

Lead and Copper Rule Implementation and Challenges

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OTCO

Water Analyst Laboratory Workshop

May 15, 2014



THE CITY OF
COLUMBUS

MICHAEL B. COLEMAN, MAYOR

DEPARTMENT OF
PUBLIC UTILITIES

Opening Remarks

Background on City of Columbus System

- Supply
- Distribution
- Historical Issues

Implementation

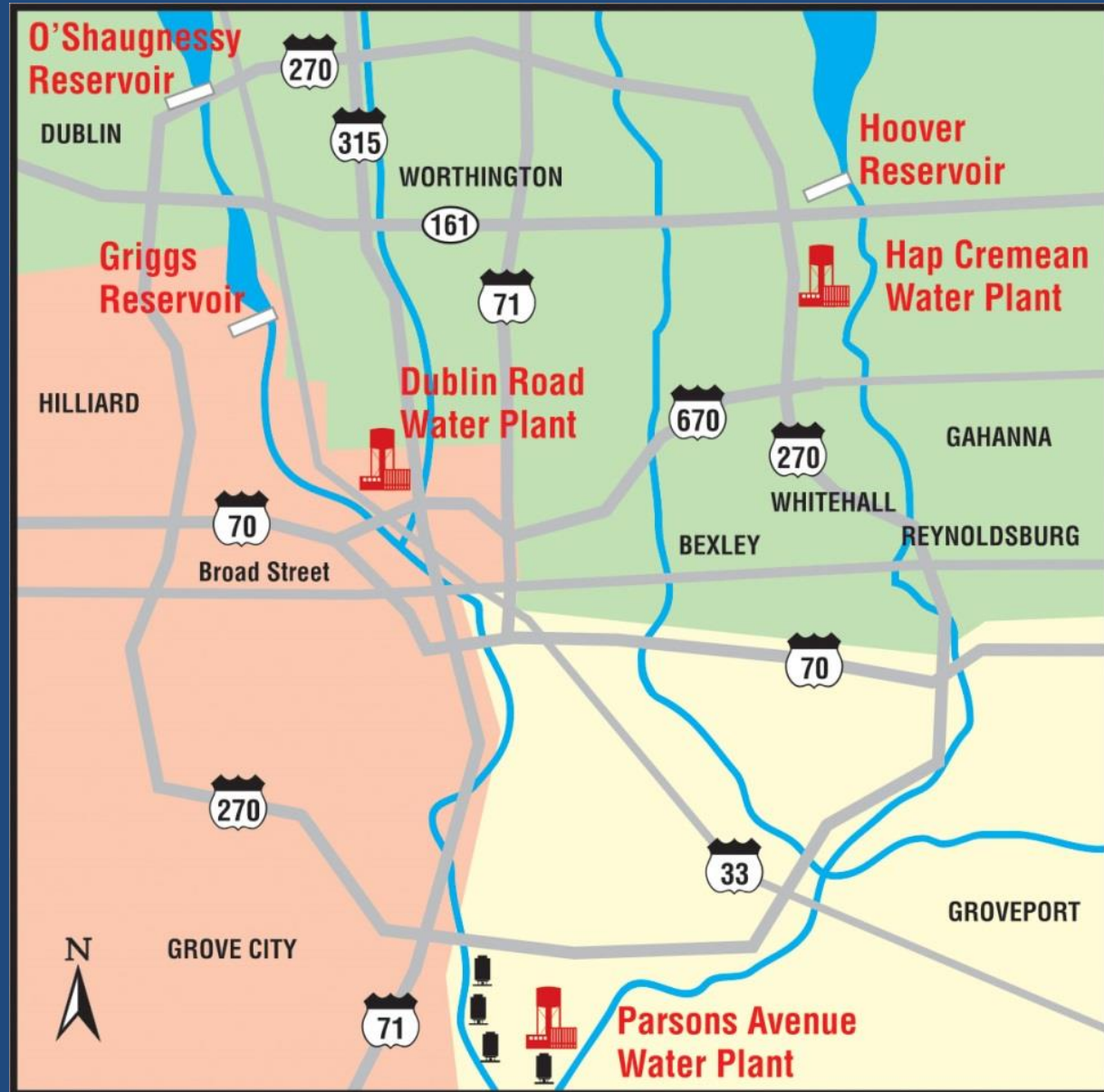
- Lead and Copper Rule (LCR) Monitoring
- Regulatory Requirements

Long-Term Revisions to the LCR

Questions

City of Columbus Supply

- 3 Plants
- Avg. = 141 MGD
- Pop. 1.2 Million
- Conventional
 - Coagulation
 - Softening
 - Filtration
 - Disinfection
- Upgrades
 - Increase Supply
 - Meet Current and future Regulations



Hap Cremean Treatment Plant



- Surface Water: Big Walnut
- Hoover Reservoir (21 BG)
- Capacity = 125 MGD
- Serves 552,000 people
- Supplies 60% of the Columbus system

Dublin Road Treatment Plant

- Surface water: Scioto River
- Capacity = 80 MGD
- Griggs & O'Shaughnessy Reservoirs (6.2 BG)
- Serves 425,000 people
- Upground Reservoir



Parsons Avenue Treatment Plant

- Ground water: 6 Collector Wells in S. Franklin Co.
- Wellfield Expansion
- Capacity = 50 MGD
- Serves 173,000 people



City of Columbus Distribution System

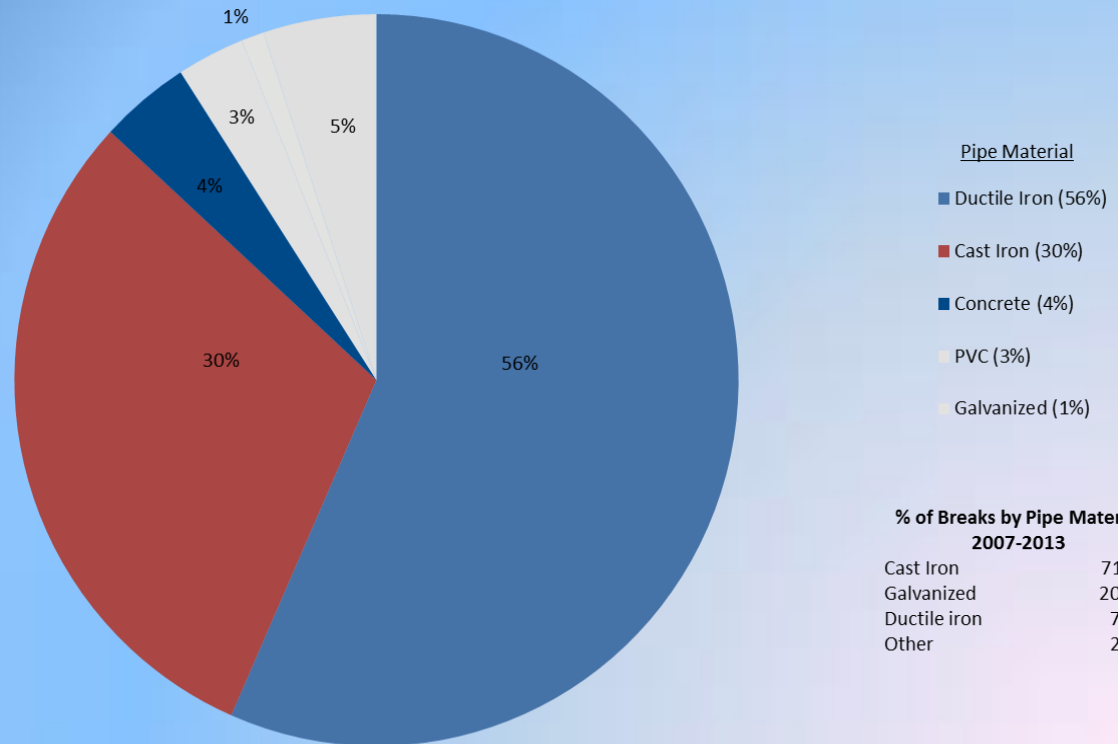
- 3700 miles of distribution mains (2"-66")

- 13 Pressure Districts

- 24 Booster Stations

- 37 Storage Tanks

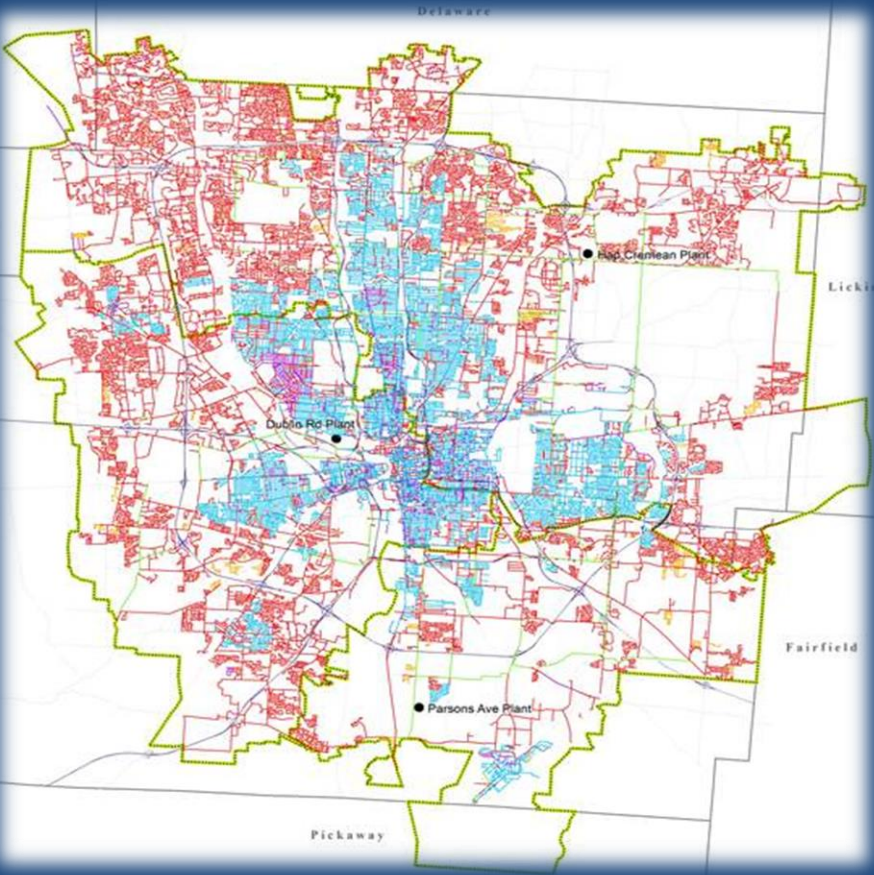
**Water Distribution System
Material Types
(including full service suburbs)**



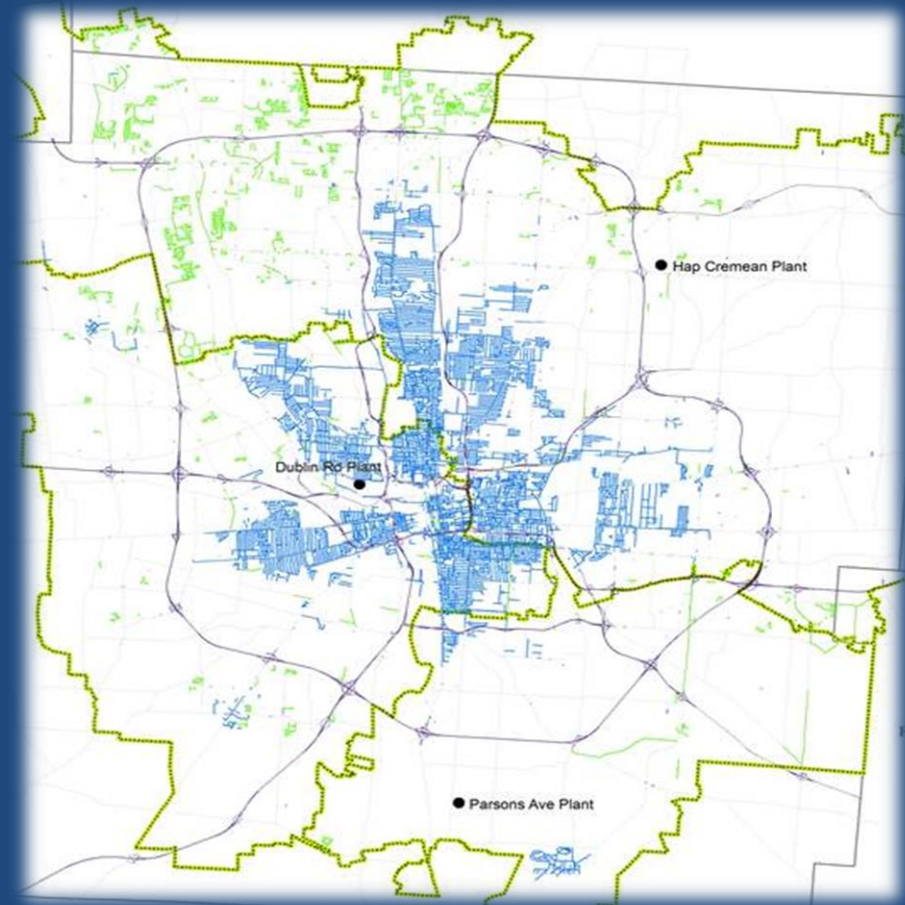
**% of Breaks by Pipe Material
2007-2013**

Cast Iron	71%
Galvanized	20%
Ductile iron	7%
Other	2%

Distribution System Pipe Material



Main Installations
Blue: Before 1954
Green: 1982-1987



Regulatory Requirements

- MCLG – Established by USEPA
 - Lead = 0 $\mu\text{g/L}$
 - Copper = 1300 $\mu\text{g/L}$
- Action Level (AL): Triggers additional requirements
 - Lead = 15 $\mu\text{g/L}$
 - Copper = 1300 $\mu\text{g/L}$
 - 90th Percentile below AL
- Currently under reduced monitoring
- Corrosion Control Optimization

Historical Issues

- Initial LCR Monitoring - Began in 1992
 - Exceeded Lead AL during 2nd round (90th percentile = 16 $\mu\text{g}/\text{L}$)
 - Optimize Corrosion Control – ZOP ratio 3:1
- Treatment Change – Ferric Chloride in 1996
 - Exceeded Lead AL in 1997 (90th percentile = 33 $\mu\text{g}/\text{L}$)
 - Changed back to Alum and increased ZOP ratio 5:1
 - Next sampling period was under AL (90th percentile = 3 $\mu\text{g}/\text{L}$)
- Simultaneous Compliance

Columbus 2014 LCR Monitoring

- Monitoring Requirements
- Initial Planning and Customer Contact
- Collection and Pre-Analysis Screening
- Analysis and Reporting
- Customer Contact and Wrap-up

Monitoring Requirements



Effective Date: 01/01/2014

2014 DISTRIBUTION SCHEDULE

OH2504412 COLUMBUS PUBLIC WATER SYSTEM

System Type: Community

Operating Period: 1/1 to 12/31

THIS SCHEDULE MAY NOT INCLUDE ALL MONITORING REQUIREMENTS FOR YOUR SYSTEM.

Contact your district office to review additional monitoring for operating parameters, and/or other monitoring requirements not included on this schedule. For water emergencies that occur after hours, please call 800-282-9378

**** REMINDER: ** Consumer Confidence Report (CCR) is due July 1, 2014**

DISTRIBUTION MONITORING SCHEDULE

Sampling Location	Facility ID: DS1	Facility Name: COLUMBUS PWS DISTRIBUTION	Facility Class: CLASS 2
	SMP ID: DS000		

Chemicals

Monitoring Requirements

LEAD - 1030 AND COPPER - 1022

50 Sample(s) Required between 6/1/2014 and 9/30/2014

Lead Consumer Notice needs issued to sampling participants within thirty days of receipt of results and verification submitted to Ohio EPA within ninety days from the end of the monitoring period. Submit Form 5105 with appendix to Ohio EPA within ten days from the end of the monitoring period. Forms are available online at: <http://epa.ohio.gov/ddagw/reporting.aspx>

- 50 Pb/Cu samples every 3 years
- Tier 1 System - 25 Pb service lines and 25 Pb solder

Initial Planning & Contact

Begin with our 2011 sampling locations....

Address	Service Type:	Zip	City	Phone #	Last Asgn'd too	Premise #
7472 Gardengate Pl.	50/50 Srv.	43016	Dublin	937-4585	BWB	1084288
727 Chestershire Rd.	Lead Srv.	43204	Columbus	279-2621	BWB	1043576
734 Chestershire Rd.	Lead Srv.	43204	Columbus	279-3457	BWB	1043579
152 S. Westgate Ave.	Lead Srv.	43204	Columbus	279-2332	BWB	1232972
858 City Park Ave.	Lead Srv.	43206	Columbus	443-2737	BWB	1044951
95 N. Virginia Lee Rd.	Lead Srv.	43209	Columbus	237-2716	BWB	1225653
524 Piedmont Rd.	Lead Srv.	43214	Columbus	542-9091	BWB	1176137
1267 Kriswood Ln.	50/50 Srv.	43228	Columbus	296-4141	BWB	1125143
1195 Kriswood Ln.	50/50 Srv.	43228	Columbus	276-1832	BWB	1125131
3020 Quinby Dr.	50/50 Srv.	43232	Columbus	863-3709	BWB	1180612
6752 Amur Dr.	50/50 Srv.	43235	Worthington	659-0313	BWB	1003968
146 E. Longview Ave.	Lead Srv.	43202	Columbus	670-8190	DCS	1136642
1695 W. 3rd Ave.	Lead Srv.	43212	Columbus	949-4184	DCS	1252548
1288 W. 1st Ave.	Lead Srv.	43212	Columbus	488-2738	DCS	1247019
1101 Urlin Ave.	Lead Srv.	43212	Columbus	488-9876	DCS	1223510
23 Winthrop Rd.	Lead Srv.	43214	Columbus	268-6649	DCS	1240914
346 Northridge Rd.	Lead Srv.	43214	Columbus	262-0495	DCS	1161230
1679 Melrose Ave.	Lead Srv.	43224	Columbus	267-7709	DCS	1148067
7464 Gardenview Pl.	50/50 Srv.	43016	Dublin	832-4918	JSK	1084360
5692 Longford Dr.	50/50 Srv.	43016	Dublin	764-4783	JSK	1136309

Initial Planning & Contact

- Letter informing homeowners of the upcoming LCR sampling

Dear Mr. Worrell, or current homeowner:

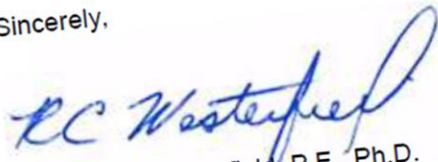
In the past your home has been a site for periodic drinking water lead/copper monitoring by the City of Columbus for compliance with USEPA drinking water regulations. The last such sampling took place in June of 2005, and we would like to ask for your assistance again.

As with last time you will receive a \$25.00 credit on your water bill if selected for sampling, and you will be provided the results of this testing.

This letter is to notify you that our staff will be calling in June to schedule a sample collection date. If for any reason you wish not to participate, please contact Matt Steele at the Water Quality Assurance Laboratory 645-7691, to be removed from our call list.

Thank you again in advance.

Sincerely,



Richard C. Westerfield, P.E., Ph.D.
Administrator

RCW/MS
PC: file

Initial Phone Contact

- Call homeowners to assess sampling conditions

Questions for current LCR sampling sites

All previously used Sites

(1) Do you still live at _____?

(2) Have you done any home plumbing, changes to faucets, or has any water service work taken place since last sampling?

- a) If NO: OK to use site
- b) If YES: MAYBE

(3) Do you have a water softener (i.e. sodium or ion-exchange)?

- a) If NO: OK to use site
- b) If YES: MAYBE ...Is water to the kitchen and bathroom sinks softened (normally both would be softened)?
 - a) If NO: Site may still be used
 - b) If YES: Site cannot be used.

(4) Do you have a POU installed?

- If NO: OK to use site.
- If YES: Can another location be found in home? Otherwise site cannot be used.

Replacement Site Selection

- Call homeowners to assess sample tap

Questions for new LCR sampling sites

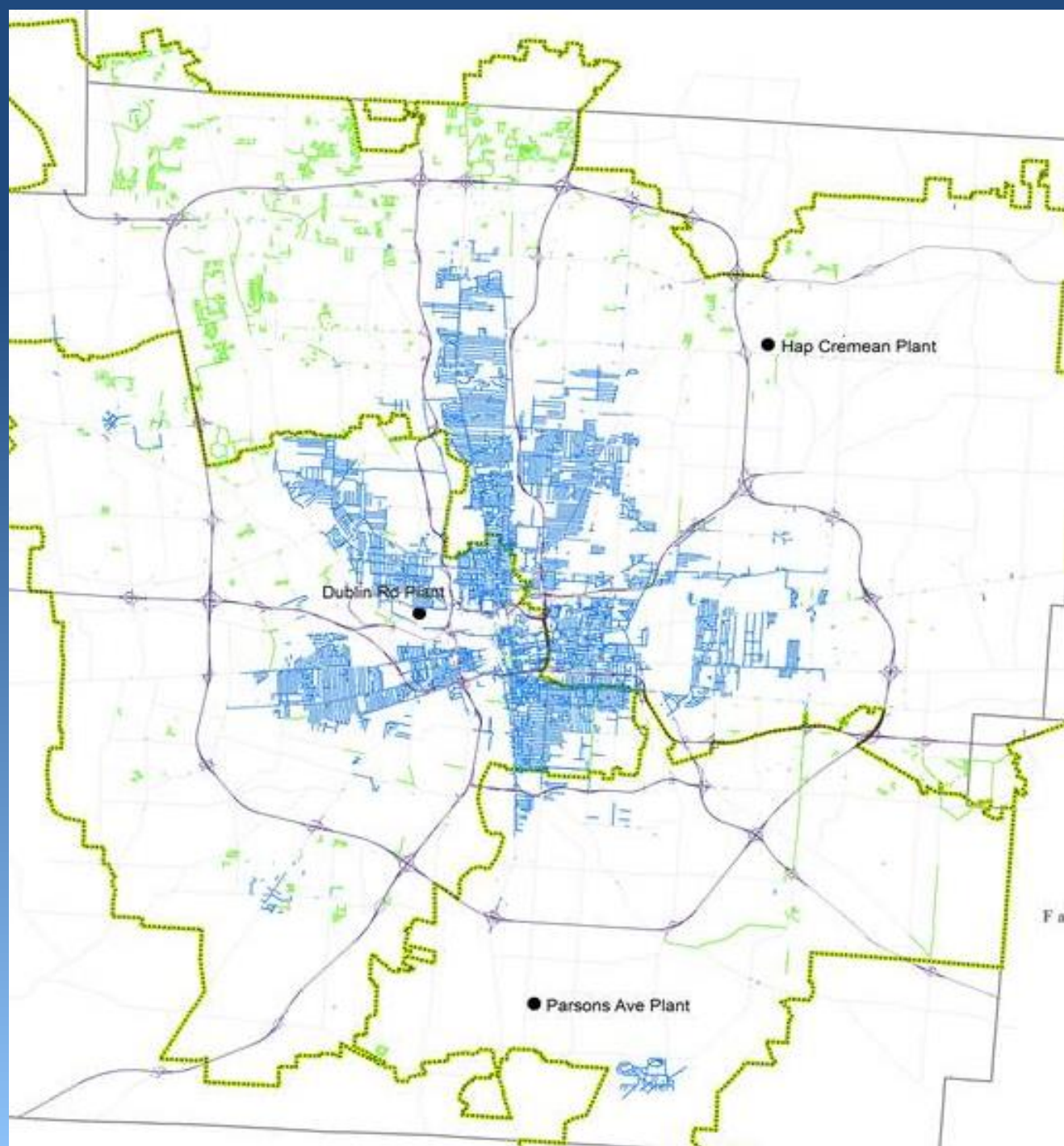
NEW Lead Service Line Sites (Found in homes built previous to 1954 in Columbus)

- (1) Is your address currently _____?
- (2) Is your service line lead (a soft dull gray metal, located behind the water meter and into the wall)?
 - a) If NO: Site cannot be used.
 - b) If YES: Site may be a candidate.....

NEW 50/50 Sites (Looking for all homes built between 1982-1987; 50/50 tin-lead solder)

- (1) Is your address currently _____?
- (2) Is your plumbing copper?
 - a) If NO: Site cannot be used.
 - b) If YES: Site may be a candidate.
- (5) Have you had any home plumbing changes since 1987?
 - a) If NO: Site may still be used
 - b) If YES: Probably can't use site.....

- GIS Data
- Tap Cards
- Mainline Install Date



Customer Collection



WATER SAMPLE COLLECTION PROCEDURE (rev 6/11)



1. **IMPORTANT:** Flush the cold water sample faucet thoroughly (for a couple of minutes) the night **BEFORE** taking the sample. Please do **NOT** use any other water sources for at least six hours in your home until you take the sample. If you do use water during this six hour period before the sampling (*examples: brushing teeth, flushing the toilet, running dishwasher, etc.*), please call the WQAL to reschedule your sample pick-up to the next convenient date.

2. Use either a **bathroom** or **kitchen** faucet that is routinely utilized. Faucets with **separate** hot and cold handles are preferred; avoid using a faucet with a single (hot and cold combined) handle if possible. Please check and mark the appropriate information below:

Bathroom
 Kitchen

Separate hot and cold handles
 Combined handle

Faucet Location [please circle one]: 1st Floor / 2nd Floor / Other _____

3. Sample Collection (collect sample the morning after the sample bottle is delivered):

A. Fully inflate the sample container by using your fingers to pull the edges outward; please do not inflate the container by blowing into it.

B. Position the container under the faucet.

C. Turn the COLD water on and SLOWLY fill the container; should take about 1 minute to fill the container.

D. Fill the container as full as possible -- it is helpful to support the container from the bottom as well as by the bottle neck.

E. Put the lid on, secure tightly, and write the date, time and samplers initials on the label.

4. Sample Pick-up:

A. Put the sample and this instruction sheet (signed) in the plastic bag and place between the front and screen doors, or place on front porch.

B. We will pick-up the sample the morning following sample bottle drop-off.

5. Your sampling credit will appear on a later bill, and the results of your test will be mailed around the same time. If there are any questions, please contact the Water Quality Assurance Laboratory at **645-3851** between 7:30 a.m. and 3:30 p.m. (Monday-Friday), and ask for Rich Rutherford.

Thank you very much for your assistance with this very important project.

I have read the above instructions and have taken the sample in accordance with these instructions:

Signature _____ Date _____

- Schedule collection
- Bypass POU/POE
- Remove aerator and flush night before
- Volume of 1L
- 6 hours of non-use prior to “First draw” sample

Pre Screening

	A	B	C	D	E	F	G	H	I
	Sample	Collection				Analysis			
1	####	Date	Collector	Address	Analyst	Date	Turbidity	pH	Comments
2	1								
3	2								
4	3								
5	4								
6	5								
7	6								
8	7								
9	8								
10	9								
11	10								
12	11								
13	12								
14	13								
15	14								
16	15								
17	16								
18	17								
19	18								
20	19								
21	20								
22	21								
23	22								
24	23								
25	24								
26	25								

- Screen for pH (<2.0) and Turbidity (<1.0 NTU)
- Acidification at laboratory

Analysis

	A	B	C	D	E	F	G	H
1	Analyst:	JSK	Run Date: 6/27/2011		Parameter: Pb / Cu (µg/l)			
2								
3			Cu	True Value	% TV	Pb	True value	% TV
4	ICV 20.0		20.4	20.0	102.0	20.4	20.0	102.0
5	QC 40		40.3	40.0	100.8	39.7	40.0	99.3
6	Blank		0.3			0.1		
7	MDL 1.0		1.2	1.0	120.0	1.0	1.0	100.0
8	61 Martin Ave. 39		8.1			0.0		
9	858 City Park Ave. 40		65.1 (16.3)			0.3		
10	1695 W. 3rd. Ave. 41		44.3			0.4		
11	SPK - 1695 W. 3rd. Ave. 41		54.5		81.6	12.0		92.8
12	1101 Urlin Ave. 42		22.4			0.6		
13	4013 Basswood Ave. 46		58.7 (14.7)			0.1		
14	SPK - 4013 Basswood Ave. 46		27.0		98.4	13.0		103.2
15	5227 Bandon Ct. 47		23.0			0.1		
16	6752 Amur Dr. 48		38.2			0.4		
17	DUP - 6752 Amur Dr. 48		37.8	38.2	99.0	0.4	0.4	100.0
18	CCV 20.0		20.7	20.0	103.5	20.8	20.0	104.0
19	QC 40		41.4	40.0	103.5	40.9	40.0	102.3
20	Rerun 7464 Gardenview Pl. 50		14.5			0.8		
21	Rerun 7464 Gardenview Pl. 50		14.5			0.8		
22	Blank		0.2			0.0		
23	QC 40		41.6	40.0	104.0	41.1	40.0	102.8
24								
25								

- Standard Methods 3113 B

- Ohio EPA Metals Requirements

COPPER			LEAD		
STD Conc.		Response	STD Conc.		Response
Blank		0.0012	Blank		-0.0001
5 µg/l		0.0321	5 µg/l		0.0164
10 µg/l		0.0608	10 µg/l		0.0307
30 µg/l		0.1835	30 µg/l		0.0909
50 µg/l		0.3181	50 µg/l		0.1537
Corr. Coeff		0.9996	Corr. Coeff		0.9999
Slope		0.0063	Slope		0.0031

OEPA Reporting

- Via eDWR and also a paper copy (Form 5105)



EPA 5105 Appendix

DRINKING WATER LEAD AND COPPER MONITORING REPORT

Submit with Form EPA 5105

Page 3 of 7 pages

PWS Name: Columbus Public Water System	PWSID: OH 2504412	Analytical Laboratory Name: Water Quality Assurance Lab	Laboratory Certification No.: 1778
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List samples sequentially by Laboratory Sample Number

Date of Sample	Time Sample Taken	Laboratory Sample Number	Address of Sample Site Example: 234 S Main St Town OH 4000	Tap Type* and Location Example: B 2 nd floor	Structure Type SFR, MFR or BLDG	Interior Plumbing Material Pb, CuPb>82 CuPb<83, or other	Service Line Material Pb, Cu, or other	Tier 1, 2, 3, or other	Lead Conc (ug/L)	Copper Conc (ug/L)
6/2/2011	6:00:00 AM	2011-4919-MET	801 S. Burgess Ave.	B	SFR		Pb	1	<1.0	69.4
6/2/2011	6:55:00 AM	2011-4920-MET	3630 Juniper St.	B	SFR	CuPb>82		1	<1.0	4.2
6/2/2011	6:30:00 AM	2011-4921-MET	4362 Trindel Way	B	SFR	CuPb>82		1	<1.0	17.1
6/3/2011	5:06:00 AM	2011-4922-MET	1258 E. 21st Ave.	B	SFR		Pb	1	<1.0	35.6
6/3/2011	7:00:00 AM	2011-4923-MET	3656 Skipstone Pl.	K 1st Floor	SFR	CuPb>82		1	<1.0	215.3
6/3/2011	8:35:00 AM	2011-4924-MET	3677 Skipstone Pl.	B	SFR	CuPb>82		1	1.4	15.4
6/3/2011	5:02:00 AM	2011-4925-MET	4400 Trindel Way	K 1st Floor	SFR	CuPb>82		1	44.8	35.3
6/2/2011	7:00:00 AM	2011-4926-MET	66 Winthrop Rd.	K 1st Floor	SFR		Pb	1	<1.0	34.4
6/3/2011	7:01:00 AM	2011-4927-MET	125 E. Pacemont Rd.	K 1st Floor	SFR		Pb	1	<1.0	3.1
6/3/2011	6:30:00 AM	2011-4928-MET	146 E. Longview Ave.	K 1st Floor	SFR		Pb	1	<1.0	5.2

*Tap type codes: B - bathroom cold water tap; D - drinking fountain; K - kitchen sink cold water tap; R - restroom sink cold water tap; O - other (with prior Ohio EPA acceptance)

Note: 1 mg/L = 1000 ug/L

EPA 5105 Appendix (Rev. 4/11)

Lead Consumer Notice needs issued to sampling participants within thirty days of receipt of results and verification submitted to Ohio EPA within ninety days from the end of the monitoring period. Submit Form 5105 with appendix to Ohio EPA within ten days from the end of the monitoring period. Forms are available online at: <http://epa.ohio.gov/ddagw/reporting.aspx>

90th Percentile Determination

- Place all results in ascending order and assign each a consecutive number
- Multiply the number of samples taken by 0.9 – the resulting numbered concentration is the 90th percentile

AL Not Exceeded



1	2	3	.....	44	45	45	47	48	49	50
0	0	0	.....	0	0	0	0	1.4	2.2	44.8

1	2	3	.....	25	26	27	28	29	30
0	0	0	.....	3	17	20	22	33	37

AL Exceeded



Customer Notification

- Within 30 days of receipt of results
- Must include:
 - Results
 - Health effects
 - Exposure reduction
 - Contact Info
- OEPA Rule 3745-81-85

Columbus Division of Power and Water
910 Dublin Rd.
Columbus, OH 43215

July 19th, 2011

I wish to thank you for participating in the Division of Power and Water's latest round of lead/copper monitoring. System wide results over the last fourteen years confirm that the Division of Power and Water continues to be in full compliance with USEPA regulations for lead and copper and that our corrosion control practices have been effective.

The concentration at the 90th percentile for the Columbus Public Water System from the 2011 lead and copper sampling are <1.0 ppb for lead and 69.4 ppb for copper. In your sample, the concentration of lead was 44.8 ppb, and the concentration of copper was 35.3 ppb. The copper levels are very low and well within USEPA regulations. However, during this sample period your residence showed elevated lead results. Historically your home has had 'less than' detections for lead (i.e. 2005 and 2008.) Again, lead and copper can be removed by flushing for at least 30 seconds prior to use.

The USEPA action level (AL) for lead is 15 parts per billion (ppb), and the copper AL is 1300 ppb at the 90th percentile. An AL is the concentration of a contaminant, which if exceeded, triggers treatment or other requirements that a water system must follow. The USEPA has also established maximum contaminant level goals (MCLG) for lead at 0 ppb and 1300 ppb for copper. An MCLG is the level of a contaminant in drinking water, below which there is no known or expected health risk. MCLGs allow for a margin of safety. For additional information on lead in drinking water and health effects please see the enclosed brochure titled "What You Need to Know About Lead in Drinking Water".

The overall results indicate that corrosion in Columbus homes from water service is minimal. Future sampling will continue to occur once every three years. Division staff will attempt to call you in mid-2014, asking for your assistance in the collection of samples for our next round of sampling.

The \$25.00 credit for your participation in this process will appear on your water bill within the next two billing cycles. If you have any questions regarding your results or the \$25.00 credit, please contact Matt Steele with the Division's Water Quality Assurance Laboratory at (614) 645-7691.

Thank you for participating in the Division of Power and Water's lead/copper monitoring program for the

Lead Consumer Notice needs issued to sampling participants within thirty days of receipt of results and verification submitted to Ohio EPA within ninety days from the end of the monitoring period. Submit Form 5105 with appendix to Ohio EPA within ten days from the end of the monitoring period. Forms are available online at: <http://epa.ohio.gov/ddagw/reporting.aspx>

Richard C. Westerfield, P.E., PhD
Administrator

Long-Term Revisions to the LCR

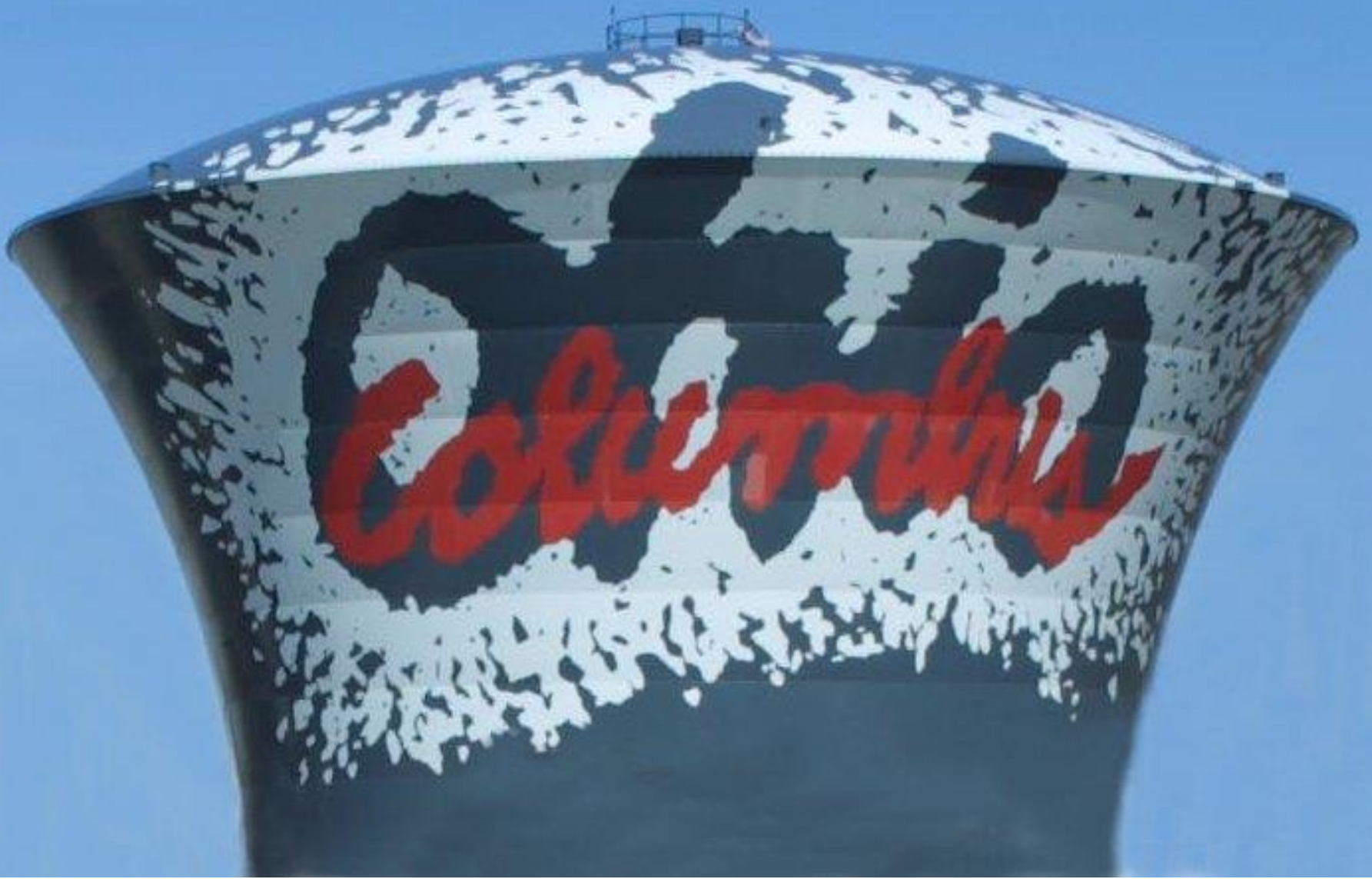
- Improve public health protection
- National Drinking Water Advisory Council
Lead and Copper Rule Working Group
- LCRWG will address:
 - Sample Site Selection
 - Corrosion Control
 - Lead service line replacement
 - School and Daycare Facilities
 - Consecutive System Requirements
 - Public meeting scheduled for May 29th – 30th

Site Selection Potential Changes

- Separate tiering structures for LSL vs. non-LSL systems
 - LSL systems would focus only on LSL sites (with no copper testing)
 - Non-LSL systems would focus on Lead Solder sites
- Separate sites for Lead and Copper
 - Separate sample pool targeting copper leaching
- Copper waiver based on WQ parameters
 - pH, alkalinity, disinfection, corrosion control factors

Additional Resources

- United States EPA
 - <http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/index.cfm>
- Ohio EPA
 - <http://epa.ohio.gov/ddagw/rules.aspx>
 - Select 'Effective Rules' then 'Chapter 3745-81: Primary Drinking Water Standards'
 - Chapters 3745-81-80 through 3745-81-90 apply
- Ohio Certified Labs
 - <http://epa.ohio.gov/portals/28/documents/labcert/LabSum.pdf>



THE CITY OF
COLUMBUS
MICHAEL B. COLEMAN, MAYOR

DEPARTMENT OF
PUBLIC UTILITIES

QUESTIONS??