

STATE OF NEW HAMPSHIRE  
PUBLIC UTILITIES COMMISSION

Docket DW 20-117  
Hampstead Area Water Company, Inc.  
Request for Change in Rates

REBUTTAL TESTIMONY

OF

DOUGLAS W. BROGAN  
Engineering Consultant to the  
New Hampshire Department of Energy

May 4, 2022

1 **Q. Please state your name, by whom you are employed, on whose behalf you are testifying,**  
2 **and your business address.**

3 A. My Name is Douglas W. Brogan. I am a self-employed engineering consultant to the New  
4 Hampshire Department of Energy. My business address is 4 Russell Street, Concord, NH  
5 03301.

6 **Q. Please indicate your education and professional background.**

7 A. Please see Exhibit DWB-1, Statement of Qualifications, for my employment history and  
8 related background.

9 **Q. Have you previously testified before the New Hampshire Public Utilities Commission?**

10 A. Yes, on many occasions.

11 **Q. What is the purpose of your testimony?**

12 A. A significant portion of the rate increase Hampstead Area Water Company (HAWC or the  
13 Company) is requesting in this case relates to the Southern New Hampshire Regional Water  
14 Project (SNHRWP or Project). This largely State-funded project involved significant additions  
15 and upgrades to HAWC's Atkinson-Hampstead core system as part of bringing water from  
16 Manchester to Derry, Windham, Salem and HAWC, and through HAWC to Plaistow.  
17 Intervenor in the case have made what I view as fairly serious allegations of excess capacity,  
18 imprudence and conflicts of interest in relation to the Project, as well as expressing concerns  
19 about things such as system reliability and adequacy of fire flows.

20 I want to first say I sincerely appreciate the level of effort expended by the intervenors in  
21 expressing those concerns, and the light they have shed on various issues as a result. I also  
22 realize the regulatory process is an imperfect one and can be challenging to navigate at  
23 times. Although it is not my intent to defend the case the Company itself has presented, I  
24 felt compelled nonetheless to provide some perspective on a number of the specific issues  
25 raised in relation to the design, physical and operational aspects of the system.

26 **Q. Please describe the SNHRWP and its impact on HAWC's water systems.**

27 A. The impetus of the Project was to address MbTE contamination as well as supply needs in  
28 the various towns and systems involved. The Project was overseen by the New Hampshire  
29 Department of Environmental Services (NHDES). A Memorandum of Understanding was

1 signed by the various participating entities in September 2018, and the final Southern  
2 Interconnect Agreement (SIA) was signed in April 2019.  
3 HAWC itself has 23 separate water systems in southeastern New Hampshire. Of those, the  
4 Atkinson-Hampstead core system is the largest by far, with about 2,800 customers (the next  
5 largest system has under 200 customers), and is the only one impacted by the Project. Prior  
6 to the Project, the core system obtained all of its water from some 30 bedrock wells  
7 scattered throughout the two towns. Physical impacts of the Project on the core system  
8 involved construction of new pump stations at the Salem/Atkinson and Atkinson/Plaistow  
9 town lines, a new 1.0 million gallon (MG) tank in Atkinson (half of the volume allocated to  
10 HAWC and half to Plaistow), and various other facility and water main additions and  
11 upgrades. While a massive project for HAWC (Project-related capital expenditures  
12 approximately equaled total Company-wide capital improvements for the years 2012 - 2019  
13 combined), the Project was largely funded with New Hampshire Drinking Water and  
14 Groundwater Trust Fund (DWGTF) monies. HAWC is currently committed to and is receiving  
15 Phase I Project flows of 250,000 gallons per day (GPD).

16 **Q. What is the first issue you wish to address?**

17 A. Intervenor Karen Steele makes certain claims in her testimony of excess capacity and of  
18 SNHRWP plant not being used and useful (p. 2, lines 6 - 11 and 20-21; p. 4, line 15 through p.  
19 5, line 13). In particular, she suggests that ultimate (combined Phase I and II) Project flows  
20 of 750,000 GPD into HAWC's core system will more than triple the amount of water  
21 currently sold there (358,502 GPD in 2019); and that Project infrastructure was significantly  
22 oversized to accommodate these excessive flows. There are a number of problems with this  
23 analysis:

- 24 1) The appropriate comparison for design purposes (per 2003 'Ten State Standards' criteria  
25 adopted by NHDES) is to compare total future supply with the largest well out of service,  
26 to the future maximum day demand (not average day demand as used by Ms. Steele).  
27 Maximum day demand is in turn based not on customer consumption alone (again as  
28 used by Ms. Steele), but on the totality of demands the supply must meet (total  
29 production). For a sense of the magnitudes involved, maximum day demand in 2020

1 was 636,048 GPD; average day demand was 429,947 GPD; and average consumption  
2 (volume sold) was 359,493 GPD. The difference between production and consumption  
3 is water used for filter backwashing (about 18,000 GPD), and lost or unaccounted-for  
4 water (averaging 14 percent of production from 2015 - 2020, not an unreasonable  
5 number in my view). Both are real contributions to demand requirements.

6 2) Ms. Steele's assessment assumes the full SNHRWP flows will be added on top of existing  
7 capacity and flows (flows from the Project itself did not begin until 2020). However, a  
8 review of relevant documents clearly anticipates taking a number of wells offline as a  
9 result of the Project (see, for example, Exhibit DWB-2, letter of support from NHDES  
10 Commissioner Robert R. Scott in docket DW 19-147).

11 3) The analysis fails to recognize increases in future demand either from normal system  
12 growth over the forecast period or from a lessening of water use restrictions as a result  
13 of the availability of Project water.

14 4) The Company, as noted by Ms. Steele, is under no obligation to take all, or even any  
15 part, of future Phase II flows. However, even assuming those full flows are one day  
16 received by HAWC, they would need to be reduced for design purposes (as noted  
17 above) by assuming the largest remaining well (Angle Pond #3) is out of service - a  
18 reduction of 163,000 GPD.

19 5) As the Windham portion of the SNHRWP contains no storage, water flowing through  
20 that portion (upstream of HAWC) must meet all peak hour demands in that section (vs.  
21 only maximum day demands) - which during brief periods could leave less than HAWC's  
22 allotted water available to it.

23 6) As far as physical oversizing, while it is true that Project infrastructure was designed  
24 (under a "no regrets" policy) to accommodate full future Phase II flows, the following  
25 comments are relevant:

26 a) The Project includes several thousand feet of new 12-inch main installed in, or in  
27 conjunction with, HAWC's core system. However, to lay a smaller (for example, 10-  
28 inch) main under these circumstances, given the small potential cost savings and very

1 long life of the asset, would be more likely to be imprudent than laying the 12-inch  
2 main itself.

3 b) Although pump station footprints and associated piping were sized to accommodate  
4 future flows (a relatively minimal impact), interior components such as pumps and  
5 valves are to be upgraded later as necessary to accommodate those flows.

6 **Q. What are your comments in relation to the 1.0 MG tank constructed in Atkinson as part of**  
7 **the SNHRWP?**

8 A. I first need to introduce Ms. Steele's own comments on the tank as found on page 8, lines  
9 12-18 of her testimony:

10 The pipeline project determined that Plaistow needed both a 400,000 gallon tank in  
11 Plaistow and a 500,000 gallon tank in Atkinson. Both these tanks were paid for with  
12 funds from the state. But then HAWC made the decision to increase the Atkinson tank  
13 from 500,000 gallons to 1 million gallons and took on the additional expense of \$1  
14 million. This additional 500,000 gallon capacity does not fall under "used and useful" for  
15 HAWC's existing customers, thereby violating RSA 378:28. Again, this is spend for future  
16 customers which HAWC is trying to get current customers to pay for with these unjust  
17 and unreasonable rate increase requests.

18  
19 Ms. Steele subsequently answered questions about these statements in her response to DOE  
20 1-6 (Exhibit DWB-3). In part to eliminate confusion and clarify some of the issues in my own  
21 mind, especially given the gravity of the allegations, I emailed Michael Unger, P.E., at NHDES  
22 with a number of related questions - see Exhibit DWB-4 (Unger Email) for the questions and  
23 his February 21, 2022 responses. Mr. Unger has been the point person at NHDES  
24 responsible for shepherding the overall Project in recent years. While I believe the email  
25 exchange speaks for itself, I offer the following additional comments:

26 1) Both Ms. Steele's response to DOE 1-6 and the Unger Email reference an earlier HAWC  
27 email exchange (Exhibit DWB-5) involving two engineering firms (Tank Email; originally  
28 provided as an attachment to the Company's response to Staff 3-27 a). In particular, the  
29 Steele and Unger documents allude to wording in the Tank Email at about the middle of  
30 the first page saying "We're considering if the Atkinson tank could or should be smaller."  
31 Without getting overly involved in the details of these documents and exchanges, I

1 believe the 'smaller tank' wording is in reference to reducing the size of the tank down  
2 from a previously contemplated 2.0 MG to the 1.0 MG that was ultimately built; not to  
3 reducing the 1.0 MG to half of that, as suggested by Ms. Steele; and therefore does not  
4 support her conclusions about the Company doubling the size of the tank.

5 2) The Tank Email uses actual current average daily flows in its page 1 table in arriving at a  
6 1.0 MG size; not, for example, projections inflated to account for future HAWC  
7 development (see later below).

8 3) While the Company lacks in-house engineering staff, it has indicated that it employed a  
9 reputable engineering firm (Lewis Engineering - unrelated to the Lewis family owners of  
10 HAWC) in assessing the need for and size and design of the tank. For example, its  
11 response to Staff 2-32 b) stated:

12 As Part of the SNHRWP the Company retained Bruce Lewis of Lewis Engineering, PLLC  
13 to review the core system storage needs. While there is no formal study his analysis  
14 indicated that a 1 MG Tank in addition to the Westside Dr. Booster Station would  
15 provide adequate storage and system flow capacity for at least the next 10 years.  
16

17 4) The overall Project was complex, involving input from many different engineers  
18 assessing a variety of factors including things such as water age. While I am unable to  
19 fill in specific gaps in any of the information the Company has provided, the 0.5 MG  
20 portion of the tank allotted to HAWC does not seem unreasonable on its face, given the  
21 0.5 MG tank at the other end of the system and the 0.4 MG of existing pumped storage  
22 in Atkinson.

23 5) As noted in a different letter of support from NHDES Commissioner Robert R. Scott (this  
24 one in DW 18-138, see Exhibit DWB-6), it is less expensive to build one tank now, half of  
25 which would accommodate HAWC's own needs, than to add a separate HAWC tank  
26 later. HAWC also gains access to additional storage in a crisis beyond its 0.5 MG  
27 allotment, that it would not otherwise have.

28 6) The new tank provides the sole gravity storage in the Atkinson portion of the system.  
29 The only other gravity storage is some 3.5 miles away and at the far opposite end of the  
30 system in Hampstead.

1 **Q. Ms. Steele suggests throughout her testimony that future SNHRWP flows to the two**  
2 **towns are solely intended for anticipated Lewis Builders development in southwest**  
3 **Atkinson; and that the Company's investment in the Project is compromised by conflicts of**  
4 **interest with its parent and affiliated companies and their development interests. What**  
5 **are your thoughts in these regards?**

6 A. In large part I do not share those concerns, and would offer the following:

- 7 1) Her concerns about Lewis Builders' development plans do not appear to be supported  
8 by the historic pace of that entity's development efforts. As noted by Ms. Steele herself,  
9 "The 800 condos were planned in 1988, 288 condos were approved in 2006, but they  
10 didn't start building any of them until 2020" (p. 7, lines 20-21). In fact, only the first two  
11 buildings, with 64 total units, have now been constructed (p. 10, lines 21-22).
- 12 2) Contrary to assertions about otherwise limited development potential in the two towns,  
13 it seems reasonable to expect normal customer growth to be a continuing contributor  
14 to system demands. The increase in number of customers averaged just over 2 percent  
15 per year from 2013 through 2020, and just under 3 percent annually over the last three  
16 of those years.
- 17 3) As noted previously, Ms. Steele's conclusions rely on flawed assessments of overall  
18 supply vs. demand.
- 19 4) Her conclusions are also based on what I believe is a misinterpretation, or at least  
20 oversimplification, of a chloramine map provided in one of the Project-related  
21 engineering studies (her Exhibit KS-11). Again without getting into extensive detail and  
22 use of citations: demands in the underlying hydraulic model were placed throughout the  
23 two towns based purely on actual current demands, not forecast demands projecting  
24 future Lewis resort development; a significant reason for the placement of the Phase II  
25 line is simply that there is a much greater well supply to begin with in Hampstead than  
26 in Atkinson; and the referenced option was a conceptual one that was rejected by the  
27 Company because the Company did not want to revert from a single large system and  
28 the many advantages it offers, to two smaller ones.

1        5) Contrary to Ms. Steele's suggestion that the Commission may be unaware of the inter-  
2        related ownership of the various Lewis family companies ("There is a very unique  
3        conflict of interest happening of which the PUC may not be aware", p. 3, line 10), the  
4        Commission has long been aware of those realities and has attempted to manage  
5        potential impacts on both the water Company and customers accordingly. While  
6        HAWC's situation is unique, opposing interests involving parent companies,  
7        shareholders, profit motives vs. customer interests and other matters are hardly rare  
8        and must be appropriately balanced. While HAWC can be viewed through many  
9        different lenses, I fail to see a determinantal conflict of interest in HAWC's ownership  
10       situation. Certainly, much of the respective towns' tax base - and even the water  
11       system itself - would likely not exist apart from those relationships.

12       **Q. How do you view the SNHRWP as a whole?**

13       A. As noted earlier, the Project was a large, multi-town effort shepherded by NHDES and  
14       funded by DWGTF money to address MtBE and other concerns. However, I believe some of  
15       the benefits to HAWC's own core system have tended to be overlooked:

- 16       1) The Project helps in reducing the cost, complexity and liability of continuing to operate a  
17       small system with 30 separate wells, a number of which have significant water quality  
18       concerns.
- 19       2) The Project provides an alternative to hoping to find additional groundwater supply to  
20       meet future demands in an area that really is not water-rich. For comparison, Aquarion  
21       Water Company of New Hampshire's largest bedrock well (Well 22 in Hampton) is  
22       capable of producing nearly seven times what HAWC's largest 'once in a lifetime' well  
23       (Angle Pond #3) can produce.
- 24       3) Things such as the Kent Farm saga and its very real impacts on residents (Steele  
25       testimony p. 4, lines 4 - 14), heightened citizen concerns over Company withdrawals,  
26       ongoing Company water use restrictions, and even the prospect of HAWC turning down  
27       other developers for lack of water, would all seem to suggest that additional water is a  
28       good thing.

29       **Q. What is your position on prudence and the recovery of Project costs through rates?**



1 A. As elaborated throughout my testimony above, I do not believe oversizing and related  
2 concerns begin to rise to the level of imprudence. Obviously the Company will need to  
3 justify its decisions regarding future uses of the SNHRWP when the time comes. On the cost  
4 side, I believe the existence of substantial post-test year Project and other activities and  
5 investments, the resulting uncertainty around expense estimates, and temporary 'used and  
6 useful' concerns related to the absence of flows from HAWC to Plaistow (which are likely to  
7 begin this year), all support spreading cost recovery out over a few years; not denial of that  
8 recovery.

9 **Q. Does this conclude your testimony?**

10 A. Yes.

### Statement of Qualifications for Douglas W Brogan

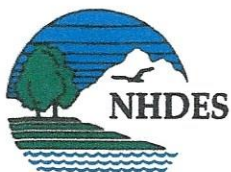
I received a BSCE degree from MIT in 1975.

My early work experience included employment with a consulting firm performing flood studies; with the NH Water Resources Board working in dam safety and related programs; two and a half years with the NH Water Supply and Pollution Control Commission performing construction inspection and other functions involving sanitary collection, treatment and training facilities; three years at the Portsmouth Naval Shipyard specifying radiological controls for submarine overhauls; and five years with a consulting firm as project engineer involved with design and construction of water distribution and storage facilities, water system studies and subdivision reviews.

My more recent experience includes 23 years (1989 - 2012) at the NH Public Utilities Commission, the last 20 as water/sewer engineer. From 2013 to 2017, and again from 2019 to present, I have provided engineering consulting services to the Commission (now Department of Energy) on water and sewer dockets. From 2018 to present I have also provided engineering consulting services to Omni Mount Washington on several dockets involving Omni at the Commission.

My responsibilities since 1991 in all of the above have generally involved review of physical facilities and operations, system improvements, and quality of service issues relating to regulated water and sewer systems.

I am a licensed Professional Engineer in New Hampshire.



The State of New Hampshire  
**Department of Environmental Services**

**Robert R. Scott, Commissioner**

Docket No. DW 20-117  
Exhibit No. 9  
Exhibit DWB-2  
Page 1 of 2



October 25, 2019

NHPUC 30OCT'19 10:59

Debra A. Howland, Executive Director  
New Hampshire Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301

**Re: DW-19-147 Hampstead Area Water Company Southern New Hampshire  
Regional Water Project**

Dear Ms. Howland:

The New Hampshire Department of Environmental Services (NHDES) is writing this letter of support for the Hampstead Area Water Company's (HAWC) Petition for approval of financing for costs directly related to and necessitated by the Southern New Hampshire Regional Water Project.

The Southern New Hampshire Regional Water Project (SNHRWP) seeks to use Manchester Water Works as a supplemental source of supply for water systems serving the Towns of Windham, Salem, Atkinson, Hampstead and Plaistow. HAWC water users and rate payers will realize the following benefits as a result of the additional supply capacity provided by the SNHRWP.

1. Increased reliability of water supply. Some existing wells are experiencing declining yields.
2. Improved water quality by allowing HAWC to prioritize higher quality wells. Some wells have experienced increasing concentrations of regulated contaminants such as arsenic, radium, and alpha particles. HAWC will be able to serve a safer product to customers by taking their lowest quality wells offline and blending in regional water.
3. Reduction in system complexity by allowing HAWC to take up to ten of its existing 19 wells offline.
4. Ability to expand to address contamination and/or loss of water in private wells.

HAWC's participation in the SNHRWP is critical because the regional water supply must be wheeled through the HAWC water system in order to serve the Town of Plaistow. The Town of Plaistow has no alternative source of water supply.

Please note that the New Hampshire Drinking Water and Ground Water Trust Fund (the Trust Fund) is providing a grant for HAWC's construction costs necessitated by and solely related to the SNHRWP. In addition, costs HAWC will incur as a result of the SNHRWP, including but not limited to, operation and maintenance, bulk water purchase and tax liabilities will be offset in part by wholesale water sales to the Town of Plaistow. In view of the foregoing, NHDES believes that

[www.des.nh.gov](http://www.des.nh.gov)

PO Box 95, 29 Hazen Drive, Concord, NH 03302-0095  
Telephone: (603) 271-3899 Fax: (603) 271-2181 TDD Access: Relay NH 1-800-735-2964

000011

HAWC's Petition is in the best interests of its customers as it will enable the company to continue to provide safe and reliable service at just and reasonable rates, and to play a critical role in the SNHRWP.

In summary, NHDES supports HAWC's request for financing for costs directly related to and necessitated by the Southern New Hampshire Regional Water Project.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert R. Scott", with a stylized flourish at the end.

Robert R. Scott

cc: Charlie Lanza, General Manager, HAWC



**Hampstead Area Water Company  
DW 20-117**

**Date Request Received: 1/5/2022**  
**Request No. DOE 1-6**

**Date of Response: 1/21/2022**  
**Witness: Karen Steele**

**REQUEST:**

**Re: Page 8, lines 12-15**

The pipeline project determined that Plaistow needed both a 400,000 gallon tank in Plaistow and a 500,000 gallon tank in Atkinson. Both these tanks were paid for with funds from the state. But then HAWC made the decision to increase the Atkinson tank from 500,000 gallons to 1 million gallons and took on the additional expense of \$1 million.

- a. Please describe your general understanding of how the decision to build a larger tank in Atkinson, half of which would serve Plaistow, was made; and
- b. Your general understanding of how the decisions about who would bear any associated costs were made; and
- c. Your source(s) of information in these regards.

**RESPONSE:**

I've not seen a cost/benefit analysis or anything quantitative to demonstrate or justify how the decision was made to increase the tank from 500,000 gallons to 1 million gallons and to justify the additional ~\$1 million in spend. Benefits quoted by HAWC appear qualitative and not quantitative. HAWC's response to Atkinson 5-26 referenced responses to Staff 2-32c & Staff 3-27a. Even in these responses, there is no quantitative justification or cost/benefit analysis. In fact in the "tank email" referenced in the response to Staff 3-27a, Thomas Page of Underwood Engineering appear to be recommending a smaller tank in Atkinson:  
"We're considering if the Atkinson tank could or should be smaller and would like to discuss."

For historical perspective, in the November 4, 2008 hearing for the Atkinson-Hampstead Interconnection (docket DW 08-088), there was no cost/benefit analysis despite repeated questioning of Harold Morse, HAWC President, by intervenors. Please see attached doc called "DOE 1-6 -- Interconnection" for snippets of the testimony as well as the actual testimony doc attached (DOE 1-6 -- 08-088 2008-11-20 TRANSCRIPT of 11-04-08 HEARING). Mr. Morse confirmed there was no dollar value for the benefits of the interconnection. When asked "How would you then justify spending \$1.1 million to obtain benefits that might not be worth \$10?" Mr. Morse replied with "From years of experience in operating a water system."

This appears to be how the decision was made to increase the Atkinson tank from 500,000 to 1 million gallons "From years of experience in operating a water system" as I am unable to find any documentation quantifying the benefit justifying the spend.

HAWC appears to have a much bigger vision and plan that is not always shared. For example, in Docket DW 19-031, for the purpose of supplying water to the Kelly Green condo development in Sandown, HAWC requested a much larger franchise area which included significant portion of the Hampstead/Sandown border. This was around the time of the Large Groundwater Withdrawal permitting process for Angle Pond Well #3 in Hampstead, very near the Sandown border. Hampstead folks were questioning why so much water was being requested to be pumped at Angle Pond, 230,000 gallons/day which was roughly the same amount of all HAWC's Hampstead water consumption at the time. I cautioned my Hampstead friends that if the large franchise request in Sandown were approved, the next request would be for an interconnection between Hampstead and Sandown and Hampstead water could possibly be flowing to Sandown. This was a very sensitive topic as Kent Farm Wellfield over pumping was already impacting private wells of Hampstead residents. When the PUC rejected HAWC's larger franchise request and only granted the area around the condo project, HAWC appealed to the PUC to reconsider as "this proposed franchise expansion allows HAWC to connect its Hampstead and Sandown franchises should a regional connection be necessary." Please see the documents attached called "DOE 1-6 -- Sandown" and the DW 19-031 response.

Another example where quantitative data, calculations or HAWC's "plan" is not shared is the source of water for the Sawmill Ridge development. When Lewis Builders proposed this development on January 21, 2015, they indicated that "Hampstead Area Water Co. will provide the water service. There are no proposed wells." This was the narrative until 14 months later when an abutter asked about the 2 wells HAWC drilled at Sawmill Ridge. On April 20, 2016, "Mr. Manning also explained that the applicant has drilled two wells for the Sawmill Ridge project and neither can produce a significant amount of water." It's very concerning that these 2 wells could not produce a significant amount of water as they are 2 of the deepest wells ever drilled in Atkinson -- 1,000 and 1,100 feet deep (DOE 1-6 -- Sawmill Ridge). Perhaps if the wells at Sawmill Ridge produced more water, the pumping volume at Kent Farm Wellfield would not have increased so significantly, impacting private homeowners' wells?

- a) Decision appears to be made based on their years of experience managing a water company as I'm unable to find quantitative justification.
- b) Decision appears to be made based on their years of experience managing a water company as I'm unable to find quantitative justification.
- c) My inability to find quantitative justification and historical HAWC dockets and activity.





Doug B <douglas.brogan@gmail.com>

## RE: SNHRWP and HAWC

1 message

**Unger, Michael** <Michael.C.Unger@des.nh.gov>

Mon, Feb 21, 2022 at 9:01 AM

To: Doug B <douglas.brogan@gmail.com>

Cc: "Laflamme, Jayson" <Jayson.P.Laflamme@energy.nh.gov>, "Tuomala, Christopher" <Christopher.R.Tuomala@energy.nh.gov>, "Holmes, Erin" <Erin.L.Holmes@des.nh.gov>

Doug,

The following additional memos and emails (attached) should help fill in some of the gaps in the evolution of tank sizing. Answers to your specific questions are in red italics below.

- 12/22/17 "Hydraulics and Alternatives Analysis – East Derry Route – Plaistow Water Feasibility Study" memo by Underwood Engineers. Assumed a 2.0 MG tank in Atkinson based on 1.0 MG storage for HAWC per their request and 1.0 MG for Plaistow per an Underwood report dated February 18, 2016.
- 2/20/2018 "Water Supply Option from Haverhill – Plaistow Water Feasibility Study" draft memo by Underwood Engineers. Recommended 0.8 MG if all storage in Plaistow.
- 2/27/2018 email from HAWC to Weston & Sampson forwarded to NHDES stating HAWC had an immediate need for the proposed 1 MG tank in Atkinson.
- 5/10/2018 NHDES meeting with HAWC. Notes reference discussion of cost sharing for Atkinson tank because "HAWC is getting a more robust system to satisfy their needs. That's why they would be contributing also."
- 6/10/18 Letter from NHDES to HAWC. References a 1.0MG tank in Atkinson.
- 10/24/18 "Town of Plaistow, NH – Proposed Potable Water System Basis of Design for Appropriation Budgeting" memo by Weston & Sampson. Proposed 0.4MG tank in Plaistow.
- 10/22/18 "Peer Review – Plaistow Regional Water Improvements" memo by Underwood Engineers. Concurred the proposed tank volume of 0.4 MGD is acceptable assuming additional storage available in Atkinson.

Please let me know if you have any other questions.

Mike

Michael C. Unger, PE

Water Engineer | Drinking Water and Groundwater Bureau | New Hampshire Department of Environmental Services

603-271-0779 | [michael.unger@des.nh.gov](mailto:michael.unger@des.nh.gov)

Learn more: <https://www4.des.state.nh.us/nh-dwg-trust/> and [www.des.nh.gov](http://www.des.nh.gov)

**From:** Doug B <douglas.brogan@gmail.com>

**Sent:** Tuesday, February 8, 2022 8:17 AM

**To:** Unger, Michael <Michael.C.Unger@des.nh.gov>

**Cc:** Laflamme, Jayson <Jayson.P.Laflamme@energy.nh.gov>; Tuomala, Christopher <Christopher.R.Tuomala@energy.nh.gov>

**Subject:** SNHRWP and HAWC

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Mike,

I'm doing engineering consulting for the NH Department of Energy in relation to water cases before the Public Utilities Commission (for background, I worked at the PUC for over 20 years before retiring in 2012). Hampstead Area Water Company (HAWC) filed a rate case in late 2020 in which Southern NH Regional Water Project (SNHRWP or Project) costs are playing a significant role. The case is nearing completion, with a final hearing scheduled next month. Intervenor are opposing the proposed rate increases.

While generally familiar with the Project, its facilities in Atkinson and Hampstead, the need to provide water to Plaistow, etc., there are a few points I'm hoping you can help clarify regarding Project-related atmospheric storage. So you're aware, I've reviewed the following documents:

- Dec 22, 2017 Underwood Hydraulics and Alternatives Analysis - East Derry Route - Plaistow Water Feasibility Study
- Nov/Dec 2017 email thread (attached) provided by HAWC and involving Bruce Lewis and Underwood, with thoughts on sizing of the Atkinson tank
- 2018 Memorandum of Understanding
- 2019 Southern Interconnect Agreement (SIA)
- Jan 4, 2019 Weston & Sampson Regional Supply Basis of Design - FINAL (Attachment A to SIA)
- Jan 7, 2019 Weston & Sampson Hampstead Area Water Company (HAWC) - Chloramine Study - FINAL (Attachment B to SIA)

I'm particularly interested in understanding the evolution of tank sizing and cost sharing decisions in relation to Atkinson and Plaistow. The 2017 Underwood report mentions alternatives including either a single 2MG tank in Atkinson serving both towns (with a future tank in Plaistow as a possibility), or a 1MG tank in each town. The 2017 email thread appears to consider reducing the Atkinson tank down to 1MG. What was ultimately constructed, as you know, was a 1MG tank in Atkinson and a 0.4MG tank on Sweet Hill Road in Plaistow, with half of the Atkinson tank also providing storage for Plaistow.

Although offering little factual support for her statement, one party in the rate case has asserted the following, based in part on her interpretation of the 2017 email thread:

The pipeline project determined that Plaistow needed both a 400,000 gallon tank in Plaistow and a 500,000 gallon tank in Atkinson. Both these tanks were paid for with funds from the state. But then HAWC made the decision to increase the Atkinson tank from 500,000 gallons to 1 million gallons and took on the additional expense of \$1 million.

However, as the email thread and 2017 Underwood report occurred about the same time, and based on the context of the email's references to a 'smaller tank', it again seems clear to me that Underwood was contemplating reducing the size of the Atkinson tank down (from 2MG?) to 1MG.

So the first few questions:

1) Can you comment specifically on whether a smaller tank (less than 1MG) was ever considered in Atkinson? *NHDES does not have any record, and I do not have any personal knowledge, of HAWC ever considering a smaller tank in Atkinson. To the best of my knowledge, 2.0MG and 1.0MG were the only sizes considered.*

2) In DES's view, would it have made sense to construct a tank in Atkinson solely for Plaistow's needs, without considering HAWC's storage needs as well? *If HAWC did not have their own storage needs in Atkinson, Plaistow*



would have constructed and owned all of its storage within the Town of Plaistow. The evaluation of Plaistow interconnecting with Haverhill (Underwood memo dated 2/20/18) is a good example of this scenario; all of Plaistow's storage was assumed to be located within the Town of Plaistow.

3) Were the numbers in the email thread the final basis for sizing the Atkinson tank? If not, do you know what those numbers were? *In addition to the email thread, two engineering studies comment on the final tank sizing. "Town of Plaistow, NH – Proposed Potable Water System Basis of Design for Appropriation Budgeting" by Weston & Sampson dated 10/24/2018 established the basis for a 0.4MG tank in Plaistow. "Peer Review – Plaistow Regional Water Improvements" by Underwood Engineers dated 10/22/2018 concurred "The proposed tank volume of 0.4 MGD is acceptable assuming additional storage is available in Atkinson. This requires future improvements to improve hydraulics" (p. 20, underline mine). NHDES is not aware of any engineering studies commissioned by HAWC to independently evaluate HAWC's storage needs.*

4) In a broader sense, are you able to fill in any of the details beyond the basics above, on how the need for, and sizing of, the two tanks evolved during Project planning and design; who made or provided input into those decisions; etc.? *The additional memos and emails attached and listed above should help fill in some of the gaps in the evolution of tank sizing. To the best of my knowledge the progression of alternatives that were evaluated was 1) One 2.0MG "shared" tank in Atkinson to provide 1MG storage for HAWC and 1MG storage for Plaistow. 2) One 1.0MG tank in Atkinson for HAWC and 1.0MG tank in Plaistow for Plaistow. 3) One 0.4MG tank in Plaistow for Plaistow and one 1.0MG "shared" tank in Atkinson to provide 0.5MG storage for HAWC and 0.5MG storage for Plaistow. The total volume was reduced due to concerns over water age / insufficient turnover possibly leading to water quality issues. Providing some storage in Plaistow was determined to be cost effective compared to a large diameter transmission main from Atkinson.*

On the money side, DWGTF grant funding in relation to the 1MG Atkinson tank was based on 25% of HAWC's half of the tank plus 100% of Plaistow's half, yielding 62.5% total grant funding for the cost of the tank (with the balance funded by a DWGTF loan).

So a couple questions in that regard:

5) What was the rationale or basis for only funding 25% of HAWC's portion as a grant? *The average grant awarded by the Drinking Water and Groundwater Advisory Commission in its review of 2018 funding applications was approximately 25%. HAWC's portion of the storage tank fit the mold of a "typical" Trust Fund construction project (i.e. improvements to an existing public water system to improve reliability and operations but not addressing contamination). Therefore, NHDES when discussing the project with HAWC, and the Advisory Commission when approving grant funding, viewed HAWC's portion of the tank (50%) as a separate project from Plaistow's portion and applied the considerations the Commission used to evaluate any other funding application. For simplicity, NHDES entered into a single grant agreement with HAWC that incorporated both 100% of Plaistow's portion and 25% of HAWC's portion.*

6) Was 100% grant funding ever anticipated for a tank in Atkinson and if so, for what size tank? *Since Plaistow required water storage to convert its fire suppression system to a potable water system and thereby address drinking water contamination in Plaistow, the costs to construct that storage were considered 100% eligible for funding under the Southern NH project. If all of Plaistow's storage had been constructed in Atkinson, it would have been eligible for 100% reimbursement under the Project. However, water storage for HAWC's needs was not necessary to implement the Southern NH project and was not eligible for 100% reimbursement.*

Although time is limited on my end given approaching deadlines, let me know if there are other reports I should look at, or if I need to contact Erin Holmes directly in regard to funding questions.

An email response would be a strong preference, as it could readily be attached to my testimony or otherwise shared with others as needed. But I am certainly available for a call or meeting if more convenient.

I'm copying Jayson Laflamme and Attorney Chris Tuomala, both of whom I work under at the Department of Energy, on this email for their information as well.

Thank you,

Doug Brogan

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**7 attachments**



**Plaistow Regional Water UE Review Draft 22Oct2018 reduced.pdf**  
5850K



**Email - HAWCs need for water.pdf**  
103K



**HAWC letter (6-20-18).pdf**  
106K



**Plaistow Haverhill interconnection study UE 2-20-18.pdf**  
9762K



**Plaistow - Basis of Design for Appropriation Budgeting W&S 10-24-18.pdf**  
561K



**DES-HAWC Coordination Mtg notes (5-10-18).pdf**  
112K



**Plaistow - Hydraulics East Derry Route memo with attachments (12-22-17) red.pdf**  
9639K



## Charlie Lanza

**From:** Joshua Manning <Joshua@LewisBuilders.com>  
**Sent:** Monday, June 21, 2021 2:23 PM  
**To:** Charlie Lanza  
**Subject:** FW: Water Tank

Thanks,

-Josh Manning

**From:** Ryan Connor <rconnor@hampsteadwater.com>  
**Sent:** Tuesday, December 5, 2017 4:18 PM  
**To:** Joshua Manning <Joshua@LewisBuilders.com>  
**Subject:** FW: Water Tank

**From:** Thomas Page [<mailto:tpage@underwoodengineers.com>]  
**Sent:** Tuesday, December 5, 2017 4:10 PM  
**To:** [lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)  
**Cc:** Ryan Connor <rconnor@hampsteadwater.com>; 'Thomas Page' <[tpage@underwoodengineers.com](mailto:tpage@underwoodengineers.com)>; 'Michael C. Unger' <[munger@underwoodengineers.com](mailto:munger@underwoodengineers.com)>  
**Subject:** RE: Water Tank

Bruce, Ryan

We've been running some water age models. The biggest impact to water age comes from the size of the storage tank(s). We're considering if the Atkinson tank could or should be smaller and would like to discuss.

This a potential basis for sizing the Atkinson tank that can justify a smaller tank. If Plaistow ever really took off long term a future tank could be added on Sweet Hill.

Item	Basis	Amount
Equalization storage	HAWC average daily flow 0.37 MGD * 20%	0.074 MGal
Equalization storage	Plaistow average daily flow 0.31 MGD * 20%	0.062 MGal
Emergency storage	HAWC ADF	0.37 MGal
Fire flow storage	3500 gpm for 3 hours (Plaistow worst case)	0.63 MGal
Total storage needed	Round up	1.2 MGal
Existing storage in HAWC	Smith tank	0.5 MGal
New storage needed	Round up to	<b>1.0 MGal</b>

We modeled this with the Atkinson tank level controlling flow into HAWC from Derry, since the Smith tank is the first to fill with each cycle. That forces the Atkinson tank to turnover more.

This assumes a good hydraulic connection between the tanks, including upgrading the 8" sections to 16".

We can discuss more tomorrow or Friday  
Thanks Tom

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**From:** Bruce Lewis [<mailto:lewis.h2o@comcast.net>]  
**Sent:** Wednesday, November 22, 2017 3:51 PM  
**To:** 'Thomas Page' <[tpage@underwoodengineers.com](mailto:tpage@underwoodengineers.com)>  
**Subject:** RE: Water Tank

Tom:

Floor of tank will be USGS 396' Full Tank Level will be USG 437' matching Smith Hill.

Basic tank with some appurtenances \$1.3 mill.. NO site work, or related costs in this preliminary estimate from Chris H. at DN.

**Bruce W. Lewis, Manager**

Lewis Engineering  
44 Stark Lane  
Litchfield, NH 03052  
Office 603-886-4985  
Cell 603-493-1619  
[lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)



Please read & consider saving electronically & not printing this email

**1 John 4:8**



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**From:** Thomas Page [<mailto:tpage@underwoodengineers.com>]  
**Sent:** Wednesday, November 22, 2017 3:23 PM  
**To:** 'Michael C. Unger' <[munger@underwoodengineers.com](mailto:munger@underwoodengineers.com)>; [lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)  
**Cc:** 'Ryan Connor' <[rconnor@lewisbuilders.com](mailto:rconnor@lewisbuilders.com)>  
**Subject:** Water Tank

Ryan, have you contracted or received budget quotes from DN tank for a new concrete tank in Atkinson? I wanted to check first before so as to not duplicate efforts.  
Also, I recall discussing a potential base elevation for the tank back on October 18 at your office but can't find a number in my notes.

Thanks Tom

**From:** Michael C. Unger [<mailto:munger@underwoodengineers.com>]  
**Sent:** Tuesday, November 21, 2017 5:17 PM  
**To:** [lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)  
**Cc:** 'Ryan Connor' <[rconnor@lewisbuilders.com](mailto:rconnor@lewisbuilders.com)>; Thomas G. Page <[tpage@underwoodengineers.com](mailto:tpage@underwoodengineers.com)>  
**Subject:** RE: HDPE / DI

Thank you Bruce



Michael C. Unger, P.E.  
Sr. Project Engineer  
Underwood Engineers  
25 Vaughan Mall  
Portsmouth, NH 03801  
(603)436-6192

**From:** Bruce Lewis [<mailto:lewis.h2o@comcast.net>]  
**Sent:** Tuesday, November 21, 2017 2:30 PM  
**To:** 'Michael C. Unger' <[munger@underwoodengineers.com](mailto:munger@underwoodengineers.com)>  
**Cc:** Ryan Connor <[rconnor@lewisbuilders.com](mailto:rconnor@lewisbuilders.com)>  
**Subject:** FW: HDPE / DI

Mike:

Information for you from Ryan at HAWC.

SDR 11 HDPE (160 psi working pressure) in 16" diameter has an ID of 14" and from the Web. C = 155. It can be purchased in 50' lengths.

Thanks,

**Bruce W. Lewis, Manager**

Lewis Engineering  
44 Stark Lane  
Litchfield, NH 03052  
Office 603-886-4985  
Cell 603-493-1619  
[lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)



Please read & consider saving electronically & not printing this email

1 John 4:8





**From:** Ryan Connor [<mailto:rconnor@hampsteadwater.com>]  
**Sent:** Tuesday, November 21, 2017 11:20 AM  
**To:** [lewis.h2o@comcast.net](mailto:lewis.h2o@comcast.net)  
**Subject:** HDPE / DI

Bruce,  
The I.D. of 16" HDPE is 14.047"  
It comes in 50' lengths



*A division of Lewis Builders  
Development*

## Ryan Connor

Project Manager • Hampstead Area Water Services, Co.

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The State of New Hampshire  
**Department of Environmental Services**

**Robert R. Scott, Commissioner**

Docket No. DW 20-117  
Exhibit No. 9  
Exhibit DWB-6  
Page 1 of 2



March 6, 2019

Debra A. Howland, Executive Director  
New Hampshire Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301

NHPUC 7MAR19PM1:45

**Re: DW-18-138 Hampstead Area Water Company Atkinson Water Storage Tank**

Dear Ms. Howland:

The New Hampshire Department of Environmental Services (NHDES) is writing this letter of support for the Hampstead Area Water Company's (HAWC) Petition for approval of financing for the Atkinson Water Storage Tank, as well as a step increase to recover debt costs.

The HAWC water system currently includes two primary water storage tanks -- the Smith Mountain Tank in northern Hampstead and the Sawyer Avenue Tank in southern Atkinson. The existing Sawyer Avenue Tank in Atkinson is buried with pumped storage. If the pumps fail, the stored water is not available to the system. Construction of the proposed gravity storage tank in Atkinson will improve HAWC's ability to provide safe and reliable service to its customers by:

1. Providing more stable pressures in the southern part of the system, which will now be maintained by the water level in the tank independent of the number of wells in operation and their flow rates.
2. Allowing wells to pump at a more constant, sustainable rate, which will reduce wear and tear on mechanical and electrical equipment. Currently wells in the south have to ramp up to meet peak demands.
3. Reducing system complexity by providing storage for peak demands. Currently, operators have to open and close valves and increase well flow rates manually to balance flows and pressures in different parts of the system based on fluctuating demands.
4. Increasing fire storage volume.
5. Increasing fire flow rates, especially in the southern part of the system.

In addition to the above-stated benefits to HAWC's system, the proposed Atkinson Tank will provide added benefits to the Southern New Hampshire Regional Water Project (SNHRWP), which seeks to use Manchester Water Works as a supplemental source of supply for water systems serving the Towns of Windham, Salem, Atkinson, Hampstead and Plaistow. The proposed Atkinson Tank is a necessary part of the SNHRWP as it will enable HAWC to make one half of the volume of water from the proposed Atkinson Tank available for purchase by the Town of Plaistow when Plaistow establishes a municipal water system.

[www.des.nh.gov](http://www.des.nh.gov)

PO Box 95, 29 Hazen Drive, Concord, NH 03302-0095  
Telephone: (603) 271-3899 Fax: (603) 271-2181 TDD Access: Relay NH 1-800-735-2964

000023



By combining efforts, both HAWC and the SNHRWP are taking advantage of an economy of scale. The cost per unit volume is less for a larger tank than for two smaller tanks. Duplication of effort and common costs such as site work are reduced and, as a result, HAWC's rate payers will realize the same benefit from the proposed Atkinson Tank at a lower cost than if HAWC were to construct the tank independently.

Furthermore, HAWC water users and rate payers will realize the following benefits as a result of the additional supply capacity provided by the SNHRWP.

1. Increased reliability of water supply. Some existing wells are experiencing declining yields.
2. Improved water quality by allowing HAWC to prioritize higher quality wells. Some wells have experienced increasing concentrations of regulated contaminants such as arsenic, radium, and alpha particles. HAWC will be able to serve a safer product to customers by taking their lowest quality wells offline and blending in regional water.
3. Reduction in system complexity by allowing HAWC to take up to ten of its existing 19 wells offline.
4. Ability to expand to address contamination and/or loss of water in private wells.

Please note that although the New Hampshire Drinking Water and Groundwater Trust Fund (the Trust Fund) is providing funds to HAWC for the proposed Atkinson Tank in the form of a loan, the Trust Fund will provide a grant for HAWC's construction costs necessitated by and solely related to the SNHRWP. In addition, costs that HAWC will incur as a result of the SNHRWP including, but not limited to, operation and maintenance, bulk water purchase, and tax liabilities will be offset, in part, by wholesale water sales to the Town of Plaistow. In view of the foregoing, NHDES believes that HAWC's Petition is in the best interests of its customers as it will enable the company to continue to provide safe and reliable service at just and reasonable rates, and to play an important role in the SNHRWP.

In summary, NHDES supports HAWC's request for financing construction of the Atkinson Water Storage Tank.

Sincerely,



Robert R. Scott  
Commissioner