

Brockton Water Supply

Impacts and Role of Aquaria Desalinization Plant in Solutions

The City of Brockton draws its water supply from several sources. This fact sheet summarizes the main sources feeding the primary supplies drawn from and treated at Silver Lake in Kingston, the adverse environmental effects of the current water management practices, and available solutions that can meet the City's water supply needs while alleviating environmental damage. A new source, the Aquaria desalinization plant in the South Coastal basin, is now available and should be utilized to reduce the environmental damage to the resources in the Silver Lake system.

Water is drawn from three watersheds for Brockton's Silver Lake water supply¹:

- Silver Lake in the Jones River watershed
- Monponsett Pond in the Taunton watershed
- Furnace Pond in the North River Watershed

Water from Monponsett Pond and Furnace Pond is diverted through large pipes into Silver Lake. Water is then drawn from Silver Lake, treated at a treatment plant on the lake's shore, and sent 20 miles through two pipes, one of which is more than 100 years old, to the City of Brockton.

All three of the supply reservoirs are natural ponds in headwater areas, artificially augmented with dams at their outlets. Brockton controls these outlets and keeps the water in Monponsett Pond and Furnace Pond artificially high at some times and draws these ponds and Silver Lake down dramatically at other times. The manipulations of the water levels are driven primarily by Brockton's maximization of water for its withdrawals. Adverse effects to the environment include:

- Lack of flow to Jones River (from Silver Lake), Stump Brook² (from Monponsett) and Herring Brook (from Furnace Pond) during significant periods of the year.
- Severe drawdown of Silver Lake for months at a time every year.
- Habitat for fish and other aquatic life in the affected waterways is severely degraded, and in some cases eliminated for months at a time, due to these practices.
- Impaired water quality: Monponsett Pond and Furnace Pond both have serious eutrophication (excessive nutrient) problems. Runoff from surrounding development and septic systems flows more readily into the ponds when water levels are kept artificially high, inundating yards and other developed areas. This polluted water is then transferred into the otherwise relatively clean Silver Lake.

The Solution: Aquaria Desalinization plant

In 1994, following years of emergency declarations by the Department of Environmental Protection (DEP) due to Brockton's overstressed water supply, a proposal was filed to build a desalinization plant on the lower Taunton River in Dighton. This plant underwent an extensive environmental review process through the Massachusetts Environmental Policy Act (MEPA) and state permitting. The Aquaria facility takes water from the lower part of the Taunton River and purifies it to drinking water quality standards. The facility is now up and running, and can provide up to 3 million gallons per day (mgd) of water. Brockton has contracted to take a minimum of 1.9 mgd in the first year, and up to 5.07

¹ Brockton also draws water from the Avon (aka Brockton) Reservoir and the Hubbard Avenue well. The Silver Lake system is Brockton's main source and the focus of this fact sheet.

² Mass Audubon's Stump Brook Wildlife Sanctuary is located along the brook, and is impacted by the lack of adequate clean flow.

mgd over the 20-year life of the contract. Water rates were raised in Brockton in April 2008 to pay for the cost of the Aquaria contract.

Throughout the environmental review process for the Aquaria plant, MEPA Certificates and other state documents related to permitting for the facility stated that the plant would be used to offset water from the overstressed Brockton supplies. DEP ordered Brockton to develop a Comprehensive Water Management Plan (CWMP) that would *identify how Brockton will manage its withdrawals, including any volumes purchased, [from Aquaria] to minimize the environmental impacts associated with the withdrawals. ...Once the plan has been reviewed and approved by the Department, the Department will modify the WMA [Water Management Act] Permit to require Brockton to implement the approved strategy.*

However, as of early 2009, the CWMP has not been completed. Brockton is accepting Aquaria water without any plans in place to offset water withdrawals from the other sources or improve management of those sources. DEP should immediately act to:

- Require completion of the CWMP;
- Modify Brockton's WMA permit to reduce stress on the existing sources and provide for use of Aquaria to offset those sources; and
- Eliminate the provision of DEP's Administrative Consent Order which allows Brockton to withdraw 110% of the Safe Yield of its existing sources.

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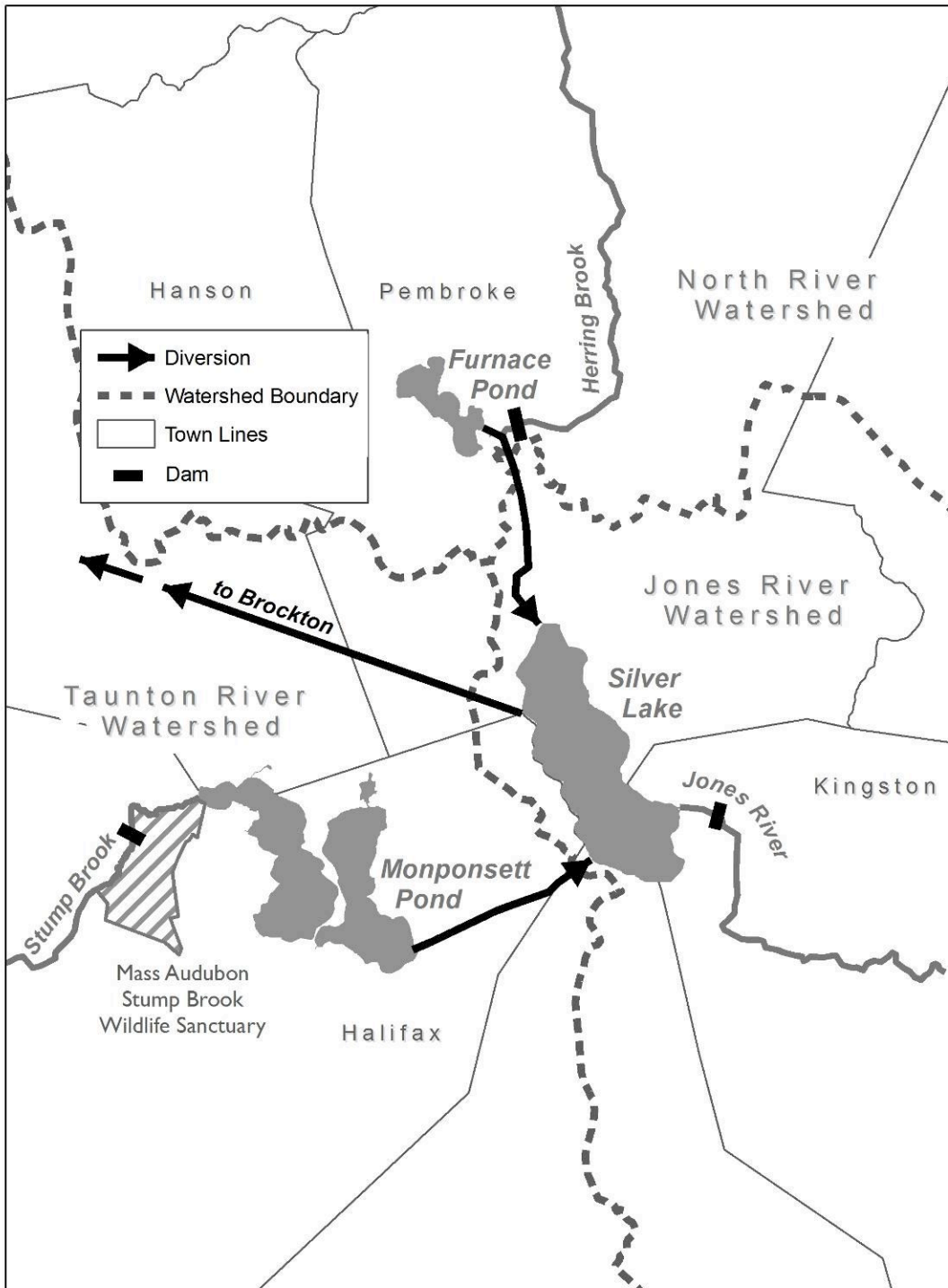


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	Estimated Safe Yield		Currently Allowed Withdrawals	Conditions under Acts of 1964 and 1981 ³	Additional Conditions Needed	
Silver Lake	4.5 mgd ⁴	9.4 mgd, aggregated for all three sources ⁵	110% of systemwide Safe Yield allowed via a 1995 DEP Administrative Consent Order (ACO)	Diversions may be prohibited when Silver Lake is at or above 46.5' MSL ⁶ but in practice this condition is not followed ⁷ .	Establish Safe Yield and permitted withdrawal amounts below Safe Yield, for each separate source.	Prohibit withdrawals from Silver Lake when no diversions into it supplement its supply.
Monponsett Pond	Unknown ⁸			Diversions into Silver Lake allowed October-May. Minimum 900,000 gpd flow to Stump Brook when diversion is on. Minimum pond level 52.0' MSL No maximum level		Minimum flows to Jones River in all seasons. Minimum flows to Stump Brook in all seasons. Clarify that the Acts of 1964 intended continuous flow to Stump Brook of at least 900,000 gpd at all times, not only when the diversion is operated. Establish limit on maximum pond level. Develop water quality plan for the pond and impose limits on diversions when water quality is low.
Furnace Pond	Unknown ⁹			Diversions into Silver Lake allowed October-May. 300,000 gpd flow to Herring Brook when diversion is on. Minimum pond level 56 MSL. No maximum level.		Minimum flow to Herring Brook throughout all seasons. Establish limit on maximum pond level. Develop water quality plan for the pond and impose limits on diversions when water quality is low.

³ These are special laws which supplemented Brockton's water supply at Silver Lake by allowing diversions from Monponsett and Furnace Ponds (1964 Ch. 371) and imposed conditions on the elevation of Monponsett Pond (1981 Ch. 237). The Acts of 1964 also established the Central Plymouth County Water District Commission (CPCWDC), to regulate the allocation of water in the area, but it has not operated regularly or fulfilled its statutory mandates in decades.

⁴ Based on CDM 1955 report, which analyzed a 20 year drought event with 180 days of no precipitation, estimating the amount that could be withdrawn before reaching the point where the intake pipe would run dry. This is not an ecological estimate of Safe Yield.

⁵ CDM determined in 1987, based on a mass-balance reservoir model, that the Safe Yield of the Silver Lake system (including transfers from Monponsett Pond and Furnace Pond) was calculated to be 9.4 mgd. DEP accepted that as shown in the 1995 ACO where 10.33 mgd is considered the Safe Yield of the Brockton water supply system (including Avon/Brockton Reservoir and Hubbard Avenue well and the Silver Lake system) and other documents.

⁶ Mean Sea Level

⁷ The CPCWDC is the authorized authority to make these decisions, but it does not meet regularly.

⁸ DEP has never issued any analysis or report determining the Safe Yield for Monponsett Pond. Water is also withdrawn from the Monponsett Pond watershed from Town of Halifax wells and by cranberry growers, who have first rights to the water under the Acts of 1964.

⁹ DEP has not issued a determination of the Safe Yield of Furnace Pond in relation to Brockton's use of water from the pond.