

## STM 8 - Sewer

minutes from 3/9/16 A&F meeting

Jonathan Beder, DPW Director, as well as staff from Environmental Partners, presented STM Article 8. Plymouth's sewer system pumps 1.5 million gallons each day. The system covers 4 ½ miles. The recent breaks are considered a catastrophic failure. The 1<sup>st</sup> break occurred on December 19<sup>th</sup> off Exit 5, 2<sup>nd</sup> break January 27<sup>th</sup> at Braley Road, and the 3<sup>rd</sup> break January 31<sup>st</sup> at Westerly Road. When a pipe is not full gases collect at the head space. These breaks occurred at high points in the line, where gases are exposed to more atmospheric pressure. Many hours have been put in cleaning up the break sites, inspecting the sewer line through pits and probes, and setting up a bypass. The temporary emergency bypass has been installed and a pump is pumping from the wet well into the bypass. The bypass is costing the town \$So far they have determined that 1 mile of pipe is no good. Cleaning and inspection is ongoing and an update will be given at Town Meeting on April 2. There are six options for repair:

	OPTION/COST/TIMELINE	PROS	CONS
1	Spot repairs at 4 locations include replacement of approximately 4,000 lf of the 30" pipe with new PVC or HDPE pipe. \$19,075,373 9 weeks	Fastest alternative Least expensive Least disruption	Leaves remaining pipe in its current condition Remaining 19,000 feet – inspection incomplete Ductile iron and cement lining left in place Extent of corrosion & abrasion not determined Future corrosion possible Lifespan uncertain
2	Slip line (using 24" pipe) approx. 12,000 lf of the existing pipe at various locations between Water Street and the WWTP, and replace the remainder with a new 24' pipe \$29,706,669 16 weeks	Suitable for first 12,000 feet Plastic preferred to DI Provides 21" internal diameter Higher velocity Lower retention time Cost effective Moderate disturbance, access pits	Grouting of annular space needs careful attention Minor loss of cross sectional capacity Short pipe segments are not cost effective Moderate disruption & traffic impacts.
3	Remove existing 30" pipe and replace with a new 24" HDPE or PVC pipe. \$30,596,544 24 weeks	Suitable for entire length Provides long term solution Improves velocity w/ smaller diameter Longest lifespan, 40-50 yrs	More disruptive than option 2 Highest restoration costs (paving, landscaping) Traffic impacts Highest cost for single pipe option
4	Spot repairs approx. 4,000 lf of the existing pipe and construct a 24" redundant line (HDPE or PVC) adjacent to the existing pipe. \$38,391,498 9 wks (repairs) & 30 wks (new pipe)	Provides immediate repair Redundant pipe Improves velocity & retention time	Leaves 19,000 feet of existing 30" pipe Restoration cost Permitting/coordination with Mass DOT Disturbance to downtown and residential areas
5	Slip line 12,000 of existing line, remove & replace remaining 12,000 & construct new 24" redundant pipe \$48,173,116 16 wks (slip line) & 30 wks (new pipe)	Can be applied to wide range of pipe Relatively rapid w/little disturbance Improves interior surface & reduces friction Most efficient w/long runs Provides redundant pipe	Most expensive pipe replacement/repair option High restoration costs Fair amount of disruption to downtown & residential areas Short pipe segments are often expensive
6	Spot repairs of 4 locations & new wastewater treatment plant closer to the Water Street pump station. \$19M + \$40,000,000* 3 yrs	Reduces length of force main Reduce long detention time New plant may be more cost effective than upgrading existing & new FM Address future treatment regulations	Suitable site needed Planning/permitting needed Public perception of plant location Duration: 3-5 years for permitting, design & construction

Sliplining: One of the oldest trenchless options, relatively quick, least amount of disruption

Available pipe options for sliplining:

- Fusible PVC: 24" Fusible - C905 PVC DR 25 (OD = 25.8" ID = 23.61")  
Bending radius: 450', Pressure Rating: 165 psi, Critical Buckling Pressure: 68 psi,  
Weight per foot: 52.09, Proprietary pipe by Underground Solutions, Inc.
- HDPE: 24" Fusible - HDPE SDR 11 (OD = 25.8" ID = 20.82")

Bending radius: 215', Pressure Rating: 160 psi, Critical Buckling Pressure: 70 psi

Weight per foot: 75.78 pounds per foot

HDPE seems to be the best option to use for sliplining because it is more flexible and smaller pits can be used.

They are looking for a long term sustainable solution. Of the options outlined in the table, DPW and the engineers believe Option #5 is the best for Plymouth.

Approximately \$7 million has been spent so far. They would like to move quickly with the permanent repair because the temporary bypass is costing approximately \$300,000 per month.

#### FASTTRACK DISCUSSION

Option5-\$48,173,116

16 Weeks to Slipline/Remove Bypass - Start April 2016

30 Weeks for new pipe line construction - Start Fall 2016

Contractors Solicitation:

Ongoing communications with 5 reputable Contractors

Meetings and discussions with PVC and HDPE technical representatives

Pricing from local Contractors and vendors

Project Bidding:

Fast track bidding restricted to 5 Contractors

Project Schedule:

Meeting with prospective Contractors: Ongoing

Plans and Specifications availability: March 31, 2016

Funds Availability: After Town Meeting

Open Bids: April 7, 2016

As far as funding sources, Spring Special Town Meeting is asked through this article to authorize the borrowing. The town will be applying through the state for SRF funding. *The Massachusetts State Revolving Fund (SRF) for water pollution abatement projects was established to provide a low-cost funding mechanism to assist municipalities in complying with federal and state water quality requirements. The SRF Program is jointly administered by the Division of Municipal Services of the Department of Environmental Protection (MassDEP) and the Massachusetts Water Pollution Abatement Trust.* The standard borrowing rate is 2% for 20 years (2.4% for 30 years) but we will work on trying to apply for 0% (or possibly 1%). Once we receive approval from Town Meeting we can start the process with DEP. There will be an article at Fall Town Meeting regarding the specifics of where the funding to pay the debt will come from. There are options including the general fund, the sewer enterprise fund, and sewer fees (perhaps a combination of 2 or 3 of those). There is plenty of time to decide on the source(s) of funding.

Questions:

- Is \$7 million so far a pretty accurate number? The \$48 plus million, how large might the plus be? (M Sirrico) \$7 - \$7.2 is accurate based on the bills received and bills anticipated. As far as the \$48 plus million, the estimate is conservative. We need it to be high because of the unknowns that we may run into like utilities downtown that may need to be moved, we need that flexibility. There is a 15-20% contingency built in.
- There were several questions about the premature failure of the forced main, maintenance contracts, and responsibility for that failure. The system is in year 16 of what was a 50 year expected life. The maintenance contract with Veolia expires in 2021. Once we figure out which option we are going with then we will sit down with Veolia and discuss any changes to the contract and work out the details with them. To the best of our knowledge, cleaning was never done to the forced main system. This subject is currently under litigation.
- There were several questions and comments regarding who was going to pay, any formulas, why people not on sewer would have to pay, and what effect borrowing \$48 million would have on the tax rate. Lynne Barrett, Director of Finance, answered those questions. There is no formula, they will be weighing all the options. The members of the Board of Selectmen are the Sewer Commissioners and they set rates for the Sewer Enterprise Fund. The Sewer Enterprise Fund will not be able to support the \$48 million so the General

Fund will have to subsidize the project, not sure if that will be 100% of the project or a lesser amount. There is time to figure it out as this breakdown will be voted by Town Meeting in the Fall. Spring Town Meeting will be authorizing the borrowing. As far as what the \$48 million borrow will look like on the tax rate assuming 100% is funded by the general fund, the first year including loan origination costs would be \$3.1 million so \$114 for the average tax payer (19 cents per thousand of value). That would be through the SRF with level debt. If we do level principal, the first year would be much larger. Melissa Arrighi, Town Manager, added that this sewer failure and accompanying price tag is a shock to all and that you have the assurance of the Town Manager, Director of Finance, and Board of Selectmen, that they will revisit the funding of this project every year when they set rates. There was some discussion about how those not on sewer will also be paying for the repair, the fairness of that, the existing Title V loan program for those not on sewer, how those with septic systems still use the treatment plant when their systems are pumped, and what "community" means.

- There were questions and discussion about the need for the redundant line and the timing of that line. We want redundancy/back up for when maintenance and cleaning need to be done and in the event of an issue. Even with a smaller pipe and increased flow, cleaning and maintenance will still be necessary. There will be an SOP, standard operating procedure, put in place that will include cleaning and maintenance procedures and timelines. As far as deferring the redundant line to a later time 2-5 years out, they would rather get it done this coming fall/winter. They would like that second line in place to start the maintenance program and have a back up when needed. If the redundant pipe installation is delayed they may need to go through restoration an additional time to the cost of \$1 - \$1.5 million. Plus the cost of construction will increase as time goes on and there is the risk that there may be an issue again, so getting the redundant pipe installed sooner is ideal.
- There were questions about the design regarding whether the high and low spots may be eliminated with the new system, whether 24" pipe is the right size based on usage, and the duration of the new line. They may be able to improve some of the elevations with the new pipe but they can not do that with the slip line into the existing pipe. The sewer system extends from North Plymouth to the Fire Station just south of downtown, and to the west to Home Depot and Commerce Way/Colony Place. There are 3,300 connections to the sewer system which include a mix of residences and businesses. Based on the usage, 24" pipe is the right size. The redundant pipe will be tested before it is put into full use. The new material should last at least 50 years.
- Is the \$6 million requested in ATM Article 9 for sewer projects still needed? (S Joyce) Yes it is. That is made up mostly of upgrades needed to the pump stations, which is an important part of the system.
- Is vandalism a concern with the bypass? (S Joyce) Yes it is. Since the bypass is above grade vandalism is a great concern. They do have the bypass lit and monitored.

**Patrick O'Brien made a motion to recommend Option #5 of STM Article 8 to Town Meeting. Marc Sirrico, second.**

Comments/Discussion:

- Disappointed to hear discussion at the Board of Selectmen's meeting last night, it is disconcerting when you hear certain areas of town being singled out, we need to remember that we are a community. (M Sirrico)
- We all benefit from sewer system upgrades, the environmental impact is huge, we have the largest aquifer in the state with 365 lakes and ponds in Plymouth. Option #5 makes the most sense. (P O'Brien)
- It is a fair question to ask how this will be paid. We are the Finance Committee and are here in an advisory role. Option #5 makes sense, it is the most logical and, yes, the numbers are huge and frightening. (H Helm)
- Let's get the sewer fixed once and fixed right. I support Option #5. We are all in it together and should all pay for it together. This has been a big topic of discussion, it is a lesson in civics, it is a community-wide matter and should be paid equitably by spreading it out to all. (M Lincoln)
- It is appropriate to ask about funding and important to understand the funding. Communities share the cost of things. In support of Option #5. It goes farther than the other options and will last 50-75 years. Would like to adjust the culture in Plymouth to take better care of what we have so it lasts longer. (K Canty)

**The motion carries unanimously (10-0-0).**