Stevens Point Recycles, Reuses, and Reaps the Benefits of Abandoned Infrastructure

October 20, 2010

Kim Halverson, City of Stevens Point
Sandra Kimmler, Donohue & Associates, Inc.
Project History and Background

- City of Stevens Point Information
- Paper Mill
  - 1995 Water Contract
  - 2003 Acquisition of Land and Infrastructure
Extension of Sewer Service Area from County Sewer Service Land Use
## Option Comparison Model

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Relative Disruption</th>
<th>Relative Cost</th>
<th>Relative Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>A</td>
<td>Connect to closest manhole and route through system</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>B</td>
<td>Construction Dixon Street diversion</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C</td>
<td>Use abandoned Patch Street water main as new force main</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D</td>
<td>New lift station at Plover River, pump to Highway 66</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>E</td>
<td>New lift station at Plover River, pump to Reserve Street</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>F</td>
<td>Construct new interceptor from study area to WWTP</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>G</td>
<td>Construct new interceptor and treat flow in Plover</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
The Challenge

- Needed to use existing infrastructure
- Growing community
- Needed redundancy
- Recently-completed bike path on route
- Needed to minimize inconvenience for local businesses and residents
Innovative Alternative

- Unused water main along part of route
- Solution: convert water main to force main by lining the interior

*Innovative reuse: greener, cheaper, less disruptive*
The Challenge

- Needed to use existing infrastructure
- Growing community
- Needed redundancy
- Recently-completed bike path on route
- Needed to minimize inconvenience for local businesses and residents
Land Use Model
Wetland Boundary

100-Year Flood Plain

Existing Lift Station

Site of New Lift Station

Wetland Boundary
The Challenge

- Needed to use existing infrastructure
- Growing community
- Needed redundancy
- Recently-completed bike path on route
- Needed to minimize inconvenience for local businesses and residents
Newly-Constructed Bike Path

- Constructed in 2007
  - Extends from the Plover River along Industrial Park Road
- The City did not want to disturb the new bike path
The Challenge

- Needed to use existing infrastructure
- Growing community
- Needed redundancy
- Recently-completed bike path on route
- Needed to minimize inconvenience for local businesses and residents
Commercial Properties along Force Main Route
The Solution

- Lift Station and Force Main
- Patch Street Water Main Conversion
- New Gravity Sewer
Design Challenges

• Had to determine the condition, location, and elevation of existing water main
  - Televised water main. View bends, obstructions, or anything that would hinder lining.
  - Ground Penetrating Radar (GPR)
Ground Penetrating Radar
Railroad Yard
Liner Evaluation

- Suitable for wastewater
- Satisfied the pressure requirements
  - Internal Design Pressure: 75 psi.
  - Internal Vacuum: -14.4 psi.
- Use materials that minimize “shrink”
- Ability of City to self-perform repairs
- Use vinyl ester resin system with woven glass fiber tube
Contract Coordination

Bidding

One Contractor for Two Designs
EXISTING FORCEMAIN HDD ACROSS RIVER & WETLANDS
Construction Challenges

- Discovery of the proximity of water main to rail road tracks concurrent with construction of force main under river
- Added new segment to contract
Construction Challenges

- Leaky pipe joints
  - Could not use pressure to dewater pipes
- Unforeseen pipe bends
  - Could not line bends
  - 12 bends outside cemetery
  - 2 bends in cemetery
18" Water Main Location
Construction Challenges

- Leaky pipe joints at connection of new DI pipe and old CI pipe
- Excavate and replace
- The mystery of the “sinking” patches
Construction Challenges

- Residents frustrated with longer-than-anticipated construction time
In the End...

- Reusing the existing water main:
  - Saved ~$500,000 over conventional construction
  - Used ~60% less energy to construct
  - Reused 7,200 LF of 18-inch water main
  - Preserved ~15,000 SY of asphalt
  - Minimized disruptions in a major transportation and utility corridor

- Coordinating construction contracts saved $$
The City of Stevens Point

Recycles
(the existing lift station)

Reuses
(the abandoned water main)

Reaps the Benefits
(saves $$, resources; less disruption)
Questions?