

Testimony of the Massachusetts Water Resources Authority

on Pharmaceuticals in Drinking Water

Before the Committee on Public Health

May 13, 2008

Thank you for invitation to testify here today. My name is Frederick Laskey and I am Executive Director of the Massachusetts Water Resources Authority. With me here today are Betsy Reilley-Mathews, manager of our Quality Assurance unit, and Stephen Estes-Smargiassi, director of Planning, who can provide answers to any of your more detailed questions.

MWRA is the wholesale water and sewer service provider to 61 communities primarily in the metro Boston area, but extending out to the Chicopee River Valley in central Massachusetts.

In early March, the Associated Press published a story about traces of pharmaceuticals found in some of the nation's water supplies. The AP reporters compiled the results of tests conducted by various water systems around the country and identified 36 pharmaceutical compounds. These compounds are not regulated by the EPA and water suppliers do not normally test for them.

The issue of pharmaceutically active compounds being found in rivers and streams is an important issue for all water suppliers and wastewater treatment operators nationwide, and MWRA has been closely following the science and research associated with the issue for a number of years.

The Massachusetts Water Resources Authority did not expect to find any pharmaceutical compounds in the water that we supply to 50 communities in eastern and central Massachusetts because the source of our water – the Quabbin and Wachusett reservoirs - is so well protected and because the ozone treatment provided at the John J. Carroll Water Treatment Plant would be effective at destroying many of them if they were present.

However, to be sure, and to be able to make a definitive statement to those who rely on our water, MWRA did conduct tests of our treated water, and the results confirmed that there are no traces of pharmaceuticals in the water we deliver to the 2.3 million customers in the MWRA service area. MWRA used a laboratory that was able to test for a well-rounded selection of 31 pharmaceuticals, hormones and potential endocrine disrupting compounds. Samples were taken both before treatment (raw water) and after treatment (finished water). None of these compounds were detected in the finished water samples. In fact, we didn't even find caffeine, a common marker for water affected by human pollution.

We did find one compound in the raw water sample – this is water prior to treatment at our ozonation plant, and it illustrates one of the difficulties with this type of testing. In the raw

water sample, we found minute trace amounts of one compound, called Tris (2-Butoxyethyl) Phosphate\*, or TBEP. What do we mean by minute trace amounts? The testing we undertook had detection levels measured in nano-grams per liter, that is, parts per trillion. Water and wastewater professionals are used to dealing with milligrams and micrograms per liter – or parts per million and parts per billion. The tests we are using to look for pharmacologically active compounds are a thousand to a million times more sensitive than the usual tests done for regulated compounds.

The one chemical we did find in the raw water, TBEP, is a common plasticizer used in rubber gaskets and washers, as well as a flame retardant used in floor polishes. It may have been introduced into the water from gaskets or washers in the treatment plant's sample line plumbing. In fact, the National Library of Medicine notes that it is used in "synthetic rubber intended for contact with food or drink." Just the kind of material likely to be in use in a water treatment plant. MWRA has re-tested the raw water for this compound, taking samples directly from the reservoir (i.e. not through the plumbing) and the results will be back in a few weeks. We do not expect to find it in the source water.

I'd like to say one more thing about testing to give you a sense of the extraordinary sensitivity we are dealing with. When we do these tests, we must instruct the sampler not to shower, shampoo, use any personal care products such as deodorant or perfume, avoid contact with any materials which may have antimicrobial treatments, and so on. If they don't, we risk false positives.

### **MWRA Water Comes From Well Protected Sources**

So if the tests are so sensitive, and so many other water systems did find them, why didn't MWRA? It is simply because of the extraordinary good fortune that we get our water from the extremely well protected Quabbin and Wachusett Reservoirs. They are special places, made so by the sacrifice of those who gave up their farms and livelihoods 70 years ago when the Quabbin was built, and by the continued attention and investment in watershed protection in the decades since then.

The Department of Conservation and Recreation owns over 150 square miles of the land in our watersheds, including all the land around the reservoirs and much of the most critical lands close to the streams feeding them. With MWRA funding, DCR continues to purchase high priority land to preserve our high quality source water. Most of the remaining land is undeveloped forest and wetlands. The watersheds are carefully monitored on a daily basis by

the DCR.

MWRA's watersheds are so well protected that Federal and State regulations only require disinfection treatment (without the addition of a filtration removal step). Only about a half a dozen big cities across the country meet these very high standards<sup>1</sup>.

### **MWRA's Ozone Treatment Would Destroy Most Pharmaceutical Chemicals**

While our well protected watersheds mean we don't need to rely on treatment to remove or destroy these compounds, it is good to know that the treatment we have in place would be effective. In 2005, MWRA began treating the water at the new John J. Carroll Water Treatment Plant, using a state of the art ozonation system. In addition to providing excellent disinfection, and improved taste and clarity, ozone is a powerful oxidant. Recent national research indicates that the type of ozone disinfection process currently being used by MWRA is effective at oxidizing and destroying these compounds.

MWRA has been an active partner with Department of Environmental Protection on this issue and will continue to work with the DEP in any efforts they undertake in this area. Last summer, we jointly worked on a research effort to look at drug disposal options nationwide, and MWRA and DEP are currently working with UMass and a number of other partners to better understand how effective conventional treatment techniques will be at removing different types of pharmaceutically active compounds from water.

Thank you again for providing this opportunity to testify on this important issue. MWRA is committed to providing our customers with drinking water they can be confident in, and with wastewater treatment that protects the environment.

Thank you.

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<sup>1</sup> Other systems with well protected watersheds requiring only disinfection treatment include New York City, San Francisco, Portland Oregon, Seattle and Tacoma, Washington.

### What Did MWRA Test For?

The testing included the compounds below, and none were found in treated drinking water:

<b>Pharmaceuticals</b>	<b>Hormones</b>	<b>Endocrine Disruptors</b>
Acetaminophen	Estradiol	2, 6-Di-tert-butylphenol
Caffeine	Estrone	4-Methylphenol
Carbamazepine	Ethyl Estradiol	4-Nonylphenol
Fluoxetine	Progesterone	Alpha Chlordane
Gemfibrozil	Testosterone	Bis Phenol A (BPA)
Ibuprofen		Carbaryl
Iopromide		Chlorpyrifos
Sulfamethoxazole		DEET
Trimethoprim		Diazinon
		Dieldrin
		Methylparathion
		Phenol
		TDCPP
		Triclosan
		Triphenyl Phosphate
		Tris (2-Butoxyethyl) Phosphate*
		Tris (2-Chloroethyl) Phosphate