



## City of Rochester Dept of Public Works

45 Old Dover Road  
Rochester, NH 03867  
Phone: (603) 332-4096  
Fax: (603) 335-4352

# Memo

To: Public Works and Buildings Committee  
From: John B. Storer, PE  
Director of City Services  
Date: May 12, 2016  
Subject: Public Works and Buildings Committee  
Meeting Thursday May 19, 2016

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There will be a Public Works and Buildings Committee Meeting on **Thursday May 19, 2016 at 7:00 PM. *This meeting will be held in Council Chambers, at City Hall.***

### AGENDA

1. Approve Minutes from April 21, 2016 meeting
2. Public Input
3. Ice Arena – update
4. Utility Leak Abatement – draft policy
5. Brownfield's candidate sites – 828 Portland Street
6. Watershed Management Plan
7. FY17 Pavement List
8. FY17 Sidewalk Priorities
9. FY 17 CIP  
Rt11 PS Inquiry  
Water line loop Inquiry
10. Project Updates  
Annex – underground fuel tank  
Haying agreement  
HSIP  
Franklin /Western Ave
11. Other



## Public Works & Buildings Committee May 19, 2016 Agenda Item

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### **Agenda Item #4 – Draft Leak Abatement Policy**

#### **Summary:**

Attached is a proposed Leak Abatement Policy that could provide financial relief to Water & Sewer customers that experienced a significant leak event on their private plumbing. Abatements would not be considered for acts of negligence operating or maintaining the plumbing systems. The draft policy would allow a customer to file for a one-time bill abatement within a 10-year period for some type of unusual leak event. The customer would still pay their normal quarterly bill and would be held responsible for 50% of the unforeseen use above their historical normal usage.

A draft policy is attached based on the Town of Exeter's. The City Attorney confirmed that we can implement a Leak Abatement Policy as a stand-alone policy. We would not have to amend the City Ordinances in Chapters 16 and 17, for Sewer and Water, respectively. Both Ordinance Chapters currently have an Appeals Process which indicates that an "aggrieved user" can contest a bill and the claim will be referred to the Utility Advisory Board. The UAB can simply utilize the Leak Abatement Policy for consideration in making any billing adjustments as long as the Policy is applied consistently and equally.

#### **Background:**

A Gonic resident raised a concern that quarterly utility billing doesn't provide timely information in the event that a leak occurs after a customer's water meter. In the specific case, a resident had a leak at a rental property and the tenant apparently did not report the issue in a timely fashion. Over a 3-month billing cycle the leak resulted in a high water and sewer bill in excess of \$1,000.

At the recent UAB meeting there were similar cases:

A couple had a single-unit rental property on Lambert Court. Extremely difficult tenant that ultimately had to be evicted. There was substantial property damage and water was left running one quarterly cycle that used over 250,000 gallons of water. Bill was about \$3,850 total when normally \$200 or \$300.

An owner of an apartment building on Walnut Street had a tenant whose hot water service in a shower failed. Hot water was running constantly. Due to tenant privacy rights, the landlord struggled to make contact to access the rental unit. Over 2 billing cycles the total went to \$4,000.

The UAB doesn't have the ability to grant relief if water passed through the meter and was returned to the sewer, which was the case in both situations.

The UAB reviewed the proposed Policy at their meeting of May 9 and recommended that the Public Works Committee support the policy and that the Policy go to the full City Council for review and adoption.

## **POLICY ON WATER & SEWER ADJUSTMENTS**

It is the policy of the City of Rochester not to grant adjustments to water & sewer bills unless the problem rests within the City's system. However, the City recognizes that a high bill resulting from accidental, unpreventable water release can present financial hardship to a customer. While most water releases are preventable, there are certain circumstances when an accidental water release cannot be reasonably prevented. The intent of this policy is to establish a one-time abatement, during any ten-year period, for up to half of the excess water consumption above normal consumption, due to an accidental, unpreventable water release.

### **Adjustment Determination Procedure:**

1. All customer requests to abate any portion of a metered water bill that is unusually high due to unpreventable leakage shall be reviewed by City staff on a case-by-case basis. In order to qualify for abatement, a customer's excess consumption must exceed the greater of 100% or 35,000 gallons above their normal average consumption. The customer must also prove that the deficiency responsible for leakage has been repaired or corrected. This policy only applies to leaks that have occurred within the previous six (6) months of the date of the abatement request.
2. In the event that a customer cannot determine the source or cause of the abnormally high consumption, the customer is required to hire a private licensed plumber to assist the customer in trying to determine said source or cause. If the plumber is unable to determine the source or cause of the abnormally high consumption, the City can only speculate that the customer has located and repaired or corrected said source. If the customer claims that said source never existed, the City shall test the meter and make an adjustment to the bill in accordance with NHPUC requirements for meters found to be over-recording. If the meter test reveals an accurate or under-recording meter, the customer shall be held responsible for the entire bill plus the cost of meter testing and shipping/handling.
3. In the event the source or cause of the abnormally high consumption is related to a leak due to customer negligence such as the failure to maintain internal (private) plumbing fixtures in good repair and/or protect plumbing from freezing, the customer shall be held responsible for the entire bill.
4. In the event the abnormally high consumption has occurred due to "unpredictable leakage" not caused by customer negligence, ignorance or unfortunate circumstances, as determined by City staff and the Utility Advisory Board, the City shall consider granting a one-time abatement, per account, during any ten-year period, up to half of the water consumption above normal consumption. The abatement calculation may consider compensation from any other sources, including insurance policy claims, etc. Normal consumption will be the average of at least the previous three years' consumption history, for similar billing periods, unless deemed otherwise by the City staff or the Board. The City staff and Utility Advisory Board reserve the right to grant adjustments on water use or sewer use or both.

5. The customer may be required to submit a written statement from their homeowner's insurance policy provider stating what portion, if any, of the leak is covered by insurance.
6. The City shall not disconnect service (for abnormally high consumption) provided the customer pays the entire amount due within the normal payment period or enters into payment arrangements for the excessive amount and is in good standing on all current billings.
7. Landlords will be responsible for tenant bills in accordance with this policy. Failure by a tenant to pay water and sewer charges will not excuse the landlord of any outstanding obligations.

**The following example shows how the abatement is calculated based on rates in effect as of 5/1/16:**

**Water Impact** – Rate \$4.81 per 1 unit of consumption

Note: 1 unit of consumption = 100 cu. ft. = 748 gallons

	Consumption	Dollar Amount
Total Usage (1 quarter)	70 units (52,360 gallons)	\$336.70
3 year average (quarterly average)	14 units (10,472 gallons)	\$67.34
Excess above average	56 units (41,888 gallons)	\$269.36
<b>Half of excess abated</b>	<b>28 units (20,944 gallons)</b>	<b>\$134.68</b>
Remaining excess - Customer responsibility	28 units (20,944 gallons)	\$134.68
3 year average (quarterly average)	14 units (10,472 gallons)	\$67.34
<b>Total remaining bill due</b>		<b>\$202.02</b>

**Sewer Impact** – Rate \$6.24 per 1 unit of consumption

Note: 1 unit of consumption = 100 cu. ft. = 748 gallons

	Consumption	Dollar Amount
Total Usage (1 quarter)	70 units (52,360 gallons)	\$436.80
3 year average (quarterly average)	14 units (10,472 gallons)	\$87.36
Excess above average	56 units (41,888 gallons)	\$349.44
<b>Half of excess abated</b>	<b>28 units (20,944 gallons)</b>	<b>\$174.72</b>
Remaining excess - Customer responsibility	28 units (20,944 gallons)	\$174.72
3 year average (quarterly average)	14 units (10,472 gallons)	\$87.36
<b>Total remaining bill due</b>		<b>\$262.08</b>

**The above policy replaces all existing water and sewer adjustment policies.**



## Public Works & Buildings Committee May 19, 2016 Agenda Item

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### **Agenda Item #5 – Brownfield's Candidate Sites**

#### **Summary:**

Strafford Regional Planning Commission is working on a Brownfield's project and they would like to include at least one candidate site from each community.

Based on discussion amongst City staff, the most likely candidate would be the former Blaisdell property located at 828 Portland Street.

Are there any other high priorities?

#### **Background:**

City Engineer, Mike Bezanson, solicited feedback from City Departments and we also discussed at the Management Team Meetings. Karen Pollard mentioned the Wallace Street site – but that is already underway with a formal Environmental Site Assessment. We have recent test results that confirmed contamination at Wallace Street and we will be submitting a NH DES application later this summer for remediation assistance.

The Gonic Brickyard site is also undergoing an Environmental Site Assessment. The Gonic Dam site was recently approved for an ESA via DES funding as well.

Strafford Regional wants to submit a candidate for Rochester. Some possible candidates included: vacant gas station off Rt 16 (Rochester Gas); former auto parts sales (Fishers Auto Parts); former furniture store (Low Price Furniture/Holiday House); Spaulding Avenue Mill; and former stove dealer (Rochester Stove).

The 828 Portland Street site is City owned, so unless anyone has a suggestion will continue with that site as a candidate. We did some water testing in the irrigation pond – found no volatile organic compounds (VOC's) – but are waiting on positive lab confirmation of synthetic organic compounds (SOC's – pesticides, herbicides). So early indications are that the site has some contamination.

## **CONSENT FOR ACCESS TO PROPERTY**

**OWNER NAME:**

City of Rochester

**SITE NAME:**

828 Portland Street

I (We) consent to the officers, employees, agents, contractors, subcontractors, consultants (including Credere Associates, LLC), and other authorized representatives of the Strafford Regional Planning Commission (SRPC) entering and having continued access to the above-referenced property for the purpose of conducting EPA Brownfields Assessment Grant funded work on the above referenced property including, but shall not be limited to, any or all of the following activities:

- Conducting Site Visits
- Property Surveys
- Taking soil, sediment, water, building materials, and air samples as may be determined necessary
- Sampling any solids or liquids stored or disposed of on-site
- Drilling or excavating holes and the installation of monitoring wells for subsurface investigation
- Taking other actions related to the investigation of surface or subsurface contamination

The Owner understands and agrees that drilling of exploratory borings or probes, installation of groundwater monitoring wells and other activities may involve penetration of the ground within paved and/or unpaved areas and other disturbances of the Property. Such disturbances will depend on the type of drilling techniques and other activities used. Proposed locations for such activities will be identified in the Phase II Scope of Work and are based on property-specific conditions. The installation of test pits, borings, probes and/or wells and other activities may result in damage to landscape, parking areas or driveway improvements. SRPC will coordinate with the Owner to locate such installations and activities as reasonably requested to minimize, prevent and/or avoid these impacts.

In addition, the Owner understands and agrees that the results of our activities conducted and reports generated for or with respect to the Property under this Program are public documents and will be kept on file with the USEPA and the New Hampshire Department of Environmental Services (NHDES). The report may be disclosed to the public if the USEPA or NHDES receives a request for a copy of such report under the Freedom of Information Act. The Owner further understands and agrees that the report may also be disclosed by SRPC to interested third parties (including municipal officials, realtors and developers) in connection with the planning, redevelopment and other programmatic and service activities of SRPC.

I (We) give this written permission voluntarily and understand that we may refuse to grant access at any time.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Property Owner or Owner's Authorized Representative



## Public Works & Buildings Committee May 19, 2016 Agenda Item

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### **Agenda Item #6 – Watershed Management Plan**

#### **Summary:**

The FY17 Water Works CIP includes a proposed amount of \$50,000 towards a Watershed Management Program. The intent is to inventory and map all parcels within the drinking water supply watershed, including parcels in Barrington, Farmington, and Strafford. Contamination threats would be assessed, and priority acquisitions would be identified.

As part of an ongoing Management Plan, we would expand the existing Forestry Management Plan that was prepared for City-owned land around Rochester Reservoir. This will trigger an annual forestry plan to target regular harvests to ensure the overall health of the forests. Part of the work would address invasive species that have been identified.

#### **Background:**

We located a Forest Management Plan that was prepared for Rochester Reservoir back in 2011 (cover sheet attached). The report recommended an ongoing harvest strategy for land around the Reservoir, which included eradication of identified invasive species. However, it doesn't appear anything was carried forward for action.

In meeting with the Forester that prepared the Management Plan, Charlie Moreno, he indicated that the City used to oversee forestry operations back in the early 1990's. It doesn't appear much, if anything, has occurred since.

Existing staff would like to implement an active Management Plan that would bring back some tree harvesting. Light cutting every 15 to 20 years can greatly enhance the health of a forest. It also eliminates the potential for dead timber that can be a fire hazard. Hardwoods can be selectively cut with a focus on encouraging softwood growth. This helps eliminate seasonal tannins in the water from leaves falling into the reservoir.

After the initial Management Plan is prepared, it is expected that ongoing revenue from harvest operations would be more than sufficient to cover expenses for assistance in monitoring and implementing the harvests. Annual work might include routine blazing and marking of property boundaries, along with regular inspections for identifying invasive species.

Lewiston-Auburn, Maine managed annual forestry operations on 2,000 acres of land in the public drinking water supply watershed and they could generate as much as \$20,000 annually in harvest revenues. Cuts were relatively light and modest, not focusing on bottom-line revenues. Annual expenses might run \$5,000 for ongoing assistance and oversight by a licensed Forester.

# **FOREST MANAGEMENT PLAN**

*for the*

## **ROCHESTER RESERVOIR FOREST**

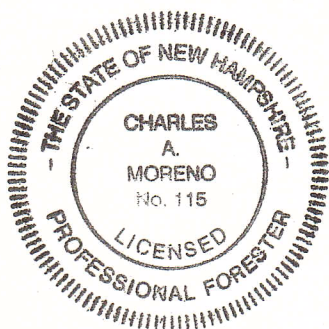
**Rochester & Barrington, New Hampshire**  
**197.5± acres**



**Prepared for Landowner:**  
**City of Rochester**  
**31 Wakefield Street**  
**Rochester, NH 03867**

**Prepared by:**  
**Charles Moreno, LPF**  
**Moreno Forestry Associates**  
**PO Box 60, Center Strafford, NH 03815**  
**(603) 335-1961**

**June 30, 2011**



**Charles Moreno, NH LPF #115**  
**Consulting Forester**  
**Moreno Forestry Associates**



**FY17 Proposed Paving List**
**Revision Date: 5/11/2016**

Street Name	Cost Estimate	Cumulative Total	Last Paved	Comments
Whitehouse Road	\$500,000	\$500,000	1990 (est.)	
Lowell Street (Hillside - Tebbetts)	\$300,000	\$800,000	2005	previously proposed (FY15 estimate)
Add Lowell St. (Hillside - Harding)	\$180,000	\$980,000		
Add Lowell St. (Harding - Columbus)	\$55,000	\$1,035,000		

\$861,000

FY16 Projected Carryover: \$ 174,000  
 City Manager recommended FY17 CIP: \$ 800,000  
 Total Projected Available Funds: \$ 974,000

**Would need FY17 Appropriation of \$806,000 to complete Lowell from Hillside to Harding**

**Would need FY17 Appropriation of \$861,000 to complete Lowell from Hillside to Columbus (final section)**

**Future Consideration - Paving List**

Columbus Ave./Old Dover Rd. Intersection	\$85,000	\$1,120,000	'02/'05/'06	previously proposed (FY16 estimate)
Hansonville Rd. (Including portion of Flagg Rd.)	\$400,000	\$1,520,000	2001/2002	previously proposed (FY16 estimate)
Tebbetts Road (portions Lowell St. to Rte. 108)	\$125,000	\$1,645,000	2004	previously proposed (FY15 estimate)
Woodside Lane	\$305,000	\$1,950,000		
Union Street Municipal Parking Lot	\$140,000	\$2,090,000		previously proposed (FY16 estimate)
City Hall Municipal Parking Lot	\$100,000	\$2,190,000		previously proposed (FY16 estimate)
Sheepboro Road	\$210,000	\$2,400,000	2006	previously proposed (FY13 estimate)
Weeping Willow Drive	\$70,000	\$2,470,000	2004	previously proposed (FY16 estimate)
Eastern Avenue (Allen St. to Fieldstone Ln.)	\$275,000	\$2,745,000	2003	previously proposed (FY16 estimate)
French Hussey Road	\$75,000	\$2,820,000	1990 (est.)	previously proposed (FY16 estimate)
Sullivan Farm Drive	\$125,000	\$2,945,000	2005	previously proposed (FY16 estimate)
Four Rod Road	\$500,000	\$3,445,000	2012 shim	previously proposed (FY13 estimate)
Jackson Street	\$65,000	\$3,510,000	1990 (est.)	previously proposed (FY15 estimate)
Rockledge Road	\$78,000	\$3,588,000	2003	previously proposed (FY14 estimate)
Boulder Avenue	\$64,000	\$3,652,000	2003	previously proposed (FY14 estimate)
Conifer Circle	\$48,000	\$3,700,000	2004	previously proposed (FY14 estimate)

Total: \$5,648,000

**Other Options:**

Myrtle Street	\$50,000		1990 (est.)	Mill & Overlay only. Future project area.
Woodman Street	\$45,000		1990 (est.)	Mill & Overlay only. Future project area.
	\$25,000			Pavement Shim only (no cold-plane/mill).



## Public Works & Buildings Committee May 19, 2016 Agenda Item

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### **Agenda Item #9 – Follow-up on last month CIP questions – TIF's**

#### **Summary:**

The draft FY17 CIP's had 2 large projects included in possible TIF funding: \$1.1 million in Granite Ridge for the Rt 11 wastewater pump station upgrade; and \$1.4 million in Granite State Business Park for a water main loop to Whitehall Road.

I included the projects in the TIF Districts, but misunderstood the financial operation of the districts. I thought money had been allocated for public improvements within the boundaries of the districts, such that money was on hand that actually had to be spent on municipal improvements.

The projects can be pulled from the TIF Districts. The recommendation moving forward would be to include the Rt 11 Pump Station into the ongoing wastewater Pump Station Replacement Program. Attached is a summary sheet that highlights prospective milestones for upgrading the various pump stations (PS's). River Street PS would simply slide ahead of Rt 11 PS by one year. Salmon Falls Road, Lowell Street and Tara Estates would follow sequentially.

At this time, we could potentially hold off on the Water Main Loop for the Granite State Business Park. Additional expansion or a new facility in the Park could be the catalyst for finally moving forward. There are slightly higher priorities that we recommend occur first.

#### **Background:**

The Water Main Loop for the Granite State Business Park has been a high priority for a few years. A memo from the previous Public Works Director is attached from August 2014. The memo references a Technical Memo prepared by Wright-Pierce Engineers that highlights several concerns about available fire flows to the Business Park, as well as deficiencies with system redundancies.

There are significant concerns about how the water system will perform during operations to fight a large scale fire.

But when factoring budget constraints, there are a few higher priority projects that are recommended to occur first. Money is proposed in the FY17 CIP Budget for continued work on source of supply. Groundwater exploration is recommended to continue and money is also being recommended for an overall augmentation of the supply capacity in Round Pond. The Round Pond project is broken into a few key segments. The first 2 fiscal years (FY 17 & FY18) include repairs to the transmission main that transfers water from the Berry's River impoundment to both Rochester Reservoir and Round Pond. In the second year (FY 18), money is also included to begin permitting and design for the additional impoundment on Round Pond. Proposed construction would occur in FY19.

Two other top priorities include upgrades to the Low Lift Pump Station which supplies raw water up to the treatment plant. While the treatment plant is rated for a 4.5 million gallons per day (mgd) capacity, the raw water pump station is limited to about only 3.9 mgd due to older, worn pumps. We have also included a small allowance to Evaluate the Alum Sludge Line. This is a dedicated backwash line that sends chemically-conditioned filter backwash waste down to the wastewater treatment plant. There have been recent breaks on the sludge line. S.U.R. Construction made another repair about 2 weeks ago. The integrity of the sludge line is essential for the operation of

the water treatment plant. Without the sludge line functioning properly, there would be no way to properly run and backwash the treatment plant filters. Using a human analogy, it is an extremely critical artery to maintaining the water supply operations.

Sort of on par with the Granite State water main loop would be the continuation of neighborhood improvement projects. Money is currently proposed in the FY17 CIP to continue with the next phase of 2 large projects. One is the continuation of the Franklin/Western Street project – which is currently out to bid. The other is the continuation of the Woodman/Myrtle Area Reconstruction. Improvement of the water mains in these areas is critical for improved water quality, fire suppression, and the streets shouldn't be paved until the underlying infrastructure is addressed.

## **Prioritized Pump Station Upgrade & Expansion**

Below is a list of all City owned pump stations prioritized for upgrade and/or expansion work.

The estimated costs below are based on historical data from previous pump station upgrades and are in today's dollars. The estimated cost includes 15% for engineering and 10% for contingency. Construction and engineering costs for projects are increasing and the costs below will need to be updated as additional data becomes available. The NH DES made several significant changes to the design requirements for pump stations which went into effect in late 2015.

Engineering costs will fluctuate based on the complexity of the design as well as the funding source. If project is funded through the NH DES State Revolving Fund (SRF), engineering costs are higher due to the requirements associated with SRF funding, such as tracking wage rates, tracking the source of iron and steel products, additional levels of review, SRF disbursement paperwork and project closeout paperwork.

Pump station upgrades include engineering reviews and recommendations for improvements to the following:

- Pump station flow capacity;
- Pump evaluation and sizing;
- Wet well and force main sizing;
- Standby power generator size, if equipped, or need for standby power;
- Electrical power and control systems.

The engineering review addresses current code requirements (NFPA, NEC, Life Safety) and NH DES design requirements.

The design of each pump station is different, and there is no "cookie cutter" formula that can be applied. For example, on the New Route 125 pump station upgrade, the existing wet well was used as part of the new design, but for the Western Avenue pump station upgrade, the existing pump station will be completely demolished and a new station will be constructed.

Pump station upgrades (and capacity expansion, if necessary) include new pumps, control systems and new standby power generators (if equipped). If necessary, other improvements may include; new wet wells, new force mains, cleaning structures, new valve vaults, new control buildings, new flow metering systems, and site improvements (i.e. new fencing). Prior to any pump station upgrade work the City also has the land surveyed and a full property record search is conducted.

The order of priority listed below is based on condition of station, flow rate and age. Engineering design criteria is based on 20 to 30 year equipment life expectancy. The list below must be flexible due to changes in pump station condition and/or requirements for

additional flow capacity. Ongoing inspection, evaluation and reprioritizing are critical to the program's effectiveness.

Additionally, coordination of pump station upgrades with street rehabilitation and infrastructure replacement projects is key to keeping overall costs in check (i.e. Franklin Street/Western Avenue PS).

General Guideline – estimation only:

- 1) Small submersibles (under 150 gpm/no gen set) \$250,000.
- 2) Mid-Range (150 to 500 gpm/gen set/building) \$750,000
- 3) Large (500 gpm and above/gen set and building) \$1,000,000


<u>Pump Station (Org Date in Service)</u>	<u>Last Upgrade/Expansion</u>	<u>FY Upgrade</u>	<u>Estimated Cost</u>
Western Avenue (1977)	1977	2016	\$1,000,000
Route 11(1990)	1990	2017	\$1,000,000
River Street (1989)	1989	2018	\$1,000,000
Salmon Falls Rd (1990)	1990	2019	\$1,000,000
Lowell Street (1989)	1989	2020	\$750,000
Tara Estates (1987)	1987	2021	\$750,000
Ledgeview (1987)	1987	2022	\$750,000
Ryan Circle (1989)	1989	2023	\$750,000
Airport Drive (1996)	1996	2024	\$1,000,000
Ray Drive (1990)	1990	2025	\$750,000
Community Center (1988)	1988	2026	\$750,000
Capital Circle (1989)	1989	2027	\$ 750,000
Old Route 125 (1974)	1999 (wet well 1974)	2028	\$1,000,000
Thomas Street (1987)	1999 (wet well 1999)	2029	\$1,000,000
Chestnut Hill Road (2005)	2005 (wet well 2005)	2030	\$750,000
Front Street ER (1970)	2006 (wet well 197)	2031	\$1,000,000
South Main Street (2008)	2008 (wet well 2008)	2032	\$1,000,000
Main Street ER (2008)	2008 (wet well 2008)	2033	\$750,000
Washington Street (2009)	2009 (wet well 2009)	2034	\$1,000,000
Norway Plains (2006)	2006 (wet well 2006)	2035	\$750,000
Matildas Way (2008)	2008 (wet well 2008)	2036	\$750,000
Sterling Drive (2009)	2009 (wet well 2009)	2037	\$250,000
Innovation Way (2012)	2012 (wet well 2012)	2038	\$750,000
Weeping Willow (1992)	2013 (wet well 1992)	2039	\$250,000
Autumn Street (1990)	2013 (wet well 1990)	2039	\$250,000
Kirsten Avenue (1990)	2013 (wet well 1990)	2039	\$250,000
Sawyer Avenue (1990)	2013 (wet well 1990)	2039	\$250,000
New Route 125 (1987)	2015 (wet well 1987)	2040	\$1,000,000



**City of Rochester  
Dept of Public Works**

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Phone: (603) 332-4096  
Fax: (603) 335-4352

# Memo

**To:** Public Works and Buildings Committee   
**From:** Peter Nourse, Director of Public Works  
**CC:** Daniel Fitzpatrick, City Manager, Blaine Cox, Deputy City Manager,  
Karen Pollard, Economic Development, Chief Norman Sanborn, RFD  
**Date:** 13 August 2014  
**Re:** Granite State Business Park – Water Distribution Interconnection  
Analysis

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1. I bring to your attention my concern regarding water supply and particularly the available fire flow at this park. I recently directed Wright-Pierce engineers to evaluate several computer modeled scenarios where parts of the existing water storage/delivery system would fail to determine the subsequent firefighting and domestic/process effects on the business park, and, the same scenarios and their effect on the business park with a hypothetical redundant interconnect.
2. The computer model predicted that an emergency break to the single water supply line under Rt. 108, or beneath Airport Dr. between Rochester Hill Tank and the Safran complex, or a failure of the Rochester Hill Tank, or when Rochester Hill Tank would next need to be taken off-line for maintenance, would present a situation where there would be inadequate flow for firefighting at the Safran complex, and for other users' domestic/process or firefighting uses. A failure of the Richardson St. booster pumps alone would result in just meeting the Safran firefighting demand but leaving little water for other park users' firefighting and domestic/process uses.
3. Further, with no equipment failures and the Safran complex under firefighting operations, there is little capacity for additional water use by existing users, or for the park should it expand and additional users come on line. Increased domestic/process consumption by existing users, or park expansion with new

users will cause a dangerous drop in pressure below the minimum required should the Safran complex require firefighting supply.

4. Wright-Pierce examined multiple interconnect alternatives which would provide redundant water supply creating sufficient firefighting flow for Safran complex, while simultaneously providing capacity at sufficient pressure for other users in the park. The least costly and most promising is the proposed interconnect from Whitehall Rd. down Shaw Dr. connecting to the existing water main at the end of Airport Dr.
5. Aside from firefighting, a redundant interconnect should also be considered for domestic uses and process efficiency. With the Whitehall interconnect, available water to the park increases 60% under non-firefighting, regular use conditions.
6. Without a redundant water supply interconnect, the Safran complex and other park users risk a potential of inadequate firefighting supply. If the tank or the delivery line fails, Safran and all other park users do not have adequate firefighting supply. If there are no system failures and there are multiple facility fires to include Safran, it is likely that no one has adequate firefighting supply. From an available fire flow perspective, a redundant interconnect is highly recommended under existing conditions and is absolutely necessary for any park expansion.

Enclosure: Technical Memo, Wright-Pierce, 7/29/14: Granite State Business Park –  
Water Distribution Interconnection Analysis



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TO: Peter Nourse, PE                      DATE: 7/29/2014

FROM: Christopher Silke, PE              PROJECT 12586A  
Dylan Thisse, EIT                      NO.:

SUBJECT: Granite State Business Park - Water Distribution  
Interconnection Analysis

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While the Rochester Hill Tank was offline for repairs and re-painting, concerns mounted over the hydraulic capacity of water main serving the Granite State Business Park. Safran, Inc. constructed a nine (9) acre manufacturing facility with a highly sophisticated fire suppression system. At the heart of the Safran fire suppression equipment is a NFPA 20 certified pump designed to deliver 2,300 gallons per minute. Wright-Pierce intervened to manage the City's surveillance of line pressure in the Rochester Hill pressure zone during a fire pump certification test by Hampshire Fire and City / State officials. Our staff also ran several hydraulic model scenarios to evaluate feasible alternatives that would increase the business park estimated available fire flow (EAFF) while sustaining a minimum 20 psi line pressure or more throughout the Rochester Hill service area. Interconnecting the water main in the Granite State Business Park with a second water distribution line will provide redundancy and increased capacity to this area in the event a shutdown is necessary for leak repairs, the 1.0 million gallon tank is offline for maintenance, new connections or other emergencies that would disrupt water service to this vital economic area of the City.

**Need for Redundancy**

An existing 12" ductile iron (DI) water main running along Route 108 to Airport Drive is currently the only water source for multiple large industrial buildings in the Granite State Business Park. The infrastructure providing pressure and flow to the customers in the pressure zone is comprised of Rochester Hill storage tank, 12" ductile iron water main, Richardson St. Booster pump station and Salmon Falls Booster pump station. The water main running along Airport Drive (Granite State Business Park) is currently a dead end with no interconnection to another source of flow in the Rochester water system. An emergency break repair or maintenance on the section of water main between the Rochester Hill tank and the business park would put the manufacturing facilities in a vulnerable position of no fire protection and impact process / domestic water use.

Memo: Peter Nourse, P.E.

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#### **Need for Additional Flow**

Currently, there is very little additional capacity for additional water usage demand to further expand the business park and maintain the required minimum 20 psi within the pressure zone during a fire flow event. The New Hampshire Department of Environmental Services (NHDES), through their adoption of the Recommended Standards for Water Works (10 States Standards), requires a minimum 20 psi at ground level throughout the distribution system during all flow conditions. If the business park continues to expand, increasing normal water demand in this area, residual pressure will drop below 20 psi during a fire flow event at Safran. With the Rochester Hill tank online and level within the recommended range of operation, residual pressure at Albany International Corporation dropped to 20 psi while running the Safran Fire Pump at the required discharge of 2,300 gpm. Also, if the Rochester Hill tank was taken offline for repairs or maintenance, either or both of the Richardson St. booster pumps fail, if the Salmon Falls booster pump station was to run on a jockey pump during an emergency, or if any combination of these events occur, the EAFF at the Safran facility will fall below the sprinkler system permit requirements for occupancy and pressure within the service area will decrease below the required minimum 20 psi.

An interconnection, as discussed in the scenarios below, would provide redundancy in the system, allow for additional water demand capacity and increase the EAFF to the business park. Multiple interconnection options were evaluated under a variety of input boundary conditions to compare existing system fire flows versus interconnect fire flows (Table 1).

#### **Option 1- Shaw Drive Interconnect**

A 14" High Density Polyethylene (HDPE) water main would be connected to the existing 12" DI main at the intersection of Whitehall Road and Shaw Drive. The main would be installed along Shaw Drive and an unpaved road extending from Shaw Drive. HDPE water main would be inserted through a 36-inch steel casing pipe jacked under the active rail bed and intersecting an abandoned roadway. The water main would then run southeasterly parallel to the existing utility right of way adjacent to the rail bed until entering a parcel owned by Albany International, Inc. The water main would be reduced to 12" ductile iron pipe prior to bury within the parking lot and re-connect to the existing water main nearby the Albany building. Total length of new water main installed would be approximately 4,500 LF. The estimated total project cost of Option 1 is approximately \$1,160,000. Engineering and Project Contingency are factored at 15% each in the total cost.

#### **Option 2A - Somersworth Interconnect**

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A 12" DI water main would be connected to the Somersworth water system at the intersection of Route 108 and Hideaway Place. The water main would then be installed along Route 108 until it is connected to the Rochester system at the intersection of Route 108 and Airport Drive. A booster pump station would be necessary to overcome the hydraulic grade line differential between Rochester and Somersworth water storage tanks. A booster pump station would increase flow and line pressure to the business park. Total length of new water main installed would be approximately 4,000 LF. The estimated total project cost of Option 2 is approximately \$1,450,000. Engineering and Project Contingency are factored at 15% each in the total cost.

#### **Option 2B - Somersworth Interconnect Alternate**

An alternate was also priced out to include upgrading approximately 1,600 LF of existing 8" asbestos cement pipe to 12" ductile iron pipe in the Somersworth system at the interconnection point. This would mitigate the loss in normal EAFF in the Somersworth system at the interconnection point as well as mitigate any capacity issues to the booster pump station created by the existing 8" main. The total length of new water main installed if this alternate is added to Option 2 would be 5,600 LF. The estimated total project cost of Option 2B is approximately \$1,878,000. Engineering and Project Contingency are factored at 15% each in the total cost.

#### **Hydraulic Modeling**

Using the City's hydraulic model and field gathered data, we previously evaluated EAFF at the Safran facility under multiple operational conditions that will not lower pressures below 20 psi in the Rochester Hill Service Area (Table 1 - Existing Conditions). Again, required fire flow at the Safran facility is 2,300 gpm for the fire pump and sprinkler system (Fire Flow Tests Performed at the Granite State Business Park- summer 2013).

The modeled scenarios include a range of potential conditions that can affect the EAFF at Safran's facility. Under fully operational existing conditions (Table 1 - Scenario 1) the EAFF at the Safran building is 2,700 gpm @ 20 psi. Pressure at the more elevated parcels in the business park would be lower than 20 psi. Realistic worst case events would be if the Rochester Tank was to fail/ require maintenance or the Richardson Street booster pump station was offline (Table 1 - Scenario 2 and 3). The controlling scenario occurs when Rochester Hill tank is offline. Under that circumstance the EAFF drops to 1,500 gpm, well below the required fire flow.

Option 1 will increase the EAFF under normal operating conditions to over 4,000 gpm at the Safran facility (Table 1 - Scenario 4). In a worst case

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scenario (Table 1 - Scenario 6) the EAFF at the Safran facility would be increased to 2,400 gpm.

Option 2 will increase the EAFF under normal operating conditions to 3,700 gpm at the Safran facility (Table 1 - Scenario 7). In a worst case scenario (Table 1 - Scenario 9) the EAFF would be increased to 3,000 gpm, which is 700 gpm higher than the required fire flow. The alternate (replacing Somersworth 8" asbestos cement pipe with 12" ductile iron water main would slightly lift the fire flow delivery to Safran, Inc. but would increase the EAFF at the Somersworth interconnect location (intersection of Route 108 and Hideaway Place) from 400 gpm to 1,200 gpm. A Somersworth upgrade of water distribution main would enhance EAFF on the suction side of a proposed booster pump station.

#### Recommendations

- 1.) Option 1 - Installation of a 14" HDPE interconnection along Shaw Drive, is recommended to increase the available flows to the Granite State Business Park and create redundancy in the Rochester Hill Service Zone.

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Table 1

Estimated Available Fire Flows at the Granite State Business Park

Scenario Description	Estimated Available Fire Flow (gpm @ psi)*
<b>EXISTING CONDITIONS</b>	
Scenario 1: Existing Conditions Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Online</b>	2,700 @ 20
Scenario 2: Existing Conditions Richardson St Pumps <b>Offline</b> ; Rochester Hill Tank <b>Online</b>	2,650 @ 20
Scenario 3: Existing Conditions Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Offline</b>	1,500 @ 70
<b>WITH SHAW DRIVE INTERCONNECTION- Option 1</b>	
Scenario 4: W/14" DIPS HDPE Shaw Dr. Interconnect; Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Online</b>	4,300 @ 20
Scenario 5: W/14" DIPS HDPE Shaw Dr. Interconnect; Richardson St Pumps <b>Offline</b> ; Rochester Hill Tank <b>Online</b>	3,500 @ 75
Scenario 6: W/14" DIPS HDPE Shaw Dr. Interconnect; Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Offline</b>	2,400 @ 70
<b>WITH SOMERSWORTH INTERCONNECTION- Option 2</b>	
Scenario 7: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; No 8" to 12" Somersworth Main Upgrade; Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Online</b>	3700 @ 20- at Safran 425 @ 20 at 12" interconnect
Scenario 8: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; No 8" to 12" Somersworth Main Upgrade; Richardson St Pumps <b>Offline</b> ; Rochester Hill Tank <b>Online</b>	3700 @ 20- at Safran 400 @ 20 at 8" interconnect
Scenario 9: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; No 8" to 12" Somersworth Main Upgrade; Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Offline</b>	3000 @ 45- at Safran 1200 @ 20 at 8" interconnect
<b>OPTION 2 WITH ALTERNATE</b>	
Scenario 10: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; 8" to 12" Somersworth Main Upgrade; Richardson St Pumps <b>Online</b> ; Rochester Hill Tank <b>Online</b>	3800 @ 20- at Safran 1200 @ 23 at 12" interconnect
Scenario 11: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; 8" to 12" Somersworth Main Upgrade; Richardson St Pumps <b>Offline</b> ; Rochester Hill Tank <b>Online</b>	3800 @ 20- at Safran 1200 @ 23 at 12" interconnect

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Scenario 12: W/12" DI Interconnect W/Somersworth; 1000 gpm Booster Station; 8" to 12" Somersworth Main Upgrade; Richardson St Pumps Online; Rochester Hill Tank Offline	3150 @ 45- at Safran 2000 @ 23 at 12" interconnect
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\*Modeled available fire flows do not reduce pressure at the hydrant below 20 psi or pressure within the service zone below 20 psi. Listed flows are instantaneous values and do not reflect any required duration. All scenarios assume Salmon Falls booster pump station is online. For all scenarios where the Rochester Hill Tank is offline, the location of the limiting zone pressure is at the Rochester Hill Tank site.