S. HRG. 111–1220

OVERSIGHT HEARING ON FEDERAL DRINKING WATER PROGRAMS

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

DECEMBER 8, 2009

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ONE HUNDRED ELEVENTH CONGRESS
FIRST SESSION

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C O N T E N T S

OVERSIGHT HEARING ON FEDERAL DRINKING WATER PROGRAMS

TUESDAY, DECEMBER 8, 2009

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10 a.m. in room 406, Dirksen Senate Office Building, Hon. Barbara Boxer (chairman of the committee) presiding.

Present: Senators Boxer, Inhofe, Lautenberg, Cardin, Klobuchar, Whitehouse, and Udall.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. The hearing will come to order.

Welcome to our panelists.

Congress passed the Safe Drinking Water Act in 1974 to protect public health by regulating the Nation's public drinking water supply. When President Ford signed the legislation into law, he spoke eloquently about the importance of providing Federal protections for drinking water.

One of the reasons I called this hearing is because I am concerned that the Federal Government has not done enough in recent years to maintain and improve drinking water safeguards. I want to ensure the Federal Government fully and effectively utilizes its authority under the law, and I want to ensure that EPA has the tools it needs to protect our children and communities all across this Nation from dangerous water contamination.

For example, perchlorate is a toxic chemical contained in rocket fuel. It does not belong in our drinking water. But the last Administration refused to set a drinking water standard for perchlorate despite strong scientific evidence that perchlorate is a public health threat. And so I believe it has left millions of Americans in dozens of States, including California, at risk.

That is why I asked Administrator Jackson in January to use the best available science to reconsider EPA's interim decision not to regulate perchlorate. And I am very pleased to say that they are taking another look at addressing this threat posed from perchlorate.

Americans also have a right to expect that their children are safe from drinking water pollution in their schools. But the Associated Press reported this year on toxic drinking water pollution, including lead contamination, in the drinking water of thousands of schools across this Nation. I have asked the Administrator to de-

velop a plan to address this unacceptable threat to America's school children.

So, I look forward to hearing from EPA about all these issues. I have also asked them to testify today specifically about steps they can take to improve assistance to small systems, to improve the effectiveness of enforcement and compliance, to improve transparency, and to better protect our children's health.

We have taken steps in this committee that demonstrate strong bipartisan support for water infrastructure improvements including the passage, 17 to 2, of S. 1005, the Water Infrastructure Financing Act, which would provide nearly $15 billion from 2010 to 2014 for EPA's Drinking Water State Revolving Fund. And Senator Inhofe and I are trying very hard to get this up before the Senate and passed.

In addition, the stimulus bill provided approximately $2 billion for this program. I worked hard to get those funds included because I believe investing in our water infrastructure not only protects public health, but it creates good jobs in communities across the Nation.

I want to thank our distinguished witnesses, and I reserve the balance of my time.

I call on Senator Inhofe.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Thank you, Madam Chairman, for taking the time today to discuss this issue. It is a very significant issue. The Safe Drinking Water Act has been a great success in providing Americans with clean, safe drinking water, and as our technology has improved we are able to detect smaller and smaller amounts of contaminants. And because of this EPA is regulating more contaminants.

But complying with EPA's new regulations is difficult. Many Oklahoman municipalities continue to struggle with the 2002 arsenic rule, and many of our small systems are having a difficult time with the disinfection by-product stage I rule. Small systems that purchase water from other systems and previously not required to test, treat and monitor their water are further burdened by this.

Because I worry about the challenges facing small systems, I am pleased today—not on this panel, but on the next panel—to have Gene Whatley from the Oklahoma Rural Water Association. Gene understands the problems facing small drinking water systems, and I look forward to his testimony on how small systems are coping with Federal regulations.

Some of the fear to make changes in this Safe Drinking Water Act is driven by press attention to reports of issues like recent polls on the pharmaceuticals in drinking water. I remind my colleagues that in 1996, under the leadership of Chairman Chafee and Ranking Member Baucus, we amended the law by requiring EPA to set standards if contaminants have known health effects or are known to occur in public water systems with a frequency and at levels of public health concern. I am quoting that. We should allow EPA to keep working on through this problem and try not to preempt it.

I am also reminding the committee that one of the most important steps Congress can take to improve our Nation's drinking water facilities is to reauthorize the State Revolving Loan Fund Programs. The Chairman and I have been very concerned about that and Senators Cardin, Crapo and I, and I believe the Chairman also, have worked hard to put together amendments to accomplish that.

I would like to say—put something in the record here. But let me tell you what it is. There is a poll done. It shows how really serious this is. People do not realize that people are concerned about this issue. The Gallup Poll just released said that pollution of drinking water, Madam Chairman, is America's No. 1 environmental concern, with 59 percent saying they worry a great deal about the issue according to the Gallup Poll. It was just released this year.

And I am quoting further. That exceeds the 45 percent worried about air pollution, the 42 percent about the loss of the tropical rainforest, and it goes on down, and it gets to global warming. It is interesting that twice as many people are concerned about the pollution of drinking water than they are global warming.

I want that in the record for two reasons. One, the obvious one, the other one to show how important drinking water is.

Senator BOXER. Without objection. So ordered.

Senator INHOFE. That is it.

[The referenced information follows:]

GALLUP

March 25, 2009

Water Pollution Americans' Top Green Concern

Worry about environmental problems has edged up since 2004

by Lydia Saad
Page: 12

PRINCETON, NJ -- The folks behind World Water Day -- a largely U.N.-sponsored effort to focus attention on freshwater resource management, observed this past Sunday -- may be on to something. Pollution of drinking water is Americans' No. 1 environmental concern, with 59% saying they worry "a great deal" about the issue. That exceeds the 45% worried about air pollution, the 42% worried about the loss of tropical rain forests, and lower levels worried about extinction of species and global warming.

I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about ... ?

	Great deal	Fair amount	Only a little/Not at all
	%	%	%
Pollution of drinking water	59	25	16
Pollution of rivers, lakes, and reservoirs	52	31	17
Contamination of soil and water by toxic waste	52	28	19
Maintenance of the nation's supply of fresh water for household needs	49	31	19
Air pollution	45	31	24
The loss of tropical rain forests	42	26	32
Extinction of plant and animal species	37	28	34
The "greenhouse effect" or global warming/ Global warming	34	26	40

March 5-8, 2009

GALLUP POLL

All eight issues tested in the 2009 Gallup Environment survey, conducted March 5-8, appear to be important to Americans, evidenced by the finding that a majority of Americans say they worry at least a fair amount about each one. However, on the basis of substantial concern -- that is, the percentage worrying "a great deal" about each -- there are important distinctions among them.

The four water-related issues on the poll fill the top four spots in this year's ranking. In addition to worrying about pollution of drinking water, roughly half of Americans also express a high degree of worry about pollution of rivers, lakes, and reservoirs (52% worry a great deal about this), and water and soil contamination from toxic waste (52%). About half worry about the maintenance of the nation's supply of fresh water for household needs (49%).

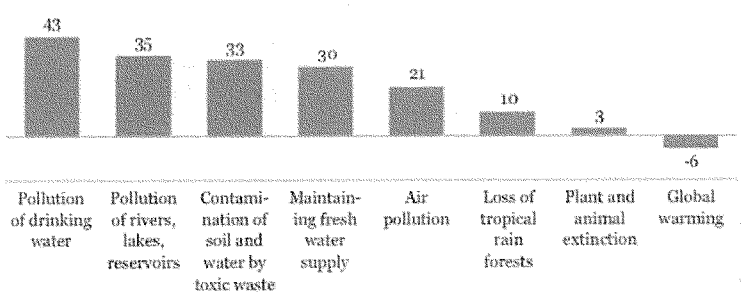
Air pollution places fifth among the environmental problems rated this year; 45% are worried a great deal about it. That issue is closely followed by the loss of tropical rain forests, with 42% -- although significantly more Americans say they worry little or not at all about rain forests than say this about air pollution (32% vs. 24%).

Extinction of plant and animal species and global warming are of great concern to just over a third of Americans. However, since more Americans express little to no worry about global warming than say this about extinction, global warming is clearly the environmental issue of least concern to them. In fact, global warming is the only issue for which more Americans say they have little to no concern than say they have a great deal of concern.

Net Worried About Environmental Issues

Percentage worried a great deal minus percentage worried only a little or not at all

In percentage points



March 5-8, 2009

GALLUP POLL

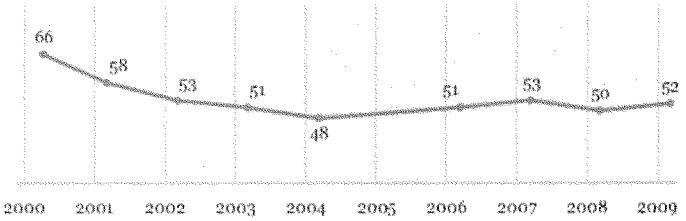
Trends

Gallup has maintained annual trends on public concern for these eight environmental issues since 2000. (Some items have trends dating back to 1989, available at the end of this report.) The long-term picture since 2000 -- based on substantial concern about the issues -- is one of declining concern except for the maintenance of household water, which has increased slightly.

However, as exemplified by the trends in concern about pollution of rivers, lakes, and reservoirs, as well as concern about air pollution, the declines were most evident between 2000 and 2004, with the 2004 levels dipping to a record low for most issues.

*U.S. Public Concern About Pollution of Rivers, Lakes, and Reservoirs**

Percentage worried "a great deal"

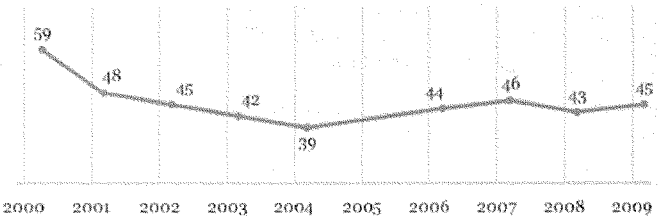


* Trend since 2000; earlier results available in tables at end of this report

GALLUP POLL

*U.S. Public Concern About Air Pollution**

Percentage worried "a great deal"



* Trend since 2000; earlier results available in tables at end of this report

GALLUP POLL

Since 2004, public concern about the eight environmental matters rated this year has either been stable, or risen. The largest increase in concern is seen with global warming. Despite remaining at the bottom of the list of expressed concerns, the issue has nevertheless seen an eight-point

increase in the last five years. There has been a similar seven-point increase in concern about the loss of tropical rain forests over that time.

Percentage Worried "a Great Deal" About Each Environmental Issue

Selected years*

	April 2000	March 2004	March 2009
	%	%	%
Pollution of rivers, lakes, and reservoirs	66	48	52
Air pollution	59	39	45
The loss of tropical rain forests	51	35	42
The "greenhouse effect" or global warming	40	26	34
Contamination of soil and water by toxic waste	64	48	52
Pollution of drinking water	72	53	59
Extinction of plant and animal species	45	36	37
Supply of fresh water for household needs	42	47	49

*See tables at end of report for full trends

GALLUP POLL

Bottom Line

The era of water pollution as a hot political issue in the United States ended sometime after the Environmental Protection Agency received powerful regulatory tools with the 1972 Clean Water Act and the follow-up 1987 Water Quality Act. Still, given the essential nature of water to sustaining human and other life, it is not surprising to find that some form of water pollution has been the top-ranking environmental issue of concern to Americans in each Gallup reading since 1989. Mention water in the context of environmental problems, and more than half of Americans still say it's something that greatly concerns them.

Beyond water pollution, air pollution is the next-highest-ranking environmental issue. However, three issues register less public concern -- notable because they nevertheless are widely discussed in the media and public affairs: loss of tropical rain forests, extinction of plant and animal species, and global warming.

Survey Methods

Results are based on telephone interviews with 1,012 national adults, aged 18 and older, conducted March 5-8, 2009. For results based on the total sample of national adults, one can say with 95% confidence that the maximum margin of sampling error is ±3 percentage points.

Interviews are conducted with respondents on land-line telephones (for respondents with a land-line telephone) and cellular phones (for respondents who are cell-phone only).

For results based on the 512 national adults in the Form A half-sample and 500 national adults in the Form B half-sample, the maximum margins of sampling error are ±5 percentage points.

In addition to sampling error, question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of public opinion polls.

13. I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about -- [RANDOM ORDER]?

	Great deal	Fair amount	Only a little	Not at all
	%	%	%	%
A. Pollution of rivers, lakes, and reservoirs				
2009 Mar 5-8	52	31	13	4
2008 Mar 6-9	50	34	12	4
2007 Mar 11-14	53	31	13	3
2006 Mar 13-16	51	33	11	5
2004 Mar 8-11	48	31	16	5
2003 Mar 3-5	51	31	13	5
2002 Mar 4-7	53	32	12	3
2001 Mar 5-7	58	29	10	3
2000 Apr 3-9	66	24	8	2
1999 Apr 13-14	61	30	7	2
1999 Mar 12-14	55	30	12	3
1991 Apr 11-14	67	21	8	3
1990 Apr 5-8	64	23	9	4
1989 May 4-7	72	19	5	3
B. Air pollution				
2009 Mar 5-8	45	31	18	6
2008 Mar 6-9	43	35	17	6
2007 Mar 11-14	46	33	15	5
2006 Mar 13-16	44	34	15	7
2004 Mar 8-11	39	30	23	8
2003 Mar 3-5	42	32	20	6
2002 Mar 4-7	45	33	18	4
2001 Mar 5-7	48	34	14	4
2000 Apr 3-9	59	29	9	3
1999 Apr 13-14	52	35	10	3
1999 Mar 12-14	47	33	16	4
1997 Oct 27-28	42	34	18	5
1991 Apr 11-14	59	28	10	4
1990 Apr 5-8	58	29	9	4
1989 May 4-7	63	24	8	4
C. The loss of tropical rain forests				
2009 Mar 5-8	42	26	21	11
2008 Mar 6-9	40	29	20	11
2007 Mar 11-14	43	30	17	10
2006 Mar 13-16	40	24	22	13
2004 Mar 8-11	35	26	23	15

13. I'm going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about -- [RANDOM ORDER]?

Continued

	Great deal	Fair amount	Only a little	Not at all
	%	%	%	%
D. (Form A) The "greenhouse effect" or global warming				
2009 Mar 5-8	35	25	20	19
2008 Mar 6-9	37	29	16	17
2007 Mar 11-14	41	24	18	16
2006 Mar 13-16	36	26	21	15
2004 Mar 8-11	26	25	28	19
2003 Mar 3-5	28	30	23	17
2002 Mar 4-7	29	29	23	17
2001 Mar 5-7	33	30	22	13
2000 Apr 3-9	40	32	15	12
1999 Apr 13-14	34	34	18	12
1999 Mar 12-14	28	31	23	16
1997 Oct 27-28	24	26	29	17
1991 Apr 11-14	35	27	22	12
1990 Apr 5-8	30	27	20	16
1989 May 4-7	35	28	18	12
E. (Form B) Global warming				
2009 Mar 5-8	33	27	20	20
F. Contamination of soil and water by toxic waste				
2009 Mar 5-8	52	28	14	5
2008 Mar 6-9	50	30	14	6
2007 Mar 11-14	52	28	13	7
2006 Mar 13-16	52	29	13	6
2004 Mar 8-11	48	26	21	5
2003 Mar 3-5	51	28	16	5
2002 Mar 4-7	53	29	15	3
2001 Mar 5-7	58	27	12	3
2000 Apr 3-9	64	25	7	4
1999 Apr 13-14	63	27	7	3
1999 Mar 12-14	55	29	11	5
1991 Apr 11-14	62	21	11	5
1990 Apr 5-8	63	22	10	5
1989 May 4-7	69	21	6	3
G. Pollution of drinking water				

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE,
U.S. SENATOR FROM THE STATE OF OKLAHOMA

Thank you, Madam Chairman, for taking the time today to discuss our Nation's Federal drinking water programs. I think there is one thing that everyone in this room can agree on: clean, safe, affordable drinking water is a national priority.

Through the Safe Drinking Water Act, we have had great success in providing America with clean, safe drinking water. As our technology has improved, we have been able to detect smaller amounts of contaminants, and EPA has regulated more contaminants.

Complying with EPA's new regulations has been difficult. Oklahoma has municipalities who struggle with the 2002 arsenic rule, and many of our small systems are having difficulty with the Disinfection Byproducts Stage I rule. Additionally, small systems that purchase water from other systems and were previously not required to test, treat or monitor their water must now comply with Disinfection Byproducts Stage II rule.

I am pleased today that we will hear from Gene Whatley of the Oklahoma Rural Water Association. Gene understands the problems facing small drinking water systems, and I look forward to his testimony on how small systems are coping with Federal regulations.

I know there have been many press reports recently about pharmaceuticals and other chemicals in drinking water. Our committee has held hearings on these issues in April and May 2008. I would remind my colleagues that in 1996, under leadership of former Chairman Chafee and Ranking Member Baucus, Congress was successful in amending the Safe Drinking Water Act. Here's what they did: The amendments required EPA to set standards if the contaminants "have known health effects," and are "known to occur in public water systems with a frequency and at levels of public health concern." The amendments also gave EPA the opportunity for "health risk reduction for persons served by a public water system." I encourage my colleagues to allow EPA to keep working through this process—we don't need new legislation that requires EPA to set standards for chemicals simply because they have received press attention.

I would also like to take the opportunity to remind the committee that we need to improve our Nation's drinking water facilities by reauthorizing the State Revolving Loan Fund programs, both for drinking water and waste water. We cannot expect our communities to continue to provide safe drinking water if they do not have the resources to meet their infrastructure needs. This committee has the responsibility to ensure clean, safe, and affordable water for our country by providing the necessary resources to States and local governments. Madam Chairman, EPA estimates that over the next 20 years eligible drinking water systems will need over $300 billion in infrastructure investments. I believe that many of the issues we are discussing today will be helped by passing S. 1005, the Water Infrastructure Financing Act.

Thank you again for holding this important hearing, and I look forward to hearing from our witnesses.

Senator BOXER. That is it? OK.

Senator Lautenberg.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thank you, Madam Chairman.

The one thing that we all know is the importance of clean, safe water to our society, essential for our health and the health and well-being of our children. And that is why it is incumbent upon us to ensure that America's water supply is safe.

When Congress passed the Safe Drinking Water Act, the EPA gained the authority to regulate the chemicals in our drinking water. But even with that authority, there is still troubling evidence that chemicals and other substances are polluting the Nation's water supply.

Right now, there are more than 140 chemicals in our drinking water that EPA does not regulate, according to a recent study. In some parts of the country these chemicals include gasoline and additive pesticides, even rocket fuel. And it does not take a rocket scientist to figure out that you should not be drinking rocket fuel.

In other parts of the country, these chemicals include additives to produce natural gas. The concentration of chemicals in some places is so high that you can literally light the water on fire. These chemicals have proven, negative effects on people's health, including some that can cause cancer, according to the EPA.

But even so, in the past EPA has ignored three mandatory Safe Drinking Water Act deadlines to set standards for unregulated contaminants. And nearly 20 percent of the contaminants that EPA is currently considering have been under study at the agency for 17 years.

Some people have turned to bottled water, believing that is a safe alternative, that bottled water is healthier than sugary, high calorie drinks. And it can be a crucial part of our safety net during natural disasters and emergencies. But bottled water might provide a false sense of security and an expensive one, also. Americans spend more than $8 billion each year on bottled water. But what many people do not know is that up to 40 percent of bottled water comes straight from the tap.

And that is why I am introducing, Madam Chairman, the Bottled Water Right to Know Act today. And this bill is going to provide consumers with information about where their bottled water comes from and the quality of the water that they are drinking.

Beyond this new commitment to overseeing our bottled water, we find a renewed commitment to protecting our tap water. First, we need to enforce the laws that are on the books. Second, we need to increase funding for our crumbling water infrastructure, including our wastewater and drinking water treatment facilities. The EPA estimates that there is a $271 billion gap between our wastewater treatment plants' needs and what they receive. And we have got to close that gap.

So, I look forward to hearing from our witnesses. I want to make mention of the fact that the New York Times today, in a front page article, confirms some of our misgivings. It says, since 2004 water provided to more than 49 million people has contained illegal concentrations of chemicals like arsenic or radioactive substances like uranium, as well as dangerous bacteria often found in the new age.

Madam Chairman, it is an appropriate thing that we are reviewing this, a little late, but we have got a chance to correct some of the problems that we have out there.

Senator BOXER. Senator, thank you. And I am very glad that you are doing something about bottled water. It has been a long time concern of mine, so thank you very much for that. We will be working with you.

Senator Klobuchar.

OPENING STATEMENT OF HON. AMY KLOBUCHAR, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator KLOBUCHAR. Thank you very much, Madam Chair. Thank you for holding this timely hearing.

Polluted water, as you all know, has a disproportionate and harmful effect on children. And this is something that I would like to focus on because of the role that I play as Chair of the Subcommittee on Children's Health, Madam Chairman. Thank you for that. Children drink more water as a percentage of their weight than adults do. So, if the water they are drinking is contaminated, children are going to get a bigger dose than adults will.

I have always believed that the first responsibility of government is to protect our citizens. In addition to the New York Times report that Senator Lautenberg just noted, a few months ago the Associated Press reported that over the last decade drinking water at thousands of schools across the country were found to contain lead, pesticides and dozens of other toxins. Contaminants were found at public and private schools alike in all 50 States. Forty-one violations were found in my State, including four violations in the school district where I attended school.

Ensuring our drinking water is safe requires preventing pollutants from entering into our groundwater. But it also requires us to ensure that we are safely treating our water before it becomes available for us to drink.

I am pleased, Chairman Boxer, that you and Senator Lautenberg convened the hearing last week to discuss reforming the Toxic Substances Control Act. I think chemical reform is also a very important part of this work.

Another part of the solution is the enforcement of existing laws, and as a former prosecutor I know the role that enforcement plays in this equation, and I am pleased that we have Ms. Giles here testifying.

In her first few months in office, Administrator Jackson called for the Office of Enforcement and Compliance Assurance to develop an action plan and to enhance public transparency regarding clean water enforcement. Under new leadership, the EPA has decided to place comprehensive reports and data on water quality enforcement in all 50 States on the Internet. That is certainly helpful for our citizens.

I look forward to you testimony again, Ms. Giles, and hearing how you are ensuring compliance with the Safe Drinking Water Act Amendments of 1996.

A final component in addressing this issue is financing infrastructure improvements. This past summer we were able to pass the Water Infrastructure Financing Act out of this committee. This bipartisan legislation aims to address the obstacles that many of our towns and cities are facing, mainly difficulty in financing drinking water infrastructure.

As you know, the Recovery Act also includes funding for 842 Federal drinking water projects across the country. In my State, with the help of Recovery Act funds, in the first 5 months of the State year 2010, we funded—we are funding 25 projects, totaling $57 million, more than the previous 2 years combined. These projects are critical to helping our communities provide safe drinking water for our residents.

I want to thank you for this opportunity today, Madam Chair, and I look forward to hearing from our witnesses.

Senator BOXER. Thank you, Senator, very much.

Senator Udall.

Senator UDALL. Thank you, Madam Chair. I am anxious to hear from the witnesses, so I will yield my time back to the Chair. Thank you.

Senator BOXER. Thank you very much.

So, we have a distinguished panel before us. The Honorable Peter Silva, Assistant Administrator for Water, Environmental Protection Agency, Hon. Cynthia Giles, Assistant Administrator for Enforcement and Compliance Assurance at the EPA, and Matthew Larsen, Associate Director for Water at the U.S. Geological Survey.

So, we welcome you. And whatever order you prefer is fine with us. And we will hope, please keep your comments to 5 minutes, and we will put your whole statement in the record.

Who is going to go first?

Mr. SILVA. I will go first.

Senator BOXER. All right. Mr. Silva.

Mr. SILVA. Thank you.

STATEMENT OF PETER S. SILVA, ASSISTANT ADMINISTRATOR FOR WATER, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. SILVA. Good morning, Madam Chair Boxer, Ranking Member Inhofe and members of the committee. I am Peter Silva, Assistant Administrator for EPA's Office of Water. Thank you for inviting me here to testify today.

The safety of our drinking water is fundamental to EPA's mission. Every single day Americans drink water from a tap in their homes, workplaces and schools. They must be assured that the water they drink is safe.

EPA and the States regulate more than 150,000 public water systems, and the vast majority of Americans served by them receive safe water. We recognize the continuing work ahead of us, and to make any real difference we must assist small communities and small systems, those serving less than 10,000 people, because that is where 95 percent of all health based violations occur.

These small systems, many of them serving disadvantaged and rural communities, face unique financial and operational challenges, partly because of their size. EPA and States have used a suite of tools that the Safe Drinking Water Act provides to help small communities maintain this capacity to provide safe drinking water, from the Drinking Water Safe Revolving Fund to technical assistance, including that provided by rural water associations and the rural community assistance partnerships. But we must do more.

Implementation of the arsenic rule has highlighted the challenges associated with small system compliance. But it has also demonstrated funding and technical assistance options States and EPA have to make available.

To boost compliance, State Drinking Water SRF programs and USDA's Rural Development Program prioritize funding for arsenic programs. We also invested some $30 million in research on cost effective technologies for small systems and provided training on treatment options. Last, we promoted the use of exemptions to give small systems more time to comply. Strong involvement of State staff has helped drive success.

In order to refocus our efforts on small systems' achieving compliance, we have developed a new agency small systems approach. The three components of this plan are designed to facilitate use of Safe Drinking Water Act tools to achieve the greatest benefit and to provide States with active oversight, guidance and technical assistance.

First, we will target Federal dollars to the small systems that need it most by promoting SRF financing and subsidies to achieve compliance and health protection. EPA will also work closely with USDA's small system funding program, RUS, to target grants and loans to high priority health issues.

Second, we will work with States to strengthen Capacity Development Programs which will help systems maintain the technical, managerial and financial capacity to provide safe water.

Finally, EPA recognizes that the most prudent way to help a small system provide safe water may be to help it choose one of many restructuring options ranging from informal cooperation with other systems to full ownership transfer or consolidation.

Strong EPA and State program oversight depends on good data, and EPA is committed to improving the accuracy and availability of information on drinking water. With the States we will continue to identify and resolve problems that produced data discrepancies in the past.

Administrator Jackson has made children's health a priority. States and EPA work with school water systems using all the tools we have including funding, technical assistance and enforcement. More than 90 percent of schools and child care centers are not Safe Drinking Water Act regulated water systems, but are served by a large community water system. Lead contamination resulting from corrosion in services and plumbing is a serious problem at some of these schools, and EPA has partnered with some other Federal agencies as well as education and public health groups to raise awareness among schools' officials and child care providers.

Madam Chair, Administrator Jackson has noted that clean and safe water is the livelihood of healthy communities and healthy economies. I can assure you that EPA is committed to using all of its tools ranging from technical and financial assistance to enforcement and to working with our State partners to provide Americans with clean and safe drinking water every day.

I look forward to working with the committee on this important issue and will be pleased to answer any questions you and the members of the committee may have.

Thank you.

[The prepared statement of Mr. Silva and Ms. Giles follows:]

TESTIMONY OF
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AND
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U.S. ENVIRONMENTAL PROTECTION AGENCY

BEFORE THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

December 8, 2009

Chairman Boxer, Ranking Member Inhofe, and members of the Committee, thank you for inviting us to testify today about the safety of our nation's drinking water. Administrator Jackson has expressed her commitment that ensuring the safety of our drinking water is a fundamental element of EPA's overall mission. Every single day, Americans drink water from a tap. It happens in our homes, at work, and at our children's schools. Americans must be assured that the water they drink is safe.

EPA affirms the goal of the Safe Drinking Water Act (SDWA) to protect public health by regulating the Nation's drinking water supply. This 1974 law, amended in 1986 and 1996, requires many actions by EPA and the states to protect drinking water and its sources, although it does not regulate private wells serving fewer than 25 people. Under SDWA, EPA and the states regulate more than 150,000 public water systems. The vast majority of Americans served by these systems receive water that is safe to drink. States reported last year that 92% of the people served by *community water systems* – the roughly 50,000 systems that serve the same population

all year - received water meeting all health based drinking water standards. There are also about 100,000 *non-community water systems*, those that serve Americans on a shorter term basis, in their schools, workplaces and when they travel.

Small Systems

We recognize our responsibility to ensure all Americans receive safe drinking water and the continuing work ahead of us. To make any real difference, we know we must assist the small systems, because 96% of all health based violations occur at systems serving less than 10,000 people. The majority of public water systems are very small – more than half of community water systems and nearly all non-community water systems serve fewer than 500 people. Thousands of these small systems need help – in particular those serving communities defined by the states as disadvantaged, including people living or working in federal Indian Country and some rural communities.

Small systems face unique financial and operational challenges in providing safe drinking water. First, many of them are not in business to provide drinking water as a primary duty. For example, more than 10,000 community water systems are owned by homeowners associations and manufactured home communities. Many do not even have full time operators and those that do sometimes cannot afford to keep up to date with changing regulations and technical skills. Additionally, the cost per household to treat drinking water at small systems can be much greater than at larger systems due to economies of scale, yet small systems may have more trouble generating revenue and obtaining financial assistance than larger systems. This lack of effective system management, trained operators and financial resources at some small systems sometimes leads to compliance problems. EPA needs to rely on a suite of SDWA tools it has to help small

systems stay in compliance and maintain their capacity to provide safe drinking water, including providing financial assistance, compliance assistance and enforcement.

SDWA Roles and Responsibilities

To protect public health, SDWA authorizes EPA to set drinking water standards, which are generally implemented by the states, most of which have been delegated "primacy" over their SDWA drinking water programs. EPA's drinking water standards include requirements for monitoring and describe procedures systems must follow upon discovering a violation, including public notice to their customers. Since the majority of states have primary enforcement responsibility (all states except Wyoming and the District of Columbia), the systems report sampling results to the states. States determine when violations have occurred and act to bring systems back into compliance using both assistance and enforcement tools. Under "primacy," the states are expected to act first in most situations, but EPA maintains federal oversight as well as an enforcement role. In addition to overseeing state enforcement actions, EPA takes its own enforcement actions in states without primacy, in federal Indian Country, where states have not been authorized for particular drinking water rules, and where EPA concludes that the states are not in a position to take timely and appropriate enforcement actions. Additionally, EPA takes direct enforcement actions on nationally significant cases, when requested by the states or in an emergency where there is imminent and substantial endangerment to the public.

SDWA provides a suite of tools for EPA to assist public water systems in achieving compliance. One of these is the Drinking Water State Revolving Fund (DWSRF), which offers systems, including small systems, access to financing for infrastructure improvements. DWSRF programs are administered by the states, which have significant latitude to customize the

assistance they offer in light of their own priorities and circumstances. Additionally, two percent of DWSRF appropriations are administered by EPA and go to tribes to fund infrastructure improvement. Tribes often request that these funds go to the Indian Health Service to provide engineering analysis, design, and construction management. Technical assistance is another important tool to help systems achieve compliance. Both EPA and the states provide training and assistance to small systems and have funded technical assistance providers, such as Rural Water Associations and the Rural Community Assistance Partnerships, to provide hands-on assistance to help with operational and compliance issues.

Tools Used in Implementation of the Arsenic Rule

Working to meet the challenge of implementing the arsenic rule has highlighted compliance issues related to new rules and demonstrates some of the funding and technical assistance options EPA has available. About 1,000 systems are currently in violation of the arsenic rule, 75% of them serving fewer than 500 people. To help boost compliance with the arsenic rule, we encouraged states to prioritize DWSRF funding for arsenic projects and also worked with the United States Department of Agriculture (USDA) to make arsenic compliance a priority for Rural Development loans and grants. We also invested more than $30 million in Arsenic Rule Implementation Research to investigate and develop more cost-effective technologies for small systems. This arsenic rule implementation research has provided direct assistance to 50 small water systems in 26 states to install and demonstrate arsenic treatment. EPA has used the lessons learned from this research program and other implementation efforts to provide significant in-person and web-based training to help small systems better understand their treatment options and identify potential vendors. EPA worked to make point-of-use

treatment a viable option for very small water systems. Lastly, recognizing the challenges water systems face in implementing this rule, we have promoted the use of exemptions under SDWA. With an exemption, qualifying systems still have to fully implement the rule but have more time, up to nine additional years, to secure funding or take other necessary steps to develop a sustainable approach.

Even with these tools, strong involvement of state staff makes the difference. For example, Maine and New Hampshire have been active in working directly with water systems, conducting site visits and one-on-one meetings to help their small systems find compliance options and work through their treatment and financial issues. Maine reduced systems exceeding the arsenic standard from 102 to 11, and New Hampshire reduced systems exceeding the arsenic standard from 173 to 28. Thanks to these efforts, these two states have been particularly successful in bringing down the number of systems with arsenic violations.

Enforcement Tools

EPA's enforcement authority can also help bring systems back into compliance and we work closely with the states to ensure that timely and effective enforcement actions are taken. EPA regularly meets with states to review systems in significant non-compliance and discusses what has been done to address the violations. In most cases, states address the violations identified, but where appropriate, EPA retains authority to take federal enforcement action to get them back to compliance. When EPA exercises its enforcement authority and takes direct enforcement action in a state that has primacy, EPA provides a notice of violation to the public water system (also to the state) and offers advice and assistance. If the system does not return to compliance, EPA may issue an administrative order to require compliance or may commence a

judicial action. EPA may collect civil penalties for non-compliance with administrative orders or through judicial actions. In general, the number of enforcement actions such as administrative orders and judicial referrals taken against public water systems by states and EPA has trended upward in recent years, rising from 4,478 in 2004 to 5,875 in 2008. In 2008, the vast majority were state enforcement actions. These numbers do not reflect other activities states and EPA take to return systems to compliance such as warning letters, notices of violation and compliance assistance activities. In recognition of the challenges among drinking water systems in federal Indian Country, for the past five years EPA has had a national compliance and enforcement priority focused on addressing noncompliance at these systems.

New Small System Approach

Access to safe drinking water should not be based on ability to pay and we have developed a new Agency small systems approach to ensure equitable consideration of small system customers. There is no single solution to the challenges small systems face and a variety of strategies will need to be employed, but EPA believes that robust use of the tools provided in SDWA can achieve our goal that all Americans have the full public health protection benefits envisioned by the Act. The new approach, developed in consultation with the states, will focus SDWA resources on the specific challenges small systems face, from regulatory compliance to sustainability. The three components of this approach are designed to facilitate use of SDWA tools to reduce difficulties and provide states with active oversight, guidance, and technical assistance. State programs are the key to this approach and we will work to help them link federal infrastructure funding to public health improvements and target technical assistance to strengthen the capacity of individual water systems. EPA recognizes the primary role of the

states in drinking water protection, but understands this does not reduce the Agency's role. However, the Agency must always be a full partner with the states in SDWA implementation through active oversight, guidance, and technical assistance.

As the first part of the small systems approach, we will target Federal dollars to the small systems that need it most. Since 1997, 72% of loans and 38% of funds have gone to systems serving fewer than 10,000 persons, but we believe this percentage should grow. To help water systems that cannot afford a loan, EPA will promote state use of no interest loans and the disadvantaged communities program in the DWSRF, which allows for principal forgiveness. Congress significantly increased DWSRF funding in FY2010. The appropriation added a new requirement that states dedicate at least 30% of their FY2010 funds to subsidize systems which may not be able to afford a loan.

Additionally, states were directed to provide subsidies with at least half of their American Recovery and Reinvestment Act (ARRA) funding, and we have several examples where states have used ARRA funding to help small water systems to address arsenic; we will build on these examples in FY 2010 and beyond. With new information tools put into place through ARRA, we can now track not just how much money is being spent, but also how it is being used, allowing us to more effectively monitor funding to small systems in the future. EPA will work closely with USDA's small system funding program, RUS, and encourage it to target grants and loans to high priority health issues. EPA and RUS already work closely to prioritize funding for arsenic, and over $387 million through 2007 had been obligated for more than 200 projects for arsenic.

Secondly, we will work to strengthen State Capacity Development Programs. SDWA requires each state to have a capacity development program to help water systems acquire and

maintain technical, managerial, and financial capacity to provide safe drinking water. EPA believes that state programs can be more effective by better using resources from optional DWSRF set-asides to provide training and technical assistance. State compliance and operational assistance is critical to the success of small water systems and at the current rate of set-aside usage, states will have over $150 million in FY 2010 to support these activities. EPA will work cooperatively with states to examine, and modify their programs to improve compliance and capacity. This includes making sure that new water systems have what it takes to be sustainable before they start operating.

Finally, EPA recognizes that in some situations the most effective way to provide safe water is to help a small water system choose one of several restructuring options, ranging from informal cooperation with other systems to full ownership transfer. Some states, such as Ohio, have used ARRA funds to provide grants to struggling water systems to hook up to a larger water system. State drinking water programs can use both the loan fund and the set-asides to help water systems implement restructuring options and ensure a sustainable, safe water supply for the community.

New Enforcement Response Policy

To complement this new focus on helping small systems, EPA has developed, in consultation with the states, an approach for enforcement targeting and response at all public water systems. Its goal is to increase the effectiveness of state and federal enforcement, streamline the identification of systems with violations, and then focus enforcement resources on those with the greatest impact on public health. The new Enforcement Response Policy, which includes a targeting tool, calls for the identification of the most significant threats to public

health by targeting public water systems with widespread violations and/or violations of health based rules. A targeting tool prioritizes the systems that the EPA and the states will address. An escalating enforcement model guides what types of enforcement actions the EPA and states will take action to return the systems to compliance in a timely manner. The new Enforcement Response Policy and targeting tool will push EPA and the states to address underlying compliance problems for entire drinking water systems. This contrasts with the current focus on addressing significant non-compliance for each drinking water rule. EPA will start to implement the policy at the beginning of calendar year 2010.

Commitment to Transparency

Strong EPA and State program oversight depends on good data and EPA is committed to improving the accuracy and availability of information on drinking water compliance. Most Agency data on compliance comes from primacy states which determine when violations have occurred and report them to EPA. The state data is used by the Agency to evaluate system compliance and oversee state drinking water programs. We have invested in the modernization of the SDWIS database and web-enabled it to reduce burden on the states. As a result, we expect to see fewer quality problems from data entry to data transmission. We will continue to work with our state partners to identify and resolve problems that may have produced data discrepancies in the past and to ensure that complete and accurate documentation is available to help assess the safety of the nation's drinking water.

Protecting Children's Health

Administrator Jackson has made protecting children's health a priority. One category of

small water systems that merits particular attention is schools. Fewer than 10 percent are regulated as *non-transient non-community water systems* – those regularly serving at least 25 people for over six months per year - and are subject to all the monitoring and reporting requirements that apply to other small non-community systems. States and EPA work with these small systems to improve compliance using tools including: funding, technical assistance, and enforcement. While general compliance rates at schools are similar to those in the larger universe of non-community water systems, the vulnerable population they serve deserves special vigilance. Fortunately, records of enforcement actions indicate that states place a priority on addressing violations in schools but it is critical that EPA and the states do everything possible to get and keep school water systems in full compliance. For the 90% of schools and child care centers served by their community water systems, lead in drinking water presents unique issues because by and large, it can occur at the tap as a result of corrosion in service lines and plumbing. This is of special concern in schools and child care centers because of its potential health effects on young children. Because most schools are connected to community water systems and not regulated directly under SDWA, outreach and public education are important tools for addressing lead concerns and EPA has worked actively to raise awareness among school officials and child care providers and to encourage them to take steps that can reduce lead contamination in drinking water at their facilities. EPA also tries to minimize the potential for lead contamination through its work with the systems to control corrosion.

To reach out most effectively to a broad range of groups, EPA has partnered with education and public health groups as well as water associations. Working with the Department of Education and the Centers for Disease Control and Prevention, EPA has crafted messages and disseminated information, and we've reached out to local public health organizations and the

National Head Start Association. As a core part of our work, we developed a comprehensive suite of materials to help schools and child care centers implement a voluntary Training, Testing, and Telling strategy. The 3Ts explains how to test for lead in drinking water; how to report results to parents, students, staff, and other interested parties; and how to take action to correct problems. As an example of the success of these programs in raising awareness, Hawaii has now implemented testing using the 3Ts in all childcare facilities. EPA has also provided direct technical assistance in various ways to help monitor and analyze samples and to remediate the problems. EPA has also obtained commitments to perform supplemental environmental projects as part of Consent Decrees in other enforcement actions, in which a defendant agrees to perform beneficial environmental projects as part of the settlement of the enforcement action. For example, EPA has negotiated supplemental environmental projects to sample and analyze for lead at schools and day cares and to remedy the problems found.

Madam Chairman, Administrator Jackson has noted that "clean and safe water is the lifeblood of healthy communities and healthy economies." EPA is committed to using tools ranging from technical and financial assistance to enforcement, and to working with our state partners to provide Americans with clean and safe drinking water, every day.

Thank you again, Chairman Boxer, Ranking Member Inhofe, and Members of the Committee, for this opportunity to speak with you today, we welcome any questions you may have.

Questions to Mr. Silva

Senator Boxer

1. News reports have found drinking water contamination in some schools that are part of public drinking water systems in urban areas. One of the contaminants found is lead, which can harm the development of the nervous system - children are especially at risk from lead exposure. These same reports have found that state and local oversight of drinking water quality may be lacking in certain areas around the country. Please describe how schools that are part of larger drinking water systems would be expected to monitor their drinking water, and what requirements apply to such drinking water systems in schools? Please also describe what steps could be taken administratively by the Agency or whether EPA would recommend legislation to help assure safe drinking water quality in schools.

We are concerned about lead in drinking water in schools and child care centers because that is where children spend a large portion of their day. Because most schools are connected to community water systems and not regulated directly under the Safe Drinking Water Act (SDWA), outreach and public education are important tools for addressing concerns about lead. EPA has worked actively to raise awareness among school officials and child care providers and to encourage them to take steps that can reduce lead contamination in drinking water at their facilities.

EPA's first objective in protecting children from lead in drinking water is to establish and maintain effective corrosion control in the community water system, thereby reducing lead levels throughout the system. To get a better understanding of lead levels at a particular school, school staff can test their school's water directly. EPA developed a comprehensive suite of materials to help schools and child care centers implement a voluntary Training, Testing, and Telling strategy. The 3Ts toolkit and guidance explain how to test for lead in drinking water; how to report results to parents, students, staff, and other interested parties; and how to take action to correct problems. EPA is continuing to conduct outreach to encourage schools to test their water and EPA is looking to pilot an effort for testing lead in schools.

2. In the hearing, I emphasized the importance that I place on EPA using the best available science to make a decision on regulating perchlorate in drinking water, and for the Agency to make the decision as quickly as possible. EPA's Science Advisory Board on Drinking Water has also recommended that the Agency make perchlorate a "high priority ... because there is a higher degree of certainty about [its] toxicity, occurrence and treatability." When does the Agency expect to make an announcement on a perchlorate standard for drinking water?

EPA plans to complete its drinking water regulatory determination for perchlorate in 2010. If the determination is to regulate, EPA will move expeditiously to develop a national drinking water standard for perchlorate and conduct the health risk reduction and cost analyses and consultations required in developing such a rule.

3. Assistant Administrator Silva, EPA uses the Drinking Water State Revolving Fund (SRF) to help clean up drinking water contamination.

Part 1: Our Committee has reported a bipartisan drinking water infrastructure bill that would increase SRF authorizations, and target funds to small systems and systems with health threats. Do you think such increased funding will be key to promoting safe drinking water, and how can EPA use such funds to reduce health risks? Please describe how increased funding levels in the Recovery and Reinvestment Act and in the federal budget have enabled EPA to improve drinking water quality more effectively?

Strong and reliable drinking water infrastructure is an essential component of public health protection. There is a great need for investment, upgrade, and improvement to maintain the nation's infrastructure. Meeting this infrastructure investment need will call for a local, state, and federal partnership and investment at the federal level can jumpstart the process. The Drinking Water State Revolving Fund (DWSRF) program exists to help close the gap in drinking water infrastructure funding and for more than a decade, the DWSRF program has helped protect America's drinking water by financing essential infrastructure improvements. The Fund's success secures the provision of safe drinking water for millions of Americans for years to come.

The substantial funding from the American Recovery and Reinvestment Act of 2009 (ARRA) and increased appropriations to the DWSRF program have provided significant resources to address infrastructure needs. In 2009, the combination between ARRA and base DWSRF program funding provided almost $3 billion to more than 1,300 projects to address drinking water infrastructure needs. Infrastructure projects, such as these, reduce health risks by improving treatment, reducing chances for contamination, minimizing service disruptions, and helping to connect small communities to public water systems.

The ARRA funding, and increased funding for FY 2010, allow states to expand the number of water systems that can be helped. In addition, the increase in FY 2010 may allow states to use a larger amount of funding through the set-asides, which can help states address water system technical, managerial, and financial capacity issues. This improves the ability of water systems to provide a safe, sustainable source of drinking water.

Part 2: Please also describe how EPA has better assisted schools and small systems using these funds?

Some communities, particularly small communities that lack the economies of scale associated with a large customer base, are challenged in meeting the cost of installing and maintaining infrastructure. To make any real difference, we know we must assist these small systems, because 96% of all health based violations occur at systems serving less than 10,000 people. Since 1997, 72% of DWSRF loans and 38% of funds have gone to these smaller systems. ARRA and current DWSRF appropriations have continued in this direction with their new requirements that states dedicate a specified percentage of their funds to subsidize systems that may not be able to afford a loan, 50% in ARRA and 30% in FY 2010. By funding projects such as equipping a new well in Hughson, CA to help them solve their arsenic problem, or building a new water storage tank and pump station in Centertown, KY, the Recovery Act has given many small systems a hand up to increased and sustainable public health protection.

The increased funding also supports capacity development programs that help water systems acquire and maintain technical, managerial, and financial capacity to provide safe drinking water. State compliance and operational assistance is critical to the success of small water systems and at the current rate of set-aside usage, states will have over $150 million from FY 2010 appropriations to support these activities. EPA will work cooperatively with states to examine, and modify their programs to improve compliance and capacity. This includes making sure that new water systems have what it takes to be sustainable before they start operating.

EPA recognizes that in some situations the most effective way to provide safe water is to help a small water system choose one of several restructuring options, ranging from informal cooperation with other systems to full ownership transfer. Some states, such as Ohio, have used ARRA funds to provide grants to struggling water systems to hook up to a larger water system. State drinking water programs can use both the loan fund and the set-asides to help water systems implement restructuring options and ensure a sustainable, safe water supply for the community.

The increased funding helps schools that are public water systems in the same way that it helps other very small systems obtain loans or subsidized financing. In addition, the increased amount of DWSRF funds available for set-asides allows states to focus managerial and technical assistance on schools. Schools generally do not have a full-time operator, and need help to understand basic maintenance and operation. They can benefit greatly from targeted state training.

4 (first). In the hearing, I asked if EPA could be doing more to help small drinking water systems address arsenic and radionuclide contamination. You highlighted the ability of states to direct funding to small systems to address such problems, and committed to provide me with information on which states were using their full set aside amount to help these small systems. Please provide a list of the states that are utilizing the maximum amount of money in the state small system set aside program to assist these communities in addressing drinking water quality problems.

The Small Systems Technical Assistance Set-aside in the Drinking Water State Revolving Fund (DWSRF) allows each state to use up to 2% of its capitalization grant for direct technical assistance and training to systems serving 10,000 persons or less. In the period of 2007 to 2009, 42 states used this set-aside to its full extent. Alabama, Arizona, Hawaii, Illinois, Minnesota and Wyoming did not take advantage of the set-aside, while Georgia, Montana and North Carolina used it, but at less than 2% of their capitalization grant.

The DWSRF offers several other mechanisms for targeting assistance to small systems and others who may need additional help. This includes two more set-asides as well as support for disadvantaged communities programs. EPA's new small system approach is working with states to use all of these tools in the most effective way.

Through the State Program Management Set-aside, up to 10% of each state's capitalization grant can be used for a) administrative assistance to the Public Water System Supervision program; b) technical assistance for source water protection activities; c) assistance for capacity development initiatives; and d) support for state operator certification programs. Through the Local Assistance and Other State Programs Set-aside, up to 15% of the allotment can be used for other activities such as technical and financial assistance to capacity development programs, wellhead protection programs, and loans to public water systems for source water protection activities. Although these

set-asides are not solely for small systems, the type of technical assistance they provide is used mostly by small systems.

In addition to the set-asides, many states also have Disadvantaged Communities programs. These programs provide additional assistance to communities defined by the state as disadvantaged. The Safe Drinking Water Act allows a state to use up to 30% of its capitalization grant as additional subsidization to these systems, including principal forgiveness, negative interest rates and extended loan repayment terms. Many states have embraced the disadvantaged community provision over the years, using an estimated 18% of DWSRF funds. With the ability to build their own programs, states define "disadvantaged" and create a variety of attractive financing packages based on the needs of the community.

All but 14 states have some sort of Disadvantaged Communities program, used to different levels. States without disadvantaged communities programs include: Alabama, Alaska, Connecticut, Hawaii, Illinois, Kansas, Louisiana, Massachusetts, Mississippi, Missouri, North Carolina, North Dakota, Puerto Rico, Tennessee and Wyoming. Disadvantaged Communities programs take a range of forms across the states. Some states define disadvantaged communities through various criteria based on median household incomes while others also consider factors such as consumer water costs or unemployment rates. In addition to the subsidization options under the DWSRF program, states can use other creative means to implement Disadvantaged Communities programs. For example, some states link assistance to requirements for asset management training and others help systems seek grants from outside agencies in addition to DWSRF program loans.

4 (second). Lead is a drinking water contaminant that can harm the nervous system, including the brain - children are especially at risk of harmful health effects from such exposures. The Committee passed the Water Infrastructure Financing Act, which has a program to fund projects to reduce lead in drinking water, including by replacing service lines and pipes in facilities that serve children. Do you believe such a program could help complement current EPA efforts to reduce lead in drinking water and help protect children's health?

Protecting children from the harmful effects of lead in their drinking water is an important goal of the drinking water program. Through the Lead and Copper Rule, regulations are designed to protect public health by minimizing lead and copper levels in drinking water, primarily by reducing corrosivity and in some cases replacing pipes. The rule also includes requirements for public education about steps people should take to protect their health. EPA does not have a position on further steps in the Water Infrastructure and Financing Act to fund lead reduction projects. In general, EPA believes that because the DWSRF programs are already designed to deliver locally responsive financial assistance, alternative means, within the structure of the DWSRF program, are more effective for distributing targeted assistance versus separate programs administered directly by EPA. State SRFs have staff and experience to administer such programs, while EPA currently has no staff capacity to administer a grant program directly to systems and individuals.

5. EPA's Science Advisory Board on Drinking Water recommended that EPA "consider addressing the cumulative effects of chemicals with similar sources and mechanisms (or modes) of action ... " The Board noted that EPA has addressed groups of drinking water chemicals in the past. In the hearing, I asked you for a timeline that describes when the Agency will consider whether to implement this recommendation. Please provide a written description of how and when the agency will determine whether to implement the Science Advisory Board's recommendation.

EPA announced recently that the Agency is seeking a new approach to expand public health protection for drinking water (http://www.epa.gov/safewater/sdwa/dwstrategy.html). One of the organizing principles of the new Drinking Water Strategy is that EPA will address contaminants as groups rather than one at a time, and cumulative health effects will be one of several key factors in identifying groups for regulation. As we move ahead in defining this strategy, EPA will engage stakeholders and the public to develop technical and procedural approaches to group contaminants, identify treatment technologies and consider adverse health effects. Over the next few months, EPA will hold public meetings, will seek advice from the National Drinking Water Advisory Council, and will consult with the Science Advisory Board's Drinking Water Committee.

Another principle of the strategy is that the Agency will foster development of new drinking water technologies to protect against health risks posed by a broad array of contaminants. With regulations that address contaminants in groups and technologies that can treat multiple contaminants, we will be able to better ensure clean, safe water for the public.

6. This January, EPA's Drinking Water Science Advisory Board described potential threats from wastewater: "Wastewater contains a wide variety of contaminants including pharmaceuticals [and] personal care products ... EPA may want to consider using data obtained in specialized wastewater effluent monitoring programs" when deciding which drinking water contaminants to regulate. Is EPA considering a wastewater effluent monitoring program? If so, please provide a written description of how and when the EPA will implement such a program.

EPA's Office of Research and Development (ORD) is currently initiating a wastewater effluent monitoring survey, but this survey is not designed to collect information directly in support of drinking water regulation. For the survey, ORD selected priority pharmaceuticals based on use rates normalized for potency and identified 50 of the largest municipal wastewater plants in the United States. One time grab samples will be collected from each plant and analyzed in ORD laboratories. This survey is expected to assess possible concentrations of pharmaceuticals in municipal effluent but is not intended to account for dilution and other factors that influence potential risk in drinking water. Therefore, characterizing pharmaceutical concentrations in municipal effluents would identify a worst case scenario for concentrations likely to be encountered in these other media. Information gathered in this survey will be valuable for understanding the introduction of pharmaceuticals into the environment from wastewater treatment.

The Contaminant Candidate List (CCL) is the tool defined under the Safe Drinking Water Act (SDWA) for identifying priority contaminants for information collection and future regulatory decision making. Contaminants are selected for the CCL if they are known or anticipated to occur in public water systems and they may affect public health and may require future regulation. The CCL relies on the best available science and information to anticipate the occurrence of unregulated contaminants in public water systems. Development of the CCL is an adaptive process driven by science and information. As wastewater effluent monitoring data become available, they would be considered, along with other occurrence data and health effects information, to identify contaminants for the CCL.

7. Congress provided EPA with $2 billion in the Recovery Act to help fund drinking water infrastructure needs. State of California data shows that as of October 2009, more than $50 million in federal Recovery Act funds have been used to help drinking water projects in 37

disadvantaged communities in California. Is EPA working to ensure that disadvantaged communities in California and elsewhere benefit from Recovery Act investments?

While the American Recovery and Reinvestment Act did not include conditions that required spending in disadvantaged communities, ARRA did include a requirement that each state use at least 50% of its capitalization grant to provide additional subsidization. The Joint Explanatory Statement in Conference Report 111-16 noted the expectation that states would "target, as much as possible, the additional subsidization monies to communities that could not otherwise afford an SRF loan" and in guidance of March 2, 2009, EPA included disadvantaged communities and environmental justice communities as examples that would respond to the intent of that expectation. EPA also made it an early and high priority of ARRA implementation to ensure that all states had the legal authority to provide the additional subsidization as required and followed through to make sure the requirement was met.

Reports on some projects provide examples that show the success of this program. For example, the state of Texas used its Disadvantaged Communities Program to provide $48 million in subsidies to the city of Laredo to upgrade its water treatment plant. In the town of Brewster, Ohio, ARRA is paying for a mobile home park with the highest levels of arsenic in the state to interconnect to another system to reduce arsenic levels and no longer have to provide its residents with bottled water.

8. The Safe Drinking Water Act requires EPA to periodically publish a Contaminant Candidate List (CCL), which is a list of contaminants that are currently not subject to any proposed or promulgated national primary drinking water regulations, that are known or anticipated to occur in public water systems, and which may require regulation under the Act. It is extremely important that EPA update its drinking water safeguards to account for new science and new types of contaminants. The press has reported that recent studies have found that some chemicals regulated by the Act pose risks at much smaller concentrations than previously known, and that many standards have not been updated since the 1980s, and that some remain essentially unchanged since the law was passed in 1974. The Agency's Science Advisory Board found that EPA's CCL for chemicals was "too large to achieve the stated objectives of the CCL process or to review ... in the time allocated." The Board recommended: "To fulfill the Agency's objectives of choosing chemicals that have the greatest opportunity for improving the safety of drinking water and protecting public health, the Committee recommends additional prioritization of the current list. A shorter list will clarify which chemicals have a reasonable probability of being selected for regulatory determination." Please describe the process that EPA has developed in response to the Advisory Board's recommendations.

EPA found that 116 contaminants met the statutory criteria for listing on the third Contaminant Candidate List (CCL 3) and listed all of these contaminants. To address SAB concerns about the length of the list and about further prioritization of the list, EPA identified data and research needs for contaminants on the CCL 3 in three areas; health effects, analytical methods, and occurrence. This was done to help the drinking water community prioritize these contaminants for research and data collection. These data needs are presented in Section IV of the Drinking Water Contaminant Candidate List 3- Final FR Notice (http://www.epa.gov/fedrgstr/EPA-WATER/2009/October/Day-08/w24287.htm).

In addition to the Agency's efforts to identify research and data needs for the CCL 3, EPA has taken a holistic look at the Agency's approach to implementing the SDWA.

On March 22, EPA announced a new strategy for drinking water to streamline decision-making, expand protection under existing law and promote cost-effective new technologies to meet the needs of rural, urban and other water-stressed communities. Specifically, this shift in drinking water strategy is organized around four key principles:

1. Address contaminants as a group rather than one at a time so that enhancement of drinking water protection can be achieved cost-effectively.
2. Foster development of new drinking water treatment technologies to address health risks posed by a broad array of contaminants.
3. Use the authority of multiple statutes to help protect drinking water.
4. Partner with states to share more complete data from monitoring at public water systems.

While implementing this shift in strategy, EPA continues to look for opportunities to increase protection using traditional approaches. In the newly finalized review of existing drinking water standards (often referred to as the Six-Year Review), EPA determined that scientific advances in technology allow for stricter regulations for the carcinogenic compounds tetrachloroethylene, trichloroethylene, acrylamide and epichlorohydrin. Tetrachloroethylene and trichloroethylene are used in industrial processing and/or for dry cleaning and can be introduced into drinking water from contaminated ground or surface water sources. Acrylamide and epichlorohydrin are impurities that can be introduced into drinking water during the water treatment process. Within the next year, EPA will initiate rulemaking efforts to revise the tetrachloroethylene and trichloroethylene standards. Revision of epichlorohydrin and acrylamide standards will follow later. As EPA looks at its new approach to addressing groups, the agency will consider whether revisions to these standards fit into that approach.

9. Arsenic and radionuclides can cause cancer and other harmful health effects. EPA data shows that hundreds of drinking water utilities have not yet complied with existing federal drinking water safeguards for these contaminants. What more can EPA do to help small and larger water systems meet the health based standards that EPA has set for arsenic and radioactive contaminants?

75% of the water systems still out of compliance with the arsenic rule serve less than 500 people. These systems often lack the expertise to determine the best option to reduce their contaminant levels and lack the funding to pay for that option. As I discussed in my December, 2009 testimony before the Committee, EPA is actively encouraging states to prioritize DWSRF program funding for arsenic and radionuclides projects, and is working with USDA to make arsenic and radionuclides projects a funding priority. We are working to make the loan application process easier to encourage small water systems to apply for loans. Where loans are not enough, we are also encouraging states to make use of their disadvantaged assistance programs to support these smaller systems. Finally, EPA is revitalizing the capacity development program to target technical assistance to water systems out of compliance and to increase the sustainability of these systems.

Senator Cardin

Intersex Fish in the Potomac River

Recent studies by the U.S. Geological Survey (USGS) have found that a large percentage of fish in the Potomac and its tributaries are intersex - having both male and female characteristics within the same fish. The most densely populated, heavily farmed, study area in the Potomac experienced a 75 percent intersex fish rate, while less habited sites had 14-35 percent rates. Sites along the South Branch of the Potomac ranged from 47-77 percent. The Shenandoah, a tributary of the Potomac, experienced the highest rates of intersex fish, ranging from 80-100 percent. The USGS found that higher incidence of intersex fish occurred in streams draining areas with intensive agricultural production and high population when compared to non-agricultural and undeveloped areas. The occurrence of intersex fish has been associated with known or suspected endocrine disrupting compounds in wastewater effluent, which are not removed during standard sewage treatment, and in runoff from farming operations. These compounds can include estrogen from birth control pills and hormone replacements, pesticides and fertilizers used on crops, and hormones from livestock operations.

Question 1: How are EPA and USGS coordinating their research findings?

EPA works closely with USGS in coordinating development of research and sharing findings. EPA relies upon the USGS as a major source of monitoring data and USGS routinely provides EPA advance notice of monitoring results. In addition, EPA provides input to USGS on selection of chemicals for future monitoring.

Question 2: What steps is the EPA taking to study the presence and human health effects of endocrine disruptors in drinking water coming from the Potomac, and what steps has the Agency taken to establish drinking water guidelines to protect human health from harmful levels of such contaminants?

EPA has already issued test orders for 67 pesticide chemicals to be screened for potential endocrine interaction through the Endocrine Disruptor Screening Program (EDSP). We are currently developing our second list of approximately 100 chemicals for screening to be published in the Federal Register this year. Chemicals that have a positive screening result for endocrine effects will be subject to additional testing to confirm specific chemical interactions with the endocrine system and provide a characterization of adverse human health effects. EPA will consider the results of the EDSP as we re-evaluate those chemicals for which the Agency has already established drinking water standards, or when we evaluate these contaminants as part of the Contaminant Candidate Listing process.

Although there is not yet a clear definition of what constitutes an endocrine disruptor, there are studies testing for emerging contaminants that may have characteristics of endocrine disruptors. With one exception noted below, EPA has not conducted studies to determine the presence of endocrine disrupters in the Potomac River, although some of the major public water systems drawing from the Potomac (Washington Aqueduct, WSSC, Fairfax County Water Authority), in cooperation with the Metropolitan Washington Council of Governments, conducted a study of a subset of emerging contaminants in their raw and finished water in 2008. In addition, the Washington Aqueduct has cooperated with sampling

studies of selected emerging contaminants in raw and finished water that were performed by the US Geological Survey and the US Department of Agriculture over the last several years. In both studies, results indicated that any chemicals detected in drinking water were at extremely low amounts and not near any level of concern. EPA Region III is a member of the Potomac River Drinking Water Source Protection Partnership (Potomac Partnership), a collaboration of 19 Federal and State agencies and drinking water utilities organized to address issues affecting drinking water source quality in the Potomac River watershed. EPA participates in the Potomac Partnership's Emerging Contaminant Work Group, which has sponsored several workshops on endocrine disrupters and drinking water since 2005.

EPA Region III coordinated with state drinking water primacy programs and eight drinking water systems along the Potomac River to perform a year-long sampling project (October 2007 – September 2008) for perchlorate in untreated river water and treated drinking water. Perchlorate was detected in all river and treated water samples, generally at levels below 1 part per billion (ppb). All results were below EPA's interim health advisory level for perchlorate in drinking water of 15 ppb.

Senator Whitehouse

1. The Role of Aging Infrastructure in Drinking Water Quality

The AP analyzed a database showing federal drinking water violations from 1998 to 2008 in schools with their own water supplies. The findings revealed that over that decade, nine Rhode Island schools failed the safe drinking water standards for coliform (North Scituate Elementary, Pinewood Park School, Ponaganset High School, Nuweetooun School at Tomaquag Museum, Wilbur and McMahon School, Scituate High School, Scituate Middle School, Nonquit School, Wawaloam School, and Ashaway Elementary). This is the direct result of raw sewage overflows from Rhode Island's aging wastewater infrastructure. In EPA's view, what role does aging drinking water and wastewater infrastructure play in our nation's drinking water quality? What can EPA do about this, within its existing authority? What can Congress do to address this situation?

The safety of our public water supply depends on the reliability of our water infrastructure. As a nation, we have built an extensive network of infrastructure to provide the public with access to water and sanitation, but much of the drinking water and wastewater infrastructure was built decades ago and is reaching the end of its useful life. Treatment plants typically can be expected to last 20–50 years before they require expansion or rehabilitation. Pipes have lifecycles that can range from 15 to over 100 years, depending on materials and local conditions.

EPA's 2007 Drinking Water Infrastructure Needs Survey estimated that for the period from 2007 to 2026, capital infrastructure investment needed for infrastructure projects to facilitate compliance with drinking water standards will be $334.8 billion. This represents the need associated with the thousands of miles of pipe, thousands of treatment plants, and billions of gallons of storage that are needed to provide a community with safe drinking water. Failures in transmission and distribution lines can interrupt the delivery of water and possibly allow contamination. Poorly functioning pumping stations or inadequate storage facilities can lead to low water pressure resulting in the intrusion of contaminants into the distribution system. And not to be forgotten are the many smaller pieces that are essential for providing safe water, such as valves for isolating problem areas during repairs, hydrants to flush the distribution system to maintain water quality, or backflow-prevention devices to avoid contamination.

As your examples demonstrate, microbial contamination is a threat for some public water systems, including some small systems like schools. Microbes are ubiquitous and reliable infrastructure is needed to prevent exposure in drinking water, both by preventing release into the environment and by managing exposure within drinking water systems. The schools you refer to have all had at least one violation of the Total Coliform Rule in the last decade. Three of the schools have current violations and the state is aware of the issue. These schools are all served by ground water sources and so it is unlikely that sewer overflow was the cause of contamination, but other infrastructure problems, such as leaking septic systems nearby, leaky well seals or aging storage tanks could be contributing factors.

The Drinking Water State Revolving Fund program is the EPA's primary tool for addressing this need. Since its inception in 1997, the base Drinking Water State Revolving Fund program has provided $16.2 billion in low-interest loans to public water systems and has entered into over 6,500 assistance agreements for projects to expand, replace, or rehabilitate the existing infrastructure that is

critical to the delivery of safe drinking water and compliance with many regulatory requirements. But the DWSRF program can't meet the need alone and is intended as a supplement to, not a replacement for funding by states, localities, and rate payers.

The Safe Drinking Water Act also provides tools outside of direct financial assistance to help public water systems address issues related to outdated infrastructure. For example, EPA works with state capacity development programs to help water systems acquire and maintain the technical, managerial, and financial capacity necessary for effective infrastructure management and planning. As part of its new small systems approach, the Agency is reinvigorating our efforts to work cooperatively with states in making robust use of these tools to put small systems on the path to sustainability. Additionally, EPA has devoted considerable attention to helping water systems with asset management as a way to address infrastructure in a comprehensive and sustainable manner. Asset management is a planning and decision-making tool that a utility can use to consistently provide the desired level of service at the least cost by optimizing a mix of repair and replacement of infrastructure assets.

Senator Inhofe

1. EPA and States have created a federal- state partnership to clean up and properly care for our nation's waters. The partnership has also given local and state governments' important flexibility in meeting both national, as well as specific, needs of local residents. States are the closest to the sources of water, and they understand best local concerns, including how to manage water quality. Additionally, Congress has determined that the States have primary rights and responsibilities over land and water resources. I am concerned by the tone of EPA recently. EPA seems to be diminishing responsibility of States and enlarging Federal responsibilities for water. What specifically are you doing to empower States to meet their goals under the Safe Drinking Water Act?

To protect public health, the Safe Drinking Water Act (SDWA) authorizes EPA to set drinking water standards, including requirements for monitoring and procedures states and water systems must follow upon discovering a violation. These standards are generally implemented by the states, because all states, except Wyoming and the District of Columbia, have primary enforcement authority, or "primacy." Systems report sampling results to the states and it is states that determine when violations have occurred and act to bring systems back into compliance using both assistance and enforcement tools. States distribute financial assistance from the Drinking Water State Revolving Fund and states manage capacity development programs.

EPA recognizes the vital role of state staff in drinking water protection, and has always supported strong funding for state drinking water programs. State staff are the primary providers of training and technical assistance that enable water systems, especially small ones, to meet public health standards. Only states reach each water system. To support state staff, EPA provides rule and technical training to states, and more recently has held a number of training sessions for state staff on cross-cutting technical issues in drinking water treatment to ensure they are able to address new challenges. EPA has also developed and supports the State Drinking Water Information System (SDWIS)-State drinking water database. This database, which is tailored to meet individual state needs, helps organize state drinking water efforts and significantly reduces state workload. More than 40 states and several territories and tribes use SDWIS-State, and those that EPA has discussed it with indicate that their use of the database has saved them the equivalent of several staff each.

EPA's new small systems approach was developed in consultation with the states and state programs are the key to this approach. We work with states to help them link federal infrastructure funding to public health improvements and target technical assistance to strengthen the capacity of individual drinking water systems. EPA recognizes the primary role of the states in drinking water protection, but also understands that the Agency must always be a full partner with the states in SDWA implementation through active oversight, guidance, and technical assistance.

2. I am pleased to hear that you have made significant investments in research into new technologies to help systems comply with the arsenic rule. Will you apply similar research and outreach opportunities to other rules?

EPA evaluates treatment technologies when establishing National Primary Drinking Water Regulations to determine if technologies have been demonstrated under field conditions to be

effective in removing contaminants and to determine if technologies are available for small systems. Following promulgation of the arsenic rule, EPA also provided demonstration programs for new technologies that were developed after the rule was promulgated. Under the recently announced Drinking Water Strategy, EPA has renewed its commitment to foster development of new drinking water technologies to address health risks posed by a broad array of contaminants. EPA will collaborate with universities, technology developers, and the private sector to develop water- and energy-efficient treatment technologies that can reliably reduce health risks and control the types of contaminants that confront utilities today and into the future. EPA will showcase field demonstrations of large and small treatment systems that address a broad suite of contaminants while providing safe drinking water at reasonable and predictable costs in a sustainable fashion.

3. What are you doing to help systems with disposal issues, such as radioisotopes or arsenic?

EPA provides a variety of training and technical guidance to states and systems to help manage disposal issues. For example, for the last two years the annual Drinking Water Workshop has included a half day session focusing on the disposal of Radionuclide Drinking Water Treatment Residuals (DWTR). This workshop, hosted by EPA's Office of Water in conjunction with our Office of Research and Development and the Association of State Drinking Water Administrators, has also facilitated an information exchange among the States on discussion topics including: allowable disposal options in their State, the rationale behind their regulations, and specific data the states have collected in terms of the fate of the Radionuclide DWTR over time.

We recently revised our EPA Radionuclide Web Page (http://www.epa.gov/safewater/radionuclides/compliancehelp.html), which provides information on treatment technologies (TTs) used most commonly for Radionuclides, key considerations with those TTs, and waste disposal issues with those TTs. The web page includes links to guidance documents and trainings developed by EPA as well as other tools to assist in managing treatment and waste disposal options. Other activities in the last year have included development of the Radionuclide Decision Narratives, which provides information on how the allowable waste disposal options drive your TT selection and participation in the Radiation Control Program Directors National Conference, which provided attendees with technical information on treatment, waste disposal, the federal waste disposal regulations and the compliance challenges facing water systems. We also continue to support our Spreadsheet Program to Ascertain Radioactive Residual Concentration (SPARRC), a user-interface software program to assist states and systems in estimating disposal costs and predicting residual concentrations from Best Available Technologies (BATs).

Senator Vitter

1. What has EPA done to help limit the complexity, and often very difficult to understand, regulations that frustrate state and municipal water agencies in their ability to implement federal regulations?

The majority of National Primary Drinking Water Regulations are simple Maximum Contaminant Levels (MCLs) that are straightforward. To comply with these MCLs, water systems must monitor their treated water for the contaminant at a specified frequency and compare their results to determine if the measured concentration is less than the MCL. However, some contaminants

- are formed as part of treatment processes (e.g., disinfection byproducts during disinfection to inactivate pathogens);
- are released from distribution system or household plumbing components (e.g., lead and copper); or
- are not either technically or economically feasible to monitor as part of a regulatory program (e.g., most pathogens)

Therefore, the regulations to address these contaminants need to be more complex to protect public health. EPA considers costs, benefits, and risk-risk tradeoffs when developing these rules and also keeps in mind that each standard applies to tens of thousands of public water systems, each with site-specific source water quality, treatment processes, available resources, and distribution systems. The Agency attempts to structure rules so that individual States can use their existing drinking water program processes and expertise, while providing an adequate framework for public health protection. In addition, EPA does not mandate the use of a particular technology to allow for the development of new technologies after a rule is finalized and to allow systems to best determine how to comply given site-specific factors. EPA balances all of these components to ensure that the rule is protective of public health, cost-effective, implementable, enforceable, and flexible, while also limiting complexity.

In developing its rules, EPA seeks input from public water systems, States, tribes, public health professionals and other stakeholders. EPA solicits public comment on proposed rules and considers those comments before promulgating final rules. EPA has also developed a variety of guidance and training products for its rules to help States and systems comply. After each rule is finalized, EPA develops guidance to assist the State in implementing and enforcing the rule. EPA also develops technical guidance and compliance guidance to assist systems with treatment, monitoring, and reporting.

2. What are the most common challenges you hear from state agencies in terms of their ability to implement federal drinking water regulations?

The most common challenges we hear from state agencies is the lack of funding and huge number of very small water systems. Over 55% of community water systems serve fewer than 500 persons, and 25% serve fewer than 100 persons. These very small water systems are mostly mobile home parks and homeowners associations, and rarely have staff who can take the time to understand

drinking water regulations and basic water system maintenance. In addition, over 100,000 non-community water systems are regulated by state agencies under the Safe Drinking Water Act. These include schools, factories, restaurants, and other entities that provide drinking water as a secondary part of their business. As a result, most state agencies spend a very large percentage of their time helping these very small systems.

Senator BOXER. Thank you, Mr. Silva.
Ms. Giles.

STATEMENT OF CYNTHIA J. GILES, ASSISTANT ADMINISTRATOR FOR ENFORCEMENT AND COMPLIANCE ASSURANCE, U.S. ENVIRONMENTAL PROTECTION AGENCY

Ms. GILES. Thank you, Madam Chair, and other members of the committee.

As EPA's Assistant Administrator for Enforcement and Compliance Assurance, I would like to highlight a few issues relating specifically to Federal and State governments' enforcement of the Safe Drinking Water Act requirements.

I want to emphasize, as Assistant Administrator Silva did, that overall compliance with the Safe Drinking Water Act is quite high, and the vast majority of the American public receives clean and safe drinking water from our public water systems. However, we do have challenging, non-compliance problems that require attention, particularly in small systems and with new regulations.

The Safe Drinking Water Act gives primary enforcement authority to the States. As the Act contemplated, almost all States have been authorized by EPA to assume primary responsibility for enforcement of the Act's requirements. EPA maintains a Federal oversight role and retains independent enforcement authority.

States bring the vast majority of enforcement actions for drinking water violations. EPA has primary enforcement responsibility in one State without primacy, Wyoming, in the District of Columbia, in the U.S. Territories, and in Federal Indian country, except in the Navajo Nation. In addition, EPA has primary enforcement authority during the period when new Federal rules for particular contaminants have not yet been adopted by the States.

Enforcement is just one tool but an important one for returning drinking water systems to compliance. To give you some idea of the numbers of enforcement actions, in 2008 the States and EPA brought a total of 5,875 enforcement actions for drinking water violations. Of these, the vast majority were brought by the States with EPA playing primarily an oversight role. This number does not include all the assistance and other actions taken to get systems back into compliance. Enforcement is taken when the other methods to return systems to compliance have not worked.

Through a policy I issued today, EPA is taking action to improve enforcement of Safe Drinking Water Act requirements and deal more effectively with systems that have multiple and repeated violations. It prioritizes the most significant threats to public health so that systems with the most serious violations or repeated violations of health based standards will automatically rise to the top of the list for enforcement attention.

We expect that this new enforcement strategy together with the small systems approach being implemented by the Office of Water will help us target the most significant drinking water problems and improve compliance with drinking water standards.

EPA is committed to clean and safe drinking water and to working with the States to achieve compliance with the law.

I would be happy to answer any questions the committee may have about enforcement of the Safe Drinking Water Act.

[The responses of Ms. Giles to questions for the record follow:]

Questions to Ms. Giles

Senator Boxer

1. Please describe the specific actions that EPA can take to improve compliance with arsenic and radionuclide contaminant standards in both small and larger drinking water systems.

This Administration is very committed to delivering on the promise of safe drinking water for all of our citizens. Drinking water served to the vast majority of Americans is safe to drink. There are still challenges, though, especially for small systems, which are broadly defined as systems that serve less than 10,000 individuals. These systems face unique financial and operational challenges in providing drinking water that meets public health standards. For example, small systems often do not have access to full-time operators, yet those that do lack the financial capacity to keep up-to-date with changing regulations and technical skills. EPA recognizes the challenges faced by small systems, and is working to address these problems by:

- Providing compliance assistance to small systems, including targeting financial assistance to the systems that need it most, strengthening capacity development tools, and promoting restructuring of non-sustainable systems;
- Stepping up our oversight of state drinking water programs where it is needed and pursuing enforcement actions as appropriate; and
- Increasing the amount of, and improving the quality of, information about drinking water quality and the state of compliance, that's available to the public.

In addition to providing compliance assistance, the new enforcement approach I announced in December 2009 applies to all suppliers of public drinking water with the goal of bringing systems back into compliance as quickly as possible. This enforcement approach consists of the Enforcement Response Policy (ERP) and the Enforcement Targeting Tool (ETT). Since December 2009, we used the ETT to identify and prioritize schools and child care facilities (all small systems) that had serious violations, and the states and EPA are working to take necessary enforcement action at these systems. Of the subset of schools and child care facilities EPA identified, states issued at least six formal enforcement actions, eleven formal enforcement actions are pending, and four notices of violation were issued with potential formal enforcement actions to follow. Additionally, data verification by the states and regions showed that 194 school and child care facility systems have returned to compliance without formal enforcement actions.

Although schools were a starting point, the application of this new enforcement approach will also apply to all suppliers of public drinking water, regardless of size. EPA will generate the list of noncompliant systems on a quarterly basis and will use this list to discuss with states what needs to be done to return the systems to compliance.

2. The EPA's written testimony notes that even where States have primary authority when EPA learns of violations causing significant health risks, it can issue a notice of violation and offer assistance to the water system to come into compliance. Will you please comment on how this can be an important tool in helping to achieve compliance with safeguards to protect public health from arsenic and radioactive contaminants?

The states with primacy have the responsibility for first responding to violations. However, EPA does have broad enforcement authority and it can issue notices of violation (NOVs) to respond in cases where it has direct implementation responsibility or when a state with primacy refers a case to EPA. In these cases the NOV provides an opportunity for EPA to offer "technical assistance" to the system and to follow up with a more formal enforcement action (such as a federal administrative order or federal judicial action) if the NOV does not help bring a system back into compliance. Under the new Enforcement Response Policy (ERP), the NOV is an enforcement tool that can be used to help bring a system back into compliance, but if the system does not return to compliance or be on a path to compliance within six months, a formal enforcement action should be taken.

How will you more effectively improve compliance with EPA's new policies and how will you measure and report progress?

Safe drinking water is a top priority for this Administration. We are particularly focused on ensuring that all of our citizens have water that is safe and clean to drink. The Agency's new enforcement approach consists of the Enforcement Targeting Tool (ETT) and the Enforcement Response Policy (ERP), which I announced in December 2009. Together, these new tools provide a comprehensive strategy to target non-complying public water systems and bring those systems back into compliance as quickly as possible.

As mentioned in my answer to question 1, EPA is diligently implementing the new Enforcement Response Policy. We applied the ERP to a subset of schools and child care facilities that are also public water systems. Since December 2009, we used the ETT to identify and prioritize schools and child care facilities that had serious violations, and the states and EPA are working to take necessary enforcement action at these systems. Of the subset of schools and child care facilities EPA identified, states issued at least six formal enforcement actions, eleven formal enforcement actions are pending, and four notices of violation were issued with potential formal enforcement actions to follow. Additionally, data verification by the states and regions showed that 194 school and child care facility systems have returned to compliance without formal enforcement actions. We will continue to monitor schools and child care facilities using the ERP to target and return to compliance those systems that are in violation. Additionally, we will provide webinar training on the ERP to our regional and state partners beginning in May 2010.

EPA is also working on reviewing and finalizing the description of the violations in the Safe Drinking Water Information System (SDWIS) and the definitions for when a violation returns to compliance. Since the ultimate goal of the ERP is to correct violations, this aspect of the ERP is vital to its success.

Although schools were a starting point, the application of this new enforcement approach will also apply to all suppliers of public drinking water, regardless of size. EPA will generate the list of noncompliant systems on a quarterly basis and will use this list to discuss with states what needs to be done to return the systems to compliance. Returning systems to compliance will be the measure of success for our efforts.

Senator Cardin

Mercury Contamination in the Shenandoah

In the 1970's a serious Mercury contamination problem was discovered in the South River and South Fork Shenandoah River. A major source of the mercury is known to be a former DuPont facility in Waynesboro that disposed mercury waste from 1929 to 1950. Currently, about 416 pounds of mercury get into the South River per year, and the mercury contamination stretches from Waynesboro for 125 miles downstream to Front Royal. Regulatory actions dealing with the streams have focused on the health threat to people who eat mercury contaminated fish. To meet safety standards in fish for human consumption, mercury loads to the South River cannot exceed four pounds per year. That's a reduction of 99 percent from current levels. Virginia is currently developing a TMDL for reducing mercury in the South River and South Fork Shenandoah River to safe levels.

Question 1: The Shenandoah drains in to the Potomac River, a major source of drinking water for Maryland, Virginia and the District of Columbia. Does this source of mercury contamination have the potential to impact the safety of that drinking water supply? If so, what steps has EPA taken to prevent and mitigate that risk?

There has been no evidence that mercury contamination is impacting drinking water in the South River or Potomac River watersheds. There have been no reported exceedances of the maximum contaminant level (MCL) established for mercury, 0.002 milligrams per liter, at public water systems in those watersheds. (Note that the MCL for mercury is established at the maximum contaminant level goal, or MCLG.) Results of surface water sampling of the South River compiled by the U.S. Geological Survey show that any detections of mercury have been an order of magnitude below the drinking water MCL and MCLG.

Question 2: As you noted in your response to this question at the hearing, most waterborne mercury pollution originates from air sources such as coal-fired electric power plants. The contamination in the Shenandoah is related to a site that might most effectively be addressed through CERCLA. Which legal mechanism will EPA employ to address this particular pollution source? How does OECA make sure that it is using all available regulatory and enforcement tools to address this type of cross-media pollution?

In addition to the air sources of mercury contamination, there are hazardous waste sites that may be sources of mercury contamination. EPA has been employing the legal mechanisms under RCRA to address water borne mercury pollution in the Shenandoah. EPA has maintained a policy of not undertaking CERCLA responses at certain sites that will be adequately addressed by RCRA. Instead of responding by way of CERCLA, EPA often defers sites which otherwise could be responded to under CERCLA to RCRA Subtitle C corrective action. This was the approach taken by our Region 3 office at the DuPont facility in Waynesboro, Virginia.

Senator Whitehouse

1. Clean Water Act jurisdiction

As you know, in the 2001 *SWANCC* decision, the Supreme Court interpreted "waters of the United States" very narrowly, restricting EPA's long-standing authority to regulate the discharge of pollutants under the Clean Water Act into bodies of water that are not navigable in fact. What role has this decision, and the 2006 consolidated cases *Rapanos v. United States* and *Carabell v. United States* which caused further confusion about the extent of EPA's Clean Water Act jurisdiction, played in the law of enforcement of Clean Water Act violations over the past 8 years?

Since the *Rapanos* decision, the most significant impacts on the Clean Water Act (CWA) enforcement program have been due to the resource burdens necessary to develop evidence sufficient to support CWA jurisdiction. Stricter and unclear standards result in significant increases in the amount of field work, including modeling, data collection and analysis, required to show jurisdiction.

Senator Inhofe

1. **EPA and States have created a federal – state partnership to clean up and properly care for our nation's waters. The partnership has also given local and state governments' important flexibility in meeting both national, as well as specific, needs of local residents. States are the closest to the sources of water, and they understand best local concerns, including how to manage water quality. Additionally, Congress has determined that the States have primary rights and responsibilities over land and water resources. I am concerned by the tone of EPA recently. EPA seems to be diminishing responsibility of States and enlarging Federal responsibilities for water. What specifically are you doing to empower States to meet their goals under the Safe Drinking Water Act?**

EPA recognizes the primary role of the states in drinking water protection, but this recognition does not eliminate the Agency's responsibility for providing oversight. EPA is diligently working to support the states and will continue to do so in the future so that states can fulfill their responsibilities under the SDWA. EPA provides implementation, compliance, and enforcement assistance to the states so that they can properly carry out their primary enforcement responsibilities.

2. **You run the Office of Enforcement and Compliance Assurance. You spend a lot of time discussing how EPA deals with enforcement, an interest of many of my colleagues, but I am interested in what EPA is doing to help systems to come into compliance. As is pointed out in your testimony, many of these systems not in compliance are small systems, without full time staff dedicated to drinking water concerns. How is your compliance assurance staff working with Mr. Silva's program staff to ensure we have fewer health-based violations in 2010?**

My staff is working jointly with the Office of Water staff to assist small systems in complying with drinking water regulations. Our new enforcement strategy coupled with the Office of Water's small systems approach will help us target the most significant drinking water problems and improve overall compliance with health-based drinking water standards. Specifically, the enforcement strategy identifies and focuses on public water systems with health-based violations and those that show a history of violations across multiple rules. In addition, the Office of Water's new small systems approach takes the lessons that have been learned combined with the increased SRF funds to help EPA and the states better target our resources and technical assistance toward the goal of small system sustainability.

Enforcement is just one tool for returning drinking water systems to compliance, and enforcement actions are often taken when other methods to return systems to compliance have not worked. In those situations where EPA takes a direct enforcement action in a primacy state, EPA consults with the state and sends a Notice of Violation (NOV) to the public water system. As required under section 1414(a)(1)(A) of the Safe Drinking Water Act, the NOV contains an offer of compliance assistance. My office is committed to working with all systems, regardless of size, to achieve compliance with the law.

3. **When dealing with drinking water, our first priority should be ensuring safe drinking water. That is best assured not by punishing systems or taking enforcement actions, but by helping systems fix their problems and deliver safe, clean water. Will you commit to making compliance assistance a priority when it comes to the safety of America's drinking water?**

Administrator Jackson is committed to clean and safe drinking water, and to working with the States to achieve compliance with the law. A major aspect of this effort must be to assist the small systems, which account for 96% of all health-based violations. These small systems face unique financial and operational challenges in providing drinking water that meets public health standards. There is no single solution and we need to employ a variety of compliance assistance strategies to address the full spectrum of needs. Key components to assuring equitable consideration of small system customers includes targeting financial assistance to the systems that need it most, strengthening capacity development tools, and promoting restructuring of non-sustainable systems.

Currently, EPA is working with the states to regulate more than 150,000 public water systems. About 50,000 of these systems are community water systems, and 92% of these systems deliver drinking water that meet all standards established to protect human health. Some public water system violations, however, are very serious and pose an immediate risk to public health. In these circumstances, it is appropriate to proceed directly to a formal enforcement action, such as an emergency administrative order, an injunction or a temporary restraining order (TRO), or an emergency civil referral.

Senator Vitter

1. Are there any proven instances where hydrofracturing for natural gas extraction has contaminated drinking water? If so, where and what were the contributing circumstances?

EPA is not aware of any conclusive cases in which hydraulic fracturing fluids were found in drinking water wells. EPA has not yet conducted a comprehensive study to investigate the relationship between hydraulic fracturing and drinking water. In 2004, EPA conducted a study assessing the potential for direct impacts to underground sources of drinking water (USDWs) from hydraulic fracturing in shallow coalbed methane reservoirs. In this study, EPA did not find a direct link between hydraulic fracturing and contamination of drinking water wells from fracturing fluids, although the study did highlight concerns about diesel used in fracturing fluids.

EPA's 2004 study was limited to hydraulic fracturing in relatively shallow coalbed methane reservoirs and assessed the potential for fracturing fluids to be introduced into USDWs in these situations. Since the 2004 report was published, the use of hydraulic fracturing has significantly increased, well beyond the scope of the 2004 study. On March 16, 2010 EPA announced a new study to investigate the relationship between hydraulic fracturing and drinking water. EPA is in the early stages of designing this study, which will be more comprehensive and will go beyond evaluation of vertical hydraulic fracturing and the direct injection into coalbed methane wells. The scoping materials for the study, which were considered at a Science Advisory Board meeting on April 7 & 8, can be found at http://yosemite.epa.gov/sab/sabproduct.nsf/0/3B745430D624ED3B852576D400514B76?OpenDocument.

Anecdotal evidence indicates potential adverse impacts on drinking water from the processes used to produce natural gas. There is, however, a lack of scientific information to verify these concerns. This study is intended to both provide data where there is a lack of adequate information and contribute to resolving these scientific uncertainties.

2. Over the last 20 years how many wells have been drilled in the United States for the purpose hydro fracturing for natural gas extraction?

EPA does not track drilling of wells for hydraulic fracturing. Additionally, hydraulic fracturing can be conducted in existing wells.

Senator BOXER. Thank you.
Mr. Larsen.

STATEMENT OF MATTHEW C. LARSEN, ASSOCIATE DIRECTOR FOR WATER, U.S. GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR

Mr. LARSEN. Madam Chairman and members of the committee, I appreciate the opportunity to appear before you to discuss the results of U.S. Geological Survey's studies of drinking water quality and related issues.

I am Matthew Larsen, Associate Director for Water at the U.S. Geological Survey. The mission of the USGS is to provide reliable, impartial and timely scientific information. This information is used by resource managers and policymakers at the Federal, State and local levels to make sound, science based decisions.

Assessment of water quality conditions and research on the transport and fate of pollutants in the hydrologic cycle are important parts of the USGS mission. For decades USGS studies of water quality have focused on the natural environment, streams and aquifers. Because of increased interest in potential human exposure to contaminants through drinking water, the USGS has increased its focus on studies of water quality in domestic wells, water quality of untreated water at the intakes of drinking water treatment facilities, often called source waters, and more recently water quality of treated drinking water, often called finished drinking water.

In undertaking these studies, the USGS has also increased its coordination with other Federal agencies that have formal public health responsibility by sharing information and lending its expertise to the interpretation of linkages between environmental data and human exposure. These agencies include USEPA, the Center for Disease Control and Prevention, and others.

Today, I will provide a brief overview of USGS activities organized in the following six categories: water quality of the Nation's streams and aquifers, source water quality, water quality of domestic wells, community drinking water quality, persistence of contaminants, and finally working with public health agencies and scientists.

The USGS has provided scientific information on the quality of the Nation's streams and aquifers since the early 20th century. Much of these data are archived in USGS National Water Information System and are accessible via the Internet to the public. These data have been a valuable source of information on water quality conditions for drinking water managers. For example, a retrospective analysis of arsenic occurrence in thousands of wells across the Nation was used by the EPA in revising the arsenic drinking water quality standard in the year 2000.

USGS studies of surface water quality have provided information on the occurrence of naturally occurring contaminants such as arsenic and radionuclides, synthetic organic chemicals used in industry, and many emerging contaminants, including pharmaceuticals and personal care products, in environmental waters that are direct sources of drinking water.

About 43 million Americans get their drinking water from self-supplied sources, the vast majority from domestic wells. USGS studies of domestic wells have provided an archive of water quality data on approximately 10,000 privately owned drinking water wells.

USGS studies of finished community drinking water quality are relatively new and very modest in comparison to our other water quality studies. Information on levels and mixtures of chemicals that persist after drinking water treatment is essential to inform Safe Drinking Water Act decisionmaking.

The USGS also collaborates with public health scientists and agencies on local and regional studies of diseases that may be attributed to drinking water exposures. The USGS provides insights into the landscape and hydrogeologic factors that may affect human exposure to environmental contaminants in drinking water and lends its expertise to studies that explore linkages between chemicals in the environment and health outcomes.

While in the past USGS studies have focused primarily on the quality of our streams, lakes and aquifers, there is now a significant need for information on the quality of source and finished drinking water and for understanding of the factors that affect that quality.

USGS contributes to drinking water management and protection by providing information on unregulated and emerging environmental contaminants and by working closely with resource managers and regulators, community water supply system managers and the public to ensure that they have access to and an understanding of that information.

Thank you, Madam Chairman and the committee, for the opportunity to present this testimony. I will be pleased to answer any questions you might have.

[The prepared statement of Mr. Larsen follows:]

STATEMENT
MATTHEW C. LARSEN
ASSOCIATE DIRECTOR FOR WATER
U.S. GEOLOGICAL SURVEY
U.S. DEPARTMENT OF THE INTERIOR
BEFORE
UNITED STATES SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

December 8, 2009

Madam Chairman and Committee members, I appreciate the opportunity to appear before the Committee on Environment and Public Works to testify on the findings of U.S. Geological Survey (USGS) studies of drinking water quality and related issues. I am Matthew C. Larsen, Associate Director for Water at the USGS.

The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life. Assessment of water-quality conditions and research on the transport and fate of pollutants in the hydrologic cycle are important parts of this mission. For decades, USGS studies of water quality have focused on the natural environment – streams and aquifers. Because of recent increased interest in potential human exposure to contaminants through drinking water, the USGS has increased its focus on studies of water quality in domestic wells, untreated water at the intakes of drinking water treatment facilities ("source" waters), and more recently on treated ("finished") drinking water. As part of these studies, the USGS has also increased its coordination with other Federal agencies that have formal public health responsibility, including the U.S. Environmental Protection Agency (USEPA), the Centers for Disease Control and Prevention, and others, by sharing information and lending its expertise to the interpretation of linkages between environmental data and human exposure. The following statement provides an overview and examples of these activities.

Water Quality of the Nation's Streams and Aquifers

The USGS has conducted systematic investigations of the quality of the Nation's water resources since the early 20th century. Much of these data are archived in the USGS National Water Information System and are accessible on the Internet via NWISWeb. These data have provided a valuable source of information on water-quality conditions for drinking water managers.

In the late 1990s, the USGS conducted a retrospective data analysis of arsenic occurrence in thousands of wells across the Nation, including community and domestic drinking water wells and observation wells (Focazio and others, 1999). The results showed regional patterns in arsenic occurrence and the relative proportion of wells above threshold arsenic concentrations. The information was used by the USEPA in revising the arsenic drinking-water quality standard (referred to as the Maximum Contaminant Level or MCL), which occurred in 2000.

Today, the USGS conducts national-scale assessments of the occurrence and behavior of contaminants in streams and groundwater of the United States. These assessments evaluate the potential for contaminants such as volatile organic compounds (VOCs) and pesticides (Zogorski and others, 2006; Gilliom and others, 2006) to adversely affect aquatic ecosystems or drinking-water supplies. Many of the contaminants investigated are unregulated. In addition, the USGS helps identify contaminants of emerging environmental concern by developing new methods and providing the first information on environmental occurrence, sources, persistence, and potential ecological effects (Kolpin and others, 2002; Focazio and others, 2008; Blazer and others, 2007; Vajda and others, 2008). The information from these studies is provided to USEPA for use in drinking water protection, including for implementing the Unregulated Contaminant Monitoring Rule (UCMR) and Contaminant Candidate List (CCL).

Source Water Quality

Motivated by the susceptibility of groundwater supplies to naturally occurring radionuclides, the USGS investigated the occurrence of radionuclides including Ra-224, Ra-226, Ra-228, Po-210, and Pb-210 in untreated water from community supply wells (Focazio and others, 1998). The data were provided to USEPA and assisted in determining revisions for combined-radium MCL compliance monitoring and prioritization for the Unregulated Contaminant Monitoring Rule.

A national reconnaissance of emerging contaminants in streams and groundwater at drinking water intakes (Focazio and others, 2008) provided the first nationally consistent dataset on the occurrence of pharmaceuticals, personal care products, and other wastewater-associated chemicals in untreated drinking water. Seventy-five community drinking-water facilities were sampled from 25 States and Puerto Rico. Stream samples from this study were analyzed for correlations between a range of wastewater-related chemicals and pathogenic bacteria (Haack and others, 2009). Some chemicals are consistently present when fecal contaminants are present and may serve as cost-efficient chemical indicators of contamination by bacterial pathogens.

In 2009, a USGS report described the occurrence of 258 synthetic chemicals in untreated water from 221 wells in community water systems (Hopple and others, 2009). One hundred and twenty chemicals were detected in at least one sample; 52 of the 120 were detected only once. . Twelve chemicals were detected in about 10 percent or more of the samples. The study provided

knowledge of the most commonly detected chemicals (for example, some pesticides and chemicals used in personal care products) and the factors that affect the vulnerability of wells.

In a more comprehensive study of 1,096 samples of untreated water from community supply wells (Zogorski and others, 2006), one or more VOCs was detected in about one-fourth of samples. About three-fourths of the 55 VOCs tested for were detected. Multiple VOCs were detected in about one-half of the samples; total VOC concentrations were less than 1 part per billion. Trihalomethanes (disinfection byproducts such as chloroform) and solvents had the largest detection frequencies (15 and 10 percent, respectively), and gasoline oxygenates, predominantly MTBE, occurred in about 5 percent of the samples. All other groups were detected in about 3 percent or less of the samples. Spatial patterns of occurrence differed for VOC classes. Detections of solvents, trihalomethanes, and gasoline hydrocarbons were distributed throughout the Nation. Gasoline oxygenates were detected primarily in the New England and Mid-Atlantic States and in Florida and California. Detections of fumigants were predominantly in Hawaii and in the eastern coastal area of the United States.

Water Quality of Domestic Wells

Approximately 43 million Americans get their drinking water from self-supplied sources, the vast majority is from domestic wells (Kenny and others, 2009). The quality of water from domestic wells which serve fewer than 25 persons is not protected by the Safe Drinking Water Act. However, information on factors that affect the quality of water from these wells can help well owners make good choices regarding installing their wells and voluntary periodic testing of water quality.

In a study of 2,401 domestic well samples, one or more VOCs was detected in 14 percent of the wells. More than two-thirds of the monitored VOCs were detected, and about 90 percent of the samples had total VOC concentrations less than 1 part per billion (Zogorski and others, 2006). The 15 most frequently detected VOCs indicate multiple contaminant sources, with gasoline oxygenates, refrigerants, solvents, and trihalomethanes detected in more than 2 percent of the domestic well samples. Chloroform, a disinfection byproduct, had the largest detection frequency, almost double that of MTBE, the second most frequently detected VOC. Solvents were detected throughout the Nation. Gasoline oxygenates were detected most frequently in the New England and Mid-Atlantic States. Few samples contained fumigants, and most of these occurred in the Central Valley of California and in New Jersey, Arizona, and Washington.

The USGS published a retrospective analysis of the chemical quality of almost 19,000 privately owned drinking water wells throughout the United States (Focazio and others, 2006). The study found that naturally occurring inorganics (such as arsenic) exceeded human-health benchmarks (MCLs) more frequently than any other contaminant group, including pesticides and VOCs.

Another USGS study of domestic well-water quality found that 23 percent of 1,389 domestic wells sampled exceeded a human-health benchmark for at least one chemical (DeSimone and others, 2009). Again, the contaminants that exceeded human health benchmarks most often were inorganic chemicals, including radon, arsenic, uranium, nitrate and fluoride. All but nitrate are predominantly naturally occurring. Only 7 of the 168 organic compounds that were analyzed—three pesticides, two solvents, and two fumigants—were found in one or more wells at concentrations greater than human-health benchmarks, and they were found above benchmark levels in less than 1 percent of sampled wells. About half (48 percent) of the sampled wells contained at least one contaminant at a level outside the range of values recommended by USEPA National Secondary Drinking Water Standards, non-enforceable guidelines largely for aesthetic, plumbing, and other purposes.

Community Drinking Water Quality

The Safe Drinking Water Act (SDWA) protects community drinking water quality through a process of establishing water quality standards (acceptable levels) for specific chemicals and periodic monitoring of supplied water. USGS studies of finished drinking-water quality are relatively new and very modest in comparison to studies of source water. This information is intended to inform the SDWA process primarily by providing information on the occurrence of unregulated chemicals in finished drinking water. Although the presence of a chemical alone may not be sufficient to warrant regulation, information on the levels and mixtures of chemicals that persist after drinking water treatment is essential to that process. All data on drinking water quality that the USGS develops are shared with USEPA and made available to the public. The types of water treatment utilized by community water systems often are not designed to remove the unregulated or emerging contaminants being tested. Therefore, results of these studies provide a starting point for development of improved treatment alternatives.

A USGS study of source and finished drinking water at 9 stream intakes detected 134 of 258 organic compounds analyzed (Kingsbury and others, 2008); this study did not include pharmaceuticals and hormones. Concentrations generally were less than 1 part per billion, and annual mean concentrations of all compounds were less than available human-health benchmarks. The most commonly detected compounds in source water were a disinfection by-product, several herbicides, a herbicide degradation byproduct, and a musk fragrance. The number of compounds detected and their total concentration were largest at source-water withdrawal sites for community water systems with considerable agricultural and urban land in their watersheds. Most of the compounds detected commonly in source water also were detected in finished-water samples at similar or lower concentrations and almost always at concentrations less than available human-health benchmarks.

Late last week, the USGS released a report on selected man-made compounds in water sampled from community water systems across the Nation that are supplied by groundwater (Hopple and

others, 2009); this study also did not include pharmaceuticals and hormones. Concentrations of 258 manmade organic compounds in finished water, sampled at 94 systems, were always less than human-health benchmarks. The chemicals tested included pesticides and pesticide degradates, gasoline hydrocarbons, personal-care and domestic-use products, and solvents. USGS findings documented the occurrence of mixtures of organic compounds in the majority (greater than 55 percent) of source and treated water samples, which is an area for further consideration as the potential human-health significance from the low-level presence of chemical mixtures in drinking water remains largely unknown.

Currently, the USGS is working with USEPA to conduct a national assessment of over 200 emerging environmental contaminants in finished drinking water at community water systems across the United States. The chemicals that will be tested include prescription and nonprescription pharmaceuticals and their metabolites (the modified chemical form in which the drug leaves the body), hormones, perfluorinated compounds, fragrances, detergent byproducts, chlorinated flame retardants, and other household and industrial chemicals.

The USGS also works closely with individual drinking-water purveyors to provide information for use in resource planning and management and to coordinate communication of information to the public in an objective and understandable manner. For example, the USGS worked with the U.S. Army Corps of Engineers, which manages the Washington Aqueduct, one of several community water systems on the Potomac River upstream from Washington, D.C. The study provided information on the occurrence of 277 chemicals in source and finished water samples collected approximately monthly over the period 2003-05 (Brayton and others, 2008).

Understanding the Potential for Contaminants to Persist to Finished Drinking Water

The USGS provides a wide range of information and knowledge related to the chemical contaminants that persist in the environment, are transported to drinking water intakes, and resist removal during drinking water treatment. This information also is essential for assessing and designing monitoring programs and prioritizing chemicals for studies of potential human health effects.

Study results show that some hormonally active chemicals that enter streams with wastewater effluent are degraded under a range of naturally occurring conditions and do not persist downstream, while other chemicals may not be removed (Bradley and others, 2009). Another study evaluated the transport of hormonally active chemicals in groundwater (Barber and others, 2008). Understanding the natural assimilative capacities of streams and aquifers – their natural capacity to reduce the levels of potentially harmful chemicals to harmless forms – is essential to making wise decisions related to the potential effects of hormonally active chemicals in sources of drinking water and mitigation measures.

The USGS is providing knowledge of the stream and groundwater source areas of community drinking water supplies. Developing and applying methodologies for estimating the land area that contributes recharge ultimately flowing to community supply wells enables resource managers to design improved well-head protection strategies (Franke and others, 1998; Masterson and Walter, 2009). Other detailed studies of the pathways of contaminants to community supply wells have identified the importance of age distribution of groundwater discharging to a community supply well and the importance of short-circuit pathways to deeper water supply aquifers, such as breaches in confining layers (Landon and others, 2009; McMahon and others, 2008).

Working with Public Health Agencies and Scientists

The USGS also collaborates with public health scientists and agencies on local and regional studies of diseases that may be attributed to drinking water exposures. The USGS can provide insights into the landscape and hydrogeologic factors that may affect human exposure to environmental contaminants in drinking water and may improve studies that explore linkages between chemicals in the environment and health outcomes.

For example, a modeling study of the probability of arsenic occurrence in New England groundwater (Ayotte and others, 2006) is being used in collaboration with the National Cancer Institute and others to assess potential linkages between arsenic in drinking water and bladder cancer in the population. The study shows that parts of New England have arsenic in the groundwater at levels far exceeding the MCL. This ongoing work has produced a number of regional water-quality databases, as well as a map of the probability of encountering arsenic in groundwater at levels above the MCL.

USGS research also is helping to explore possible linkages between lignite aquifers, pathogenic microbes, and renal pelvic cancer in northwestern Louisiana (Bunnell and others, 2006). Drinking water was sampled and analyzed for a range of chemical and microbial contaminants and correlations were identified with incidence of renal pelvic cancers.

Drinking-water quality was also assessed in association with a leukemia cluster in Nevada (Seiler, 2004). Groundwater used as a source of drinking water in an area with high incidence of leukemia was sampled and analyzed for a range of contaminants, including radionuclides. Uranium, polonium, and other potential carcinogens were found at concentrations of human-health concern.

Finally, USGS investigations at a drinking-water treatment facility in New Jersey described the changes in concentrations of emerging contaminants from the source water through multiple stages of the treatment process (Stackelberg and others, 2004, 2007). Additional investigations like this one will inform decisions on improving existing and developing new treatment works

that are more efficient at removing these chemicals from source waters (the sources of drinking water).

While traditionally USGS studies have had great emphasis on the quality of our streams, lakes, and aquifers, there is a significant need for the information on the quality of source and finished drinking water and understanding of the landscape and hydrogeologic factors that affect that quality. The primary USGS contribution to drinking-water management and protection is providing information on unregulated and emerging environmental contaminants and working closely with resource managers and regulators, community water-supply system managers, and the public to ensure that they have access to and understanding of that information.

This statement provides a brief overview of USGS activities related to drinking-water quality. We welcome the opportunity to provide any further information or assistance to the Committee.

Thank you, Madam Chairman, for the opportunity to present this testimony, and I will be pleased to answer questions you and other Members might have.

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Response to Questions
For Matthew Larsen
Associate Director for Water
U.S. Geological Survey
Subsequent to Testimony
To the Senate Committee on Environment and Public Works
December 8, 2009

Response to Questions from Senator Barbara Boxer:

1. Associate Director Larsen, this January, EPA's Drinking Water Science Advisory Board described potential threats from wastewater: "Wastewater contains a wide variety of contaminants including pharmaceuticals [and] personal care products ... EPA may want to consider using data obtained in specialized wastewater effluent monitoring programs" when deciding which contaminants to regulate.

Has USGS collected data on wastewater effluent, and do you think that this type of program could create useful data for EPA's drinking water program?

The USGS has conducted surveys of contaminants in the effluents of wastewater treatment plants, as well as other sources of contaminants to surface water and groundwater. Our studies have focused on pharmaceuticals, personal care products, and other wastewater-related contaminants of concern, such as those with potential endocrine disrupting effects. Some studies directly sample and analyze the wastewater effluents, whereas others sample and analyze stream waters from upstream and downstream of the point of discharge. The data and information from these studies are very useful in determining the contaminants that persist through the treatment process, the levels at which they occur in stream waters, and the contaminant mixtures that occur together in these susceptible waters. More recently, our studies are looking farther downstream to better understand which chemicals persist in the environment, persist to the intakes of drinking-water treatment facilities, and even persist through drinking-water treatment to our taps. Some of these studies have been conducted jointly with USEPA. All of the information is shared with USEPA; we believe continuing to supply this type of information to USEPA is an important part of our mission and is important to EPA managers addressing safe drinking water issues and the Contaminant Candidate List (CCL) process specifically, as well as surface-water-quality protection, wastewater management, pesticide registration, and solid-waste management.

2. Associate Director Larsen, a September 2009 report produced by the National Water Research Institute, the University of California, Irvine, and other institutes from California recommended that agencies focus on gather information and addressing potential threats about classes of emerging contaminants in drinking water, rather than individual chemicals.

How can prioritizing classes of chemicals use resources most effectively, while still producing good data for agencies to use in protecting drinking water quality?

We agree with the recommendation of the National Water Research Institute of California and, in fact, have been prioritizing the emerging contaminants that we believe are priorities by class or mode of action for some time now. Our initial studies of pharmaceuticals and other wastewater-related chemicals focused on determining whether the chemicals entered the environment in sufficient quantities to be observed. To answer this question, we prioritized chemicals that were produced and used in the largest quantities. Now our research is much more focused on whether these and other emerging contaminants are present at high enough levels to warrant a human or ecological health concern. Therefore, we focus on identifying classes of chemicals that have similar modes of action, such as estrogenic chemicals (chemicals that act like the female reproductive hormone estrogen). The chemicals of concern in this class include biogenic (produced naturally in organisms) and synthetic hormones as well as industrial chemicals that mimic or interfere with the normal function of estrogen in organisms. Another example of a class of chemicals that we have identified as a priority is the group of antidepressants known as SSRIs (Selective Seronin Reuptake Inhibitors). We recently published papers on the occurrence of a range of these chemicals in environmental waters, sediments, and the brain tissue of fish. Currently, we are working with USEPA and the Food and Drug Administration to coordinate our efforts to identify the highest priority classes of emerging contaminants.

Response to Questions from Senator Benjamin L. Cardin

Recent studies by the U.S. Geological Survey (USGS) have found that a large percentage of fish in the Potomac and its tributaries are intersex - having both male and female characteristics within the same fish. The most densely populated, heavily farmed, study area in the Potomac experienced a 75 percent intersex fish rate, while less habited sites had 14-35 percent rates. Sites along the South Branch of the Potomac ranged from 47-77 percent. The Shenandoah, a tributary of the Potomac, experienced the highest rates of intersex fish, ranging from 80-100 percent. The USGS found that higher incidence of intersex fish occurred in streams draining areas with intensive agricultural production and high population when compared to non-agricultural and undeveloped areas.

The occurrence of intersex fish has been associated with known or suspected endocrine disrupting compounds in wastewater effluent, which are not removed during standard sewage treatment, and in runoff from farming operations. These compounds can include estrogen from birth control pills and hormone replacements, pesticides and fertilizers used on crops, and hormones from livestock operations.

Question 1: How are EPA and USGS coordinating their research findings?

The USGS and EPA are partners in the Chesapeake Bay Program, through which USGS science is shared routinely with USEPA and other partners. USGS and EPA activities will be coordinated further under the Executive Order for the Chesapeake Bay.

Question 2: Would you please briefly outline what additional research USGS is planning on this important issue?

In fiscal year 2010 USGS is conducting the following research:
(1) A Potomac Spawning Study (in smallmouth bass nesting areas). This builds on earlier work by looking at more compounds and more sample types (discrete water, time-integrated water, sediment) and will compare tissue chemical concentrations and biological effects such as intersex and sperm quality/quantity.
(2) Assessment of Total Estrogenicity. Passive samplers are being deployed at 16 sites to try to determine the chemicals that contribute to the estrogenicity of stream waters. This follows a study that used an *in vitro* estrogen screen to assess total estrogenicity in water samples collected in tributaries of the Shenandoah.
(3) Total Estrogenicity/Androgenicity Survey. 50-60 sites in the Potomac and upper James Rivers will be sampled and analyzed using *in vitro* estrogenicity and androgenicity assays. A stratified sampling design will be used based on land use and habitat for smallmouth bass. This study will further evaluate the role of different land use practices as well as help identify sites that may require additional chemical and biological characterization.
(4) Interpret Tissue Chemical Data. Data on chemical concentrations in individual tissues (skin, brain, spleen/anterior kidney, ovary, testes) from bass at numerous sites are being analyzed to determine which chemicals may be accumulating and affecting both endocrine function and disease resistance.
(5) Exposure Studies. Exposure studies of newly hatched smallmouth bass to selected chemicals based on passive sampler and tissue chemical analyses will be initiated. (6) Molecular Markers. A suite of molecular markers that together with microscopic pathology observations will allow us to better understand mechanisms and effects of exposure will be developed.

Question 3: Has USGS detected these intersex problems in other Maryland waters? If so, which ones and would you please send my staff a copy of your findings?

The only waters within the state of Maryland and outside of the Potomac drainage in which we have recently evaluated intersex are one site on the Patuxent River and two sites on the Susquehanna River. These sites were part of a 3-year collaborative project with the U.S. Fish and Wildlife Service to assess largemouth bass health on and around national refuges in the Northeast. These data are being prepared for publication; we will provide the information to your staff as soon as it is available.

Response to Questions from Senator James M. Inhofe

1. USGS traditionally has focused on water quality and the environment. Who is USGS working with when it is trying to understand human health effects from water?

The traditional focus of USGS water-quality activities has been on the occurrence, movement, and effects of contaminants in the environment. Increasingly over the past decade, the USGS has included priorities to develop science information and data that also are useful for the assessment of potential human health effects from environmental contaminants. Such information and data include defining the persistence of contaminants to source waters (untreated drinking water) and finished (treated) drinking waters; assessing the occurrence of natural and human contaminants

in domestic drinking-water supplies (individual household wells); assessing volatile chemicals in waters that may be inhaled during household use (such as radon and volatile organic chemicals); and occurrence of contaminants in recreational waters (such as algal toxins). The USGS does not do human health effects assessments but partners with public health agencies, which rely on USGS data and information on water resources and water quality. The environmental information that we provide improves their ability to make informed public health decisions. We work with a wide range of human health agencies (including USEPA, the Centers for Disease Control and Prevention, the National Cancer Institute, the Food and Drug Administration, and more) to ensure that the information we develop is useful to, and is used by, those agencies.

Senator BOXER. Thank you.

I will start off with Administrator Silva. I am extremely concerned by recent press reports indicating that children may be drinking contaminated water in small rural schools that run their own drinking water systems. Now, you have stated in your opening statement that you do not have the authority to intervene in that situation. Is that correct?

Mr. SILVA. That is correct. We do not have any——

Senator BOXER. Could you turn on the mic?

Mr. SILVA. No, that is correct. We do not have a direct authority over those kinds of systems. However, we do work with the States and communities to try to do a number of things, target funding, educational programs.

Senator BOXER. Well, I am not interested in roundabout help. What do I have to do to make sure that you can get in there and clean up that water? Education is great, but I want action. So, what do we need to do to help you be able to intervene?

Ms. Giles.

Ms. GILES. Senator, the schools that supply their own drinking water which you are mentioning is about 10 percent of the schools nationally. As small systems, those systems are required to comply with the Safe Drinking Water Act, and it is a matter of particular attention to EPA because, as has been pointed out here, children are particularly vulnerable to contamination in drinking water systems.

So, in addition to the assistance, both financial, technical and managerial assistance that the States and EPA provide to these systems, we, of course, also have enforcement possibilities for those drinking water systems. And where we cannot get a return to compliance through these various forms of assistance, enforcement is certainly an option.

Senator BOXER. OK. So that is good news. So, you do not need any change in the law if you come to the conclusion that, after trying to help these systems in doing everything you can, they are still not complying? You can go into those rural schools and protect those children. Is that what you are saying?

Ms. GILES. Like all small systems that are required to comply with the Safe Drinking Water Act, they are——

Senator BOXER. Could you cite that area of the Act that gives you that authority to me now, and if not could you get it to me in writing?

Ms. GILES. It is the General Enforcement Authority of the Act, so it is section 1413.

Senator BOXER. OK. I just cannot imagine, I mean, Senator Klobuchar has made the point so well that children are the most vulnerable. Pregnant women, children, the elderly, the disabled, they are much more at risk.

So, do you have anything to tell me that you intend to move on this, these news reports? Because I understand Senator Inhofe's point about, newspapers make a report, let us not just move on that. I agree with him. They may not be accurate. But they may be. And if they are, then we know that a lot of our rural schools are, kids are drinking contaminated water. So, has Administrator Jackson talked to you about moving on these?

Ms. GILES. Absolutely, Senator. Protection of children's health is a high priority for this Administration. There are many supports that are available for these systems, and as Administrator Silva mentioned in his testimony, one of these principal ones is helping the smaller systems with restructuring where that is appropriate to move them off of their own supply into a supply that can be better managed. And I think that there are roughly 1,000 schools of these small supplies that have been moved off their own source of drinking water to a larger system over the last 5 years. And that is an effort that needs to continue.

Senator BOXER. Well, let me follow that up, thank you, because I want to talk about children in larger schools. News reports also have found drinking water contamination in some schools that are part of a public drinking water system in urban areas. And one of the contaminants found is lead, which we know harms the development of the nervous system, and children, again, are especially at risk. And again I take to Senator Klobuchar—because our work on getting lead out of toys and stopping them from being used by our children, it does not help us if the lead is in the water.

So, are State or local authorities monitoring drinking water quality for such contamination at schools that are part of larger water systems, and if not, will EPA develop a program that helps to locate and address these serious problems? It seems to me that when you do that you are really helping the whole community because if you are helping these larger schools, where they are part of the public drinking water system, and you go after those to protect the kids, you are protecting everybody who drinks water out of those systems.

So, could you tell me what you are doing here? Are you monitoring, currently, the drinking water for such contamination at those schools that are part of larger public water systems? And what are your plans on that front?

Mr. SILVA. Well, right now we do not require separate monitoring for schools if they are part of a larger system. The larger system is required to test for lead and copper, the lead and copper rule, and if they have any issues, they have to report it and work with their consumers to resolve those issues. But right now, we do not have any direct monitoring requirements at schools.

Senator BOXER. OK, let me make my point here. We know from reading these news stories, and they do seem to be very well documented, that the reports were made, but nothing has happened. In other words, everybody feels that yes, the water system, everybody said yes, there is more lead, there is more this, there is more that, but no follow up.

What are you doing now, in light of the past 8 years where not much was done as far as I can tell? What are you doing now? And if you are not monitoring these schools, you are monitoring these larger water systems. What action are you taking on these larger water systems that service the schools?

Ms. GILES. Senator, if I could respond. The larger systems are required to monitor for contaminants that are regulated in the Safe Drinking Water Act and those standards are set, certainly with children in mind. So, the new enforcement approach that we an-

nounced today is intended to target the violations that we find in these larger, as well as the smaller systems——

Senator BOXER. Say it again for us, your new enforcement. Explain what you are doing.

Ms. GILES. The new enforcement approach, Senator, is a new way of targeting and requiring enforcement response from all Safe Drinking Water Act systems. The concept of it is to make sure that the most serious violations rise to the top of the list for prompt enforcement action. So, what we are doing is implementing a targeting system that will identify the health threats where there is a violation of health based standards, and especially where there have been repeated violations at a system, and put those to the top of the list for enforcement attention.

Senator BOXER. And when are you going to take your first enforcement moves?

Ms. GILES. Excuse me?

Senator BOXER. When are you going to move? When are you going to move on this? We already know this——

Ms. GILES. January. It is being implemented, it is being issued today and it is being implemented——

Senator BOXER. And you are going to move on enforcement in January?

Ms. GILES. Well, the enforcement approach, we are moving on some enforcement cases now. But the enforcement approach is a way of targeting our enforcement resources, both at the State and the Federal level——

Senator BOXER. There is a lot of bureaucratic talk here. What I just would like to close with—and I am sorry for taking an extra couple of minutes, and I will be happy to grant that to my colleague over here. We already know kids are being exposed to these contaminants, and they are deadly, and we already know there are problems. And what Mr. Silva said, and I appreciate his honesty, is we are not really tracking schools, we are tracking the public systems, and we do not know which public systems serve the schools.

We need a lot—I need a lot more specificity from you. I do not—I am not confident that we are now ready to go. So, I would urge you to speak with Administrator Jackson. I know she is often doing very important work, and we will talk to her, of course. But, what I am getting from you is, well, we have this new plan. And I say we need enforcement now. And it just sounds like it is a plan, and it is going into effect in January and when will it be done and when.

So, I expect to see some enforcement and I hope that you will—I do not mean to put you on the spot to identify systems, but I am going to need in writing, after this hearing, what are you concerned about, where are you moving, and I am just very worried about our kids and their safety.

Senator Inhofe.

Senator INHOFE. Thank you, Madam Chairman. I will not need additional time.

You mentioned something in your opening statement, Ms. Giles, with the exception of—and you named some—you named Wyoming.

What is the situation there where they would have primary as opposed to—just out of curiosity?

Ms. GILES. The Safe Drinking Water Act is established to allow States to assume primary authority for implementation and enforcement of the Act, and all of the States have been given that authority with the exception of Wyoming. So, in Wyoming EPA is the primary——

Senator INHOFE. Well, yes, that is what you had said. But I am asking why. Why Wyoming?

Ms. GILES. I am sorry, Senator, I do not know the reason why Wyoming did not——

Senator INHOFE. Well, would you find out for the record? I am just curious. It is not very important.

To both Mr. Silva and Administrator Giles, this was set up, the EPA and the States created a Federal-State partnership to clean up the water. And I like that. My concern is, and I am anxious to get to the second panel so that we can hear from some of the people, including Gene Whatley from Oklahoma, is that, I spend a lot of time around the States. We are the small communities that we are talking about. That is what Oklahoma is. And one of the reasons I originally came here, with my experience and my background, was being concerned about unfitted mandates.

So, I am concerned about the—what specifically, the emphasis in the Federal responsibilities for water—what specifically are you doing to empower States to meet their goals under this Act? Both of you. You have two, kind of, I see, competing things. I am not in total agreement with the Chairman on enforcement. I am more concerned about compliance assistance. So, tell me what you are doing now to help these small systems that we are talking about.

Mr. SILVA. I am sorry, with the school systems?

Senator INHOFE. Yes, all small systems.

Mr. SILVA. Yes, small systems. Well, again, we—that is something that we are going to target. We are developing what we call a new small systems program. Again, it is a three pronged approach where we are going to work with the States on better targeting the SRF programs that they have to small communities. We are going to work directly with the communities in some manner in terms of providing technical assistance to build up their institutional capacity, their financial capacity.

Also, we are going to try to work with the partners, the Rural Assistance Program, for example, where we have, for example, circuit riders that can help small communities directly. So, those are——

Senator INHOFE. OK. Circuit riders, those are people that actually get out there and get dirty and——

Mr. SILVA. Exactly. For example, if there are a number of small systems that are close by, instead of trying to build one big system, they can use one operator for, let us say, three systems, instead of having one operator where communities cannot afford one operator. That is one of the ideas——

Senator INHOFE. That is good.

And Ms. Giles, you have, I guess in your jurisdiction, the compliance assistance teams. Is that correct?

Ms. GILES. Yes, EPA does provide compliance assistance. But as I mentioned before, the States really do the bulk of the compliance assistance as part of their primacy responsibilities, although EPA is certainly there to support the States——

Senator INHOFE. I was going to say because a lot of times the States do not have the resources and the background and expertise to do this. That is how I see the assistance. Not that the Federal Government is coming in to take something over, but to actually assist.

We have small communities. We do not have all the expertise and the engineers and people who can make analysis. And they cannot afford, in most cases, to have studies done. And that is where I see your role as being a very significant role. And that does take staff to do that. And so if you feel that you do not have that, that ability, those resources to do that, you let me know. I would appreciate it.

That is primarily what I have, Madam Chairman.

Senator BOXER. Thank you.

Senator Lautenberg.

Senator LAUTENBERG. Thank you, Madam Chairman.

Mr. Silva, do you think that bottled water manufacturers ought to be required to give the public some detailed information such as source, what the source of the water is and the level of contaminants?

Mr. SILVA. Yes, Senator. Well, under the Safe Drinking Water Act we provide, we require all of our drinking systems to provide information to their consumers on a yearly basis. And additionally, if they have violations, they have to report that——

Senator LAUTENBERG. Yes, but you do not——

Ms. SILVA. We do not regulate right now, but I mean, it makes sense to me that just for, if nothing else, for transparency and openness, to me it would make sense for that to happen.

Senator LAUTENBERG. OK.

Ms. Giles, an investigation by the New York Times found that fewer than 6 percent of the polluters have been punished for violations. What would your new enforcement policies do to—that the States must carry out with their enforcement responsibilities under the Safe Drinking Water Act?

Ms. GILES. Thank you, Senator, and thank you for that question. I think I was not clear about the enforcement plan, and I would like to be clear about that. It is not a plan to consider enforcement. It is the mechanism that requires that we take enforcement with respect to the facilities that are not in compliance with the requirements.

It is a way of prioritizing which enforcement should be taken first. And what it says is we should focus on systems that are not in compliance with health based standards, especially where there have been repeated violations, and specifically says that we should pay special attention to schools because, of course, exposure of children to drinking water is——

Senator LAUTENBERG. Yes, the vulnerability of the young——

Ms. GILES. Yes——

Senator LAUTENBERG [continuing]. Ought to get priority attention. There is no doubt.

Mr. Larsen, hydrologic fracturing, I am sure you know what that is, involves the underground injection of chemicals to extract natural gas. Now, this practice is beginning to occur in areas in New Jersey, and the drinking water that is provided should get attention. But EPA is severely limited in its ability to regulate this activity.

Should EPA have the authority to investigate the health risks of this process that is now becoming rather common across the country? And would that protect our people from risks?

Mr. LARSEN. I can comment on some of the science behind it. I do not normally recommend policy for the EPA. But certainly it is a growing concern in Pennsylvania and New Jersey and other parts of the country as water is injected deep underground to fracture rock under pressure and then liberate gases and petrochemicals. There are water quality issues associated with it as that water is returned to the surface or to groundwater, and the USGS is involved in a number of studies in different States to help understand and define what those water quality issues are. We share those data with the EPA so that they can then make determinations about what actions to take.

Senator LAUTENBERG. Mr. Silva, do you have any view of that, and what kind of risks are presenting as a result of this process?

Mr. SILVA. Well, right, we have heard the concerns, and we understand there are two primary issues. One is the wastewater that has gone of the out of the system and is put in reservoirs on the ground. The other is when you do the fracturing, there are some kinds of chemicals that are used for the fracturing process, and the science is not clear whether that poses risk to ground, especially to potable drinking water sources if they are there.

So, we are concerned about it. We understand the issue. And we have been asked to start looking at that. It just requires, we are not sure about the funding for that. It probably would take——

Senator LAUTENBERG. I think, as the Chairman said, that action in these situations is a requirement, and when we see something that is growing in popularity as a process, I think it suggests that we ought to get after it.

I wanted to ask you this. Scientists have reported disturbingly high numbers of fish with both male and female characteristics and other reproductive problems. The problems have been linked to exposure to pharmaceuticals and other chemicals in the water. What is EPA doing to address this problem, or do they register any concerns?

Mr. SILVA. No, certainly, again, that is another area where we are not clear about the threats, although we understand the issues and——

Senator LAUTENBERG. Well, but we see a result that is, I think disturbing, rather alarming.

Mr. SILVA. We do have what we call a list of contaminants that we do every 6 years, so we are taking a look at that.

Senator LAUTENBERG. Thank you, Madam Chairman.

Senator BOXER. Thank you very much, Senator.

Senator Klobuchar.

Senator KLOBUCHAR. Thank you very much, Madam Chairman.

The first question I have of you, Mr. Silva, is a practical question about the Recovery Act. I talked about how important that is, the funding nationwide. A number of the water infrastructure projects have been held in abeyance for, I think, some legal issues. Can you provide an update on EPA's effort to get the shovels in the ground on these shovel ready projects? I have been hearing from the people in my State, I visit every county every year, so I hear a lot about the rural water projects.

Ms. SILVA. No, no, I can tell you that it is a highest priority in the agency to get the money out and to help States, and through the States and communities to make sure this money is spent. Right now, as of right now, we have 842 agreements under the Safe Drinking Water Act part of it, the $2 billion, so about half of the money, about 60 percent, is now available for projects. Of that total, about 33 percent are now under contract. So, we are doing well.

I mean, our concern is that, as you know, under the authority, we have to have that money spent by February 17th of next year. So, we are concerned about that and we are working with States.

Senator KLOBUCHAR. OK. Well, we——

Mr. SILVA. We sent some support to New Mexico recently to a small community to help them with their project.

Senator KLOBUCHAR. All right. Well, we will work with you on these specific projects to see what is happening.

The other thing I thought was interesting is that you were talking about how so many of the issues arise from small communities with less than 10,000 people because, I think, the problem is they do not have the financing to do this.

In Minnesota, we maintain a county well index, which is a computerized data base that contains basic information for over 300,000 water wells that have been drilled. The data is derived from water well contractors' logs of geologic materials encountered during drilling. Is there data about water quality from private wells that are predominantly found in rural parts of our country?

Mr. SILVA. Well, unfortunately, that is, one of the dilemmas is that we do not have any authority, and the States a lot of time do not have the authority also to control draft of private wells. And that is one of the issues that we have both with trying to ensure that all people have safe drinking water, because I think about 15 percent of the Nation uses private wells for their supply. So, unfortunately, it is an area that we do not have a lot of control of. All we can do there is work, again, with States on educational programs to make sure that, through the local counties perhaps, they provide information to their individual users.

Senator KLOBUCHAR. Thank you.

I want to get back to my original opening, where I talked about the school data. And, as I mentioned, the Associated Press reported that over the last decade, unsafe levels of lead, pesticides and dozens of other toxins have surfaced at public and private schools in all 50 States.

Just to give you one example, in 2001, 28 children at a Worthington, Minnesota, elementary school experienced severe stomach aches and nausea after drinking water tainted with lead and copper, which was the result of a poorly installed treatment system.

What is being done now? Is there a new found focus over the previous Administration on the kids' drinking water?

Ms. GILES. Senator, in addition to the measures that Administrator Silva testified about, the direction of the funds, technical assistance and assisting these smaller systems to connect to larger systems or otherwise improve their managerial capacity to handle these systems, we also are increasing our enforcement attention on these systems, especially where there has been, as you mentioned, health based concerns at these smaller systems and persistent noncompliance that these assistance mechanisms have not succeeded in getting resolved. We need to make sure that we get the attention that is needed to get these systems into compliance, and enforcement can be one of the tools to achieve that objective.

Senator KLOBUCHAR. Mr. Silva, did you want to add anything?

Mr. SILVA. Yes, I just wanted to let you know that we are also looking at updating our lead and copper rule, I think by 2012. So, I think those kinds of things, I think we can look at how we could better work with schools in that aspect.

Senator KLOBUCHAR. Thank you. And then, a good thing. A few years ago, Minneapolis opened North America's largest ultrafiltration plant that produces drinking water for the residents of Minneapolis and surrounding suburbs. We actually, and somewhat facetiously, sell our bottled water, or city water, as the best water in the world.

The plant was constructed to replace existing sand based filters that were installed in the early 20th century. This new drinking water facility aims to provide additional protections against pathogens such as cryptospiridium, did I say that right?

Mr. SILVA. Yes, you did.

Senator KLOBUCHAR. Excellent. And other chlorine-tolerant organisms. How many facilities are equipped with this kind of new filtration system like we have in Minneapolis? That was like one of those questions you get asked on 20 Questions. You can tell me later.

Mr. SILVA. Actually, not too many. It says here we only have about 5.5 percent.

Senator KLOBUCHAR. OK. I am impressed that you knew that. That was very good, Mr. Silva. But I think the idea here is, as we look at the funding for infrastructure projects, the more that we can do to use some of the new technology that is available, the more our cities and towns will be able to sell their city drinking water, the same as some of the expensive kind.

So, thank you very much.

Senator BOXER. Thank you very much.

Senator Cardin followed by Senator Whitehouse, unless a Republican shows up.

Senator CARDIN. Well, Madam Chairperson, let me thank you very much for conducting this hearing. I would ask consent that my opening statement be made part of the record.

Senator BOXER. Without objection.

[The prepared statement of Senator Cardin follows:]

STATEMENT OF HON. BENJAMIN L. CARDIN,
U.S. SENATOR FROM THE STATE OF MARYLAND

Madam Chairman, my highest priority as Chairman of the Water and Wildlife Subcommittee is to ensure that all Americans have clean and safe drinking water. Thank you for holding this important hearing on the safety of our drinking water.

Water is an essential and precious resource that we all too often take for granted. Most Americans expect the water flowing from their faucets to be safe to cook with and to drink. In some jurisdictions that slight chlorinated smell leads people to think that their water has been treated and is safe.

Unfortunately, chlorine and fluoride do not treat or remove all harmful substances including:

• Lead: which impairs children's mental development and is associated with behavioral problems has been present in tap water in cities like Baltimore and Washington, DC.

• Perchlorate: A jet and rocket fuel residue has been found in drinking water systems at high enough concentrations to disrupt normal human hormonal functions, and

• Nitrates: a common and costly pollutant found in the drinking water of many agricultural communities leads to a condition known as "blue baby syndrome" where decreased oxygen carrying capacity of hemoglobin in babies leads to death.

These pollutants are especially dangerous to vulnerable populations like infants, pregnant women and people with compromised immune systems. Treating these and other emerging pollutants in our drinking water is incredibly costly. The best way to keep them out of our water is to prevent them from getting in there in the first place.

SOURCE WATER PROTECTION AND GREEN INFRASTRUCTURE

Keeping pollutants out of our rivers, lakes and streams protects the water we drink. Restoring Clean Water Act protections of source water streams and wetlands that filter harmful pollutants from our water helps ensure the safety of our drinking water.

This October, EPA released a report indicating that because of two Supreme Court decisions, 117 million Americans' drinking water is supplied by smaller streams which no longer fall under the Clean Water Act.

Maintaining upland forests and natural systems is key to protecting in stream water quality and to reducing the burden on drinking water facilities downstream.

New York City has recently done exactly that. Its outstanding, non-chemically treated drinking water comes straight from the Catskill Mountains. To protect this drinking water source, New York recently decided to spend $100 million to protect the 19 upland reservoirs and 3 controlled lakes.

The city decided that conserving the natural landscape was more cost-effective than spending billions of dollars it would take to treat the city's water supply.

REPAIRING INFRASTRUCTURE

Some of the issues surrounding emerging contaminants, particularly lead, can be dealt with proper maintenance of water systems. The American Society of Civil Engineers estimates the cost of the maintenance backlog for America's drinking water infrastructure somewhere around $255 billion.

Drinking water systems provide a critical public health function and are essential to life, economic development, and growth. Failing systems hinder disaster response and recovery efforts, expose the public to water-borne contaminants, and cause damage to roadways, homes, and other infrastructure, endangering lives and resulting in billions of dollars in losses.

Maryland is all too familiar with these losses as we have suffered serious infrastructure failures in the last year on River Road in Bethesda and in the town of Dundalk outside of Baltimore.

Safe and secure water supplies and healthy drinking water start with a functional and modern water infrastructure system. The Nation's drinking water systems face staggering public investment needs over the next 20 years.

Although America spends billions on infrastructure each year, drinking water systems face an annual shortfall of at least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future Federal water regulations.

Federal assistance has not kept pace with demand, however. Between fiscal year 1997 and fiscal year 2008, Congress appropriated approximately $9.5 billion for the

SRF. This 11-year total is only slightly more than the annual capital investment gap for each of those years as calculated by the EPA in 2002.

MARYLAND AND REGIONAL WATER CONTAMINATION ISSUES

Lead in Baltimore: In Maryland these maintenance issues are the root of serious contamination issues that have gone unaddressed for years.

The presence of lead in Baltimore City schools' drinking fountains was first documented in the early 1990s. The source of the contamination was believed to be old pipes within the school buildings. At the time school officials said sinks and fountains with unsafe lead levels would be turned off, and water coolers similar to those in many offices would replace them.

In 2003, however, the city's health commissioner ordered water fountains turned off at more than 100 schools because of reports that drinking fountains in scores of city schools were dispensing lead tainted water, more than a decade after the fountains had been ordered shut off.

Sadly, in 2007 the school system determined that it would be more cost-effective to provide bottled water indefinitely, rather than retrofitting and monitoring the existing plumbing in school buildings.

INTERSEX FISH AND PHARMACEUTICALS

Recent studies by the U.S. Geological Survey (USGS) have found that a large percentage of fish in the Potomac and its tributaries are intersex—meaning they have both male and female characteristics within the same fish. The most densely populated, heavily farmed study area in the Potomac experienced a 75 percent intersex fish rate while less habited sites had 14–35 percent rates. What human populations are flushing and dumping into the river is causing these mutations in the fish.

The occurrence of intersex fish has been associated with known or suspected endocrine disrupting compounds which are not removed during standard sewage treatment and in runoff from farming operations. These compounds can include estrogen from birth control pills and hormone replacements, pesticides and fertilizers used on crops, and hormones from livestock operations.

According to Dr. John Peterson Myers, chief scientist for Environmental Health Sciences of Charlottesville, Virginia, "Endocrine disrupting compounds are major pollutants in the Potomac watershed, and we need to exercise the utmost caution when introducing these compounds into our rivers, streams, and ultimately our drinking water."

The Potomac River is Maryland's largest drinking water source. These fish are equivalent to the canaries in the mine. Like the canaries that signal contaminants in the air miners breathe, these mutant fish alert us to the contaminants in the water we drink.

We've got to do better. Madam Chairman, I look forward to hearing from our witnesses today on how we will begin to do that.

Senator CARDIN. I have the honor of chairing the Water and Wildlife Subcommittee on this committee, and I can tell you that one of our highest priorities is to make sure that Americans who expect, when they turn on their faucets and pour out a glass of water, that it is safe to drink. We need to do a better job to make sure that we are carrying out that responsibility.

Let me just cite some Maryland concerns which—my colleagues have brought up things in their own individual States, which I think points out our concern.

We talk about our children in our schools. Well, in the 1990s, Baltimore City schools were identified as not having safe drinking water for their students in the schools because of high levels of lead. That was in the 1990s. And the coolers were turned off, the faucets were turned off, and to this date they have not been turned on. We are using bottled water in the Baltimore City school system because of the high cost of retrofitting the piping system in the Baltimore City schools.

And then I have cited, Madam Chair, several times the concerns of failures of pipes in Maryland, when River Road in Montgomery

County became a river, or when the Dundalk community in Baltimore was flooded because of the break of water systems.

And Madam Chair, I think that is our responsibility. I must tell you that. You have, and I have authored, along with the Republicans, legislation, the Water Infrastructure Financing Act, to try to deal with the deficiencies in Federal funds for water infrastructure. I think it has been estimated to be about $11 billion a year, the shortfall. And I think we have a responsibility to do a better job in providing those resources to improve the water infrastructure for safe drinking water in America.

But let me just say one more example which really follows up on Senator Lautenberg's point, and that is the intersex fish, 75 percent rate in the Potomac River, the largest source of drinking water in my State. Perhaps this water came from there. I do not know. But I am not satisfied with the answer, Mr. Silva, that you gave on the intersex issue.

To me, it is like the canary that dies in a mine shaft. When it dies, I know that there is a concern about humans going into that area. When fish become intersex, that means having characteristics of both male and female, it is a clear indication that there are too many hormones or estrogen-laden drugs that are being put into our water system that are not being cleansed, or too much fertilizer is being used by our farmers that are getting into the water.

And there it is not, to me, so much the infrastructure, it is the pollutants that are getting into the water. And there is it your responsibility, the regulatory system, to make sure that we have the proper regulations and enforcement in place to keep these pollutants out of the water in the first place.

So, I think we do need to work together. Congress needs to provide the resources for improving and upgrading our infrastructure so we can transport clean water more efficiently so that when you turn on your tap, you do not have lead in it. But also we need to make sure that we keep pollutants out of the water that are causing concern.

So, I would just urge a more aggressive plan, at first understanding the science, but also keeping these pollutants out of our water. And I heard you respond to the Chairman's question. I just think that we need to be more aggressive about this. I welcome your thoughts.

Mr. Silva, let me start with you, because as the intersex fish——

Mr. SILVA. No, I think, I think you are raising a number of excellent points in terms of the number of challenges that we have from nutrient pollution, non-point source pollution, to contaminants of concern, pharmaceuticals specifically. And so I think the communities now are facing a number of challenges that ultimately are going to end up in some way probably in more extensive treatment at the treatment plants.

And so we have to be very, very clear about the standards that we set, what kind of standards we set for the communities, because it is going to be more costs for them for the point source. It also could involve things like education, to avoid putting things into the system. Source reduction, for example, is one that does not cost a lot of money, is more educational, getting the citizens involved.

So, I think what I am saying is that it is a multi-faceted issue that is going to require a multi-faceted approach. And certainly funding is going to be one critical thing, as I mentioned, because once we get into this, I think as we find more contaminants of concern, they may require more standards and more regulation.

Senator CARDIN. Well, I agree that it is multi-faceted. I think education is critically important. But I also think enforcement is going to be an important role here.

Thank you, Madam Chair.

Senator BOXER. Thank you.

Senator Whitehouse.

Senator WHITEHOUSE. Thank you very much.

Could each of you give me your views on the extent to which the drinking water contamination problem relates to infrastructure failure?

Mr. SILVA. I am not sure I understand that question. Are you talking about infrastructure failure in terms of not having enough infrastructure or the existing not working——

Senator WHITEHOUSE. The existing not working.

Mr. SILVA. I would say overall, nationwide, I do not think that is a major issue at this point. I mean, I think in some areas it is a concern, especially, again, where you have older infrastructure——

Senator WHITEHOUSE. What percent, would you say?

Mr. SILVA. Senator, I could not give you that off the top of my head. Again, I do not think it, in terms of the pollution problems that we have, I do not think that is a major one. I know, for example though, that in CSOs, combined sewer issues, there you have a big need throughout the country, especially in large communities that require large investment. So, in that case, it is not really a lack of old infrastructure, it is just that they do not have it in place.

I think the ARRA funds have really addressed some of the aging infrastructure issues, such as old pipes and upgrades——

Senator WHITEHOUSE. Well, what I am getting at is that I think EPA has identified $662 billion in decrepit infrastructure.

Mr. SILVA. Right. Right.

Senator WHITEHOUSE. ARRA gave out six, less than 1 percent, so I am not very excited by what ARRA contributed to the solution if, in fact, the EPA is correct that it is $662 billion. So, I do not find your answer very reassuring, if that is what you are relying on.

Mr. SILVA. Well, no, I mean, what I am saying is that I do not think that is a big issue right now. But again, if we do not start investing more in the near future and the long term, I think there will be more issue with pollution from point sources.

Senator WHITEHOUSE. Ms. Giles.

Ms. GILES. Thank you, Senator. As you correctly point out, there is a big infrastructure concern, both on the drinking water and on the wastewater side, of the capacity of the systems that attempt to deliver clean water to meet their obligations.

In addition to the physical infrastructure, though, that you have mentioned here, there are also other aspects of infrastructure, the capacity of the systems to operate and maintain their systems and

to have not only the financial wherewithal to do that but the managerial and administrative capacity to do that.

And that is something—so on both aspects that is something that is an important priority to EPA, both the physical and the other aspects of infrastructure that help us to deliver clean and safe water.

Senator WHITEHOUSE. Mr. Larsen.

Mr. LARSEN. I would only add that, well, first of all, the USGS as a science provider does not normally deal with this side of the question. But I would add that one of the big challenges in addition to dealing with the decaying infrastructure, whether it be pipes and sewage treatment plants or bridges or whatever, is the fact that as the new science emerges on different contaminants, and the topic we were just talking about, estrogen-active chemicals in water, our existing sewage treatment facilities were never designed to deal with the concentrations in low levels of the types of contaminants we are talking about. And we do not really know yet, in terms of the science, whether we need to retrofit, whether or to what degree we need to upgrade those kinds of facilities. This is still an emerging question.

So, in addition to repairing our aging infrastructure, we also have a large challenge which is to examine to what degree we may need to revise our treatment methodologies to deal with these very low concentrations as we have acknowledged. In fact, we do not really know to what degree they may affect humans and to what degree we need to respond.

Senator WHITEHOUSE. Well, I would, the news today reports that the President looks at highways, small business and jobs plan, is the headline. I would ask that within the Administration you use whatever efforts you have to try to assure that water and wastewater infrastructure are included in the jobs plan.

I think that the infrastructure failure in water and wastewater is considerably worse than Mr. Silva has suggested. I think it is your own number, that it is $662 billion that we are behind in this coming, whatever it was, 6 or 7 years, and it is very sad for me, representing Rhode Island, where, Ms. Giles, you come from, and which has a near 13 percent unemployment rate, to see decrepit infrastructure and unemployed people, side by side, and we have not yet connected those two obvious dots.

And I know that there are concerns about the deficit, but by God, if the stuff is going to have to be fixed sooner or later anyway, it really is not a deficit problem to move it forward and get it done now while we need the jobs.

So, I would hope that you would urge internally for water and wastewater infrastructure to be part of the jobs program through EPA into the Administration's counsels.

Senator BOXER. Thank you, Senator.

We are going to do a second round of 4 minutes each.

Mr. Silva, I want to back up what Senator Whitehouse said. Here is the EPA's own document. Drinking water infrastructure needs $334 billion over 20 years, and most of it is because of repair or replacement. So, there is a lot of deteriorating infrastructure, and that is why, again, the bill we passed out of here is a strong start. And we need to move forward.

So, I have a couple of questions more. Assistant Administrator Silva, I have long called for EPA to use the best available science to make a decision on regulating perchlorate, which is rocket fuel, is found in rocket fuel, in drinking water in a lot of States, including mine. What is the time line for EPA to make a decision on regulating perchlorate in drinking water supplies, the time line?

Mr. SILVA. Well, there are a couple of steps. First, we have to study the science to see if we first need to regulate. We are looking at that right now. We feel that we can do that probably by the middle of next year sometime, to decide whether we are going to regulate or not, and then get into the science of what kind of standards we need to set——

Senator BOXER. So, in 6 months you will let us know whether or not you think it ought to be regulated? That would be the middle of next year. Correct?

Mr. SILVA. Well, I can back to you with a date certain——

Senator BOXER. Would you really put it in writing, please?

Mr. SILVA. Yes, I can do that.

Senator BOXER. Because a lot of work has been done. My State has already set a standard. So, you do not have to start from square one. We know the impact on pregnant women. We know the impact on our people. So, please, I am going to look at that and I would like that in writing.

Let us see. On arsenic and radionuclides, Assistant Administrator Silva, what more can EPA do to help small water systems meet the health based standards that EPA has set already for arsenic and radioactive contaminants? What more can you do to help small water systems?

Mr. SILVA. Well, as I mentioned earlier, we have a number of approaches. But I do want to say that, make a comment, that we have made a lot of progress. When this rule was set up for arsenic at 10 parts per billion, we had about 4,000 systems out of compliance. We have been able to pull that down to about 1,000. And of those, 20 are large and the rest are small. So, you can see again that the issue is really with small communities.

And again, our focus is to get funding to those communities and technical assistance to make sure that they can meet those standards. I do want to say that we also have, through the $30 million in investment in technology research, we do feel that there is affordable technology for small communities.

Senator BOXER. So, just to go over that again. I asked you what more can EPA do to help small water systems, and you are saying get them the funding they need. And where do you stand on that funding?

Mr. SILVA. Well, right now, again the——

Senator BOXER. What do you need?

Mr. SILVA. Well, right now we need more funding focused to small communities. And again, we are working with the States because they do have already the authority to use what is called set asides for small communities. We also want to encourage those States to use more of that authority for small communities. In the ARRA funding, we were also able to use what was called buy downs, or, essentially grants for small communities, and continue——

Senator BOXER. Well, let me just press you, because this is good information. You are saying there is a set aside that the States have to follow, they have to follow. Are they following it?

Mr. SILVA. It is voluntary at this point.

Senator BOXER. It is voluntary?

Mr. SILVA. But it is a 2 percent set aside, or they can go higher if they like. So, again, we are going to try to work——

Senator BOXER. So, could you get us a report on which States are doing that and which States are not?

Mr. SILVA. Certainly.

Senator BOXER. Because we worry, all of us, about our smaller systems, because they are the ones that just do not have the ability to move forward.

Is EPA considering the recommendation from the Science Board on Drinking Water which suggests addressing the cumulative effects of chemicals and similar sources? Because we believe it is important to figure, as you look at the human health consequences, what has been the accumulation? So, what is the time line for making a decision on whether to increase the consideration of cumulative effects on drinking water contaminants?

Mr. SILVA. Well, right now we do not have a time line. We have just received the report and we are looking at it. Our research branch is——

Senator BOXER. OK, if you could confer with Administrator Jackson and get back to us, in writing. That would be very good.

You noted that ARRA started to fund some of these smaller systems, and that is correct, and I will ask unanimous consent to place in the record the investments in ARRA that went toward these smaller systems in my home State because I think it is important.

But again, I want to see dates certain because these are problems that are impacting people every day. I do not want a situation that Senator Cardin has where you cannot—you have to drink out of bottled water. As Senator Lautenberg has said that is not the answer either because there are no standards for bottled water. I mean, it is the facts. And we need to deal with that as well.

Senator Inhofe.

[The referenced information follows:]

California Department of Public Health

Funded Projects List

For

2009 American Recovery and Reinvestment Act
Safe Drinking Water State Revolving Fund

1 System No.: 2701900
System Name: San Jerardo Coop Wa
Project Title: San Jerardo Well Replacement, Transmission Pipeline, Water Storage, Intertie, and Core System Improvement Project
Category: A Bonus Points: 15 Type: C Population: 249 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$3,068,554** Running Total: $3,068,554

2 System No.: 3700960
System Name: Sun Island Resort/ Padre Dam MWD
Project Title: Harbison Canyon Estates Water Consolidation Project
Category: B Bonus Points: 25 Type: C Population: 50 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 387,670** Running Total: $3,454,224

3 System No.: 4901140
System Name: Wilmar Union/Wilson Elementary School
Project Title: Wilson Elementary School Safe Drinking Water Project
Category: B Bonus Points: 15 Type: P Population: 200 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,060,517** Running Total: $4,514,741

4 System No.: 4700530
System Name: Tennant CSD
Project Title: Tennant Community Service District Water System Upgrade
Category: C Bonus Points: 25 Type: C Population: 82 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$2,081,000** Running Total: $6,595,741

5 System No.: 1200540
System Name: Phillipsville CSD
Project Title: Phillipsville Water System Upgrade 1200541
Category: C Bonus Points: 20 Type: C Population: 300 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$2,228,104** Running Total: $8,823,845

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

California Department of Public Health
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6 System No.: 2701260
System Name: Garrapata WC Inc
Project Title: Install treatment plant for Garrapata Water Co., Inc.
Category: C Bonus Points: 0 Type: C Population: 150 Disadv. Community:No Ownership: Private
ARRA Funding Amount: **$ 450,250** Running Total: $9,283,095

7 System No.: 2910000
System Name: City Of Grass Valley
Project Title: Alta Hill Water Tanks Project No. 04-01
Category: D Bonus Points: 25 Type: C Population: 9,600 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$2,999,066** Running Total: $12,282,161

8 System No.: 5310000
System Name: Weaverville CSD
Project Title: West Weaver Water Treatment Plant 2009 Improvements
Category: D Bonus Points: 20 Type: C Population: 3,554 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 495,100** Running Total: $12,777,261

9 System No.: 4400570
System Name: Davenport County Sanitation
Project Title: Davenport Water System Improvement Project
Category: D Bonus Points: 15 Type: C Population: 350 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,620,000** Running Total: $14,397,261

10 System No.: 4610000
System Name: Downieville Public UD
Project Title: Downieville Disinfection Contact Tank
Category: D Bonus Points: 15 Type: C Population: 391 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 277,500** Running Total: $14,674,761

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
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California Department of Public Health
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11 System No.: 1910070
System Name: Los Angeles-City, Dept. Of Water & Power (River Supply)
Project Title: City T/L South Unit 2
Category: D Bonus Points: 15 Type: C Population: 4,071,873 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$10,000,000** Running Total: $24,674,761

12 System No.: 1910070
System Name: Los Angeles-City, Dept. Of Water & Power (Santa Ynez)
Project Title: River Supply Conduit Lower Reach Unit 3
Category: D Bonus Points: 15 Type: C Population: 4,071,873 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$10,000,000** Running Total: $34,674,761

13 System No.: 1910070
System Name: Los Angeles-City, Dept. Of Water & Power (Trunkline)
Project Title: Santa Ynez WQIP
Category: D Bonus Points: 15 Type: C Population: 4,071,873 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$10,000,000** Running Total: $44,674,761

14 System No.: 3710020
System Name: Rainbow Municipal Wd
Project Title: North & Northside Reservoirs Rehabilitation Project
Category: D Bonus Points: 5 Type: C Population: 18,250 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$6,702,680** Running Total: $51,377,441

15 System No.: 2800540
System Name: Capell Valley Estates
Project Title: Capell Valley Water Company Improvement
Category: D Bonus Points: 0 Type: C Population: 250 Disadv. Community:Yes Ownership: Private
ARRA Funding Amount: **$ 502,970** Running Total: $51,880,411

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
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16 System No.: 2800530
System Name: Napa County Public Works-Lbrid
Project Title: LBRID Water Treatment Plant Replacement Project, LB 03-06
Category: D Bonus Points: 0 Type: C Population: 500 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$2,250,000** Running Total: $54,130,411

17 System No.: 1000048
System Name: Town of Herndon (Applicant = City of Fresno)
Project Title: Herndon Town Water Project
Category: E Bonus Points: 40 Type: C Population: 457,511 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 826,000** Running Total: $54,956,411

18 System No.: 1210020
System Name: Loleta CSD
Project Title: Loleta Community Services District (CSD) Well, Pipeline and Water Treatment Facility
Category: E Bonus Points: 20 Type: C Population: 750 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,007,989** Running Total: $55,963,400

19 System No.: 5510030
System Name: Tud - Big Hill Water System
Project Title: Big Hill West Distribution System Replacement
Category: E Bonus Points: 15 Type: C Population: 517 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$4,083,790** Running Total: $60,047,190

20 System No.: 3710010
System Name: Escondido, City Of
Project Title: Alexander Area Waterline Replacement Phase II
Category: E Bonus Points: 10 Type: C Population: 140,000 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$6,500,000** Running Total: $66,547,190

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
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21 System No.: 4900660
System Name: Yucaipa Mutual Water Company
Project Title: YMWC Upper Well Replacement 2009
Category: E Bonus Points: 0 Type: C Population: 200 Disadv. Community:No Ownership: Mutual
ARRA Funding Amount: **$ 617,200** Running Total: $67,154,390

22 System No.: 4910020
System Name: Windsor, Town Of
Project Title: Windsor Drinking Water Well Replacement
Category: E Bonus Points: 0 Type: C Population: 26,432 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$1,101,276** Running Total: $68,265,666

23 System No.: 2110009
System Name: North Marin Water District
Project Title: STP Backflow Meter & Check Valve
Category: E Bonus Points: 0 Type: C Population: 56,000 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$ 86,286** Running Total: $68,351,952

24 System No.: 1500190
System Name: Arvin CSD (formerly Edmundson)
Project Title: Edmundson Acres Consolidation with Arvin CSD Construction Project
Category: F Bonus Points: 35 Type: C Population: 550 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,505,367** Running Total: $69,857,319

25 System No.: 3301750
System Name: Whispering Sands Mh Park (APPLICANT = MISSION SPRINGS WD)
Project Title: Whispering Sands MHP Consolidation with Mission Springs Water District
Category: F Bonus Points: 30 Type: C Population: 37 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 249,728** Running Total: $70,107,047

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
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26 System No.: 1502250
System Name: South Fork School Water System
Project Title: South Fork USD water improvement project
Category: F Bonus Points: 25 Type: P Population: 154 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 450,926** Running Total: $70,557,973

27 System No.: 2702410
System Name: Jensen Mhp WS
Project Title: Water treatment plant expansion Valley Creek
Category: F Bonus Points: 10 Type: C Population: 56 Disadv. Community:Yes Ownership: Private
ARRA Funding Amount: **$ 110,665** Running Total: $70,668,638

28 System No.: 3200190
System Name: Greenhorn Creek CSD
Project Title: Water System valve and controls repair
Category: F Bonus Points: 0 Type: C Population: 280 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 374,219** Running Total: $71,042,877

29 System No.: 3302070
System Name: La Pena Housing Facility (APPLICANT = COACHELLA VALLEY WD)
Project Title: La Pena Housing Facility, Consolidation with CVWD
Category: G Bonus Points: 45 Type: C Population: 100 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 939,644** Running Total: $71,982,521

30 System No.: 4900900
System Name: Shady Lane Mobile Home Park
Project Title: Shady Lane MHP-Consolidation with City of Santa Rosa
Category: G Bonus Points: 35 Type: C Population: 36 Disadv. Community:Yes Ownership: Private
ARRA Funding Amount: **$ 300,000** Running Total: $72,282,521

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

California Department of Public Health
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31 System No.: 1502220
System Name: Pond School Water System
Project Title: Arsenic Treatment Plant for Pond School
Category: G Bonus Points: 20 Type: P Population: 300 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 435,822** Running Total: $72,718,343

32 System No.: 5110003
System Name: Yuba City (Pipeline 14' and 16')
Project Title: Lincoln 14-inch Waterline - Walton to Phillips
Category: G Bonus Points: 20 Type: C Population: 10,200 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,874,317** Running Total: $74,592,660

33 System No.: 1600010
System Name: Pioneer Elementary School
Project Title: Pioneer Union Elementary School Replacement Well
Category: G Bonus Points: 15 Type: P Population: 750 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,505,467** Running Total: $76,098,127

34 System No.: 1610010
System Name: Lemoore, City Of
Project Title: City of Lemoore Municipal Water System Arsenic Mitigation Project
Category: G Bonus Points: 15 Type: C Population: 23,388 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$5,792,000** Running Total: $81,890,127

35 System No.: 5010010
System Name: Hughson, City Of
Project Title: Well No 8 Improvements Project
Category: G Bonus Points: 10 Type: C Population: 6,082 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$3,003,060** Running Total: $84,893,187

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

California Department of Public Health
Funded Projects List
2009 American Recovery and Reinvestment Act

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36 System No.: 5010030
System Name: Ceres, City Of
Project Title: Uranium Treatment Plant Upgrades
Category: G Bonus Points: 10 Type: C Population: 40,643 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$ 236,000** Running Total: $85,128,187

37 System No.: 5010030
System Name: Ceres, City Of
Project Title: Replacement of well due to Uranium And Nitrate contamination
Category: G Bonus Points: 10 Type: C Population: 40,643 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$ 455,000** Running Total: $85,583,187

38 System No.: 5010010
System Name: Modesto, City Of
Project Title: Wellhead Treatment and Blending Lines - Well 283 and 236
Category: G Bonus Points: 10 Type: C Population: 212,000 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$ 800,000** Running Total: $86,383,187

39 System No.: 3700910
System Name: Julian Community Services District
Project Title: Replacement of Well 8
Category: G Bonus Points: 5 Type: C Population: 578 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 225,000** Running Total: $86,608,187

40 System No.: 910002
System Name: South Tahoe Pud - Main
Project Title: Arrowhead Well Arsenic Treatment
Category: G Bonus Points: 0 Type: C Population: 60,000 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$1,185,221** Running Total: $87,793,408

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

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41 System No.: 5100005
System Name: COMD, West Point
Project Title: West Point WTP Clear Well Replacement
Category: H Bonus Points: 20 Type: C Population: 1,398 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$1,750,000** Running Total: $89,543,406

42 System No.: 1010030
System Name: Parlier, City Of (GPR)
Project Title: Parlier Water Meter Project
Category: H Bonus Points: 20 Type: C Population: 12,058 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$3,180,969** Running Total: $92,724,377

43 System No.: 3400166
System Name: Southwest Tract WMD (GPR)
Project Title: Meter Retrofit for South West Tract Water System
Category: H Bonus Points: 20 Type: C Population: 150 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 76,000** Running Total: $92,800,377

44 System No.: 1810000
System Name: Westwood CSD (GPR)
Project Title: Install Water Meters Westwood CSD
Category: H Bonus Points: 20 Type: C Population: 2,000 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 544,000** Running Total: $93,344,377

45 System No.: 1510020
System Name: Wasco, City Of (GPR)
Project Title: Expedite Installation of Residential Water Meters in Non-metered Service Connections
Category: H Bonus Points: 20 Type: C Population: 16,657 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$4,100,000** Running Total: $97,444,377

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

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46 System No.: 5110002
System Name: City of Yuba City (GPR)
Project Title: Water Metering Project
Category: H Bonus Points: 20 Type: C Population: 51,504 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$3,500,000** Running Total: $100,944,377

47 System No.: 3400100
System Name: Hood Water Maintenance Dist (GPR)
Project Title: Meter Retrofit for the Town of Hood
Category: H Bonus Points: 15 Type: C Population: 100 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 142,000** Running Total: $101,086,377

48 System No.: 3400110
System Name: Mwc: East Walnut Grove PWS (GPR)
Project Title: Meter Retrofit for E. Walnut Grove Water System
Category: H Bonus Points: 15 Type: C Population: 250 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$ 282,000** Running Total: $101,368,377

49 System No.: 910002
System Name: South Tahoe Pud - Main (GPR)
Project Title: Water Conservation/Metering Installation
Category: H Bonus Points: 15 Type: C Population: 60,000 Disadv. Community:Yes Ownership: Public
ARRA Funding Amount: **$4,387,500** Running Total: $105,755,877

50 System No.: 3410020
System Name: Golden State Water CO - Cordova (GPR)
Project Title: Cordova Water Meter Retrofit
Category: H Bonus Points: 10 Type: C Population: 48,900 Disadv. Community:No Ownership: Private
ARRA Funding Amount: **$9,000,000** Running Total: $114,755,877

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

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51 System No.: 3410020
System Name: City Of Sacramento (GPR)
Project Title: Water Meter Retrofit Program
Category: H Bonus Points: 10 Type: C Population: 457,514 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$20,000,000** Running Total: $134,755,877

52 System No.: 5710006
System Name: Woodland, City of (GPR)
Project Title: Water Meter Project 2
Category: H Bonus Points: 5 Type: C Population: 54,060 Disadv. Community:No Ownership: Public
ARRA Funding Amount: **$14,839,000** Running Total: $149,594,877

Category: State Revolving Fund Project Funding Category Green Project Reserve = (GPR)
Type: System Type (C = Community, P = Non-transient Noncommunity, N = Transient Noncommunity)
Disadv. Community DC = MHI < 80% statewide MHI Ownership: Public/Private/Mutual

Senator INHOFE. I will take the 3 minutes I had remaining from the first round but not the second round. I am anxious to get to the second panel, Madam Chairman.

I cannot remain silent after Senator Lautenberg's statement about hydraulic fracturing. I have something to say about that. But first I want to ask all three of you, in response, do any one of you know of one case of groundwater contamination that has resulted from hydraulic fracturing?

Mr. SILVA. Not that I am aware of, no.

Senator INHOFE. Ms. Giles.

Ms. GILES. I understand that there is some anecdotal evidence, but I do not know that it has been firmly——

Senator INHOFE. So the answer is no, that you do not know of it. All right.

Mr. Larsen.

Mr. LARSEN. I will have to respond in writing. I do not know of all of our studies on that topic.

Senator INHOFE. Well, but you have already answered. You are not aware of. That is the question that I asked you.

Here is the problem that we have. Senator Lautenberg referred to this as something that is new. This is not new. This has been around over 50 years. And we do approximately 35,000 wells a year, nearly 1 million wells, without one documented case of groundwater contamination. I am concerned about this because I know for a fact that if you took away the ability, as all other countries do, of hydraulic fracturing, we are going to be much more dependent upon other countries for our ability to produce oil.

Now, I want to repeat that one more time. There has never been a documented case in almost 1 million uses of that technology. The EPA did an extensive study of this back, prior to—it lasted a long period of time. They concluded in 2004 that it does not warrant any further study. And I want to submit, for the record, a document that tells the history of hydraulic fracturing——

Senator BOXER. Without objection. So ordered.

Senator INHOFE. And I will reserve time in case I need it. I hope I do not.

Senator BOXER. Sure.

Senator Lautenberg.

[The referenced information follows:]

Executive Summary

A USDW is defined as an aquifer or a portion of an aquifer that:

A. 1. Supplies any public water system; or

2. Contains sufficient quantity of groundwater to supply a public water system; and

i. currently supplies drinking water for human consumption; or

ii. contains fewer than 10,000 milligrams per liter (mg/L) total dissolved solids (TDS); and

B. Is not an exempted aquifer.

NOTE: Although aquifers with greater than 500 mg/L TDS are rarely used for drinking water supplies without treatment, the Agency believes that protecting waters with less than 10,000 mg/L TDS will ensure an adequate supply for present and future generations.

The U.S. Environmental Protection Agency (EPA, or the Agency) conducted a study that assesses the potential for contamination of underground sources of drinking water (USDWs) from the injection of hydraulic fracturing fluids into coalbed methane (CBM) wells. To increase the effectiveness and efficiency of the study, EPA has taken a phased approach. Apart from using real world observations and gathering empirical data, EPA also evaluated the theoretical potential for hydraulic fracturing to affect USDWs. Based on the information collected and reviewed, EPA has concluded that the injection of hydraulic fracturing fluids into CBM wells poses little or no threat to USDWs and does not justify additional study at this time. EPA's decision is consistent with the process outlined in the April, 2001 Final Study Design, which is described in Chapter 2 of this report.

The first phase of the study, documented in this report, is a fact-finding effort based primarily on existing literature to identify and assess the potential threat to USDWs posed by the injection of hydraulic fracturing fluids into CBM wells. EPA evaluated that potential based on two possible mechanisms. The first mechanism was the direct injection of fracturing fluids into a USDW in which the coal is located, or injection of fracturing fluids into a coal seam that is already in hydraulic communication with a USDW (e.g., through a natural fracture system). The second mechanism was the creation of a hydraulic connection between the coalbed formation and an adjacent USDW.

EPA also reviewed incidents of drinking water well contamination believed to be associated with hydraulic fracturing and found no confirmed cases that are linked to fracturing fluid injection into CBM wells or subsequent underground movement of fracturing fluids. Although thousands of CBM wells are fractured annually, EPA did not find confirmed evidence that drinking water wells have been contaminated by hydraulic fracturing fluid injection into CBM wells.

EPA has determined that in some cases, constituents of potential concern (section ES-6) are injected directly into USDWs during the course of normal fracturing operations. The use of diesel fuel in fracturing fluids introduces benzene, toluene, ethylbenzene, and xylenes (BTEX) into USDWs. BTEX compounds are regulated under the Safe Drinking Water Act (SDWA).

Given the concerns associated with the use of diesel fuel and the introduction of BTEX constituents into USDWs, EPA recently entered into a Memorandum of Agreement (MOA) with three major service companies to voluntarily eliminate diesel fuel from hydraulic fracturing fluids that are injected directly into USDWs for CBM production (USEPA, 2003). Industry representatives estimate that these three companies perform approximately 95 percent of the hydraulic fracturing projects in the United States. These companies signed the MOA on December 15, 2003 and have indicated to EPA that they no longer use diesel fuel as a hydraulic fracturing fluid additive when injecting into USDWs.

ES-1 How Does CBM Play a Role in the Nation's Energy Demands?

CBM production began as a safety measure in underground coalmines to reduce the explosion hazard posed by methane gas (Elder and Deul, 1974). In 1980, the U.S. Congress enacted a tax credit for non-conventional fuels production, including CBM production, as part of the Crude Oil Windfall Profit Act. In 1984, there were very few CBM wells in the U.S.; by 1990, there were almost 8,000 CBM wells (Pashin and Hinkle, 1997). In 1996, CBM production in 12 states totaled about 1,252 billion cubic feet, accounting for approximately 7 percent of U.S. gas production (U.S. Department of Energy, 1999). At the end of 2000, CBM production from 13 states totaled 1.353 trillion cubic feet, an increase of 156 percent from 1992. During 2000, a total of 13,973 CBM wells were in production (GTI, 2001; EPA Regional Offices, 2001). According to the U.S. Department of Energy, natural gas demand is expected to increase at least 45 percent in the next 20 years (U.S. Department of Energy, 1999). The rate of CBM production is expected to increase in response to the growing demand.

In evaluating CBM production and hydraulic fracturing activities, EPA reviewed the geology of 11 major coal basins throughout the United States (Figure ES-1). The basins shown in red have the highest CBM production volumes. They are the Powder River Basin in Wyoming and Montana, the San Juan Basin in Colorado and New Mexico, and the Black Warrior Basin in Alabama. Hydraulic fracturing is or has been used to stimulate CBM wells in all basins, but it has not frequently been used in the Powder River, Sand Wash, or Pacific Coal Basins. Table ES-1 provides production statistics for 2000 and information on bydraulic fracturing activity for each of the 11 basins in 2000.

Figure ES-1. Major United States Coal Basins

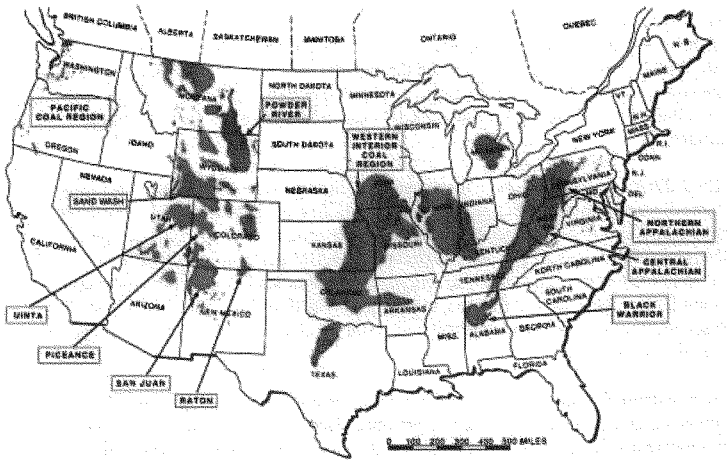


Table ES-1. Coal Basins Production Statistics and Activity Information in the U.S.

Basin	Number of CBM Producing Wells (Year 2000)*	Production of CBM in Billions of Cubic Feet (Year 2000)*	Does Hydraulic Fracturing Occur?
Powder River	4,200	147	Yes (but infrequently)
Black Warrior	3,086	112	Yes
San Juan	3,051	925	Yes
Central Appalachian	1,924	52.9	Yes
Raton Basin	614	30.8	Yes
Uinta	494	75.7	Yes
Western Interior	420	6.5	Yes
Northern Appalachian	134	1.41	Yes
Piceance	50	1.2	Yes
Pacific Coal	0	0	Yes (but infrequently)
Sand Wash	0	0	Yes (but infrequently)

* Data provided by the Gas Technology Institute and EPA Regional Offices. Production figures include CBM extracted using hydraulic fracturing and other processes.

ES-2 What Is Hydraulic Fracturing?

CBM gas is not structurally trapped in the natural fractures in coalbeds. Rather, most of the methane is adsorbed to the coal (Koenig, 1989; Winston, 1990; Close, 1993). To extract the CBM, a production well is drilled through the rock layers to intersect the coal seam that contains the CBM. Next, fractures are created or existing fractures are enlarged in the coal seam through which the CBM can be drawn to the well and pumped to the surface.

Figure ES-2 illustrates what occurs in the subsurface during a typical hydraulic fracturing event. This diagram shows the initial fracture creation, fracture propagation, proppant placement, and the subsequent fracturing fluid recovery/groundwater extraction stage of the CBM production process. The actual extraction of CBM generally begins after a period of fluid recovery/groundwater extraction. The hydraulically created fracture acts as a conduit in the rock or coal formation, allowing the CBM to flow more freely from the coal seams, through the fracture system, and to the production well where the gas is pumped to the surface.

To create or enlarge fractures, a thick fluid, typically water-based, is pumped into the coal seam at a gradually increasing rate and pressure. Eventually the coal seam is unable to accommodate the fracturing fluid as quickly as it is injected. When this occurs, the pressure is high enough that the coal fractures along existing weaknesses within the coal (steps 1 and 2 of Figure ES-1). Along with the fracturing fluids, sand (or some other propping agent or "proppant") is pumped into the fracture so that the fracture remains "propped" open even after the high fracturing pressures have been released. The resulting proppant-containing fracture serves as a conduit through which fracturing fluids and groundwater can more easily be pumped from the coal seam (step 3 of Fig. ES-1).

To initiate CBM production, groundwater and some of the injected fracturing fluids are pumped out (or "produced" in the industry terminology) from the fracture system in the coal seam (step 4 of Figure ES-1). As pumping continues, the pressure eventually decreases enough so that methane desorbs from the coal, flows toward, and is extracted through the production well (step 5 of Figure ES-1). In contrast to conventional gas production, the amount of water extracted declines proportionally with increasing CBM production. In some basins, huge volumes of groundwater are extracted from the production well to facilitate the production of CBM.

Figure ES-2. A Graphical Representation of the Hydraulic Fracturing Process in Coalbed Methane Wells

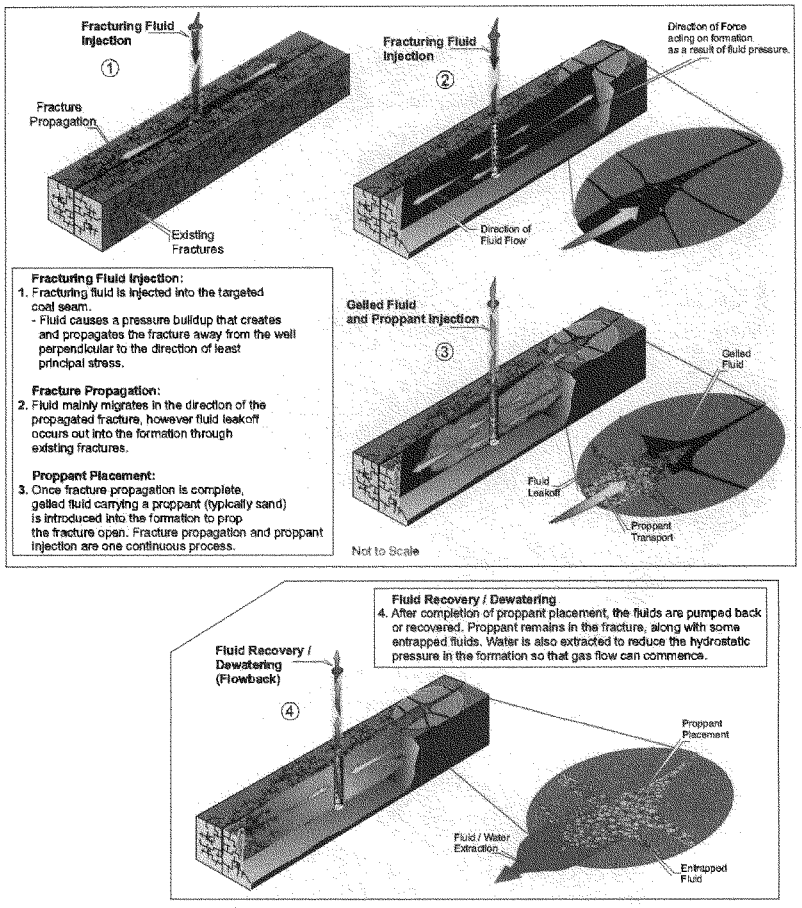
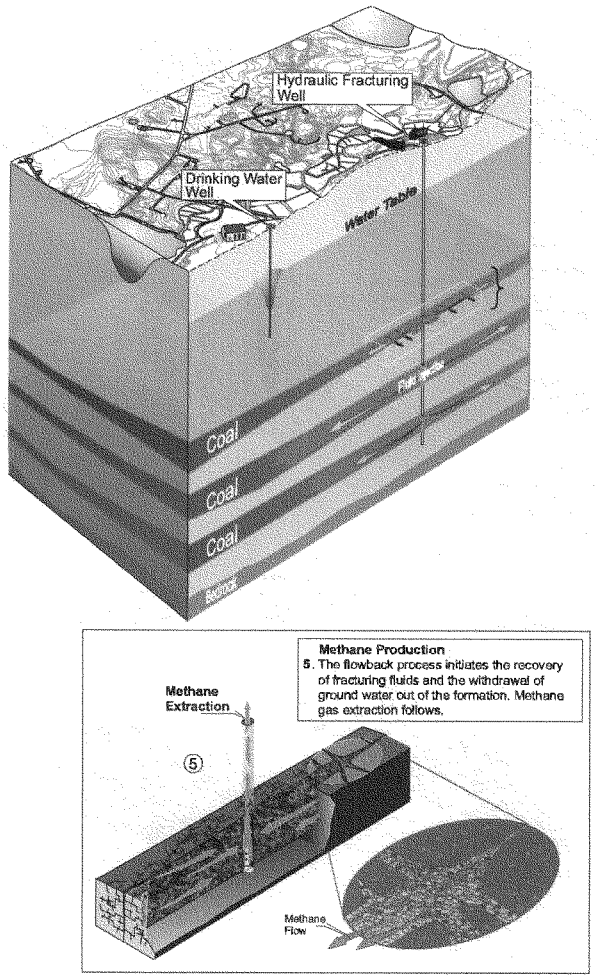


Figure ES-2. A Graphical Representation of the Hydraulic Fracturing Process in Coalbed Methane Wells (Continued)



ES-3 Why Did EPA Evaluate Hydraulic Fracturing?

SDWA requires EPA and EPA-authorized states to have effective programs to prevent underground injection of fluids from endangering USDWs (42 U.S.C. 300h et seq.). Underground injection is the subsurface emplacement of fluids through a well bore (42 U.S.C. 300h(d)(1)). Underground injection endangers drinking water sources if it may result in the presence of any contaminant in underground water which supplies or can reasonably be expected to supply any public water system, and if the presence of such a contaminant may result in such system's noncompliance with any national primary drinking water regulation (i.e., maximum contaminant levels (MCLs)) or may otherwise adversely affect the health of persons (42 U.S.C. 300h(d)(2)). SDWA's regulatory authority covers underground injection practices, but the Act does not grant authority for EPA to regulate oil and gas production.

In 1997, the Eleventh Circuit Court ruled, in *LEAF v. EPA* [LEAF v. EPA, 118F.3d 1467 (11th Circuit Court of Appeals, 1997)], that because hydraulic fracturing of coalbeds to produce methane is a form of underground injection, Alabama's EPA-approved Underground Injection Control (UIC) Program must effectively regulate this practice. In the wake of the Eleventh Circuit's decision, EPA decided to assess the potential for hydraulic fracturing of CBM wells to contaminate USDWs. EPA's decision to conduct this study was also based on concerns voiced by individuals who may be affected by CBM development, Congressional interest, and the need for additional information before EPA could make any further regulatory or policy decisions regarding hydraulic fracturing.

The Phase I study is tightly focused to address hydraulic fracturing of CBM wells and does not include other hydraulic fracturing practices (e.g., those for petroleum-based oil and gas production) because: (1) CBM wells tend to be shallower and closer to USDWs than conventional oil and gas production wells; (2) EPA has not heard concerns from citizens regarding any other type of hydraulic fracturing; and (3) the Eleventh Circuit litigation concerned hydraulic fracturing in connection with CBM production. The study also does not address potential impacts of non-injection related CBM production activities, such as impacts from groundwater removal or production water discharge. EPA did identify, as part of the fact-finding process, citizen concerns regarding groundwater removal and production water.

ES-4 What Was EPA's Project Approach?

Based on public input, EPA decided to carry out this study in discrete phases to better define its scope and to determine if additional study is needed after assessing the results of the preliminary phase(s). EPA designed the study to have three possible phases, narrowing the focus from general to more specific as findings warrant. This report describes the findings from Phase I of the study. The goal of EPA's hydraulic fracturing Phase I study was to assess the potential for contamination of USDWs due to the injection of hydraulic fracturing fluids into CBM wells and to determine based on these findings, whether further study is warranted.

Phase I is a fact-finding effort based primarily on existing literature. EPA reviewed water quality incidents potentially associated with CBM hydraulic fracturing, and evaluated the theoretical potential for CBM hydraulic fracturing to affect USDWs. EPA researched over 200 peer-reviewed publications, interviewed approximately 50 employees from industry and state or local government agencies, and communicated with approximately 40 citizens and groups who are concerned that CBM production affected their drinking water wells.

For the purposes of this study, EPA assessed USDW impacts by the presence or absence of documented drinking water well contamination cases caused by CBM hydraulic fracturing, clear and immediate contamination threats to drinking water wells from CBM hydraulic fracturing, and the potential for CBM hydraulic fracturing to result in USDW contamination based on two possible mechanisms as follows:

1. The direct injection of fracturing fluids into a USDW in which the coal is located (Figure ES-3), or injection of fracturing fluids into a coal seam that is already in hydraulic communication with a USDW (e.g., through a natural fracture system).

2. The creation of a hydraulic connection between the coalbed formation and an adjacent USDW (Figure ES-4).

Figure ES-3. Hypothetical Mechanisms - Direct Fluid Injection into a USDW (Where Coal Lies Within a USDW or USDWs)

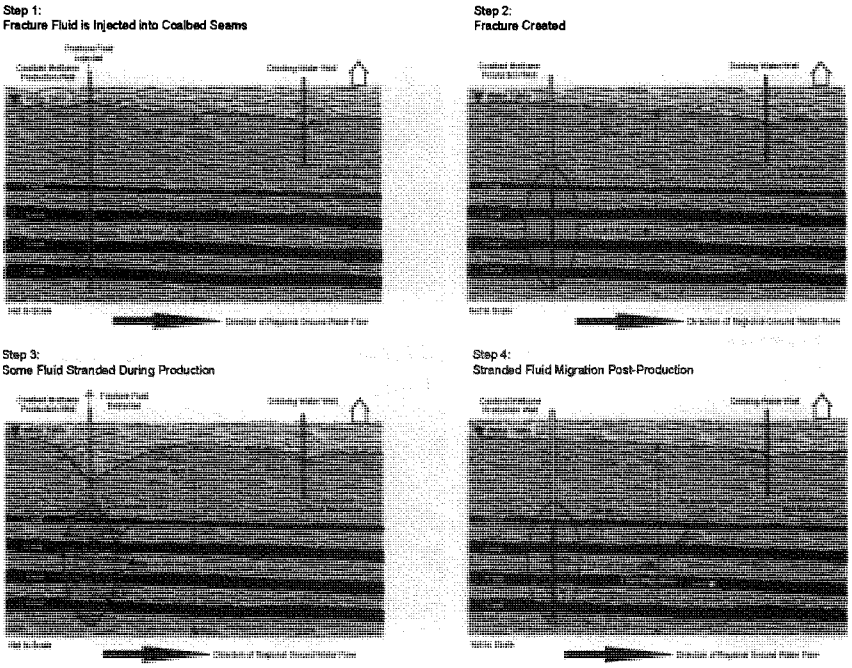
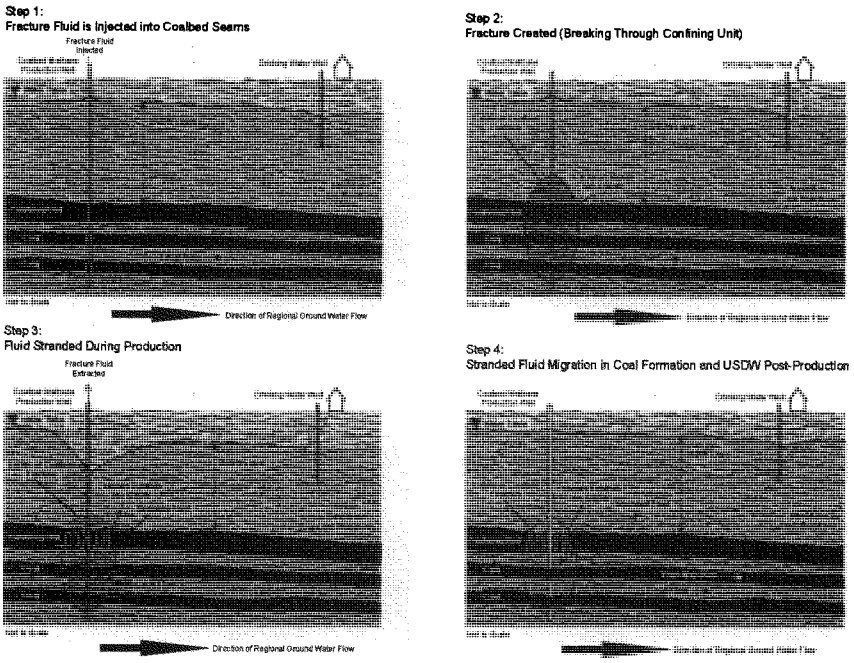


Figure ES-4. Hypothetical Mechanisms - Fracture Creates Connection to USDW



ES-5 How Do Fractures Grow?

In many CBM-producing regions, the target coalbeds occur within USDWs, and the fracturing process injects "stimulation" fluids directly into the USDWs. In other production regions, target coalbeds are adjacent to the USDWs (i.e., either higher or lower in the geologic section). Because shorter fractures are less likely to extend into a USDW or connect with natural fracture systems that may transport fluids to a USDW, the extent to which fractures propagate vertically influences whether hydraulic fracturing fluids could potentially affect USDWs.

The extent of the fractures is difficult to predict because it is controlled by the characteristics of the geologic formation (including the presence of natural fractures), the fracturing fluid used, the pumping pressure, and the depth at which the fracturing is being performed. Fracture behavior through coals, shales, and other geologic strata commonly present in coal zones depends on site-specific factors such as the relative thickness and in-situ stress differences between the target coal seam(s) and the surrounding geologic strata, as well as the presence of pre-existing natural fractures. Often, a high stress contrast between adjacent geologic strata results in a barrier to fracture propagation. An example of this would be where there is a geologic contact between a coalbed and an overlying, thick, higher-stress shale.

Another factor controlling fracture height can be the highly cleated nature of some coalbeds. In some cases, highly cleated coal seams will prevent fractures from growing vertically. When the fracturing fluid enters the coal seam, it is contained within the coal seam's dense system of cleats and the growth of the hydraulic fracture will be limited to the coal seam (see Appendix A).

Deep vertical fractures can propagate vertically to shallower depths and develop a horizontal component (Nielsen and Hansen, 1987, as cited in Appendix A: DOE, Hydraulic Fracturing). In the formation of these "T-fractures," the fracture tip may fill with coal fines or intercept a zone of stress contrast, causing the fracture to turn and develop horizontally, sometimes at the contact of the coalbed and an overlying formation. (Jones et al., 1987; Morales et al., 1990). For cases where hydraulically induced fractures penetrate into, or sometimes through, formations overlying coalbeds, they are most often attributed to the existence of pre-existing natural fractures or thinly inter-bedded layering.

ES-6 What Is in Hydraulic Fracturing Fluids?

Fracturing fluids consist primarily of water or inert foam of nitrogen or carbon dioxide. Other constituents can be added to fluids to improve their performance in optimizing fracture growth. Components of fracturing fluids are stored and mixed on-site. Figures ES-5 and ES-6 show fluids stored in tanks at CBM well locations.

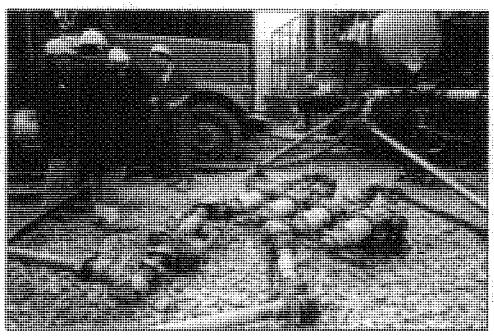
During a hydraulic fracturing job, water and any other additives are pumped from the storage tanks to a manifold system placed on the production wells where they are mixed and then injected under high pressure into the coal formation (Figure ES-6). The hydraulic fracturing in CBM wells may require from 50,000 to 350,000 gallons of fracturing fluids, and from 75,000 to 320,000 pounds of sand as proppant (Holditch et al., 1988 and 1989; Jeu et al., 1988; Hinkel et al., 1991; Holditch, 1993; Palmer et al., 1991, 1993a, and 1993b). More typical injection volumes, based on average injection volume data provided by Halliburton for six basins, indicate a maximum average injection volume of 150,000 gallons of fracturing fluids per well, with a median average injection volume of 57,500 gallons per well (Halliburton, Inc., 2003).

Figure ES-5. Water used for the fracturing fluid is stored on-site in large, upright storage tanks and in truck-mounted tanks.

EPA reviewed material safety data sheets to determine the types of additives that may be present in fracturing fluids. Water or nitrogen foam frequently constitutes the solute in fracturing fluids used for CBM stimulation. Other components of fracturing fluids contain benign ingredients, but in some cases, there are additives with constituents of potential concern. Because much more gel can be dissolved in diesel fuel as compared to water, the use of diesel fuel increases the efficiency in transporting proppant in the fracturing fluids. Diesel fuel is the additive of greatest concern because it introduces BTEX compounds, which are regulated by SDWA.

A thorough discussion of fracturing fluid components and fluid movement is presented in Chapter 4.

Figure ES-6. The fracturing fluids, additives, and proppant are pumped from the storage tanks to a manifold system placed on the wellhead where they are mixed just prior to injection.



ES-7 Are Coalbeds Located within USDWs?

EPA reviewed information on 11 major coal basins to determine if coalbeds are co-located with USDWs and to understand the CBM activity in the area. If coalbeds are located within USDWs, then any fracturing fluids injected into coalbeds have the potential to contaminate the USDW. As described previously, a USDW is not necessarily currently used for drinking water and may contain groundwater unsuitable for drinking without treatment. EPA found that 10 of the 11 basins may lie, at least in part, within USDWs. Table ES-2 identifies coalbed basin locations in relation to USDWs and summarizes evidence used as the basis for the conclusions.

ES-8 Did EPA Find Any Cases of Contaminated Drinking Water Wells Caused by Hydraulic Fracturing in CBM Wells?

EPA did not find confirmed evidence that drinking water wells have been contaminated by hydraulic fracturing fluid injection into CBM wells. EPA reviewed studies and follow-up investigations conducted by state agencies in response to citizen reports that CBM production resulted in water quality and quantity incidents. In addition, EPA received reports from concerned citizens in each area with significant CBM development. These complaints pertained to the following basins:

- San Juan Basin (Colorado and New Mexico);
- Powder River Basin (Wyoming and Montana);
- Black Warrior Basin (Alabama); and
- Central Appalachian Basin (Virginia and West Virginia).

Examples of concerns and claims raised by citizens include:

- Drinking water with strong, unpleasant taste and odor.
- Impacts on fish, and surrounding vegetation and wildlife.
- Loss of water in wells and aquifers, and discharged water creating artificial ponds and swamps not indigenous to region.

Water quantity complaints were the most predominant cause for complaint by private well owners. After reviewing data and incident reports provided by states, EPA sees no conclusive evidence that water quality degradation in USDWs is a direct result of injection of hydraulic fracturing fluids into CBM wells and subsequent underground movement of these fluids. Several other factors may contribute to groundwater problems, such as various aspects of resource development, naturally occurring conditions, population growth, and historical well-completion or abandonment practices. Many of the incidents that were reported (such as water loss and impacts on nearby flora and fauna from discharge of produced water) are beyond the authorities of EPA under SDWA and the scope of Phase I of this study.

Table ES-2. Evidence in Support of Coal-USDW Co-Location in U.S. Coal Basins

Basin	Are coalbeds found within USDWs?	Explanation and/or evidence
San Juan	Yes	A large area of the Fruitland system produces water containing less than 10,000 mg/L total dissolved solid (TDS), the water quality criterion for a USDW. Analyses taken from a selected coal well area (16 of 27 wells) show that produce water containing less than 10,000 mg/L TDS (Kaiser et al., 1994).
Black Warrior	Yes	Some portions of the Pottsville Formation contain waters that meet the quality criteria of less than 10,000 mg/L TDS for a USDW. According to the Alabama Oil and Gas Board, some waters in the Pottsville Formation do not meet the definition of a USDW and have TDS levels considerably higher than 10,000 mg/L (Alabama Oil and Gas Board, 2002). In the early 1990s, several authors reported fresh water production from coalbed wells at rates up to 30 gallons per minute (in Pashin et al., 1991; Elard et al., 1992).
Piceance	Unlikely	The CBM producing Cameo Coal Zone and the lower aquifer system in the Green River Formation are more than 6,000 feet apart. The coal zone, lies at great depth, roughly 6,000 feet below the ground surface in a large portion of the basin (Tyler et al., 1998). A composite water quality sample taken from 4,637 to 5,430 feet deep within the Cameo Coal Zone in the Williams Fork Formation exhibited a TDS level of 15,500 mg/L (Graham, 2001). The produced water from CBM extraction in the Piceance Basin is of such low quality that it must be disposed of in evaporation ponds, re-injected into the formation from which it came, or re-injected at even greater depths (Tessin, 2001).
Uinta	Likely	The water quality in the Ferron and Blackhawk varies greatly with location, each having TDS levels below and above 10,000 mg/l (Utah Department of Natural Resources, 2002)
Powder River	Yes	A report prepared by the United States Geological Survey (USGS) showed that samples of water co-produced from 47 CBM wells in the Powder River Basin all had TDS levels of less than 10,000 mg/L (Rice et al., 2000). The water produced by CBM wells in the Powder River Coal Field commonly meets drinking water standards. In fact, production waters such as these have been proposed as a separate or supplemental source for municipal drinking water in some areas (DeBruin et al., 2000).
Central Appalachian	Likely	Depths of coal groups are coincident with fresh water in at least two of the states within the overall basin (Kelafant et al., 1988; Wilson, 2001; Foster, 1980; Hopkins, 1966; USGS, 1973). Anecdotal information suggests that private wells in Virginia are screened within coal seams (Wilson 2001; VDMME, 2001).

Basin	Are coalbeds found within USDWs?	Explanation and/or evidence
Northern Appalachian	Yes	The depth of each coal group within the basin is coincident with the depths of USDWs (Kelafant et al., 1988; Platt, 2001; Foster, 1980; Hopkins, 1996; USGS, 1973; Sedam and Stein, 1970; USGS, 1971; Duigon, 1985). Water quality data from eight historic Northern Appalachian Coal Basin projects show TDS levels below 10,000 mg/L (Zebrowitz et al., 1991).
Western Interior:		
Arkoma	Yes (in Arkansas) Unlikely (in Oklahoma)	The depths of coalbeds within Arkansas are coincident with depths to fresh water (Andrews et al., 1998; Cordova, 1963; Friedman, 1982; Quarterly Review, 1993). Based on maps provided by the Oklahoma Corporation Commission (OCC) showing depths of the 10,000 mg/L TDS groundwater quality boundary in Oklahoma, the location of CBM wells and USDWs would most likely not coincide in that state. This is based on depths to coals typically greater than 1,000 feet (Andrews et al., 1998) and depths to the base of the USDW typically less than 900 feet (OCC Depth to Base of Treatable Water Map Series, 2001).
Cherokee	Yes	The depths of coalbeds in Kansas are coincident with depths to fresh water (Quarterly Review, 1993; Macfarlane, 2001; DASC, 2001a).
Forest City	Unlikely	The thinness of the aquifer suggests that there is significant separation from the deeper coalbeds within the basin (Bostic et al., 1993; DASC, 2001b; Condra and Reed, 1959; Flowerday et al., 1998).
Raton	Yes	Water quality results from CBM wells in the Raton Basin demonstrate TDS content of less than 10,000 mg/L. Nearly all wells surveyed show a TDS of less than 2,500 mg/L, and more than half had TDS of less than 1,000 mg/L (National Water Summary, 1984).
Sand Wash	Yes	Two gas companies produced water from coals that showed TDS levels below 10,000 mg/L. At Craig Dome in Moffat County, Cockrell Oil Corporation drilled 16 CBM wells. The wells yielded large volumes of fresh water with TDS <1,000 mg/L (Colorado Oil and Gas Commission, 2001). Fuelco was operating 11 wells along Cherokee arch. Water pumped from the wells contained 1,800 mg/L of TDS and was discharged to the ground under a National Pollution Discharge Elimination System (NPDES) permit (Quarterly Review, 1993).
Pacific and Central Coal Regions	Yes	Data from a 1984 study demonstrates the co-location of a coal seam and a USDW in Pierce County. Water quality information from four gas test wells indicates TDS levels between 1,330 and 1,660 mg/L, well below the 10,000 mg/L criterion (Dion, 1984). Wells in the basalts commonly yield 150 to 3,000 gallons per minute. TDSs levels in the water produced generally range from 250 to 500 mg/L (Dion, 1984).

ES-9 What Are EPA's Conclusions?

Based on the information collected and reviewed, EPA has determined that the injection of hydraulic fracturing fluids into CBM wells poses little or no threat to USDWs. Continued investigation under a Phase II study is not warranted at this time.

As proposed in the Final Study Design (April 2001), Phase I of the study was a limited–scope assessment in which EPA would:

- Gather existing information to review hydraulic fracturing processes, practices, and settings;
- Request public comment to identify incidents that have not been reported to EPA;
- Review reported incidents of groundwater contamination and any follow-up actions or investigations by other parties (state or local agencies, industry, academia, etc.); and,
- Make a determination regarding whether further investigation is needed, based on the analysis of information gathered through the Phase I effort.

EPA's approach for evaluating the potential threat to USDWs was an extensive information collection and review of empirical and theoretical data. EPA reviewed incidents of drinking water well contamination believed to be associated with hydraulic fracturing and found no confirmed cases that are linked to fracturing fluid injection into CBM wells or subsequent underground movement of fracturing fluids. Although thousands of CBM wells are fractured annually, EPA did not find confirmed evidence that drinking water wells have been contaminated by hydraulic fracturing fluid injection into CBM wells.

EPA also evaluated the theoretical potential for hydraulic fracturing to affect USDWs through one of two mechanisms:

1. Direct injection of fracturing fluids into a USDW in which the coal is located, or injection of fracturing fluids into a coal seam that is already in hydraulic communication with a USDW (e.g., through a natural fracture system).
2. Creation of a hydraulic connection between the coalbed formation and an adjacent USDW.

Regarding the question of injection of fracturing fluids directly into USDWs, EPA considered the nature of fracturing fluids and whether or not coal seams are co-located with USDWs. Potentially hazardous chemicals may be introduced into USDWs when fracturing fluids are used in operations targeting coal seams that lie within USDWs. In particular, diesel fuel contains BTEX compounds, which are regulated under SDWA.

However, the threat posed to USDWs by the introduction of some fracturing fluid constituents is reduced significantly by the removal of large quantities of groundwater (and injected fracturing fluids) soon after a well has been hydraulically fractured. In fact, CBM production is dependent on the removal of large quantities of groundwater. EPA believes that this groundwater production, combined with the mitigating effects of dilution and dispersion, adsorption, and potentially biodegradation, minimize the possibility that chemicals included in the fracturing fluids would adversely affect USDWs.

Because of the potential for diesel fuel to be introduced into USDWs, EPA requested, and the three major service companies agreed to, the elimination of diesel fuel from hydraulic fracturing fluids that are injected directly into USDWs for CBM production (USEPA, 2003). Industry representatives estimate that these three companies perform approximately 95 percent of the hydraulic fracturing projects in the United States.

In evaluating the second mechanism, EPA considered the possibility that hydraulic fracturing could cause the creation of a hydraulic connection to an adjacent USDW. The low permeability of relatively unfractured shale may help to protect USDWs from being affected by hydraulic fracturing fluids in some basins. If sufficiently thick and relatively unfractured shale is present, it may act as a barrier not only to fracture height growth, but also to fluid movement. Shale's ability to act as a barrier to fracture height growth is primarily due to the stress contrast between the coalbed and the shale. Another factor controlling fracture height can be the highly cleated nature of some coalbeds. In some cases, when the fracturing fluid enters the coal seam, it is contained within the coal seam's dense system of cleats and the growth of the hydraulic fracture will be limited to the coal seam (see Appendix A).

Some studies that allow direct observation of fractures (i.e., mined-through studies) indicate many fractures that penetrate into, or sometimes through, one or more formations overlying coalbeds can be attributed to the existence of pre-existing natural fractures. However, given the concentrations and flowback of injected fluids, and the mitigating effects of dilution and dispersion, adsorption, and potentially biodegradation, EPA does not believe that possible hydraulic connections under these circumstances represent a significant potential threat to USDWs.

It is important to note that states with primary enforcement authority (primacy) for their UIC Programs implement and enforce their regulations, and have the authority under SDWA to place additional controls on any injection activities that may threaten USDWs. States may also have additional authorities by which they can regulate hydraulic fracturing. With the expected increase in CBM production, the Agency is committed to working with states to monitor this issue.

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Senator LAUTENBERG. Thank you, Madam Chairman.

Are you aware of any chemicals of concern in the hydraulic fracturing process?

Ms. GILES. Senator, my understanding is that Congress has exempted hydraulic fracturing from the provisions of the Safe Drinking Water Act, so we do not——

Senator LAUTENBERG. But my question goes beyond that. Is there any, do you have any information, has anybody looked at it to see whether there is any, there are any chemicals of concern used in the process?

Mr. SILVA. I would have to get back to you, Senator.

Senator LAUTENBERG. I find it surprising, because we ought to certainly know that.

Ms. Giles, I asked you before, what is being done to ensure that States carry out their responsibility for enforcement under the Safe Drinking Water Act? What is being done? You, before, said that you are, I think, reviewing it. Just tell me, is there anything being done? There is only 6 percent of the polluters that have been punished for water violations.

Ms. GILES. Senator, the EPA does retain a State oversight responsibility for the States that have primacy under the Safe Drinking Water Act, and the enforcement approach that issued today is about how that oversight should be undertaken——

Senator LAUTENBERG. That should be undertaken——

Ms. GILES. Working with the States to identify the existing violations——

Senator LAUTENBERG. Ms. Giles, I am sorry that we are missing one another here on this. But is there anything currently being done to make certain—or at least get some sense of what the States are doing to enforce it?

Ms. GILES. There is a current oversight protocol which is what I am revising today. But the existing protocol is that States are required to report to EPA when there are violations of the Safe Drinking Water Act——

Senator LAUTENBERG. But is anything—what I deduce is that you are saying no, in some terms. So, I am going to assume that little is being done.

Ms. GILES. I think perhaps I am not being clear, Senator.

Senator LAUTENBERG. Not for me. Perhaps for everybody else.

Ms. GILES. The existing protocol is that when there is a violation at a drinking water system of a contaminant standard under the Safe Drinking Water Act, that there is required to be an escalating series of enforcement responses to try to return that system to compliance.

What we are doing today is focusing that enforcement protocol so that instead of a contaminant by contaminant approach it is a system based approach so that we make sure we return the whole system to compliance and that we are holding ourselves and the States to a high standard for getting those systems into compliance.

Senator LAUTENBERG. Would you argue with the fact that there are only a maximum 6 percent of the polluters that have been punished for water violations? Is that——

Ms. GILES. I am not sure where that number comes from. Under the Safe Drinking——

Senator LAUTENBERG. Frankly, it comes from the New York Times. They may not be the perfect monitor. But do you think there is a lot more progress than that?

Ms. GILES. Well, under the Safe Drinking Water Act, we do, as I mentioned earlier, start with trying to provide compliance assistance and then——

Senator LAUTENBERG. I know, but you are talking about process. I am talking about results. Forgive me, please.

Ms. GILES. The important thing is whether the system returns to compliance. That is what is important. And that is what we are attempting to do here. The penalty provisions of the Safe Drinking Water Act are somewhat different from the provisions of other Federal environmental laws. And what they provide is that EPA has to, before it can take a penalty action, first issue an administrative order and only for violations of an administrative order can we assess——

Senator LAUTENBERG. Thank you very much, Ms. Giles.

Senator BOXER. Senator Klobuchar.

Senator KLOBUCHAR. Thank you very much, Madam Chair.

Just to follow up on Senator Lautenberg's questions. I know that back in July, Ms. Giles, that Administrator Jackson directed you and Mr. Silva to work with the States or the 10 regional offices of the EPA to work with them and with the States to have more transparency in the water quality enforcement. Could you talk about the status of those efforts?

Ms. GILES. Certainly. Yes, in July, the Administrator directed me to work with Assistant Administrator Silva to develop a plan to improve our enforcement for the Clean Water Act Program, which is the discharges to surface waters of the United States. And, as you point out here, there is a connection, a direct connection, between that and safe drinking water because two-thirds of Americans do obtain their drinking water from surface water supplies.

So, the current status is, as mentioned earlier, we have released data on what the compliance information we have is and how the government has responded. We are targeting the sources that have the most significant effects on clean water, including specifically where there is an affected drinking water system to make sure that we return those systems to compliance.

And we have started work on a rule for electronic reporting of the discharge data so that we can improve both the transparency and the accuracy of the information. So, we are hard at work on making sure that we are targeting the most important work on the roughly 1 million sources that affect surface water quality.

Senator KLOBUCHAR. Very good. I have just always found that no matter what agency you are dealing with, or what level of government, that that transparency really can spur people to action, if that information gets out there.

Then the second thing I wanted to get back to, Mr. Silva, is we have talked here about ways to get at this problem. One is clearly enforcement and transparency and openness to get out the problem. But the second is this infrastructure issue, because that is what I hear the most around my State. And I was surprised at

your answer and maybe you want to go back and look at it just, I mean, I am going to give you just one example in the city of Oronico, which is just north of Rochester. They had a mix of old and newer housing with no municipal water or sewer system. In the older part of the town, septic systems on small lots were causing private well contamination for approximately 100 households.

With the help of the $1.3 million with the principal forgiveness that came from the Recovery Act, and some money from the Drinking Water State Revolving Loan Fund, this city, this town of Oronico, was able to build a municipal drinking water system to provide safe water. And I have just heard these kinds of needs from all over our State.

So, I hope you will go back and look at that, because I think it is a combination of, as I said, of this enforcement, but also this declining infrastructure, particularly in these small towns that you have both identified as the ones that are having the most problems. They just simply cannot afford it. They have less than 10,000 people. And it is trying to help them, collecting data on their wells, which we have done well in our State, and then helping them to get the update infrastructure in place. OK?

Thank you very much.

Senator BOXER. Thank you, Senator.

Senator Cardin, and then Senator Whitehouse.

Senator CARDIN. Thank you, Madam Chair.

Ms. Giles, I want to get an update from you on how we are proceeding in regard to mercury and mercury in our waters. Mercury-laden seafood, the warnings go out all the time, and the amount of mercury load in our rivers is well above any recognized level of safety. Can you just give me—and I will talk a little specifically about some of the concerns in Maryland coming in from the Shenandoah. But where are as far as mercury?

Ms. GILES. Well, Senator, I think that the principal source of mercury in surface waters comes from the air, and that is where rules are being considered by EPA now about control of mercury emissions from utilities, at least within the United States. So, it is a help to contribute to reducing the load of mercury in our waters, that is where we are looking.

Senator CARDIN. There is at least some evidence that the mercury coming in from plant activity is affecting Maryland waters, the Potomac. There is a long history of concerns about water that enters in through the South Fork Shenandoah River, dealing with industrial activities in Pennsylvania and in Virginia.

Let me just give you one number that has been given to me, and maybe you want to counter that as not being accurate. About 416 pounds of mercury get into the South River per year, and the mercury contamination stretches from Waynesboro for 125 miles downstream to Front Royal, and that Virginia is considering developing the total maximum daily loads of not to exceed 4 pounds per year, which would be a 99 percent reduction. Are you saying all of that is from the air?

Ms. GILES. Senator, I am not familiar with the specific circumstances of that one river that you are referring to. In addition to the air sources of contamination, there are, of course, some site-specific concerns, especially hazardous waste sites that might be

cleaned up that could be sources of mercury, too. And the program does look at those. I can get back to you as to that specific river and let you know what those——

Senator CARDIN. Well, if you would get back with the specifics, I would appreciate that.

I guess I share the Chairman's urgency here. Mercury contamination is a significant health care risk for people in our community, and the levels appear to be way too high. And there are warnings given out all the time about not eating certain seafood. I come from a State in which the seafood industry is critically important to our economy and to our way of life.

Whether it is airborne or pollutant activities on industrial use or whatever, we need a game plan to deal with this. If it is air, and part of the problem clearly is airborne, we need that strategy, and this committee is working on it. I just wish there was a greater sense of urgency in some of these replies as to these issues.

Ms. GILES. Well, Senator, I am sorry I am not familiar with those specific circumstances. But I would have to say I think this Administration does share your sense of urgency, that the need to address clean water, both in our rivers and from the tap, and we are—this is a top priority for this Administration, and that is why we have devoted some attention here to try to make sure that we beef up our enforcement actions as well as the other mechanisms that Administrator Silva has discussed.

Senator CARDIN. Thank you.

Thank you, Madam Chair.

Senator BOXER. Thank you.

Senator Whitehouse.

Senator WHITEHOUSE. Thank you, Madam Chair.

The New York Times, which I think has been cited already today, reports that for over a quarter of water systems have violated the arsenic or radioactive standards, there is no record that they were ever contacted by a regulator, even after they sent in paperwork revealing those violations. Those figures are particularly worrisome, say researchers, because the Safe Drinking Water Act limits on arsenic are so weak to begin with. A system could deliver tap water that puts residents at a 1 in 600 risk of developing bladder cancer from arsenic and still comply with the law.

I am not sure what the story means by 1 in 600 risk of developing bladder cancer. Does that mean that in a small community of 6,000 people, if water was delivered at that level, there would be 10 cases of bladder cancer? Is that what the 1 in 600 means?

Mr. SILVA. I am assuming so, although I am not an expert in those kinds of numbers. But I do not know whether USGS—are you familiar with that?

Mr. LARSEN. We do not really deal with risk assessment. That is how I would interpret it, based on what you just reported. But I would have to look more closely at the numbers to know the risk.

Senator WHITEHOUSE. Cynthia, Ms. Giles. We are both from Rhode Island, so we are on a first name basis outside the hearing, and I slipped into that.

Ms. GILES. Senator, that was also my understanding, but I would also describe myself as not an expert in risk assessment. The violations of arsenic standards are of concern, and it is something that

we have been working on, both on the compliance side and on the enforcement side. There have been a number of enforcement actions taken for systems in violation of the arsenic standards, and that is something that we are looking closely at. It is a particular challenge, of course, for the smaller systems.

Senator WHITEHOUSE. Yes. If that is the number, that is a little town of 6,000, 10 cases of bladder cases is a lot. In a medium-sized town of 60,000, that is 100 people stricken with bladder cancer. You get up to the size of the State of Rhode Island, you are talking about 1,500 people. That is a pretty high toll. Bladder cancer is a very serious cancer. So, I hope that will be part of the examination.

Mr. SILVA. And again, we feel we have made progress on the road to, hopefully, get to all the systems eventually.

Senator WHITEHOUSE. Thank you.

Thank you, Madam Chair.

Senator BOXER. Well, colleagues, we are going to end this first panel. But I just have to say we are looking forward to your specific responses.

What I am going to take away from this is that we are going to know in 6 months if you are going to regulate perchlorate, we anticipate that you are going to take enforcement actions starting in January against these systems that have been out of compliance and are endangering our children, you are going to look at ways that you can be more involved in protecting our children in these small systems, and we are going to follow up, I am, at least, and any of my colleagues who have concerns, are going to follow up with a letter with specific points so that there is no confusion.

You have a lot to time to make up for. But you have the information. The information is there. The New York Times piece is very clear. They are fair. They say, these systems reported that they were out of compliance on some of the most serious and dangerous chemicals and toxins. You have the information. You need to take the action.

And I would say the vast majority of this committee, and I am not speaking for all, believe me, but the vast majority of this committee expects you to take action to protect our kids and our families. And anything less than that we will consider a stall. So, we expect action. Not just plans, not just good answers and ideas, but specific action, because these bad actors need to be called to account. And nothing helps more than that. I love the idea of electronic filing, but that is going to take time. You have the information in your possession. And so we expect action.

And I thank you so much from the bottom of my heart for your being here, for your answering these tough questions. But this is a message to you from a lot of us that we want to see more. And we thank you very, very much.

Senator INHOFE. Madam Chairman.

Senator BOXER. Yes.

Senator INHOFE. For the record, I would like to insert the one-page summary of the national study and final report of the EPA on hydraulic fracturing.

Senator BOXER. Absolutely, it will be done.

[The referenced information follows:]

EPA United States Environmental Protection Agency

Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs; National Study Final Report

Summary

EPA has published a final report summarizing a study to evaluate the potential threat to underground sources of drinking water (USDWs) from the injection of hydraulic fracturing fluids into coalbed methane (CBM) production wells. As in its August 2002 draft report, EPA has concluded that additional or further study is not warranted at this time. In making this decision, EPA reviewed more than 200 peer-reviewed publications, other research, and public comments. The Agency has concluded that the injection of hydraulic fracturing fluids into CBM wells poses minimal threat to USDWs.

In its review of incidents of drinking water well contamination believed to be associated with hydraulic fracturing, EPA found no confirmed cases that are linked to fracturing fluid injection into CBM wells or subsequent underground movement of fracturing fluids. Further, although thousands of CBM wells are fractured annually, EPA did not find confirmed evidence that drinking water wells have been contaminated by hydraulic fracturing fluid injection into CBM wells. Where fluids are injected, EPA believes that groundwater production, combined with mitigating effects of dilution and dispersion, adsorption, and biodegradation, minimize the possibility that chemicals included in fracturing fluids would adversely affect USDWs.

In the course of conducting the study, EPA found that diesel fuel, which may pose some environmental concerns, was sometimes used in fluids for hydraulic fracturing within USDWs. To address any environmental concerns, EPA worked with the three service companies that perform 95% of the hydraulic fracturing projects in the U.S. to voluntarily remove diesel fuel from CBM fracturing fluids injected into USDWs. The three companies agreed and signed a Memorandum of Agreement (MOA) to that effect in December 2003.

Background

Coalbed methane is a gas contained in varying quantities within all coal. Hydraulic fracturing of production wells is technology that has been used for more than 50 years in conventional oil and gas production to enhance recovery by enlarging fractures through which oil and gas, including CBM, can be drawn to a well and pumped to the surface. Water-based fluids have become the predominant type of CBM fracturing fluids; although fluids can also be based on oil, methanol, or a combination of water and methanol. After fluids are injected to expand fractures within a coal seam, large quantities of ground water and some of the injecting fracturing fluids are pumped out of the well to facilitate the production of CBM. Additional technical information on the practice of hydraulic fracturing can be found in the final report.

In 1997, in *LEAF v. EPA*, the Eleventh Circuit Court ruled that, because hydraulic fracturing of coalbeds to produce methane gas is a form of underground injection, Alabama's EPA-approved underground injection control (UIC) program must effectively regulate this practice. In response to the Eleventh Circuit's decision, citizen complaints, and Congressional interest, EPA made the determination to investigate the potential for hydraulic fracturing of CBM wells to contaminate USDWs.

In addition to reviewing more than 200 peer-reviewed publications, EPA also interviewed 50 employees from state or local government agencies and communicated with approximately 40 citizens who were concerned that CBM production impacted their drinking water wells. EPA made a draft of the report available for a 60-day public comment period in August 2002. Comments received from more than 100 commentors, including private citizens, environmental and citizen groups, government agencies, oil and gas companies, and trade associations, have been summarized in a Response to Comments document that is available on the EPA website.

For More Information

The final report and a Response to Comments document can be found on the EPA website at http://www.epa.gov/safewater/uic/cbmstudy.html. The Memorandum of Agreement to remove diesel fuel from hydraulic fracturing fluids and general information about the UIC program are available at http://www.epa.gov/safewater/uic.html.

Environmental and Public Health Benefits

This notice does not impose any new regulations, information collection, or record-keeping burden on the public or other entities. The publication of the final report will not change the environmental or public health benefits of the UIC program.

Office of Water (4606M) **EPA 816-F-04-017** June 2004 www.epa.gov/safewater

Senator BOXER. We thank you again, and we will call up our second panel. Thanks again.

We will call up Jerome Paulson, Professor, the George Washington University School of Public Health and Health Services, on behalf of the American Academy of Pediatrics; Michael Baker, President, Association of State Drinking Water Administrators; Gene Whatley, Executive Director, Oklahoma Rural Water Association.

We need the panel to leave quietly, please, because we are inviting up our panelists.

Gene Whatley, Executive Director, Oklahoma Rural Water Association, and Jeffrey Griffiths, Professor, Tufts University, Chair of the EPA Science Advisory Committee.

And unless there is any other way you want to do it, I guess I will just simply start with the way it is explained to me here on this list, which would be Jerome Paulson first, Professor of the George Washington University School of Public Health on behalf of the American Academy of Pediatrics.

Dr. Paulson.

STATEMENT OF JEROME A. PAULSON, M.D., FAAP, PROFESSOR, THE GEORGE WASHINGTON SCHOOL OF PUBLIC HEALTH AND HEALTH SERVICES, ON BEHALF OF THE AMERICAN ACADEMY OF PEDIATRICS

Dr. PAULSON. Good morning. Thank you for this opportunity to testify today before the Committee on Environment and Public Works regarding safe drinking water and children's health. My name is Dr. Jerome Paulson, and I am a proud representative of the American Academy of Pediatrics.

The safety of our Nation's drinking water is of primary importance to child health. The general water supply is used for drinking, cooking, preparation of infant formula for children who are not breast fed, and bathing. Contamination of the water supply has obvious implications for children who may swallow, inhale or have skin contact with pollutants.

As with many types of exposures, children are more vulnerable than adults to adverse effects from water contamination. Children drink more water per pound of body weight than do adults. Drinking water is consumed in a number of forms, as water, liquid used to reconstitute infant formula, reconstitute juice or other drinks, and in cooking.

Household water supplies can lead to inhalation exposures if volatile substances or gases such as organic solvents or radon are present in the water and when water vapor from showering is inhaled. Contaminated bathing water can result in exposure by ingestion or dermal contact. Young children are particularly at risk because they swallow more water while bathing than do older children and adults. They are babies. What can you say?

The effect of exposure on children's health may vary widely depending upon the nature of the pollutant, its concentration, duration of exposure and other factors. In general, however, their developing minds and bodies place children at disproportionate risk to toxins of any kind. Exposure during sensitive windows of development or periods of growth may have even more serious adverse

health consequences. Because children live longer than adults, those outcomes which take years to manifest themselves have ample time to become apparent as the individual exposed as a child becomes an adult.

Under the Safe Water Drinking Act of 1974, the EPA is responsible for setting national standards for both naturally occurring and human made contaminants that may be found in drinking water. EPA works in partnership with States and localities and water systems to monitor safety and ensure compliance.

As is the case with many public health programs, however, costs and benefits of providing safe drinking water accrue to different parties. While water systems, schools or individual consumers bear the cost of installing, maintaining or upgrading systems, the financial benefits of those outlays are most often seen in other areas, such as lowered health care costs.

Policymakers have the responsibility of balancing the many competing interests and assuring that public health and children's health are protected. My written testimony describes in greater detail the challenges associated with both public water supplies and private wells.

Schools present a special challenge. Although a variety of pollutants may be present in school water supplies, the presence of lead has been the subject of specific attention from the media, Congress and EPA. In 1988, Congress passed the Lead Contamination Control Act in an attempt to reduce lead levels in drinking water in schools. The law requires monitoring of water in schools and replacement of fixtures if excess lead is found.

The law contains two key weaknesses, however. First, it requires remediation to take place only after a problem is detected and after children may have been exposed rather than attempting to deal prospectively with the problem. Second, there are no enforcement provisions in the law. Compliance is voluntary and requires local and State government entities to cooperate in order for effective implementation to take effect.

As with many other environmental hazards in schools, no one is really in charge in this situation. Therefore, it is not surprising that numerous reports in the press and medical literature have documented that lead continues to be found in drinking water in schools. Without enforcement authority, EPA is forced to rely upon voluntary programs such as the three Ts—training, testing and telling. While this is certainly a commendable effort its effectiveness is limited because the agency is unable to compel action in those cases where violations persist.

Certain contaminants are known to pose specific health hazards for children. You will find in my written testimony a table that outlines some of the most common pollutants in drinking water and their health impacts on children. A handful of these pollutants merit special consideration due to their known hazards to children's health, including coliforms, lead, nitrates, volatile organic compounds, pesticides, and perchlorate.

The American Academy of Pediatrics makes the following recommendations on maintaining and improving the safety of drinking water in the United States. Safe drinking water must continue to be a priority given the fundamental importance of water to

human health. We must continue to prioritize drinking water safety among the activities at EPA and State and regulatory agencies.

Federal regulators must increase oversight and technical assistance to State and localities. EPA Administrator Jackson has made welcome statements increasing the agency's activities on safe drinking water. But the agency must work effectively with State regulators and water systems to actually improve water safety. Serious and repeated violations should be identified and pursued aggressively.

Congress should increase funding for EPA's efforts on clean water and safe drinking water. Schools and child care providers need more assistance in assuring the safety of their drinking water. Steps must be taken to establish clear lines of responsibility for testing school water supplies and correcting deficiencies. Communities should not wait until children are exposed or ill.

More attention should be paid to the safety of private water supplies such as wells, and the EPA should increase funding for pediatric environmental health specialty units.

Thank you, Madam Chairman.

[The prepared statement of Dr. Paulson follows:]

TESTIMONY OF JEROME A. PAULSON, MD FAAP
ON BEHALF OF THE AMERICAN ACADEMY OF PEDIATRICS

ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE

December 8, 2009

Department of Federal Affairs
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202-347-8600 / 800-336-5475 / Fax 202-393-6137

Good morning. I appreciate this opportunity to testify today before the Committee on Environment and Public Works regarding safe drinking water and children's health. My name is Jerome A. Paulson, MD, FAAP, and I am proud to represent the American Academy of Pediatrics (AAP), a non-profit professional organization of more than 60,000 primary care pediatricians, pediatric medical sub-specialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. I currently serve on the AAP's Council on Environmental Health, and I co-direct the Mid-Atlantic Center for Children's Health & the Environment, a Pediatric Environmental Health Specialty Unit based at Children's National Medical Center here in Washington, D.C.

The safety of our nation's drinking water is of primary importance to child health. The general water supply is used for drinking, cooking, preparation of infant formula for children who are not breastfed, and bathing. Contamination of the water supply has obvious implications for children who may swallow, inhale, or have skin contact with pollutants. The fundamental importance of safe drinking water has long been recognized as a public health issue; in fact, the field of public health is traditionally considered to have begun with clean water, when in 1854 Dr. John Snow traced a deadly cholera outbreak to the Broad Street water pump in London.

The passage of the Safe Drinking Water Act of 1974 (SDWA) marked a significant public health victory in underscoring the importance of clean water and establishing federal standards. While much progress has been made in improving the safety and

cleanliness of water supplies, major challenges remain. A variety of systemic issues present barriers to further progress, and a range of specific pollutants must be addressed.

Children Are Vulnerable to Water Contaminants

As with many types of exposures, children are more vulnerable than adults to adverse effects from water contamination. Children drink more water per pound of body weight than do adults. Drinking water is consumed in a number of forms: as water, as a liquid used to reconstitute infant formula, in juice and other drinks, and in cooking. Household water supplies can lead to inhalation exposures if volatile substances or gases (e.g. organic solvents, radon gas) are present in the water and when water vapor from showering is inhaled. It has been estimated that 50 percent of the total exposure to volatile organic compounds in drinking water is via this inhalation route. Contaminated bathing water can result in exposures via ingestion or dermal contact as well. Young children are particularly at risk because they swallow more water when bathing than do older children and adults.[1]

The effects of exposure on children's health may vary widely depending upon the nature of the pollutant, its concentration, duration of exposure, and other factors. In general, however, their developing minds and bodies place children at disproportionate risk to toxins of any kind. Exposure during sensitive windows of development or periods of growth may have even more serious adverse health consequences. Because children live longer than adults, those outcomes which take years to manifest themselves have ample time to become apparent as the individual, exposed as a child, becomes an adult.

Congress Should Address Systemic Issues on Safe Drinking Water

Under the SDWA, the U.S. Environmental Protection Agency (EPA) is responsible for setting national standards for both naturally-occurring and man-made contaminants that may be found in drinking water. EPA works in partnership with states, localities, and water systems to monitor safety and ensure compliance.

As is the case with many public health programs, however, the costs and benefits of providing safe drinking water accrue to different parties. While water systems, schools, or individual consumers bear the various costs of installing, maintaining, or upgrading systems, the financial benefits of those outlays are most often seen in other areas, such as lower health care costs. Policymakers have the responsibility of balancing the many competing interests and ensuring that public health and children's health are protected.

Water Systems

Public Water Supplies. According to EPA, approximately 90 percent of Americans receive their drinking water through public systems that draw and filter water from underground or from surface sources like rivers, lakes, and reservoirs.[ii] The approximately 155,000 water systems across the nation vary widely. Under the Government Performance and Results Act, a number of goals were set for providing water that complies with health-based drinking water standards for over 80 contaminants to over 90 percent of people served by 90 percent of water systems by the year 2011.[iii]

While EPA regulates public water systems and has the power to enforce safe drinking water standards, the patchwork nature of water systems across the nation poses a significant challenge. Traditionally, EPA and state regulators have emphasized efforts to bring systems into compliance rather than punish infractions; however, this has unfortunately meant that in some cases, significant violations have not been pursued aggressively in order to prevent recurrences. Recent investigative reports by the *New York Times* and others have underscored the human cost of allowing such violations to persist.[iv]

Noncommunity Water Systems. Approximately 15 percent of households in the United States obtain their water from private wells.[v] Private wells are not subject to EPA regulation and are minimally regulated by states. These water systems are vulnerable to many of the same issues and pollutants as public systems, but they usually involve no monitoring, meaning that consumers are almost universally ignorant of contamination when it occurs. The American Academy of Pediatrics issued a new policy statement and accompanying technical report on well water issues in mid-2009.[vi,vii]

Drinking Water in Schools

Schools that receive water from public systems and schools that meet the definition of a public water system are regulated under the SDWA. Although a variety of pollutants may be present in school water supplies, the presence of lead has been the subject of specific attention from the media, Congress, and EPA.

The 1986 SDWA Lead Ban requires the use of "lead-free" pipe, solder and flux in public water systems or in plumbing in a residential or nonresidential facility providing water for human consumption. However, "lead-free" as defined by Congress allows 0.2% lead in solder and flux and up to 8% in pipes and pipe fittings.[viii] This contradiction may allow small amounts lead to be present in drinking water in schools.

In 1988, Congress passed the Lead Contamination Control Act (P.L. 100-572) in an attempt to reduce lead levels in drinking water in schools. The law requires monitoring of water in schools and replacement of fixtures if excess lead is found. The law contains two key weaknesses, however. First, the law requires remediation to take place only after a problem is detected, and after children may have been exposed, rather than attempting to deal prospectively with the problem. Second, there are no enforcement provisions in the law. Compliance is voluntary and requires local and state government entities to cooperate in order for effective implementation to take place. As with many other environmental health hazards in schools, no one is "in charge;"[ix] not surprisingly, therefore, it has been documented in numerous reports in the press and medical literature that lead continues to be found in drinking water in schools.[x,xi,xii,xiii] Without enforcement authority, EPA is forced to rely upon voluntary programs such as "3Ts -Training, Testing, and Telling." While this is certainly a commendable effort, its effectiveness is limited because the agency is unable to compel action in those cases where violations persist.

Concerns Associated with Specific Contaminants

Certain contaminants are known to pose specific health hazards for children. Below is a table that outlines some of the most common pollutants in drinking water and their health impact on children.

Table 1: Potential Types of Chemical Contamination of Well Water

Chemical	Source	Effects
Nitrates	Sewage Fertilizer	Methemoglobinemia Possible promoter of carcinogenesis
Volatile organics and pesticides	Dry cleaning agents, gasoline, etc. Often source cannot be identified	Compound-specific effects
Lead	Leached from the brass in a submersible pump, from solder, or from old lead pipes	Impairs neurocognitive development
Arsenic	Occurs in specific rock formations, (e.g., the "slate belt" in the southeastern United States, Nevada, Alaska, and other areas in the western United States)	Acutely toxic carcinogenic (bladder, skin, and lung) in humans
Chromium VI	Used in the electroplating and other industries	Toxic and carcinogenic in laboratory animals
Radon	Naturally occurring radioactive gas	Carcinogenic (lung) in humans
Fluoride	Naturally in water in a few parts of the United States	Accepted preventive for dental caries, supplement if low concentrations Too much can cause dental fluorosis
Uranium	Naturally occurring in western mountains in the United States and in areas that have granite outcrops in the eastern United States	High dose is acutely toxic A source of ionizing radiation, which causes cancer
Methyl tertiary butyl ether	Partially oxidized hydrocarbon fuel additive used to oxygenate gasoline	Carcinogenic in laboratory animals
Perchlorate	Oxidizing agent used in rocket fuels, fireworks, and airbag	Inhibits synthesis of thyroid hormone

	inflators, among other applications Can occur naturally	

Source: Committee on Environmental Health and Committee on Infectious Disease. Drinking Water from Private Wells and Risks to Children. *Pediatrics*. Jun 2009; 125:1599-1603.

A handful of these pollutants merit special consideration due to their known hazard to child health.

Coliforms. Coliforms refers to a family of bacteria capable of causing gastroenteritis. The most common source of coliforms in drinking water is fecal contamination. Monitoring for fecal coliforms is a standard practice in public water systems. In children, coliforms can cause a wide range of illness, from mild gastroenteritis to sickness requiring hospitalization.[xiv]

Lead. Lead is often not present in groundwater but can be leached from old lead pipes, from brass, or from solder, particularly in cases where the water is naturally acidic or is made acidic by treatment.

There is no "safe" level of lead exposure. Childhood exposure to lead is associated with decrements in IQ;[xv,xvi] attention deficit, reading disabilities, and failure to graduate from high school;[xvii] and increased aggression, commission of crime and antisocial or delinquent behaviors.[xviii,xix,xx,xxi]

Nitrates. The source of nitrates in drinking water is either sewage or fertilizer. Nitrates themselves are not toxic to humans, but can be converted to more reactive and toxic

nitrites by gut bacteria. Nitrates in drinking water above the EPA level of 10 micrograms/liter may cause fatal methemoglobinemia in infants.[xxii]

Volatile Organics and Pesticides. These chemicals and compounds are very mobile and can appear without specific identifiable sources. Examples include formaldehyde, organophosphates, and pyrethroids. For some of these substances, the health effects are well documented; for example, acute exposure to many pesticides can cause nausea, vomiting, seizures, and even death. Frequently, however, low-level, chronic and mixed exposures to volatile organics and pesticides are poorly studied, particularly in infants and children.[xxiii]

Perchlorate. Perchlorate is an oxidizing agent used in rocket fuels, fireworks, and airbag inflators. It also occurs naturally. Perchlorate interferes with the function of thyroid hormone and, thereby, has the potential to cause brain damage.[xxiv] It is now recognized as a water pollutant. There is evidence that perchlorate interferes with thyroid function in adult women in the U.S., even at background exposures.[xxv]

Other drinking water contaminants of concern include arsenic, methylmercury, chromium, radon, fluoride (at high concentrations), uranium, methyl tertiary butyl ether (MTBE), polychlorinated biphenyls and dioxins, disinfectants, and infectious microorganisms other than coliforms.[xxvi]

AAP Recommendations

The American Academy of Pediatrics makes the following recommendations on maintaining and improving the safety of drinking water across the United States.

Safe drinking water must continue to be a priority. Given the fundamental importance of water to human health, we must continue to prioritize drinking water safety among the activities at EPA, state, and local regulatory agencies.

Federal regulators must increase oversight and technical assistance to states and localities. EPA Administrator Lisa Jackson has made encouraging progressive statements about increasing the agency's activities on safe drinking water. The agency must work extensively with state regulators and water systems to improve water safety. Serious and repeat violations should be identified and pursued aggressively.

Congress should increase funding for EPA's efforts on clean water and safe drinking water. EPA's efforts to improve the safety of drinking water are inhibited by low staffing and funding levels. Congress must provide the resources necessary for the agency to perform its work appropriately.

Schools and child care providers need more assistance in assuring the safety of their drinking water. Steps must be taken to establish clear lines of responsibility for testing school and child care center water supplies and correcting deficiencies. Communities should not wait until children are ill before moving to identify and address these issues.

More attention should be paid to the safety of private water supplies, such as wells. Information about local ground water conditions should be readily available, along with resources to assist homeowners in understanding test results and address problems.

EPA should increase funding for Pediatric Environmental Health Specialty Units

(PEHSUs). Pediatric Environmental Health Specialty Units serve a vital function in providing each of the ten EPA regions with direct access to pediatric environmental health experts. The Units could be directed to use a portion of this funding to increase the education of health and education professionals and others about water contaminants and the impact of those contaminants on the health of children.

In conclusion, the American Academy of Pediatrics commends you, Madam Chair, for convening this hearing on the importance of safe drinking water for children's health. I appreciate this opportunity to testify, and I look forward to your questions.

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April 20, 2010

The Honorable Barbara Boxer
Chairman
Senate Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Boxer:

The American Academy of Pediatrics (AAP) appreciates this opportunity to answer your additional questions following my testimony at a hearing of the Senate Environment and Public Works Committee.

1. *Your testimony refers to "sensitive windows of development or periods of growth" where exposure to contaminations "may have even more serious adverse health consequences" for children than at other times. Could you please describe that concept in greater detail, and how it relates to protecting children's health?*

The concept of *"sensitive windows of development or periods of growth"* holds that there are aspects of growth or development that can only occur at proscribed times. When toxic substances interfere with that aspect of growth or development at that specific time, there is no "going back" and correcting the abnormality that occurred. Moreover, it is also a recognition that if that aspect of growth or development did not occur at the specific time, events that were programmed to follow either do not occur or do not occur properly. Different organs (e.g., the brain, liver, lungs, etc.) will have different sensitive windows; some of the sensitive windows can be as short as hours to days, while others can be as long as years. In general, the shorter sensitive windows occur prior to birth and the longer sensitive windows occur after birth.

Some of the best know examples of the impact of toxicants during specific sensitive windows of development are the adverse effects of certain drugs or toxic substances taken by women during pregnancy. For example, the adverse effect of thalidomide on the developing fetus is greatest during the third to eighth week of conception. The effect on the fetus of alcohol use by the mother during pregnancy is worse when used earlier in pregnancy. On the other hand, the sensitive window of development for the adverse effect of air pollution on the growth of the lungs probably extends through many years of childhood. Lead has its greatest adverse effect when infants and young children are exposed.

There is certainly reason to expect that there are other "critical windows of exposure;" however, with the exceptions noted above and a few others, relatively few such windows have actually been defined. This area is the subject of intense investigation.

Some of the work on "critical windows" was published in a landmark special supplement to the journal *Environmental Health Perspectives*. For example:

- The first six months after birth is a potential critical window for testis development. Animal models indicate that exposure to the pesticide atrazine during this period alters prolactin levels and causes inflammation of the prostate in the adult male rat.
- Rat, mouse and chicken models show that several critical windows exist for lead-induced developmental immunotoxicity, including decreased immune response in children exposed within the first seven weeks of life.
- Children exposed to methyl mercury during the early postnatal years, a critical window in neurodevelopment, may develop blindness as a result of malformed sensory processes.

While these preliminary studies are intriguing, more research is needed on all fronts to identify critical developmental windows and refine our understanding of the impact of environmental toxicants. In particular, one would expect that there are critical windows of development during the intense period of metabolic, growth and developmental changes that occur during adolescence although no such windows have been identified yet.

Regulatory policies usually do not take into account the unique combinations of developmental characteristics, physical environment and biological environment that place children at risk. Most laws and regulations are based on studies using adult men weighing 70 kilograms, and, hence, are intended to protect adult men. However, advances have been made to change regulations to protect children. For example, the Food Quality Protection Act of 1996 states that pesticide tolerances must be set to protect the health of infants and children. The U.S. Environmental Protection Agency (EPA) enacted more stringent regulations on outdoor air quality to protect children. The Consumer Product Safety Improvement Act of 2008 set strict limits on lead in products designed for children under the age of 12.

2. *Should Agencies focus just on the water that infants and children drink to determine the range of potential exposures to a dangerous chemical, or should an Agency analyze other types of exposure, too?*

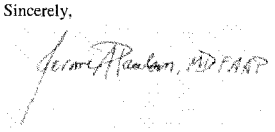
In order to determine the range of potential exposures to a toxicant, agencies should perform a complete exposure assessment. This assessment must accurately characterize all important sources of a particular toxicant in the environment (e.g., point or non-point source), identify sources of exposure (e.g., groundwater, surface water, air, soil, food, breast milk), and quantify the exposure (e.g., microgram per liter in drinking water, microgram per gram in soil). Examples of common exposures in children include licking fingers after touching lead dust (ingestion), pesticides being absorbed into the blood stream through the skin (dermal), and breathing high levels of volatile organic compounds (inhalation).

Increasingly in recent years, biomarkers for various environmental toxicants have been developed that can be measured directly in representative exposed populations to eliminate some of the uncertainties in modeled exposures.

For more information on either topic, you may wish to refer to the Academy's *Pediatric Environmental Health* handbook.

Again, thank you for providing the opportunity to respond to your questions. Please do not hesitate to call upon the AAP whenever we may be of assistance on children's health issues.

Sincerely,



Jerome Paulson, MD FAAP

Senator BOXER. We will next turn to Michael Baker, President, Association of State Drinking Water Administrators.

Welcome, sir.

STATEMENT OF MICHAEL G. BAKER, PRESIDENT, ASSOCIATION OF STATE DRINKING WATER ADMINISTRATORS

Mr. BAKER. Thank you, Madam Chairman, committee members.

I can assure you that State drinking water programs take our responsibility of ensuring that public water systems comply with safe drinking water requirements extremely seriously. We recognize that the health and well-being of our citizens and our communities are dependent on their having access to adequate supplies of safe drinking water.

Overall, our public water systems do a good job. In general, community systems do a better job than non-community systems, and larger systems tend to do a better job than smaller ones. One hundred percent compliance by all public water systems with all drinking water requirements continues to be our goal. Admittedly, achieving that goal is challenging.

For instance, contaminants in our sources of drinking water such as nutrients associated with non-point sources of pollution continue to be a problem. The number and complexity of drinking water requirements continue to grow as does the technology required for meeting those requirements. New arsenic, disinfection byproduct and radionuclide rules have been a particular challenge due to the large number of small water systems and some large that have had to meet those more stringent standards for the first time.

When a public water system does have violations, a variety of approaches can be used to return them to compliance. Those approaches can be taken with or without formal enforcement actions depending on the nature and severity of the violation. Bringing systems back into compliance is not easy, but it can be done. In Ohio, for example, we used a combination of outreach, technical assistance, financing, and when necessary enforcement to bring systems into compliance with the arsenic standard.

In 2003, we had 153 systems that were exceeding the new standard. Today, we have 14 systems that are still exceeding the standard, and all but 2 of those are in some kind of enforcement action to return them to compliance.

I will mention that States do support and actually help develop the revised approach for identifying and prioritizing significant non-compliers for enforcement, as mentioned by Administrator Giles. However, before enforcement comes into play the most reliable approach to ensuring compliance at public water systems is to enhance their overall technical, managerial and financial capacity. Reactive approaches after violations occur tend to be more expensive, more time consuming and less protective of public health.

With that in mind and with the support of Senator Voinovich and Senator Brown, the Ohio EPA has been providing training to our local decisionmakers to make sure that they have the managerial and fiscal knowledge necessary to operate and maintain their public water systems. States do not support waiving standards or lowering the bar for systems due to financial challenges and thus allowing for two tiers of public health protection.

Safe drinking water in schools is vitally important. States recognize that children are particularly sensitive to certain contaminants such as lead, and States have taken action to address drinking water compliance at our schools.

Whether building capacity at the local level or conducting oversight and enforcement activities, to be successful States and public water systems have to have adequate resources. We commend Congress for increased funding for drinking water infrastructure through both the Recovery Act and the 2010 appropriations.

States also appreciate the efforts of this committee to reauthorize the SRF programs, and overall we support the proposed changes in that legislation. We particularly appreciate the increased funding but also the increased flexibility in the use of the set asides and the emphasis on increasing the capability of our public water systems.

But without question, if we are going to improve drinking water compliance, State drinking water programs need more resources. And while not the direct purview of this committee, I do ask your support for increased funding for the State Public Water Supply Supervision Grant, which has been the primary source of Federal support for State drinking water programs.

In summary, States take very seriously our ongoing challenge of ensuring public water systems comply with all requirements. In cooperation with our partners at the Federal, State and local level, we believe we have, given the challenges, a solid record of success. But we know collectively we can and need to do better.

We appreciate Federal support for the SRF programs and this committee's particular efforts to support reauthorization of those programs. However, if we are going to fully recognize the public health protection goals that we all seek State drinking water programs need more resources to implement and enforce the Safe Drinking Water Act.

Thank you for the opportunity to offer testimony, and I would be pleased to answer any questions.

[The prepared statement of Mr. Baker follows:]

Association of State Drinking Water Administrators

Testimony of Michael G. Baker
before the Senate Environment and Public Works Committee
December 8, 2009

Who Are We?

The Association of State Drinking Water Administrators (ASDWA) represents the collective interests of the 50 state drinking water programs, the District of Columbia, the five territories, and the Navajo Nation in their efforts to provide safe drinking water to their citizens. State drinking water programs operate "source to tap" programs – implementing all relevant aspects of the Safe Drinking Water Act (SDWA) within their jurisdictions. *(The exception is Wyoming, which does not have "primacy" for directly implementing drinking water regulations within the state.)*

What are the Demographics of Water Systems in the U.S.?

To appreciate the challenge of ensuring compliance with the SDWA, it's important to understand the universe of water systems to which the Act applies. Public water systems in the U.S. can be divided into two principal groups: *community water systems* serving cities, villages, counties and various types of residential facilities (of which there are approximately 50,000) and *non-community water systems* (of which there are approximately 100,000). Non-community water systems can be further subdivided into *non-transient* water systems (e.g. schools and manufacturing facilities) and *transient* water systems (e.g. restaurants and camp grounds). (Please see the definitions on the attachment for more complete information about demographics.) Most of the citizens in the U.S. receive their water from large community water systems, but the overwhelming number of systems are *small* (serving less than 10,000 people). This fact has real implications for the challenges that states, EPA, and water systems themselves face in complying with drinking water regulations. Thus, effective public health protection must involve strategies for both addressing the greater number of citizens served by larger water systems as well as approaches designed to help medium and small water systems comply with all applicable drinking water requirements.

How do States (and EPA) Ensure Compliance with Drinking Water Regulations?

Principal State Roles

State drinking water programs take their responsibility of ensuring public water systems are in compliance with drinking water requirements extremely seriously. States recognize the health and well being of their citizens and communities is dependent on receiving safe and reliable drinking water. In brief, this responsibility involves informing water systems of requirements; ensuring they have the capability to implement and comply with those requirements; and providing oversight to ensure they continue to comply. The overarching objective of states, in all of these efforts, is to get and keep water utilities in compliance, thereby protecting public

health. Ideally, this process occurs proactively on the part of water systems; however, if not, states will undertake an escalating series of compliance and enforcement actions to return a facility to compliance. Some further details about each of these activities are provided below:

- **Informing:** Most water systems do not read the *Federal Register* on a routine basis and many do not have full time staffs. Thus, states reach out to water systems to inform them of all applicable requirements. Many states also translate the Federal regulations into more user-friendly state-specific regulations and guidance documents. States may also include additional state requirements, beyond the Federal minimums.

- **Training/Technical Assistance**: States (along with technical assistance providers[1] and EPA) spend considerable time training water facilities to enhance their overall technical, managerial, and financial capacities to comply with all rules as well as providing rule-specific training, where appropriate. Proactive approaches to building this capacity, on the part of water systems, which helps ensure long term compliance, is by far the best and most effective approach to public health protection. Reactive approaches (after problems occur) tend to be expensive, time-consuming, and less protective of public health.

  [1]*Note: States are assisted in their efforts by technical assistance (TA) providers – either under direct contract to states or through national contracts. The principal TA providers are the Rural Community Assistance Partnership (RCAP), the National Rural Water Association (NRWA), and state affiliates of the American Water Works Association.*

- **Compliance/Enforcement Actions**: States spend a great deal of their time conducting on-site inspections and reviewing various water quality reports to ensure public water systems are complying with all drinking water requirements. When a system is not in compliance, a state will employ an escalating series of responses appropriate to the severity of the violation. For instance, minor infrequent violations can often be addressed by a phone call or letter. Ongoing, more serious violations warrant more serious responses – up to and including fines and penalties levied through Administrative Orders or Consent Decrees. These orders typically contain a date certain for coming into compliance with interim steps required by the water system – often associated with construction of new treatment facilities or enhancement of the treatment system.

Principal EPA Roles

EPA's Office of Ground Water and Drinking Water, together with the ten EPA Regional offices oversee the activities of the states in their respective regions in connection with compliance and enforcement activities. EPA is also engaged in each of the areas summarized above, in concert with their state counterparts. EPA (and EPA-funded Technical Assistance Centers) have been instrumental in providing outreach and training materials to help water systems understand their obligations in connection with particular rules or across-the-board capacity-building approaches. Rule training materials are most useful when they're provided "upfront" (i.e., at the same time or shortly after a new rule is promulgated) and EPA has been very attuned that need in recent years. For instance, EPA's Simple Tools for Effective Performance (STEP guides) have been extremely valuable outreach tools in explaining various aspects of the program to small water systems. Similarly, the Agency's Check-up Program for Small Systems (CUPSS) provides a

user-friendly computer program for small systems to assess their financial capacity and to undertake long range planning. EPA also provides (through their Office of Research and Development) information about treatment options and analytical methods that water systems may use to help comply with drinking water regulations. Finally, EPA holds states accountable for getting and keeping water systems in compliance and may elect to take enforcement action at a state's request, in those instances where a state is unable to take the requisite action as well as in the infrequent event a state fails to do so (referred to as "over-filing"). It's worth noting that states still expend significant resources even in those cases where EPA takes the lead for an enforcement case, since the state will typically have much of the site-specific information needed for case development.

Public Water Systems' Compliance with Regulations

Overall, public water systems do a very good job maintaining compliance with SDWA requirements. Community systems tend to do a better job than non-community systems and larger systems tend to do better than smaller. Larger community water systems provide safe drinking water as their principal function; thus, states are typically dealing with entities that are every bit as dedicated to provision of safe drinking water as are states. This often is not the case with certain smaller community systems (including manufactured home parks or community homeowner associations) and the many types of non-community water systems. Small water systems have poorer economies of scale and often lack in-house expertise for operating and maintaining water systems.

However, there are also some good success stories and models that can be cited (as summarized below). States are committed to safe drinking water for all consumers of water from public water systems – we do not support "lowering the bar" to allow two tier public health protection. Rather, we believe all of the "tools in the toolbox" should be brought to bear on these challenges. The small system variance provisions of the SDWA (that would allow for a less stringent regulatory level for certain small systems) should be a last resort under very circumscribed circumstances.

When a public water system has violations, a variety of approaches can be used to return them to compliance. These approaches generally fall into the following categories and can be taken proactively (i.e., in the absence of a formal enforcement action) or reactively (i.e., in response to an enforcement action).

- **Rule-Based Training and Technical Assistance:** Training on the specific requirements of particular regulations (by EPA, states, or technical assistance providers) – especially, where new, complex rules are promulgated (e.g., the Ground Water Rule).

- **Upgrading Existing or Installing New Treatment:** Installation of new treatment facilities where needed to reduce levels of a particular contaminant (or groups of contaminants). Grants and loans through the Drinking Water SRF, USDA, and HUD have been instrumental, over the years, in helping to build needed infrastructure. An encouraging phenomenon sometimes seen with new technologies is that costs may actually go down over time, as more treatment options become available and those

technologies are used on a more widespread basis (e.g., certain of the arsenic treatment technologies).

- **Enhancing Overall Water System Capacity:** Training and assistance (by states or technical assistance providers) of water system owners and operators to enhance the overall technical, managerial, and financial capacity of water systems. This includes ensuring proper certification of the system operator as well as education of Water Utility Boards or other governmental entities about the importance of adequately funding the operation and maintenance of their community's water utility. It also includes comprehensive management of utility assets and water pricing structures that reflect the full cost of producing and conveying water.

- **Managerial and/or Physical Consolidation:** To help improve economies of scale, some small communities have found it possible to physically integrate both their infrastructure and their managerial structure. In some cases, physical consolidation may not be possible, but managerial consolidation may still offer benefits and savings.

What are Some Good Examples of these Approaches being Effectively Used?

States use an array of approaches to ensure compliance with drinking water regulations and support water system needs. States' efforts have targeted particular technical, managerial, or financial needs of water systems to enhance their ability to achieve and maintain compliance with national primary drinking water regulations and to protect public health. These actions can be as simple as education and outreach to a community council or homeowner's association or as complex as advice about operation and maintenance of complex water treatment processes. For example, in my own experience, as the Ohio drinking water administrator, we undertook the following initiatives:

- We used a combination of outreach, technical assistance, financing and when necessary enforcement to achieve compliance with the new arsenic standard. In 2003 we had 153 public water systems with arsenic levels greater than10 ug/l. We now have just 14 systems exceeding the MCL and all but two of those, which just exceeded the standard this year, are in some type of enforcement to return to compliance.

- A specific strategy being used in Ohio of which I am particularly proud is our efforts to ensure local decision makers have the necessary managerial and fiscal knowledge to maintain compliance with the SDWA. Co-sponsored by Senators Voinovich and Brown, Ohio EPA and the Great Lakes Rural Communities Assistance Program offered water infrastructure training seminars. These seminars were designed to equip community officials with the skill, templates, and informational resources necessary for placing utilities on a long-term path to success.

Other states can share similar success stories and I offer several below. The last three examples are but a few of the many recent examples of water utility compliance issues that are being effectively addressed through funding provided by the American Recovery and Reinvestment Act (ARRA).

- **New Hampshire's Drinking Water Program** performed extensive outreach and enforcement to educate water system owners, operators and small treatment firms on the most feasible and cost effective options to address the MCLs for arsenic and uranium. As a result, of the 205 systems with historical arsenic detections above the 10 ppb MCL, ony 15 remain out of compliance as of September 30 2009, but all are on a schedule to address this contaminant, pending major infrastructure upgrades or funding assistance. For uranium, only 5 of approximately 40 systems with historical uranium above the 30 ppb MCL remain out of compliance -- all on schedules to address this contaminant within a short timeframe.

- **Kansas' Drinking Water Program** has instituted a statewide capacity development program called "KanCap" that provides training, outreach, and education to governing boards of small water systems. Over the past year, Kansas trained 102 individuals representing 56 public water supply systems. The drinking water program also has devised "Rate Check-Up", a rate-setting software tool that is available at no cost to public water supply systems. In FY 2009, 62 systems worked through the process to help them better manage and balance their financial conditions.

- **Massachusetts' Drinking Water Program** has created a mentoring group for contract operators (i.e., "circuit-riders") within the state that manage 220 systems. As a result, more than 400 of the state's open enforcement actions have been closed out. In a proactive effort to mitigate operator workforce shortages (15-20% retirements expected), the state has created a Drinking Water Operator Training Initiative to train the next generation of operators (200-300) for small water systems; provide them with practical field experience opportunities (10-20 state-supported internships); and establish positive relationships with the state regulatory agency. One of the principal areas of focus is on what and how an operator functions to help the water system with its technical, financial, and managerial capabilities to maintain public health protection goals and compliance with drinking water regulations.

- **Nebraska's Drinking Water Program** has used SRF set-asides to provide operator education, awareness, and technical assistance for smaller water utilities. This assistance has resulted in a consistent reduction of significant deficiencies in sanitary surveys (a comprehensive facility inspection done by states). In a five year timeframe, there has been a 60% reduction in deficiencies – from 1,330 in 2003 down to 530 in 2008.

- **California's Drinking Water Program** partners with assistance providers to help communities like Rainbird Valley work through rate setting exercises and roles/responsibilities training for Boards of Directors. This assistance has led to interest in forming a regional water supply entity in concert with 13 other local very small water systems. This consolidation will offer greater economies of scale; improve system operations and management; and collectively help the systems attain and maintain compliance.

- **Wisconsin's Drinking Water Program** provided a subsidized loan to the community of Suring, Wisconsin (a small disadvantaged community) that will enable the community to install an arsenic removal system and address a long-standing source of contamination. The project also includes a number of "green" elements.

- **Washington State's Drinking Water Program** provided a subsidized loan to the community of Skate Creek Terrace to enable the community to install corrosion control treatment, a new reservoir, and replace an aging water distribution system. The project will result in protecting customers from lead and copper contaminated water, as well as provide infrastructure that will ensure safe and reliable water in the future.

- **Ohio's Drinking Water Program** provided subsidized loans to the Village of Cumberland to enable this small Village to abandon their water plant and purchase water from the Village of Byesville. The Village of Cumberland is a disadvantaged community with a population of 402 people and a median household income of $29,792 and simply did not have the ability to maintain their failing water system.

Elaboration on some of these examples and additional examples of state strategies to support water system needs, improve their capabilities, and enhance public health protection within their communities can be found as an appendix to this testimony.

Why Can't All Systems be In Compliance All of the Time?

One hundred per cent compliance by all public water systems with all drinking water regulations and requirements remains our ultimate goal. However, water systems face several challenges in achieving that goal. Sources of drinking water are often contaminated, to various degrees, as a result of point and nonpoint sources of pollution – consisting of both regulated and unregulated contaminants. Particularly challenging are contaminants, including nutrients , associated with non-point source runoff. Water facilities must then attempt to remove these contaminants, which can be both technically challenging and expensive. (Our funding recommendations below take this reality into consideration.)

Further, the number and complexity of drinking water regulations continue to grow as the complexity of the treatment needed to comply with those regulations. States oversee and water systems implement regulations addressing over 90-plus contaminants. It is not unusual for a large water system to have literally thousands of rule obligations over the course of a month with which they must comply and report. Thus, there are many opportunities for error to creep in, despite our collective best efforts. Overall, the SDWA regulatory implementation process works remarkably well, however, we continue to work in partnership -- EPA, states, water systems, and TA providers/consultants -- to get and keep water systems in compliance with all applicable rules.

What is the Role of Accurate and Reliable Data and Information?

Accurate and reliable information about state and national drinking water programs is a fundamental cornerstone of our collective efforts. Reliable data allows us to accurately set

priorities for compliance and enforcement activities and to know when these efforts have been successful. States expend considerable resources ensuring the data they collect, maintain and report is accurate and reliable. States are currently engaged in a workgroup with EPA to "drill down" into data reliability questions and issues to help address remaining data quality problems; however, it should be noted that as state resources become more strained it becomes more and more difficult for states to direct limited resources on data maintenance activities.

What Special Challenges Exist in Implementing Recently Promulgated Regulations *(e.g., Arsenic/Radionuclides)?*

Special challenges are associated with implementing new or revised rules. First, there is the challenge of fully understanding what the rule requires, at a particular water utility, in terms of monitoring and reporting. However, the most daunting challenge is often putting in place the necessary treatment to comply with the rule or augmenting existing treatment.

New arsenic, disinfection by-product, and radionuclide rules have been a particular challenge for many states due to the large number of small public water systems that, for the first time, are having to meet the more stringent standards. In many cases, these new standards have necessitated installation of treatment where there was no treatment before. Heretofore, many of these systems simply pumped and distributed ground water to their customers (with or without disinfection, depending upon the state and the water system in question). In addition, treatment to remove arsenic or radium (the principal contaminant of concern in the radionuclides rule) can be expensive. As time goes on, the range of treatment options has become more diverse and costs have tended to go down; but, these treatment options still represent a significant expense to small systems with fewer customers to share the costs. Safe disposal of the residuals remaining after treatment (particularly, where such residuals are deemed hazardous or radioactive) can also be expensive and extremely challenging. Operation and maintenance of these treatment systems often requires a level of expertise that may not exist in these water systems. Many of the various challenges associated with complying with new rules are also true of larger systems that serve considerable populations. While many of these systems may have full time staffs or consultants at their disposal, states must also be ensure that such systems take all appropriate steps along a path to compliance with the new rules.

What Special Challenges Exist in Implementing Regulations in Schools *(especially the Lead and Copper Rule)?*

Most schools are served by community water systems. While water that meets all of the requirements of the Lead and Copper Rule may be delivered to the school by the community water system, the school's own water distribution system, water fountains, and restroom faucets may add unacceptably high levels of lead and/or copper to the water prior to consumption. In these cases, the community water system and the school need to work in tandem to address the problem – typically, by installing new plumbing devices and water fountains.

A relatively small minority of schools (typically, in rural areas not served by a community water systems) are themselves considered public water systems (they are deemed to be non-transient non-community water systems). Such systems face many of the same challenges of small public

water systems generally (i.e., lack of in-house expertise, poor economies of scale to provide a revenue basis for making needed improvements, etc.). State drinking water programs work directly with such systems (along with TA providers and consultants) to get and keep them in compliance with all applicable regulations.

The special sensitivities and susceptibilities of children to many contaminants also underscores the need, as described below under the emerging contaminants discussion, for an expeditious process for making regulatory decisions about contaminants of concern.

How Can Current Approaches be Improved?

We believe the best and most reliable approach to ensuring compliance is to work with water systems to enhance their overall technical, managerial, and financial capacity to get and stay in compliance. Helping these systems lay a strong foundation in these three areas will go a long way toward improving compliance with SDWA requirements. It is perhaps analogous to the classic example of providing a fish for a day versus teaching someone to fish. Enhancing water system capacity is like the latter, in that it provides a built-in ability to better ensure compliance over the long term. That overall result takes a concerted effort by EPA, states, and TA providers – adequate resources to do so. Our recommendations with regard to increased resources for states and an improved process for setting enforcement priorities are as follows.

Resource Needs (How Congress Can Help)

Congress is to be commended for dramatically increasing funding for the Drinking Water SRF. Congress appropriated $2 billion in supplemental appropriations through the American Recovery and Reinvestment Act in FY 09 (on top of the baseline appropriation of approximately $830 million) and about $1.4 billion in FY 10. Those funding levels have had and will continue to have a major impact on the ability of states to provide funding to some of the most "needy" water systems. States will continue to strive to be wise stewards of those funds and work to address many long-standing public health problems. States will also coordinate with Federal and local officials with respect to other sources of funding, such as loans offered by the U.S. Department of Agriculture, to help address as many water system needs as possible.

We also appreciate Congress' very substantial support for increased levels for the Clean Water SRF -- well beyond amounts dedicated to the Drinking Water SRF. However, we take note of the fact that both clean water and drinking water infrastructure "gaps" are roughly comparable and thus believe the Drinking Water SRF could be boosted even further to levels commensurate with the Clean Water SRF. We also recommend that more focus and accountability be placed on addressing pollution that contaminates sources of drinking water. For instance, Congress could add provisions to the Clean Water SRF that a certain percentage of the funds or funding priority be given to cleaning up or preventing pollution of drinking water sources. As an example of the connection between the two issues, a recent state-EPA report on nutrient contamination, "An Urgent Call to Action", was clear in establishing the linkage between point and nonpoint sources of pollution and impaired sources of drinking water.

It's hard to get past resources when considering ways that Congress can help states directly. State drinking water programs have two principal sources of Federal revenue to administer their programs: the Public Water Supply and Supervision (PWSS) Grant and set-asides from the Drinking Water SRF. (These funds are supplemented, in many states, by state general funds and state fees for service charged to water utilities; these sources of revenue are used to fill the gap when Federal sources of revenue are insufficient for administering the program.) Of these two Federal sources, by far the more important is the PWSS grant. It is very flexible in its use and has been the principal Federal source of support. Set-asides from the DWSRF, while extremely helpful, have key "strings attached" under the terms of the SRF and can only be used for certain types of activities. These funds are also "in competition" with use of the funds for drinking water infrastructure and the percentages used for set-asides is often hotly contested within states. In some states, the SRF is administered by a separate agency and the drinking water Primacy agency has little or no access to set-asides. The PWSS grant has been "flat-lined" at roughly $100 million for the past several years (on average, a wholly inadequate amount of about $2 million per state). That appropriation was bumped up to $105.7 million for FY 10, while the state drinking water security grant of $5 million was zeroed out – thus, leaving a net gain of a meager $1 million nationwide.

State drinking water programs are currently struggling with the combination of the national economic downturn, historically flat funding for the PWSS program, and severely constrained state general funds. These challenges have manifested themselves in hiring freezes in most states; positions not refilled (or, in some cases lost) as staff have left through attrition or retirement; no salary increases; severe travel restrictions; mandatory furlough days in many states; and, in some cases, required reductions in force. It is exceedingly hard, in that environment, to consider increasing and enhancing state compliance and enforcement efforts. States are doing a remarkable job, all things considered, and are carefully setting priorities to help ensure that public health protection remains preeminent. But, without question, if we are going to achieve our shared goals of increased compliance at our public water systems states need more funding and Congress could certainly help in this regard. The following is an excerpt from our written testimony to the Senate Appropriations Committee for Interior and Related Agencies for FY 10:

> *ASDWA respectfully requests that, for FY-10, the Committee appropriate funding for three state drinking water programs at levels commensurate with Federal expectations for performance and at levels that ensure appropriate public health protection. ASDWA requests $200 million for the Public Water System Supervision (PWSS) program; $1.5 billion for the Drinking Water State Revolving Loan Fund (DWSRF) program; and $7 million for state drinking water program security initiatives.*

New Approach to Establishing Enforcement Priorities (How EPA Can Help)

It also helps to have a predictable, well-conceived, and fair enforcement response to violations, as they occur. We believe a better approach than the current approach to establishing enforcement priorities should be put in place. The new approach should be one which directs enforcement resources to the most important problems. Fortunately, states and EPA have been working over the past year or so to put in place just such a system.

The highest priority enforcement cases are those facilities deemed to be in *Significant Non-Compliance (SNC).* Heretofore, SNC criteria were established for particular rules, irrespective of the significance of that rule relative to other rules. A new approach, that states are anxious to pilot test and ultimately implement, would set enforcement priorities on a *facility basis.* In other words, the state compliance personnel would examine the number, type, and duration of all violations at a particular facility – assign point values for those violations and, if the number exceeded a particular threshold, the facility would be deemed to be in SNC. I would hasten to add that *any* violation of any rule warrants an enforcement response (again, escalating in severity of response to the gravity of the situation). However, the new SNC approach would be a better one for targeting state priorities.

What about Emerging Contaminants? How Should they be Addressed and How do States Help Ensure Protection of Public Health in the absence of National Regulations?

As mentioned before this Committee in testimony in May 2008, we believe the SDWA construct with respect to developing a priority list (i.e., the Contaminant Candidate List); making decisions or whether or not to regulate contaminants on that list; and using the SDWA criteria for developing new drinking water regulations is a sound one. We would not wish to see that construct replaced with disparate legislative mandates to regulate particular contaminants. However, we do agree that the process needs to work more expeditiously – particularly in connection with EPA's review and evaluation of health effects data about particular contaminants. In the absence of expeditious decisions about contaminants of concern, states may develop their own regulations – and, some do. But, most states do not have the technical staffs nor expertise for these undertakings and rely entirely on EPA to make these decisions.

What are States' Thoughts about Pending SRF Reauthorization Legislation?

States appreciate efforts of this Committee to re-authorize the CWA and SDWA State Revolving Funds. Overall, we support many of the changes developed by the Committee and believe if enacted will assist us in our efforts to establish more capable and sustainable public water systems. We would like to see a stronger statement of the states' role in developing and implementing many of the proposed programs such as the grant programs for Critical Drinking Water Infrastructure, Reducing Lead in Drinking Water and the Program for Water Quality Enhancement and Management.

- We support the various changes that allow greater flexibility in state use of the set-asides (e.g., increasing the administrative set-aside from 4% to 6%; removing the 100% state match requirement for use of the 10% set-aside; and clearly indicating that the 15% set-aside may be used for source water protection activities). These are the very kinds of changes that will enable states to enhance their efforts to build water system capacity, as mentioned throughout this testimony.

- We strongly support the high priority assigned to public health protection and addressing compliance issues as a part of the state priority-setting process. That emphasis is entirely

consistent with the strong record of success of the SRF program in addressing some of the highest priority public health needs over the years.

- We fully support continuation of the disadvantaged loan program in the draft legislation and the option to extend that program to parts of service areas.

- We support consideration of green projects (e.g., water conservation/energy efficiency) as a weighting factor in developing intended used plans, as the current draft of S. 1005 provides and would not support a mandatory percentage.

- Finally, we appreciate the substantial increase in overall authorization of the DWSRF ($14.7 billion from FY 2010 through 2014). That level of commitment from Congress is heartening.

Summary

As I hope I've made clear in this testimony, states take very seriously the challenge of ensuring compliance, on the part of public water systems, with all applicable requirements of the Safe Drinking Water Act. It's a challenging task that we undertake with our partners at the Federal, state, and local levels – and, much remains to be done. Fortunately, we have a solid record of success and a number of outstanding case examples to build upon. We also have a variety of effective tools that can be brought to bear on this challenge – from technical assistance and training to a range of enforcement tools. Federal funding assistance through the State Revolving Fund also undergirds our efforts – both in terms of support for infrastructure as well as set-asides available to states. But, I'd be remiss if didn't mention again that states are and have been extremely resource-strapped. Thus, we would very much appreciate Congress' help in redressing this imbalance so that states can carry out their responsibilities most effectively and fully realize the public health protection goals we all seek.

The vast majority of drinking water in the United States is safe and reliable. This is due to the dedicated people who operate the public water systems and the training and technical assistance they receive from states, in concert with our Federal and local partners. It takes constant and persistent attention and effort to maintain this high level of public health protection. The economic vitality and well-being of our country depends upon a sustainable supply of safe and reliable water, so funding safe drinking water is a sound investment. I appreciate the opportunity to offer this testimony to the committee and would be pleased to respond to any questions the Committee may have during my oral testimony.

Attachment 1

Public Water Systems Definitions & Demographics

(Data from 2000)

Public Water Systems are defined as providing water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serve an average of at least 25 people for at least 60 days a year. EPA has defined three types of public water systems:

- *Community Water System* (CWS): A public water system that supplies water to the same population year-round.
- *Non-Transient Non-Community Water System* (NTNCWS): A public water system that regularly supplies water to at least 25 of the same people at least six months per year, but not year-round (e.g., schools, factories, office buildings, and hospitals which have their own water systems).
- *Transient Non-Community Water System* (TNCWS): A public water system that provides water in a place where people do not remain for long periods of time (e.g., gas stations, campground, highway rest stops)

Number of Systems and Population Served:
(Note: populations are not summed because some people are served by multiple systems and counted more than once)

- 51,988 CWS served 292.3 million people
- 18,742 NTNCWS served 6.3 million people
- 84,149 TNCWS served 13.6 million people

Community Water System (CWS):

Sources of water:
- 11,671 systems relied on surface water, serving 204.1 million people
- 40,301 systems relied on ground water, serving 88.1 million people

System size:
- 22% of CWS are very large, large, or medium, serving 70% of those who get their water from a CWS
- 78% of CWS are small or very small, serving 30% of those who get their water from a CWS

Non-Transient Non-Community Water System (NTNCWS):

Sources of water:
- 688 systems relied on surface water, serving 788,360 people
- 18,041 systems relied on ground water, serving 5.5 million people

System size:

- 96% of NTNCWS are small or very small, serving 87% of those served by NTNCWS
- 4% of NTNCWS are medium, large, or very large, serving 13% of those served by NTNCWS

Transient Non-Community Water Systems (TNCWS):

Sources of water:

- 2,010 systems relied on surface water, serving 2,534,900 people
- 82,126 systems relied on ground water, serving 11 million people

System size:

- 98% TNCWS are small or very small, serving 81% of those served by TNCWS
- 2% of TNCWS are medium, large, or very large, serving 19% of those served by TNCWS

Attachment 2

Examples of State Actions Taken to Assist Public Water Systems and Ensure Compliance with Drinking Water Requirements

STATEWIDE APPROACH IN NEW HAMPSHIRE

The Problem: As of January 23, 2006, 72 New Hampshire water systems were serving water above the new 10 ppb arsenic standard, and 21 were serving water above the 30 ppb uranium standard.

The Approach: Between 2004 and 2006, the state did extensive outreach to the 200+ systems with historical arsenic results above 10 ppb which resulted in a great deal of compliance prior to the effective date of the regulation. After 2006, the state performed extensive outreach and enforcement to educate water system owners, operators and small treatment firms on the most feasible and cost effective options to address these contaminants. Specific elements of the approach included:

- Close state involvement in three EPA arsenic demonstration projects awarded to New Hampshire.
- Multiple technical seminars across southeast and central New Hampshire (i.e. high arsenic areas).
- Policy development for arsenic and radionuclides treatment residuals with state solid waste and radiological health departments.
- State treatability studies for low-cost treatment solutions.
- Geological studies for well borehole modification/alternative blending scenarios.
- Staff attendance at water system board meetings to educate on treatment costs and maintenance.
- One-on-one meetings with vendors, operators, and individual water system representatives.
- New laboratory procedure for arsenic speciation testing, a key factor in treatment effectiveness.
- The use of enforcement tools in cases where progress was not occurring.
- Close working relationship with the EPA regional office.
- A history of performing routine sanitary surveys at the state's 2300+ water systems which has resulted in an ongoing relationship with system operators and owners
- Partnering with technical assistance providers and academic resources.
- Extensive newspaper coverage of an arsenic occurrence study done by USGS and health effects research being performed at Dartmouth College.
- Widespread information (public service announcements, etc) about arsenic and radon via our private well initiative supported by EPA.
- A standardized, routine enforcement strategy that closely tracked and responded to lack of compliance.

The Results: As a result, of the 205 systems with historical arsenic detections above 10 ppb, 15 remain out of compliance as of September 30, 2009, but all are on a schedule to address this contaminant pending major infrastructure upgrades or funding assistance. For uranium, 5 of approximately 40 systems with historical uranium above 30 ppb remain out of compliance, again all with schedules to address this contaminant within a short timeframe.

WHITESTOWN, INDIANA

The Problem: A small town of 1500 had chronic problems with exceeding the disinfection byproduct MCL, Lead & Copper problems, frequent water main breaks, and customer complaints related to poor water quality and unresponsiveness of the town board.

The Approach: The Indiana Department of Environmental Management's Drinking Water Program Capacity Development staff met with town personnel to develop plans to lower the disinfection byproducts to *below* the MCL and to better understand other concerns. State program staff quickly realized that the town lacked the technical, managerial and financial capacity to work through their water quality problems. To help resolve *managerial* capacity issues, the state capacity development staff worked with the town to set up a complaint tracking system; devise a managerial chain-of-command between the utility and the town board; and create a new position for a utility manager to oversee both the drinking water and wastewater utilities. In the *financial* capacity arena, state staff facilitated discussions between the town and the DWSRF program and discovered that the town had been using incorrect budgeting practices and would not, unless the practices were corrected, qualify for loan assistance. The town has since self audited, rectified their financial practices, successfully applied for and been awarded a DWSRF loan as well as a grant from the Office of Community and Rural Affairs. *Technical* capacity issues were also addressed and correction plans were developed during meetings with the water utility. The community used an ozone treatment system that needed redundant components to meet proper operation and maintenance requirements. This was too costly for the town. State staff worked to help the utility rehabilitate old filters to augment those already in place. This was a very cost-effective solution that was approved by the town board.

The Results: The town now has a complaint tracking system to monitor customer concerns; they have hired a new utility manager to oversee the water and wastewater systems; they have reconfigured their financial practices to meet state requirements; and with the resulting DWSRF award, have returned to compliance for their DBP violations. As of the fall of 2009, the town disinfection byproducts levels remain below MCL values.

SUMNER COUNTY KANSAS RURAL WATER DISTRICT #7

The Problem: A small homeowners' association had repeated monitoring and reporting violations. The Kansas Department of Health and Environment could not identify a legal entity for enforcement action. The operator was unresponsive and no financial and managerial records could be located. Customers were unaware of problems with the water system.

The Approach: The Kansas Drinking Water Program contacted each customer to advise them of personal liability for pending enforcement and civil penalty actions, since no legal entity could

be identified. The state agreed to waive the penalty if the water system took appropriate corrective actions. Through the new system permitting requirements under the capacity development program, the state outlined the necessary process and actions – including formation of a legal entity under Kansas law. State capacity development program staff provided assistance with financial and managerial procedures. Kansas also provided technical assistance through the 2% TA Small System set-aside to help the system operator establish monitoring and reporting procedures to ensure compliance with drinking water regulations.

The Results: The community formed a rural water district to create a responsible legal entity; the system has implemented a monitoring plan to meet regulatory requirements; the district developed financial policies to ensure appropriate checks and balances; the district also developed management plans to ensure proper overall system management. The system has returned to compliance.

RAINBIRD VALLEY, CALIFORNIA MUTUAL WATER COMPANY

The Problem: The Rainbird Valley water system's main well had failed. The small community was dependent on a backup well that was high in nitrates and low in water supply. Residents were forced to restrict water use in order to maintain adequate pressure and supply. The majority of residents are retired, live on fixed incomes, and could not afford repair assessments – particularly since the Mutual Water Company had just spent more than $40,000 in reserves for water system repairs.

The Approach: An assistance provider (Self Help Enterprises) was called in to help. As a result of an emergency meeting, the community agreed to increase their rates and seek state and Federal funding to cover the repairs. The assistance provider found that with the rate increase ($65/month), the minimum water fees would be more than 4% of the community's median household income ($19,265). This qualified the community for California Department of Public Health Emergency Grant funding assistance. The assistance provider and California Drinking Water Program staff worked to ensure that the community understood and could meet state contract requirements, obtain pump repair services, and restore water supply. This intervention also involved training the operator to resolve low system pressures and maintenance problems, such as security at well sites and leaking booster pumps. The assistance provider also worked with the water company's Board to identify and take advantage of board and operator training opportunities provided by the state's drinking water program.

The Results: Rainbird Valley now has repaired its main well and no longer must rely on a high nitrate water supply. The community has undergone a rate-setting exercise and successfully met state requirements for grant applications and funding awards. The operator has received appropriate training on technical, O&M, and water system security needs. The Board has applied for training by the state's drinking water program on water system roles, requirements, and responsibilities. Finally, Rainbird Valley is investigating opportunities to form a regional water supply entity with 13 other water systems in the area. This would significantly increase operational efficiencies and economies of scale.

SKY VIEW COUNTY CALIFORNIA WATER DISTRICT

The Problem: Formerly known as Ponderosa Sky Ranch Water System, the water system had been in receivership for approximately three years. Concerned citizens had formed a county water district in an attempt to achieve local control of the system and bring it out of receivership. This required submitting a Change of Ownership to the California Department of Public Health and the Tehama County Health Department.

The Approach: The state's District Engineer reviewed the system's request and placed it on the Assistance Referral List which allowed assistance providers to work with the community. As part of the Change of Ownership process, the newly formed water district had to undergo a capacity development "TMF" (technical, managerial, financial) assessment. The assessment is used to evaluate whether the newly formed water district has an appropriate rate structure, a certified operator, appropriate permits for water supply, formal management policies and procedures, and other operating conditions to ensure that it can comply with all state and Federal drinking water requirements. The assistance provider facilitated this evaluation and the subsequent Change of Ownership application.

The Results: The TMF Assessment has been approved by both Tehama County and the California Department of Public Health Drinking Water Office. The Ponderosa Sky Ranch Water System has been removed from receivership and now operates as the Sky View County Water District. The District's Board of Directors is now investigating infrastructure funding opportunities (state and Federal) to fund improvements for the water system.

PLAINVIEW CALIFORNIA MUTUAL WATER COMPANY

The Problem: Aging and undersized pipes serve this small farmworker community. The California Department of Public Health had shut down one of the community's two wells due to nitrate MCL violations, detectable DBCP pesticide levels, and episodic occurrences of coliform bacteria. The community was faced by chronic leaks in the distribution system and water lines located in proximity to failing septic systems. The state subsequently had to issue a compliance order requiring continuous chlorination.

The Approach: Through an assistance provider (Self Help Enterprises), the community and the Water Company Board worked to identify funding to conduct a Preliminary Engineering Report; conduct a leak detection survey; and drill a water test well. The community successfully applied for $294,000 in funding from the DWSRF and $1 million from the USDA Rural Development grant program.

The Results: Because of the DWSRF loan and USDA grant awards, this community has drilled a new well which meets all drinking water standards; replaced the entire water distribution system which has stopped the loss of more than 58,000 gallons of potable water per day; and distanced water lines from septic tank leach fields. Installation of a backup generator, a sand separator, a new storage tank, and closure of the abandoned well are ongoing projects that will further improve public health protection in this small community. The assistance provider continues to work with this community to apply for HUD Community Development Block Grant funding for low income residents to be able to connect to the new water lines.

ROYALSTON, MASSACHUSETTS

The Problem: The town of Royalston built a new elementary school. The old school building (owned by the town) was rented to a private school. The town's Selectmen did not realize that the old school was a public water supply and made no provision in the lease for the renters to operate the system. Nor did the town include funds within its own budget. The Massachusetts Department of Environmental Protection Drinking Water Program was on the verge of issuing an Administrative Consent Order for failure to have a certified operator, failure to monitor, failure to submit annual reports, failure to submit the self-sanitary survey, and other drinking water violations.

The Approach: The Drinking Water Program Central Office referred the case to the state's regional capacity development program staff. The Regional staff immediately contacted the town and arranged to meet with the Selectmen. Subsequently, the capacity development staff was able to assist the town in completing and submitting required forms and reports and hiring a certified operator at an affordable rate. State capacity development staff continued to meet with the Selectmen to address ongoing concerns.

The Results: The Administrative Consent Order was not issued. The newly hired certified operator understood the proper monitoring and reporting schedules and the process for the sanitary survey. The state capacity development staff had left a detailed "to do" list with the town Selectmen which has been accomplished. The system has not experienced compliance problems since. The key was working with the town decision-makers to solve the technical problems and, once the immediate crisis was past, to provide financial guidance for an appropriate operating budget for the system.

DOWNIEVILLE CALIFORNIA PUBLIC UTILITY DISTRICT

The Problem: The District's surface water treatment plant could not achieve the required contact time (CT) for disinfection to comply with the Surface Water Treatment Rule. The District also had inadequate storage capacity. Downieville is the county seat for Sierra County which has a county-wide population of about 3500 people.

The Approach: The California Department of Public Health encouraged the water system to apply for DWSRF funding to construct a new water tank that would supply approximately 100,000 gallons of storage and increase the chlorine contact time. The water system's public health need and the national economic downturn presented Downieville with an opportunity to submit their project under the state's ARRA funding program. One of the state's assistance providers worked with the District to complete the application and state-required "TMF" assessment report.

The Results: The Downieville PUD was approved for ARRA funding to construct a 100,000 gallon steel storage tank. Upon completion, this tank will increase chlorine contact time and bring the water system back into compliance with state and Federal SDWA requirements.

STATEWIDE APPROACH IN IDAHO

The Problem: In 2006, approximately 50 systems were impacted by the arsenic rule.

The Approach: To assist public water systems with the new standard, the state used flexibilities such as formally allowing and writing rules for managed point of use (POU) treatment systems and providing extended timelines for compliance. The state has entered into enforceable schedules with nearly all systems impacted by the lower arsenic standard. Through the process, there have been systems that have either connected with another public water system or drilled private wells to deregulate. Even with the extended timelines and POU allowances, many systems are having difficulty meeting the timelines and obtaining adequate funding due to various factors.

The Result: Thirty-two enforceable orders were written, approximately 16 systems have installed POU devices to date (also for uranium), and 14 systems currently in various stages of the implementing the POU process. Three systems have deregulated with a few more in the process.

Association of State Drinking Water Administrators

Responses to Questions Posed in April 7, 2010 Letter from Senators Boxer and Inhofe

Questions from Senator Inhofe

1. ***Are there additional tools that ASDWA believes should be made available to states to help them meet their drinking water goals?***

As I mentioned in my testimony, the biggest single impediment that hinders states' ability to help water systems of all sizes is funding. The principal Federal grant to states for this purpose (the Public Water System Supply and Supervision Grant) provides, on average, slightly more than $2 million per state to operate their programs for the year. We would greatly appreciate an expression of the Committee's support for increasing this funding level by way of a letter on states' behalf to the Interior and other Agencies Appropriations Subcommittee. Beyond appropriations, we believe that Federal drinking water rules need to be written in a manner that makes them as "implementable" as possible – providing adequate flexibility, sufficient time frames, and clarity for both states and water systems to implement the rules. In the process of program implementation, we also believe that states should be able to focus on the most important public health priorities and minimize any unnecessary or duplicative reporting. Further, at time of rule promulgation, EPA should have all of the necessary data management "modules" needed to track rule implementation built and available to states. In addition, in the process of ensuring compliance and enforcement on the part of water systems that are out of compliance with drinking water regulations, EPA (in their oversight capacity) should recognize and accept informal enforcement actions on the part of states (e.g., Bilateral Compliance Agreements) if such actions are effective in putting facilities firmly on a path to compliance. Finally, while states appreciate the efforts of technical assistance providers such as the National Rural Water Association and the Rural Community Assistance Partnership, the activities of those organizations need to be closely aligned with state drinking water program priorities to ensure that assistance is provided where it is most needed to address the most pressing public health priorities.

2. ***I appreciate your support for many of the provisions of S. 1005. How can we make sure that, in providing Federal assistance, we aren't attaching too many strings?***

We believe the Drinking Water State Revolving Loan Fund (DWSRF) has been a highly successful program since its inception in 1996 and has led to the building of much needed infrastructure -- by conscientiously using Federal funds and leveraging them with additional state dollars. However, we believe the program is fundamentally a state-run program. Thus, as an overarching recommendation, we believe that key programmatic decisions need to be made by states and that sufficient flexibility should be provided to allow states to administer those programs in the most effective ways. We would be happy to work with Committee staff to suggest ways that S. 1005 could be adjusted to better reflect that overall philosophy. We also believe that some of the elements of the American Recovery and Reinvestment Act, while understandable in the context of a short term stimulus plan, should not be permanent

features of the DWSRF. In particular, we believe the emphasis on green projects should be realized through ranking factors in states' project priority lists (as envisioned by S. 1005), rather than as a mandatory percentage of the capitalization grant under the DWSRF (as is the case in the FY 10 appropriation). The mandatory percentage will work to increasingly displace more important public health priorities from states' lists of fundable projects. Finally, we recommend that the requirement to devote at least a certain percentage of the fund to subsidies (50% was required under ARRA and 30% is mandated under the Fiscal Year 2010 DWSRF appropriation) be deleted and revert to the current language of the Safe Drinking Water Act (SDWA). The SDWA allows states to devote *up to* 30% of their funds in the form of subsidies but sets no minimum percentage requirement. We believe the current SDWA formulation in this regard better ensures the long term sustainability of the fund and provides greater state flexibility than a mandatory percentage.

3. ***Does ASDWA still think the current EPA process for regulating contaminants works?***

Generally yes; but it can work better. As I've testified before the Committee on two occasions, we think the fundamental SDWA construct in this regard is sound and is far preferable to legislative mandates to regulate particular contaminants within specified time frames. EPA has been inclusive and participatory toward stakeholders (including states) for the current Contaminant Candidate Lists (CCLs) and we very much appreciate that. However, the system can be approved. While we believe the approach to developing the list has improved significantly in recent years (as EPA has implemented the recommendations of the National Academy of Sciences (NAS)), the process of making regulatory determinations (i.e., to regulate or not) has become somewhat bogged down. The principal "weak link" in this chain has been the fairly laborious process of achieving Agency consensus about the health effects of CCL contaminants. In this regard, we are intrigued by the Agency's March 22nd announcement to consider addressing contaminants as groups rather than exclusively one-by-one and to use the authorities of multiple environmental/statutes to gather the requisite data and information about contaminants of concern. We intend to work closely with the EPA in providing state perspectives and input as the Agency moves through this process.

4. ***Is the operator workforce problem in Massachusetts one that ASDWA sees for other states as well? Are other states looking into an approach similar to Massachusetts'?***

Yes, this is a ubiquitous problem for most of the country and virtually all states are exploring a variety of approaches, in concert with other concerned stakeholders, to help address this problem. The aging workforce of current operators, combined with the low numbers of prospective operators coming into the field has combined to paint a rather dire picture in most states. Many states have developed comprehensive approaches, along the lines of those described in my testimony concerning Massachusetts (e.g., mentoring contract operators, specially designed training initiatives for operators, state-supported internships, etc.) to help address this problem. Some of the other approaches states are pursuing include brochures and outreach materials for high schools, vocational schools, and colleges to promote water system operations as a career as well as including information on state web sites about available positions for operators. The operator workforce problem is also very much a

shared challenge that argues for collaborative solutions, in partnership with both Federal and local partners. As an organization, ASDWA has worked closely with EPA and the American Water Works Association in this regard.

5. ***In your experience, does EPA involvement stretch far enough into training and technical assistance for small systems?***

In our experience, EPA has been very active and engaged in this area, but, there is certainly more that can be done. Given the demographics of the drinking water industry (i.e., greater than 90% of the water systems nationwide serve less than 500 people), this can be expected to be an ongoing challenge for years to come. EPA has developed an array of guidances and training documents designed to assist small systems (e.g., Simple Tools for Effective Performance (STEP) Guides and simple summaries of all promulgated rules). However, we believe more funding could be used to support EPA's Drinking Water Academy to help build some of these training tools. We're also pleased to see that EPA's "Sustainable Systems (e.g., small systems) Team" is now fully staffed and active. Further, as you know, Congress directed EPA, as a part of its FY 10 appropriation, to conduct an analysis of ways to build and enhance small system capacity. To inform that analysis, EPA has formed a state-EPA workgroup that has recently begun meeting and is expected to offer its recommendations in the Fall of 2010 on ways to reenergize our collective small system capacity development efforts – building on successful state approaches and trying new approaches that appear promising. EPA's funding for Technical Assistance (TA) providers and regional Technical Assistance Centers (TACs) has also been quite helpful. However, as discussed above (in the response to question #1), the efforts of those TA providers need to be closely coordinated with states in order to be most effective. .We would also like to see more emphasis, at the national level, on tools and approaches for encouraging small system consolidation (either physical or managerial) and restructuring, in order to provide better economies of scale and to assist non-viable systems in finding long term solutions. Finally, because the vast majority of all our public water systems are very small, training and technical assistance has to be conducted locally. Unfortunately in a resource constrained environment, these non-mandatory activities are the first states must abandon to focus on required activities. States must have more resources to deliver whatever tools are developed.

Senator BOXER. Thank you so much.

Now, we would go to Mr. Whatley, Executive Director, Oklahoma Rural Water Association.

Welcome, sir.

STATEMENT OF GENE WHATLEY, EXECUTIVE DIRECTOR, OKLAHOMA RURAL WATER ASSOCIATION

Mr. WHATLEY. Chairman Boxer, Ranking Member Inhofe, and members of the committee, I appreciate very much the opportunity to be able to appear before the committee today.

To begin, I would like to take this opportunity to thank my Senator from Oklahoma, Senator James Inhofe, for his efforts on behalf of sensible regulation of the environment and his efforts to protect the environment and his leadership in working for practical, reasonable and affordable drinking water regulations. Thank you very much, Senator.

When I started to work with the association in 1978, EPA had developed regulation for seven or eight contaminants. During the past 30 years, the numbers of regulated contaminants has steadily increased to near 100 today. Each new regulation has a cost, whether it is for monitoring, additional personnel, increased treatment costs or infrastructure improvements. New requirements usually place additional costs on small systems with limited financial resources.

Many of the EPA regulations, such as testing for bacteria, filtration of surface water, and regulation of nitrates have made our water safer. But I believe many of the regulations and water quality standards are overly restrictive for small systems and do not justify the costs.

Many of the rules are complex and very difficult to understand and implement for both the water systems and State regulatory agencies. This is a significant problem for systems that do not have experienced full-time operators. Many of the small system operators do not understand the regulations, and they do not know what they need to do to comply.

Systems are having to spend an increasing amount of time and money trying to comply with regulations. As a result, systems do not have the money to make system improvements to better serve existing customers or expand services to areas where individuals are on unsafe private wells. Many small systems spend money on overly prescriptive testing that they could be using to upgrade their infrastructure to provide more reliable service.

When the Disinfection/Disinfection Byproducts Rule went into effect a few years ago, 75 percent of the 250 surface water treatment plants in Oklahoma were unable to comply. With training and technical assistance provided by ORWA and the Oklahoma Department of Environmental Quality, compliance has improved. Currently, over 50 percent of the systems in the State are in compliance with the rule, and we continue to work with them.

But the cost of compliance has been extremely high for the systems. For many systems, operating costs have escalated dramatically. On one system that I am aware of the cost just for chemicals alone has gone from $1,800 a month to $18,000 per month. It has also been necessary for some systems to upgrade their treatment

processes or construct new water treatment plants at a cost of hundreds of thousands of dollars, maybe even millions of dollars, with no immediate health improvements.

The governing boards and operators of public water supply systems want to comply with Federal regulations and provide the best quality water possible to their customers. To achieve this objective systems need training to educate operators and board members on drinking water regulatory requirements, technical assistance is needed to provide onsite, hands-on help for operators in troubleshooting problems and evaluating alternatives for enhancing or improving operations and treatment processes.

Rural Water Training and Technical Assistance is a primary source of help for small community water systems. These programs have contributed substantially to better compliance with Federal drinking water regulations and clean water regulations and helped to improve system management, operations and liability. Continued funding for training and technical assistance is essential to maintain grassroots support and assistance for small water systems.

For water systems to be successful in complying with Federal regulations and meeting the present and future needs of their communities, adequate low cost financing must be available for system development and infrastructure improvements. Systems in Oklahoma and around the Nation rely heavily on Drinking Water SRF and Clean Water SRF for financing system improvements. The program is well managed and very effective in helping systems meet their water and wastewater needs. We encourage Congress to continue funding for these very important programs.

That concludes my remarks. Thank you again for the opportunity to appear before the committee.

[The prepared statement of Mr. Whatley follows:]

December 8, 2009

Senate Committee on Environment and Public Works
Oversight Hearing on Federal Drinking Water Programs
10:00 a.m.
Tuesday, December 8, 2009
Room 406
Dirksen Senate Office Building

Testimony of

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Chairman Boxer, Ranking Member Inhofe and members of the Committee. I am Gene Whatley, Executive Director of the Oklahoma Rural Water Association (ORWA).Thank you for allowing me to share some of my thoughts this morning about the impact of federal drinking water regulations on small water systems in Oklahoma. I would also like to take this opportunity to thank Senator Inhofe for his efforts to protect the environment and his leadership in working for practical, reasonable and affordable drinking water regulations.

The Oklahoma Rural Water Association represents 458 member rural water district and small community water systems that serve over 800,000 people in rural Oklahoma. The majority of our members are small and very small systems with the average system serving approximately 700 connections.

When I started to work with the Association in 1978, EPA had developed regulations for seven or eight contaminants. During the past thirty years the number of regulated contaminants has steadily increased to near 100 today. Each new regulation has a cost. Whether it's for monitoring, additional personnel, increased treatment costs or infrastructure improvements new requirements usually place additional costs on small systems with limited financial resources.

Many of the EPA regulation, such as testing for bacteria, filtration of surface water, regulation of nitrates, etc. have made our water safer. But, I believe that many of the regulations and water quality standards are overly restrictive for small systems and do not justify the cost. Many of the rules are complex and very difficult to understand and implement for both the water systems and the state regulatory agencies. This is a significant problem for small systems that do not have experienced, full time operators. Many of the small systems operators do not understand the regulations and they do not know what they need to do to comply. Systems are having to spend too much time and money trying to comply with regulations. As a result, systems often don't have the money to make system improvements to better serve existing customers or expand service to areas where individuals are on unsafe private wells. Small and rural water systems spend money on unnecessary testing that they could be using to upgrade their infrastructure to provide more reliable service.

Public notification is another concern. The extent of public notification requirements are unrealistic. Systems have to provide public notice for paper violations when there is no verified threat to public health. The public notice requirements need to be modified to address primary public health threats.

When the Disinfection/Disinfection Byproducts Rule went into effect a few years ago, seventy five percent (75%) of the 250 surface water treatment plants in Oklahoma were unable to comply. With training and technical assistance provided by ORWA and the Oklahoma Department of Environmental Quality compliance has improved. Currently over fifty percent (50%) of systems in the state are in compliance with the rule. But, the cost of compliance has been high. For many systems operating costs have escalated dramatically. On one system the cost, just for chemicals alone, has gone from $1,800.00 to $18,000.00 per month. It has also been necessary for some systems to upgrade their treatment processes, or construct new water treatment plants, at a cost of hundreds of thousands dollars with no immediate public health improvement.

Stage 2 of the disinfection/disinfection byproducts rule affects over 1,000 purchase water systems in our state. Operators of these purchase systems have no experience with water treatment and are not aware of what the rule requires of them. The cost of required monitoring is a hardship for some systems and some are concerned that they may be required to install some form of treatment to comply with the disinfection byproducts standards. Other systems in Oklahoma continue to struggle with the expense and technical aspects of how to comply with the new groundwater rule, arsenic rule and other EPA regulations.

The governing boards and operators of public water supply systems want to comply with federal regulations and provide the best quality water possible to their customers. To achieve this objective systems need training to educate operators and board members on the drinking water regulatory requirements and technical assistance is needed to provide on-site, hands-on help for operators in troubleshooting problems and evaluating alternatives for enhancing or improving operations or treatment processes. Rural Water Training and Technical Assistance is the primary source of help for small community water systems. These programs have contributed substantially to better compliance with federal drinking water and clean water regulations and helped to improve system management, operations and viability. Continued funding for training and technical assistance is essential to maintain grassroots support and assistance for small water systems.

For water systems to be successful in complying with federal regulations and meeting the present and future needs of their communities, adequate, low cost financing must be available for system development and infrastructure improvements. Systems in Oklahoma and around the nation rely heavily on the Drinking Water SRF and Clean Water SRF for financing system improvements. The program is well managed and very effective in helping systems meet their water and wastewater needs. We encourage Congress to continue funding for these very important programs.

Madam Chairman that concludes my remarks. Thank you again for the opportunity to appear before the Committee today.

Responses to Senator Inhofe Questions From April 7, 2010 Letter

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1. **Could you please name specific EPA regulations of water quality standards that you feel are overly restrictive for small systems?**

   In general Senate Bill (S. 3038) that Senator Inhofe has sponsored and reintroduced for the past several years outlines specific naturally occurring contaminant regulations that we have found to be overly prescriptive and unaffordable for many small and rural communities. The specific regulations include the inorganic contaminants in the phase II/V regulations, the Disinfection By-Products regulation, the Radionuclides rule, Nitrates rule and the proposed Radon Rule.

   The Disinfection By-Products Rule has been especially difficult for systems in Oklahoma. Initially, seventy-five percent of our 250 surface water treatment plants were not able to comply. Compliance has improved, but at a very high cost. Monthly operating costs for chemicals, personnel, etc. have increased dramatically. Chemical costs alone have increased two and one-half times for Creek County RWD #1, rising from $20,000.00 per month to over $50,000.00 per month in the last three years. In addition to rising operating costs some systems, like Wagoner County RWD #5, have spent millions of dollars to construct new treatment facilities. Stage II of the rule affected over 1500 systems that purchase water from a surface water treatment system. These systems have no control over the quality of the water that they purchase. Operators of these systems generally are not experienced in water treatment and the monitoring that is required. According to the EPA, 367 water systems in Oklahoma are currently non-compliant with the MCL for the Stage II Disinfection By-Products Rule.

   We are also very concerned about the Total Maximum Daily Load (TMDL) requirements that are being enforced through significant ratcheting down of permit discharge limits on wastewater treatment plants because they are point source dischargers who are being targeted for what we see as marginal benefits. Nitrates and Phosphate limits are the primary concern for these systems often times set at unachievable or unaffordable levels.

Approximately two dozen systems in the state are in violation of the Nitrate standard, many for only minor violations. There is no history of adverse health effects in the areas of the state with high nitrate levels in drinking water. Preferred treatment processes for removing nitrates, such as reverse osmosis and ion exchange, cost a lot to construct and operate, and 20 to 30 percent of water entering the plant is wasted in the treatment process. EPA should raise the Nitrate MCL to the previous level, or come up with less costly ways for systems to comply.

EPA's procedure for setting maximum contaminant levels needs to be reviewed to ensure that the agency is utilizing best available science and considering affordability for small systems. Just because technological advances make it possible to detect lower levels of contaminants, doesn't mean the water is less safe. Current regulations appear to have excessive safety factors that unnecessarily increase the cost of compliance.

2. **What do you think EPA could do to best help small water systems, which lack sufficient experienced full time operators to implement and comply with regulations and water quality standards?**

There are several solutions already in place that will help alleviate the lack of experienced operators. First EPA should continue to utilize the training through the State Rural Water Associations. Second, changing the stringent requirements (sometimes implemented at the state level) that impede qualified personal from gaining entry level jobs into the industry would be helpful. For example, qualified applicants who have no experience in the water industry cannot obtain even the most simple license to operate the lowest level drinking water system (this type of operator may only be required to add chlorine to a groundwater system and ensure that proper bacteria samples and residual chlorine is being maintained for proper public health protection). However, the operator certification requirements impede new potential employees from getting their license without having several years of experience with direct experience running complex treatment facilities. Applicants interested in getting into the drinking water and wastewater industry should be encouraged to take advantage of Rural Water training (both in the classroom and hands on training in the field).

There are more than 7,700 certified water and wastewater operators in Oklahoma. Approximately 1,500 operators leave the field each year to pursue other careers. Much of the turnover can be attributed to low pay and lack of benefits. But, more and more operators are citing having to comply with excessive and ever changing complex regulations and requirements as their reason for pursuing other interests.

Last year ORWA provided 880 hours of free operator certification training around the state and 576 hours of training for laboratory technician certification. 966 operators and 228 laboratory technicians were trained at these sessions. Upon demonstrating competency and completing the Rural Water training these

individuals were certified and qualified to operate their systems. Over 1700 operators attended ORWA training for certification renewal.

3. **Do you think that a greater emphasis by the EPA on training and technical assistance rather than enforcement would lead to greater compliance rates and ultimately safer, cleaner drinking water?**

On-site training and technical assistance is the most highly effective means to help communities provide safe drinking water. Levying fines and penalties against towns and rural water systems only prevents those resources from being used to correct problems and improve the quality of employees.

4. **How damaging is it to small systems' efforts to achieve compliance with new regulations and standards before they are even able to achieve compliance with the old standards?**

We believe that EPA must help utilities comply with the most pressing public health standards that have the most public health improvement outcomes. Establishing a priority list of regulations that channels resources to those areas most in need would help the most Americans achieve more uniform public health protection. For example, utilities that have acute (bacteriological or viral) contamination problems and have many low income residents should be the number one priority for a grant.

New regulations are often imposed before many systems can afford to comply with the previous regulations. With new regulations coming out every year, it is impossible for systems to construct facilities today that will meet regulations tomorrow, without knowing what those regulations will be.

Senator BOXER. Thank you, Mr. Whatley.

And our last speaker, well, just to let you know after we are going to proceed, after we hear from Professor Griffiths, who is the Chair of the EPA Science Advisory Board, I am going to ask just one question. Then, I am going to allow, of course, Senator Inhofe to take his full time. I am going to ask Senator Lautenberg if he can then take the gavel because I have got to be on the floor of the Senate for some debate. So, that is what we are doing.

So, let me in advance thank everybody for being here.

So, please, Professor, go ahead.

STATEMENT OF JEFFREY K. GRIFFITHS, M.D., MPH&TM, DEPARTMENT OF PUBLIC HEALTH AND COMMUNITY MEDICINE, ASSOCIATE PROFESSOR OF PUBLIC HEALTH AND OF MEDICINE, TUFTS UNIVERSITY SCHOOL OF MEDICINE

Dr. GRIFFITHS. Good morning Chairman Boxer, Ranking Member Inhofe and other members of the committee.

My name is Jeff Griffiths, and I am a public health and infectious disease physician at Tufts University. Although I serve on the Science Advisory Board as the Chair of the Drinking Water Committee, I am speaking today for myself as a member of the public health community, not as an official representative of that body.

We supply water to children which contains copper, lead, arsenic, nitrates and other toxic compounds. This is disgraceful. Our drinking water is contaminated with industrial chemicals such as perchlorate and MTBE and agricultural chemicals such as nitrates and atrazine. We have, in my opinion, a flawed approach to these issues and have allowed lax enforcement of regulations. We have failed to protect vulnerable people such as children, pregnant women and the elderly.

Our process for identifying worrisome compounds is flawed and is doomed to miss truly risky chemicals. Some of them, I should say. We test and regulate chemical contaminants chemical by chemical, rather than by using reasonable, prudent, common sense approaches which would allow us to regulate groups of chemicals.

We simply do not have the scientific capacity to test every individual chemical used in the United States. The U.S. EPA has the resources to thoroughly examine only a relative handful of chemicals. Yet hundreds to thousands of new chemicals are introduced into industrial production every year. In support of these statements, I have referenced a letter from the Science Advisory Board to Lisa Jackson.

We artificially divide the oversight of agricultural chemicals and animal wastes at the State and Federal levels. And we have a mess because of this. The majority of fertilizers such as nitrates which are applied to croplands end up in water. The public health and economic costs to this contamination are shifted downstream. It also is destroying critical incubators for sea life and related commerce, such as in the Chesapeake. It makes the job of treating water for human consumption more difficult and more expensive.

When manure from our industrialized concentrated animal feedlot operations is applied to the land, we will contaminate the water of some people, some proportion of the time, and make some people

sick. We must find a way to feed the public wholesome food without asking them to drink bad water.

The water crisis is not solely a rural phenomenon. It is a national phenomenon. Cities and towns are dealing with limited quantities of water, which is worsened by drought in dry areas. Climate variability has also led to increased flooding, which overwhelms combined sewer and overflow systems so that sewage contaminates our drinking water. We all know it is bad to have poop in our drinking water. Water delivery is at risk because of our aging infrastructure of pipes in the ground.

We have institutionalized an approach to testing for water contamination that in my opinion will not protect the public unless it is changed. We test for contaminants infrequently and average the exposure over a year so that we are guaranteed to miss important seasonal spikes of contamination, and we give false reassurance to ourselves because of this.

Do we really want pregnant women, babies and children to drink water with high levels of contaminants during periods of their sensitivity? I should think not.

In my opinion we need a paradigm shift about water. We have to better protect our water from contamination. We must better monitor our water. We must face the fact that we cannot test every potential chemical contaminant for safety and must devise a more rational and comprehensive regulatory approach. We have to do a better job of keeping infectious pathogens out of our water by stopping sewage overflows and animal manure intrusions.

We must hold our drinking water providers accountable for their lapses. We should, in turn, help our drinking water utilities to deal with these challenges in three ways. First, keep water from being contaminated in the first place so they have an easier and less expensive task when removing contaminants. Second, help them to adopt modern treatment technologies that will remove a suite of contaminants, not just the currently identified bad actors but the potential bad actors of the future. And third, we must value their work and value clean water through managerial, operational and financial support.

If we choose to do these things, we will be healthier, we will have spent money in the long run, and we will have acted as good stewards for this precious resource.

Thank you very much for your time, and thank you for this opportunity.

[The prepared statement of Dr. Griffiths follows:]

December 8, 2009

Senate Committee on Environment and Public Works

Oversight Hearing on Federal Drinking Water Programs

10 am, Room 406, Dirksen Senate Office Building

Testimony of

Jeffrey K. Griffiths, MD MPH&TM

Department of Public Health and Community Medicine

Associate Professor of Public Health and of Medicine

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Good Morning, Chairman Boxer, Ranking Member Inhofe, and Members of the Committee. My name is Jeffrey K. Griffiths, and I am a public health and infectious diseases physician at Tufts University School of Medicine in Boston. Although I serve on the Science Advisory Board of the US EPA as the Chair of the Drinking Water Committee, I am speaking today for myself and not as an official representative of that body.

Recent press reports continue to identify water-related threats to public health. We supply water to children which contains copper and lead, arsenic, nitrates, and other toxic compounds. This is disgraceful. Our drinking water is contaminated with industrial chemicals such as perchlorate and MTBE, and agricultural chemicals such as nitrates and atrazine. We have, in my opinion, a flawed approach to these issues, and have also allowed lax enforcement of regulations. We have failed to protect vulnerable people, such as children, pregnant women, and the elderly.

Our process for identifying worrisome compounds is flawed and doomed to miss some truly risky chemicals. We test and regulate chemical contaminants chemical by chemical, rather than by using reasonable, prudent, common-sense approaches which would allow us to regulate groups of chemicals. We simply do not have the scientific capacity to test every individual chemical used in the United States. The US EPA has the resources to thoroughly examine only a relative handful of chemicals; yet hundreds to thousands of new chemicals are introduced into industrial production every year. In support of these statements allow me to reference a letter to the Honorable Lisa Jackson from the Science Advisory Board, dated January 29, 2009.[1]

Water ignores artificial political boundaries as it journeys from the sky to the sea. We artificially divide oversight of agricultural chemicals and animal wastes at the state and federal levels, we have a mess when it comes to these contaminants. The majority of fertilizers applied to croplands ends up in water. The true public health and economic cost to this contamination is shifted downstream. It makes the job of treating water for human consumption more difficult and more expensive. It is also destroying critical incubators for sealife and related commerce, such as the Chesapeake Bay. When the manure from our industrialized concentrated animal feedlot operations is applied to the land, we *will* contaminate the water some proportion of the time and

[1] Science Advisory Board Advisory on EPA's Draft Third Drinking Water Contaminant Candidate List (CCL 3), EPA-SAB-09-011

make some people sick. We must find a way to feed the public wholesome food without asking them to drink bad water.

The water crisis is not a rural phenomenon, it is a national phenomenon. Cities and towns are dealing with limited quantities of water. This is being exacerbated by new climate variability, with worsening drought in dry areas. Climate variability has also led to increasing flooding, which overwhelms combined sewer and overflow systems, so that sewage contaminates our drinking water. We all know it is bad to have poop in our water. Water delivery is at risk because of our aging infrastructure of pipes in the ground.

We have institutionalized an approach to testing for water contaminants that in my opinion will not protect the public unless it is changed. We test for contaminants infrequently and average exposures over the year, so that we are guaranteed to miss important seasonal spikes of contamination and give false reassurance to ourselves. Do we really want pregnant women, babies, and children to drink water with high levels of contaminants during periods of sensitivity? I think not.

In my opinion, we need a paradigm shift about water. We have to better protect our water from contamination, and we must better monitor our water. We must face the fact that we cannot test every potential chemical contaminant for safety, and must devise a more rational and comprehensive regulatory approach. We have to do a better job of keeping infectious pathogens out of our water, by stopping human sewage overflows and animal manure intrusions. We must hold our drinking water providers accountable for their lapses. We should, in turn, help our drinking water utilities to deal with these challenges in three ways: First, keep water from being contaminated in the first place so they have an easier and less expensive task when removing contaminants; second, help them to adopt modern treatment technologies that will remove a suite

of contaminants, and not just the currently identified bad actors; and third, value their work and value clean water through managerial, operational, and financial support. If we choose to do these things, we will be healthier and we will have spent less money in the long run, and acted as good stewards of this precious resource.

Thank you for your time. Madame Chairman, this concludes my remarks, and thank you for this opportunity to appear today.

Respectfully yours,

Jeffrey K. Griffiths MD MPH&TM

Associate Professor of Public Health and of Medicine; of Nutrition; of Veterinary Medicine; and of Civil and Environmental Engineering, Tufts University School of Medicine

Tufts UNIVERSITY
SCHOOL OF MEDICINE
Department of Public Health & Family Medicine

April 28, 2010

Responses for Written Submission to:
Follow-Up Questions from Senators Barbara Boxer and James M. Inhofe.

Question 1, from Senator Boxer:

Dr. Griffiths, can you please describe the importance of ensuring that children have clean drinking water at school or day cares -- even if children are there only for a few hours a day?

in response,

The reason for children to have clean drinking water at school is to avoid exposure to chemical contaminants or microbial pathogens which could be harmful. Children may receive different quality drinking water at a school or day care center than they receive at home. Children drink water at school between classes, after recess, during lunch, in the afternoon, and after sports. The water at school is used to cook their food. Thus a substantial portion of a child's water intake may be at school. The concern is that the water received at a school or day care center may not be healthy yet represents a major part of their water intake.

An example of an unintended exposure to chemical contaminants in a well-run school district was in the Seattle School District, which examined 97 schools during April to June 2004. Water which has been in contact with lead pipes overnight ("standing overnight") will have more lead in it than water that has be flowing through the pipes. 81% of schools had at least one fountain with elevated levels in the standing samples, and 43% of the schools had elevated levels in at least one running sample. Thus even if the children had water without lead at home, they were exposed at school.

Dr. Marc Edwards, who received a MacArthur award in 2007, has documented numerous instances of excessive lead in school drinking water. A paper he wrote with Simoni Triantafyllidou is available at www.seas.yale.edu/watersymposium/pdfs/edwards1.pdf for further information. He and his colleagues have documented school drinking water lead exposures far, far greater than the Seattle example. Thus the evidence is from both water utilities themselves, and from persons exploring the issues, that schools may provide water with elevated lead levels.

No safe level of lead ingestion has been identified. There is no scientific reason to believe that any level of lead is "safe." A number of studies have shown an inverse relationship between blood lead levels and IQ scores. Early childhood is the most critical period for avoiding adverse effects of lead. The United States goal is to eliminate exposure to lead. Governmental researchers and academic researchers have repeatedly shown that lead levels are higher in children of color and whom come from low-income families. These children often go to schools in older, poorer school districts where the schools have substantial lead in their pipes.

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In summary, children drink a significant portion of their daily intake of water at school; early childhood is a critical period for avoiding the adverse effects of lead; many schools have been demonstrated to provide water with lead levels that exceed national standards; and there is substantial scientific evidence that the current "action" levels for blood levels do not protect children from the adverse effects of lead. These provide an example for why we must ensure children have safe drinking water at their schools or day care centers.

Question 2, from Senator Boxer:

Dr. Griffiths, your testimony refers to potential weaknesses in drinking water quality monitoring based on average levels of contaminants, or monitoring that does not consider spikes in contamination.

Is this because average levels of contamination may not tell you if vulnerable populations are fully protected from dangerous exposures? Could you please describe the reasons for concern in greater detail?

in response,

Please allow me to break my response into several pieces so it is most clear.

Acute versus chronic exposure risks. For some chemical contaminants, we are concerned about *acute* exposures as well as *chronic* exposures. A one-time exposure to high levels of a chemical may be as dangerous, or more dangerous, as chronic exposure to low levels of the chemical. The chemical might, for example, affect the development of the fetus in a pregnant woman, or the growth and development of the young child, or promote the risk of cancer. An acute exposure at a critical time for the fetus or infant could carry more risk than the same exposure later on in life.

Some compounds may be tolerated by people without injury to them, or to their fetuses, when low levels are present. In this case the body can detoxify the compound if not much of it is present. However, high levels may overwhelm the capacity of the body to detoxify the chemical contaminant, leading to an unhealthy exposure. (Furthermore, there is now scientific evidence that people have different abilities to detoxify chemicals, based upon their genetic backgrounds. Thus what might be a 'safe' amount for me might not be a 'safe' amount for you or your child, simply based upon our ability to detoxify low-level exposures to these chemicals).

Why and when do spikes in chemical contaminants occur. Levels of drinking water contaminants often vary for economic, seasonal and climatic reasons. Chemicals may only be used during a defined period. For example, herbicides and pesticides, and fertilizers are often applied in the greatest amounts onto crops in the spring. As these are flushed into surface water supplies by rainfall, or absorbed into ground water, then the "spike" may - or may not - occur at a time when the measurements are being taken. The monitoring measurements are usually pre-arranged to occur at some periodic interval (such as monthly or quarterly). The contaminant's presence in the water supply may or may not coincide with when the monitoring sample is taken. Similarly a chemical spill into a water supply might not be detected if it is between monitoring times. There are many well documented instances when the chemical contaminant of concern has been found at vanishingly low amounts, but then becomes quite high - due to the factors (seasonal use or a spill) mentioned above - for a relatively short period.

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The effects of averaging. In the examples given above, the average level would not represent the risk to the person drinking the water during the time when levels are high. There are two reasons for this: First, the averaging would include low levels before and after the spike. The average level would not tell you the true risk to the population, because the true risk is determined by the acute spike event. Second, the monitoring schedule may not coincide with the high acute exposure during the spike, and so completely misses the spike which provides the risk to the population drinking the water.

For a microbial pathogen the analogies are similar.

Some of the protozoan parasites of concern, such as *Cryptosporidium* and *Giardia,* vary in water supplies by the season. Many studies have shown that after storm events (which wash parasites off the land into water, which overwhelm combined sewer systems, and which stir up the sediment in rivers) the concentrations of these parasites in source waters may increase 10 - 100 fold. Thus, the drinking water utilities whom must remove these parasites have a 10 - 100-fold greater task at the time of the storm event. However, their filtration and treatment capacity may only be capable of dealing with a 10-fold increase, but not the 100-fold increase. During this period, some parasites might not be inactivated or filtered out at the treatment plant, and would then make their way into the water sent to households.

Current testing for *Cryptosporidium* is monthly or less frequent. Thus a storm event that occurs between the testing periods would miss the risky period when this parasite is in the water provided to the households. To quote an authoritative review of this subject,

> "The likelihood that these peaks are missed is high, while these peaks represent periods of high risk. Atherhold *et al* [1998] showed that the maximum concentrations found by monthly sampling was 7-fold lower than a scheme where daily samples were taken for three weeks in each season." (source: Risk Assessment of Cryptosporidium in Drinking Water, World Health Organization, 2009, page 39).

Dr. Mark LeChevllier, an highly respected authority in this field, and colleagues examined water from well-run water utilities in the United States (Aboytes *et al,* 2004). He found that 1.4% of the finished drinking water samples he tested for *Cryptosporidium* were positive for infectious *Cryptosporidium* parasites. By finished we mean the water that has already undergone treatment at a central plant and is being delivered to utility customers. In this analysis the authors conclude that during peak periods, such as the springtime, the risk of infection with cryptosporidiosis is likely to exceed drinking water standards. Averaged over a year, the overall risk might still meet drinking water standards because it is being averaged with measurements taken during a time when the utility can more effectively remove or kill the parasites. Again, the effect of averaging is to provide false reassurance that there is no time when a susceptible population is not fully protected.

In such a scenario the risk for infants, the elderly, or people with immunosuppression (people with AIDS, cancer chemotherapy, certain other medical conditions such as transplantation) would likely be at elevated risk of infection during a specific period of the year, and thus "not be fully protected from dangerous exposures." By averaging the number of parasites found, the important information that there is a specific time of year where additional precautions are warranted would be lost.

For some groups of susceptible people, such as persons with AIDS, even a tiny, tiny dose of *Cryptosporodium* can be lethal. Thus knowing about periods of time where parasites might be present in water is important. As a physician I took care of a number of the people with AIDS who were infected with *Cryptosporidium* during the 1993 Milwaukee waterborne outbreak. They travelled

to Boston to see me as I was conducting clinical trials on what we hoped would be new therapies to cure them of their *Cryptosporidium* infection. Several of them told me of having drunk only limited amounts of municipal water. All of them died as none of the treatments worked, and to this day we do not have any reliable agents to treat this disease. Thus for some groups of susceptible people, we must truly rely of preventing the disease rather than treating it.

Question 3, from Senator Inhofe:

Farming is very important in my state and, as I understand it, there is a program in place under the Safe Drinking Water Act to monitor atrazine. Under this program, since 1993, 340,000 finished drinking water samples were analyzed and not a single one has exceeded EPA's Office of Water Health Advisory Level of a one day level of298 PPB or greater. Aren't there programs already in place to monitor the presence of agricultural chemicals in water?

in response,

The Senator is quite correct in that there are programs in place to monitor the presence *of some* of the agricultural chemicals in water.

There are agricultural chemicals which are not monitored. The adequacy of these monitoring programs has been subject to a great deal of scientific debate. Some of the agricultural chemicals (this is not an exhaustive list) which are not being systematically monitored include:

-Hormonally active growth promoters and estrus modulators for animals which may exert effects upon humans (these fall into the larger class of endocrine disruptors);

-Antiparasitic drugs which are very toxic to some invertebrates, which are important for healthy rivers and lakes;

-Antibiotics of specific classes which may lead to increased bacterial resistance in human bacteria;

-Newer fungicides and pyrethroid insecticides.

Question 4, from Senator Inhofe:

In your testimony you mentioned the three principal state roles which included informing, training and technical assistance, and compliance/enforcement actions. You also mentioned that these are areas the EPA is also engaged in along with their state counterparts. In your experience/opinion, does EPA involvement stretch far enough into training and technical assistance for smaller systems?

in response,

My opinion is that the stretch of the EPA is probably about right *given current restraints.* This is based upon my experience of discussions with many colleagues, which include many colleagues in the water world. The observations upon which my opinion is based are as follows:

1. In most states the state has primacy regarding the protection of water and the enforcement of water regulations. The US EPA is secondary to the State. In this role the US EPA can be seen as providing technical expertise and information but should not, by law, overstep its bounds given

the leadership and local knowledge of the State. My experience has been that operators have closer relationships with their State counterparts and appreciate their local knowledge. The roles of the State and the US EPA likely differ, and the US EPA has the capacity to advise more on "the science" and the States on the "compliance and enforcement issues" particular to the individual State. I see the State role as being primary and the US EPA role as secondary.

2. My consistent experience has also been that the smaller systems are resource-poor when compared to larger, resource-rich (or at least richer) systems, and would benefit if additional resources were available from whatever the source. These resources include the ones you ask about, e.g. training and technical assistance. Whether this is the responsibility of the US EPA, the States, the communities themselves, or others may be a larger societal decision which soberly looks at the needs, the issues, and the possible resolutions. It is clear that some of the smaller systems do not have the managerial capacity to fully take advantage of the resources which are available from the US EPA. To summarize, additional resources are needed and would be valuable, be it from the EPA or others.

This occurs in a setting where:

(A) There are genuine, valid, and real concerns about water contaminants and protecting the public, which are often most acute in smaller systems with fewer resources. As a public health professional I do not believe these can be swept under the rug unless we agree as a society that we will have a two-tier system - good and not so good - of water protection.

(B) The States and the US EPA currently do not appear, in my opinion, to have additional resources to augment what they are already doing in terms of training and technical assistance, especially given the current recession.

I have some experience with reviewing the science budget of the US EPA in an advisory role. Based on the figures available on the EPA's Office of the Chief Financial Officer, the number of all employees (FTEs) the Agency had for FY 1992 was 17,101, and in FY 2009, it was FY 16,988 - thus the size of the US EPA has been the same over the past ~ 2 decades. During this same period of time, the number of known potential threats to the health of the public has increased and as have their responsibilities. It is difficult for me as a scientist and public health professional to state that given all of the tasks the US EPA is charged with, that the amount of effort they are making (regarding training and technical assistance for small systems) is realistically too much or too little. Recent reviews of the US EPA's science budget suggest this budget is too small to deal with the scientific questions relating to water contaminants, and that additional funds are needed. My understanding is that nearly every State budget is being cut in response to the recession across the nation as well.

(C) A number of indirect yet important factors are making the stresses felt by smaller systems more acute. These include, for example, an aging (and now retiring) work force and low pay for water system operators, as well as the increasing complexity in the treatment and compliance arenas. Each of these affects the ability of improved training and technical assistance to be of any use. If a system has no operator, then training is of secondary importance.

My answer does not mean that I think there are enough resources in hand for small systems; however, I cannot offer you greater clarity (in terms of my own personal experience) on where

these resources should come from. It is clear the States and the US EPA should work together. If I may offer an opinion, it is my belief that this is a question for a larger societal debate which allows priorities to be set given the genuine needs in a variety of areas. The word 'crisis' is used by professionals with more personal knowledge than I when it comes to infrastructure and managerial capacity needs throughout the water industry, and I take them at their word.

It is an honor to provide these remarks, and I hope they are useful to you and the other members of the Committee on Environment and Public Works.

Respectfully yours,

Jeffrey K. Griffiths, MD MPH&TM
Associate Professor of Public Health, Medicine, Nutrition Science and Policy, Veterinary Medicine, and Civil and Environmental Engineering
Department of Public Health and Family Medicine
Tufts University School of Medicine

Senator BOXER. Thank you so much. I really appreciate your call to action, and I think you and Mr. Baker said it well. If we can keep the water from being contaminated in the first place, it is far better than having to put all kinds of costly repairs into place.

And I would say to Mr. Baker, and this is my question to you, and then I am going to turn it over to Senator Inhofe for his time and then the gavel to Senator Lautenberg, I really appreciated what you said, Mr. Baker. You said we do not want to roll back standards. We want to keep that water clean. But we need some assistance, some technical assistance and help.

And I would say to Professor Griffiths, who is calling for a whole new way of looking at our water, even the way we have got it now, where we are being told there are violations, there is no option, which is why I was so—and I think other Senators—were pretty hard on our EPA folks who were here because we want them to act on the information that is already out there.

We may have to change the system, but right now the system is working in this sense. We know where the standards are being violated, but it falls apart because there is no enforcement.

And I so appreciate Mr. Baker, because you are an important witness here. You are President of the Association of State Drinking Water Administrators, and you said it beautifully. You want to protect our kids, you want to protect our families, you do not want to weaken the standards, but you need help.

So, my question to you is will you help us pass this State Revolving Fund, the S. 1005, which Senator Inhofe and I have worked so closely on, where we improve the amount of funds that go to the rural—we approve the technical assistance, we take care of well water. This is our intent.

And so I wanted to ask you, would you help us? And I mean this sincerely. We need to get time on the Senate floor. Obviously, it is not going to happen before the end of the year, but early next year. We are going to have to file cloture on that and move forward. I think there is overwhelming support, but there are a few people who do not support it.

So, can I ask you if you and your agencies would help us by simply writing to your Senator Reid and Senator McConnell and letting them know that this is important for us to take up?

Mr. BAKER. Thank you, Madam Chairman. Very simply, yes. As I said in my testimony, States recognize and need a good SRF program. We support overall all the changes that have been proposed by this committee in there. Of course, as I said, we appreciate the increase in infrastructure funding because our public water systems do have tremendous need to address their failing infrastructure.

The set asides that are made available for use for States are also extremely important. They can help us to provide direct technical assistance to small systems to help build system capability as well as for our own enforcement activities with the added flexibility that is being proposed in that bill.

So, yes, we do support it. We do think it is valuable, and we will do our efforts to move it forward.

Senator BOXER. Please. I think it would be very helpful.

Senator Inhofe.

Senator INHOFE. Thank you, Madam Chairman.

First of all, the Chairman mentioned the legislation that we have and the technical assistance is dramatically increased with that legislation. Now, since we are kind of confined on time, the first panel lasted a little longer than I thought it would, I want to confine my questions to Mr. Whatley and then, on each question, if you have any, I would like to know from you, Mr. Baker, what is happening in Oklahoma is also consistent with wishes and problems in other States.

First of all, Mr. Whatley, do you think a greater emphasis by the EPA on the training and technical assistance as opposed to enforcement is something that would be helping you to do a better job to clean up the drinking water?

Mr. WHATLEY. Thank you, Senator. I believe that most of our systems in the States do not really understand what they need to do and what the rules are. That is why we have some of the problems that we have. We have about 7,000 certified operators in the State of Oklahoma. We have a turnover of around 1,500 every year. So, we have a lot of people with no experience and very little or no training. So, we think we can address it and help systems meet a lot of these requirements through educational and onsite technical assistance that we work with the State in providing.

Senator INHOFE. I appreciate that because many of our small communities—we are a State of small communities. Many of those communities do not have the resources to have the studies and all of the things that—and so we rely on the assistance, the technical assistance. Do you agree with that, Mr. Baker?

Mr. BAKER. Yes, I do. The complexity of our drinking water regulations continues to grow, as does the technology required to meet those requirements. We have a challenge of making—helping people to just to be aware of what the requirements are and then to understand what those requirements are and how best to achieve them.

Senator INHOFE. Yes. And I appreciate that. Mr. Whatley, could you name some specific EPA regulations or water quality standards that you feel are overly restrictive for our small systems?

Mr. WHATLEY. Well, I just learned yesterday that EPA has sent out notice to systems under the Long Term II Enhanced Surface Water Treatment Rule. It is going out to those small—well, all surface water systems that serve less than 10,000 people. It is going to require monitoring that is going to cost about $24,000 a year, and as you pointed out we are a State of very small systems. Eighty-five percent of the entities in Oklahoma serve less than 3,300 people. So, we will be in——

Senator INHOFE. That is less than 3,300, and yet the benchmark was 10,000.

Mr. WHATLEY. Yes, so that——

Senator INHOFE. That is almost——

Mr. WHATLEY. So, 90 percent of our folks are less than 10,000.

Senator INHOFE. Ninety percent.

Mr. WHATLEY. So, nearly all of our systems in Oklahoma as you pointed out are small or very small systems. So it is going to be extremely difficult for these systems to meet this standard or the launching requirement for cryptospiridium. Of course systems al-

ready are having to comply with turbidity standards which were reduced, I think, by 50 percent a couple of years ago from 1 NTU down to .5. So, we are very concerned about the effect of that rule.

The Stage II Disinfection Byproducts Rule is of great concern to us. There are 1,000 systems in Oklahoma, or more than 1,000 systems, that will be impacted by that rule. These are systems that have, that purchase water systems, that buy water from a surface water system or another groundwater system that have no treatment experience. They are going to be required to do monitoring and potentially have to install expensive treatment processes to meet the requirements of that rule.

Senator INHOFE. Those are good examples. For the record, and by that I mean after this is over we keep the record open, I would like to have you list other examples that specifically are problems for you because I know that the time does not allow us to get into too many of them. You have given a couple of good examples.

Do you want to add to that, Mr. Baker?

Mr. BAKER. I think the particular rules that were mentioned are in fact challenging and are particularly challenging for the large number of small systems that have to achieve compliance with those. But I would also note that I think that they are particularly important rules in addressing acute contaminants that can impact people's health in the short term as well as in the long term.

So, while I think there are challenges I think we have to utilize all the tools in the tool box to try and assist small systems to bring them into compliance with those regulations.

Senator INHOFE. OK, that is good. And then for the record, I would like to have each one of you send us something, what you think the EPA could do to be of help to us, and particularly I emphasize the small communities.

And Mr. Whatley, my time has expired, and I have to go because I am making a talk off campus here. But if you are around today, I looked at my schedule, any time between 3 and 5 o'clock or after 6 o'clock, if you could drop by the office, I would like to visit with you.

Mr. WHATLEY. Thank you, Senator.

Senator INHOFE. Thank you, Mr. Chairman.

Senator LAUTENBERG [presiding]. Thank you very much. I will proceed with a few questions, and then I would pass the gavel and the time over to Senator Whitehouse. Everybody is interested. The problem is everybody is so busy. And we thank you, each, for your testimony.

Mr. Whatley, one of the things that I kind of deduce as I read your commentary is that you say the regulations are—you said you believe that many of the regulations and water quality standards are unnecessary, that benefits of regulations do not justify the cost. You say that many small system operators do not understand the regulations.

Well, since we know that small communities typically have revenue shortfalls, are we then consigning people who live in these communities to have to bear up under unsanitary conditions, contaminated water? What are the alternatives for people who live in these communities?

Mr. WHATLEY. Senator, we certainly do not advocate some lower standard for people in small systems. We think we are all entitled to equal health protection. I guess what I was alluding to in my remarks is that we think that we need to look at the science when we are setting regulations, we need to ensure that we are getting the benefit from that regulation, more benefit from that, say lowering the standard for THMs from 160 to 80, we are getting more benefit from that regulation than we would by investing our money in helping people pay for medical costs somewhere.

So, we need to take a close look at what kind of benefits we are really getting from, the health benefits that we are really getting from the regulations.

Senator LAUTENBERG. Yes, because I am concerned when there is a position saying that they do not have the knowledge, and they do not have the facility, and I am wondering where they go.

Mr. Griffiths, do you believe bottled water manufacturers should be required to give the public detailed information such as the source, where does the water come from, and the level of contaminants?

Dr. GRIFFITHS. Yes, Senator, I do believe the bottled water manufacturers should do that. I had the experience about 10 years ago as a member of the National Drinking Water Advisory Council, an organ that advises the EPA, to ask people from the FDA could they come and give us some information about that. And of course the EPA has hundreds if not thousands of people working on drinking water. And that time, the FDA had one-third of an FTE operating on this. And it took us several, an extended period of time, before we were able to get a representative from the FDA to come speak with us.

Bottled water, as you know, simply has to meet drinking water criteria for being put into the bottle. So Senator Lautenberg could go ahead and set up his own bottling plant, and we would not know where it comes from or anything else like that. And we have had people doing that in Massachusetts. They just turn on the faucet and do it.

Senator LAUTENBERG. I assure you, I would drink it first.

[Laughter.]

Senator LAUTENBERG. Mr. Baker, your testimony, each of you made a significant contribution to our hearing today. Recent studies said that only 5 percent of the funds under the Clean Water State Revolving Fund went to control non-point source pollution, like agricultural or urban runoff, point source pollution from water pipes.

And yet, non-point pollution accounts for as much as 60 percent of the total pollution in the rivers and streams that supply our drinking water. What can we do to encourage more State action to control non-point? I know it is a big problem in my State.

Mr. BAKER. Senator, as you noted, non-point sources of pollutants, particularly nutrients, pesticides and other agricultural and urban stormwater runoff, are a particular challenge, both for folks on the Clean Water Act that are trying to ensure the quality of our rivers and streams as well as on the drinking water for systems that are using those.

Recently, the Association of State Drinking Water Administrators and State Water Pollution Control Administrators, in cooperation with EPA, formed a work group over the last year which was called the Nutrient Innovation Task Group where we published a call for action that was submitted to the Administrator to specifically look at nutrient loading and non-point sources of pollution.

Senator LAUTENBERG. Yes. I will take just a minute more. What is happening to force the States—no, strike that—to help the States improve enforcement from EPA? Are you satisfied with the efforts of EPA to enforce—to help the States enforce the regulations that they are responsible for?

Mr. BAKER. First off, as I said in my testimony, States do support, and we actually help develop, the approach that Assistant Administrator Giles mentioned for identifying and prioritizing significant non-compliers for enforcement. And we think that that will help ensure that those systems that are presenting the greatest public health threat are the ones that in fact we are spending our time taking enforcement actions on.

Having said that, I want to also note that enforcement is extremely time consuming and takes a tremendous amount of resources. A single case can take hundreds of hours and lots of staff time dedicated to building that case and enforcing it. So, while a hammer is one of the most important tools in the tool box, you cannot fix everything with it. And we believe enforcement is a very important tool, but we cannot address all of our systems and all of our problems with enforcement.

Enforcement all takes a long time. We have cases out there on some of most recalcitrant systems that we have been working on for years. So, taking enforcement is not necessarily the quickest approach to achieving public health protection either.

So, I guess more directly in answer, I think EPA has been working in cooperation with the States and support the States when we request that support.

Senator LAUTENBERG. I thank my colleague while I ran a little over time here. And I am going to just say this and close my session here. But the record will be kept open, so we would ask you to respond to any inquiries that you get over the next couple of weeks as promptly as you can. What you are doing is very important.

And I do close with this statement, that a group of scientists, which I am putting in the public record, and they say more than 20 scientists are writing to express a collective view that oil and gas companies, like any other industry, should fully comply with all health and environmental protections. Oil and gas operations, they are talking now about the fractionation, are known to release substances into the environment that are known to be very hazardous to human health.

And with that, I relinquish my—you do not need this. I thank you all very much.

[The referenced information follows:]

June 8, 2009

The Honorable Diana DeGette
2335 Rayburn House Office Building
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Maurice Hinchey
2431 Rayburn House Office Building
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Jared Polis
501 Cannon House Office Building
U.S. House of Representatives
Washington, D.C. 20515

Dear Representatives DeGette, Hinchey and Polis:

As scientists and health professionals, we are writing to express our collective view that oil and gas companies, like any other industry, should be required to fully comply with all health and environmental protections in U.S. law, including the Safe Drinking Water Act, Clean Water Act, Clean Air Act and others, rather than being exempt from any of their safeguards.

While we recognize the importance to the nation of appropriate extraction of energy resources, we are concerned about the serious public health impacts associated with the accelerating oil and gas development occurring across the United States. There are already hundreds of thousands of wells in 34 states from New York to California, and hundreds of thousands more wells are anticipated—each one involving the use of toxic chemicals.

Oil and gas operations are known to release substances into the environment that are known to be very hazardous to human health, including benzene, arsenic, mercury, hydrogen sulfide, and radioactive materials. The demonstrated health effects caused by these substances include cancers, central nervous system damage, skin and eye irritation, and lung diseases. For example, fluids used in the hydraulic fracturing process may contain toxic chemicals such as 2-butoxyethanol, formaldehyde, sodium hydroxide, glycol ethers, and naphthalene. For these reasons, we support regulation of hydraulic fracturing under the Safe Drinking Water Act and the disclosure of all chemical constituents in hydraulic fracturing fluids to public agencies, including the disclosure of constituent formulas in cases of medical need. Moreover, we support full regulation of stormwater runoff, which can pollute drinking water supplies, under the Clean Water Act.

We are also concerned that wells, compressor stations, generators, and truck traffic produce significant air pollution in the form of hazardous air pollutants, volatile organic compounds, ozone, hydrogen sulfide, particulates, and nitrogen oxides, contributing to asthma and other serious diseases. In addition, there are billions of gallons of oil and gas waste nationally, some of it very hazardous, that go unregulated by federal hazardous waste provisions in the Resource Conservation and Recovery Act.

There are growing reports of individuals living near oil and gas operations who suffer illnesses that are linked to these activities, yet there has been no systemic attempt to gather the necessary data, establish appropriate monitoring, analyze health exposure or assess risk related to any of these activities. This should be done, in addition to full Health Impact Assessments to inform future planning and policy efforts.

We understand that affordable technologies are now available to reduce the adverse health impacts of oil and gas development. For example, non-toxic water-based hydraulic fracturing fluids have been used successfully, air pollution control technologies and flareless completions can greatly reduce toxic air emissions, and pitless drilling systems can eliminate the need for open air storage of hazardous wastes. Use of these technological advances will help reduce impacts on the environment and human health, while often providing cost-savings to the industry.

We support legislation to close loopholes in federal environmental or health statutes for oil and gas exploration and production, including exemptions in the Safe Drinking Water Act, Clean Water Act, Clean Air Act, and Resource Conservation and Recovery Act. In addition, we support the rapid transition to cleaner safer technologies and the rapid implementation of health-tracking and environmental monitoring programs with data available to the public.

Thank you for your important work to protect the health of your constituents and all Americans. Advancing protection for human health from oil and gas activities can help set an example for the world.

Sincerely,

*Institutional affiliation provided for identification purposes only. Views expressed here represent the views of the individual and do not represent the views of the institution.

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Senator WHITEHOUSE [presiding]. I join my colleagues in thanking all of you for being here with us. I was struck by Mr. Whatley's testimony about the problems that small systems face. In Rhode Island we have a number of small systems as well.

It strikes me that we are moving into a new environment, as Dr. Griffiths described, in which there are more pollutants and more chemicals and more human health risks than have been faced by systems in the past. I see four nodding heads on that point. We are also dealing with a question of the public health, which should be, I would say, our highest priority.

And so I am concerned about the argument that the public health should yield to the concerns of small operators who are, I think the phrase was, unable to understand or implement the new regulatory requirements that are driven not by frivolous concerns, but are driven by, frankly, new exposures to new chemicals.

And I am wondering, I guess, Mr. Baker, let me ask you, because I understand that Oklahoma is widely populated with small systems, from a national perspective, what is the continuing role of the small system?

I know that there cannot be geographic consolidation because this is hard, in the ground, fixed infrastructure, but are there opportunities for administrative consolidation among small systems so that they are not incapable of understanding regulations and incapable of implementing regulations? Is it time to look at the way in which small systems are structured in order to try to meet these new and changed needs?

Mr. BAKER. Senator, I think that there are several different approaches that can be utilized to assist small systems in achieving compliance with requirements. Those can include managerial restructuring. In some cases, where it is possible regionalization and becoming part of another system physically could be a solution. But due to the geographic dispersion that is not always the case.

I think that there are opportunities for systems to work together and to work with technical assistance providers in the States in how they are structured and how they can gain some better efficiencies of scale by working together. Direct technical assistance is going to continue to be part of the problem. I mean, it is really a challenge——

Senator WHITEHOUSE. Part of the solution, I think you mean. Direct technical assistance is going to be part of the solution.

Mr. BAKER. Yes. Direct technical assistance is going to be part of the solution. But the challenge is getting out there to the large number of those and helping each of those individual operators and owners understand what their requirements are. And that is just one of the first basic principles that can be there. And then financially——

Senator WHITEHOUSE. So you agree with Mr. Whatley that there is a structural problem out there in that the chemical and pollutant inputs into our waters have reached a point where safe regulation and testing is a real challenge for water systems below a certain size just because of the increased complexity driven by the increased pollutants?

Mr. BAKER. They are increasing challenges that present themselves. Some small public water systems are more capable of meet-

ing those challenges than others, and that is where that assistance is needed to help them develop the managerial, technical and financial knowledge base in order to operate it.

Some systems are so small and face challenges of contaminants in their drinking water that they do not have the proper number of customers in order to support, financially, the challenges that they face. In those cases, yes, we have to look for alternative structures for them.

Senator WHITEHOUSE. Yes. Mr. Griffiths, did you have a comment on that? You are, OK, engaged in the exchange.

Dr. GRIFFITHS. Well, I think that it is well recognized that we are at risk of having second class water delivery in some parts of the country because of these limitations of resources and finances. I think we have to fish or cut bait in many ways. We have to come up with solutions that will deal with these issues. They are genuine issues; they are real issues.

At the same time it is very clear that there are a host of chemicals, a sea of chemicals, that we have not really understood what their health effects were before. The fact that we have frogs and fish with confused gender is a major problem, if you ask me. And we have to deal with that.

And so it is not simply a matter of, I think, tweaking the system. We do need a paradigm shift in terms of the way that we support water infrastructure and the way that we value water. We have to make sure that the small systems get the support they need, and at the same time we must be robust in our protection when it comes to public health.

The figure of a 1 in 600 risk for bladder cancer because of arsenic is, frankly, not something that I would like to publicize, let anybody know. I would be ashamed of it if that was the case. It is really a problem.

Senator WHITEHOUSE. You consider that to be an accurate figure? I read it out of a newspaper so it is not always clear that that is——

Dr. GRIFFITHS. It is a central estimate, sir, of some scientific information. I think that one of the things that is not well appreciated is that while we have contaminants in food, we say 1 in 1 million risk of cancer. With drinking water, we have a risk level of 1 in 10,000 of having an adverse impact. So, our water regulations are inherently 100 times less protective, if you will, against something like cancer.

And this, this is a historic lacuna in the way that we think about this kind of thing. We have some very significant issues, and there is no way to paper over this. And the small systems are bearing the brunt of the managerial and financial hit when it comes to this. It does not mean that we should come up with a two-tiered system of public health protection of the country, though.

Senator WHITEHOUSE. Well, your testimony has been very compelling and helpful. I appreciate it. And I want to take this opportunity to thank you also for your service on the Scientific Advisory Panel.

Dr. GRIFFITHS. That is an honor.

Senator WHITEHOUSE. And I thank all of the witnesses for their testimony. It was very helpful to all of us.

As the previous Chairman said, the record of the hearing remains open for a week for anything that anybody would want to add.

The hearing is adjourned.

[Whereupon, at 12:15 p.m. the committee was adjourned.]

[An additional statement submitted for the record follows:]

STATEMENT OF HON. KIRSTEN GILLIBRAND,
U.S. SENATOR FROM THE STATE OF NEW YORK

Thank you, Chairman Boxer, for calling this critical hearing. Of the many important issues that this committee is responsible for, I can think of none that touches every American, in every region of the country, more so than ensuring clean drinking water.

In their most recent Infrastructure Report Card, the American Society of Civil Engineers describes the budget shortfalls for drinking water infrastructure at staggering proportions. They estimate that our Nation's drinking water systems need over $108 billion in investment just to meet current demands. When taking into account future growth and necessary maintenance over the next 20 years, the Nation's drinking water systems will require an additional $146 billion.

The funding needs in my home State of New York follow these national trends. According to analysis by the New York State Department of Health, which manages the Drinking Water State Revolving Funds, over the next 20 years New York drinking water systems will require an infusion of nearly $39 billion. The current funding streams simply do not meet the lengthy backlog in improvements and general maintenance. For instance, in New York 95 percent of the projects submitted to the Drinking Water State Revolving Funds Program remain unfunded due to lack of available funding.

Chairman Boxer, it is not just our crumbling infrastructure that is threatening our drinking water systems. Long known threats to the safety of our drinking water supply such as arsenic and lead continue to be a problem in many communities across the country.

Just 2 years ago in Rockland County located in New York's lower Hudson Valley, elevated levels of arsenic were discovered in two wells that service the county water supply.

New York in particular has been successful in reducing lead levels in drinking water over the last decade, but there are many communities in the United States still facing health threats from lead and other chemicals in drinking water.

In its investigative series Toxic Waters, the New York Times has detailed many of the threats to clean water that communities across the United States are facing. In one of their recent articles, the author details the high levels of lead, arsenic, manganese, and other cancer causing chemicals in Charleston, West Virginia. The article goes on to describe the effects of many of these chemicals irritating and burning the skin from bathing and erosion of tooth enamel leading to a child as young as 7 needing multiple capped teeth.

The series also details the state of the Nation's enforcement of water pollution laws. In 2008 alone approximately 40 percent of the Nation's water systems violated the Safe Drinking Water Act at least once, based on Environmental Protection Agency data. These systems provide water to more than 23 million Americans.

One area of major concern is the lack of enforcement of the Clean Water Act. According to the New York Times, since 2004 the Clean Water Act has been violated more than 506,000 times by more than 23,000 companies and other facilities. Of those, 60 percent were found to be in "significant noncompliance," which includes major violations such as dumping cancer causing chemicals or failure to measure or report where they pollute. In total, less than 3 percent of all Clean Water Act violations result in fines or any other significant punishment.

For a nation as blessed as the United States, basic clean drinking water should never be a concern.

But as science advances, we are beginning to learn of new threats to our Nation's drinking water. Over the last 2 years a series of investigations and articles have outlined how chemicals found in everyday products including shampoos, lotions and cleaning products as well as medications are turning up in waters across the United States.

An Associated Press investigation from 2007 reported that water supplies across the United States tested positive for traces of a number of drugs including antibiotics, anti-convulsants, mood stabilizers and even sex hormones. The United States Geological Survey has found numerous cases of intersexing occurring in fish

across the United States. One likely cause that researchers are identifying with the increased intersexing taking place in wildlife is from endocrine disrupting chemicals that are common in household cleaners, laundry detergents, shampoos, hand sanitizers and many pharmaceuticals.

Wastewater treatment facilities are not equipped to remove these chemicals from wastewater before treated water is released. Likewise, many drinking water systems are not built to remove these drugs from our drinking water before it reaches our tap.

It is critical that as this body moves forward with increased funding to meet our Nation's drinking water and wastewater system needs that we take into account the new challenges that we are facing. We currently do not have the information as to how best to prevent these pharmaceuticals and personal care products from entering into our environment.

That is why I authored an amendment to S. 1005, the Water Infrastructure Financing Act, calling for a 2-year study of the presence of pharmaceuticals and personal care products (PPCPs) in waters of the United States. My amendment, which was unanimously approved by my fellow committee members, takes a comprehensive approach to the concerns associated with PPCPs in the Nation's water looking at what PPCPs are present, and where, how much, and what cost-effective steps can we take to control, limit, treat or prevent the disseminations of drugs into our drinking water.

I am confident that by working with Federal, State and local authorities as well as industry and consumers we can take common sense steps to protect our families and our environment from potential adverse health effects.

Madam Chair, I thank you again for holding this important hearing and hope that very soon the Senate will be able to take up S. 1005, the Water Infrastructure Financing Act so that we can not only address the funding needs but also the real health concerns that are associated with the Nation's drinking water systems. The legislation passed by this committee in May provides $34.7 billion in funding over the next 5 years for the Drinking Water and Clean Water State Revolving Funds. This funding is critical to digging out from the lengthy backlog in critical drinking water and wastewater infrastructure improvements New York and other States are facing. Increased funding for water infrastructure will create good paying American jobs at a time when we need them most, protect both public health and our environment, and help to lower property taxes by assisting our local communities with financing these expensive improvements.

[Additional material, Rural Water's 2009 Report to Congress Documenting Environmental Accomplishments, is available in the committee's files.]