ADVISORY & FINANCE COMMITTEE

The following meeting of the Advisory & Finance Committee has been posted and will be held

At: **Plymouth Town Hall**
Mayflower II Meeting Room
11 Lincoln Street
Plymouth, MA 02360

On : **Wednesday, March 9, 2016 at 6:30PM**

Items on the agenda will include but are not limited to the following.
Other discussion may include items that were not reasonably anticipated by the Chairman 48-hours in advance of the meeting posting.

Call to Order

Public Comment

Agenda Items

- Town Meeting Articles
  - STM 8 – Sewer — Jonathan Beder, DPW Director
  - ATM 27 – Ground Mounted Solar — Patrick Farah, Planning Technician
  - ATM 21 – Alarm Systems – Vote to Rescind
- Town Meeting Schedule
  - Caucus Scheduling
  - Motions Meeting
  - Town Meeting Presentation Forum
  - Town Meeting Preview
  - Town Meeting

Old/New/Other Business
- Sub-Committee & Committee Liaison Updates

Meeting Minutes
- February 24, 2016
- March 2, 2016
- March 3, 2016

Public Comment

Adjournment

Next Meeting: Saturday, April 2, 2016 7:30AM Plymouth North High School – Band Room
Followed by 8AM Town Meeting – Plymouth North High School – Performing Arts Center

Special Town Meeting
April 2, 2016

ARTICLE 8:

To see if the Town will vote to raise and appropriate, transfer from available funds, or borrow a sum of money for costs of temporary repairs and permanent repairs related to sewer lines, including but not limited to repair of line breaks and related failures, and/or the Town's sewer system in general, including the payment of costs incidental or related thereto; and to determine whether this appropriation shall be raised by borrowing under the provisions of G.L. c.44, §§7 or 8, from the Massachusetts Clean Water Trust, or pursuant to any other enabling authority, with principal and interest on any borrowing authorized hereunder to be repaid from the general fund and/or sewer enterprise fund; or take any other action relative thereto.

BOARD OF SELECTMEN

BOARD OF SELECTMEN
March 8, 2016

2016 SPECIAL TOWN MEETING
ARTICLE 8
Emergency Sewer Force Main Repair

PLYMOUTH FORCE MAIN PROJECT UPDATES

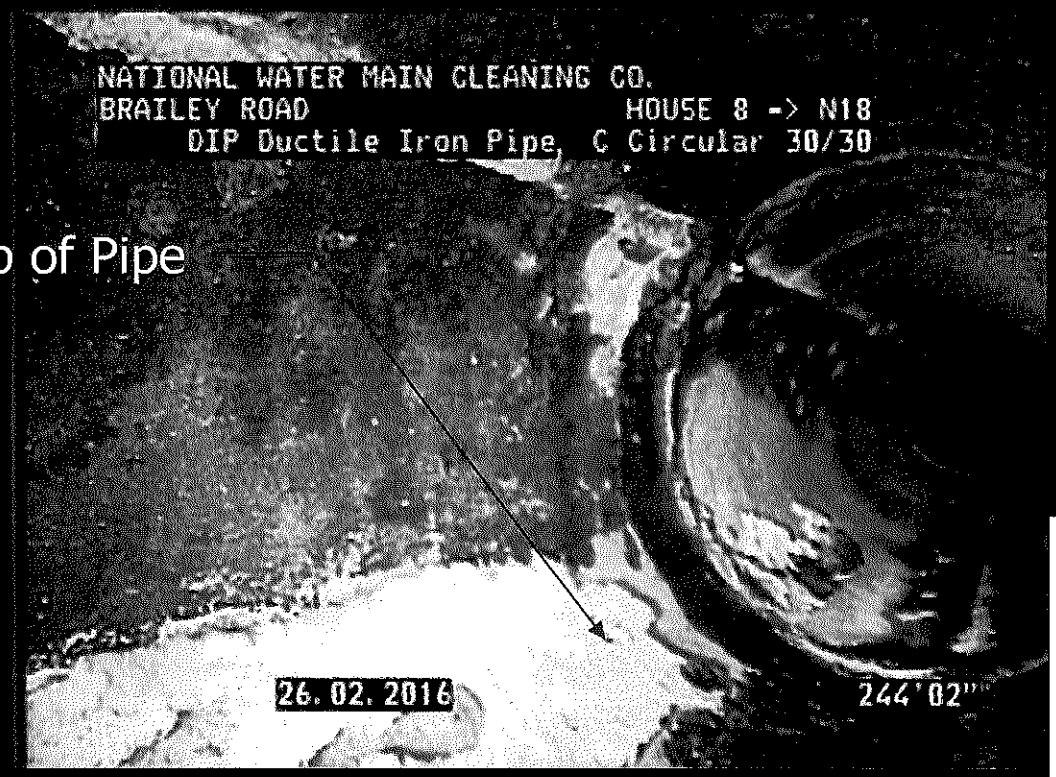
1. Project Update
2. Field Activities Updates
3. Engineering and Peer Review Updates
4. Preliminary Design
5. SRF Funding Updates
6. Bidding

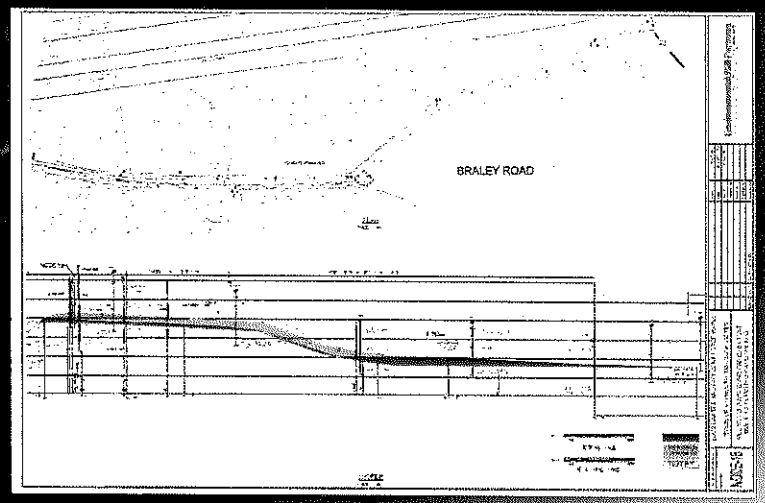
CORROSION PROBE STUDIES

Pipe Assessment and Preliminary Findings:

- Ultrasonic testing conducted at various locations
- Samples collected and transported to the laboratory for analysis
- Comparative options with CIPP and Slip Lining
- Comparative Weighted Scoring of Options

NWM PRELIMINARY FINDINGS

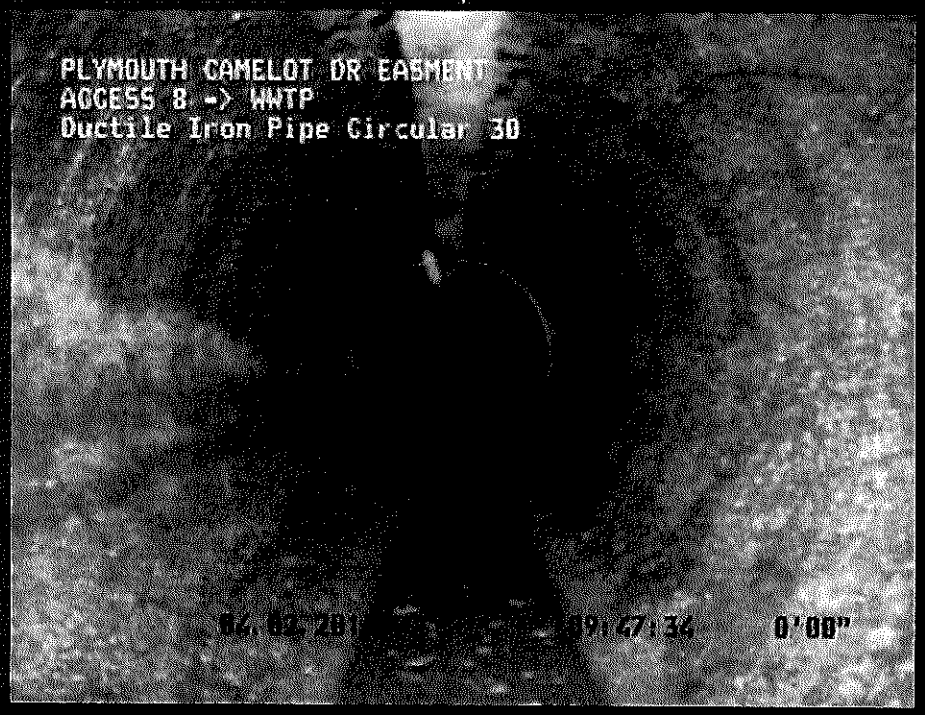


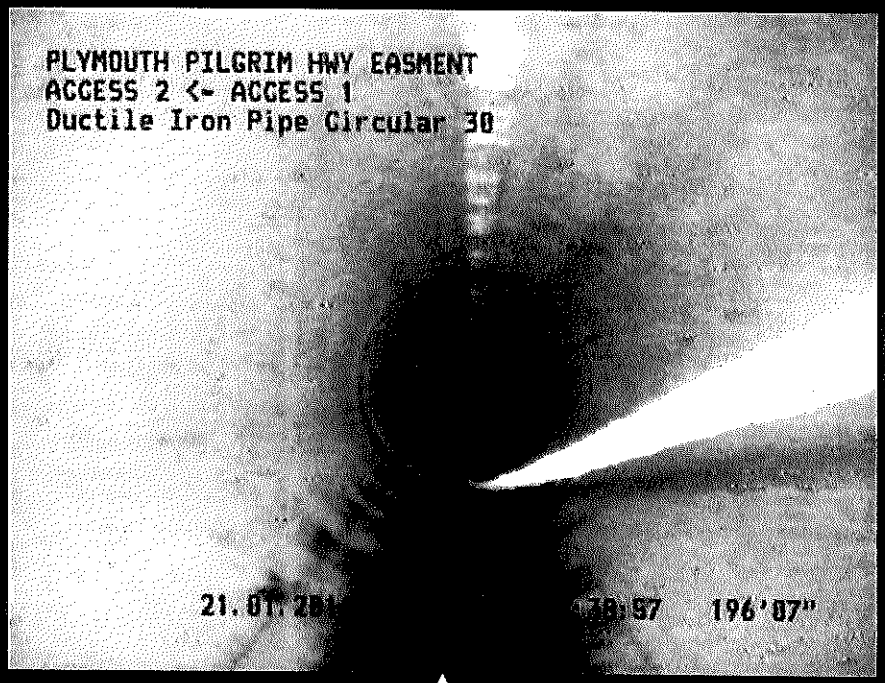


Pipe condition 244' downstream from the bypass tap access on Braley Road (≈Sta. 121+50)
Approximate break location Sta. 127+76

NWM PRELIMINARY FINDINGS

LONG POND ROAD
EASEMENT PIPE SEGMENT
≈Sta. 235+07





LONG POND ROAD
EASEMENT PIPE SEGMENT
≈Sta. 198+75

REDZONE PRELIMINARY FINDINGS

CORRODED PIPE SEGMENT

Start: ≈Sta. 200+18

End: ≈Sta. 200+62

GOOD PIPE SEGMENT

Start: ≈Sta. 203+28

End: ≈Sta. 203+94

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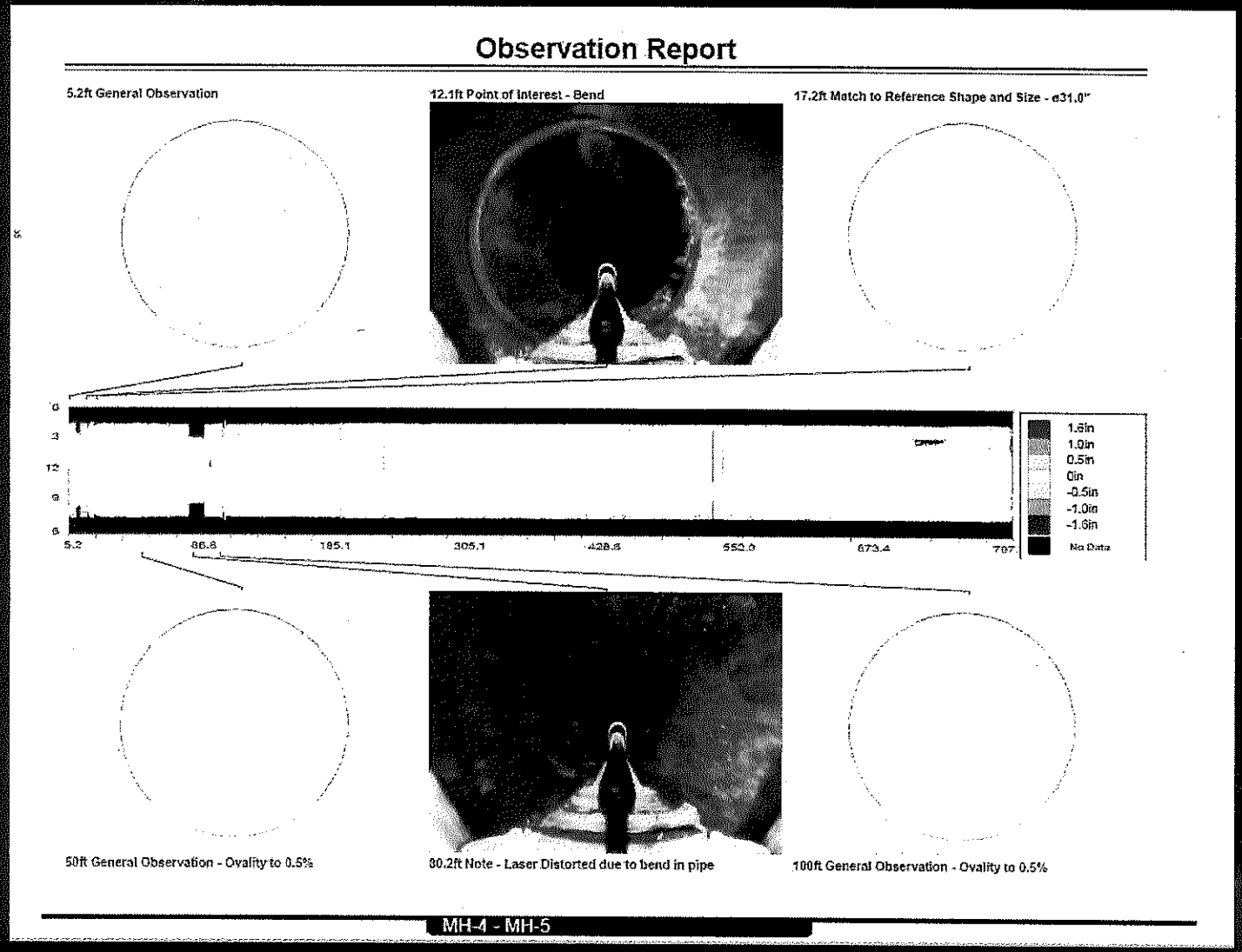
REDZONE PRELIMINARY FINDINGS



Some corrosion seen beyond expected limits based on the hydraulic model.

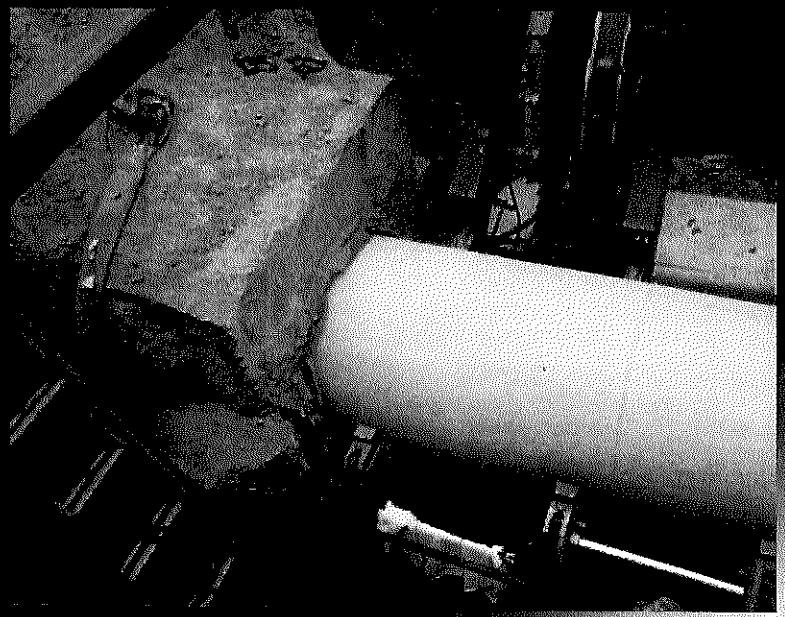
TRENCHLESS TECHNOLOGIES

A. Sliplining:

- One of the oldest trenchless technology options
- Relatively quick
- Least amount of disruption

B. 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 pounds per foot
  - 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



**The smaller the bending radius, the greater is the materials flexibility*

Courtesy of Underground Solutions

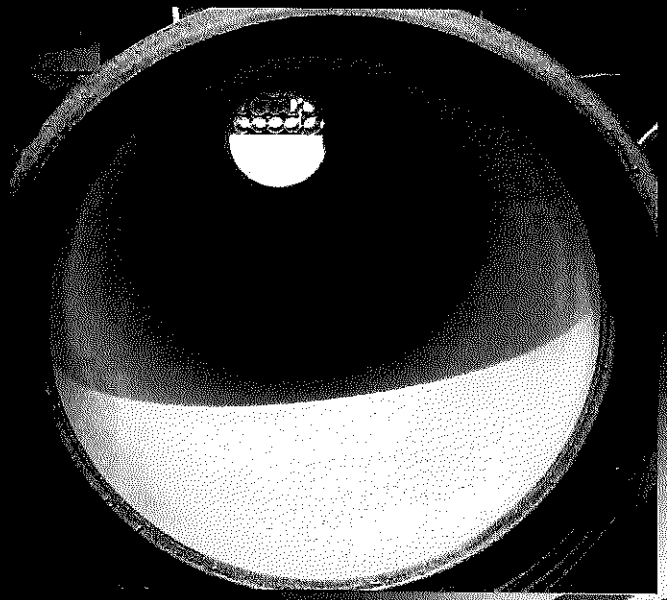
TRENCHLESS TECHNOLOGIES CONT'D

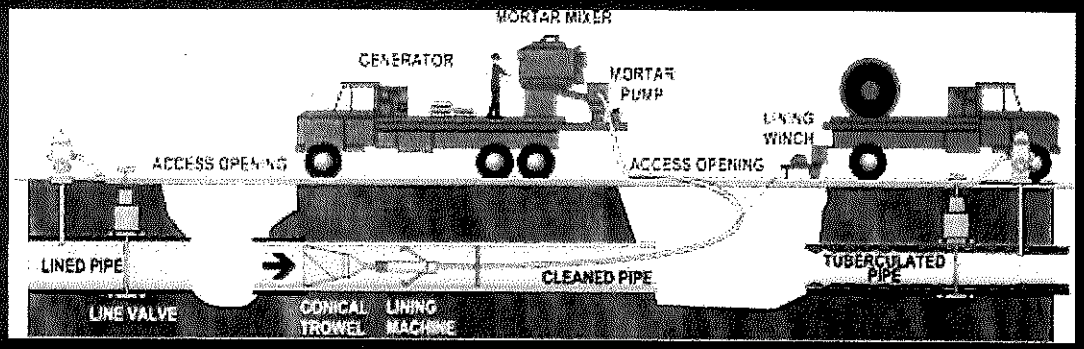
A. CIPP:

- Cured-in-Place pipe used to repair existing pipelines
- Widely used technology with fast curing time
- Jointless, seamless pipe within a pipe
- Requires smaller pits

B. Cement Lining:

- High abrasion resistance allows high flow rate
- Lining machine is pulled through pipe



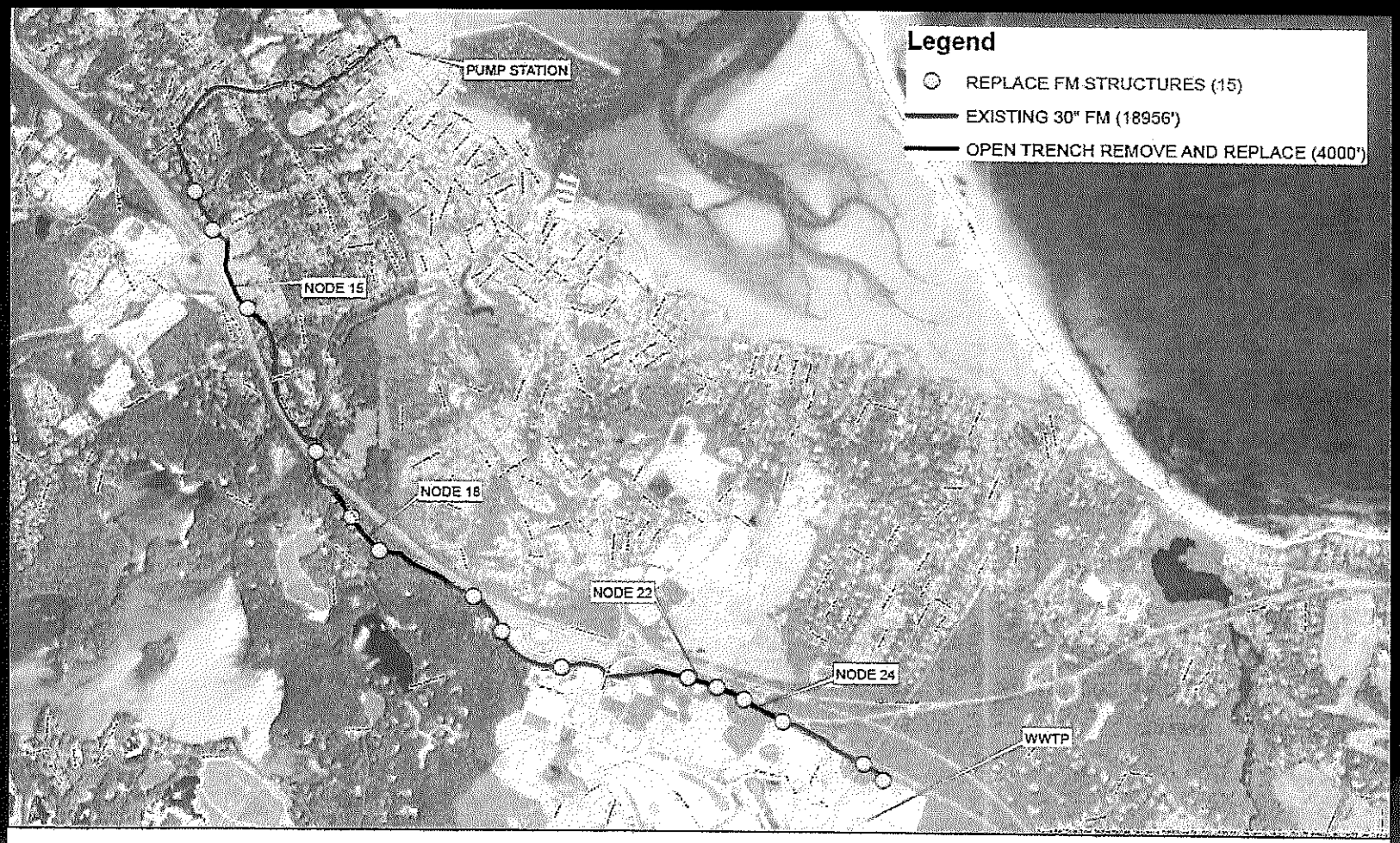


Courtesy of W. Walsh Company

PIPE REPAIR OPTIONS

OPTION	OPTION DESRCIPTION
1	Spot repairs at 4 locations include replacement of approximately 4,000 lf of the 30" pipe with new PVC or HDPE pipe.
2	Slip line (using a 24" pipe) approximately 12,000 lf of the existing pipe at various locations between Water Street and the WWTP, and replace the remainder (~12,000) with a new 24' pipe
3	Remove the existing 30" pipe and replace with a new 24" HDPE or PVC pipe.
4	Spot Repairs of approximately 4,000 lf of the existing pipe and construct a 24" redundant line (HDPE or PVC) adjacent to the existing pipe.
5	Slip line 12,000 of the existing line, remove and replace the remaining 12,000 lf and construct new 24" redundant pipe
6	Spot repairs of the four locations, and a New wastewater treatment plant closer to the Water Street pump station.

PIPE REPAIR OPTION 1



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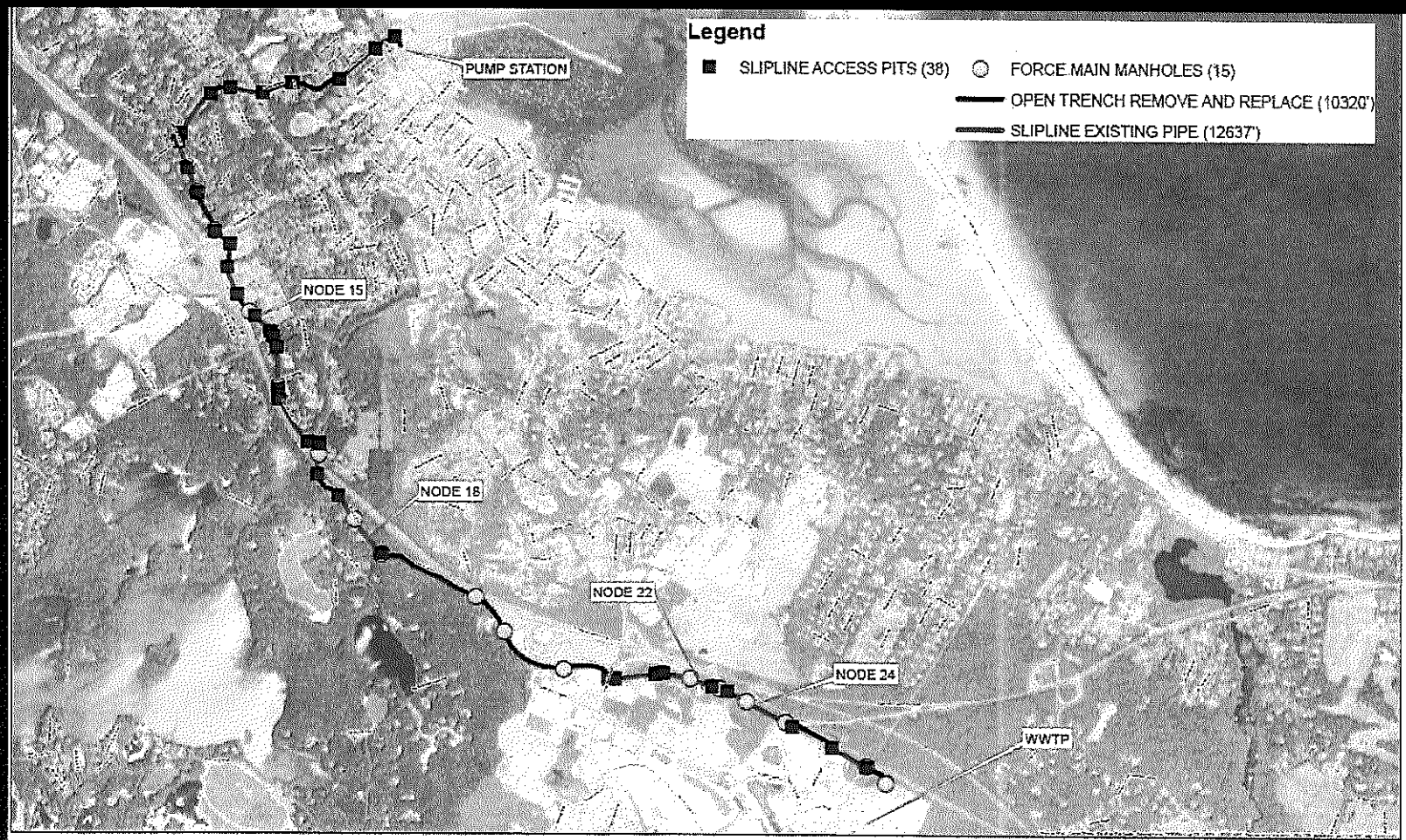
1 in = 700 feet

OPTION 1
SPOT PIPE REPAIR
AT FOUR LOCATIONS
INCLUDING ACCESS PITS
AND ALL AIR RELEASE VALVE
AND BLOWOFF MANHOLES

PIPE REPAIR OPTION 2



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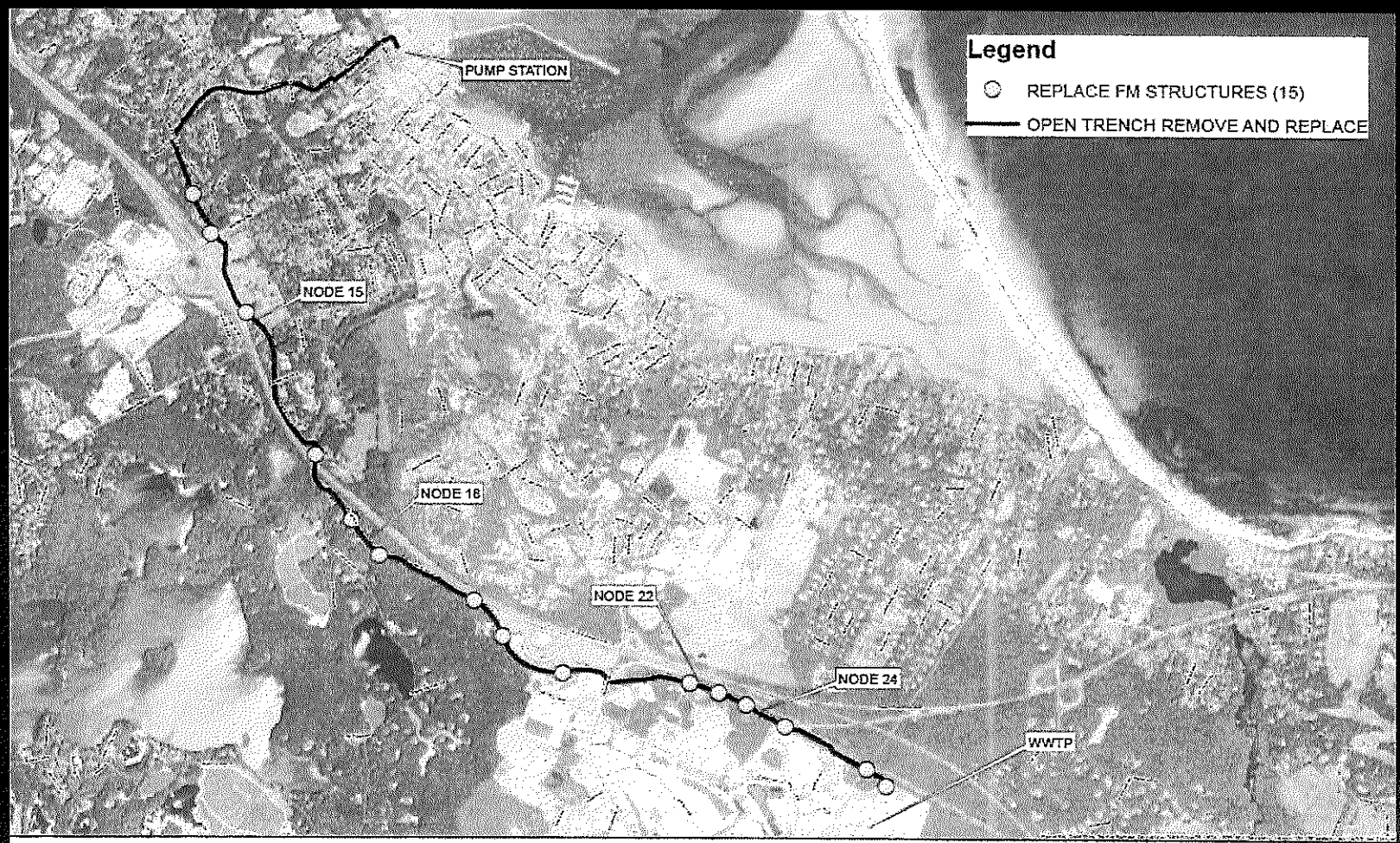
1 in = 700 feet

OPTION 2
SLIPLINE/REPLACE EXISTING PIPE
INCLUDING ACCESS PITS
AND ALL AIR RELEASE VALVE
AND BLOWOFF MANHOLES

PIPE REPAIR OPTION 3



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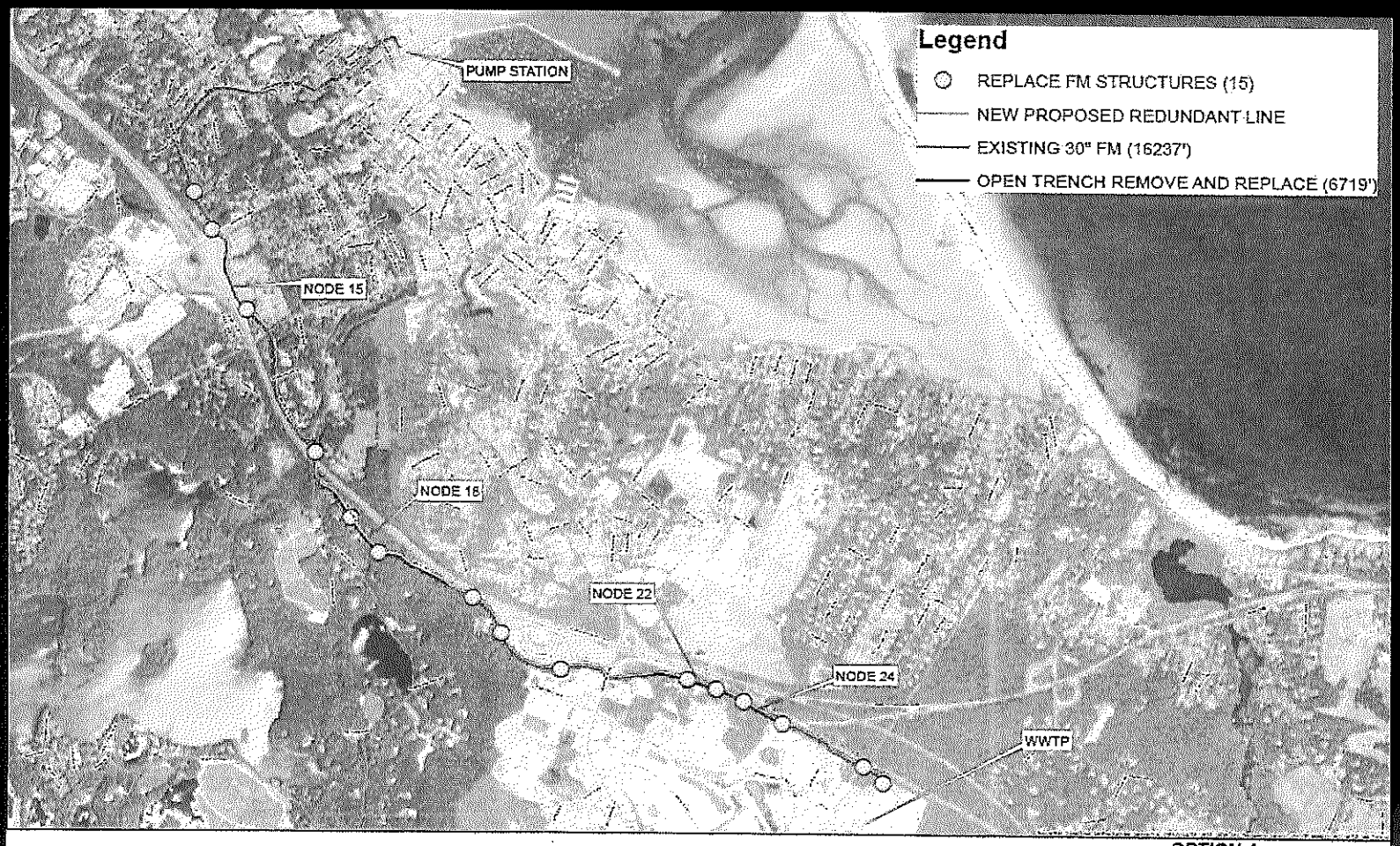
1 in = 700 feet

OPTION 3
REMOVE AND REPLACE COMPLETE 30" FORCE MAIN INCLUDING ACCESS PITS AND ALL AIR RELEASE VALVE AND BLOWOFF MANHOLES

PIPE REPAIR OPTION 4



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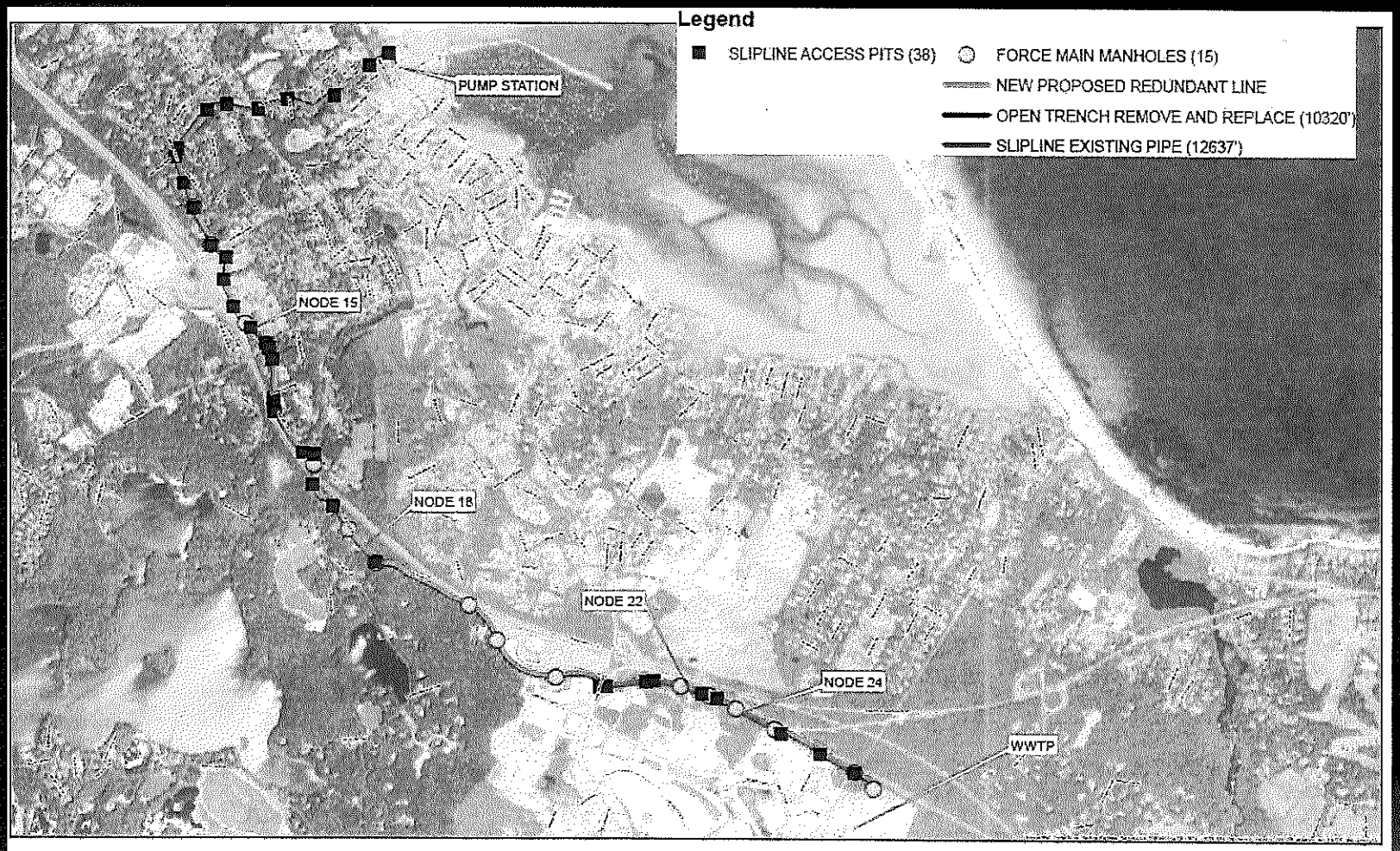
1 in = 700 feet

OPTION 4
SPOT PIPE REPAIR
AT FOUR LOCATIONS
INCLUDING ACCESS PITS
AND ALL AIR RELEASE VALVE
AND BLOWOFF MANHOLES
WITH ADJACENT REDUNDANT PIPE

PIPE REPAIR OPTION 5



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1 in = 700 feet

OPTION 5
SLIPLINE/REPLACE EXISTING PIPE
INCLUDING ACCESS PITS
AND ALL AIR RELEASE VALVE
AND BLOWOFF MANHOLES
WITH ADJACENT REDUNDANT PIPE

RECOMMENDATION-Option 5

ADVANTAGES/DISADVANTAGES OF PRIMARY OPTIONS			
OPTION	DESCRIPTION	ADVANTAGES	DISADVANTAGES
1	SPOT PIPE REPAIRS 30" AT 4 LOCATIONS	1. Fastest alternative 2. Least expensive 3. Least amount of disruption.	1. Leaves remaining pipe in its current condition 2. Remaining 19,000 feet – inspection is incomplete. Ductile iron and cement lining left in place. 3. Extent of Corrosion and abrasion has not been determined. 4. Future corrosion possible. 5. Lifespan uncertain.
2	SLIPLINE HALF& REPLACE HALF EXISTING 30-INCH PIPE WITH 24" HDPE PIPE.	1. Suitable for first 12,000 feet. 2. Plastic preferred to DI. 3. Provides 21" internal diameter. 4. Higher velocity. 5. Lower retention time. 6. Cost Effective. 7. Moderate Disturbance. Access pits	1. Grouting of annular space needs careful attention. 2. Minor Loss of cross sectional capacity. 3. Short pipe segments are not cost effective. 4. Moderate disruption and traffic impacts.
3	REMOVE AND REPLACE EXISTING 30-INCH PIPE WITH 24-INCH HDPE/PVC PIPE	1. Suitable for entire length. 2. Provides long term solution 3. Improves velocity with a smaller diameter pipe. 4. Longest lifespan. 40 to 50 years.	1. More disruptive than option 2. 2. Highest restoration costs. (paving, landscaping) 3. Traffic impacts. 4. Highest cost for single pipe option.
4	SPOT PIPE REPAIRS AND NEW REDUNDANT PIPE	1. Provides immediate repair alternative 3. Redundant pipe 3. Improves velocity and retention time	1. Leaves 19,000 feet of existing 30" pipe [illegible] 2. Restoration cost 3. Permitting/coordination with MassDOT 4. Disturbance to downtown and residential areas
5	SLIPLINE EXISTING PIPE AND ADD A NEW REDUNDANT PIPE	1. Can be applied to a wide range of pipe 2. Relatively rapid with little disturbance 3. Improves interior surface and reduces friction 4. Most efficient with long runs 5. Provides a redundant pipe	1. Most expensive pipe replacement/repair alternative 2. High restoration costs 3. Fair amount of disruption to downtown and residential areas 4. Short pipe segments are often expensive
6	NEW WWTP NEAR WATER STREET	1. Reduces length of the force main and long detention time. 2. New plant may be more cost effective than upgrading the existing plant and construction of new FM. 3. Address future treatment regulations	1. Suitable site needed. 2. Planning/permitting needed 3. Public perception of plant location. 4. Duration: 3-5 years for permitting, design and construction

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Annual Town Meeting
April 2, 2016

ARTICLE 27:

To see if the Town will vote to amend the Zoning Bylaw, as on file with the Town Clerk, by adding a new section entitled, "Ground-Mounted Solar Energy Facilities", that identifies solar energy facility site locations, selection criteria and evaluation criteria as well as amending associated definitions, procedures, and schedules, or take any other action relative thereto.

ENERGY COMMITTEE

AMENDED DRAFT

205-3 Definitions

ACTIVELY OCCUPIED – As applied to the site of a GMSPS, that portion of a Development Site that contains the solar array, accessory structures, interconnection infrastructure and internal vehicle access roads.

DISTURBED AREA – Land which, due to human activity or as a result of natural forces, including but not limited to fire or flooding, is devoid of significant naturally occurring vegetation, the topography of which has been significantly altered or destabilized by any means.

GRID – Power transmission system used to transfer electricity from generation facilities to commercial and residential electric loads.

GROUND-MOUNTED – A solar energy system installed directly on the ground through various ground-mounting technologies which may include fixed, passive tracking or active tracking metal racking.

GROUND-MOUNTED SOLAR PHOTOVOLTAIC SYSTEM (GMSPS) – A ground-mounted, solar energy system that is either:

1. Located on land in agricultural use as defined in G. L. c.128, § 1A and used primarily for the accessory generation of energy for the operation of the agricultural use, or:
2. Installed for the principal purpose of selling generated electricity to the grid.

205-77. Ground-Mounted Solar Photovoltaic Systems

A. **Intent.** The intent of this bylaw is to promote, by-right, subject to Site Plan Review, in all Districts, the generation of solar energy while preserving the natural environment and supporting reduction of Plymouth's carbon footprint.

B. **Location and Area Requirements.**

1. Site Plan Review is not required for a GMSPS that:
   a. Actively occupies 1,500 square feet or less of land and has a total GMSPS height of less than 8 feet from final grade;
   b. is located on agricultural land, and used primarily for the accessory generation of energy for the operation of the agricultural use; or
   c. is located on a Development Site consisting primarily of Disturbed Area, and, if located within any of the following Districts, provided a minimum 200-foot Buffer is in place along each Lot line that abuts a Residential District:
      I. Airport (AP)
      II. Arterial Commercial (AC)
      III. General Commercial (GC)
      IV. Highway Commercial (HC)
      V. Light Industrial (LI)

VI. Light Industrial/Waterfront (LI/WF)
VII. Mixed Commerce (MC)

2. Prohibited. A GMSPS that actively occupies more than forty (40) acres in area.

C. **Standards.** The following standards apply to all GMSPS:

1. **Setback** – A GMSPS site and construction thereon shall conform to the dimensional and intensity requirements set forth in Table 5 of the Zoning Bylaw.

2. **Design** –

a. **Lighting** – Lighting shall be limited to that required for safety and operational purposes, and shall comply with the requirements of §205-65 Prevention of Light Pollution.

b. **Utility Connections** – Cabling and utility connections within the GMSPS shall be placed underground.

c. **Security** – The GMSPS must be physically secured by measures including, but not limited to, appropriate fence material, construction, locking devices and surveillance equipment.

d. **Signage** –

i. Required: A sign complying with Sign bylaw §205-19 shall identify the owner and operator, if not the same, and provide the following information: business name for any company or other entity owning and/or operating the installation, with the business address and name of a contact person for each; electric utility or other safety warnings and a 24-hour emergency contact phone number.

ii. Prohibited: Any advertising display.

d. All emergency vehicle access ways shall conform to dimensional requirements of the Plymouth Fire Department.

e. Screening, as defined in §205-3, shall be installed to shield residences from a GMSPS.

f. Buffers as defined in §205-3 are required as follows:

i. A minimum of 50 feet for 1 to 2 MW systems;

ii. A minimum of 100 feet for systems greater than 2 MW.

3. **Land Clearing, Soil Erosion and Habitat Impacts.**

a. Clearing of native vegetation shall be limited to that necessary for the construction, operation and maintenance of the GMSPS. Effective storm water management and erosion control features shall be maintained at all times during and post-construction. Installed fencing shall maintain a minimum distance of 8 inches from final grade for small wildlife passage.

b. Management of all vegetated areas within the GMSPS shall be maintained throughout the life of the project through mechanical means and without the use of chemical herbicides.

4. **Information Required with Zoning Permit for all GMSPS.**

a. **Landscape Plan** – A landscape plan prepared by a Registered Landscape Architect

is required and shall include location of existing significant trees, shrubs and grasses to remain and all proposed additions, identified by specimen size and species at installation. Low growth vegetation shall be planted and maintained in areas under GMSPS rack equipment.

b. **Materials** – Manufacturer's specifications for a proposed GMSPS shall be provided for all equipment and attendant facilities and include documentation of the major system components to be used, including panels, mounting system, rated name plate capacity, colors, inverter and interconnection details.

c. **Safety** – The GMSPS Owner or Operator shall submit a copy of the project summary, electrical schematic, and Development Site plan to the Building Commissioner, with a copy for review by the Fire Chief. Instructions to de-energize the system shall be made available to public safety personnel. The owner or operator shall identify a responsible person for public inquiries throughout the life of the GMSPS.

e. **Financial Surety** – Except for a municipally owned GMSPS, for a project designed to generate in excess of 2MW, a performance guarantee is required to cover the cost of GMSPS removal in the event the town must remove the installation and stabilize the Development Site with loam and seed in an amount approved by the Building Commissioner.

5. **Other Requirements.**

a. Modification – A substantial modification to a GMSPS shown on an approved Site Plan shall require Site Plan modification in compliance with the standards and procedures applicable to the original application.

b. **Segmentation** – Adjacent parcels in the same ownership or control shall be deemed to be one parcel for purpose of calculating the area limitation of §B.2 above.

c. **Abandonment** – A GMSPS shall be deemed abandoned when it fails to operate or its operations are discontinued for more than one year without the written consent of the Building Commissioner; or if the Building Commissioner has determined that the installation is a hazard to public safety and the conditions have not been corrected within three (3) months.

d. **Site Restoration** – A GMSPS must be removed by its owner at the end of its useful life or when it use has been discontinued or abandoned as provided herein, and shall be removed by the owner or operator within 150 days from the date of discontinuation of operations. The owner or operator shall notify the Building Commissioner by certified mail of the proposed date of discontinuation and provide detailed plans and schedule for GMSPS removal.