MDC WATER SUPPLY – THE FACTS

The Metropolitan District (MDC) is a non-profit, specially-chartered municipal corporation dedicated to providing its customers with safe and pure drinking water. Over the last thirty years, drinking water consumption in the MDC’s service area has decreased by over twenty seven percent, and as a result the recurring costs associated with the providing drinking water are distributed over a decreasing amount of water sold. In large part, this decrease in water consumption is the result of both public and private sector emphasis on water conservation, efforts which the MDC supports. Over the same period of time, increased government regulation together with an aging water infrastructure, require continued operational and capital investment towards regulatory compliance and maintenance and replacement of water supply and distribution assets. With an aging infrastructure, capital investment is critical to offset and mitigate the burden of rising maintenance and repair costs.

The MDC is aware of the increasing cost of water to its customers. MDC has an obligation to its member and non-member towns to continuously evaluate best management practices to mitigate costs to customers while maintaining the highest standards for water quality and protecting our water resources for the next 50 years to address population growth and future development needs. Simply put, one way to meet this goal is to sell more of our available water, while ensuring that in doing so we maintain our commitment to our existing customer base.

WATER SUPPLY

The MDC and its member towns and customers are blessed with a pure and abundant water supply today because of sound financial investment, engineering and conservative long range planning decisions made more than a century ago. The MDC’s drinking water supply comes from two large reservoirs located within the Farmington River Watershed– Barkhamsted Reservoir (commissioned in 1940) and Nepaug Reservoir (commissioned in 1917). Barkhamsted Reservoir is the largest drinking water reservoir in Connecticut, with a capacity of 30.3 billion gallons. Nepaug Reservoir, also one of the largest reservoirs in the state, has a capacity of 9.5 billion gallons.

When full, these two reservoirs store almost 40 billion gallons of water, a volume equivalent to more than two years of typical water use by all of MDC’s customers. Because of the depth and large size of these reservoirs relative to the amount of water typically used, the MDC is better able to sustain operations during extended drought conditions than most other water utilities in Connecticut.
The Barkhamsted Reservoir, built in 1940, has a capacity of 30.3 billion gallons.

The Nepaug Reservoir, built in 1917, has a capacity of 9.5 billion gallons.

The size of the Farmington River Watershed area is 609 square miles.

The MDC reservoirs consist of 86 square miles, only 14% of the entire watershed.

86% of the Farmington River Watershed area is unrelated to the MDC reservoirs.

The MDC does not make any withdrawals directly from the Farmington River.
Unfortunately, misconceptions about where MDC’s water comes from and whether the MDC diverts water from the Farmington River abound. Let’s be clear:

- **Fact**: The MDC’s Barkhamsted and Nepaug Reservoirs were impounded several decades ago for the sole purpose of providing drinking water necessary for growth, public health and economic development to the City of Hartford and its subsequent MDC member towns.

- **Fact**: The Farmington River Watershed lands consist of approximately 609 square miles of drainage area. The watershed of MDC’s drinking water reservoir system consists of a very small percentage, approximately 86 square miles. This is only a fraction (14%) of the Farmington River’s drainage area. The water collected within this area never was intended to and does not reach the Farmington River; its intended purpose was to be impounded for drinking water and economic development. Therefore, when MDC draws water from the reservoirs, it does not come from the Farmington River. Said differently, 86% of the Farmington River Watershed’s drainage area is totally unrelated to MDC drinking water reservoirs.

- **Fact**: The MDC makes no drinking water withdrawals directly from the Farmington River. There is no existing physical infrastructure in place that would allow diversion of the West Branch or Farmington River mainstem for drinking water use.

**SAFE YIELD**

MDC’s Connecticut Department of Public Health (DPH) approved “safe yield” of its existing reservoir system, including the Barkhamsted and Nepaug reservoirs, is 77.1 mgd (million gallons per day). “Safe yield” means the maximum dependable quantity of water per unit of time which may be continuously withdrawn from a source of supply during a critical dry period, specifically a critical dry period with a 1% chance of occurrence.

To develop its safe yield, MDC actually uses a more conservative method than DPH requires. MDC’s safe yield analysis uses data from the actual 1960’s drought (correlates to a 115 year drought) which was more severe than the DPH recommended 1 in 100 year drought. If MDC applied the DPH method, MDC’s safe yield would increase to 83.9 mgd, an additional 6.8 mgd. This is because the 100 year frequency streamflows would actually be higher than those streamflows experienced from 1964 to 1968. As a result, there is a substantial “cushion” built into the MDC’s safe yield value that would not exist under DPH safe yield criteria.
Although the safe yield analysis was approved by DPH in 1996, the 1960s data is actual historic data and does not change with time. MDC currently partners with the United States Geological Survey (USGS) to operate stream gauges installed prior to 1939, which measure the stream flow within the tributaries to the MDC reservoir system. These gauges continue to this day to demonstrate that the 1960s drought condition is still the critical drought period of record for the MDC’s watershed, and therefore validate utilizing the 77.1 mgd 1996 Safe Yield calculation as a very relevant yet conservative approach for the protection of our water supply into the next 50 years of population growth and economic development.

**DROUGHT ADVISORY CONDITIONS & TRIGGERS**

As part of all water utilities’ water supply plan, reviewed and approved by DPH, and the Connecticut Department of Energy and Environmental Protection (DEEP) and its subdivision, the Public Utility Regulatory Agency (PUR), a specific drought contingency plan is included. Certain triggers have been established as part of the MDC’s approved Water Supply Plan for drought planning. During any drought condition, the MDC is required to work closely with DPH to plan and implement operational procedures and conservation measures, and with the Connecticut Department of Energy and Environmental Protection (DEEP) to manage water releases from our reservoirs. Much of the response action to drought triggers involves simply raising public awareness about conservation through the media.

There are specific conservation measures the MDC requests of its customers when a drought lowers the MDC reservoir from full capacity levels (40 billion gallons) by certain percentages, which we refer to as “trigger points”.

*Examples of restrictions at each of the 5 trigger point levels include the following:*

- **75%** - Request municipal officials to cut back water use on non-essential operations (street cleaning, watering, and vehicle washing)
- **53%** - Ban lawn sprinkling between 7AM and 8PM
- **40%** - Monitor large and unusual user consumption through special meter readings
- **27%** - Plan for cutback of industrial operations in conjunction with DPH, Chambers of Commerce, etc.
- **10%** - Cut back of designated industrial operations

*Under a severe 40% drought trigger, the MDC would work with DPH and DEEP to prioritize the flows in the best interest of the public’s health, not only for high users, but for environmental releases as well.*
### MDC Drought Year Comparison

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Average Daily Production (MGD)</th>
<th>Total Annual Precipitation Nepaug Reservoir (inches)</th>
<th>Precipitation Deficit (100 YR AVG 47&quot; per year)</th>
<th>Reservoir Levels</th>
<th>Volume in Storage End of Year (Barkhamsted + Nepaug) (Billion Gallons)</th>
<th>Days Supply at Average Daily Demand (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>49.11</td>
<td>31.34</td>
<td>-15.66*</td>
<td>42.0</td>
<td>16.7</td>
<td>340</td>
</tr>
<tr>
<td>2001</td>
<td>58.94</td>
<td>42.99</td>
<td>-4.01</td>
<td>77.8</td>
<td>30.9</td>
<td>525</td>
</tr>
<tr>
<td>2015</td>
<td>49.60</td>
<td>41.31</td>
<td>-5.69**</td>
<td>87.9</td>
<td>35.0</td>
<td>705</td>
</tr>
</tbody>
</table>

*Safe Yield of 77.1 mgd is based on this 1965 drought deficit of -15.66 inches.

**The 2015 deficit of 5.68 inches is well within the 1960s’s Safe Yield analysis correlating to a 115 year drought.

There is no authority of the MDC or DPH to prioritize water usage during the drought triggers based on the type of business or industry. In 1988, the MDC supplied 17 mgd for industrial, yet today less than 2 mgd is supplied for industrial use.

In the 1965 drought, the precipitation deficit was 15.66 inches and MDC reservoirs dropped to 42% capacity. Even under this most extreme of drought condition, the MDC’s reservoirs still held almost a full year’s supply in storage. In 2015, the rain deficit of 5.69 inches left MDC reservoirs at 87% capacity. Since the 1960’s, MDC has not seen our reservoirs drop below 62% capacity.

It should be noted that the MDC has not issued any mandatory water use restrictions due to low water supply levels in the past 50 years.

_There have been concerns expressed regarding the ability of MDC’s water supply to safely serve the Niagara bottling plant proposed in Bloomfield without affecting the remaining customers served by the MDC._

These concerns are unfounded.

Currently, the water levels of the MDC’s two reservoirs are at 88% of full capacity, which represents 35 billion gallons of water. As such, the first drought trigger of 75% capacity would be reached at a total water volume of approximately 30 billion gallons. Assuming no precipitation whatsoever and an average daily consumption of 50 mgd, the MDC, without providing water to the proposed Niagara plant, would reach capacity of 75% in 105 days.
If Niagara was a customer today, our average daily flow would increase to 51.8 mgd, and the 75% drought trigger would be reached in 101 days, assuming no precipitation over that time, a negligible difference experienced under an unlikely set of circumstances.

Therefore, Niagara would not make any significant impact on MDC’s water supply capacity during a drought condition.

**WATER CONSUMPTION TRENDS**

Current MDC water withdrawals from Barkhamsted and Nepaug Reservoirs are approximately 49.6 mgd, nearly 30 mgd less than the approved safe yield.

As an outgrowth of initiatives to promote and develop a state-wide water plan, the Governor convened the Connecticut Strategic Water Resources Planning Conference & Workshop held in February 2014. Dr. Richard Palmer from the University of Massachusetts demonstrated that study after study attempting to estimate future water consumption based on population growth across the country were extremely inaccurate. To the contrary, the actual data demonstrated that even in areas with significantly growing populations, actual water demand has continued to decline, due in large part to conservation measures driven by a general awareness of the need to preserve natural resources such as water. The MDC supports conservation efforts.

As support for Dr. Palmer’s conclusion, the MDC’s daily water demand has steadily declined over the last several decades. In 2007 MDC expected to produce over 57 mgd by 2012 to meet demand. In 1988, the average day demand was 66 mgd compared to 2015, where the average day demand was 49.6 mgd.
MDC RATES

MDC water rates have remained stable over the past decade, increasing only 82 cents per CCF (100 cubic feet of water, or 748 gallons) over the last 10 years. The major increases MDC customers see on their bills are a result of the state and federally mandated Clean Water Project (CWP), which requires infrastructure upgrades of the wastewater side of the MDC’s operations. Customers have seen their water bills more than double as the Special Sewer Service Charge (SSSC), which began in 2008, that funds the Clean Water Project is calculated through customer water use and applied to customer water bills.

It is important to note that it is not unique for water utilities such as the MDC to have reduced rates for high volume or industrial users. Other public and private water utilities located in Connecticut offer reduced rates for commercial, industrial and public authorities, and many at greater levels than those afforded to MDC customers.

Simply put, selling more water will serve to stabilize, and likely reduce, the MDC’s base water rate. Further, keeping water rates down by selling more water will, to a degree, offset the impact of the SSSC. In fact, if MDC included the anticipated sale of an additional 1.8 mgd of water to Niagara in its 2016 budget deliberations, the impact on the rates would have been an approximate $0.10 decrease in the cost per ccf for all customers.

MDC Water Consumption and Water Rate History
The MDC’s consumption demand has decreased over the past 25 years. Consistent with the data from Dr. Palmer, with Connecticut’s population growth decreasing in 2015, population growth over the next 50 years will not increase water demand.

Therefore, one of the only viable ways to stabilize water rates for all MDC customers is with increased water consumption by industrial customers.

The MDC water rate has increased by only $0.82 per CCF over the last 10 years. The Special Sewer Service Charge, enacted in 2008, funds the Clean Water Project and has more than doubled MDC water bills as it is calculated based on water use. As the MDC is a non-profit water company, any increases to the water rates are to cover the cost of the operations to produce the water. Selling additional available water helps to mitigate increases.
The MDC’s new high volume industrial user rate does not apply to any customer until they exceed 668 CCF (approximately 500,000 gallons) per day. The industrial rate is reduced to $2.16 per CCF or a reduction of $0.50 per CCF, (or 18%) for only the consumption above 668 CCF. There is no rate reduction for the first 668 CCF.

By comparison, large private and municipal water companies in CT have descending rates for high volume water users follows:

- The Aquarion Water Company charges $4.24 per CCF up to a threshold of 420 CCF (314,182 gallons) per quarterly billing period, after which the rate drops to $2.08 per CCF, a reduction of $2.15 per CCF – over 50%.

- The Connecticut Water Company charges $5.91 per CCF for residential customers, which is dropped to $4.40 for industrial customers, a reduction of $1.41 per CCF – approximately 25%. There is no threshold at which the lower rate is in effect; rather it applies to all consumption for industrial users.

### Industrial Rate Structure Comparison

<table>
<thead>
<tr>
<th>Water Utility</th>
<th>Rate - $/CCF</th>
<th>Rate Reduction after Limit/CCF</th>
<th>Rate Reduction difference</th>
<th>Rate difference %</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDC</td>
<td>$2.66</td>
<td>$2.16</td>
<td>$0.50</td>
<td>18%</td>
</tr>
<tr>
<td>Aquarion - Eastern Division</td>
<td>$4.23</td>
<td>$2.08</td>
<td>$2.15</td>
<td>50%</td>
</tr>
<tr>
<td>CT Water Company*</td>
<td>$5.91</td>
<td>$4.40</td>
<td>$1.51</td>
<td>25%</td>
</tr>
</tbody>
</table>

*$5.91 is Residential Rate $4.40 is the Industrial Rate

The Niagara Bottling company would be just one of the MDC’s many types of diverse processing customers, including companies like United Technologies, Coca-Cola Bottling Company, Kohler Mix Specialties of CT and the Hooker Brewery.
WATERSHED MANAGEMENT AND CONSERVATION

The MDC owns over 31,000 acres of watershed land in Connecticut and Massachusetts, the majority of which is watershed forest land. A watershed forest is the first line of defense for protecting water from degradation and maintaining high quality drinking water. This land acts as a natural filter and buffer to pollutants and protects the integrity of the District's drinking water supply reservoirs.

Maintaining the health of the watershed lands for water supply is the principal mission of the District's Watershed Management Unit. This is accomplished through its source protection and forest management programs. The drinking water infrastructure extending from the watershed lands and reservoirs to our treatment and delivery system was paid for by the customers of the MDC, as it is the cost of operating and maintaining this infrastructure.

The MDC moves water from Barkhamsted and Nepaug Reservoirs to its water treatment facilities in West Hartford and Bloomfield via gravity pipelines and tunnels. One of the benefits of this transmission system is that there is no pumping involved and therefore no energy costs to deliver the water, both to the plants and the customer.

THE WEST BRANCH OF THE FARMINGTON RIVER

The MDC is just one of many stakeholders in the Farmington River. Although MDC’s role on the Farmington is significant, and covers more than a century of the river’s history, MDC’s role is often misunderstood.

As stated previously, only a small fraction (14%) of the Farmington River’s drainage area of 609 square miles is controlled by the MDC for drinking water purposes. The MDC also plays a role in the management of approximately 120 square miles of the West Branch of the Farmington River. The regulation of river flow release primarily takes place at the MDC’s Goodwin Dam and the U.S. Army Corps of Engineer’s Colebrook River Dam.

Colebrook River Dam, which impounds Colebrook River Lake, is owned by the U.S. Army Corps of Engineers and is a multipurpose water resource impoundment built for flood control, water supply, riverflow augmentation and fisheries enhancement. This dam is operated through an interagency agreement between the U.S. Army Corps of Engineers, CT Department of Energy & Environmental Protection and the MDC.

The MDC owns and operates Goodwin Dam and makes releases to the West Branch of the Farmington River in accordance with the Connecticut General Statutes, a riparian agreement, and an agreement with the Allied Connecticut Towns.
Pursuant to these obligations, required releases from Goodwin Dam occur as follows:

- Minimum release of 50 cubic feet per second (cfs) (or 32 mgd) at all times;
- Additional release of all natural flows up to 150 cfs;
- Additional release of any flows released from Otis Reservoir;
- Additional riparian releases upon request by the Farmington River Power Company, up to 21.7 billion gallons per year; and
- Pass through of fisheries releases from Connecticut DEEP controlled pools in Colebrook River Lake.

Without this water release protocol, the flows within the river would frequently be below 25 cfs during the summer months. Today MDC releases a minimum of 50 cfs daily under this protocol.

- CONNECTICUT DEEP’S ROLE IN MANAGING WEST BRANCH FLOWS

Connecticut DEEP controls 3.3 billion gallons of water stored in Colebrook River Lake for the purpose of maintaining sufficient flows in the river for fisheries. A total of 1.63 billion gallons of storage is set aside within Colebrook River Lake for Connecticut DEEP to enhance anadromous brown trout runs and 1.63 billion gallons is set aside for Connecticut DEEP to enhance American shad runs. Connecticut DEEP is responsible for the control of these fishery management pools and the releases are coordinated through the MDC.

- U.S. ARMY CORPS OF ENGINEERS

USACOE manages storage capacity in Colebrook River Lake to provide flood protection to downstream communities during periods of heavy inflow. The Corps oversees all flood control on the Farmington River.

- UPPER FARMINGTON RIVER MANAGEMENT PLAN

The Upper Farmington River Management Plan was prepared under the Farmington Wild and Scenic River Study authorized by Congress in 1986. The plan outlines management of a 14 mile section of the West Branch and the Farmington River mainstem in Connecticut extending from immediately below the Goodwin Dam to the downstream end at the New Hartford/Canton town line.

The Study was led by the Farmington River Study Committee which included representatives from the State of Connecticut, the MDC, the Farmington River Watershed Association, the U.S. Department of the Interior and local towns along the Farmington River. The National Park Service serves as the key federal representative in the implementation of the management plan.
One of the key Goals of the Management Plan is to “Balance the legitimate demands on the river for water supply, waste assimilation, energy production, and commercial and industrial uses, while maintaining stream flow and water quality necessary to sustain fisheries, recreation and scenic qualities at levels sufficient for wild and scenic river designation.”

The plan established the Farmington River Coordinating Committee (FRCC) to promote the long-term protection of the upper Farmington River by bringing the key stakeholders together on a regular and ongoing basis. The Metropolitan District is an active participant on the FRCC.