

## MEMORANDUM

**TO:** Erin Holmes, P.E. and Michael Unger, P.E.  
**FROM:** Jeff McClure, P.E., Jeff Provost, P.E.  
**DATE:** January 4, 2019  
**SUBJECT:** Regional Supply Basis of Design - FINAL

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The purpose of this memorandum is to summarize the basis of design for the Southern New Hampshire Regional Water (SNHRW) project. The project identified how to transmit water supply from Manchester Water Works (MWW) to meet domestic water demands in the towns of Windham, Salem, Atkinson, Hampstead and Plaistow. Two supply volumes from MWW were to be assessed as part of this project; 1.0 million gallons a day (MGD) defined as Phase I flows and 3.13 MGD defined as Phase II flows. The following provides a summary of the basis of design.

### **PREVIOUS WORK**

The following is a listing of all reports that were developed as part of the SNHRW project.

#### Weston & Sampson Reports

- Town of Windham, NH – Route 111 and Salem Extensions, DES Site Name: Exit 3 Water Main Extension, DES Site No. 201605008 dated April 5, 2017
- Southern New Hampshire Regional Water Main Extension Alternatives - DES Site #201605008 dated April 21, 2017
- Town of Salem Water Supply Study dated February 20, 2018
- Plaistow & Haverhill Interconnection Report Review, Regional Water Main Options, DES Site #201605008 dated March 27, 2018
- Town of Derry, NH – Derry Water System Alternatives Analysis dated June 5, 2018
- Route 111 Water Main Extension Study – Routing Memo dated July 16, 2018
- Field Testing Program Technical Results dated August 2, 2018
- Town of Plaistow, NH – Proposed Potable Water System Basis of Design for Appropriation Budgeting – Final dated October 24, 2018
- Route 28 Water Main Design – Preliminary Design Report - Draft dated November 30, 2018
- HAWC Chloramine Study, DES Site #201605008 - Draft dated November 2, 2018
- Manchester Water Works Hydraulic Modeling Results dated January 2019 - Pending

- Water Rate Cost of Service Study, DES Site # 201605008 – Southern NH Regional Water Supply Options Report – Draft dated November 30, 2018

Underwood Engineers Inc. Reports

- Hydraulics and Alternatives Analysis – East Derry Route – Plaistow Water Feasibility Study dated December 22, 2017
- Water Supply Improvements Phasing – Plaistow Water Feasibility Study dated January 9, 2018
- Water Supply Option from Haverhill – Plaistow Water Feasibility Study dated February 20, 2018
- Peer Review – Derry Water System Alternatives Analysis – Regional Water Supply dated September 12, 2018
- Design of Plaistow Regional Water Improvements – Final dated November 16, 2018

**Normandeau Associates Reports**

- Town of Plaistow Potable Water Supply Feasibility Study Summary Report, NHDES Site # 198903017, Plaistow Lido, MtBE dated April 4, 2016
- Potable Water Supply Feasibility Study Phase II Technical Submittal, Plaistow Lido, MtBE, NHDES Site # 198903017 dated March 27, 2017

Wright Pierce Reports

- Water Interconnection Study for the City of Haverhill, MA Water Division dated January 2018.

CDM Smith Reports

- Salem/Methuen Interconnection Evaluation – Phase 1 dated March 26, 2018

Town of Plaistow Reports

- Plaistow, NH – Potable Water User Rates & Needs Assessment dated December 14, 2017 (Confidential)

Hampstead Area Water Company, Inc. Technical Documents

- Proposed Page Farm Water Tank Site – Hampstead Area Water Company dated January 9, 2018 and May 8, 2018

**DEMANDS/FLOWS**

The initial basis of the demand allocation to each water system/community was developed in the April 21, 2017 Southern New Hampshire Regional Water Main Extension Alternatives memo by Weston & Sampson. The initial, estimated Maximum Day Demand (MDD) and brief basis for the demand is summarized in Table 1:

**TABLE 1**  
**ORIGINAL ESTIMATED MAXIMUM DAY WATER DEMAND APPROPRIATIONS – April 21, 2017**

<b>Water System</b>	<b>Estimated Maximum Day Demand (MGD)</b>
Windham – Exit 3 Area	0.3
Salem Public Water System	1.0
HAWC Water System	0.25
Plaistow	0.5
<b>Total</b>	<b>2.05</b>

- **Windham – Exit 3 Area:** Provide a maximum day demand of 0.3 MGD to supply the MTBE affected Klemm's Mobil property, as well as the existing W&E water system operated by Pennichuck Water Works (PWW) since the MTBE bureau has also identified MTBE as being present in the W&E system [below the ambient groundwater quality standard (AGQS)].
- **Salem Public Water System:** Provide a maximum day demand of 1.0 MGD to offset the loss of the MTBE-contaminated Turner Campbell Well.
- **HAWC Water System:** Provide an initial maximum day demand of 0.25 MGD to the HAWC system to allow relief for the existing water supply system. HAWC has indicated that a future maximum day demand of approximately 0.5 – 0.75 MGD may be desired, however the final demand supplied to the system will be determined later.
- **Plaistow:** Provide an estimated future maximum day demand of 0.5 MGD. Future demand is approximately equivalent to the Phase 2 demand presented by Normandeau Associates in Table 1 of a March 27, 2017 report titled "Potable Water Supply Feasibility Study Phase II Technical Submittal". In that report, the Max Day demand estimate 10 years after the Plaistow potable water system is established is 0.557 MGD.

As the project developed from April 2017 to January 2018, the total MDD requested to serve the four water systems described above increased to 3.13 MGD from 2.05 MGD predominantly due to additional supply requested by Salem and HAWC. In Salem, the Tuscan Village development, among others, prompted a request for additional

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supply. In HAWC, there wasn't a particular development that prompted the additional supply request. Per the December 22, 2017 memo by Underwood Engineers, HAWC requested 0.5 MGD supplemental supply from the SNHRW project to meet the 10-year estimated maximum day demands in HAWC. From that same memo, HAWC also requested 1.0 MGD supplemental supply from the SNHRW project to meet the 20-year estimated maximum day demands in HAWC. The Windham demand estimate changed from 0.3 to 0.31 MGD because a transcription error was carried forward during MSDC estimating conducted in early 2018. From the March 27, 2017 Underwood report, the 10-year Max Day demand estimate for Plaistow was 0.557 MGD. However, a transcription error carried forward the value of 0.57 MGD and formed the basis of the 3.13 MGD total SNHRW Max Day demand estimate.

After review of the initial budgetary cost estimate to supply 3.13 MGD to the SNHRW project area, DES requested that the project be divided into two phases; Phase 1A (now referred to as Phase I) and Phase 1B (now referred to as Phase II), in order to reduce the initial capital cost of the project. Under Phase I, the total water supply into the regional system was limited to a total maximum daily flow of 1.0 MGD to serve the four water systems. The maximum amount of water MWW can deliver to the SNHRW project without a new water treatment plant (as of the writing of this memo) under the Merrimack Supply Development Charge (MSDC) program is approximately 1.0 MGD. Table 2 provides a breakdown of the Phase I and Phase II supply appropriations, as approved by DES.

**TABLE 2**  
**REVISED ESTIMATED MAXIMUM DAY WATER DEMAND APPROPRIATIONS – PHASE I & II**

Water System	Estimated Maximum Day Demand (Phase I)  (MGD)	Estimated Maximum Day Demand (Phase II)  (MGD)	Estimated Maximum Day Demand (Total)  (MGD)
Windham – Exit 3 Area	0.2	0.11	0.31
Salem Public Water System	0.3	1.2	1.5
HAWC Water System	0.25	0.5	0.75
Plaistow	0.25	0.32	0.57
<b>Total</b>	<b>1.0</b>	<b>2.13</b>	<b>3.13</b>

**SNHRW Supply Limitations**

The SNHRW supply conceptual design is based on supplying domestic demand only (no fire flow) to all end users defined in Table 2. The domestic demand provided will be to satisfy or supplement (depending on the user)

maximum day demands only, except for Windham where all conditions of domestic demand including peak hour, will be met with SNHRW supply.

Water storage tanks are present or are proposed as part of the SNHRW project in Salem, HAWC and Plaistow. Storage tanks, by definition, are designed to provide storage to meet peak hour demands in a water system. Since a water storage tank is not present or proposed under the SNHRW project for Windham, peak hour demands need to be satisfied via pumping capacity at the Rockingham Road Pump Station in Derry. The estimated peak hour demand for Windham under Phase I is 417 gpm. Upgrades to Rockingham Road Pump Station, however, should be limited to 1.0 MGD (694 gpm) capacity (for Phase 1 of the SNHRW project) because the impacts on the Derry water system were only evaluated for 1.0 MGD under Phase 1. Any additional SNHRW supply flow under Phase 1 could require additional upgrades to the Derry water system. During a peak hour event in Windham, storage tanks in Salem, HAWC and Plaistow should be able to meet domestic demand for all normal conditions of flow in those water systems while the peak hour demand in Windham is being satisfied by the Rockingham Road Pump Station. Back pressure sustaining valves or other flow control valves should be incorporated into the SNHWR designs to allow this hydraulic condition to occur. It should be noted that in addition to the SNHRW demand, the Rockingham Road Pump Station is satisfying all normal conditions of flow (including peak hour demands) and fire flow in South Derry.

Allocation of Design Flow per Each Component of Project

DES requested that each component of the project (e.g. booster pumping station, transmission main, pressure reducing valve, etc.) be listed with the design flow that the component would convey. The following tables represent the design flow conveyance through each project component for Phase I and Phase II. One element of the design basis for each component was to have "no regrets" of the component from Phase I to Phase II. Therefore, each component that is listed under Phase I of the project was sized to accommodate Phase II flows, too.

**TABLE 3  
CONVEYANCE OF FLOW THROUGH EACH PHASE I PROJECT COMPONENT**

<b>Water System</b>	<b>Phase I Component</b>	<b>SNHRW Design Flow Phase I</b>	<b>SNHRW Design Flow Phase II</b>
<b>Derry</b>	<b>Pump Station @ Derry/Londonderry town line*</b>	<b>1.0 MGD</b>	<b>3.13 MGD</b>
	<b>Upgrade Rockingham Road Pump Station*</b>	<b>1.0 MGD</b>	<b>3.13 MGD</b>
	<b>7,400 LF of 16-inch water main in Route 28 from end of existing Derry water system to Derry/Windham town line</b>	<b>1.0 MGD</b>	<b>3.13 MGD</b>

**TABLE 3 (cont.)  
CONVEYANCE OF FLOW THROUGH EACH PHASE I PROJECT COMPONENT**

<b>Water System</b>	<b>Phase I Component</b>	<b>SNHRW Design Flow Phase I</b>	<b>SNHRW Design Flow Phase II</b>
Derry (cont.)	Pressure Reducing Valve (PRV) and meter near Derry/Windham town line*	1.0 MGD	3.13 MGD
Pennichuck East Utility (PEU)	4,500 LF of 12-inch water main in Route 111 from Route 28 to Klemm's Mobil gas station	0.2 MGD	0.31 MGD
Salem	14,000 LF of 20-inch water main in Route 28 from Derry town line to Route 111 (in Windham)	1.0 MGD	3.13 MGD
	PRV and chemical feed station near Derry town line on Route 28 (in Windham)*	1.0 MGD	3.13 MGD
	Meter pit on Route 111 near Route 28 (in Windham)	0.2 MGD	0.31 MGD
	2,200 LF of 16-inch water main in Route 28 from Route 111 to Salem town line (in Windham)	0.8 MGD	2.82 MGD
	PRV near Salem/Windham town line*	0.8 MGD	2.82 MGD
	650 LF of 16-inch water main in Route 28 from Salem town line to the existing Salem water system	0.8 MGD	2.82 MGD
	1,100 LF of 12-inch water main in Shannon Road from end of Salem water system to Salem/Atkinson town line	0.5 MGD	1.32 MGD
HAWC	Pump Station and meter near the Salem/Atkinson town line on Westside Drive in Atkinson*	0.5 MGD	1.32 MGD
	600 LF of 12-inch water main in Westside Drive in Atkinson from proposed pump station to existing HAWC water system and 2,500 LF of 12-inch water main from proposed pump station to existing HAWC water system in Providence Hill Road near Atkinson Farm Road in Atkinson	0.5 MGD	1.32 MGD
	1.0 MG storage tank near Winslow Drive in Atkinson	0.5 MGD	1.32 MGD
	Chloramine conversion at Midpoint & Midpoint Island, Settlers Ridge Pope Road and Jameson Ridge well stations in Atkinson	0.25 MGD	
	Main Street PRV vault improvements in Atkinson*	0.25 MGD	0.57 MGD
	1,500 LF of 12-inch water main in Bryant Woods Road and East Road in Atkinson from end of HAWC water system to Atkinson/Plaistow town line	0.25 MGD	0.57 MGD
Plaistow	Pump Station and meter near Plaistow/Atkinson town line*	0.25 MGD	0.57 MGD

**TABLE 3 (cont.)**  
**CONVEYANCE OF FLOW THROUGH EACH PHASE I PROJECT COMPONENT**

<b>Water System</b>	<b>Phase I Component</b>	<b>SNHRW Design Flow Phase I</b>	<b>SNHRW Design Flow Phase II</b>
Plaistow (cont.)	2,900 LF of 12-inch water main in East Road from Plaistow/Atkinson town line to existing Plaistow fire suppression system	0.25 MGD	0.57 MGD
	5,300 LF of 12-inch water main in Sweet Hill Road from existing Plaistow fire suppression system to proposed tank site	0.25 MGD	0.57 MGD
	0.4 MG storage tank on Sweet Hill tank site	0.25 MGD	0.57 MGD
	2,300 LF of 8-inch water main in Westville Road from end of existing fire suppression system near Plaistow Road northeasterly for 2,300 feet.	**	**
	1,000 LF of 8-inch water main in Wentworth Avenue from end of existing fire suppression system westerly for 1,000 feet.	**	**
	Connections to MtBE contaminated parcels	N/A	N/A
	System Flushing & Disinfection	N/A	N/A

\* - Phase II improvements to include modifications/replacement of pumps, valves, etc. to accommodate the higher Phase II flows. Building footprint, pipe sizing, etc. was established in Phase I to accommodate Phase II improvements. Refer to Table 4 for listing of Phase II improvements.

\*\* - Improvements recommended to serve MtBE contaminated areas in Plaistow.

#### Phase II Water Main Routing Alternatives

Table 4 provides a listing of additional project components that would be necessary to convey 3.13 MGD through the Regional project area. It should be noted that the components listed in Table 4 represent one design concept alternative. Other Phase II alternative routes include, but are not limited to, the Warner Hill Loop in Derry, a Londonderry to Windham connection and an East Derry Route to HAWC.

**TABLE 4**  
**CONVEYANCE OF FLOW THROUGH EACH PHASE II PROJECT COMPONENT**

<b>Water System</b>	<b>Phase II Component</b>	<b>SNHRW Design Flow Phase II</b>
MWW	Upgrade Cohas Avenue Pump Station	3.13 MGD
	2,700 LF of 20-inch water main in Cohas Avenue from the pump station to Bodwell Road	3.13 MGD
Derry	Upgrade pump station at Derry/Londonderry town line	3.13 MGD
	2,000 LF of 24-inch water main in Manchester Road	3.13 MGD

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**TABLE 4 (cont.)**  
**CONVEYANCE OF FLOW THROUGH EACH PHASE II PROJECT COMPONENT**

<b>Water System</b>	<b>Phase II Component</b>	<b>SNHRW Design Flow Phase II</b>
<b>Derry (cont.)</b>	1,200 LF of 16-inch water main in Manchester Road	*
	4,200 LF of 12-inch water main between Manchester Road and Tsienneto Road tank	*
	1,300 LF of 12-inch water main in Rockingham Road	*
	12,300 LF of 16-inch water main in Rockingham Road	3.13 MGD
	Upgrade Rockingham Road Pump Station	3.13 MGD
<b>Salem</b>	Localized water main improvements (TBD)	TBD
	Localized water main improvements (TBD)	TBD
<b>HAWC</b>	2,700 LF of 12-inch water main in Westside Drive and Village Drive between Woodlock Park Lane and Wellington Circle in Atkinson	0.66 MGD

\* - Improvement recommended to allow 3.13 MGD to be conveyed through the Derry water system

#### **HYDRAULIC GRADE LINE**

In order to convey water from the source (MWW) to the end users (Windham, Salem, HAWC and Plaistow), an assessment of the hydraulic gradeline (HGL) in each existing and proposed water system was necessary. At the interface of each system, a pump station or a PRV was identified to allow conveyance of the design flow from one system to the next. Table 5 below and Figure 1 provide a summary of the HGL for each system.

**TABLE 5**  
**SNHRW HGL's**

<b>Water System</b>	<b>HGL (ft)</b>
MWW - Londonderry	480.6
Derry Main Service System	471
Derry – Rockingham Road Pump Station Service System	590 – 615*
Derry – Route 28 Reduced Pressure Area	TBD*
Salem & PWW (in Windham)	420*
Salem	346.5
HAWC Main Service System	437
HAWC – Bryant Woods Service System	260*



**TABLE 5 (cont.)  
SNHRW HGL's**

Water System	HGL (ft)
Plaistow	280*

\* - To be confirmed during final design

### **COSTS**

Budgetary costs estimates were developed for each component of each phase of the project. The costs presented in the tables below reflect what the current budgetary costs are for Phase I and Phase II for the SNHRW project. It should be noted that refinements in the conceptual design layout have occurred since the original budgetary cost estimates were established. Where different components are being proposed a new cost estimate is presented below.

**TABLE 6  
CURRENT BUDGETARY COST ESTIMATE - PHASE I**

Water System	Phase I Component	SNHRW Phase I Cost
Derry	Pump Station @ Derry/Londonderry town line	\$1,000,000*
	Upgrade Rockingham Road Pump Station	\$750,000
	7,400 LF of 16-inch water main in Route 28 from end of existing Derry water system to Derry/Windham town line	\$2,405,000
	Pressure Reducing Valve (PRV) and meter near Derry/Windham town line	\$850,000*
PEU	4,500 LF of 12-inch water main in Route 111 from Route 28 to Klemm's Mobil gas station (in Windham)**	\$1,215,000
Salem	14,000 LF of 20-inch water main in Route 28 from Derry town line to Route 111 (in Windham)	\$5,600,000
	PRV between Derry town line and Route 111 (in Windham)***	\$1,000,000*
	Meter pit on Route 111 near Route 28 (in Windham)	\$350,000*
	2,200 LF of 16-inch water main in Route 28 from Route 111 to Salem town line (in Windham)	\$715,000
	PRV near Salem/Windham town line	\$900,000*
	650 LF of 16-inch water main in Route 28 from Salem town line to the existing Salem water system	\$215,000
	1,100 LF of 12-inch water main in Shannon Road from end of Salem water system to Salem/Atkinson town line	\$300,000
HAWC	Pump Station and meter near the Salem/Atkinson town line on Westside Drive in Atkinson***	\$1,000,000*

**TABLE 6 (cont.)**  
**CURRENT BUDGETARY COST ESTIMATE - PHASE I**

<b>Water System</b>	<b>Phase I Component</b>	<b>SNHRW Phase I Cost</b>
HAWC (cont.)	600 LF of 12-inch water main in Westside Drive in Atkinson from proposed pump station to existing HAWC water system	\$165,000
	2,500 LF of 12-inch water main from proposed pump station to existing HAWC water system in Providence Hill Road near Atkinson Farm Road in Atkinson	\$675,000
	1.0 MG storage tank near Winslow Drive in Atkinson	\$1,130,000
	1,500 LF of 12-inch water main in Bryant Woods Road and East Road in Atkinson from end of HAWC water system to Atkinson/Plaistow town line	\$405,000
	Main Street PRV improvements	TBD
	Chloramine conversion improvements to Settler's Ridge Pope Road, Midpoint & Midpoint Island and Jameson Ridge well stations	\$300,000
Plaistow	Pump Station and meter near Plaistow/Atkinson town line***	\$850,000*
	2,900 LF of 12-inch water main in East Road from Plaistow/Atkinson town line to existing Plaistow fire suppression system	\$785,000
	5,300 LF of 12-inch water main in Sweet Hill Road from existing Plaistow fire suppression system to proposed tank site	\$1,435,000
	2,300 LF of 8-inch water main in Westville Road from end of existing fire suppression system near Plaistow Road northeasterly for 2,300 feet.	\$345,000****
	1,000 LF of 8-inch water main in Wentworth Avenue from end of existing fire suppression system westerly for 1,000 feet.	\$150,000****
	0.4 MG storage tank on Sweet Hill tank site	\$1,100,000*
	56 connections to MtBE contaminated parcels	\$560,000
	System Flushing & Disinfection	\$150,000

**TABLE 6 (cont.)  
 CURRENT BUDGETARY COST ESTIMATE - PHASE I**

<b>Water System</b>	<b>Phase I Component</b>	<b>SNHRW Phase I Cost</b>
Phase I Subtotal		\$24,201,500
Phase I Contingency (11.1%)		\$2,698,500
<b>Phase I Total</b>		<b>\$26,900,000</b>
Original Phase I Budget		\$26,900,000

\*Budgetary cost includes \$100,000 for land acquisition/easement costs. These costs are eligible for reimbursement upon approval by NHDES.

\*\*Project is eligible for reimbursement for cost of 12-inch pipe only. However, per the Route 111 Water Main Extension Study – Routing Memo dated July 16, 2018, 16-inch water main is recommended.

\*\*\*Budgetary cost estimate includes cost for backpressure sustaining valve and chemical feed equipment. Chemical feed equipment is TBD contingent upon the results of further water quality assessment.

\*\*\*\*Budgetary cost estimated by Weston & Sampson based upon available information provided by UEI

**TABLE 7  
 CURRENT DESIGN COST ESTIMATE – PHASE II\***

<b>Water System</b>	<b>Phase II Component</b>	<b>SNHRW Phase II Cost</b>
MWW	Upgrade Cohas Avenue Pump Station	\$920,000
	2,700 LF of 20-inch water main in Cohas Avenue from the pump station to Bodwell Road	\$1,080,000
Derry	Upgrade pump station at Derry/Londonderry town line	\$250,000
	2,000 LF of 24-inch water main in Manchester Road	\$900,000
	1,200 LF of 16-inch water main in Manchester Road	\$390,000
	4,200 LF of 12-inch water main between Manchester Road and Tsienneto Road tank	\$1,135,000
	1,300 LF of 12-inch water main in Rockingham Road	\$355,000
	12,300 LF of 16-inch water main in Rockingham Road	\$4,000,000
	Upgrade Rockingham Road Pump Station	\$250,000
	Localized water main improvements (TBD)	\$1,000,000
Salem	Localized water main improvements (TBD)	\$1,000,000

**TABLE 7 (cont.)  
CURRENT DESIGN COST ESTIMATE – PHASE II**

<b>Water System</b>	<b>Phase II Component</b>	<b>SNHRW Phase II Cost</b>
HAWC	2,700 LF of 12-inch water main in Westside Drive and Village Drive between Woodlock Park Lane and Wellington Circle	\$730,000
Phase II Subtotal		\$12,010,000
Phase II Contingency (15%)		\$1,801,500
Phase II Total		<b>\$13,811,500</b>

\*Costs for Phase II have not been considered, voted on, or approved by the DWG Advisory Commission. Phase II costs are for planning only. DES makes no commitment to funding Phase II at this time. Phase II improvements are not eligible for MtBE settlement funds since Phase I will address the MtBE impacts. In addition, the improvements listed in Table 7 represent one design concept for conveying 3.13 MGD through the Regional project area. Other possible alternatives for Phase II have been suggested including but not limited to the Warner Hill Loop in Derry, a Londonderry to Windham connection and an East Derry Route to HAWC.

**SCHEDULE**

The following is a conceptual Phase I project schedule based upon the current understanding of expected project completion dates.

**TABLE 8  
CONCEPTUAL PROJECT SCHEDULE - PHASE I**

<b>Water System</b>	<b>Project Deliverable</b>	<b>Date</b>
Derry	30% Design Completion	1/2019
	Final Design Completion	6/2019
	Construction Completion	6/2020
Salem/PEU	30% Design Completion	12/2018
	Final Design Completion	6/2019
	Construction Completion – Route 28 Water Main	6/2020*
HAWC	Construction Completion – PEU water main in Windham and work near Salem/Atkinson border	12/2020
	30% Design Completion	3/2019
	Final Design Completion	9/2019
Plaistow	Construction Completion	9/2020
	30% Design Completion	3/2019
	Final Design Completion	9/2019
	Construction Completion	12/2020

\*Date requested by DES to have SNHRW supply available at the Windham/Salem border

It is unknown when Phase II design and construction would be scheduled. For the purpose of this memo, we assume that the conceptual project schedule for Phase II will be determined at a later date.

### **RECOMMENDATIONS FOR FURTHER STUDY**

As part of the Phase I 30% design process, the following items should be further reviewed by the appropriate parties:

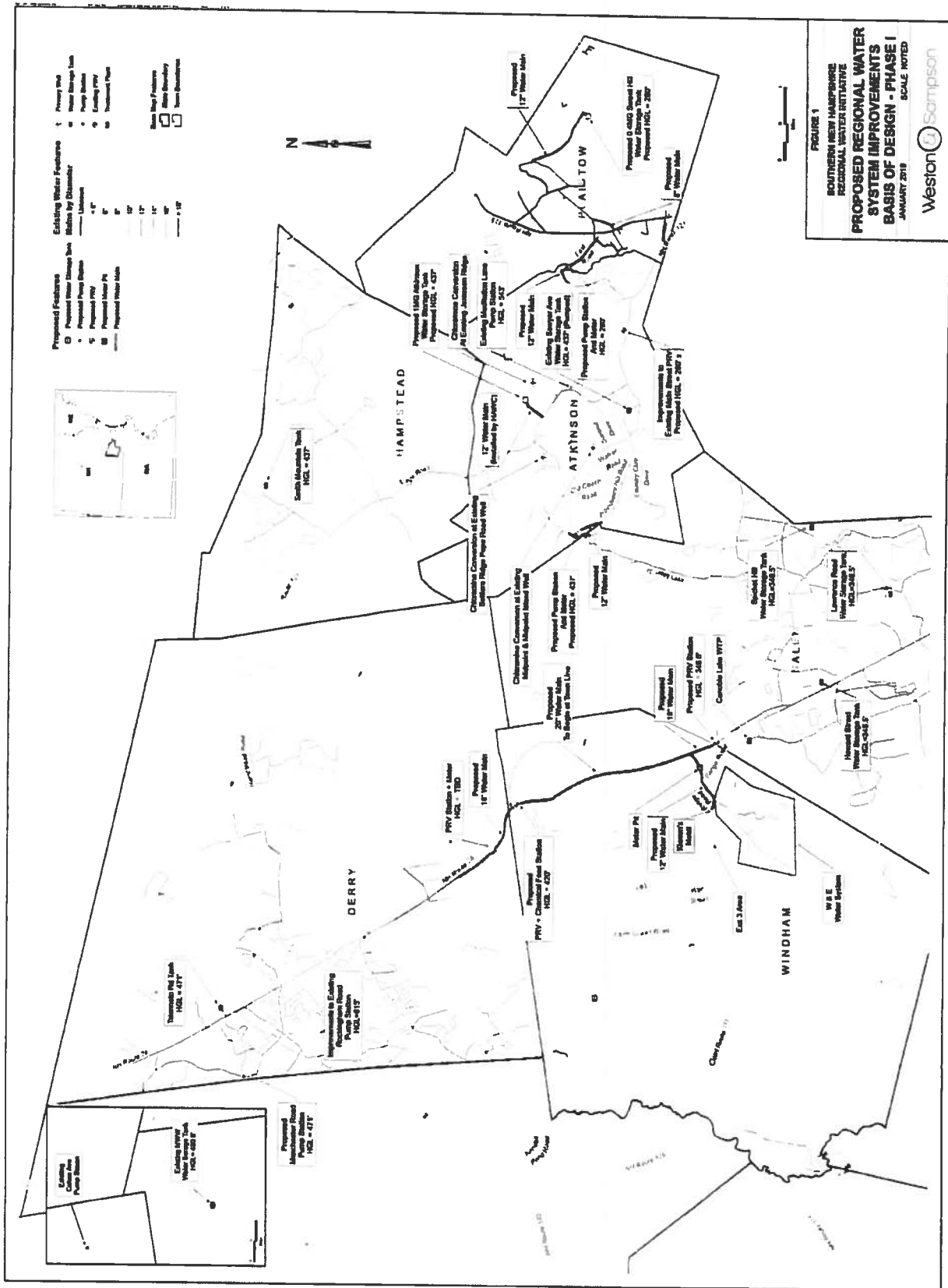
#### **Work in Progress**

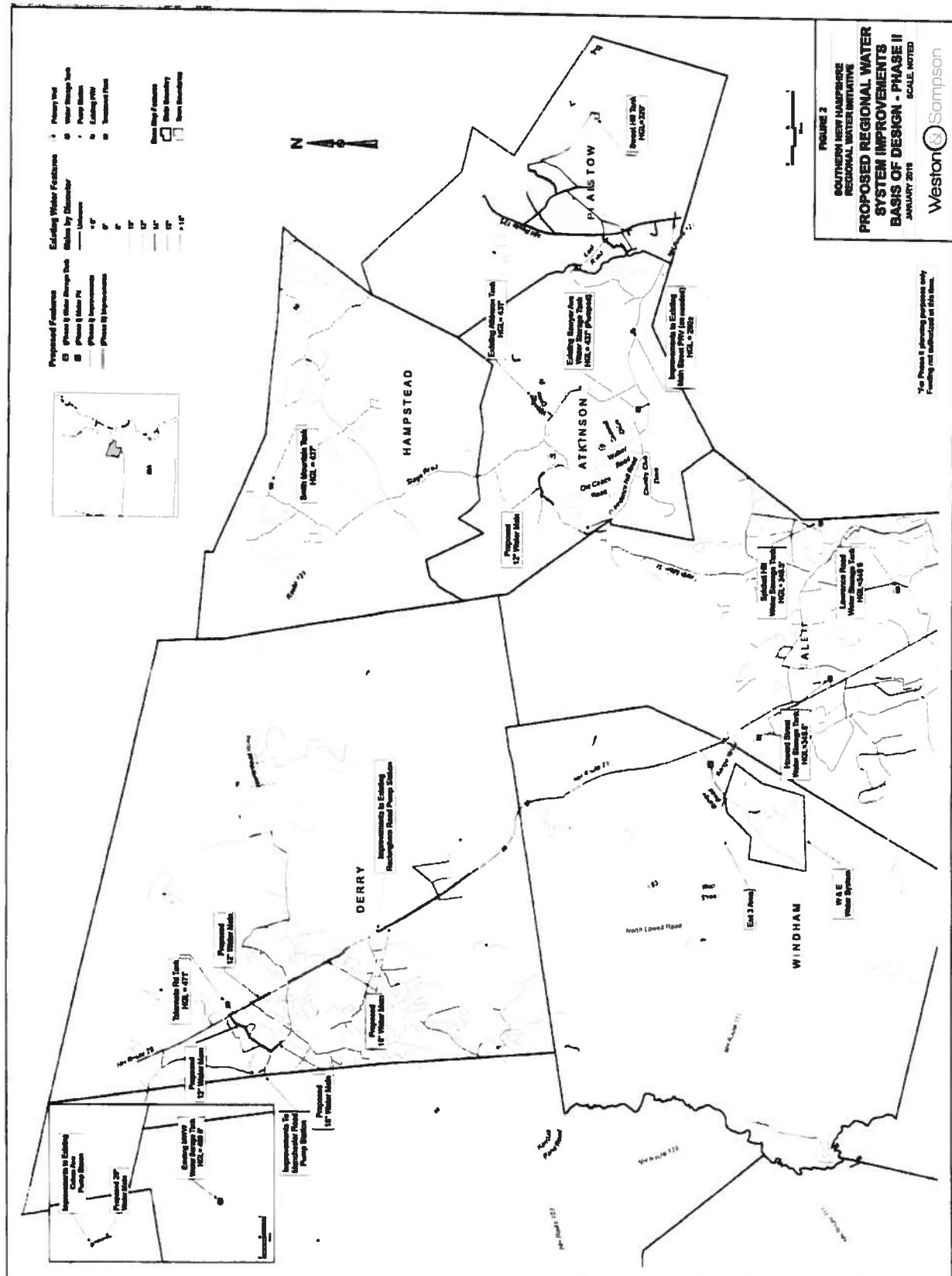
- Determine ownership and location of the pump station between MWW and Derry water systems (UEI);
- Determine the optimal location of the PRV on Route 28 in Derry (UEI);
- Determine the optimal location of the PRV on Route 28 in Windham (UEI and W&S discussing);
- Identify the local improvements necessary, if any, within the Salem water system (W&S);
- Identify if any chemical feed infrastructure is needed to adjust the water quality of MWW finished water prior to it mixing with Salem finished water (W&S);
- Determine the minimum daily flows that each partner in the Joint Public Works Agreement (JPWA) will be required to use to ensure proper turnover of water in the SNHRW project area;
- Identify if any improvements are needed at the existing Main Street PRV in Atkinson.

#### **Other Recommendations for Study (not currently under contract)**

- Conduct further analysis of the Bryant Woods service area in Atkinson. Identify if the limits of the service area could be modified to better serve the highest ground elevation water users in that area of the HAWC system;
- Conduct further analysis regarding disinfection byproduct and/or corrosion control issues derived from Salem/MWW finished water mixing with the HAWC finished water;
- Identify if any chemical feed infrastructure is needed to adjust the water quality of Salem/MWW finished water prior to mixing with HAWC finished water;
- Evaluate chemical feed needs at HAWC/Plaistow border;
- Evaluate impacts of project on disinfection byproducts and recommend updated DBP monitoring sites as appropriate;
- Prepare emergency response plans (water main break, pump failure, water quality issue, natural disaster, etc.

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# HAMPSTEAD AREA

## WATER COMPANY, INC

54 SAWYER AVENUE, ATKINSON, NH 03811

TEL: 603.362.4299 FAX: 603.362.4936  
www.hampsteadwater.com

**October 31, 2018**

Attn. Erin Holmes  
DWG Trust Fund Administrator

**RE: Request for funding to construct 1.0 million gallon water storage tank**

Dear Erin,

Please consider this letter and supporting information as Hampstead Area Water Company's (HAWC) request for funding under the NH DWG Trust Fund. The request is for a proposed 1.0 Million Gallon prestressed concrete water storage tank and associated site work to be constructed in Atkinson NH. The tank's location is commonly referred to as Jameson Ridge.

The proposed tank will serve a regional need for HAWC's existing core system of 2,525 water service connections which serve 6,205 residents as well as support a planned interconnection with the Plaistow, NH water system as part of a greater effort in providing clean drinking water to sites in Plaistow that have had their wells contaminated by MtBE.

Plaistow's current fire protection water system is in the process of being converted into a large community water system. Regional water studies funded by NH DES have shown this to be the most cost effective and practical approach to get clean drinking water to contaminated properties throughout Plaistow. Water will flow through the HAWC core system to the proposed Plaistow water system.

In converting Plaistow's fire system to a community water system, existing fire flows will still need to be maintained. Water supply for Plaistow's existing fire system is via an outdoor reservoir and fire pump system. In converting to a large community water system, engineering studies have recommended the construction of potable water storage tanks to meet the needs of Plaistow and the HAWC system.

One tank will be a future 0.4-Million-gallon tank to be constructed in Plaistow and the other tank is the one being requested by this proposal in Atkinson.

In an effort to get potable water to Plaistow, supply will be coming from Manchester Water Works via Derry, Windham and Salem through HAWC'S system in Atkinson and then on to Plaistow.

This tank site has been chosen due to its hydraulic grade line and close proximity to both Plaistow and HAWC's system.

The tank has been identified by engineering study prepared by Weston and Sampson as part of phase 1 in implementing this regional plan.

The proposed project will consist of the following:

Construction of a 1.0-Million-gallon prestressed concrete water tank located on land in Atkinson off Main St. Parcel is controlled by existing water rights deed and easement held by HAWC.



- -Construction of a 12' wide gravel access road.
- -Construction of 12" PVC water line along section of proposed access road through metering building and on to tank location.
- -Construction of 10'x20' metering and control building just outside of tank and located along side of access road
- -Integration of control system to incorporate tank level and flow readings via SCADA back to HAWC's main office. Will be incorporated into HAWC's existing SCADA system.
  - Project also includes 2,684' of 12" PVC main that HAWC has paid the difference to upgrade an original 6" and 8" main that was planned for an existing adjacent residential development. The above distance represents the length of main between HAWC's existing main and the beginning of the proposed access road.

Below is a breakdown of cost. Work completed to date includes 95% engineering, permitting, site survey and 100% 12" water main size upgrade.

**REVISED COST ESTIMATE for THE ATKINSON WATER STORAGE TANK  
in ATKINSON, NEW HAMPSHIRE for  
HAMPSTEAD AREA WATER COMPANY**

Item No.	Description	
1	Site Survey	\$10,000.00
2	Legal Fees	\$5,000.00
3	Engineering & Permitting for Tank & Tank Site	\$60,000.00
4	12" Water Main size upgrade	\$38,100.00
5	Tank install & SITEWORK, including Clearing, Access Road, Excavation for Tank Footing, Valve Vault, & U.G. Utilities, Backfill, Compaction Testing, Finish Grading & Final Landscaping, etc.	\$1,470,036.00
6	Easement for Tank Access (Winslow Dr.)	\$60,000.00
7	Federal Tax on Costs in Aid of Construction (CIAC)	\$338,896.80
8	10% Contingencies	\$164,313.60

**Estimated Total Cost = \$2,146,346.40**

Rounded to \$2,150,000.00

At this time, we are formally requesting a grant and loan as noted in Table 1 below from the Drinking Water and Ground Water Trust fund to be issued to Hampstead Area Water Company. Please note that in order for us to proceed with financing with the Public Utilities Commission we will need a commitment letter authorizing the request on or before 11/15/18.

The breakdown of the project funding allocation is as follows:

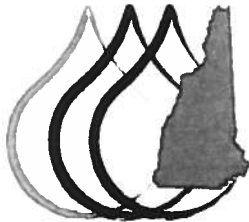
**Table 1. Proposed Atkinson Tank Project Funding Allocation and DWGTF Request**

<b>Item</b>	<b>Cost</b>	<b>Notes</b>
Project Budget	\$1,807,449.60	(including engineering, construction, and 10% contingency) excluding federal taxes
DWGTF Grant for Plaistow share (So. NH Regional Water Project)	\$903,724.80	50% of construction & engineering costs
DWGTF Grant for 25% of HAWC share	\$225,931.20	
<b>Total grant to HAWC</b>	<b>\$1,129,656.00</b>	Rounded to \$1,130,000.00
DWGTF Loan for 75% of HAWC share	\$677,793.60	excluding federal CIAC tax burden
Assumed federal CIAC tax on grant	\$338,896.80	30% of grant, to be taken as a loan from the DWGTF by HAWC
<b>Total loan to HAWC</b>	<b>\$1,016,690.40</b>	Rounded to \$1,120,000.00
<b>Total DWGTF Funding Request</b>	<b>\$2,146,346.40</b>	Rounded to \$2,150,000.00

If you have any questions, please do not hesitate to reach me at 603-560-3320 or at [charlie@hampsteadwater.com](mailto:charlie@hampsteadwater.com).

Sincerely,

Charlie Lanza  
General Manager  
Hampstead Area, Water Company, Inc.



## NEW HAMPSHIRE DRINKING WATER & GROUNDWATER TRUST FUND



### Commission Members

**Senator Chuck Morse, Chair**

**Rep. Chris Christensen, Vice Chair**

**Senator Daniel Feites, Clerk**

**Rodney Bartlett, Public Member**

**William W. Boyd, III, Town Council Member**

**Bruce Bretton, Town Selectman**

**Clark B. Freise, Governor's Designee**

**Andrea Kenter, P.G., Public Member**

**Dorothy Kurtz, Public Member**

**Rachel Miller, NH State Treasury**

**Lisa Morris, Division of Public Health**

**David Paris, NH Water Works Association**

**Rick Russman, State or Regional Land Trust Member**

**Paul Sanderson, NH Fish and Game Department**

**Bernie Rousseau, Public Member**

**Robert R. Scott, NH Department of Environmental Services**

**Suzanne Smith, House of Representatives**

**Tim Vadney, P.E., NH Water Pollution Control Association**

**Christopher S. Way, NH Economic Development**

November 6, 2018

Harold Morse  
Hampstead Area Water Company, Inc.  
54 Sawyer Avenue  
Atkinson, NH 03811

**Subject: Drinking Water and Groundwater Trust Fund  
Atkinson Water Storage Tank Project  
Loan and Grant Funding Availability**

Dear Mr. Morse,

The purpose of this letter is to notify you of action taken by the Drinking Water and Groundwater Advisory Commission (Commission). On November 5, 2018 the Commission voted to authorize funding for the Atkinson Water Storage Tank Project for the Hampstead Area Water Company, Inc. (HAWC) for a grant of up to \$1,130,000 and a loan of up to \$1,020,000 for 30 years at 3.38%.

The next step is to enter into a loan and grant agreement and obtain Governor and Council (G&C) approval. The final application documents were received by the NH Department of Environmental Services (NHDES) from HAWC on November 2, 2018. NHDES will review the materials and will be in contact if there are any questions.

We ask that you keep us informed of progress made toward seeking the authority to borrow with the Public Utilities Commission (PUC). Once PUC approval has been obtained, NHDES will prepare a loan agreement and a grant agreement which will be returned to HAWC for review and signature prior to submission to G&C for approval. We look forward to working with you on this project.

Sincerely,

Erin Holmes, P.E.  
Drinking Water & Groundwater Trust Fund Administrator

cc: Charlie Lanza, General Manager, Hampstead Area Water Company, Inc.  
Richard Skarinka, P.E., Drinking Water and Groundwater Bureau, NHDES  
Michael Unger, P.E. Drinking Water and Groundwater Bureau, NHDES  
Michael Juranty, P.E., MtBE Remediation Bureau, NHDES  
Clark Freise, Assistant Commissioner, NHDES  
Robert Scott, Commissioner, NHDES  
Michael Wimsatt, P.G., Waste Management Division Director, NHDES

## **Hampstead Area Water Company**

### **Atkinson Tank Financing and Step Increase**

#### **Major Assumptions**

HAWC participates in The Southern NH Regional Water Interconnection Project with NHDES, Derry, MWW, Plaistow, Salem and Pennichuck East.

NHDES provides HAWC with grant of \$1,129,656. HAWC treats grant as CIAC.

Under new tax law, CIAC treated as income for federal tax purposes. As such, owner incurs 30% federal tax on NHDES grant.

NHDES lends \$338,897 (30% of \$1,129,656) to HAWC in order for HAWC to pay 30% federal tax.  
The debt financing assumes 3.38% interest rate over 30 years.

NHDES lends HAWC \$1,016,690 for the balance of the costs.  
The debt financing assumes 3.38% interest rate over 30 years.

HAWC constructs 1,000,000 gallon tank with estimated costs of \$2,146,346.

Upon completion of construction and connect to the water system, HAWC submits actual costs and recovers such costs as part of Company's next rate case.

HAWC Estimated that step increase will amount to an increase in annual revenues of \$97,003.

HAWC proposed to maintain customer charges per meter size and increase consumption charges.  
HAWC estimates that the consumption charge will increase from \$6.11 to \$6.51 per ccf.

SPSt. Cyr  
1/4/2019

## Hampstead Area Water Company

SPS-5

## Revenue Requirement - Step Increase for 2019 Additions to Plant and related CIAC associated with Atkinson Water Tank

RATE BASE			Amount
2019 Plant in Service			\$2,146,346
Less: Accumulated Depreciation			<u>23,848</u>
NET PLANT IN SERVICE			\$2,122,498
Contribution in Aid of Construction			(1,129,656)
Plus: Accumulated Amortization of CIAC			<u>12,552</u>
NET PLANT IN RATE BASE			\$1,005,394
Cash Working Capital			<u>-</u>
TOTAL RATE BASE			<u>\$1,005,394</u>
Return on Additional Plant	@	3.380%	<u>\$33,982</u>
O&M Expenses			\$ -
Depreciation Expense			47,696
Amortization of CIAC			(25,104)
State Utility Property Taxes			6,096
Local Property Taxes			34,087
State Business Enterprise Taxes	34,058	0.0072	<u>245</u>
Operating Expenses			<u>\$ 63,021</u>
Additional Revenue Requirement			<u>\$ 97,003</u>
Revenues from General Metered Customers			<u>\$ 1,964,857</u>
% Increase associated with Step Increase			<u>4.94%</u>

SPSt. Cyr  
1/04/2019

Annual Report of Hampstead Area Water Co, Inc.

Year Ended December 31, 2017

SPS-3

Atkinson Tank Financing and Step Increase

**F-1 BALANCE SHEET**  
**Capital Structure**

Line No. (a)	Account Title (Number) (b)	Current Year End Balance (c)	Adjustments (d)	Adjusted Year End Balance (e)
<b>EQUITY CAPITAL</b>				
1	Common Stock Issued (201)	\$ 16,767		\$ 16,767
2	Other Paid-In Capital (209,211)	3,154,354		3,154,354
3	Retained Earnings (214-215)	(759,974)	10,595	(749,379)
4	Total Equity Capital	\$ 2,411,147	\$ 10,595	\$ 2,421,742
<b>LONG TERM DEBT</b>				
5	Other Long-Term Debt (224)	\$ 3,893,007	\$ 996,777	\$ 4,889,784
6	Total Long-Term Debt	\$ 3,893,007	\$ 996,777	\$ 4,889,784
7	Total Capital Structure	\$ 6,304,154	\$ 1,007,372	\$ 7,311,526

Line No. (a)	Account Title (Number) (b)	Current Year End Balance (c)	Adjustments (d)	Adjusted Year End Balance (e)
<b>EQUITY CAPITAL</b>				
1	Common Stock Issued (201)	0.27%	0.00%	0.23%
2	Other Paid-In Capital (209,211)	50.04%	0.00%	43.14%
3	Retained Earnings (214-215)	-12.06%	1.05%	-10.25%
4	Total Equity Capital	38.25%	1.05%	33.12%
<b>LONG TERM DEBT</b>				
5	Other Long-Term Debt (224)	61.75%	98.95%	66.88%
6	Total Long-Term Debt	61.75%	98.95%	66.88%
7	Total Capital Structure	100.00%	100.00%	100.00%

SPSt. Cyr  
1/04/2019