

Policy Recommendations

Co-Digestion

Co-digestion, or the addition of food waste to the digesters at the Deer Island Treatment Plant (DITP), has been an oft-discussed and much debated topic since it first came to prominence last fiscal year.

Because Deer Island has excess digester capacity, and the addition of organic material has the potential to greatly increase self-generation at the facility, the decision was made to pursue a pilot program. This program was to be a one to three-year small-scale testing of the impacts of adding additional organic material (food waste) to the digesters with the hope of determining feasibility for doing so on a much larger scale.

No one, including the Advisory Board, has ever doubted that the potential benefits are great, and thus the Advisory Board supported the pilot program, while cautioning against moving too quickly toward adoption of a large-scale program. In last year's *Comments*, the Advisory Board reminded the Authority that the initiative to remove food waste from the solid waste stream was a Commonwealth initiative, not the MWRA's. In fact, the initiative is far outside of the MWRA's core mission; as such, the Advisory Board argued that the threshold for moving forward on full-scale co-digestion should be fairly high. In short, this was not to be a "break even" endeavor, but instead should dramatically increase revenue in the form of tipping fees as well as reducing costs through additional self-generation on the island.

To its credit, the Authority acknowledged the Advisory Board's concerns and early on in the updates and presentations to the MWRA Board of Directors, narrative to this effect was included. In last year's document, the Advisory Board posed many questions to be worked out, including:

- What additional infrastructure and associated costs would be needed to accept this organic material on a large scale?
- What additional staff or staff time would be required for co-digestion?
- How much extra energy would the slurry actually produce?
- Does DITP have the capacity to capture and use said energy with its existing infrastructure and facility?
- How much additional sludge would result from the added material, and what would the impact upon the quantity and cost on sludge Pelletization be?
- What impacts are there upon the treatment process, specifically as it relates to quality standards required by the NPDES permit?
- How would the material be transported and received by DITP, and what financial implications would this have?

Many of these questions should be answered by the pilot program, particularly related to process and impacts; however, the first and the last questions have generated some new discussion and raised some new questions.

Recently, the town of Winthrop raised concerns over the increased number of trucks that would be traveling to Deer Island as a result of the co-digestion pilot. In response to a highly attended community meeting, the Authority agreed to halt progress of the pilot program until an alternative to trucking could be found.

If Winthrop and its residents are concerned over the number of trucks associated with the pilot program, it stands to reason that concerns will only be greater if the full-scale program were to use an increased number of trucks to transport materials. This then leads to the other alternative now being explored – barging the material to Deer Island.

MWRA staff has indicated that preliminary assessments of the existing pier on Deer Island have been planned to determine the ability to barge the material for the pilot program. The Authority has not barged material to or from the

island for some years. Waste Management, the third-party provider of the organic slurry for the pilot, has begun exploring options for leasing barges for the pilot program. If barging is feasible, the next issue to be resolved is the best way to move the organic slurry from the barge to the digesters. The options currently being examined are piping and using an on-island truck to move the material.

All of these actions to work around the issue of trucking the material through Winthrop have now raised additional questions for the Advisory Board related to cost. The pilot program is estimated at about \$700 thousand, of which the Commonwealth is providing \$360 thousand. How do these new factors – examining the pier and surrounding area, any dredging required, and costs for pumping or trucking the material from a barge to the digesters – impact the costs of completing the pilot program?

Concerns over potentially escalating costs required to resume the pilot program have the Advisory Board again wondering why the Authority is spending so much for a Commonwealth initiative. A contribution of about 50% of the funds for the pilot program demonstrated a clear commitment by the Commonwealth to help the MWRA pursue something that was largely driven by their initiative. **The Advisory Board recommends that the co-digestion pilot program should not be resumed until an updated estimate on the costs required to resume the pilot program are detailed AND the Commonwealth provides the Authority with its plans for substantial financial support for the increased costs associated with the pilot program.**

The recent community meeting in Winthrop clearly demonstrated residential concerns are likely to be great with regard to this initiative. In fact, since that meeting, local Charlestown publications began outlining community concerns surrounding the organic food waste processing facility that Waste Management intends to site there.

Once again, the Advisory Board's reminder that this is a Commonwealth initiative bears repeating. As such, the Advisory Board emphasizes that any concerns raised by communities relative to organic food waste processing should be addressed by the Commonwealth; moreover, responsibility for mitigating any impacts to the communities should also fall solely on the Commonwealth.

The amended regulations also raise another concern for the Advisory Board and the Authority. Namely, if affected entities are required to dispose of organic material (food waste) differently than its other solid waste, the potential for using the wastewater system as a method of complying has massive implications. Depending on the cost for third-party haulers to remove the food waste, a facility might deem it more cost-effective to purchase and install industrial strength grinders and dispose of this waste down the drain.

Presently, there are no regulations at the MWRA that prevent entities from disposing of food waste in this manner. The MWRA's Toxic Reduction and Control (TRAC) program focuses primarily on industrial users and regulates permits for specific substances; however, a wholesale ban on commercial and industrial food wastes would likely be beyond the Authority's ability to permit and monitor. Under this scenario, any impacts will fall largely upon the communities by directly impacting their local sewer systems and requiring them to make changes to their sewer use regulations and place the burden of enforcement upon them.

Of the respondents in an informal email survey to member communities, the Advisory Board found that only 53% were aware of the pending changes to DEP regulations prior to the survey.²² Of the same respondents, 76% acknowledged that they have entities that would be affected within their community; however, 70.5% indicated they were not planning on making any changes to their local sewer regulations in anticipation of these rules.

²² Survey results as of May 9, 2014

The uncertainty surrounding the options available to communities or the MWRA is of great concern to the Advisory Board. **Therefore, the Advisory Board recommends that the Authority clearly identify and share with member communities what steps it can take to directly control the diversion of additional organic food waste into the wastewater stream.**

While a pilot program is necessary to develop a true cost-benefit analysis of a full-scale co-digestion program, the Advisory Board remains concerned that not all costs are being factored in. At the April MWRA Board of Directors meeting, preliminary numbers were presented estimating total capital costs for the full-scale program at \$21.1 million. However, these costs do not include any dredging or capital improvements to the pier should barging be the only method whereby the Authority could receive the organic food waste material. Factors that the Advisory Board feels are important to include in the cost-benefit analysis are:

- All costs associated with barging (e.g. pier rehabilitation and/or dredging)
- The incremental cost of projects already included in the CIP that have been “sized up” for additional organic waste material (e.g. Combined Heat and Power generation equipment)
- Updated benefits or costs to pelletization quantities
- Any changes to costs associated with processing and treating additional organic material (e.g. chemicals or energy)

The Advisory Board applauds the Authority for its decision to halt progress on the co-digestion pilot program and looks forward to thorough and satisfactory answers to the questions raised herein prior to resuming the pilot program.

System Expansion

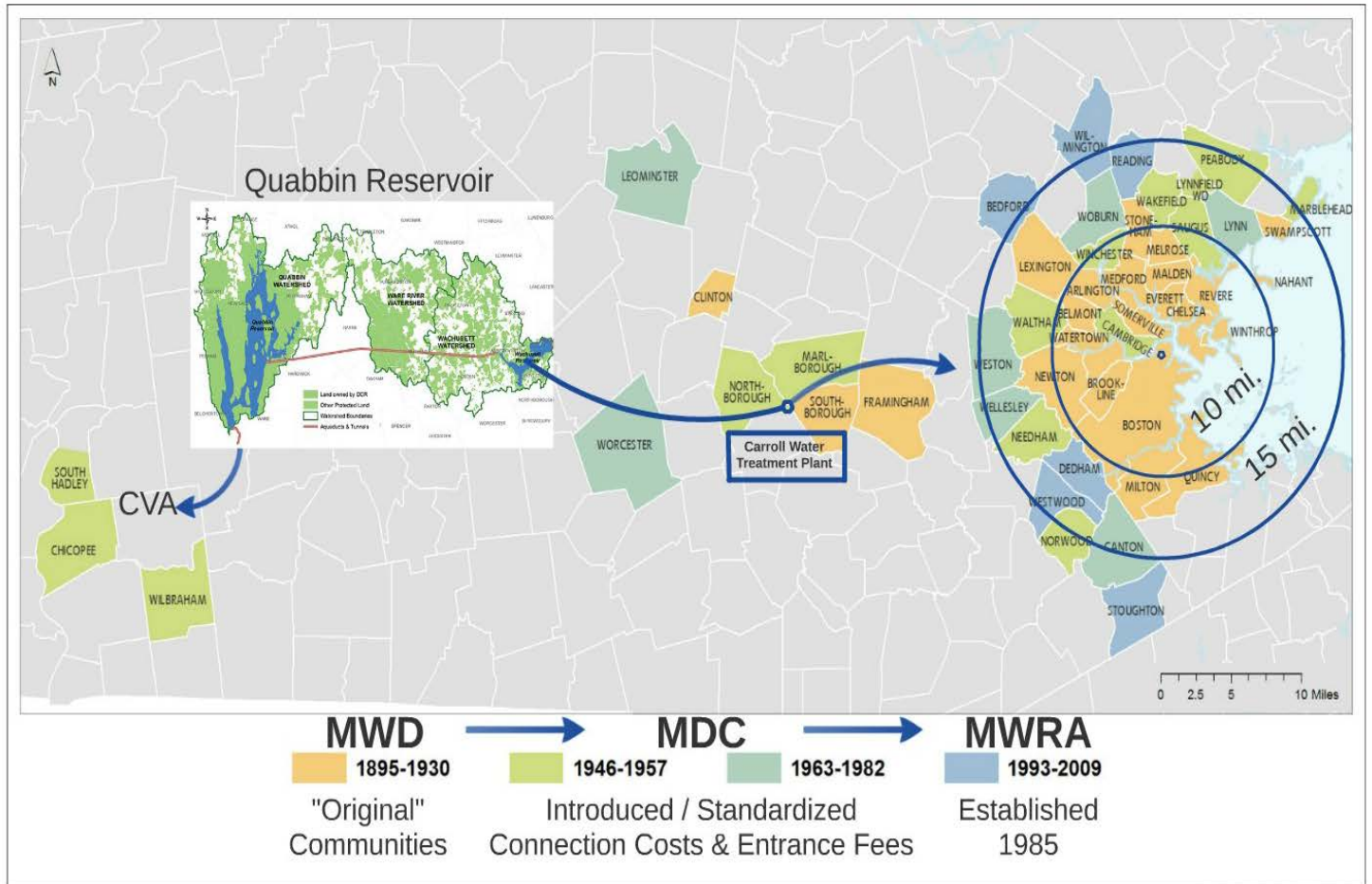
As noted in the introduction to this year’s *Integrated Comments and Recommendations* the financial pressures and cost increases facing the Authority in the coming years remain significant challenges. Since the primary source of funding is rate revenue, the communities and ratepayers will be bearing the added burden of these increased costs. As such, finding additional funding sources to relieve this burden is of critical importance.

System expansion has been one such source of additional funding that both Advisory Board and Authority staff has worked diligently to pursue. As cited before, MWRA water distribution is, in essence, a “zero-sum game”; consequently, the benefit of adding member communities comes from “spreading the base” across a greater number of users.

The second financial benefit to current MWRA water-service communities is the oft-maligned entrance fee. The Advisory Board has continuously and ardently reminded both the Authority and new potential members that the so-called “entrance fee” is, in actuality, a cost-recovery mechanism. The perception exists that it is some sort of a “convenience fee” or additional surcharge with which the MWRA fills its coffers – this could not be further from the truth. The entrance fee, as currently calculated, is designed to recover the actual capital infrastructure investment that has been made by the Authority and already paid by the existing water communities. The Advisory Board regards this cost-recovery mechanism to be essential in compensating member communities for their prior capital costs in an equitable fashion and, as such, reiterates its adamant belief that the entrance fee is an important requirement for any community or entity looking to join the MWRA’s waterworks system.

The origins of the MWRA’s Waterworks System date back to the 19th century when the Massachusetts Legislature created the Metropolitan Water District (MWD). The MWD represented the first step in creating a regional approach to constructing, maintaining, and operating a waterworks system within a 10-mile radius of the State House.

Origins of the MWRA Waterworks System



DATE: 5/6/2014 MWRA GIS 1738-1

Figure 45

In 1926, the Metropolitan District Commission (MDC) consolidated responsibility for metropolitan water, sewage, and parks into one agency, taking over the MWD waterworks system. The MDC continued to evolve through many legislative acts, including Chapter 543 of the Acts of 1943 and Chapter 575 of the Acts of 1947, the latter of which extended the radius to the 15 miles surrounding the State House. The reason for the expansion was due to the creation of the Quabbin Reservoir, which added 412 billion gallons of water to the system, and was delivered to the metropolitan area by the newly constructed Hultman Aqueduct.

Throughout the growth of the system was an underlying legislative intent, stated as far back as 1895, "that any other city and town ... would upon application [to enter the waterworks system] and payment of money" as determined by the MWD Board be admitted. The concept was carried forward by the MDC, which standardized the practice of charging new water customers an entrance fee in the 1960s due to growing capital costs:

Table 37

Entrance Fee Payments 1957 – 1982		
COMMUNITY/ENTITY	YEAR	ENTRANCE FEE
Peabody	1957	\$ 125,000
Wakefield	1957	\$ 109,544
Weston	1963	\$ 78,897
Canton	1967	\$ 119,975
Woburn	1972	\$ 268,922
Wellesley	1974	\$ 608,100
Lynn WS	1982	\$ 207,370

As the MDC evolved into the Massachusetts Water Resources Authority (MWRA) in July 1985, the practice and procedure of new communities paying for connection costs and entrance fees has been strictly and even-handedly enforced. Here is the list of entities that have entered the MWRA system since 1985 and the fees that have been paid:

Table 38

Entrance Fee and Connection Costs Since Creation of MWRA		
COMMUNITY/ENTITY	ENTRANCE FEE	CONNECTION COST
Bedford – 1993	\$5,623,467	\$1.25 million construction/ annual fees to Lexington
Stoughton – 2002	\$5.66 million (annual payments with interest)	\$5 million construction for 4.5 mile dedicated line; \$1.5 million mitigation to Canton
Reading – 2005/2007	\$11,084,248	\$1,055,822 for 24" main, vault, incidentals
Dedham-Westwood 2005	\$548,748	Meter vaults/booster station \$1 million
Wilmington – 2009	\$3,126,210 (annual payments with interest)	2 mile dedicated line into Woburn – \$3 million
SINGLE CONNECTIONS INTO SYSTEM		
Avalon Bay – 2003 Danvers into Peabody	\$62,736	\$302,000 – tie into Peabody
Leggs Hill YMCA – 2006 Salem into Marblehead	\$70,823	\$295,000 – tie into Marblehead

Communities' Investment in Waterworks System

When the MWRA was created, communities drawing water from the Quabbin Reservoir have been the principal payer of capital costs; additionally, the MWRA reimbursed the Commonwealth for \$129 million of prior capital expenses. In the 1990s, under Governor Weld's administration, the Commonwealth sought another \$120 million from the Authority. The Advisory Board and its member communities filed suit against the Commonwealth contesting the amount, which ultimately brought the amount down to \$80 million. Totaled, the MWRA reimbursed the Commonwealth \$209 million for prior capital expenses.

Since 1985, MWRA’s commitment to infrastructure has dramatically increased. For example, of the \$2.53 billion dollars in water rate assessments collected between FY 1996 and FY 2014, \$1.25 billion was for capital improvements to the system, just below 50%.

Two recent examples of the MWRA’s significant capital investment were the Carroll Water Treatment Plant, which went operational in 2005, and the MetroWest Tunnel, which came online in 2003. Together these two capital investments account for over \$1 billion in capital spending through FY 2013.

With this capital investment in mind, entrance fees are calculated as follows:

Table 39

MWRA Waterworks System Net Asset Value (NAV), June 30, 2013

Gross Waterworks System Assets	\$	3,084,362,000	} Audited Statement
Less Water portion of current debt	\$	(2,116,827,000)	
NAV of Waterworks System	\$	967,535,000	

75% NAV Allocated to Average Use:	\$	725,651,250	} Simple % Calc
25% NAV Allocated to Peak Use:	\$	241,883,750	

MWRA Waterworks System Withdrawals

5 YEAR AVERAGE		72,823.051	} Share x Ave. NAV
Applicant Usage (1 MGD)		365.000	
Applicant Share		0.498715%	
Applicant's Average Use Entrance Fee	\$	3,618,934	
SIX MONTH PEAK		40,585.129	} Share x Peak NAV
Applicant Peak Usage (est.)		203.688	
Applicant Share		0.499372%	
Applicant's Peak Use Entrance Fee	\$	1,207,902	

Total Entrance Fee - 1 MGD Applicant \$ 4,826,836

For a more detailed explanation of the history and calculation of entrance fees, please see the Advisory Board’s May 2014 installment of the “Green Sheet” (<http://mwraadvisoryboard.com/2014/05/may-2014-green-sheet/>).

As clearly demonstrated above, the precedent of the entrance fee is longstanding and well justified. Its purpose is clear, and its methodology sound. That said, the Advisory Board has also agreed with the criticism that the entrance fee can prove to be a significant financial barrier to communities looking to join the system. To any city or town a one-time potentially multi-million dollar cost can prove a difficult “sell” to its residents and businesses when discussing membership. The Advisory Board thus sought to balance the importance of recovering current members’ capital costs with the needs of new members when it discussed and recommended changes to the method of paying the entrance fee. In the end, a multi-year, interest-free payment plan for the entrance fee with a grace period for the first payment was recommended by the Advisory Board. Although the MWRA Board of Directors has not voted to change the policy’s language, the Advisory Board has maintained its recommendation, to a point.

As part of last year's *Comments and Recommendations*, the Advisory Board recommended that a sunset provision be included on its recommendation for a multi-year, interest-free payment plan for the entrance fee. In the interest of facilitating ongoing negotiations with TriTown (collectively Braintree, Randolph, and Holbrook) to enter the waterworks system, **the Advisory Board is, therefore, recommending that the sunset provision on its proposed entrance fee payment schedule be extended one full year to June 30, 2015.**

In addition to this extension of its recommended changes to the entrance fee payment policy, the Advisory Board pledges to continue to work to mitigate the impacts of entrance and connection costs for communities interested in joining the system. As part of its legislative strategy, the Advisory Board has been a driving force in a landmark water/wastewater infrastructure financing bill, which provides a 50-50 match from the Commonwealth (subject to appropriation), as well as principal forgiveness for connection costs.

Inflow/Infiltration Community Assistance Program

As noted in the CIP Chapter of this year's *Integrated Comments and Recommendations*, the Advisory Board recommended a sizeable increase to both Phases 9 and 10 of the Inflow/Infiltration (I/I) Local Financial Assistance Program. As mentioned before, the Authority staff are already planning to include this expanded I/I program into the final FY15 CIP.

However, as the budget review process progressed, Advisory Board staff began to rethink the program as a whole. Indeed, since the opportunity arose to examine the size of the program in dollars, it made sense to consider other elements of the program's structure as well.

The first consideration was a logical extension of the recommendation to effectively double the size of the I/I program. In general, communities could expect its share of the I/I funding to double in size, following the program's overall increase; yet, the payback period for the loan portion of the program remained unchanged at five years. If the amount being provided is doubled, it seems to make sense to double the payback period as well. Thus, **the Advisory Board recommends that the payback period for Phase 9 and Phase 10 of the Inflow/Infiltration Local Financial Assistance Program be extended to ten years.**

The second consideration was given to the division of grants and loans. The existing program includes a grant/loan ratio of 45% grants and 55% interest-free loans. Discussion at prior Operations Committee meetings has indicated that the grant aspect of the program makes seeking local approval for I/I borrowing much easier. Added to this accessibility of funds for local sewer projects is the inevitable increase in the amount of work communities will be required to do. With stormwater regulations and permits looming, as well as additional monitoring and reporting requirements, the communities will need as much help as possible to begin meeting these unfunded mandates. Given the popularity of this portion of the program, and the overall benefit that both the communities and the Authority's wastewater system have seen since its inception, the Advisory Board believes it is important to further incentivize this program. Toward that end, **the Advisory Board recommends that Phase 9 and Phase 10 of the Inflow/Infiltration Local Financial Assistance Program be reconfigured to allow for a grant/loan ratio of 75% grants and 25% interest-free loans.**

Debt Service Assistance – "Pay It Forward"

Debt Service Assistance (DSA), though a huge benefit to the Authority, has been a historically difficult line item to budget in the MWRA's Current Expense Budget. When DSA levels were high and continued increasing according to a predetermined formula, budgeting for DSA was simple and automatic. However, once DSA was eliminated in FY03, it highlighted the danger of budgeting for a line item that could be cut at any moment. (See Figure 46.) As a case in point,

after the elimination of DSA in FY03, funding for the line item once again grew up to \$25 million,²³ when once again it was cut in FY10. These two instances of DSA's elimination highlighted the dilemma facing the Authority during its budgeting process. On the one hand, the preference would be to include it not only because it was an expected source of income, but also to thank the Legislature for providing the funds in the approved budget. On the other hand, if the Governor were to exercise his authority under MGL Chapter 29 §9C to eliminate DSA during the course of the fiscal year, the Authority would have to find another source of funds to replace it.

**Actual Receipt of Debt Service Assistance vs. Projected Levels
Fiscal Years 1994 through 2021**

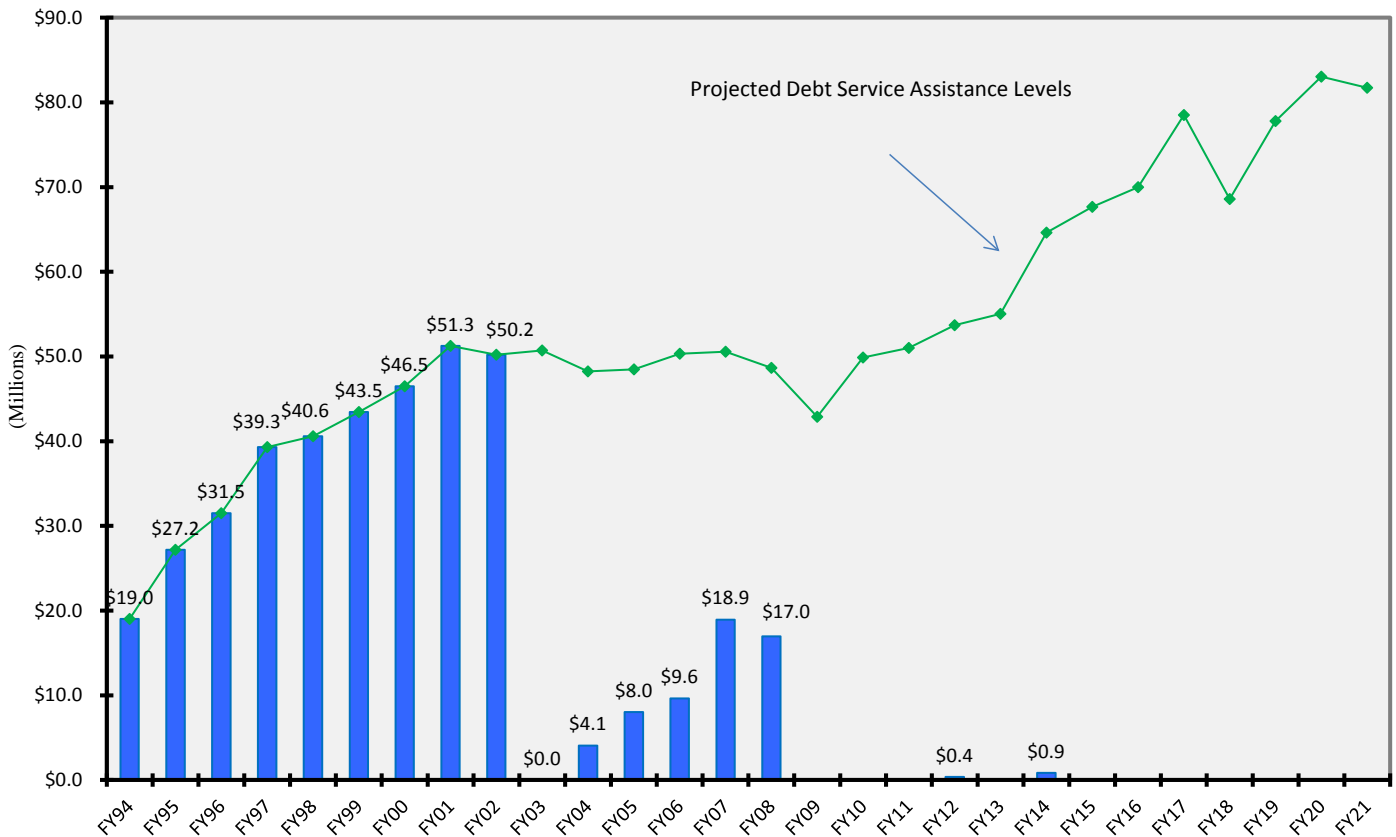


Figure 46

This year, the Legislature increased DSA in the FY14 budget to \$1 million, of which the Authority has received \$853,660. The hope is that the Commonwealth's FY15 final budget will include an even greater number for DSA; however, the familiar concern about budgeting for revenues that cannot be guaranteed remains.

In an effort to not only thank the Legislature for its commitment to providing DSA to the Authority, but also to demonstrate an intention to pass the benefit of any DSA actually received on to the communities and ratepayers, the Advisory Board has proposed a "pay it forward" strategy. In essence, the \$853,660 received in FY14 will be "paid forward" into FY15 by directly reducing the rate revenue requirement. The hope is that this commitment to "paying it forward" will help service area legislators continue their efforts to continue increasing DSA in future years by demonstrating the measurable and immediate benefit for cities and towns and ratepayers.

²³ State-wide appropriation. MWRA received approximately \$19 million of this.

In response to the Advisory Board’s presentation first discussing this recommendation as part of the budget review process, Authority staff has already indicated to the MWRA Board of Directors its intention to use the FY14 DSA receipts in this manner. The Advisory Board thanks the Authority for taking this proactive step.

Formally, the Advisory Board recommends that in FY15 and all future years, any Debt Service Assistance received from the Commonwealth be utilized in the fiscal year immediately following its receipt in the form of a direct reduction to the rate revenue requirement.

Molybdenum

Another issue where state regulations and initiatives have a direct impact upon the Authority’s operations and costs is the regulation of biosolids, specifically the concentration of molybdenum in the pellets produced at the Authority’s Fore River Pelletization Plant.

The Authority’s March Yellow Notebook page reviewing its Toxic Reduction and Control (TRAC) states:

Cooling tower usage typically causes a seasonal spike in molybdenum concentrations due to the blowdown on large AC systems that use corrosion inhibitors containing molybdenum. Levels drop again following the end of the cooling season, although this is delayed due to biosolids processing time. The hotter the season, the higher the spike. TRAC has an ongoing program to persuade cooling tower operators to switch to phosphate based corrosion inhibitors, but increases this year indicate that additional regulatory options must be considered.

The regulation of molybdenum is aimed at preventing molybdenosis, which is a disease affecting ruminants, especially cattle. As such, the use of pellets containing high concentrations of molybdenum are not allowed at certain levels.

The issue affecting the MWRA is specifically the discrepancy between the Massachusetts Department of Environmental Protection (DEP) limits and the federal Environmental Protection Agency (EPA) limits. In February 1993, the EPA published biosolids regulations known as the 503s with an interim molybdenum limit of 75 mg/kg. Shortly afterwards the DEP published its rule related to sludge (310 CMR 32) with a molybdenum limit of 10/25 mg – 10 mg for grazing land 25 mg for all other uses. The intention is for DEP to review the limits when EPA finalizes the 503s, which has yet to be done.

In the interim, however, the much more restrictive DEP limits have a direct impact on the MWRA’s operations. As seen in Figure 47, the seasonal spike in molybdenum causes the Authority’s biosolids to exceed this lower limit for a significant portion of the year. During this period New England Fertilizer Company (NEFCo) can either not distribute pellets in

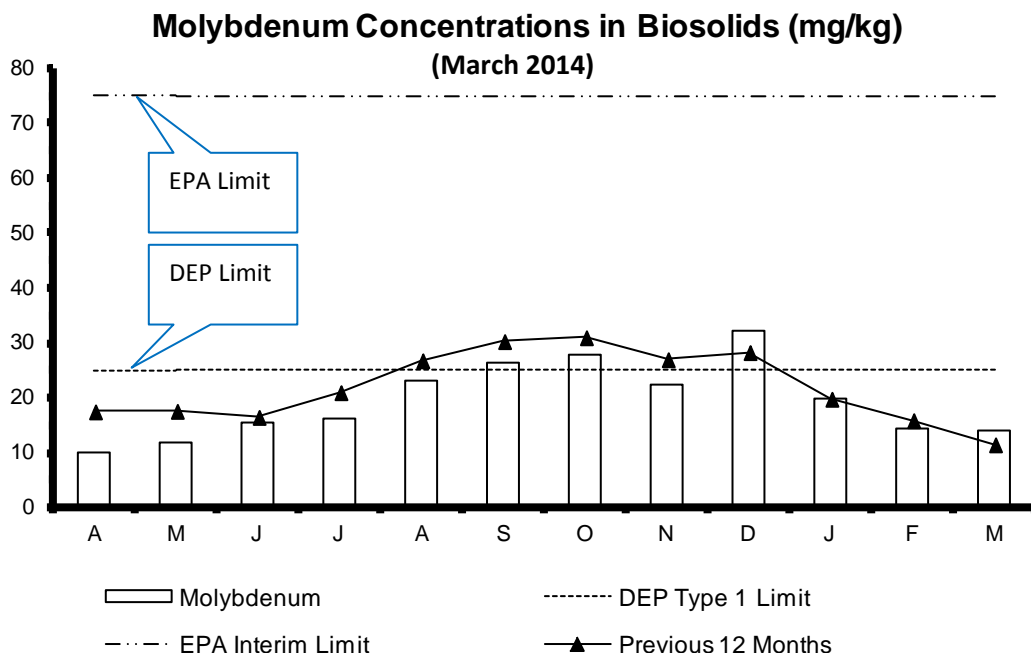


Figure 47

Massachusetts or have to pre-qualify the pellets by storing them in a silo then testing on a specific frequency. Once the silo is complete and has been documented to meet Massachusetts DEP limits, then NEFCo can sell the material in Massachusetts. In essence, the Authority and its contractor NEFCo cannot place product in Massachusetts for half of the year or incur additional costs to handle and test the pellets. Transportation of the product out of the state naturally includes higher costs, as well as an increase in carbon emissions due to the increased travel. These expenses are presently in the terms of the NEFCo contract, but the Advisory Board remains concerned that these costs will increase in the future. Albeit subsumed in the costs of the pelletizing contract, the costs are real, and they will be passed on to the Authority one way or another.

The Authority made a presentation to the Advisory Board in March where it identified four potential options for attaining molybdenum compliance including:

1. Seeking an MWRA-specific variance from the DEP limit
2. Seeking a DEP rule change by trying to persuade DEP to adopt the federal limit of 75 mg/kg
3. Education Program and other outreach (mailings like presently done on the Fats/Oils/Grease and wipes issues)
4. Voluntary Program to switch to phosphorous

The Advisory Board, in its preliminary presentations on this year's *Integrated Comments and Recommendations* had suggested seeking a DEP rule change; however, the Advisory Board hadn't even suggested raising the state's molybdenum limits to the EPA standard, but rather somewhere in between the two to offer just enough relief to allow in-state product placement throughout the entire year.

Additionally, the Advisory Board had suggested that the Authority begin permitting entities contributing to the molybdenum issue; moreover, that the fees for permit be established such that they encouraged affected industries to convert to phosphate-based cooling systems. During the budget review process, Authority staff explained that the number of entities that would need to be permitted would be exceptionally high, and the Authority's TRAC program did not have adequate staff or resources to enact such a permitting process. During these conversations, Advisory Board staff then wondered if a wholesale ban on molybdenum system-wide might be a simpler and more cost-effective solution. Authority staff indicated that an outright ban of molybdenum also has enforcement difficulties and may have unintended consequences (e.g. increase of other chemical product that may have negative impacts to Deer Island).

In the end, the method of achieving the end goal is of less consequence to the Advisory Board than that the target is met. Therefore, **the Advisory Board recommends that the Authority begin immediately working toward ensuring its processed pellets can be placed in-state throughout the entire year, using any of the methods discussed and present a specific and detailed plan to do so to the MWRA Board of Directors by October 2014.**