KEY QUESTIONS FOR THE WATER RESOURCES TASK FORCE

1) How much water are we using?

- MBTS has a permitted registration with MassDEP under the Water Management Act, Massachusetts General Laws, Chapter 21G to withdraw an average volume of 0.72 million gallons per day (MGD) with an annual volume of 262.8 million gallons from the North Coastal River Basin.
- Based upon the Town's Public 2020 Water Supply Annual Statistical Report (ASR), which is submitted to the MA DEP Bureau of Water Resources – Drinking water program, The town used ~229 million gallons of water in 2020. Some fluctuation from year to year is expected/normal.

1a) Residential vs. commercial vs. institutional/governmental

- 157m gallons for residential; 7m gallons for commercial; 2m municipal
- We have 2,404 residential services,111 commercial services, 5 industrial, and 13 municipal services

1b) How much per household?

- Per 2020 ASR - ~73,000 gallons/year/household -> or 200 gallons/day/household, 77 gallons/person/day

1c) What's the range among households?

- low user - 12,000 gallons/year -> 32 gallons/day
- high user – 1.6m gallons/year -> 4,383 gallons/day

1d) How much more in summer than winter? (proxy for irrigation, swimming pools, car washing, and other outdoor uses)

- Typical winter (Nov-April) usage is ~400,000 gallons/day; Winter lowest flow day was ~200,000 gallons
- Typical summer (May-October) usage is ~800,000/day; summer peak flow day was ~1.2m gallons.

1e) What's the trend in usage? (overall and per household)

- Based upon the 12month rolling average, which averages daily finished water flow put into the system by our treatment plants over the previous year on a rolling basis
- Exceeded 700,000 gallons/day from ~2011 thru 2015; increased to over 800,000 gallons/day from 2015 to 2017; a large drop was seen in 2017 due to the replacement of the water main on Pine Street and brought the rolling average down and fluctuates around 600,000 gallons/day +/- ~30,000 gallons over the course of the year. Since covid we have seen a sustained small increase due to more people being at home. Usage over the past 5 years has been within expected levels.

2) How much water are we losing?

- Per the 2020 ASR, the Town had ~25% unaccounted for water or 57.2 million gallons in 2020. The Town had ~167 million gallons of metered use and ~ 5 million gallons of

unmetered municipal use – hydrant flushing, town construction, fire training, etc. The MassDEP goal is 10% unaccounted water.

- The Town has leak detection performed annually to identify potential sources of leaks in the system, which are generally leaks on water services that may be imperceptible to the homeowner but could be losing anywhere from 0-5 gallons per minute. Leaks on the water main are generally quickly identified due to a loss of system pressure or an obvious leak or depression in the road.
- Currently production meters are original "venturi" style meters, which have known error even after calibration. Currently replacing these with "mag" meters which will increase accuracy and perhaps lower water "loss".
- One other potential source of water loss is through unmetered connections. This generally does not apply to single family homes with standard 1" or below water services. Many of the large estates have larger 4" water services that branch off to various parts of the property. There is potential that some branches are unmetered since the meters are generally installed in the house or in a meter pit near the house. There is also potential that these branches have breaks that cannot be detected. DPW is looking into new water meter technology that would allow us to install a meter at the connection to the water main so water consumption coming directly off the water main can be compared to the totals for the water meters read/billed on the property. Purchase and installation of these meters would cost ~$10k per meter/install location.

2a) Current condition of our distribution system? (pipes, valves, meters)

- The distribution system consists of approximately 44 miles of water main. The majority of the water distribution system was installed in the late 1800s and early 1900s – this cast iron water main is generally in structurally good due to the thickness of the cast iron pipe; coupons (samples of pipe) have been collected by DPW in recent years to evaluate the integrity of these pipes. However, tuberculation (buildup of minerals that precipitate out of the water and adhere to the interior walls of the pipe) over time reduces the internal diameter of the pipe, thereby reducing the capacity of the pipe. Tuberculation will also cause dirty water when a piece breaks off. This is part of the reason we do hydrant flushing twice per year.
- DPW has a project under design to clean and cement line (tuberculation does not adhere to the cement lining readily) the School St water main, which is a main distribution main, this summer. Subsequent cleaning and lining projects are anticipated for Summer St in the coming years.
- Recent DPW water main projects have targeted water mains in areas that are adjacent to the ocean, which are in soils that are highly corrosive. Water mains on Raymond, Ocean St, and Boardman Ave have recently been replaced with plastic (c900) water main which is designed for use in these areas. DPW will also continue to replace water mains in areas that are prone to water main breaks – Forest st is the most recent example – 4 breaks in the span of a year while the water main replacement project was under design) and install new water mains that will complete "loops" of the system which helps increases flow and pressure at the extents of the distribution system and improves water quality as water will not stagnate at dead-ends.
- In the last 4 years, DPW has replaced a significant number of valves that were not working or leaking and also installed new valves at critical intersections to better control

our distribution system both for hydrant flushing and mitigating effected areas when shutdowns are required to complete emergency repairs or scheduled work.

- DPW has also replaced a significant number of old fire hydrants in the last 4 years.
- Water meters were replaced approximately 15 years ago with a lifespan of 20-25 years. DPW is evaluating new metering technologies that could be implemented when meters are replaced in the coming years. New metering technology can provide, via web-interface, real-time updates to both the Town and user.

2b) Are we staying ahead of failure/deterioration/obsolescence?

- There was a significant lack of upkeep to the water distribution system prior to the 2010s which has resulted in a backlog of work. The Town is currently allocating ~$1m/year for water main projects and an additional $300k for water treatment plant work. The Town will be utilizing ARPA funds this year to complete additional water main work. The Town will apply for any grants available from BBB.

3) What are the primary impacts of climate change on our water supply & demand?

3a) Total annual rainfall (replenishing rain)? Frequency of droughts?

- W&C collects rainfall data as well as pond level data. We have daily data dating back to 2009. Dryer summers tax Gravelly Pond due to the increase of irrigation and reduced inflow to the pond. The pond generally recovers over the winter as wet weather provides the needed inflows and water demand greatly decreases over the winter. More historical context could be researched by the task force. The state also has developed their own Drought Management Plan for all watersheds/water suppliers.

3b) Frequency & severity of storms, floods?

- More historical context/implications could be researched by the task force.

3c) What happens to drinking water if our WWTP floods or fails? (worst case scenarios)

- If the WWTP has a major failure that requires the treatment train to be bypassed the town would discharge untreated effluent out of the outfall into Manchester Bay. The Town would likely implement water restrictions to essential use only to reduce the amount of untreated effluent being discharged to Manchester Bay. The wastewater and water systems are not directly tied together.
- If the WTP fails, we could use LSW for essential water. The Town would need to implement water use restrictions. We would also activate emergency connections to Beverly and Gloucester, however these come with their own set of challenges due to differences in system pressures and water chemistry/treatment between the water systems.

4) How is the Town acting to manage water demand?

4a) Rates?

- The Town utilizes a tiered water rate structure that places the highest cost (per 100 cubic feet of water) on the highest water users. These high-water users subsidize the

lower tiers. Implementing conservation measures would reduce the usage of the high-water users which would reduce revenue and thereby require the rates to be increased on the lower tiers to balance the loss of revenue for the water enterprise. The rate tiers are reviewed annually by the DPW and provide a recommendation to the BOS. In 2016, a member of the BOS modeled the rate structure. It could be beneficial for the Task Force to re-model the rates if significant changes are warranted. The current rate tiers are:

Water (2.25% increase across all tiers)

- $6.36 per 100 cf., for first 900 cubic feet used (prior year $6.22)
- $6.47 per 100 cf., for 900-1,700 cubic feet used (prior year $6.33)
- $7.11 per 100 cf. for 1,700-5,700 cubic feet (prior year $6.95)
- $7.72 per 100 cf., for 5700-16,000 cubic feet used (prior year $7.55)
- $8.34 per 100 cf., for 16,000-39,000 cubic feet used (prior year $8.16)
- $8.96 per cf., for 39,000+ cubic feet used (prior year was $8.76)

4b) Conservation, use of gray water?

- Conservation/watering bans could be implemented to reduce our peak demands in the summer. This is done in many of the adjacent towns to varying degrees of severity. These range from only using outside irrigation during low demand periods of the day to complete bans of outdoor watering. Manchester last implemented a water use restriction due to insufficient supply in 2016. The effectiveness of these bans in MBTS is debatable. During the last water ban in July/August 2020, which was due to a mechanical failure of the pump at the Lincoln Street Well which look LSW offline, the water demand only slightly dropped. To have effective water bans, proper enforcement would be needed.

5) How is the Town acting to manage our water supply?

5a) Roles of DPW, BOS, BOH?

- DPW manages all aspects of town infrastructure and property related to the water system as a whole. DPW efforts in watershed management are more or less concentrated on Town-owned property. Occasionally we comment or review aspects of permits of various town boards or other initiatives.

5b) Planning Board and ZBA, Zoning Bylaw & Water Protection Districts

- For task force members to inform and research.

6) What are neighboring Towns doing to manage their water supply and demand?

6a) Any important lessons from their successes or failures?

- Many of the neighboring Towns must implement water bans/restrictions during the summer to meet demand. Due to a combination of continued development and water sources (Ipswich River Water Basin) not having as much water in recent years. These are

mainly triggered by Public Water System **requirements** within their various registration limits or permitted withdrawals and regulated by DEP.

6b) What collaboration is occurring among towns

- DPW is active in professional organizations dedicated to water works industry (MWWA and NEWWA).
- The Town is involved in the North Shore Water Resiliency Task Force, which is facilitated by Senator Tarr and his staff, that was established in fall of 2021 to bring together the communities on the North Shore to identify and advance long-term solutions to improve water supply resilience and ecosystem health in the Ipswich River Watershed.
- The Town of Hamilton was awarded a WMA grant to investigate the feasibility of regionalization of supplemental water supplies which would include all their surrounding towns and the Salem-Beverly Water Board.

6c) Which towns are most similar to Manchester's current situation?

- What is Manchester's current situation? Most public water systems are underfunded, need major capital improvements, workforce shortages, climate change, and increasing regulatory requirements.

7) What are some best demonstrated practices nationally?

7a) For protecting watersheds?

- Typically buying the abutting land in the watershed is considered best practice. Additional research warranted.

7b) For managing demand?

- Increasing block rates or conservation rates are typical. Additional research warranted.

7c) For planning long-term?

- We have capital improvements plans on record, additional planning for watershed management and climate resiliency is warranted (working on CREAT grant to address the latter).

8) How dangerous are contaminants in our drinking water? Including PFAs, chloromethanes and halomethanes, bromo- and chloroacetic acids, radium and other radioactive? (salts, minerals)?

- The Towns water meets all current applicable standards and treatment levels in accordance with MassDEP and USEPA.
- Per-and polyfluoroalkyl Substances (PFAS) is an emerging contaminant that MassDEP has established a regulatory maximum contaminant level (MCL) of 20 parts per trillion (PPT) for the combined total of the "PFAS6", which are the 6 PFAS compounds that are regulated. USEPA has established an MCL of 70ppt.
- MBTS was required by MassDEP to start testing our water for PFAS in September 2021. The Town did exploratory sampling in January 2021 on the finished water. MassDEP requires water samples to be taken at "point of entry" (POE) into the water system which means after the water has been thru the treatment process. The Town has taken raw

water samples from Gravelly Pond and LSW so the Town could identify the background levels in our water sources in addition to the POE samples.

- All results have come back below the 20ppt threshold with the raw water and POE samples at the WTP coming in below 10ppt, which only requires quarterly testing per MassDEP going forward. The LSW has tested between 14 and 19.8ppt which requires us to test monthly at the LSW. If the LSW 3-month testing average exceeds 20ppt, the Town will be required to shut down the well which would reduce the amount of water that can be supplied. This would result in a significant reduction of available water and result in mandatory watering bans/restrictions.
- Upon receiving results for the LSW, the Town hired a consultant to perform a study on the PFAS at LSW, evaluate treatment options, and a study level cost estimate. The report resulting from this work will be finalized in the next month. It will be distributed upon completion.
- Additional testing is done for disinfection byproducts, lead and copper and future testing for emerging contaminants is likely under UMCR 5 (Fifth Unregulated Contaminant Monitoring Rule)

8a) what are the primary sources of each contaminant?

- Some are natural, some man made. Additional research warranted.

8b) What are the trends and vulnerabilities in terms of contaminant levels?

- As technology advances, our ability to test and treat otherwise unknown or non-detect contaminants is possible and additional regulatory pressure results. Additional research warranted.

8c) What are the most important risks and potential costs of protection?

- Further treatment processes could be added to both the WTP and LSW to treat the unregulated contaminants listed on the EWG.org website. As these are unregulated there are no grant/funding opportunities available so funding would be on the Town. Adding these treatment processes would cost in the $5-15+ million range depending on what treatment process is added.

9) What's the same and what's changed since the 1990 Horsley-Witten Report?

9a) What else have we learned about sources of our drinking water?

- Additional research warranted.

9b) What's changed in terms of development and specific risks?

- Additional research warranted.

9c) How many recommendations have been enacted? Which have been rejected? Which have been ignored?

- Additional research warranted.

9d) What does Scott Horsley recommend to make our Task Force successful?

- Additional research warranted.

10) What are the relevant laws and regulations pertaining to our drinking water at State and Federal levels?

- 310 CMR 22.00 Drinking Water Regulations

10a) Maximum permissible levels of contaminants?

- 310 CMR 22.00 Drinking Water Regulations

10b) Required protection of watershed?

- MassDEP Source Water Assessment & Protection
- Federal Safe Drinking Water Act Amendments of 1996

10c) Which current rules would we be violating if not for "grandfathering"?

- Besides the location of the well itself and perhaps the existence of the landfills, there are no drinking water regulations that the Town is grandfathered into. We meet all applicable MassDEP and USEPA regulations.

10d) What assistance is on offer from the State or Federal governments, and how do we avail ourselves of it?

- There are various grant programs thru the state and federal government. Grant notifications are sent out via applicable state/federal agencies and various professional organizations. Consultants also reach out with grant opportunities.
- The MassDEP State Revolving Fund (SRF) program was utilized for the Pine Street Water main replacement work completed in 2016 however the financing available thru this program is generally not as favorable as financing the Town can acquire on its own.
- Many of the grants heavily favor economic justice (EJ) communities, or systems out of compliance, which Manchester is not, where the grants are targeted.
- Sue Croft is working on the CREAT grant opportunity with EPA

10e) Protection of unused water sources (idle drinking wells, e.g.)?

- In terms of approved sources of municipal drinking water we have no "unused sources". If the town would like to develop sources it could be done in accordance with the new source approval and permitting process with DEP. Additional research could be warranted however keep in mind there is a finite amount of Town capital for this type of work.

11) How exactly do we treat our drinking water today?

- Water from Gravelly Pond is treated by the WTP and pumped each day to the Moses Hill water storage tank (located at 139 Pine St) and flows into the system as demand dictates. The WTP is largely only run when W&C staff are onsite as enough water can be treated during normal working hours to provide enough water to the water tank to meet daily demands. The water tank holds 1.7 million gallons of water. The WTP provides approximately 60% of water demand for the Town.
- Round Pond well supplements Gravelly Pond by pumping to a settling pond which flows to Gravelly Pond. Round pond well supplements up to 400,000 gallons per day however

it is run intermittently (not every day) over the course of a month, ie when GP pond levels dictate a need to be supplemented.

- The LSW provides approximately 40% of the Towns water demand. Water is drawn from LSW, treated, and pumped into the system based upon pressure differentials – on demand so to speak. Both the WTP and LSW are largely run via automated processes controlled by SCADA.

11a) Gravelly Pond

- The Gravelly Pond Water Treatment Plant is located at 599 Chebacco Rd in South Hamilton and was built in 1995-1997 and put online in May of 1997. The WTP was designed to supply up to 3 MGD, however, this vastly exceed our permitted average daily withdrawal limit 0.72 MGD. Prior to the WTP construction, a raw water pump station that did minor treatment was located on the site.
- Gravelly Pond has a surface area of 49 acres and a capacity of over 360 million gallons when full. Gravelly Pond water level is measured by W&C from the wet well of the raw water pump station and have historically measured the pond level to reflect the actual usable water levels at which the intakes can draw water from; 0' being the bottom of the lower intake pipe. There is an 18.5' difference between the level of the pond as measured from the wet well and elevation, ie when the pond level is measured by W&C to be 29.5' in the wet well, the actual elevation of water using an altimeter would be 48.0'.
- Normal water level in Gravelly Pond is 29.5' (elevation 48.0') when measured from the wet well of the raw water pump station'. Gravelly pond is considered to be "full" when it utilizes the spillway at water level is 31.0' (or elevation 49.5'). At this point, water from Gravelly Pond starts to encroach on the walking paths around Gravelly Pond. Gravelly Pond has a flood level of water level 36' (or elevation 54.5'). As of March 1, 2022 the pond water level was at 30.96'.
- At the facility the process starts with the Raw Water Pump Station built on Gravelly Pond in Hamilton, MA. The Raw Water Pump Station has 2 underwater intakes (an upper and a lower) with intake screens and 4 vertical turbine pumps.
- Raw water is moved with one or more of these vertical turbine pumps to the main treatment facility building's Filter Room – where it is first injected with: Potassium Permanganate, Liquid Aluminum Sulfate, and Polymer. Potassium Permanganate is used for Pre-Oxidation to oxidize the Manganese and Iron in the raw water. Liquid Aluminum Sulfate and Polymer are used as our Primary Coagulant and Coagulant Aid respectively. These help consolidate errant particles in the raw water so that they can better adhere to the clarifier beads and filter media. The clarifier beads and filter media are cleaned through periodic clarifier backflushes and filter backwashes to ensure optimal particle removal.
- After these 3 chemicals have been injected, the water flows through an in-line static mixer before entering the 3 - 1.0 MGD stainless steel upflow clarification and filtration modules. From here the effluent filtered water from the three filters flow by gravity to 2 - 250,000-gallon capacity, below grade clearwells where the water in treated with Sodium Hypochlorite for disinfection and Sodium Fluoride for Fluoridation.
- The water then flows through the 2 clearwells which have baffled walls to ensure proper contact time is achieved and no short circuiting occurs. From the end of the clearwell water is pumped into the distribution system by one or more of the 4 vertical turbine

pumps located over the clearwells, but not before being treated with Sodium Hydroxide for pH Adjustment, and Zinc Orthophosphate for corrosion control.

- As part of the treatment process, there are also a few other processes that must take place to ensure proper treatment is being completed. These processes include clarifier backflushes, filter backwashes, and backwash water recycling:
    - The clarifier backflushes are completed with the use of 1 of 2 Air Blowers to perform an Air Scour (which helps to strip the beads of collected debris) and are finished by being flushed with raw water until clear or mostly clear. This process is done at timed intervals and helps gives the clarifier media a nice clean surface to achieve optimal adsorption of the particles.
    - The filter backwashes are also completed with the use of 1 of 2 Air Blowers to perform an Air Scour (which helps to disturb the media and "shake off" the collected debris) and are finished by being flushed with treated water from the clearwell with 1 of 2 Backwash Pumps. Just like the clarifier backflushes, this process is done at timed intervals and helps gives the filter media a nice clean surface to achieve optimal adsorption of the particles not collected by the clarifiers.
    - Clarifier backflush and filter backwash "waste" are delivered to three on-site settling lagoons for periodic dewatering and off-site disposal of removed solids. Two of the lagoons operate on a Lead, Lag basis, with the third lagoon being offline for a freeze/thaw cycle to allow sludge to dry out. Through this lagoon system, the decant, or top level of clear filter water, from the "Lag" lagoon flows into the basin of the Recycled Water Pump Station, where 1 of 2 submersible recycled water pumps move up to 10% of the recycled raw water flow back to the head of the plant for further treatment. Any overflow from the recycled water basin, the lagoons 'bird baths', or through the underdrains of the "offline" lagoon is also directed through the outfall, which feeds directly into Gravelly Pond which leads to little water lost in treatment.

11b) Lincoln St Well

- The Lincoln Street Well Water Treatment Facility is located at 40 Lincoln Street, was built in 1958, and upgraded with the addition of a chemical addition facility in 1996/1997. The facility consists of a 58-foot-deep gravel packed well. The pump and motor were replaced in 2020.
- Water is pumped from the well with a submersible well pump/motor, and is injected with Sodium Hypochlorite for disinfection, Sodium Hydroxide for pH adjustment, Sodium Fluoride for fluoridation, and Zinc Polyphosphate for the sequestering of the iron and manganese in the well water. The sequestering action keeps the iron and manganese in solution – which is imperative due to having no form of filtration. Water then flows through 200 ft. of serpentine pipe to meet 4 log removal disinfection before it is pumped directly into the distribution system.

11c) Round Pond Well

- The Round Pond Well Transfer Station is operated when needed to help replenish Gravelly Pond due to its limited watershed recharge area. The facility is located on the edge of Round Pond in Hamilton, MA. This facility consists of a submersible well pump/motor that pumps water from the 30 foot deep well. The water is then injected

with Sodium Hypochlorite as a pre-oxidant to oxidize the iron and manganese present in the well water, before flowing into a solids settling lagoon located in Chebacco Woods on the edge of Gravelly Pond. The treated water flows into the lagoon where solids are given a chance to settle out before the supernatant, or top layer of clear water, flows over into Gravelly Pond.

11d) Woodard & Curran's role vs DPW?

- DPW is responsible for the overall management of the water system, management of Woodard and Curran (W&C) and the treatment at WTP and LSW, management and operation of the distribution system, regulatory compliance, and administration of the water enterprise. W&C are the contract operators providing professional operators (and licensure) of the Gravelly Pond Water Treatment Plant, Lincoln Street Well, and Round Pond Well and are responsible for operation and maintenance of these sites in accordance will all applicable standards and regulations for water treatment as set forth by MassDEP, USEPA, and AWWA. W&C has been the contract operator since 2000. DPW is in daily contact with W&C staff. W&C have 2 full time staff, with the required water treatment licensure, dedicated to MBTS with at least 1 staff onsite daily. W&C also has management staff that are onsite ~ 1 day per week. W&C provides water treatment contract operations services to a number of municipalities in the area. The Town Water Department has 3 full time staff (licensed operators), a part time water clerk, and is overseen by the DPW Director and Town Engineer.

11e) Frequency and accuracy of testing?

- The water from each facility is tested daily in the laboratory at the WTP as required by MassDEP and USEPA. W&C's daily laboratory testing includes turbidity, color, temperature, free chlorine residual (and total chlorine residual when applicable), fluoride residual, pH, phosphate residual, iron residual, and manganese residual. W&C calibrate their benchtop laboratory equipment and online laboratory analyzer daily, or on a frequency recommended by the manufacturer or required by MassDEP. W&C also conduct an array of sampling on a weekly, monthly, quarterly, and annual basis such as: Total Coliform Bacteria, THM's, HAA's, Nitrate, Nitrite, Perchlorate, SOCs, IOCs, and Lead & Coppers - as required as part of the systems MassDEP sampling plan at the various facilities and throughout the distribution system to assure we are compliant with permit requirements with the various regulatory agencies. Any testing (such as PFAS) that is beyond W&C lab's capabilities is done by third party, MassDEP certified laboratories who report directly to MassDEP.

11f) How do our facilities and practices compare to best practices

- The facilities here in MBTS are all operated by Woodard & Curran following the best practices laid out by the MassDEP and American Water Works Association (AWWA) for the operations of a water system. Every three years MassDEP conducts a Sanitary Survey which is an onsite review for the purpose of evaluating the adequacy of the water source, facilities, equipment, operation, and maintenance of a public water system. The most recent survey was conducted in 2020 and resulted in zero violations.

- As the operators of the facility (W&C staff) as well as the distribution system operators (Town Staff), are required to hold the necessary licensure to operator said facilities.

These professional licenses require the operators to take classes that are certified to provide Training Contact Hours/Continued Education Units to maintain compliance. These courses and trainings are done in variety of topics, from all aspects of Plant Operations to things like Health & Safety.

- Woodard & Curran has also instituted their own internal compliance and training programs where they are required to be certified in: CPR/First Aid, Confined Space Rescue, Qualified Electrical Work, and Cyber Security Awareness. W&C conduct monthly safety training through a program from UL called PureSafety, as well as take part in a monthly SPARKS program where they host onsite Safety ToolBox talks. With a range of industry experts on staff, W&C also benefit from the ability to receive remote and/or onsite training on a variety of topics from new treatment or testing methods to new computer technology.

12) What are our citizens' attitudes and concerns about drinking water?

12a) How important is drinking water quantity and quality to them? (Does it keep them up at night or do they place it low among issues facing the Town?)

- Additional research warranted.

12b) How well-informed are they about the major issues we're looking at?

- Additional research warranted.

12c) What are people doing to ensure their own drinking water quality? (filtering, buying bottled water?)

- Additional research warranted.
- Installing a whole house filter, a point of use filters (at the faucet), or using a countertop (Brita style) is an effective way to provide additional treatment to household drinking water. Many residents in Town utilize these. Bottled water in many instances is just tap water from the community where the bottling plant is located. It is a misnomer that bottled water is higher quality than tap water in many instances. Additionally, these bottling plants are generally less regulated than municipal water systems.
  - **https://www.nrdc.org/stories/truth-about-tap**
  - **https://www.greenamerica.org/drinking-water-risk/bottled-water-vs-tap-which-best**
  - **https://www.ewg.org/research/ewgs-bottled-water-scorecard-2011**

13) What are our options for increasing quantity of our drinking water?

13a) Possible new sources? (capped wells near Gravelly and Round Ponds, old wells near Cedar Swamp/Sawmill Brook, new wells, sharing with neighboring towns, tying into MWRA Quabbin, tapping into Gloucester, private wells, other?)

- The Town is limited by our registration with DEP for the amount of water we are allowed to withdraw from our sources and/or watershed/basin. Adding new sources of water (wells) would not increase our permitted withdrawal limit. Our withdrawal limit was established in 1986 by MassDEP and our permit is renewed as required. Water Management Act, Massachusetts General Laws, Chapter 21G to withdraw an average

volume of 0.72 million gallons per day (MGD) with an annual volume of 262.8 million gallons from the North Coastal River Basin.

- Ability to connect to MWRA would likely need to be made at a regional level.
- Ability to purchase or "wheel" water from surrounding communities is being vetted but has capital and operational challenges.

13b) Curtailing outdoor use of drinking water?

- Additional research warranted. Financial ramifications.

13c) Conserving indoor use of drinking water?

- Additional research warranted. Financial ramifications.

14) What are our options for better protecting quality of our drinking water?

14a) Land acquisition or restriction to protect watersheds?

- Additional research warranted. Capital/financial ramifications.

14b) Preventing leaching from capped landfills, toxic dump sites, etc.?

- The Town, as required and in accordance with MassDEP regulations completes biannual sampling of the landfill at ground water sampling wells located around the permitter of the capped landfill. Reports of the samples are submitted to DEP for their review. The landfill was capped in 1995. The site now functions strictly as a transfer station (soon to include black earth compost operations).

14c) ORW designation for Sawmill Brook? (per Trout Unlimited + Ashley?

- Additional research warranted