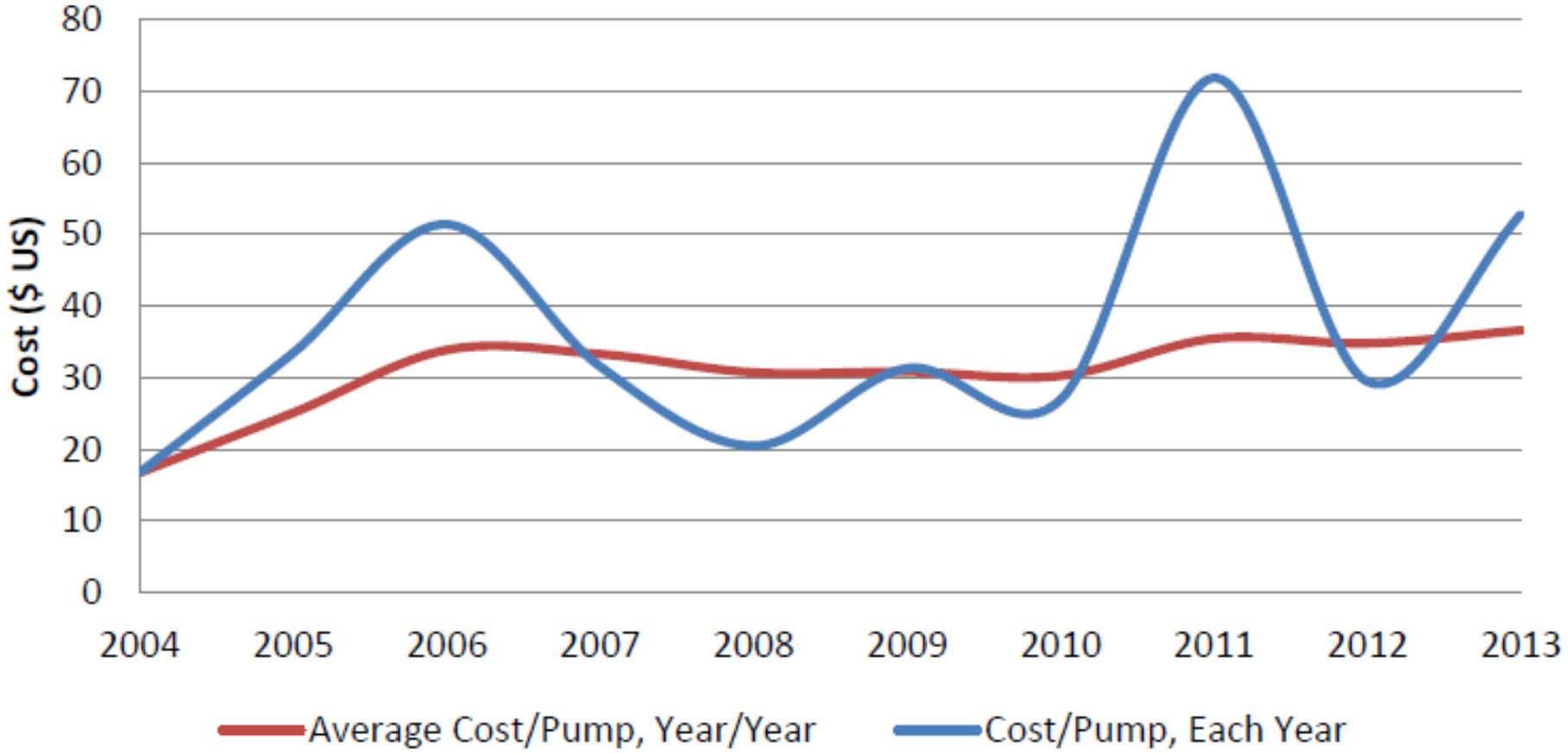
Frequency and Cost for Repairs?

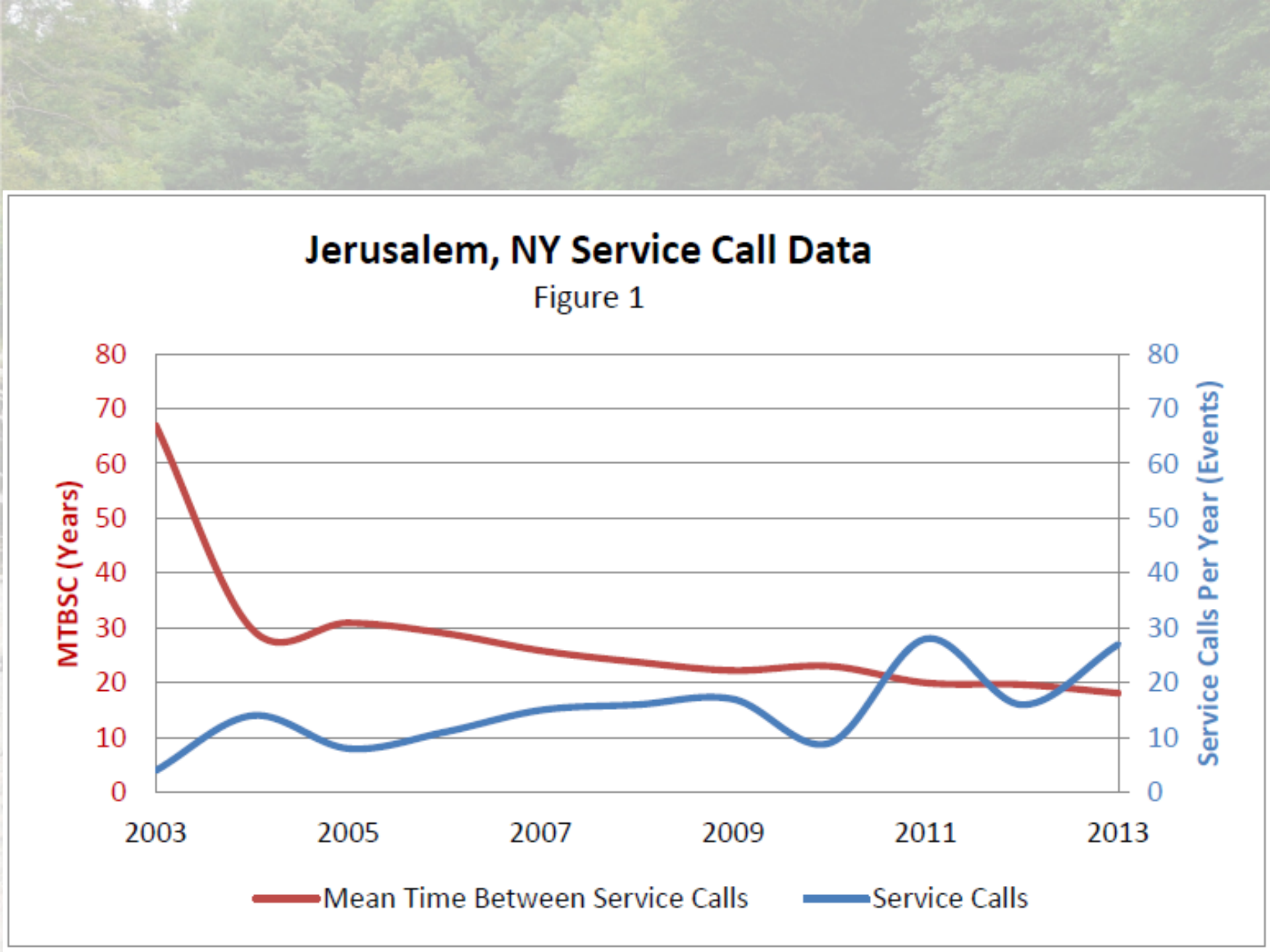
- Mean-time-between-calls is on average 8-10 years.
- Major repair or replacement between 15-20 years.
- Average maintenance cost of $30-$50/pump/year.



Jerusalem, NY Maintenance Costs

Figure 2




Jerusalem, NY Service Call Data
Figure 1
MTBSC (Years)
Service Calls Per Year (Events)
80
70
60
50
40
30
20
10
0
2003
2005
2007
2009
2011
2013
Mean Time Between Service Calls
Service Calls

Cost to Operate?

- Typical single family home generates <200 GPD.
- EONE pump consumes 16kwh/month
- At $0.11/kwh…
  - **$1.80/month**

Appliance	Typical Annual Usage
Air Conditioner	2000
Clothes Dryer	1200
Refrigerator	750
Television	500
E/One Grinder Pump	200
Coffee Maker	100
Vacuum Cleaner	45
Clock	17

Noise?

Quieter than the noise from your refrigerator.

Odors?

- Properly designed and installed systems have no odor issues.
- Tank size and cycle time are important.
  - Bigger is not always better

Power Outage?

- The pump requires electricity to operate.
- During an outage, home water use drops significantly.
  - Dishwasher
  - Washing machine
  - Shower

- EONE tank has 70 gallon of storage.
- Can also run the pump on a generator

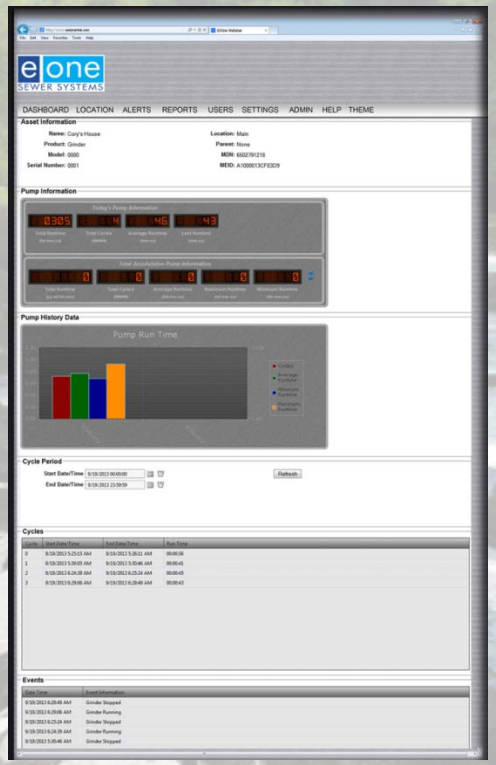
Power Outage?

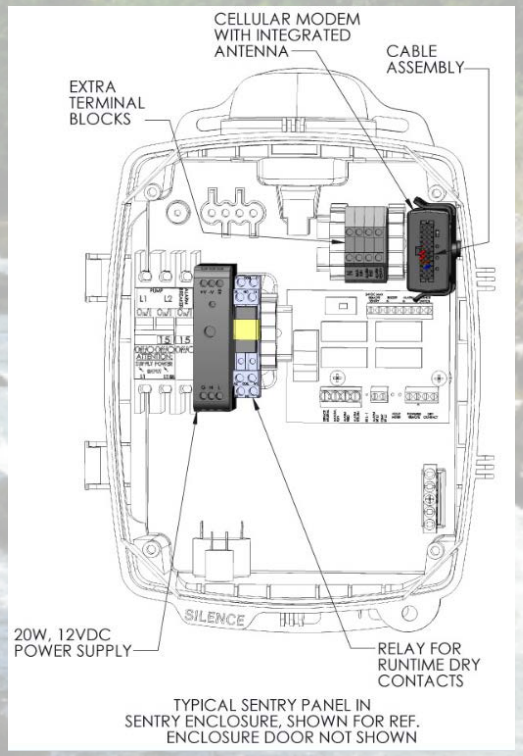
So…YES, you can still us the bathroom

Little Johnny?

Table 1- Household Items added to the Pump Basin	NSF 46-1997
Item	Frequency
Toilet tissue, 24 perforated sheets (wetted in test water)	4 times per day, 5 days per week
Facial Tissue	2 per day, 5 days per week
Filter Tip Cigarette	1 per day, 5 days per week
Egg	1 per day, 5 days per week
Paper towel*	1 per day, 5 days per week
Condom*	1 per day, 5 days per week
Sanitary napkin* (wetted in test water)	1 per day, 5 days per week
Chlorine laundry bleach* (8 ounces)	1 per day, 5 days per week
Cotton swab* (plastic stick)	1 per day, 5 days per week
Disposable diaper* (large childerns size)	1 per day, 5 days per week
Tampon* (plastic applicator added separetely)	1 per day, 5 days per week
Adhesive bandage* (paper wrapper added separetely)	1 per day, 5 days per week
Dental floss (12 inch piece)	1 per day, 5 days per week
Alkali drain cleaner (8 ounces)	1 per week, at random
Handi-wipe	1 per week, at random
Acidic drain cleaner (8 ounces)	1 per week, at random
Liquid animal fat (4 ounces)	1 per week, at random
One pair nylon panty hose (size large)	1 per week, at random
Cloth diaper (wetted in test water)	1 time during test, at random
Toothbrush	1 time during test, at random
Wood pencil	1 time during test, at random
Plastic table utensil	1 time during test, at random
Metal bottle cap	1 time during test, at random
HDPE bottle cap	1 time during test, at random
Metal, toy car (Matchbox or Hotwheels)	1 time during test, at random
Eight ounce drinking glass (crushed)	1 time during test, at random
* Items added separately each day in succession	

Remote System Communications





TYPICAL SENTRY PANEL IN SENTRY ENCLOSURE, SHOWN FOR REF. ENCLOSURE DOOR NOT SHOWN

Installed

Questions?