

## MEMORANDUM

### Survey of Other Cities' Experience with LSLR

To: Priscilla Hackney, David McLaughlin  
Date: 7/9/08 (update of original memo dated 10/31/07)  
Author: Greg Welter  
Copies: Jeff Thielker, George Rest, Kevin Williams, Mike Walsh

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The purpose of this memo is to report on the results to date of our telephone survey of other cities to ask questions on their experience with Lead Service Line Replacement (LSLR) program execution and current policies and practices. We could find no definitive (or even approximate) lists of cities that have conducted LSLRs, either mandatory or voluntary, from EPA or other sources. To identify cities to contact as part of this survey, we have consulted the following sources:

- attendance list from 2004 EPA workshop on LSLR in Atlanta,
- list of respondents on AWWA survey of LSLR experience conducted in 2004,
- internet search,
- a 2004 report from EPA on Lead and Copper Rule contraventions based on EPA SIDWIS database, and
- a 2007 EPA SIDWIS search conducted at our request.

Based on these referral sources, telephone interviews have been conducted with parties from the following water systems:

Greater Cincinnati Water Works (OH)  
Boston Water and Sewer Commission (MA)  
Massachusetts Water Resources Authority (MA)  
Saint Paul Regional Water Services (MN)  
Louisville Water (KY)  
Birmingham Water Works Board (AL)  
Lansing Board of Water and Light (MI)  
Madison Water (WI)  
Providence Water Supply Board (RI)  
Portland Water Bureau (OR)  
San Francisco Public Utility Commission (CA)  
New York City Department of Environmental Protection (NY)  
Philadelphia Water Department (PA)

A synopsis of information obtained from interviews with staff of these cities follows. (In the discussions that follow, I have identified the agency staff that I spoke with to facilitate follow-up inquiry if needed. However, any misstatement or misinterpretation of the information received is the responsibility of this writer.)

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**Greater Cincinnati Water Works**

Informants: David Hartman and Renea Lohmann of GCWW water quality office

GCWW has never exceeded the LCR action levels and so it has never been required to conduct a mandatory LSLR program. However, it did conduct a specific LSLR program (i.e. LSLR conducted independent of other infrastructure or street renewal or service line repairs) in the late 1990s. Their current practice is to conduct LSLR in conjunction with street or infrastructure renewal. Both in their earlier targeted program and in their more recent work they have collected data on the lead concentrations following LSLR (both partial and complete), and the data have been reported in a presentation at the 2006 AWWA national conference. In their current work they have a program of customer outreach to encourage private side participation.

*7/9/08: Update - Lohmann reports that they do about 100 LSLRs annually, at a unit cost of about \$2000 to \$2500. This work is incidental to other capital work, or in lieu of repair.*

**Boston Water and Sewer Commission**

Informants: Jim Steinkrauss (legal office), Charles Jewell (planning office), and Steve Shea (engineering and design).

BWSC is a somewhat similar organization to WASA as it was formerly a city department, but was later chartered as a public agency independent of the city government. It is also similar in that it is responsible for distribution of water that is supplied and treated by another agency, the Massachusetts Water Resources Authority, which also provides supply (or backup supply) to 47 other systems. BWSC and two other MWRA supplied distribution systems have had lead exceedance problems under the LCR, and BWSC is in the third year of a mandatory LSLR program. In last semester's LCR monitoring, lead levels were in compliance and they are optimistic that this semester's will also be compliant.

Under the mandatory LSLR program BWSC has been required to remove 107 LSLs annually, based on an inventory of a little over 1500 public LSLs. Actual removals in the first two years were 297 and over 500. In conjunction with the LSLR program BWSC has had an energetic private side Lead Replacement Incentive Program. Under this Program, BWSC offers to replace the private side service with the cost to be handled by

- a cost credit of up to \$1000 to be handled by BWSC, and
- the balance to be paid for by the customer either as a lump sum or in installments over 24 months as part of the water bill.

This program is available to residential properties containing one, two or three family units. Of the approximately 4500 residences with private lead services (as identified in an earlier automatic meter reading project), approximately 1300 have responded with requests for replacement, and between 700 and 800 have been accomplished.

Our informants were asked what BWSC's intentions with regard to the program were if the next semester LCR sampling was compliant and LSLR was no longer mandatory. They

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indicated that a decision had not been made, but in view of the aggressive nature of the program that had been authorized, they expected that it would be continued.

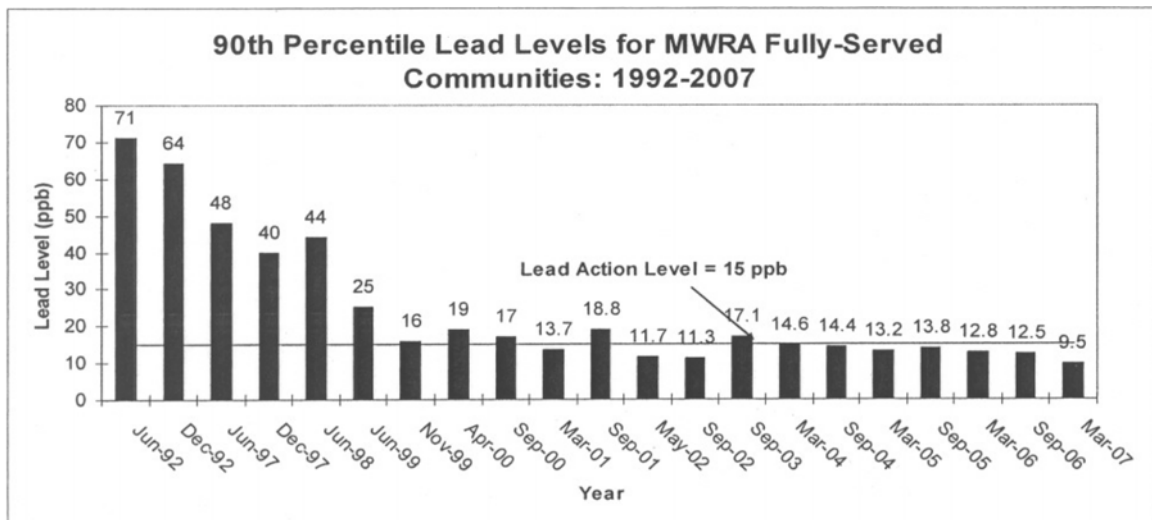
*Update: 7/9/08 - Boston became non-compliant with LCR in 2004 and started mandatory LSR program. The second semester 2007 sampling was again under the 15 ppb action level, so Boston's program was no longer mandatory beginning in early 2008; however, it is continuing LCR on a voluntary basis. The system was estimated to have approximately 1500 public lead services at the beginning of the mandatory program in 2004, and at the end of 2007 there were an estimated 1074 remaining. There is no established formal target date for complete removal. Their estimated unit cost per public LSLR has been approximately \$2300. The typical cost for private side replacement is similar, but varies considerably because of varying lengths of private side services.*

**Massachusetts Water Resources Authority**

Informants: Stephen Estes-Smargiassi (Dir. of Planning), Joshua Das (water quality)

BWSC is the largest of 31 retail water systems that receive their water supply from the Massachusetts Water Resources Authority (MWRA). (There are additional water systems that receive water from MWRA as either a backup supply or as one of multiple water sources.) MWRA's experience with the Lead and Copper Rule and with LSLR projects is quite interesting, and in recent years, the Authority has been significantly impacted by the national attention that developed following the District of Columbia situation.

MWRA conducted treatability studies for optimal corrosion control and implemented a plan in the early 1990s based on control of pH and alkalinity. The parameters of this treatment plan have been refined over the years, resulting in a gradual reduction of its system-wide 90<sup>th</sup> percentile lead levels, as shown below (from MWRA "Staff Summary" report, dated 6/6/07). (MWRA's LCR compliance sampling program has been based on 25 residential sample locations in its largest subsystem (BWSC) and 15 each in all of the smaller systems.)



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In the immediate aftermath of the publicity occasioned by the District of Columbia lead excursions in 2004, the Massachusetts Department of Environmental Protection (MADEP), the state regulatory agency, started implementing different regulatory and enforcement principles relative to MWRA.

First, MADEP began reviewing the L&C (lead and copper) compliance data for each individual water system, in addition to MWRA in aggregate.

Second, MADEP began enforcing the requirement of 7% annual replacement lead service lines for those systems failing the 15 ppb level in L&C compliance sampling.

Since that time the MWRA aggregate system has always passed; however, several of the client systems have failed. The number of systems over the 15 ppb level has varied by sampling period, typically in the range of 7 to 10 systems. The most recent sampling concluding in March 07 has been the most successful, with only 4 systems exceeding the Action Level. Some systems have fairly consistently failed, while others have never failed or have failed only occasionally. Some systems have failed, come back into compliance, and then failed again. The systems that have been most frequently above the Action Level have included Boston (pop. 589,141), Malden (pop. 58,690), Medford (pop. 56,203), and Somerville (pop. 77,478). Estes-Smargiassi said for most of the systems it takes only two failing samples for the system to fail the 90<sup>th</sup> percentile Action Level, and he noted that it is often the same individual sampling locations that exceed 15 ppb on successive sampling rounds.

Estes-Smargiassi reported that the individual systems have operated their own individual Lead Service Line Replacement programs, each with somewhat different characteristics. He indicated that MWRA has been active in assisting the communities, particularly in terms of sample analysis and reporting, and in the development and dissemination of public education materials. He noted that Boston's program (described above), has been the most aggressive in its inducements for private side participation.

Estes-Smargiassi indicated that the local systems have tended to maintain their LSLR programs after coming into compliance, which has been a good thing as some then subsequently failed the Action Level and would have had to restart the program. He indicated that generally they would maintain the LSLR program, but without many of the regulation required sampling and reporting elements of a mandatory program. He indicated that he was not aware of any permanent decisions that any of the systems may have made on whether to continue or curtail their LSLR programs should they arrive at a point of consistent compliance.

Estes-Smargiassi noted that MWRA had participated in the recent AwwaRF studies on lead service line replacement, and that the experiments done in their system were consistent with the interpretation that complete, integrated LSLR is more effective at reducing lead concentrations than partial LSLR.

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In an informal conversation on what kind of LSLR practice he would recommend, he indicated that he would probably recommend the following elements:

- 1) Lead service line replacement in conjunction with other major infrastructure or repaving work, with a coordinated program to solicit private side participation;
- 2) Lead service line replacement whenever repair work on the service line is done by the utility.
- 3) Replacement of individual lead service lines if requested by the individual property owner, and if the property owner also replaces the private portion, so that a complete LSLR would result.

*7/9/08: Update - Currently there are four wholesale customers of MWRA that are out of compliance with the LCR.*

**Saint Paul Regional Water Services**

Informant: Steve Gleason, up until recently the director of the LSLR program

St. Paul conducted a mandatory LSLR program in the late 1990s due to LCR sampling noncompliance. (St. Paul has since addressed the corrosivity issue through the addition of a proprietary stannous chloride compound in treatment. Their experience with phosphate based corrosion inhibitors was negative due to bacterial growth problems.) Gleason indicated that they estimate that they have approximately 15,000 to 20,000 public LSLs, which they are removing at a rate of about 500 to 1000 annually. These removals are accomplished during infrastructure renewals coordinated with street repavings. The infrastructure (and LSL) considerations are factored in to the priorities of the street repaving program.

Gleason said that St. Paul encourages private side participation when the utility pays for the private side replacement and is then reimbursed by the customer when the utility bill is paid. He estimated that they got about 20% private side replacement, although he has seen participation rates up to 50% in some areas.

**Louisville Water**

Informant - Keith Combs

As taken from its web site, the Louisville Water Company has an interesting charter. "*The city of Louisville is the sole stockholder. LWC is not a city agency – it is publicly owned and privately operated as a for-profit agency with an appointed board of directors.*"

Louisville has had a specific LSLR program for the last ten years, and a goal of removal of all public side lead services by 2017. Their program has not been required due to LCR sampling issues. Combs indicated that they attempt to do most work incidental to other infrastructure or street work; however, some is specifically targeted. He indicated that they do notify customers of planned work to encourage participation, but most private side services are already non-lead. Their practice has been to extend their excavations a few feet

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beyond the property line to that they can make sure that they don't leave a short stub of lead between the new non-lead public service and a largely non-lead private service. They conduct a one-hour post flushing operation following an LSLR.

*7/9/08: Update - Louisville has budgeted approximately \$1.5 million annually for the LSLR capital program, which is being conducted on a neighborhood-by-neighborhood basis, mostly in conjunction with other capital infrastructure or repaving projects. In addition, they have maintenance funds set aside for replacement of lead service that are found to be leaking. The lead services are replaced rather than being repaired. The number of services replaced annually under the maintenance program varies significantly from year to year, but Mr. Combs guessed that this might push annual expenditures to about \$2 million.*

**Birmingham Water Works Board**

Informant: Parry Barron, principal engineer.

Birmingham has not had to conduct a mandatory LSLR program under the Lead and Copper rule; however, it did conduct a lot of LSLRs during the late 1980s. Barron reports that they feel that they probably have about 2000 LSLs left in the system, but they are at unknown locations. She indicated that it is their practice to replace lead service lines that are encountered. They also check the services on adjacent properties and replace those as well if found to be lead. They notify the owner of the properties, but they offer no particular incentives for private side participation.

Barron indicated that Birmingham had been considering a disinfectant switch to chloramines, but held off in the light of DC experience. They have now resumed consideration of a chloramine switch for disinfection by-product (DBP) control.

**Lansing Board of Water and Light**

Informant: Kevin Webber

*According to its web site, "the Lansing Board of Water & Light is a municipally owned utility, providing drinking water, electricity, steam and related services to the Greater Lansing area in Mid-Michigan."*

Webber reports that Lansing has a very aggressive LSLR program that has very strong local political support, particularly from the Lansing mayor. He said that about ten years ago the Board made the decision that the entire water service line was the responsibility of the Board, from the main into the building. They initiated their LSLR program in response to the national concern that was prompted by the District of Columbia situation in 2004, and it is not a mandatory program. According to their web site, so far they have replaced a total of 4,859 lines out of 12,904 as of the end of September 2007. They intend to complete the program by 2013.



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Webber indicated that there is considerable local support for the program, and that they expect future federal regulation will require that utilities replace all LSLs.

Webber indicated that in keeping with their prior ownership decision, their practice has been to replace the service line all the way into the house, unless they find that it is non-lead beyond the property line. He indicated that they do have an extensive program to coordinate with home owners, and for the most part the service line replacement is welcome. They do have some customers who choose not to participate, in which case the utility does NOT do a partial replacement. There are some instances in which there are coordination and scheduling problems with customer access, but the street side replacement is started anyway. In these cases, a temporary connection is made to the building, but the permanent replacement is installed at a later date.

*7/9/08: Update - As of May 2008, Bill Maier of Lansing Water reported that they have completed approximately 6000 lead service line replacements, with about 8000 remaining. Webber reports that they have been spending approximately \$4.5 million annually on the program, and this year it has been boosted to \$6 million. Also, in the recent contracts that they just bid they have found that the unit costs have been substantially reduced by the bidders, so they expect to be able to increase the numbers of LSLRs to be accomplished significantly.*

**Madison Water**

Informant: Doug Demaster

Madison Water is somewhat unusual in that it chose lead service line replacement as its optimized corrosion control technique. This was done out of concerns that a phosphate based corrosion inhibitor would ultimately increase the phosphorus in its wastewater discharge and be detrimental to the highly prized lakes that surround the city. As of 2001 the city had already accomplished significant LSLRs and the inventory was at approximately 6000, and at this time there are approximately 800 remaining. As part of its program a municipal ordinance was enacted requiring that private owners replace their portion of the services. The City also has financial assistance program in which 50% of the private side cost is reimbursed, up to a limit of \$1000. The city web site has the additional details as follows:

*"In February, 2000, Madison's lead water service line replacement Ordinance (MGO Section 13.18) went into effect. The Ordinance requires that all lead water service lines in the city be replaced by January, 2011. The requirement applies to both the Utility-owned service line extending from the water main in the street to the curb stop box, and the customer-owned service line extending from the curb box to the customer's water meter. Water Utility crews, in coordination with customers and their plumbers, are systematically replacing Utility-owned water service lines made of lead that remain part of the water system. When the Utility replaces its lead service line from the water main to the curb box, property owners are required to replace the lead service line on their private property. Property owners are notified by mail when lead service replacement is scheduled for their area.*

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*Where the property-side part of the water service is lead and the Utility's side is copper, property owners are required to replace the lead service line. Property owners are notified by mail when they must arrange with a licensed plumber to have the work done. The Utility will work with customers who know they have a lead service line to get the work done in advance of the notification.*

*Madison must minimize the lead level in tap water in order to meet mandated federal water quality standards. Lead concentrations at customers' taps must be reduced to below 5 parts per billion to meet the federal standard. The U. S. Environmental Protection Agency, Wisconsin Department of Natural Resources, and the City of Madison require implementation of Madison's Lead Service Replacement Program as a means of attaining the federal water quality standard for lead in drinking water.*

*Property owners are eligible for partial reimbursement for the cost of replacing their lead service line. Fifty percent of the cost of the replacement, up to a maximum reimbursement of \$1,000, will be reimbursed to the property owner by the Water Utility following completion of the work and submittal of a completed application form and payment receipt from the plumber. Two weeks after the plumbing contractor has applied for an Application for Water Service, the Water Utility will send out an application form to the property owner to begin the cost reimbursement process."*

*7/9/07: Update - Updated information from Dennis Cawley indicates that Madison is nearly completed with its LSLR program, now less than 200 lead services left. He reported that during the program they have been removing about 500 to 600 lead services annually, at a annual cost between \$500,000 and \$1,000,000.*

**Providence Water Supply Board (RI)**

Informant: John Phillips (O'Brien & Gere)

PWSB is in its first year of a mandatory LSLR program as required due to sampling levels exceeding the LCR Action Level of 15 ppb. The system, which supplies water to multiple municipal jurisdictions, is estimated to have an inventory of 25,600 LSLs, thus requiring an annual removal rate of 1800 per year to meet the 7% requirement. They are very early in the implementation of the program so don't have much experience on private side participation. The preliminary customer notifications have resulted in 25% of the customers requesting a cost estimate for the private side replacement.

*7/9/08: Update - Providence has replaced approximately 3000 public side LSLs and 25 private side LSLs in the first year of the mandatory replacement program. Cost in this initial year were approximately \$15 million.*

**Portland Water Bureau (OR)**

Informant: Yone Akagi



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Portland has had a rather interesting experience under the Lead and Copper Rule. According to the Portland Water Bureau website, that system does not have nor has it historically had any lead services. There were lead "pigtailed", short pieces of pipe connecting the water main to the service line; however, these were all removed between 1985 and 1998. Accordingly, Portland Water contends that all sources of lead in water in their system is derived from internal customer premise plumbing.

In response to the Lead and Copper Rule, Portland conducted a study to determine the required Optimal Corrosion Control Technique (OCCT). The recommended technique from the study was to maintain a pH of 9.0 and an alkalinity of 20. However, Portland entered into a negotiation with its state regulatory agency, and they came to an agreement that in lieu of full implementation of the OCCT, Portland would enter into a joint project with city health and housing agencies to fund a more general Lead Hazard Reduction Program. This was done under the assessment that other sources of lead exposure were more significant than the water exposure.

At this time, the partial implementation of the OCCT (pH target of 7.8-8.0, and no alkalinity target) has been largely successful in controlling lead in water; although, the most recent round of LCR testing yielded a 90<sup>th</sup> percentile value of 17 ppb (i.e. above the 15 ppb Action Level). However, this is largely without regulatory consequence, as Portland Water already participates in enhanced public education under the original OCCT agreement, and reportedly has no lead service lines remaining.

**San Francisco Public Utilities Commission**

Informant: Andrzej Wilczak, Ph.D., PE; Senior Sanitary Engineer

Dr. Wilczak advised that San Francisco also has no lead service lines, having replaced them all in the 1980s. They have found that pH adjustment is the only corrosion treatment technique they have needed. However, they have a number of programs that are targeted at reducing lead exposure. One is replacement of water meters with more recent nonlead models. The other is a customer outreach effort in which the SFPUC will sell customers nonlead kitchen faucet kits for a reduced price of \$10.

**New York City Department of Environmental Protection**

Informant: David Lipsky, DEP Chief of Water Quality

In the aftermath of the publicity over the District of Columbia lead excursion, the New York State regulatory agency gave a more rigorous review of the city's reporting under the Lead and Copper Rule, and then gave a Notice of Violation for technical errors in the calculation of the 90<sup>th</sup> percentile concentrations over several years. This was purely a technical violation, as even with re-calculation the levels did not exceed the Action Level.

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The assigned penalty was that the city was required to replace 7% of the lead services that it owned for each of the previous years that its calculations had been deemed to be faulty. However, then the determination was made, based on city code, that the customer owned the entire service line from the water main into the building. Thus the city's liability under the penalty has been for about 52 service lines to city owned buildings, plus one service line to a juvenile detention facility owned by the state. In an emergency contract the city has replaced about 26 lead service lines, mostly to police substations. The contracting for the remaining 26 has been delayed for a number of contracting issues.

**Philadelphia Water Department**

Informant: Matthew G. Smith; Manager, Planning and Research

Philadelphia's water system is served by two river sources (Delaware and Schuylkill) with disparate alkalinities, and multiple water treatment facilities. The treatability studies for the plants have yielded a treatment strategy based on pH control and zinc-orthophosphate addition. Smith indicated that at times LCR sampling compliance has been close, but their most recent sampling has been about 9 ppb, compared to the 15 ppb Action Level.

PWD did not have a good record of the service line materials. In the immediate aftermath of the DC event they estimated the number of lead service lines at approximately 120,000. However, subsequent review of data sources now suggests that the number is closer to 32,000.

PWD does not have a lead service line replacement program. Similar to New York City, the Philadelphia city code specifies that service lines are privately owned from the water main to the building.

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**Appendix: EPA SIDWIS data on systems in contravention of Lead and Copper Rule**

**2007 SIDWIS Query:** For this benchmarking survey, we requested from EPA a query of the SIDWIS database of water systems that have undertaken mandatory LSLR programs due to LCR contravention. The EPA analyst noted that they do not consider the SIDWIS database reliable due to vagaries in state reporting; however, it was thought to be useful in identifying a pool of benchmarking targets. There were 69 systems identified as listed below.

**2007 EPA SIDWIS Query on Lead and Copper Rule LSLR Milestones and Violations**

Public Water System Name	State	Pop Served	Public Water System Name	State	Pop Served
UTL INC-FERSON CREEK UTILITIES CORP	IL	1,134	WEYMOUTH WATER DEPARTMENT	MA	52,632
BANNOCKBURN	IL	1,429	BAKER CITY OF	MT	1,948
WESTBORO STATE HOSPITAL	MA	1,650	GIBRALTAR	MI	4,600
BELMONT WATER DEPT. (MWRA)	MA	27,000	COUNTRY CLUB ESTATES CONDO	PA	41
SALEM BEVERLY WATER SUPPLY BOARD	MA	82,072	JIM THORPE BOROUGH WATER WEST	PA	2,274
NEW BEDFORD DEPT. OF PUB. INFRASTRUCTURE	MA	93,768	HOLY CROSS DAY CARE	PA	99
NORWOOD WATER DEPT. (MWRA)	MA	28,192	MINERSVILLE MUNICIPAL WATER AU	PA	6,547
BOSTON WATER & SEWER COMMISSION (MWRA)	MA	589,141	PATTON BORO WATER DEPT	PA	2,250
BAY CITY, CITY OF	MI	36,817	SAINT FRANCIS UNIVERSITY	PA	2,072
EVERETT WATER DEPT. (MWRA)	MA	36,000	RICHFIELD AREA JOINT AUTH	PA	1,000
RIVERVIEW	MI	13,189	SUSQUEHANNA TWP ELEM SCH	PA	72
WAYNE	MI	19,093	NORTH STAR EAST MID SCH	PA	620
Ada	MN	1,657	UTL INC-DEL-MAR WATER COMPANY	IL	290
FRAMINGHAM WATER DEPT. (MWRA)	MA	67,610	KNOUSE FOODS INC GARDNERS	PA	150
STORY CITY WATER DEPT	IA	3,228	LANCHESTER LANDFILL	PA	35
LEXINGTON WATER DEPT. (MWRA)	MA	31,507	HOLIDAY TRAV-L-PARK	VA	2,195
LYNNFIELD WATER DIST. (MWRA)	MA	3,000	Saint Paul Regional Water Services	MN	414,735
MALDEN DPW WATER DEPT. (MWRA)	MA	58,690	BAKER CITY OF	MT	1,948
MEDFORD WATER DEPT. (MWRA)	MA	56,203	NEWTOWN ARTESIAN WATER CO	PA	30,000
MELROSE WATER DEPT. (MWRA)	MA	27,244	TOWNSHIP OF BUCKINGHAM-FS	PA	333
MILTON WATER DEPT. (MWRA)	MA	26,825	NEW HOPE SOLEBURY ELEM. SCHOOL	PA	300
NEWTON WATER DEPT. (MWRA)	MA	83,829	RIVER VALLEY SCHOOL	PA	90
GALESBURG	IL	33,706	WESTTOWN-THORNBURY ELEM SCHOOL	PA	500
SOMERVILLE WATER DEPT. (MWRA)	MA	77,478	S BRANDYWINE MIDDLE SCHOOL	PA	680
STONEHAM WATER DEPT. (MWRA)	MA	22,914	HORSHAM CLINIC	PA	488
WATERTOWN WATER DEPT. (MWRA)	MA	32,986	ROCKLAND ELEM SCH	PA	300
D.C. WATER AND SEWER AUTHORITY	DC	581,530	TILDEN ELEM SCH	PA	150
DENTON TOWN OF	MT	301	BEAVER MEADOWS BOROUGH	PA	968
WYANET	IL	1,100	MADISON WATER UTILITY	WI	200,814
WESTON WATER DEPT. (MWRA)	MA	10,983	GENOA CITY WATERWORKS	WI	2,060
CONYNGHAM WATER CO	PA	1,932	ELKHORN WATERWORKS	WI	8,820
MANSFIELD UNIVERSITY	PA	3,000	STRATFORD WATERWORKS	WI	1,651
WINTHROP WATER DIVISION, (MWRA)	MA	19,249	DIXFIELD WATER & SEWER DEPT.	ME	1,485
BARRINGTON	IL	10,168	TOULON	IL	1,400
FALL RIVER WATER DEPARTMENT	MA	94,000			

**2004 SIDWIS Query:** In 2004, during its investigations prompted by the District of Columbia situation, EPA made a vigorous query of the state primacy agencies to collect data on LCR compliance. This is reported on in the report "**Summary Lead action level exceedances for medium (3,300-50,000) and large (>50,000) public water systems** (Updated as of June 1, 2004)." In this report EPA stated that there were 27 systems serving populations greater than 50,000 that had contraventions of the LCR in the previous four years, and 237 systems serving populations between 3300 and 50,000. The excerpted tables on the next two pages give the contravention data from the report for the 27 systems serving greater than 50,000.

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**Table 3 - SDWIS/Fed data for active public water systems serving more than 50,000 people which have exceeded the lead action level of 15 parts per billion (ppb) since January 2000**  
 (Italicized data reflect additional data received from state/system that has not yet been loaded to SDWIS/FED)

In 2003	PWSName	State	Population	Monitoring Period Start Date	Monitoring Period End Date	Lead 90th Percentile Measure (ppb)
X	district of columbia water and sewer aut	DC	595,000	7/1/2003	12/31/2003	63
				1/1/2003	6/30/2003	40
				1/1/2002	12/31/2002	75
				1/1/2001	12/31/2001	8
				1/1/2000	12/31/2000	12
	city of port st lucie utilities	FL	61,275	1/1/2003	12/31/2003	6
				1/1/2002	12/31/2002	5
				7/1/2001	12/31/2001	7
				1/1/2001	6/30/2001	7
				7/1/2000	12/31/2000	8
				1/1/2000	6/30/2000	60
X	pompano beach, city of	FL	75,000	1/1/2003	12/31/2003	59
				1/1/2000	12/31/2000	11
	forsyth co. water & sewer	GA	75,192	1/1/2003	12/31/2003	5
				1/1/2002	6/30/2002	5
				7/1/2001	12/31/2001	3
				1/1/2000	12/31/2000	27
	fall river water department	MA	94,000	7/1/2002	12/31/2002	26
				1/1/2002	6/30/2002	43
				7/1/2001	12/31/2001	33
				1/1/2001	6/30/2001	19
	falmouth water dept	MA	77,500	7/1/2001	12/31/2001	23
X	massachusetts water resources authority (service for 28 communities)	MA	2,000,000	9/1/2003	9/30/2003	17
				9/1/2002	9/30/2002	11
				5/1/2002	5/31/2002	12
				9/1/2001	9/30/2001	19
				3/1/2001	3/31/2001	14
				9/1/2000	9/30/2000	17
				4/1/2000	4/30/2000	19
	new bedford water/wastewater department	MA	100,000	7/1/2002	6/30/2003	6
				7/1/2001	6/30/2002	15
				7/1/2000	6/30/2001	16
				7/1/1999	6/30/2000	28
X	saalem beverly water supply board	MA	82,123	1/1/2000	12/31/2003	29
	weymouth water department	MA	53,988	1/1/2001	6/30/2001	15
				7/1/2000	12/31/2000	23
				1/1/2000	6/30/2000	43
	portland water dist /greater	ME	113,560	1/1/2003	12/31/2003	6
				1/1/2002	6/30/2002	15
				7/1/2001	12/31/2001	11
				1/1/2001	6/30/2001	10
				7/1/2000	12/31/2000	16
				1/1/2000	6/30/2000	20
	saint paul regional water services	MN	414,735	1/1/2003	12/31/2003	11
				1/1/2002	6/30/2002	12
				7/1/2001	12/31/2001	14
				1/1/2001	6/30/2001	14
				7/1/2000	12/31/2000	15
				1/1/2000	6/30/2000	19
X	hendersonville, city of	NC	52,840	7/1/2003	12/31/2003	16
				1/1/2002	6/30/2002	8
				7/1/2001	12/31/2001	8
				1/1/2001	6/30/2001	7
	onslow county water system	NC	79,832	7/1/2000	12/31/2000	37
	bayonne mua	NJ	61,000	1/1/2002	6/30/2002	16
				7/1/2001	12/31/2001	21
	ridgewood water dept	NJ	60,000	7/1/2000	12/31/2000	18
				1/1/2000	6/30/2000	17
X	syracuse city	NY	192,000	7/1/2003	12/31/2003	17
				1/1/2003	6/30/2003	25
				7/1/2002	12/31/2002	15
				1/1/2002	12/31/2002	23
				1/1/2001	12/31/2001	28
				7/1/2001	12/31/2001	20
			7/1/2000	12/31/2000	22	

**MEMORANDUM**

Re: APPENDIX - Survey of Other Cities' Experience with LSLR  
 Date: 10/31/07  
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In 2003	PWSName	State	Population	Monitoring Period Start Date	Monitoring Period End Date	Lead 90th Percentile Measure (ppb)
X	yonkers city	NY	196,088	7/1/2003	12/31/2003	13
				1/1/2003	6/30/2003	18
				7/1/2002	12/31/2002	33
	portland bureau of water works	OR	456,000	7/1/2003	6/30/2006	8
				1/1/2003	12/31/2005	10
				7/1/2002	6/30/2005	17
				1/1/2002	12/31/2004	13
	rockwood water district (purchases water from portland bureau of water works)	OR	53,250	7/1/2003	6/30/2006	8
				1/1/2003	12/31/2005	10
				7/1/2002	6/30/2005	17
				1/1/2002	12/31/2004	13
	salem public works	OR	170,000	1/1/2004	12/31/2006	10
				1/1/2003	12/31/2005	23
				7/1/2003	6/30/2006	8
X	tualatin valley wd	OR	158,000	7/1/2003	6/30/2006	8
				1/1/2003	12/31/2005	10
				7/1/2002	6/30/2005	17
				1/1/2002	12/31/2004	13
X	el yunque	PR	138,512	7/1/2003	12/31/2003	35
				1/1/2003	6/30/2003	7
X	fajardo ceiba	PR	70,348	7/1/2003	12/31/2003	8
				1/1/2003	6/30/2003	21
				7/1/2002	12/31/2002	7
				1/1/2002	6/30/2002	6
				7/1/2001	12/31/2001	16
				1/1/2001	6/30/2001	14
	juncos - ceiba sur	PR	59,708	7/1/2003	12/31/2003	4
				1/1/2003	6/30/2003	5
				7/1/2002	12/31/2002	2
				1/1/2002	6/30/2002	27
				7/1/2001	12/31/2001	16
				1/1/2001	6/30/2001	188
X	metropolitano	PR	1,536,172	7/1/2003	12/31/2003	21
				1/1/2003	6/30/2003	4
				7/1/2002	12/31/2002	5
				1/1/2002	6/30/2002	9
				7/1/2001	12/31/2001	4
X	rio blanco,vieques,culedra	PR	127,880	7/1/2003	12/31/2003	18
				1/1/2003	6/30/2003	11
				7/1/2002	12/31/2002	8
				1/1/2002	6/30/2002	11
				7/1/2001	12/31/2001	14
				1/1/2001	6/30/2001	6

From 2000-2004      27 systems      7,163,801      in 2003      12 systems      5,235,961