

ENERGY AND WATER DEVELOPMENT
APPROPRIATIONS FOR 2016

HEARINGS
BEFORE A
SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS
FIRST SESSION

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

MICHAEL K. SIMPSON, Idaho, *Chairman*

RODNEY P. FRELINGHUYSEN, New Jersey	MARCY KAPTUR, Ohio
KEN CALVERT, California	PETER J. VISCLOSKY, Indiana
CHARLES J. FLEISCHMANN, Tennessee	MICHAEL M. HONDA, California
JEFF FORTENBERRY, Nebraska	LUCILLE ROYBAL-ALLARD, California
KAY GRANGER, Texas	
JAIME HERRERA BEUTLER, Washington	
DAVID G. VALADAO, California	

NOTE: Under Committee Rules, Mr. Rogers, as Chairman of the Full Committee, and Mrs. Lowey, as Ranking Minority Member of the Full Committee, are authorized to sit as Members of all Subcommittees.

DONNA SHAHBAZ, ANGIE GIANCARLO, LORAIN HECKENBERG,
PERRY YATES, and MATTHEW ANDERSON
Staff Assistants

PART 9
WITNESSES



Printed for the use of the Committee on Appropriations

U.S. GOVERNMENT PUBLISHING OFFICE

COMMITTEE ON APPROPRIATIONS

HAROLD ROGERS, Kentucky, *Chairman*

RODNEY P. FRELINGHUYSEN, New Jersey	NITA M. LOWEY, New York
ROBERT B. ADERHOLT, Alabama	MARCY KAPTUR, Ohio
KAY GRANGER, Texas	PETER J. VISCLOSKEY, Indiana
MICHAEL K. SIMPSON, Idaho	JOSÉ E. SERRANO, New York
JOHN ABNEY CULBERSON, Texas	ROSA L. DELAURO, Connecticut
ANDER CRENSHAW, Florida	DAVID E. PRICE, North Carolina
JOHN R. CARTER, Texas	LUCILLE ROYBAL-ALLARD, California
KEN CALVERT, California	SAM FARR, California
TOM COLE, Oklahoma	CHAKA FATTAH, Pennsylvania
MARIO DIAZ-BALART, Florida	SANFORD D. BISHOP, Jr., Georgia
CHARLES W. DENT, Pennsylvania	BARBARA LEE, California
TOM GRAVES, Georgia	MICHAEL M. HONDA, California
KEVIN YODER, Kansas	BETTY McCOLLUM, Minnesota
STEVE WOMACK, Arkansas	STEVE ISRAEL, New York
JEFF FORTENBERRY, Nebraska	TIM RYAN, Ohio
THOMAS J. ROONEY, Florida	C. A. DUTCH RUPPERSBERGER, Maryland
CHARLES J. FLEISCHMANN, Tennessee	DEBBIE WASSERMAN SCHULTZ, Florida
JAIME HERRERA BEUTLER, Washington	HENRY CUELLAR, Texas
DAVID P. JOYCE, Ohio	CHELLIE PINGREE, Maine
DAVID G. VALADAO, California	MIKE QUIGLEY, Illinois
ANDY HARRIS, Maryland	DEREK KILMER, Washington
MARTHA ROBY, Alabama	
MARK E. AMODEI, Nevada	
CHRIS STEWART, Utah	
E. SCOTT RIGELL, Virginia	
DAVID W. JOLLY, Florida	
DAVID YOUNG, Iowa	
EVAN H. JENKINS, West Virginia	
STEVEN M. PALAZZO, Mississippi	

WILLIAM E. SMITH, *Clerk and Staff Director*

Written testimony submitted to:
**House Appropriations Subcommittee on
Energy & Water Development, and Related Agencies**
in support of Department of Energy programs
By
Randi S. Martinsen
President, American Association of Petroleum Geologists

To the Chair and Members of the Subcommittee:

Thank you for this opportunity to provide testimony on the importance and need for strong federal R&D efforts in the fields of oil and natural gas, coal, and geothermal technologies. These activities reside in the U.S. Department of Energy's (DOE) fossil energy program (oil, natural gas, coal), and energy efficiency and renewable energy program (geothermal). In addition, a new crosscutting program for subsurface engineering integrates Office of Science activities with these applied research areas. This represents essential investment in this nation's energy security.

The American Association of Petroleum Geologists (AAPG) is the world's largest scientific and professional geological association. The purpose of AAPG is to advance the science of geology, foster scientific research, and promote technology. AAPG has over 40,000 members around the world, with nearly two-thirds living and working in the United States. These are the professional geoscientists in industry, government and academia who practice, regulate and teach the science and process of finding and producing energy resources from the Earth.

AAPG strives to increase public awareness of the crucial role that geosciences, and particularly petroleum geology play in energy security and our society.

You are certainly aware of how oil and gas from shales has quickly boosted domestic energy production, creating well-paying jobs, stimulating manufacturing and enhancing U.S. energy security. This energy renaissance would not have been possible without fossil energy R&D, started in the 1970s at the DOE's predecessor agency, the Energy Research and Development Administration (ERDA).

AAPG is disappointed to see the President's budget request zeroes out funding for the methane hydrates program. Methane hydrates could well represent the next energy renaissance. Methane is the predominant component of natural gas. Hydrates below arctic permafrost and in sediments of the Outer Continental Shelf hold vast quantities of this potential resource. The DOE fossil energy program began research on methane hydrates in 1997, when methane hydrates were only a scientific curiosity. Methane hydrates also play a significant role in the global carbon cycle and it is gaining recognition as an important component player in global climate processes and climate change. It is critical, therefore that DOE continues to provide funding for this critical research area.

AAPG supports FY 2016 funding of the DOE methane hydrates program in order to move this novel, potential energy source toward commercialization.

(1)

What is frequently misunderstood, however, is that the federal energy R&D investment cannot be solely focused on new and alternative energy sources. Growing domestic production from shales, is resulting in on-going improvements in efficiency and environmental safety. But fully realizing the potential of these resources for the benefit of U.S. consumers requires additional scientific insights and technological breakthroughs. AAPG supports research proposed in the President's budget to mitigate the impacts of oil and gas production from shales.

Oil and natural gas technologies program

Although AAPG applauds the increased funding in the President's budget request for DOE's natural gas technologies program, we oppose the zeroing out of the oil technologies program. In past budget requests these programs have regularly been either targeted for elimination or funded at levels insufficient to conduct necessary field experiments. This is ironic considering oil and natural gas deliver 62 percent of our nation's energy. Consistent and sustained funding is important to maintaining U.S. research capability and advancing technologies in this area.

AAPG Supports DOE's role in conducting priority collaborative research and development in conjunction with the Department of Interior and the Environmental Protection Agency to ensure that shale gas development is done in a sustainable manner. In particular, we support the development of technologies that focus on gaining a better understanding on the subsurface. AAPG is also supportive of the development of new technologies to mitigate methane emissions and to work with stakeholders on this important issue.

Several commonly overlooked trends in the oil and natural gas sectors support a federal role in oil and natural gas technologies R&D:

1. **The independent oil and gas producer is responsible for finding and producing most U.S. oil and natural gas resources.** According to the Independent Petroleum Association of America (IPAA), a trade association, independent producers produce 44 percent of the nation's oil, 72 percent of the nation's natural gas, and develop 90 percent of the nation's oil and natural gas wells. The median-sized independent producer is the epitome of an American small business. Technology is vitally important for these **producers, who do not have the capacity to conduct independent research.**
2. **Increasingly domestic oil and natural gas production is coming from non-traditional (unconventional) resources,** such as the Marcellus Shale of Appalachia or the Bakken formation of the Williston Basin. The Monterey Shale of California is a new, huge but geologically unique resource that will require additional scientific study and new technologies to develop. These resources hold the key to American energy security, but their development requires significant R&D investment.
3. **Federal R&D has historically provided support for the nation's universities and colleges,** which have proven to be a rich source of technological innovation. But as federal support for oil and natural gas technology development has waned, so has the ability to conduct this type of research and train the next generation of U.S. scientists and engineers. There is a serious workforce shortage rapidly approaching both industry and government.

4. A robust federal R&D program in oil and natural gas technologies, according to a 2010 study by the National Research Council “could help to provide greater energy security for the United States and to help address future energy needs globally.”

AAPG requests that the Subcommittee on Energy & Water Development and Related Agencies increase funding for oil and natural gas technology programs in the Department of Energy’s Office of Fossil Energy in order to fund research supporting increased, environmentally responsible production of domestic oil and natural gas resources including methane hydrates, and the interagency unconventional oil and gas research program with EPA and USGS, including the cross-cutting Subsurface Technology and Engineering (SubTER) program.

Coal program

AAPG supports research and development funding for clean coal technologies such as carbon capture and sequestration (CCS). This will aid power generators in reducing greenhouse gas emissions from coal-fired and natural gas power plants. Additional geologic and engineering research and large-scale field trials are also necessary to bring geologic storage and sequestration of CO₂ to commerciality.

AAPG supports the increased funding levels for Carbon Storage R&D in the President’s FY 2016 request.

Geothermal energy technologies program

Geothermal energy is an important alternative energy resource that provides base-load power to the nation’s electrical grid. Significant expansion of geothermal power production may be possible through the development of enhanced or engineered geothermal systems, but developing and proving these technologies requires R&D investment. The Geothermal program will also be a major contributor to the SubTER crosscutting initiative.

AAPG supports increased funding for the DOE geothermal program to support SubTER and the Frontier Observatory for Research in Geothermal Energy (FORGE) proposed in the President’s FY 2016 budget request.

Summary

Thank you for the opportunity to present this testimony to the Subcommittee. Our nation has the resources and capacity for a bright energy future. Ensuring this future requires prudent investment in R&D to deliver the science and technology needed to safely and efficiently supply the conventional energy sources we will rely on in coming decades, and the breakthroughs in new and alternative energy sources that will power the future.

If you have any questions about AAPG or this testimony, please contact Edith Allison, the director of our policy office in Alexandria (phone: 202-643-6533, e-mail: eallison@aapg.org).



**Written Testimony
American Geosciences Institute**

**Testimony Submitted by
American Geosciences Institute**

Maeve Boland, Director of Geoscience Policy
Abigail Seadler, Geoscience Policy Associate

**To the United States House of Representatives
Committee on Appropriations
Subcommittee on Energy and Water Development, and Related Agencies
Regarding the Department of Energy**

April 3, 2015

Thank you for this opportunity to provide the perspective of the American Geosciences Institute (AGI) on fiscal year (FY) 2016 appropriations for programs within the Subcommittee's jurisdiction. Department of Energy (DOE) investments in geoscience-related research and development (R&D) will help develop and sustain energy resources to support economic growth and resilient communities.

AGI supports robust funding for science at DOE and the President's request of \$5.34 billion for the Office of Science. AGI supports proposed increases to the Geothermal Energy Technologies Program, the continued funding of the Critical Materials Hub in the Office of Energy Efficiency and Renewable Energy, and the development of the Subsurface Technology and Engineering RD&D crosscut. We again note that there may be scope for increased collaboration between DOE and the U.S. Geological Survey in several of these programs. AGI supports funding for research and technology that will lead to a clean energy future and we also recognize that fossil fuels will continue to be important energy sources for several decades. We urge the Committee to fund continued research to support economically and environmentally efficient use of fossil fuels.

AGI is a nonprofit federation of about 50 geoscientific and professional associations that represent approximately 250,000 geologists, geophysicists, and other earth scientists who work in industry, academia, and government. Founded in 1948, AGI provides information services to geoscientists, serves as a voice of shared interests in our profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in society's use of resources, resilience to natural hazards, and the health of the environment.

DOE Office of Science

The DOE Office of Science is the single largest supporter of basic research in the physical sciences in the United States. The Biological and Environmental Research Program carries out important work in atmospheric modeling and the linkages between Earth, biological, and human systems; the Chemical Sciences, Geosciences, and Biosciences Division of the Basic Energy Sciences program helps elucidate the geochemical and geophysical characteristics of the Earth. **AGI asks that you support the President's request of \$5.34 billion for the Office of Science.**

Crosscutting Initiatives

Subsurface Technology and Engineering RD&D crosscut (SubTER): AGI is impressed by DOE's Subsurface Technology and Engineering RD&D crosscut which integrates research, development, and demonstration on shared issues associated with the Earth's subsurface across the agency. It is encouraging to see a collaborative effort to minimize duplication and maximize synergies across many diverse offices. We strongly suggest that DOE expand this effort to include communication and, to the extent possible, collaboration with the U.S. Geological Survey, which has great experience and expertise in studying the Earth's subsurface. **AGI asks the Committee to support crosscutting DOE initiatives and to encourage interagency collaboration on subsurface RD&D in order to avoid unnecessary duplication of effort and to ensure the most efficient use of federal resources.**

DOE Office of Energy Efficiency and Renewable Energy

Geothermal Technologies Program: The President is requesting an increase of \$41 million, or 75 percent, for the Geothermal Technologies Program. This major investment in the Frontier Observatory for Research in Geothermal Energy (FORGE) and other R&D projects should lead to significant advances in this promising energy sector. **AGI supports the President's request for the Geothermal Technologies Program.**

Advanced Manufacturing Technologies: New materials are a foundation for innovative energy development. The Advanced Manufacturing Technologies program focuses on one section of the lifecycle of materials for the energy sector: developing new materials and technologies. **We urge DOE to take a more comprehensive and holistic view of the lifecycle of materials. Studies should integrate knowledge from the geosciences with the existing expertise in DOE to produce a full lifecycle analysis of the flow of materials critical to the energy sector.** The lifecycle of mineral materials starts with understanding the earth processes that create ore deposits and continues through to ultimate disposal of the materials, which often involves storage or dispersal in the Earth system. The U.S. Geological Survey may be able to provide additional expertise in the geoscience aspects of energy-critical materials.

AGI is a member of the Mineral Science and Information Coalition, which supports mineral functions in the federal government. The Critical Materials Hub, a consortium led by Ames National Laboratory, is carrying out important and timely research that should increase

resilience to possible disruptions in the supply chains of elements that are critical to the energy sector. To ensure more robust and reliable supply chains, we suggest that the Critical Materials Hub needs a complementary Hub that would focus on the upstream sourcing of raw materials including innovations in mineral exploration, mining, and processing. **AGI supports funding for the Critical Materials Hub of \$25 million.**

DOE Office of Fossil Energy Research and Development

Fossil Energy R&D: The President requests essentially flat funding for Fossil Energy R&D. AGI believes that fossil fuels, and particularly natural gas, will be a pillar of the nation's energy supply for some time (see *America's Increasing Reliance on Natural Gas: Benefits and Risks of a Methane Economy*, <http://www.americangeosciences.org/policy/ci-forum-2014/final-report>, for more information). We respectfully request that the committee support increased research on natural gas, unconventional fossil fuel, and carbon dioxide technologies, and geologic carbon storage. This research would have the potential to optimize the extraction and processing of our finite fossil fuel resources and to mitigate any negative impacts associated with fossil fuel development while other energy sources are being examined. **AGI supports greater investment in fossil fuel R&D that would enable the nation to reap the greatest benefit, while causing the least associated harm, from ongoing fossil fuel production and use.**

Thank you for the opportunity to present this testimony to the subcommittee. If you would like any additional information for the record, please contact Maeve Boland at 703-379-2480, ext. 228 voice, 703-379-7563 fax, mboland@agiweb.org, or 4220 King Street, Alexandria VA 22302-1502.

THE AMERICAN INDIAN HIGHER EDUCATION CONSORTIUM
SUBMITTED TO THE U.S. HOUSE OF REPRESENTATIVES - COMMITTEE ON
APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT, AND RELATED AGENCIES
DEPARTMENT OF ENERGY – NATIONAL NUCLEAR SECURITY ADMINISTRATION
 April 6, 2015

I. REQUEST SUMMARY

On behalf of the nation's Tribal Colleges and Universities (TCUs) that collectively are the American Indian Higher Education Consortium (AIHEC), thank you for this opportunity to present our Fiscal Year 2016 (FY 2016) appropriations request with regard to the Department of Energy, National Nuclear Security Administration (NNSA) Minority Serving Institutions Partnership Program (MSIPP). Included in the FY 2016 Budget is an added \$4.6 million for a targeted Tribal Colleges and Universities initiative within the NNSA-MSIPP. This initiative will help to meet a primary objective of the MSIPP, by focusing on advancing the TCUs' opportunities to engage in collaborative research projects throughout the NNSA complex and future workforce development.

II. NNSA-MSIPP TRIBAL COLLEGES AND UNIVERSITIES INITIATIVE

The added \$4.6 million included in the Fiscal Year 2016 budget will launch a Tribal Colleges and Universities initiative designed to educate, train, and develop researchers, engineers, and technicians that will expand and diversify the STEM workforce in important technology growth areas, such as advanced manufacturing and energy efficient materials development. The project will focus on capacity building at TCUs in these growth areas and on facilitating TCU research partnerships with NNSA's National Laboratories and their industry partners. In addition to furthering the science mission of the Department of Energy, activities supported through this program will encourage Native students to pursue science and technology careers resulting in a sustainable career pipeline for American Indian and Alaska Native (AI/AN) students in science and technology fields that are emerging as key drivers of the U.S. and global economies.

A key goal of the 2013 Federal STEM Education Strategic Plan is to better serve groups historically underrepresented in STEM fields and to increase the number of underrepresented minorities and women that graduate with STEM degrees. The proposed TCU program provides an important opportunity to help address simultaneously, the national need for a strengthened STEM workforce as well as the need to respond to the underrepresentation of American Indians and Alaska Natives in that workforce. Increasing the participation of underrepresented minorities in science and engineering must be at the center of our overall approach to sustaining our capacity to conduct research and to innovate. This new \$4.6 million initiative is a modest but solid step toward achieving these important goals.

III. BACKGROUND ON TCU: "DOING SO MUCH WITH SO LITTLE"

Tribal Colleges and Universities are an essential education component for American Indians/Alaska Natives (AIs/ANs). Currently, 37 TCUs operate more than 75 campuses and sites in 16 states, within whose geographic boundaries 80 percent of all American Indian reservations and federal Indian trust land lie. They serve students from well over 250 federally recognized tribes, more than 70 percent of whom receive federal financial aid. In total, the TCUs annually

AIHEC/Tribal College and Universities FY 2016 E&WD Appropriations Statement

serve about 89,000 AI/ANs through a wide variety of academic and community-based programs. TCUs are public institutions accredited by independent, regional accreditation agencies and like all U.S. institutions of higher education must periodically undergo stringent performance reviews to retain their accreditation status. Each TCU is committed to improving the lives of its students through higher education and to moving AI/ANs toward self-sufficiency. To do this, TCUs must fulfill additional roles within their respective reservation communities functioning as community centers, libraries, tribal archives, career and business centers, economic development centers, public meeting places, and child and elder care centers.

The federal government, despite its direct trust responsibility and binding treaty obligations, has never fully funded the TCUs' institutional operating budgets, authorized under the Tribally Controlled Colleges and Universities Assistance Act of 1978. In fact, TCU operating support is well below the level received by other institutions of higher education. The Administration requests and Congress appropriates approximately \$200 million annually towards the institutional operations of Howard University (exclusive of its medical school), *the only other Minority Serving Institution (MSI) that receives institutional operations funding from the federal government*. Howard University's current federal operating support exceeds \$20,000/student, because this is the level of need as determined by the U.S. government. In contrast, most TCUs receive \$6,355/Indian Student (ISC) under the Tribal College Act, less than 80 percent of the authorized level. TCUs have proven that they need and have earned an investment equal to -- at the very least -- the congressionally authorized level of \$8,000/Indian student. It is important to understand that we are by no means suggesting that our sister MSI, Howard University does not need or deserve the funding it receives; it does. We are only pointing out that the TCUs also need and deserve adequate institutional operations funding; however, TCU operating budgets remain chronically underfunded.

TCU budgets are at a further disadvantage, because these colleges receive funding for only about 76 percent of their enrolled students. Almost every other U.S. institution of higher education receives institutional operations funding based on its entire student body. However, it is important to note that although approximately 24 percent of the TCUs' collective enrollments are non-Indian students living in the local community, TCUs receive federal funding based only on AI/AN students, defined as members of a federally recognized tribe or the biological children of an enrolled tribal member. While many TCUs do seek funding from their respective state legislatures for their non-Indian, state-resident students (oftentimes referred to as "non-beneficiary" students) successes have been inconsistent, at best. Yet, if a TCU's non-beneficiary students attended any other public institution in the state, the state would provide the college with ongoing funding toward its day-to-day operations. Given their locations, often hundreds of miles from another postsecondary institution, TCUs are open to all students, Indian and non-Indian, believing that education in general, and postsecondary education in particular is a catalyst to a better economic future for their areas.

IV. FURTHER JUSTIFICATIONS & FACTS

- a) TCUs provide access to valuable postsecondary education opportunities that can lead to lucrative career choices and paths to brighter futures. Tribal Colleges and Universities provide access to higher education for American Indians and Alaska Natives and others living in some of the nation's most rural and economically depressed areas. In fact, seven of

AIHEC/Tribal College and Universities FY 2016 E&WD Appropriations Statement

the nation's 10 poorest counties are home to a TCU. The American Community Survey/ U.S. Census Bureau reported the annual per capita income of the U.S. population as \$28,184. However, the annual per capita income of AI/ANs is reported to be \$16,777, or 40 percent lower than that of the general population. TCUs offer their students a high level of support and guidance to bolster their chances of achieving academic success. In addition to serving their student populations, these tribal institutions offer a variety of much-needed community outreach programs.

- b) TCUs are producing a Native workforce that includes highly trained AI/AN teachers, tribal government leaders, nurses, engineers, computer programmers, and other much-needed professionals. By teaching the job skills most in demand on their reservations, TCUs are laying a solid foundation for tribal economic growth, with benefits for surrounding communities and the nation as a whole. In contrast to the high rates of unemployment on many reservations, graduates of TCUs are employed in "high demand" occupational areas such as Head Start teachers, elementary and secondary school teachers, agriculture and land management specialists, and nurses/health care providers. Just as important, the vast majority of TCU graduates remains in their tribal communities, applying their newly acquired skills and knowledge where they are most needed.
- c) Growing number of TCUs - Compounding existing funding disparities is the fact that although the numbers of TCUs and students enrolled in them have dramatically increased since they were first funded, appropriations have increased at a disproportionately low rate. Since 1981, the number of TCUs has happily, more than quadrupled and continues to grow; the number of AI/AN students enrolled has risen over 355 percent. In the past 10 years, six additional TCUs have become accredited and eligible for funding under Title I of the Tribal College Act, and there are several more colleges currently in the pipeline. TCUs are in many ways victims of their own successes. The growing number of tribally chartered colleges and universities and increasing enrollments have forced TCUs to slice an already inadequate annual funding pie into even smaller pieces.
- d) Local Tax and Revenue Bases - TCUs cannot rely on a local tax base for revenue. Although tribes have the sovereign authority to tax, high reservation poverty rates, the trust status of reservation lands, and the lack of strong reservation economies hinder the creation of a reservation tax base. As noted earlier, on Indian reservations that are home to TCUs, the unemployment rate can well exceed 70 percent. By contrast, the national unemployment rate is currently 5.5 percent.
- e) Gaming and the TCUs - Although several of the reservations served by TCUs have gaming operations, these are not the mega-casinos located in proximity to urban outlets and featured in the broad-based media. Only a handful of TCUs receive regular income from the chartering tribe's gaming revenue, and the amounts received can vary greatly from year to year. Most reservation casinos are small businesses that use their gaming revenue to improve the local standard of living and potentially diversify into other, more sustainable areas of economic development. In the interim, where relevant, local TCUs offer courses in casino management and hospitality services to formally train tribal members to work in their local tribally run casinos.

AIHEC/Tribal College and Universities FY 2016 E&WD Appropriations Statement

Some form of gaming is legalized in 48 states, but the federal government has not used the revenues generated from state gaming as a justification to decrease federal funding to other public colleges or universities. Some have suggested that those tribes that operate the few extremely successful and widely publicized casinos should be financing higher education for all American Indians. And yet, no state is expected to share its gaming revenue with a less successful or non-gaming state.

V. CONCLUSION

TCUs provide quality higher education to many thousands of AIs/ANs and other reservation residents, as well as essential community programs and services to those who might otherwise not have access to such opportunities. The modest federal investment that has been made in TCUs has paid great dividends in terms of employment, education, and economic development. Continuation of this investment and expanding it into the energy arena to increase the number of Native students engaged in STEM programs and focusing on careers in STEM related fields makes sound moral and fiscal sense. We greatly appreciate your past and continued support of the nation's Tribal Colleges and Universities and your thoughtful consideration of our FY 2016 appropriations requests.

Testimony



John Howes, Senior Policy Advisor, and Boris Monahov, PhD., Program Manager
Advanced Lead-Acid Battery Consortium, Durham, North Carolina
House Appropriations Subcommittee on Energy & Water Development
March 30, 2015

The Advanced Lead-Acid Battery Consortium (ALABC)¹ is pleased to provide the House Appropriations Subcommittee on Energy and Water Development our views on the US Department of Energy's basic science and advanced battery research and development programs in the proposed Fiscal Year 2016 budget.

The ALABC supports the President's request for a 5.3 per cent increase in the FY 2016 budget for the Office of Science. We draw your attention specifically to the Basic Energy Sciences (BES) budget, for which DOE seeks a 6.7 per cent increase. The ALABC respectfully hopes this request receives favorable attention. With regard to EERE's vehicle technologies program, we support the proposed increase to \$444 million from the current \$290 million.

The ALABC represents 80 companies and institutions from 23 countries, including 23 in the U.S., engaged in the research, development, production and recycling of lead-acid batteries used in a variety of transportation and stationary applications. Virtually all automobiles manufactured and sold throughout the world use starting, lighting and ignition (SLI) lead-acid batteries. There also are "deep cycle" lead-acid batteries for forklifts, traffic signals, cellular phone towers, grid storage, marine use, etc. This versatility has made the U.S. lead-acid industry a \$10 billion per year business that has served consumers for more than 150 years. Lead-acid batteries, moreover, are recycled at a rate of 99 per cent, far higher than any other consumer product.

While alternative battery chemistries (lithium-ion, nickel metal hydride, etc.) have entered the market, none has replaced lead-acid as the world's best-selling rechargeable battery. The lead-acid industry has continually adapted to changing consumer demands with batteries that are more powerful and longer lasting. Research is a high priority for our industry, which has worked with public and private research institutions throughout the world and is very interested in continuing work with the U.S. Department of Energy to leverage DOE's investment in advanced characterization tools for materials to drive new areas of advancement in lead acid batteries.

While much of DOE's battery research has been allocated to lithium-ion batteries, lead-acid has also played an important role. DOE has provided the lead-acid industry with key technical and financial support in battery testing, with outstanding results. DOE also has provided grants for new domestic lead-acid manufacturing capabilities. The ALABC presently is working with DOE's

¹ The ALABC (www.alabc.org) is a program of the International Lead Zinc Research Organization, Durham, NC.

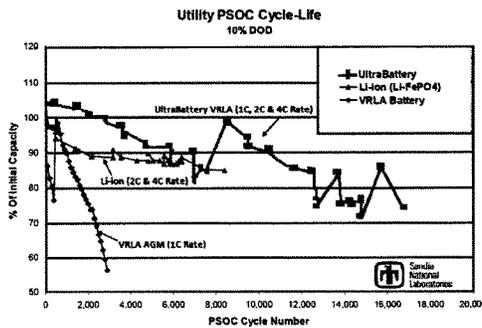
Advanced Vehicle Testing and Evaluation program and Idaho National Laboratories to evaluate the performance of lead-acid batteries in a 12 volt stop-start alternative fuel vehicle.

Continuing lead-acid battery innovation

For many years, the standard flooded lead-acid cell battery has served—and continues to serve—the SLI function in vehicles. This design costs well below \$100/kWh—by far the lowest among the various battery chemistries.

Progress is a hallmark of the lead-acid industry. The sealed valve regulated lead-acid battery (VRLA) was developed in the 1950s so batteries would no longer need continuous monitoring of electrolyte fluid. Gel batteries, introduced in the 1960s, use electrolyte in gel form for greater stability and are ideal in deep cycling systems. The absorbed glass mat (AGM) battery, which came to market in the 1980s, uses porous glass mats to absorb and hold electrolyte. AGMs have become popular in hybrid vehicle and other “high performance” applications.

In recent years, the lead-acid industry has come through with another great innovation, the advanced “lead-carbon” design. This new battery uses carbon to reduce sulfation in the negative plate to expand the cycle life of flooded and VRLA batteries under high rate pulse cycling at partial state of charge. With this dramatic improvement, an advanced lead-carbon battery can now equal the performance of nickel-metal hydride (NiMH) and lithium-ion (Li-Ion) batteries, but at far lower cost.



The chart at left compares the superior cycle life of the lead carbon UltraBattery® with a typical Lithium-ion battery and a standard valve regulated lead-acid battery tested for operation in photovoltaic systems.

Source: Sandia National Laboratories (2011)

Learning about the effect of carbon on lead-acid battery performance, however, has brought the industry to a new threshold that requires more extensive basic, fundamental research into the material science of lead-acid batteries.

The reason for more basic research is that the underlying mechanisms responsible for improving capacity and cycling with carbon and other additives – as well as cell design optimization – remain only partially understood. Better insight into the fundamental

performance enhancements seen in the last decade can help bring about further improvements in lead-acid batteries by designing electrode structures with superior performance. The ALABC believes DOE's facilities used for other battery chemistries could be readily and efficiently applied to lead carbon cells thereby leveraging efforts already pushed forward.

For example, there is considerable variation from study to study of which carbons (graphite, carbon black, activated carbon, and nano-sized carbon particles) work best with other battery materials and the mechanisms by which they work. Other factors such as paste preparation and plate production technology parameters also play an important role. We have four goals to achieve in an expanded basic research program:

- Minimized gassing and water loss
- Sustainable performance at elevated and lower temperatures
- High energy efficiency
- High dynamic charge acceptance (DCA) in hybrid electric vehicle

These goals will be addressed through studies in the following research topics:

- Continue improving the performance of negative plates by adding carbon
- Enhance positive plate performance in long life cells with carbon-enhanced negative plates
- Optimize cell design for better dynamic charge acceptance and longer cycle life
- Optimize charge strategy

Achieving these goals can result in enhanced performance of lead-carbon batteries and further reduce their life-cycle costs.

Why the federal government's role in basic research is in the public interest

We should note that U.S. DOE's budget for basic research is considerably less than the department's expenditures for applied research, by a factor of 10. Yet, as Dr. Patricia Dehmer (Acting Director of the DOE Office of Science) said in her statement before the subcommittee on March 17, 2015, the DOE Basic Energy Sciences Program "supports research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies."

Since lead-acid batteries use less than 50% of their theoretical performance capability, research can help improve this without changing the chemistry, the raw material base or the recycling efficiency while hopefully keep production costs low.

A strong basic energy science research program also can have significant “spillover” effects into areas beyond the original purpose. Furthermore, a sound, well-structured government basic research program can have a broader approach to inquiry than one initiated by a private sector entity motivated by rate of return.²

The lead-acid sustainability model

The ALABC offers another reason for continued collaboration with DOE. Making lead-acid batteries better will enhance one of the industry’s most crucial advantages: sustainability.

The lead-acid industry’s undisputed economic advantage is due in large part to the fact that the batteries are 99 per cent recycled. From lead to sulfuric acid to even the plastic cases, all lead-acid batteries—including those made with advanced lead-carbon technologies—can be recycled. The life-cycle costs of lead-acid batteries manufactured with recycled materials are far less than batteries made with other chemistries using only new materials. This is because considerably less energy is required – and less CO₂ emitted – to manufacture lead-acid batteries with recycled materials. The cost of recycling is rolled into the retail price of lead-acid batteries. No other battery chemistry can make that claim.

Lead-acid battery recycling has been in operation for many years – long before the U.S. Congress enacted its first solid waste disposal law in 1976 – and its success has enabled lead, an otherwise highly toxic substance, to continue its role as a resource for low cost batteries that are essential for mobile and stationary requirements.

DOE has recognized lead-acid’s superior sustainability profile and looks on the industry as a “model” that can extend to other battery chemistries.³ Therefore, a modest effort in lead-acid basic R&D using DOE’s pre-existing staff and equipment would help broaden this recycled materials resource base while also supporting the economy’s ever-increasing need for sustainable energy management.

In summary, the ALABC believes there is a strong need for DOE to maintain and enhance its role in helping strengthen the US energy storage industry’s role in providing the most efficient and environmentally beneficial products. The lead-acid industry plays an important role and looks forward to continued collaboration with DOE.

For further information, contact: John Howes – Jahowes@redlandenergy.com – 202-449-8531

² A useful discussion can be found in Jaffe, “Introduction and Overview: Economic Analysis of Research Spillovers, Implications for the Advanced Technology Program,” Brandeis University & National Bureau of Economic Research, December 1996

³ <http://www.transportation.anl.gov/pdfs/B/964.PDF>

**Testimony by Dr. Michael Brady Raap
President, American Nuclear Society
House Appropriations Subcommittee on Energy and Water Development
On the FY 2016 Energy and Water Development Appropriations Bill
April 3, 2015**

Chairman Simpson, Ranking Member Kaptur, members of the Subcommittee, on behalf of the 11,000 members of the American Nuclear Society, I am pleased to provide testimony on FY 2016 appropriations for the U.S. Department of Energy and other relevant agencies under the Subcommittee's jurisdiction.

As you know, ANS represents a diverse cadre of nuclear professionals. As such, our members' opinions on nuclear issues are often wide-ranging, and perhaps sometimes different from the Subcommittee. However, ANS truly appreciates the thoughtful and deliberate manner in which the Subcommittee approaches issues related to nuclear energy, science, and technology.

ANS believes the United States must maintain its nuclear science and energy technology capabilities, both from an energy supply and national security perspective. While we recognize that US demand for new nuclear reactors has cooled recently because of the economic downturn and historically low natural gas prices, the ANS believes nuclear energy is still an indispensable part of our long-term energy policy in the US.

Overall, The administration has set forth a sensible plan to address the current set of nuclear challenges: a targeted research and development program to promote sustainability of our current light water reactor fleet; a program to accelerate development and licensing of Small Modular Reactors (SMRs); research and development programs focused on the nuclear fuel cycle, advanced reactors, and developing simulation and modeling tools that have broad application across the nuclear sector. In general, we are supportive of the administration's request, however we have several specific areas of concern that require specific action on the Subcommittee's part.

DOE/NRC Integrated University Program

We are extremely grateful to the subcommittee for its continued support of the Integrated University Program. The IUP continues to provide critical support for University-based programs in nuclear engineering and related disciplines through scholarships, fellowships, and young faculty awards.

The federal government, through science-centric agencies such as the National Science Foundation, has consistently provided funding for these activities in other scientific and engineering disciplines. However, NSF has consistently demonstrated an unwillingness to provide support for nuclear engineering and related fields, thus necessitating a dedicated stream of funding that the IUP provides.

Aerospace engineering is perhaps the most analogous discipline to compare when considering the appropriate federal stewardship for the nuclear education. At the graduate level, both nuclear and aerospace engineering programs at US institutions of higher education are extremely resource intensive academic efforts. For aerospace, federal government provides roughly \$1.8 million in support for each doctorate awarded. By comparison, under the current funding structure, nuclear engineering academic programs receive roughly \$700,000 per doctorate awarded.

Each year, OMB proposes the termination of the IUP, justifying their decision with some vague indication that NSF should provide support. Most recently, the IUP has been targeted as part of a larger STEM program consolidation effort. Given the history, we remain convinced that termination of the program would result in significant harm to the US nuclear engineering education enterprise.

In FY 2016, we request that the Subcommittee continue to support the full \$15 million in funding for the Nuclear Regulatory Commission's portion of the IUP program and \$5 million for DOE-NE. While we are pleased that the current leadership of the DOE NE has reestablished its commitment as the primary steward of university-based nuclear education programs, we believe it is critically important for NRC to continue its activities in this area.

**DOE; Office of Science; Office of Biological and Environmental Research;
Radiological Sciences Research**

In its budget request, the administration has proposed appropriating \$2 million for the "orderly closeout" of its Radiological Science activities in FY 2016. BER has been the principal federal sponsor for research related to the biological and health effects of low dose radiation since the beginning of the 2000s. Current federal radiation standards are based on the 60-year-old "Linear No Threshold Theory" (LNT) which posits a linear relationship between exposure to ionizing radiation and cancer risk. Simply put, the LNT theory indicates that populations receiving a higher annual dose of radiation from either natural or man-made sources (airline pilots, residents of high-altitude areas) would have a higher incidence of cancer and cancer related deaths. However, nearly 60 years of research has failed to identify any meaningful epidemiological evidence of increased cancer risk from low-dose radiation. Indeed, there are some studies at both the cellular and population level which suggest that low level doses of radiation may have beneficial health effects.

ANS does not have a position on the issue, however we believe it is critically important for DOE Office of Science to continue funding radiological exposure research. As such, we urge the subcommittee to provide language and budget authority to continue the DOE/BER radiological sciences program in FY 16 and direct the department to reevaluate its decision to shut down the program.,

NRC; Yucca Mountain Repository

The ANS supports the development and use of a geological repository for disposal of high-level radioactive waste and the expeditious completion of the Yucca Mountain licensing process in an open, technically sound manner. In October 2014, the NRC published volume 3 of its safety evaluation report on the Yucca Mountain project. In it, the NRC staff found that, "the Department of Energy's repository design meets the requirements that apply after the repository is permanently closed, including but not limited to the post-closure performance objectives in NRC's regulations," and that the proposed facility "meets the NRC's limits or standards for individual protection, human intrusion and groundwater protection."

Given NRC's determination, The ANS believes that it should move forward with the remainder of the licensing process, including reestablishment of the official docket and direction to the Construction Advisory Board (CAB) to restart its suspended proceeding.

We recognize that the project is politically controversial, and that ultimately the State of Nevada retains authority over several "critical path" issues, including the necessary water rights to operate the facility. However, whether or not Yucca Mountain ultimately becomes operational, completing the licensing process is fundamental to demonstrating the efficacy of NRC's licensing process.

DOE; Office of Science; Fusion Energy Sciences

ANS supports the modest growth scenario outlined in the recently approved Fusion Energy Sciences Advisory Committee (FESAC) 10-year strategic plan. ANS is concerned that the administration's FY 2016 request for the Fusion Energy Program is a substantial cut over what was enacted in FY15, and even below the most pessimistic scenario given to FESAC by the administration for planning purposes.

Furthermore, this budget does not reflect any of the FESAC recommendations to support progress in the domestic fusion program and preserve U.S. leadership in the field. We respectfully request that the Subcommittee consider, at a minimum, the same level of funding for the domestic fusion program that was included in the FY 2014 Energy and Water Development appropriations bill, in addition to an adequate amount to ensure that the U.S. can meet its obligations to ITER.

General Provisions; Radiological Sources

Section 402 of the published subcommittee draft of the FY 2015 Energy and Water Development Appropriations Bill included language that would've forced NRC to adopt DOE source security guidelines in its regulation and mandate the eventual prohibition of NRC licenses for workhorse radioisotopes such as cobalt 60, cesium 137, americium 241, and californium 252, -- without due consideration of the cost, reliability, risks and overall effectiveness of potential substitute technologies. This language was not included in Division D of the Consolidated Appropriations Act of 2014. Instead, the

Omnibus included language directing NRC to submit a report to Congress in 2017 on the status of its implementation of 10 CFR part 37, and GAO to complete a follow-on study of source security standards and submit to Congress by 2019.

We urge the subcommittee to refrain from including any legislative and/or report language on this issue appropriations legislation until these reports have been completed and submitted to Congress.

In closing, we hope the Subcommittee will closely consider our testimony as it assembles its FY 2016 Energy and Water Development Appropriations Bill, and we stand ready and willing to provide additional technical assistance as needed.

Thank you.

Outside Witness Testimony to the Subcommittee on Energy and Water

Submitted by:

Jim Bradley

Vice President, Policy and Government Relations

American Rivers

On behalf of American Rivers' members and supporters across the nation, thank you for the opportunity to submit testimony on the Fiscal Year 2016 Energy and Water Appropriations. Thank you for considering our recommendations for funding the following programs, projects, and policy changes for the U.S. Army Corps of Engineers and the Bureau of Reclamation which are critical for the protection and restoration of America's rivers.

U.S. Army Corps of Engineers

Arguably, no other agency has more impact on our nation's rivers than the U.S. Army Corps of Engineers (USACE). Decades of constructing dams, levees, and navigation infrastructure has fundamentally changed our rivers and communities. Today, we realize that this infrastructure can have unintended consequences, do irreparable harm to our natural resources, and poses public safety and liability concerns when it no longer serves its intended purpose. American Rivers' appropriations requests for the USACE reflect the agency's efforts to use cheaper and more effective non-structural approaches to reduced flood risk, to begin addressing their growing list of outdated infrastructure, and to repair some of the environmental damaged caused by our infrastructure investments of the past. We ask for your support of the following appropriations:

Investigations, U.S. Army Corps of Engineers Headquarters*Planning Assistance to States, \$5.5 Million*

American Rivers supports the Administration's request for \$5.5 million for Planning Assistance to States. This program allows the USACE to assist states, local governments and tribes to engage in comprehensive water resources planning including floodplain management, dam safety, environmental restoration, water supply, and more.

Flood Plain Management Services, \$15 Million

The USACE's Flood Plain Management Services Program provides critical assistance to communities to reduce damage and prevent the loss of life from flooding. These programs allow communities to be proactive about addressing their flood risk and to utilize non-structural approaches to flood risk management. The program supports the Silver Jackets initiative, which has been particularly successful at coordinating on the ground activities various federal, state, and local entities take to reduce flood risk and respond during floods. American Rivers supports the Administration's request for \$15 Million for the Flood Plain Management Services Program.

National Flood Risk Management Program, \$6 Million

The Flood Risk Management Program under the Institute for Water Resources seeks to ensure that USACE activities across the agency are reducing overall flood risk and promotes the use of non-structural alternatives that will reduce the risk of flooding while reducing long-term economic damages, and can improve natural systems. American Rivers supports the Administration's request for \$6 Million.

Disposition of Completed Projects, \$800,000

In the decades since the USACE was founded, the agency has constructed thousands of pieces of infrastructure designed with an intended lifetime- but no plan for what to do with the infrastructure once it is no longer of use. The President has requested \$800,000 for fiscal year 2016 to develop a process for disposing of outdated infrastructure and prioritize projects to be considered for disposition. Multiple districts have disposition studies pending in order to deal with aging infrastructure that is no longer of use. For instance, locks 1 through 4 on the Green River in Kentucky are considered excess property. Likewise, locks 5 through 9 on the Allegheny River are no longer operated and are in caretaker status. Upper St. Anthony Lock and Dam on the Upper Mississippi was ordered to be closed in the Water Resources Reform and Development Act and a disposition study should be undertaken in order to determine the future of the lock. The USACE needs to develop a consistent methodology for undertaking disposition studies and working with communities, states, and other federal agencies to transfer ownership and dispose of outdated infrastructure. American Rivers supports the Administration's request for \$800,000 for disposition of completed projects.

Construction, Rock Island District*Upper Mississippi River Restoration- Environmental Management Program, \$33.17 million*

The Upper Mississippi River is one of the most complex ecosystems on earth. It provides habitat for 50 species of mammals, 45 species of reptiles and amphibians, 37 species of mussels, and 241 species of fish. Unfortunately, the USACE correctly stated in its study of navigation expansion, this ecosystem is "significantly altered, is currently degraded, and is expected to get worse." As habitat vanishes, many species will decline and some will disappear. The Upper Mississippi River Restoration (subaccount for the Environmental Management Program) has received more than \$30 million in each of the past two fiscal years and fully executed the funding to promote science and monitoring and construct habitat rehabilitation and enhancement projects. Unfortunately the President's FY2016 budget request reduced the UMR Restoration Program funding to below \$20 million. We strongly encourage the Subcommittee to prioritize investment in ecosystem restoration by appropriating \$33.17 Million, the full authorized amount, for the Upper Mississippi River Restoration Program in FY2016.

We also agree with the Administration's position that the Navigation and Ecosystem Sustainability Program should not receive any appropriation in FY2016. The large-scale

navigation modifications included in the Recommended Plan for the Upper Mississippi Navigation and Ecosystem Sustainability Program (NESP), as authorized by the Water Resources Development Act of 2007, have not been justified by the Corps and should not be pursued. Previous reviews by the National Academy of Sciences and the Assistant Secretary of the Army, Civil Works found that the navigation construction component of NESP was not economically justifiable. A report released in 2010 by the Nicollet Island Coalition provides additional evidence that proposed locks and dams in this region are not a good investment. American Rivers supports the Corps' decision not to request funding for NESP in FY2016.

Report Language

Implementation of the Principles, Requirements, and Guidelines for Water and Land Resources
American Rivers supports the Administration's revisions to the Principles, Requirements and Guidelines (PR&G). In 2007 Congress looked at the abundant evidence and recognized that the old rules for planning water projects are sorely outdated, resulting in projects that are an unwise use of taxpayer dollars and can cause significant harm to the environment and our nation's rivers. As a result, the Water Resources Development Act of 2007 required that the old Principles and Guidelines be rewritten. These critical revisions were finalized in December 2014 and are currently being implemented at federal agencies; however, language prohibiting the USACE from developing or implementing rules or guidance to implement the new PR&G continues to persist in report language of the Energy and Water appropriations bills. This prohibition means the USACE will continue to use an outdated water project planning policy that serves the interests of a few at the expense of federal taxpayers and the environment. American Rivers strongly encourages the Committee to refrain from including report language that prohibits the USACE from implementing the new PR&G in FY2016.

Bureau of Reclamation

The facts are clear: the demand for water from the western river basins exceeds the supply. According to the Bureau of Reclamation, by 2060 there will be a 3.2 million acre-foot deficit in river supply in the Colorado River Basin alone. The supply-demand imbalance is impacting the West's natural ecosystems, harming world-class fisheries and unique natural wonders. The ripple effect will impact everything from the cost of vegetables to the economic base for hundreds of communities along the banks of the river that rely on healthy river flows.

These challenges are significant and will require basin stakeholders to work together to identify possible solutions and develop landscape scale approaches to address these issues. Fortunately, there are several federal programs investing in locally-driven, collaborative solutions. It is critical that Congress support programs capable of improving conditions throughout the Western river basins at levels needed to accomplish the task of bringing the river systems back into balance and providing a reliable water supply for the communities that depend on these resources.

Programmatic spending should support projects that offer feasible, affordable, common-sense solutions that can be implemented now to protect the flow of the river, ensure greater economic vitality, and secure water resources for millions of Americans dependent on this critical natural resource. Specifically, we ask your support for the following appropriations that meet these criteria:

WaterSMART Program (Bureau of Reclamation), \$63.8 million

The WaterSMART Program has been a critical component of efforts in the Colorado River Basin to restore system supply and demand balance. However, only one in five applicants for WaterSMART Grants is funded, indicating significant untapped water conservation potential. Of the total amount for the WaterSMART Program, I request an increase of \$5.75 million over the administration's request so that Reclamation can fund roughly one-third of grant applicants.

Lift the authorization cap on water conservation grants SECURE WATER Act of 2009 Sec. 9504 (Bureau of Reclamation)

We request that you include language to lift the statutory cap on the authorization of appropriations for grants to improve water management (42 U.S.C. 10364) so that grant programs, like the WaterSMART Grants, can continue supporting local solutions to conserve water and increase water use efficiency.

Yakima River Basin Water Enhancement Project, YRBWEP (\$12.8 million)

The YRBWEP budget will continue to address water supply shortages by evaluating and implementing structural and nonstructural measures to increase the reliability of the irrigation water supply and enhance stream flows and fish passage for anadromous fish in the Yakima River Basin. Construction of the Cle Elum Dam Fish Passage is being funded jointly by Reclamation and the State of Washington through a memorandum of understanding. Cle Elum Dam fish passage contributes towards Reclamation's obligation for fish passage in accordance with the Yakama Nation Settlement Agreement.

Thank you for considering our testimony and considering investing in these studies, projects and policy that are critical to the protection and restoration of rivers across the country. Please contact Eileen Shader (eshader@americanrivers.org, 202-347-7550) regarding U.S. Army Corps of Engineers requests or Matt Niemerski (MNiemerski@americanrivers.org, 202-347-7550) regarding Bureau of Reclamation requests.

Jim Bradley
Vice President, Policy and Government Relations
American Rivers



American Society of Agronomy • Crop Science Society of America • Soil Science Society of America

5585 Guilford Road, Madison WI 53711-5801 • Tel. 608-273-8080 • Fax 608-273-2021
www.agronomy.org • www.crops.org • www.soils.org

Written Public Witness Testimony of

Karl E. Anderson

Director of Government Relations

American Society of Agronomy

Crop Science Society of America

Soil Science Society of America

kanderson@sciencesocieties.org

**Before the
Senate Appropriations Committee, Subcommittee on Energy and Water Development**

March 20, 2015

Subject: FY 2016 Appropriations— Department of Energy's Office of Science

Dear Chairman Lamar Alexander, Ranking Member Dianne Feinstein, and Members of the Subcommittee:

The American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA) urge the subcommittee to support **\$5.4 billion for the Department of Energy's (DOE) Office of Science** in fiscal year 2016 appropriations.

Within the DOE Office of Science, we specifically support:

\$1.849 billion for Basic Energy Sciences (BES)

\$612.4 million for Biological and Environmental Research (BER)

The American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA), represent over 18,000 scientists in academia, industry, and government, 12,500 Certified Crop Advisers (CCA), and 781 Certified Professional Soil Scientist (CPSS), as the largest coalition of professionals dedicated to the agronomic, crop and soil science disciplines in the United States. We are dedicated to utilizing science to manage our agricultural system and sustainably produce food and fuel for a rapidly growing global population in the coming decades.

Energy, agriculture, and food production are inextricably linked. In 2007, 16 percent of the national energy budget went to producing, distributing, processing, preparing and preserving the plant and animal matter we consume. Plant breeding and advances in biotechnology can develop new plant varieties with characteristics that could help mitigate greenhouse gases by increasing crop yields, increase the storage of carbon in soil, and improve efficiency of fertilizers produced from fossil fuels. Understanding fundamental life processes requires investigations that reach

across multiple levels, from the information encoded in individual genomes to the functioning of cells as communities and plants in an ecosystem.

Strong investments in energy, food, and agriculture research have enabled U.S. farmers to be among the most efficient in the world. The United States is the global leader in meeting the world's demand for food. Agriculture and agriculture-related industries contributed \$742.6 billion to the U.S. gross domestic product (GDP) in 2011, a 4.8-percent share. In 2012, 16.5 million full- and part-time jobs were related to agriculture—about 9.2 percent of total U.S. employment. However, in the coming decades, our agricultural system will face significant challenges in the form of an increasingly variable climate, limited natural resources and a rapidly expanding global population. Our Nation's economic prosperity and security depend on our dedication to developing innovative, science-based solutions to meet our growing agricultural needs and managing efficient food systems.

In order to meet these challenges, our nation needs the best and brightest minds to do the research that will lead to innovations and technologies that will help ensure the U.S. maintains its position as a global leader. The DOE Office of Science prepares the next generation of American scientific talent by supporting a diverse portfolio of research at colleges and universities nationwide. It sponsors half of all university energy research and more than 25,000 Ph.D. scientists, engineers, graduate students, undergraduates and technical personnel at over 300 institutions through competitively awarded grants. DOE-funded research and education programs strengthen our Nation's scientific knowledge base and prepare the next generation of scientists and engineers.

Six of the largest life science companies show they expect to hire more than 1,000 domestic scientist-level FTEs before the end of 2015, representing 13% of their current scientist workforce. The largest numbers of scientists to hire will be in the disciplines of plant sciences, plant breeding/genetics, and plant protection. **Nearly half (46%) will need to hold doctoral degrees.** Given the current state of the research workforce pipeline, these companies are concerned about their ability to successfully fill this workforce need.

A steadily increasing need for industry professionals outpaces the supply. Both new job growth and retirements help explain the large number of monthly job postings employers release each month. For occupations in plant research, economics and engineering fields, an average of 11,600 job ads were posted each month – and **nearly 34,000 people were hired in these fields each month** – from January to August 2014.

Basic Energy Sciences (BES)

The Basic Energy Sciences (BES) program is a multipurpose, scientific research effort that fosters and supports fundamental research to expand the scientific foundations for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. The research disciplines that the BES program supports include chemistry, soil, mineralogical, and geosciences. These subjects influence virtually every aspect of energy production, conversion, transmission, storage, efficiency, and waste mitigation.

The Chemical Sciences, Geosciences, and Biosciences subprogram supports the quest to understand and control chemical processes and the transformation of energy at the molecular scale in systems spanning simple atoms and molecules, active catalysts, and larger biochemical or geochemical systems. Only through the greater understanding of these basic energy processes, can we hope to ensure a sustainable energy future for our Nation and the world.

Biological and Environmental Research (BER)

The Biological and Environmental Research (BER) program produces advanced environmental and biological knowledge and operates unique scientific user facilities that are critical to national security through improved energy production, international scientific leadership, and research that improves the quality of life for all Americans.

BER-supported biological research aims to achieve a predictive understanding of complex microbial and plant systems of importance to bioenergy and environmental remediation. For example, by using systems and synthetic biology to understand and re-engineer microbes and plants specifically for biofuels and other bio-based products, and to clean the water, soil, and air. BER environmental science research aims to achieve a predictive understanding of the environmental consequences of energy production and use, such as understanding the movement of nuclear and other contaminants underground through soils.

Genomic science within BER supports basic, multidisciplinary research aimed at achieving a systems-level understanding of plants, microbes, and microbial communities relevant to Department of Energy missions in bioenergy, carbon management, and the environment. By revealing the genetic blueprint and fundamental principles that control plant and microbial systems, the Genomic Science program is providing the foundational knowledge underlying biological approaches to producing biofuels, sequestering carbon in terrestrial ecosystems, and cleaning up contaminated environments. The fundamental scientific advances emanating from this program are transferable to a broad range of application areas and lay a foundation for new generations of industrial biotechnologies.

Support for Department of Energy's Office of Science is essential to maintain the capacity of the United States to conduct both basic and applied agricultural research, to improve crop and livestock quality, and to deliver safe and nutritious food products while protecting and enhancing the nation's environment and natural resource base.

Now is not the time to reduce federal funding for the basic research and scientific facilities that are so critical to our economic growth and energy security. China, India, South Korea, the European Union, and others are copying our approach to innovation and increasing their R&D investments. Strong and sustained funding for DOE science programs is needed to maintain scientific leadership, build a world-class technical workforce, improve the nation's energy security, and ensure continued U.S. competitiveness in the global economy.

Thank you for your consideration. For additional information or to learn more about the ASA, CSSA, and SSSA, please visit www.agronomy.org, www.crops.org, or www.soils.org.



Government Relations tel 1.202.785.3756
 1828 L Street NW, Suite 810 fax 1.202.429.9417
 Washington, DC www.asme.org
 20036-5104 U.S.A

**Position Statement on the
 U.S. Department of Energy Fiscal Year 2016 Budget Request
 submitted by
 ASME Energy Public Policy Task Force**

April 6, 2015

Mr. Chairman, Ranking Member, and Members of the Subcommittee:

The ASME Energy Public Policy Task Force (Task Force) of ASME's Board on Government Relations is pleased to provide this testimony on the Fiscal Year 2016 (FY16) budget request for research and development (R&D) programs in the Department of Energy (DOE).

Introduction

ASME is a more than 130,000-member nonprofit, worldwide educational and technical Society. It conducts one of the world's largest technical publishing operations, holds more than 30 technical conferences and 200 professional development courses each year, and sets some 600 industrial and manufacturing standards, many of which have become *de facto* global technical standards.

ASME has long advocated a balanced portfolio of energy supplies to meet the nation's energy needs, including advancing clean coal, petroleum, nuclear, natural gas, waste-to-energy, biomass, solar, wind, and hydroelectric power technologies. ASME also supports energy efficient building and transportation technologies, as well as transmission and distribution infrastructure sufficient to satisfy demand under reasonably foreseeable contingencies. A balanced energy portfolio will allow the U.S. to maintain its quality of life while addressing our environmental and security challenges. Sustained growth in the energy systems on which the U.S. depends will also require stability in licensing and permitting processes not only for power generating stations but also for transmission and transportation systems.

Electricity Delivery and Energy Reliability

The FY16 budget request of \$270 million for Electricity Delivery (OE) is a \$123 million, or 84 percent, increase over the FY15 appropriated amount of \$147 million. The Task Force is pleased by the level of interagency coordination being led by OE, particularly related to transmission siting, cyber security, FEMA, and the Department of Defense.

The Task Force believes advances in power electronics, micro-grids, systems integration, controls, and modeling and simulation are going to be critical in a future more modern electric grid. We are pleased to see that the OE budget seeks robust support for the Smart Grid Research

and Development area. Similarly, the Task Force fully supports the large increased request of \$14 million for Infrastructure Security and Energy Restoration.

Fossil Energy

We are pleased that the Administration has requested a \$44 million (or 75 percent) increase for the Natural Gas Technologies program in FY16. We recommend that the Unconventional Fossil Energy Technologies program be restored to its FY 2014 enacted level of \$15 million, an increase of \$15 million over the Administration request. The U.S. has access to significant unconventional gas and liquid petroleum resources with the potential to provide an abundant, affordable, and environmentally sound energy source for years to come. Prior FE R&D has contributed to making this possible through multidisciplinary and cross-agency funded research. However, the potential for environmentally responsible unconventional oil and gas energy development will not be realized unless our nation makes the investments to ensure that these resources can be produced reliably, economically, safely, and with minimal environmental impact. Accomplishing this task and keeping the U.S. in the forefront of unconventional fossil energy technology will require basic research, technology development, and advances in low impact environmental technologies that will not be undertaken by industry in the current economic climate.

The Task Force recommends funding the Coal CCS and Power Systems program at \$450 million, an increase of \$81 million over the President's request and \$50 million over the level enacted for FY15. Coal is, and will remain, a critical resource for our nation and the global energy economy. We must continue to invest in research that will reduce coal's environmental impacts and to retain our global leadership in coal-based technology. New systems such as pressurized oxycombustion and chemical looping combustion must be deployed in the 2025 time frame to retain coal in our national power generation mix, given the rise in the use of natural gas for power generation. The \$50 million recommended increase for coal programs over the FY 2015 enacted level should be directed toward larger scale demonstration projects to shorten the development period for deploying new technologies. We further recommend increasing coordination between the ARPA-E and Fossil Energy programs to ensure the development of newer technologies that can further decarbonize fossil fuels to take advantage of our nation's abundant resources.

Advanced Research Projects Agency-Energy (ARPA-E)

The Task Force strongly supports the \$325 million budget request for the Advanced Research Projects Agency-Energy (ARPA-E), a \$45 million or 16 percent increase over the FY15 appropriated amount. ARPA-E received its first funding as part of ARRA, but has stood out quickly among its fellow DOE programs. ARPA-E has already spun out over 30 new energy companies and represents a significant opportunity for the U.S. to cultivate technological breakthroughs related to energy sources, and uses. A steady commitment to ARPA-E has begun to encourage new energy technology innovation and the Task Force believes that this is a worthwhile endeavor for the DOE as we seek to accomplish technological breakthroughs in energy technology research.

Nuclear Energy

Total funding for the DOE Office of Nuclear Energy for FY16 would rise to \$907 million, a 9 percent increase over the FY15 enacted amount of \$833 million. The Task Force remains

convinced that nuclear energy will hold an important role in the nation's energy future. While funding for SMR Licensing and Technical Support has received a strong request, programs like Reactor Concepts (slated for a 19 percent budget cut) and Fuel Cycle R&D need sustained funding to aid the nation's transition to a low-carbon energy future. Reactor Concepts is a particularly critical program as the commercial nuclear reactor fleet faces life extension challenges. Lack of funding for this type of research in nuclear energy may adversely impact the ability of the current US fleet to continue to operate past its 60 year life. The loss of funding may also contribute to the loss of the US nuclear technology competitive edge in developing the nuclear technologies of the future.

Energy Efficiency and Renewable Energy

The Office of Energy Efficiency and Renewable Energy (EERE) manages America's investments in research, development and deployment of DOE's diverse energy efficiency and renewable energy applied science portfolio. The FY16 budget request of \$2.72 billion, an \$808 million, or 42 percent, increase over the FY 2015 appropriated amount of \$1.9 billion, demonstrates the Administration's strong commitment to clean energy technology development. Most of the key EERE programs, including Bioenergy, Solar, Wind, Geothermal, Building Technologies, Vehicle Technologies, and Advanced Manufacturing technologies, receive substantial increases in funding to support the growth of renewable energy and energy efficiency.

The Task Force is particularly pleased to see large increases for both the Advanced Manufacturing program (\$404 million, or a 102 percent increase), as well as the Building Technologies Program (\$264 million, or a 53 percent increase). The budget for Vehicle Technologies R&D is slated to receive a \$164 million increase to \$444 million for FY16. The Task Force also believes that the development of transportation fuel systems that are not petroleum-based is a critical part of our future national energy policy.

The integration of all cost effective electric generating and storage technologies into the operation of the electricity distribution system is critical to economic operation of the national electric grid. The Task Force believes that R&D related to the integration of the electric grid and its control as a truly national system is imperative for the growth of effective and economic energy generation technologies and we encourage full funding for such research.

Science

The mission of the Office of Science (SC) is the delivery of scientific discoveries and major scientific user facilities and tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States. The FY16 budget proposal of \$5.3 billion is an increase of \$272 million, or 5.4 percent, from the FY15 appropriation. The Task Force encourages Congress to fully support funding for SC programs in the FY16 budget.

As successive budget cycles come and go, the nation is getting further away from the funding trajectories necessary to sustain long-term energy innovation. Science programs in high energy physics, fusion energy sciences, biological and environmental research, basic energy sciences, and advanced scientific computing, serve, in some small way, every student and research institution in the country. These funds support not only research at the DOE Laboratories, but also the work at a large number of researchers from other federal agencies, universities and

colleges, and companies that use our national lab system's instruments for cutting edge research across a wide array of disciplines.

Other DOE Programs

DOE is also very active in areas outside of R&D. The environmental remediation program that funds the decommissioning and decontamination of old DOE facilities is one such research area. The Task Force urges close oversight of funding for the Environmental Management program, requested at 5.8 billion for FY16, a 0.7 percent reduction.

Conclusion

Members of the Task Force consider the issues related to energy to be one of the most important issues facing our nation. There is an urgent need for more coherent national energy policies. The Task Force is concerned that without a National Energy Policy, proposed and ongoing research will not be utilized to its full potential. We applaud the Administration and Congress for their understanding of the important role that scientific and engineering breakthroughs will play in meeting our energy challenges. To promote such innovation, strong support for energy research will be necessary across a broad range of technology options. DOE research can play a critical role in allowing the U.S. to use our current resources more effectively and to create more advanced energy technologies.

Thank you for the opportunity to offer testimony regarding both the R&D and other parts of the proposed budget for the DOE. The Task Force is pleased to respond to requests for additional information or perspectives on other aspects of our nation's energy programs.

###

This statement represents the views of the Energy Public Policy Task Force of ASME's Board on Government Relations and is not necessarily a position of ASME as a whole.



**AMERICAN
SOCIETY FOR
MICROBIOLOGY**

Public and Scientific Affairs Board

Statement of the American Society for Microbiology
Submitted to the House Committee on Appropriations, Subcommittee on Energy and Water
Development, and Related Agencies on the Fiscal Year 2016 Appropriation for the Department
of Energy, Office of Science

March 20, 2015

The American Society for Microbiology (ASM) supports the Administration's FY 2016 budget proposed for the Office of Science (SC) within the US Department of Energy (DOE). The \$5.34 billion request is \$272 million above the FY 2015 enacted level, an increase of 5.4 percent. The Office of Science supports unique basic, discovery research in physics, chemistry, biology, applied mathematics, materials science, environmental science and computational science. Investments in DOE Office of Science programs have led to important discoveries and expanded scientific knowledge. DOE funding in FY 2016 will continue projects at 17 DOE national laboratories and more than 300 academic institutions. DOE has built the foundation for large sectors of the R&D enterprise, such as new energy technologies and advanced computing. It is the largest federal sponsor of basic research in the physical sciences and is an international leader in leveraging the intersections of science and technology.

In addition to direct project funding, the Office of Science constructs and operates open access user facilities containing remarkable tools and technologies, many of which are one-of-a-kind and immensely valuable to science. During FY 2016, an expected 31,000 researchers from the national labs, universities, industry and other countries will utilize the impressive resources maintained by SC programs. The FY 2016 budget includes requests to sustain facilities like the DOE's Energy Frontier Research Centers and its Bioenergy Research Centers, as well as increased funding for intensified development of exascale computing systems capable of 1000 fold improved performance.

The Office of Science sustains six core DOE programs: Advanced Scientific Computing Research, Basic Energy Sciences, Biological and Environmental Research, Fusion Energy Sciences, High Energy Physics and Nuclear Physics. Each of these contributes to efforts critical to scientific and technological (S&T) innovation and our continued preeminence in global S&T markets. DOE advances in fields like computing and imaging technology have benefited all areas of scientific research. SC funds also support DOE workforce development, technology transfer and initiatives for small business and industry.

Exploring Frontiers in Biological Sciences

The Administration requests \$612.4 million for DOE's Biological and Environmental Research (BER) program, a minimal 3.4 percent above FY 2015 levels. The FY 2016 request includes BER's two divisions, Biological Systems Science and Climate & Environmental Sciences, for basic research on complex biological, climatic and environmental systems. Also included are the

1752 N Street, NW • Washington, DC • 20036
tel: 202-737-3600 • fax: 202-942-9335 • email: publicaffairs@asmusa.org



three DOE Bioenergy Research Centers (BRCs) and the three BER scientific user facilities: the Joint Genome Institute (JGI), the Environmental Molecular Sciences Laboratory (EMSL) and the Atmospheric Radiation Measurement Climate Research Facility (ARM). BER funding additionally supports interagency collaborations like the program's ten year collaboration with the US Department of Agriculture to develop new bioenergy crops and conduct research on plant microbe interactions and the rhizosphere.

The BER program incubates discovery in the fields of energy, climate dynamics, sustainable environment and basic biological sciences like genomics, microbiology and biogeochemistry. A notable example is the program's Human Genome Project begun in 1986. Farsighted DOE funding initiated the project's catalytic role in the biotechnology revolution. The FY 2016 budget request would support BER's ongoing efforts to similarly transform emerging energy resources by developing technology like cellulosic biofuels production.

In 1997, DOE created the Joint Genome Institute (JGI) to best organize and utilize advances in DNA sequencing, informatics and parallel tech development made by multiple DOE laboratories. JGI applies large scale genomics to microbes, plants and microbial communities and supports user research ranging from the microbial life of Antarctica to the root symbionts of salt tolerant trees. During FY 2014, nearly 1,300 individual researchers used the facility, and JGI added 100,608 billion base pairs to its database. BER funded genomics continues to expand the forefronts of biology, as DOE distributes intramural and extramural funding to explore the following in FY 2016:

- Sustainable bioenergy research
- Function/organization of plant and microbial systems
- Bioimaging technology
- Carbon cycling mechanisms in plant and microbial communities
- Biosystems design
- Computational bioscience

Voluminous data generated by genomic research complicates the efficient data management and integration needed to fully leverage new information. Responding to this challenge, BER designed the open access DOE Systems Biology Knowledgebase (KBase), a software and data platform that gives researchers access to a cloud based, high performance computational platform for large scale bioinformatics analyses that is interactive to allow uploads and analyses of users' own data as well as data available from web based sources. As of January, this community resource hosted 22,253 microbial genomes, 96 eukaryotic genomes and 15,462 metagenomic datasets.

The Administration's FY 2016 budget would increase funding for DOE's laboratory infrastructure by \$34 million. DOE infrastructure pushes R&D achievement that affects domestic and global markets, protecting the environment and advancing scientific knowledge and technological capabilities. BER sponsored facilities and S&T tools offer opportunities that might be impossible elsewhere, and both DOE and non-DOE researchers benefit. During seven years of operation, the Bioenergy Research Centers

(BRCs) have generated 602 invention disclosures/patent applications, 19 patents awarded, 108 licensing agreements and over 1,661 peer reviewed scientific publications.

At the Pacific Northwest National Laboratory, the EMSL facility houses over 60 state of the art instruments for molecular scale research in microscopy, microfabrication, multiple imaging techniques, and more. In FY 2014, 726 researchers from academia, industry, and other DOE labs used the facility, yielding 461 peer reviewed publications, three patents awarded and eight patent applications submitted.

Leveraging Microbiology in DOE Science and Technology

Much of DOE's portfolio utilizes microorganisms and microbiology methods to achieve agency goals like biosequestration, carbon management and environmental stewardship. Examples are the genetic redesign of microbes and plants for sustainable biofuels production or improved carbon storage. DOE's enabling technologies give disciplines like microbiology new R&D tools and analytical approaches, such as electron microscopy, genomic sequencing, mass spectrometry and unequaled computing capabilities.

In 2014, DOE supported research won 31 of R&D Magazine's annual R&D 100 awards, given for outstanding products or processes reaching the marketplace during the previous year. Several of the technologies open new research opportunities or benefit public several sectors.

- A suite of genetic tools called Tissue Specific Cell Wall Engineering provides a new synthetic biology platform to improve crops for food, biofuels, pharmaceuticals and other purposes, and to manipulate microbes to produce specific drugs and biomaterials.
- The only computational platform that delivers web based images from 3-D cell culture models, BioSig3D is primarily used to study cancer related cell disorganization, but could engender other cellular level 3-D model systems.
- An inexpensive, rapid anthrax detector, the size of a credit card, uses an innovative microculture chamber that requires a very small sample for testing. The field ready detector cartridge then self sterilizes when the operator pushes a button post result.

The Office of Science website <http://science.energy.gov/ber/highlights/> features the latest science highlights in biology.

The ASM urges Congress to increase the FY 2016 budget for DOE programs that have consistently delivered huge returns on annual federal R&D investments. There is no question that DOE user facilities and discoveries have strengthened broad sectors of US science and technology, providing large scale research capabilities and unique instrumentation otherwise unavailable.

Tyrone C. Spady, PhD
 Director of Legislative and Public Affairs
 American Society of Plant Biologists
 Email: tspady@aspb.org



American Society of Plant Biologists

Cultivating a better future through plant biology research

Official Written Testimony in Support of the Department of Energy's Office of Science Fiscal Year 2016 Budget

Submitted to the Subcommittee on Energy and Water Development
 Committee on Appropriations
 United States House of Representatives
 Submitted by
 American Society of Plant Biologists
 April 6, 2015

On behalf of the American Society of Plant Biologists (ASPB), we submit this written testimony to support the fiscal year (FY) 2016 requested level of \$5.34 billion for the Department of Energy's (DOE) Office of Science. ASPB supports the FY 2016 request for the Office of **Basic Energy Sciences at \$1.849 billion** and the Office of **Biological and Environmental Research at \$612.4 million**. The testimony highlights the importance of biology—particularly plant biology, which is a major backbone for enhanced bioenergy production—as the nation seeks to address energy security and other vital issues.

ASPB recognizes the difficult fiscal environment our nation faces but believes investments in scientific research will be a critical step toward economic recovery. We would also like to thank the Subcommittee for its consideration of this testimony and for its support for the basic research mission of the DOE Office of Science.

ASPB is an organization of approximately 4,500 professional plant biology researchers, educators, graduate students, and postdoctoral scientists with members across the nation and throughout the world. A strong voice for the global plant science community, our mission—achieved through work in the realms of research, education, and public policy—is to promote the growth and development of plant biology, to encourage and communicate research in plant biology, and to promote the interests and growth of plant scientists in general.

Fuel, Food, Environment, and Health: Plant Biology Research and America's Future

Plants are vital to our very existence. They harvest sunlight, converting it to chemical energy for food and feed; they take up carbon dioxide and produce oxygen; and they are the primary producers on which most life depends. Indeed, plant biology research is making many fundamental contributions in the areas of domestic fuel security and environmental stewardship;

15501 Monona Drive, Rockville, MD 20855 USA • Phone 301 251 0560 • Fax 301 279 2996 • www.aspb.org

the continued and sustainable development of better fuels, foods, fabrics, pharmaceuticals, and building materials; and in the understanding of basic biological principles that underpin improvements in plant growth and home-grown energy sources for all Americans.

In particular, plant biology is at the center of numerous scientific breakthroughs in the increasingly interdisciplinary world of alternative energy research. For example, discoveries will enable energy crops that are more drought and pest tolerant, thereby greatly boosting yields. Bioenergy research encompasses fundamental and applied plant biology, engineering, chemistry, and physics, representing critical frontiers in both basic biofuels research and bioenergy production. Similarly, with the increase in plant genome sequencing and functional genomics, the interface of plant biology and computer science has become essential to our understanding of complex biological systems, ranging from single cells to entire ecosystems. This research is critical for our future in bioenergy production.

Despite the fact that foundational and mission-oriented plant biology research—the kind of research DOE funds—underpins vital advances in practical applications in energy, health, and the environment, plant scientists have had to maximize and leverage modest federal funding in order to understand the basic function and mechanisms of plants. A strong investment in plant biology research is important considering the significant positive impact crop plants have on the nation's economy and in addressing some of our most urgent challenges like energy and food security.

In order to address these future challenges, ASPB organized a two-phase Plant Science Research Summit with support and funding from DOE, the National Science Foundation, the U.S. Department of Agriculture, and the Howard Hughes Medical Institute. The Summit brought together representatives from across the full spectrum of plant science research to develop a research agenda and resulted in a report released in August 2013—*Unleashing a Decade of Innovation in Plant Science: A Vision for 2015-2025* (plantsummit.files.wordpress.com/2013/07/plantsciencedecadalvision10-18-13.pdf). The report puts forth a ten-year consensus plan to fill critical gaps in our understanding of plant biology and address the grand challenges we face. As a research community, our vision is to create plant systems that are flexible and adaptable to new and existing challenges by increasing the predictive and synthetic abilities of plant biology. In achieving these goals, the plant science research community will make significant contributions to:

- Exploring, conserving, and utilizing our natural resources;
- Protecting, maintaining, and improving energy crop productivity; and
- Creating new plant-inspired industries.

DOE Recommendations

Because the ASPB membership has extensive expertise and participation in the academic, industry and government sectors, ASPB is in an excellent position to articulate the nation's plant science priorities as they relate to fundamental plant biology and, specifically, with regard to recommendations for bioenergy research funding through DOE's Office of Science.

Within the Office of Science, the programs in Biological and Environmental Research (BER) and Basic Energy Sciences (BES) are crucial to understanding how basic biological processes work. For this reason, ASPB supports the administration's FY 2016 request for the Office of Basic Energy Sciences and the Office of Biological and Environmental Research. Sustained funding for these programs is vital as the discoveries made in these areas will ultimately be the foundation for the next fuels and technologies we use in our daily lives.

In addition:

- We commend the DOE Office of Science, through its programs in BES and BER, for funding the Bioenergy Research Centers and the Energy Frontier Research Centers. These centers provide a model for collective science innovation that complements DOE's essential investment in individual investigator and small group science. ***ASPB strongly encourages additional funding for the DOE Office of Science that would specifically target funding at individual or small-group grants for bioenergy and plant growth research.***
- Considerable research interest is now focused on the processing of plant biomass for energy production. Fundamental discoveries of the genes that control plant growth and enable plant growth in response to stresses, including drought, are needed to secure our energy future. If biomass crops, including woody plants, are to be used to their full potential, extensive effort must be expended to improve our understanding of their basic biology and development, as well as their agronomic performance and conversion efficiency in processing to fuels and high-value co-products. ***Therefore, ASPB calls for DOE to support research targeted at efforts to increase the utility and agronomic performance of bioenergy feedstocks both in the field and for their end users in the bioeconomy.***

Thank you for your consideration of our testimony on behalf of the American Society of Plant Biologists. For more information about the American Society of Plant Biologists, please see www.aspb.org.

Outside Witness Testimony

House Appropriations Committee
Subcommittee on Energy and Water

Army Corps of Engineers Civil Works FY 2016 Budget Request
Programs under General Investigations

Submitted by:
Chad Berginnis, Executive Director
Association of State Floodplain Managers
April 6, 2015

The Association of State Floodplain Managers appreciates this opportunity to comment on aspects of the Fiscal year 2016 Budget Request for the Army Corps of Engineers – Civil Works. We wish to express the strong support of our members for the several technical assistance programs of the Corps – Flood Plain Management Services, Planning Assistance to States, Silver Jackets and the National Flood Risk Management Program. We were very pleased to note that the Army Corps budget request includes a total of \$31 million for technical assistance programs.

The Association of State Floodplain Managers and its 36 State Chapters represent more than 16,000 state and local officials and other professionals who are engaged in all aspects of floodplain management and hazard mitigation including mapping, engineering, planning, permitting, hydrology, forecasting and management of floodplain areas. All ASFPM members are concerned with reducing loss of life and property due to flooding. Our website is: www.floods.org.

Disaster related costs to the nation continue to rise. Flooding is the most frequent and most predictably costly type of natural disaster that can affect every part of the country. Many localities and states in the nation can be vastly assisted in their efforts to reduce flood related loss of life and property through technical assistance from the Army Corps of Engineers. The Corps has the capacity, not only to design, build and maintain important flood control structures, but to assist local jurisdictions in assessing their flood risk, suggesting solutions and helping to design ways to lessen vulnerability to flooding through both non-structural and small structural means.

These technical assistance programs are funded at very low levels when compared to the average costs of Corps projects, yet they can yield cost reduction benefits that far exceed the small investment. So many communities and counties around the nation cannot afford an in-house engineer or to contract with an engineering firm. This is where the Army Corps of Engineers can bring its expertise to help them thoughtfully and expertly address their flood challenges.

Flood Plain Management Services (FPMS) was funded in FY '15 at \$8 million and the request for FY '16 is \$15 million. Planning Assistance to States (PAS) was funded at \$3.5 million in FY '15 and the FY '16 request is for \$5 million. The National Flood Risk Management Program (NFRMP) was funded at \$5 million for FY '15 and the request for FY '16 is \$6 million. Funding and support for the very successful intergovernmental Silver Jackets initiative is partially derived from these programs. Because there is no line item for Silver Jackets, it is not clear to us what level of funding is planned for FY '16, but budget materials indicate intent to expand the current Silver Jackets efforts.

ASFPM members know first hand the value of these programs in reducing flood losses at very low cost to taxpayers. We strongly urge expansion of these technical assistance programs to the greatest amount feasible within the subcommittee's budget constraints.

Thank you very much for the opportunity to make these recommendations about the FY '16 budget request for the Army Corps of Engineers – Civil Works. If you have any questions, please contact ASFPM Executive Director, Chad Berginnis, at (608) 828-3000 or cberginnis@floods.org.

Association of State Floodplain Managers
575 D'Onofrio Drive, Suite 200
Madison, WI 53719

**Testimony
David V. Modeer
General Manager
Central Arizona Project**

**House Committee on Appropriations
Subcommittee on Energy and Water Development**

**Support for \$11.2 million in Fiscal Year 2016 Funding for the Colorado River Basin
Salinity Control Program under Reclamation's Basinwide Program
April 1, 2015**

On behalf of the Central Arizona Water Conservation District (CAWCD), I encourage you to include \$11.2 million for the U.S. Bureau of Reclamation's Basinwide Program for the Colorado River Basin in the Fiscal Year 2016 Appropriations bill. Continued funding for the Basinwide Program, which supports salinity control projects, will help protect the water quality of the Colorado River that is used by approximately 40 million people for municipal and industrial purposes and used to irrigate approximately 4 million acres in the United States.

CAWCD manages the Central Arizona Project, a multi-purpose water resource development and management project that delivers Colorado River water into central and southern Arizona. The largest supplier of renewable water in Arizona, CAP delivers an average of over 1.5 million acre-foot of Arizona's 2.8 million acre-foot Colorado River entitlement each year to municipal and industrial users, agricultural irrigation districts, and Indian communities.

Our goal at CAP is to provide an affordable, reliable and sustainable supply of Colorado River water to a service area that includes more than 80 percent of Arizona's population.

These renewable water supplies are critical to Arizona's economy and to the economies of Native American communities throughout the state. Nearly 90% of economic activity in the State of Arizona occurs within CAP's service area. CAP also helps the State of Arizona meet its water management and regulatory objectives of reducing groundwater use and ensuring availability of groundwater as a supplemental water supply during future droughts. Achieving and maintaining these water management objectives is critical to the long-term sustainability of a state as arid as Arizona.

Negative Impacts of Concentrated Salts:

Natural and man-induced salt loading to the Colorado River creates environmental and economic damages. The Environmental Protection Agency (EPA) has identified that more than 60 percent of the salt load of the Colorado River comes from natural sources. With the significant federal ownership in the Basin, most of this comes from federally administered lands. Human activity, principally irrigation, adds to the salt load of the Colorado River. Further, natural and human activities concentrate the dissolved salts in the River.

The U.S. Bureau of Reclamation (Reclamation) has estimated the current *quantifiable* damages at about \$382 million per year to U.S. users with projections that damages would increase to approximately \$614 million annually by 2035 if the program were not to continue. These damages include:

- a reduction in the yield of salt sensitive crops and increased water use to meet the leaching requirements in the agricultural sector;
- increased use of imported water and cost of desalination and brine disposal for recycling water in the municipal sector;
- a reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector;
- an increase in the cost of cooling operations and the cost of water softening, and a decrease in equipment service life in the commercial sector;
- an increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector;
- a decrease in the life of treatment facilities and pipelines in the utility sector; and
- difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions, and an increase in desalination and brine disposal costs due to accumulation of salts in groundwater basins.

History of the Colorado River Basin Salinity Control Program:

Recognizing the rapidly increasing salinity concentration in the Lower Colorado River and its impact on water users, Arizona joined with the other Colorado River Basin States in 1973 and organized the Colorado River Basin Salinity Control Forum (Forum). In 1974, in coordination with the Department of the Interior and the U.S. State Department, the Forum worked with Congress in the passage of the Colorado River Basin Salinity Control Act (Act) to offset increased damages caused by continued development and use of the waters of the Colorado River. Title I of the Salinity Control Act deals with the United States' commitment to the quality of water being delivered to Mexico. Title II of the Act deals with improving the quality of the water delivered to the U.S. users.

In the early years of the Program, Reclamation implemented salinity control through large projects which were funded with specific line item amounts. In 1995, Congress amended the Act and created Reclamation's Basinwide Program. Under this program, Reclamation funds competitive proposals which will decrease the salt load to the Colorado River. Most of the received proposals target off-farm irrigation distribution systems such as canals and laterals. The lining or piping of canals and laterals prevents leakage into the groundwater and the dissolution

and transportation of salts to the Colorado River and its tributaries. States provide a 30 percent cost share of the projects implemented by Reclamation.

The threat of salinity continues to be a concern in both the United States and Mexico. On November 20, 2012, a five year agreement, known as Minute 319, was signed between the U.S. and Mexico to guide future management of the Colorado River. Among the key issues addressed in Minute 319 included an agreement to maintain salinity standards. The CAWCD and other key water providers are committed to meeting these goals.

Conclusion:

Implementation of salinity control practices through Reclamation's Basinwide Program has proven to be a very cost effective method of controlling the salinity of the Colorado River. In fact, the salt load of the Colorado River has now been reduced by roughly 1.2 million tons annually. However, shortfalls in recent Basinwide Program funding levels have led to inefficiencies in the implementation of the overall Program. The Plan of Implementation, as adopted by the states and approved by EPA, calls for 67,000 tons of additional salinity control measures to be implemented by Reclamation by 2035, or approximately 11,400 tons of new control each year.

The current drought that has significantly impacted the West affects the amount of and quality of available water, which in turn has the potential to exacerbate the salinity concentration levels. In addition to initiatives such as the Drought Response program and WaterSMART Grants, adequate funding for salinity control will prevent water quality of the Colorado River from further degradation and ensure the availability of supplies for future generations.

CAWCD urges the subcommittee to include \$11.2 million for the U.S. Bureau of Reclamation's Basinwide Program for the Colorado River Basin in the Fiscal Year 2016 Appropriation bill. If adequate funds are not appropriated, significant damages from the higher salt concentrations in the water will be more widespread in the United States and Mexico.



**Statement of the Coalition of Northeastern Governors
to the Committee on Appropriations
Subcommittee on Energy and Water Development, and Related Agencies
United States House of Representatives
Regarding FY2016 Appropriations
for the U.S. Department of Energy**

April 6, 2015

The Coalition of Northeastern Governors (CONEG) is pleased to share with the Subcommittee on Energy and Water Development, and Related Agencies this testimony on FY2016 appropriations for the Department of Energy (DOE). The governors recognize the fiscal challenges that continue to confront Congress this year. They also believe that a strong federal-state partnership and robust federal funding for critical energy efficiency and clean energy programs are crucial to improving the nation's energy security and independence while helping businesses and households across the nation reduce their energy costs. Specifically, the governors request no less than \$70 million for the State Energy Program as base program formula funding; \$230 million for the Weatherization Assistance Program; \$131 million for the Energy Information Administration; \$63 million in energy reliability and assurance grants for state, local and tribal governments; and \$14 million for critical energy emergency preparedness and response to super storms. They also request no less than current funding for the U. S. Department of Energy's Office of Energy Efficiency and Renewable Energy, the Office of Electricity Delivery and Energy Reliability, the Office of Science, and ARPA-E; as well as sufficient funding for maintenance and operation of the Northeast Home Heating Oil Reserve.

Weatherization Assistance Program

The CONEG governors request \$230 million in FY2016 for the Weatherization Assistance Program (WAP) to help low-income families improve the efficiency of their homes and reduce their energy costs. Adequate funding for WAP is particularly important in the Northeast where winters are long and cold, and many low-income homes must heat with expensive delivered fuels. Since the program began in 1976, WAP has helped improve the lives of more than seven million low-income families by reducing their energy bills. According to DOE, on average, the value of the weatherization improvements is 2.2 times greater than the cost. In addition, every home that is weatherized saves an average of up to \$400 on their annual heating and cooling bills.

State Energy Program

The CONEG governors request no less than \$70 million as base program formula funding for the State Energy Program (SEP) in FY2016. SEP is a proven cost-shared program that brings the federal and state governments and private sector together in partnerships that help the nation increase its energy security and economic competitiveness. By providing the funds as base formula funding, these partnerships can continue to identify and deliver energy use reductions

400 North Capitol Street, N.W. • Suite 382 • Washington, DC 20001 • (202) 624-8450 • Fax (202) 624-8463
E-mail coneg@sso.org • www.coneg.org
♻️ Printed on recycled paper

and energy cost savings in residential, commercial, industrial, power generation, agricultural and transportation sectors across the nation. The base SEP program is particularly important to smaller states since it allows them to identify and leverage non-federal resources toward energy efficiency, conservation and renewable energy initiatives.

The SEP funds allow each state to carry out a wide variety of activities most appropriate for its unique energy profile, needs and goals – activities that provide meaningful economic benefits to business and consumers. SEP provides an indispensable source of funding for state energy offices to conduct important research, regional collaboration, outreach and policy work. In the Northeast, SEP funds have contributed to residential energy audits, installation of real-time energy meters in buildings, solar installations at water and wastewater treatment facilities, and residential retrofits – all resulting in reduced energy use, reduced emissions, and lower energy costs to households and businesses. SEP funds have also contributed to saving and creating jobs by leveraging investment in clean energy projects and helping energy-intensive industries become more competitive by reducing their energy costs.

DOE estimates that every dollar in federal SEP funding is typically leveraged by \$10.00 in state and private sector funds, and yields approximately \$7.00 in annual energy cost savings. An Oak Ridge National Laboratory report found that at recent appropriations levels, SEP produces \$333 million in sustained, annual energy cost savings for households, businesses, and state and local governments.

Energy Information Administration

The governors request \$131 million in FY2016 funding for the Energy Information Administration (EIA). As the independent statistical arm of the Department of Energy, EIA is the leading source for reliable impartial data, analyses and forecasts on U.S. energy production, demand, consumption, imports and prices. EIA's workload has greatly increased as national and global energy markets undergo dynamic change, and as emerging technologies change the landscape of energy production and delivery. These changes have made more vital than ever the comprehensive, timely, objective information and analyses that EIA provides to federal, state and local government and private sector policy-makers as they develop critical energy, economic, security and environmental strategies. For example, changes in natural gas markets and in environmental requirements for distillate fuels can affect the logistics chains that provide petroleum products to the Northeast, a region that is particularly vulnerable to supply disruptions and price volatility. EIA's close monitoring of market developments and the accurate and timely price and supply data in EIA's state heating oil and propane survey allows decision-makers to act quickly in the event of a supply disruption. EIA also collects, analyzes and distributes a wide range of information to help consumers make informed household decisions, understanding the interaction between energy, the economy and the environment.

Efficiency and Reliability

The CONEG governors strongly support the efficient use of energy in all sectors, and a reliable and diverse mix of affordable and environmentally sound energy options. As technology and innovation drive the transformation of domestic energy production and energy markets, an effective federal partner in energy is critical for the nation's consumers – individuals and

businesses – to count upon diverse sources of energy, an effective and reliable energy infrastructure network, and the efficient use of energy throughout the economy.

Maintaining no less than current funding for the programs of the Office of Energy Efficiency and Renewable Energy, the Office of Electricity Delivery and Energy Reliability, the Office of Science, and ARPA-E are sound investments that reinforce the foundation of the U.S. economy by strengthening the resiliency and efficiency of the nation’s energy infrastructure, and creating new products and new jobs.

- The Office of Energy Efficiency and Renewable Energy (EERE) works with a large network of researchers, manufacturers, national laboratories, and state and local governments to develop and deliver innovative technologies, products and solutions for sustainable transportation, renewable power and end-use energy efficiency. EERE invests in only the highest-impact activities to achieve its mission, while addressing national priorities such as saving money for U.S consumers, creating jobs, reinvigorating domestic manufacturing and reducing pollution.
- Robust funding for the Office of Electricity Delivery and Energy Reliability (OE) in FY2016 will support effective partnerships and collaboration – among the public and private sectors and across political jurisdictions and levels of government – that can reduce or mitigate potential risks to the nation’s energy infrastructure and networks, moderate the impacts of a disruptive event and speed an effective response and recovery. A secure, reliable, efficient and safe interdependent network of transmission grids, pipelines, petroleum terminals, barges, rail and trucking fleets is vital to the security and economic competitiveness of the nation’s people and its businesses.
- The governors specifically request \$63 million in energy reliability and assurance grants for state, local and tribal governments, and no less than \$14 million for the DOE Division of Infrastructure Security and Energy Restoration for critical energy emergency preparedness and response to devastating and powerful storms such as Hurricane Sandy. These funds allow state, local and tribal governments to be effective partners in addressing energy emergency planning, response and training as well as enhance resiliency of the energy infrastructure.

The northeast states, like many other regions across the country, have first-hand experience with the extensive, costly impacts that affect the safety, health and pocketbooks of households and businesses, and disrupt public services when a region’s wholesale and retail energy infrastructure is disrupted or destroyed on a massive scale by extreme weather and other hazards. State officials are “front-line players” – before, during and afterwards – when extreme weather and other risks threaten energy infrastructure. They provide information and coordination among energy providers, communities, first responders and recovery personnel, and state and federal agencies in their own and neighboring states. Direct federal funds to states will enable them to continue the informational and outreach networks, and participate in training exercises that are vital to effective and timely responses when critical energy infrastructure is threatened.

- The Office of Science conducts and sponsors basic research vital to strengthening the nation's leadership in science, and maintaining and enhancing U.S. competitiveness in the international field of scientific research. Basic research is a foundation to advancing the private sector's efficient production, delivery and use of energy throughout the nation's economy. For example, Energy Innovation Hubs are integrated research centers that facilitate the collaboration of top scientists from academia, industry, and government to accelerate the path of critical energy technologies from basic laboratory research to pre-deployment of new technologies.
- The Advanced Research Projects Agency – Energy (ARPA-E) helps nurture the innovation in energy technologies that is vital to achieving the goal of ensuring reliable, secure energy through the development and delivery of environmentally sound domestic energy and the creation of diverse, clean, sustainable and affordable energy portfolios. ARPA-E accelerates research and development on high-risk, high-reward energy technologies – investment that is critical to advancing the nation's energy future, but may not be a feasible investment for the private sector. This transformative R&D is done in partnership with industry and academia, focusing on innovative breakthrough technologies for the generation, storage, distribution, and use of energy. ARPA-E strives to maximize speed and efficiency, and its management principles and practices have been recognized by government and industry.

Northeast Home Heating Oil Reserve

The CONEG governors request sufficient FY2016 funding for maintenance and operation of the Northeast Home Heating Oil Reserve. The Northeast is uniquely dependent on home heating oil. Over 25 percent of northeast homes use fuel oil for heating. These homes account for over 80 percent of residential heating oil use nationwide, making the region particularly vulnerable to the effects of supply disruptions and price volatility. The states of the Northeast have been hard-hit in recent years by a series of major natural disasters such as hurricanes, snow and ice storms and flooding. The Reserve provides a valuable buffer that allows additional time for supplies to reach the region. After Hurricane Sandy devastated the energy infrastructure in the Northeast causing severe supply disruptions across the region, emergency releases from the Reserve provided crucially-needed fuel supplies to state, local and federal responders to ensure their continued response and recovery efforts.

The CONEG Governors recognize the difficult decisions that confront the Subcommittee, and urge your consideration of these requests for funding vital to the immediate and long-term energy security of the nation.

**Submitted by Ben Yamagata, Executive Director, Coal Utilization Research Council
Written Statement Submitted to the House Committee on Appropriations
Subcommittee on Energy and Water Development Appropriations
Testimony on the FY 2016 Budget Request, Department of Energy Fossil Energy Program**

Introduction and Importance of Coal. This statement is submitted on behalf of the membership of the Coal Utilization Research Council (“CURC”).¹ Coal is essential to the U.S. economy and provided the fuel for 18.5% of total U.S. energy consumption, and 39% of U.S. electric power generation in 2013. This energy resource plays a similar role in the global energy economy. Between 2002 and 2010, world coal consumption grew at nearly twice the rate of growth of all other fuels. Coal’s popularity derives from its abundance, accessibility, and stable low cost compared to other fuels. The ready availability, reliability, and consistent price of coal has guaranteed fuel options for U.S. electricity generation and assured electricity consumers of affordable, reliable power even during times of volatile price swings by other fuel sources. Coal has a long history of success in meeting environmental challenges through public/private sector collaboration and cost-share in research, development, and demonstration of new and improved technologies, which resulted in the doubling of coal use since the 1970’s while we experienced an 85% decrease in emissions of criteria pollutants from coal, per unit of electricity generated.

CURC FY 2016 Budget Recommendation. CURC is recommending that the Coal CCS & Power Systems Research & Development R&D be funded at \$449 million, an increase of \$80 million over the President’s Request and \$49 million more than Congress appropriated in FY 2015. The CURC proposed increases to the Coal CCS & Power Systems R&D budget will allow for development of technologies that can be applied to both the existing and new fleet of coal power plants and for the accelerated development of important transformational technologies through large scale pilot activities.

CURC 3-Part Program and CURC-EPRI Roadmap. CURC has developed a comprehensive coal technology program designed to support an achievable energy future. The CURC program calls for the application of technology to three different market segments of the coal industry: (1) today’s existing fleet of coal-fueled power plants; (2) a transitional market for new coal-fueled facilities over the next 10 to 15; and (3) a future market that contemplates new, transformational electricity generation systems that can serve as a replacement option for the existing fleet of base load plants in the next 15-25 years. To be successful, this program needs enhanced levels of federal funding *targeted to the specific technology areas identified in the CURC-EPRI Roadmap*, and it will require a regulatory and public policy framework that supports coal use. CURC’s FY 2016 recommendations for the Department of Energy’s (DOE) Coal CCS & Power Systems program are keyed to CURC’s program with a focus on the R&D identified in the CURC-EPRI Coal Technology Roadmap (“Roadmap”).² Full funding and aggressive implementation of the Roadmap will result in coal-based power plants in 2025-2030 that will continue to provide affordable electricity and enhanced environmental performance competitive with other low carbon alternatives.

Coal provided 39% of electricity in the U.S. in 2013. While an average coal unit is 40 years of age, the existing fleet will be in operation for another 20+ years and will be expected to provide

¹ CURC is an organization of coal-using utilities, coal producers, equipment suppliers, universities and institutions of higher learning, and several state government entities interested and involved in the use of coal resources and the development of coal-based technologies (see www.coal.org).

² Members of CURC, together with the Electric Power Research Institute (“EPRI”), have developed a Technology Roadmap (“Roadmap”) that defines the research, development and demonstration (“RD&D”) necessary to ensure that the benefits of coal utilization in the U.S. continue into the future.

Submitted by Ben Yamagata, Executive Director, Coal Utilization Research Council
Written Statement Submitted to the House Committee on Appropriations
Subcommittee on Energy and Water Development Appropriations
Testimony on the FY 2016 Budget Request, Department of Energy Fossil Energy Program

reliable, low cost electricity under more flexible operations. It is critical to invest in R&D that will maximize the efficiency, reliability, cost-effectiveness, and environmental performance of the existing coal fleet, particularly as these important requirements will be challenged under increasingly frequent changes in output due to growing generation from renewables and increased reliance on demand response. CURC recommends that DOE initiate R&D activities that focus on addressing these challenges as well as other ongoing R&D in the program to address water withdrawals and discharge, CO₂ capture retrofit technologies, and efficiency improvements that leverage investments in technologies applicable to both new and existing units.

CURC's recommendations emphasize accelerated development of promising transformational technologies, which are distinguishable by their reliance upon novel chemical reactions, alternative combustion methods, or by replacing traditional steam cycles with alternative working fluids such as supercritical CO₂ – all of which result in higher conversion efficiencies in the production of energy. These technologies also produce concentrated streams of CO₂, eliminating the need for additional CO₂ capture systems and facilitating the removal of CO₂ from the flue gas, resulting in significantly higher efficiencies and lower costs. CURC believes that the rapid development of transformational energy systems is required so that they can be available within the next 15 years, a time when a significant portion of the existing coal-fired electric generating fleet may be candidates for replacement.

Many of CURC's budget recommendations in each of the program areas call for the funding of laboratory and bench scale R&D, but many of the technologies in the pipeline are readying for both small and large scale pilot testing of technologies under real operating conditions. A cost-effective approach to accelerate the development of transformational technologies so they can be candidate replacement options in the 2025 timeframe is by supporting the advancement of large scale pilot scale projects. CURC believes that large pilot scale projects will bridge the gap between bench-scale proof of concept research projects, or very small pilot plants, and commercial-scale demonstration projects. Importantly, they can provide valuable design and operational data for an emerging technology at a cost far lower than a commercial demonstration-scale unit, and this learn by doing can translate into new technology designs and offerings by 2025 if initiated in a pilot scale project in the next two years.

Lastly, CURC emphasizes the need for R&D on “breakthroughs” across several program areas that encourage revolutionary approaches to converting coal to useful energy and products. This also includes aggressive R&D to examine beneficial uses of coal ash, carbon dioxide and other constituents that remain after coal use. Much of this innovation work should be initiated at universities and research institutions.

CURC Recommendations for the Coal CCS & Power Systems Program:

Carbon Capture. CURC is requesting no change from the President's proposed budget for this program. However, CURC would like to make two points with the proposed FY16 budget for this program. (1) CURC understands that funds in FY16 are being requested by the Department to undertake pilot scale CO₂ capture on natural gas combined cycle (NGCC) systems. While CURC applauds DOE for recognizing that the management of CO₂ emissions is not limited to

Submitted by Ben Yamagata, Executive Director, Coal Utilization Research Council
Written Statement Submitted to the House Committee on Appropriations
Subcommittee on Energy and Water Development Appropriations
Testimony on the FY 2016 Budget Request, Department of Energy Fossil Energy Program

the use of coal, CURC also believes that the limited funds allocated to the Coal CCS & Power Systems R&D program should be provided for **coal based** technology development initiatives. If the Administration wishes to support CO₂ capture on NGCC systems, CURC recommends that **additional** funds be requested and provided to DOE for this activity. At a time when the coal industry is challenged by regulations requiring CO₂ capture on new coal plants and this same requirement is **not** imposed on NGCC systems, funds should be allocated to support CO₂ capture on coal, particularly given the limited budget available to support the development of technologies necessary for coal to compete with uncontrolled NGCC gas systems. (2) CURC would like to emphasize that R&D in this program area - targeted at capturing CO₂ - is intended to address the cost effective capture of CO₂. The transformational technologies supported in the Advanced Combustion Program also address the capture of CO₂ where a pure stream of CO₂ is produced as a consequence of the energy conversion system, which means CO₂ capture systems are not required. CURC believes that these technologies should not be precluded from the support of program budgets such as the carbon capture program where the intent of the program is to address the capture and management of CO₂ from coal based generating systems.

Carbon Storage. CURC recommends \$113.768 million for FY2015, an increase of \$5 million over the President's request. The Regional Carbon Sequestration Partnerships ("RCSPs") have made significant progress in fully characterizing storage opportunities in a variety of geographic areas. CURC agrees with the requested funding to continue the RCSP projects, but recommends that for those sites injecting CO₂ into saline formations, DOE transition those operations to large scale CO₂ injections of over 1 MTPY for 10 years. CO₂ storage is a necessary enabling technology to support future capture and storage of CO₂. FutureGen 2.0 was the only integrated electric generation CCS project slated to inject CO₂ into a saline formation at a minimum of 1 MTPY; with DOE withdrawal of support, there are no large scale, long term injection projects into saline formations (or non-EOR reservoirs) and this activity must be initiated. CURC is also recommending \$5 million for DOE to undertake scoping studies to characterize additional geologic storage sites for commercial scale (large volume, 1+ MTPY) CO₂ saline storage.

Advanced Energy Systems. CURC recommends \$71.385 million (+32 M) for the programs identified below.

- **Advanced Combustion (Transformational Energy) Systems.** CURC recommends increasing this budget by \$16 million over the President's request (for a total of \$26 million). The increase will enable pre-engineering work to begin on large pilot projects of transformational technologies, such as pressurized oxycombustion and chemical looping, which are readying for scale up. These pilots are critical to ensuring the availability of these technologies as replacement technology options in the next decade. Additional funds should support R&D necessary for dynamic modeling and plant integration of these new technologies as well as to support the integration of efficiency improvements of new generating systems.
- **Gasification.** CURC recommends \$31 million for this program, an increase of \$20 million over the request, to support Roadmap-identified advancements in both cost and performance for power and poly-generation gasification systems. CURC recommends that funds support design of large scale pilot scale activities of new gasifier technologies that have higher efficiencies and lower capital cost due to their compact, modular size, and can be applied to a variety of coals including higher moisture content coals. Recommended funds should also support advancing dry-feed, high pressure systems, integration optimization, scale up of oxygen separation technology, and support the National Carbon Capture Center gasification related technology development projects.

Submitted by Ben Yamagata, Executive Director, Coal Utilization Research Council
Written Statement Submitted to the House Committee on Appropriations
Subcommittee on Energy and Water Development Appropriations
Testimony on the FY 2016 Budget Request, Department of Energy Fossil Energy Program

- Turbines. CURC is in alignment with the proposed FY16 program funding and direction.
 - Coal and Coal Biomass to Liquids. CURC recommends FY15 enacted levels of \$5 million to continue work to improve cost and efficiency of coal-to-fuels technology implementation.
 - Fuel Cells. The Roadmap does not have a program that supports fuel cells.
- Supercritical CO₂ (STEP) Program**. CURC supports the proposed \$19 million for the development of supercritical CO₂ (s-CO₂) cycles. This is in addition to the \$15.5 million proposed for advanced materials development for s-CO₂ cycles and funds allocated from the Advanced Turbine budget. The Roadmap emphasizes this technology as one of the several transformational technologies that should be pursued.
- Cross Cutting R&D Program**. CURC recommends \$94.2 million (+\$43 M) for the Cross-Cutting program which supports several activities important to both the new and existing fleet as well as all of the technologies contemplated in the Roadmap and under development at DOE. Unless otherwise stated, CURC recommends that cross cutting subprograms be funded at Administration FY 2016 request levels. Our further recommendations are as follows:
- Existing Plants R&D: CURC recommends \$5 million to initiate a program at DOE dedicated to R&D for existing plants that focuses on improved pollution control systems; fuel flexibility to operate on different fuel blends; and programs focused on the reliability of units under flexible operations. To achieve the effective integration of technology solutions, CURC recommends that DOE develop a computer simulation to address integration of approaches for steam temperature control under cycling conditions.
 - Sensors and Controls: Given the added stresses on coal based systems which will operate under cycling load conditions described above, we recommend \$6.5 million (+\$2 M) for sensors and controls to improve monitoring of systems and to apply solutions to those units.
 - Water Management R&D: CURC recommends \$10 million (+ \$4 M) to focus on R&D to reduce water withdrawals from both new and existing plants as well as clean up of water discharge streams. The existing fleet is currently facing stringent regulations to address these issues and cost effective technology solutions are needed.
 - University Training and Research: CURC recommends \$5 million to develop talent for this industry which is currently experiencing a very large generation gap (+\$2 M).
 - Materials R&D: While CURC applauds the proposal of \$1.5 million to support cross-cutting materials R&D, and also supports the development for supercritical CO₂ materials, the recommended funding for the AUSC program is not enough. CURC again recommends that an additional \$14 million be allocated to support the development of a component test facility which is critical to assessing high temperature and pressure materials for more efficient steam power generation under real operating conditions while firing a variety of US coals. The test facility is essential to deploying highly efficient generation systems that use less fuel per unit of electricity output, which results in less emissions of CO₂ and criteria pollutants, and will enable U.S. suppliers to manufacture these products at home and export the components and know-how to countries that are building power generating stations.
 - Breakthrough R&D: CURC recommends \$16 million to undertake innovative, breakthrough technology R&D program focused on novel approaches to converting coal to useful energy and products, such as nanotechnologies, bioprocesses and new materials, supported by academia and research institutions. There is no equivalent program in the DOE for this activity.



GOVERNORS

Doug Ducey, AZ
 Jerry Brown, CA
 John Hickenlooper, CO
 Brian Sandoval, NV
 Susana Martinez, NM
 Gary R. Herbert, UT
 Matthew H. Mead, WY

FORUM MEMBERS

Arizona
 Thomas Buschatzke
 Larry R. Dozier
 Linda Taunt

California
 Bill Hasencamp
 Thomas Howard
 Tanya Trujillo

Colorado
 James Eklund
 Patrick Jon Pfaltzgraf
 David W. Robbins

Nevada
 Leo M. Drozdoff
 John J. Entsainger
 Jayne Harkins

New Mexico
 Scott A. Verbines

Utah
 Leah Ann Lamb
 Eric Millis
 Gawain Snow

Wyoming
 Pan S. Budd
 Patrick E. Tyrrell
 David Waterstreet

EXECUTIVE DIRECTOR

Don A. Barnett

106 West 500 South, Ste. 101
 Bountiful, UT 84010
 (801) 292-4663
 dbarnett@barnettwater.com
 www.coloradoriversalinity.org

OUTSIDE WITNESS TESTIMONY
 FY 2016 APPROPRIATION

TO: **The Honorable Mike Simpson, Chairman**
The Honorable Marcy Kaptur, Ranking Member
House Appropriations Subcommittee on Energy and Water
Development

SUBJECT: **Continued Funding for the Colorado River Basin Salinity**
Control Program under Reclamation's Basinwide Program

FROM: **Don A. Barnett, Executive Director**
Colorado River Basin Salinity Control Forum

DATE: **March 30, 2015**

Waters from the Colorado River are used by approximately 40 million people for municipal and industrial purposes and used to irrigate approximately 5.5 million acres in the United States. Natural and man-induced salt loading to the Colorado River creates environmental and economic damages. The U.S. Bureau of Reclamation (Reclamation) has estimated the current *quantifiable* damages at about \$382 million per year. Congress authorized the Colorado River Basin Salinity Control Program (Program) in 1974 to offset increased damages caused by continued development and use of the waters of the Colorado River. Modeling by Reclamation indicates that the *quantifiable* damages will rise to approximately \$614 million annually by the year 2035 without continuation of the Program. Congress has directed the Secretary of the Interior to implement a comprehensive program for minimizing salt contributions to the Colorado River. Reclamation serves as the lead federal agency in implementing the Program. **Reclamation** primarily institutes salinity control through its **Basinwide Program**. Funding levels have fallen behind in recent years, and a funding level of **\$11.2 million** is required in 2016 to prevent further degradation of the quality of the Colorado River with a commensurate increase in downstream economic damages.

EPA has identified that more than 60 percent of the salt load of the Colorado River comes from natural sources. The majority of land within the Colorado River Basin is federally owned and administered. In implementing the Colorado River Basin Salinity Control Act (Act) in 1974, Congress recognized

that most of the salt load in the Colorado River originates from federally owned lands. Title I of the Salinity Control Act deals with the United States' commitment to the quality of waters being delivered to Mexico. Title II of the Act deals with improving the quality of the water delivered to U.S. users. This testimony deals specifically with the Title II efforts.

In the early years of the Program, Reclamation implemented salinity control through large projects which were funded with specific line item amounts. In 1995, Congress amended the Act and created Reclamation's Basinwide Program. Under this program, Reclamation funds competitive proposals which will decrease the salt load to the Colorado River. Most of the received proposals target off-farm irrigation distribution systems such as canals and laterals. The lining or piping of canals and laterals prevents leakage into the groundwater and the dissolution and transportation of salts to the Colorado River and its tributaries. It is more efficient for Reclamation to perform the off-farm distribution system improvements prior to NRCS treating the on-farm acres with salinity control practices (i.e., Reclamation should pipe a canal or lateral prior to NRCS putting a pressurized sprinkler system on farm). Shortfalls in recent Basinwide Program funding levels have led to inefficiencies in the implementation of the overall Program. The funding amount identified above is required to get the Basinwide Program back on pace with the overall Program implementation needs.

Concentration of salt in the Colorado River causes approximately \$382 million in quantified damages annually and significantly more in unquantified damages in the United States and results in poor water quality for United States users. Damages occur from:

- a reduction in the yield of salt sensitive crops and increased water use to meet the leaching requirements in the agricultural sector,
- increased use of imported water and cost of desalination and brine disposal for recycling water in the municipal sector,
- a reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector,
- an increase in the cost of cooling operations and the cost of water softening, and a decrease in equipment service life in the commercial sector,
- an increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector,
- a decrease in the life of treatment facilities and pipelines in the utility sector, and
- difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions, and an increase in desalination and brine disposal costs due to accumulation of salts in groundwater basins.

The Colorado River Basin Salinity Control Forum (Forum) is composed of gubernatorial appointees from Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming. The Forum is charged with reviewing the Colorado River's water quality standards for salinity every three years. In so doing, it adopts a Plan of Implementation consistent with these standards. The Plan of Implementation, as adopted by the states and approved by EPA, calls for 67,000 tons of additional salinity control measures to be implemented by Reclamation and NRCS by 2035, or approximately 11,400 tons of new control each year by Reclamation. Based on current cost levels, Reclamation's funding under its Basinwide Program needs to be \$11.2 million in FY2016. The level of appropriation requested in this testimony is in keeping with the adopted Plan of Implementation. If adequate funds are not appropriated, significant damages from the higher salinity concentrations in the water will be more widespread in the United States and Mexico.

In summary, implementation of salinity control practices through Reclamation's Basinwide Program has proven to be a very cost effective method of controlling the salinity of the Colorado River and is an essential component to the overall Colorado River Basin Salinity Control Program. Continuation of adequate funding levels for salinity within this program will prevent the water quality of the Colorado River from further degradation and significant increases in economic damages to municipal, industrial and irrigation users. A modest investment in source control pays huge dividends in improved drinking water quality to nearly 40 million Americans.

COLORADO RIVER BOARD OF CALIFORNIA

770 FAIRMONT AVENUE, SUITE 100
 GLENDALE, CA 91203-1068
 (818) 500-1625
 (818) 543-4685 FAX



**OUTSIDE WITNESS TESTIMONY
 FY 2016 APPROPRIATION**

TO: The Honorable Mike Simpson, Chairman
 The Honorable Marcy Kaptur, Ranking Member
 House Appropriations Subcommittee on Energy and Water Development

SUBJECT: Continued Funding for the Colorado River Basin Salinity Control Program
 under Reclamation's Basinwide Program

FROM: Tanya Trujillo, Executive Director
 Colorado River Board of California

DATE: March 25, 2015

This testimony is in support of Fiscal Year (FY) 2016 funding for the Department of the Interior for the Title II Colorado River Basin Salinity Control Act of 1974 (P.L. 93-320). In the Act, Congress designated the Department of the Interior, Bureau of Reclamation (Reclamation) to be the lead agency for salinity control in the Colorado River Basin. Reclamation primarily institutes salinity control through its Basinwide Program, which was established by Congress through an amendment to the Act in 1995. Funding levels for the Basinwide Program have fallen behind in recent years, and although the President's Budget requests \$8.4 million, a funding level of \$11.2 million should be provided in 2016 to prevent further degradation of the quality of the Colorado River and the resulting economic damages.

Waters from the Colorado River are used by approximately 40 million people for municipal and industrial purposes and used to irrigate approximately 5.5 million acres in the United States. The Colorado River serves close to 20 million residents of southern California, including municipal, industrial, and agricultural water users in Ventura, Los Angeles, San Bernardino, Orange, Riverside, San Diego, and Imperial counties. Natural and man-induced salt loading to the Colorado River creates environmental and economic damages. Reclamation has estimated the current *quantifiable* damages at about \$382 million per year. Modeling by Reclamation indicates that the *quantifiable* damages will rise to approximately \$614 million annually by the year 2035 without continuation of the Program.

The Colorado River Board of California (Colorado River Board) is the state agency charged with protecting California's interests and rights in the water and power resources of the Colorado River system. In this capacity, California participates along with the other six Colorado River Basin states through the Colorado River Basin Salinity Control Forum (Forum), the interstate organization responsible for coordinating the Basin States' salinity control efforts. In close cooperation with the U. S. Environmental Protection Agency (EPA) and pursuant to requirements of the Clean Water Act, the Forum is charged with reviewing the Colorado River's

March 25, 2015
Page 2 of 2

water quality standards every three years. The Forum adopts a Plan of Implementation consistent with these water quality standards. The level of appropriation being supported by this testimony is consistent with the Forum's *2014 Plan of Implementation* for continued salinity control efforts within the Colorado River Basin. The Forum's *2014 Plan of Implementation* can be found on this website: <http://coloradoriversalinity.org/docs/2014%20Final%20REVIEW%20-%20complete.pdf>. If adequate funds are not appropriated to Reclamation's Basin-wide Program, significant damages associated with increasing salinity concentrations of Colorado River water will become more widespread in the United States and Mexico. For example, damages occur from:

- a reduction in the yield of salt sensitive crops and increased water use to meet the leaching requirements in the agricultural sector,
- an increase in the amount of imported water,
- an increased cost of desalination and brine disposal for recycling water in the municipal sector,
- a reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector,
- an increase in the cost of cooling operations and the cost of water softening, and a decrease in equipment service life in the commercial sector,
- an increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector,
- a decrease in the life of treatment facilities and pipelines in the utility sector, and
- difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions.

The *2014 Plan of Implementation*, as adopted by the Basin States and approved by EPA, calls for 67,000 tons of additional salinity control measures to be implemented by Reclamation by 2035, or approximately 11,400 tons of additional salinity control measures each year. Over the past years, the Salinity Control Program has proven to be a very cost effective approach to help mitigate the impacts of increased salinity in the Colorado River. Adequate federal funding of this important Basinwide program is essential. Based on current program cost levels, Reclamation's funding under its Basinwide Program needs to be at least \$11.2 million to achieve these goals.


COLORADO

 Colorado Water
 Conservation Board

Department of Natural Resources

 1313 Sherman Street, Room 721
 Denver, CO 80203

April 6, 2015

 House Appropriations Committee
 Subcommittee on Energy and Water Development
 EW.Approp@mail.house.gov

Dear Members,

In fiscal years 2012, 2014, and 2015, Congress increased the funding in the Bureau of Reclamation's water and related resources account as compared to the President's request. The increased funding was included as "Additional Funding for Ongoing Work" and was distributed among several general "funding categories" within the line item.

The State of Colorado urges the committee to again increase the total funding for the water and related resources account.

The State also urges the committee to change the title of the current "Water Conservation and Delivery" funding category to "Water Supply, Delivery, and Conservation Projects." Reclamation has projects underway which address the need for new sources of supply, or additional water supplies, for both irrigation and M&I purposes. The "Water Supply, Delivery, and Conservation Projects" funding category would encompass these projects, along with projects that conserve existing water supplies and improve the efficiency of delivery systems.

Colorado also requests that new language be included in the committee's report which ensures that on-going work on authorized Reclamation projects that would provide new sources of supply or additional water supplies will be eligible for consideration by Reclamation to receive additional monies from this funding category. The suggested new language is as follows as underlined and inserted into the conference committee's explanatory statement on the FY 2015 omnibus bill:

Additional Funding for Water and Related Resources Work.—The agreement includes funds in addition to the budget request for Water and Related Resources studies, projects, and activities. Priority in allocating these funds should be given to advance and complete ongoing work; improve water supply reliability; improve water deliveries; enhance national, regional, or local economic development; promote job growth; advance tribal and nontribal water settlement studies and activities; or address critical backlog maintenance and rehabilitation activities. Funding provided under the heading "Water Supply, Delivery, and Conservation Projects" may be utilized for ongoing work, including pre-construction activities, on projects which provide new or existing water supplies through additional infrastructure; provided, however, that

 P 303.866.3441 F 303.866.4474 www.cwcb.state.co.us
 John W. Hickenlooper, Governor | Mike King, DNR Director | James Eklund, CWCB Director


priority should be given in allocating funds to ongoing work on authorized projects for which environmental compliance has been completed. Funding provided under the heading "Western Drought Response" may be allocated to any authorized purposes.... This additional funding may be used alone or in combination with any other funding provided in a program, project, or activity.

Among the state's priorities is Reclamation's ongoing work on the Arkansas Valley Conduit (AVC), which was included in the original 1962 authorizing legislation for the Fryingpan-Arkansas Project. It is a regional surface water supply project which will deliver treated drinking water to nearly 40 small water providers serving farming and ranching communities in the lower Arkansas River Valley from Pueblo east to the Colorado/Kansas state line.

Communities in the lower Arkansas Valley presently draw on groundwater for their drinking water supplies. However, 14 towns have groundwater which contains naturally occurring radioactive elements, such as radium and uranium, in concentrations that exceed the primary drinking water standards mandated by the federal Safe Drinking Water Act.

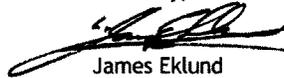
The Colorado Department of Health and Environment (CDPHE) has notified these 14 water providers (via enforcement actions) that they must treat these groundwater supplies to remove contaminants or find a better quality water source. Seven additional water providers have elevated levels of naturally occurring radioactive elements, but do not currently violate CDPHE standards.

In addition, water providers in the lower Arkansas are generally having difficulty meeting non-mandatory secondary drinking water standards for salts and sulfate. The median salts concentration over the past 40 years has been about 3,400 mg/L in lower Arkansas River Basin groundwater, which is nearly 7 times greater than the secondary drinking water standard. Like radionuclides, salts and sulfate are not removed by conventional water treatment methods.

Finally, some AVC water providers also are not meeting the secondary drinking water standard for iron. In 2014, one water provider was notified by CDPHE that it has "Industrial Wastewater Unpermitted Discharges," and that a Colorado Discharge Permit System may be required for its discharge of backwash water from iron removal filters.

Simply replacing contaminated groundwater supplies with local surface water from the Arkansas River is problematic because the river downstream of Pueblo also contains high levels of selenium, sulfates, uranium, and salts. This is why the AVC is urgently needed and an example of the kind of project Reclamation should consider if Congress increases funding for Reclamation's water and related resources account.

Sincerely,



James Eklund
Director
Colorado Water Conservation Board



Richard Burbank
Chair, Efficiency First

House Appropriations Committee
Subcommittee on Energy and Water Development

Fiscal Year 2016 Department of Energy Funding for
Residential Energy Efficiency Programs

April 6, 2015

As the voice of the home performance contracting industry, Efficiency First respectfully urges your support for funding to advance programs at the Department of Energy that invest in residential energy efficiency and whole-house initiatives, as outlined in this testimony, in the Fiscal Year (FY) 2016 Energy and Water Development Appropriations bill. On behalf of our stakeholders and members, thank you for this opportunity to express our support for these important programs and initiatives.

Efficiency First (EF) is a national industry association with members across the country that unites the home performance workforce, building product manufacturers and related businesses and organizations in an effort to advance cost-effective energy efficiency solutions for residential customers to create jobs, boost the economy, and fight rising energy costs.

Efficiency First offers its strong support for whole-home residential efficiency programs and initiatives. By looking at a home as a system, customers make better energy choices. For example, installing a high-efficiency HVAC unit in a home without insulation in its attic will not result in the home owner receiving the heating and cooling efficiently, nor the comfort expected. Home performance contractors and professionals help home owners make smart energy decisions by making home assessments, recommendations, and improvements based on building science and the whole-home structure. Yet, as building science has developed, so has the home performance industry which is still on the cutting edge as it strives to serve and educate homeowners around the country about the ways and means for reducing their energy use. Public initiatives that support this industry are vital as it continues to develop.

The following programs at the Department of Energy, in the Energy Efficiency and Renewable Energy Office and Office of Weatherization & Intergovernmental Assistance, deserve the support of the American taxpayer as these programs, by supporting an American-based industry and American jobs that will strengthen the economy, the electric grid, and our national security; will provide a significant return on their investment.

\$48M for Residential Building Integration, with the focus on accelerating the development and adoption of advanced building energy technologies and practices in new and existing homes. The Residential Building Integration program has the capacity to fundamentally transform homebuilding and renovation in this country. However, we recommend that the funding be focused on research, development and the widespread deployment of whole-house energy

efficiency through their partnerships with builders, the construction trades, equipment, smart grid technology and systems suppliers, integrators and state and local governments. We encourage the direct engagement with builders, contractors, and business, which are crucial to the success of buildings programs. To that end we strongly support the increased funding for the expanded residential building energy efficiency retrofit program supporting all residential building types and income levels. Efficiency First recommends that DOE allocate **\$10 Million** of this increase to allow for the residential buildings program to work with national organizations and companies specializing in home performance and/or weatherization to generate policy recommendations leading to the development of a new residential energy efficiency retrofit program to support increased energy efficiency in all residential buildings and income levels.

\$100 M Energy Productivity Innovation Challenge. In the President's Budget Request for the Department of Energy last year (Race to the Top for Energy - FY 2015) this program would provide for awards to support state governments that implement innovative and effective policies such as those that would advance residential energy efficiency upgrades. A September 2013 study by ACEEE on a similar proposal notes that the program could result in estimated net savings of \$11.8 billion and cut energy by 1.30 Quads and carbon dioxide emissions by 71.25 MMT by 2030. These results are a great investment for the American taxpayer, returning \$8.40 in energy savings for every \$1 invested. We believe funding for this initiative should be placed in addition (plus up) in the Energy Efficiency and Renewable Energy accounts.

\$70 M for State Energy Program. We urge the Committee to provide funding at the level of \$70 million for the State Energy Program, which allows states to assist with the development of energy efficiency and renewable energy projects, and support funding a state competitive grant programs with monetary awards to states to use to improve their energy productivity programs.

\$230 M for Weatherization Assistance Program. We ask the Committee to return funding to historical levels for the Weatherization Assistance Program, which helps low-income families, seniors, and individuals with disabilities make crucial lasting energy efficiency improvements to their homes. However, we recommend that the Committee direct the program to undertake efforts to include private home performance contractors, leveling-the-playing-field for independent, qualified contractors to participate in this program.

Efficiency First believes that energy efficiency is vital to our economic growth and international competitiveness. Again, thank you for providing this opportunity to submit testimony. We would also appreciate the opportunity to brief you or your staff on these important programs and initiatives and the successful energy savings we anticipate they will achieve. We look forward to working with you.

Contact Information

Kara Saul Rinaldi
 Government Affairs Representative
 Efficiency First
 717 Kennebec Ave, Takoma Park MD 20912
 Phone: (202) 276.1773, Fax: (202) 747-7725
 kara@anndyl.com

TESTIMONY OF
GENEVIEVE CULLEN, INTERIM PRESIDENT
OF THE
ELECTRIC DRIVE TRANSPORTATION ASSOCIATION
SUBMITTED TO THE
ENERGY AND WATER DEVELOPMENT APPROPRIATIONS SUBCOMMITTEE
OF THE
HOUSE APPROPRIATIONS COMMITTEE

APRIL 3, 2015

The Electric Drive Transportation Association (EDTA) is the cross-industry trade association promoting the advancement of electric drive technology and electrified transportation. We are writing regarding the FY2016 funding for the Department of Energy's programs that advance electric drive technologies, including the Vehicle Technologies and Hydrogen and Fuel Cell Technologies Programs.

Our members represent the entire value chain of electric drive, including vehicle manufacturers, battery and component manufacturers, utilities and energy companies, smart grid and charging infrastructure developers. Collectively, we are committed to realizing the economic, national security, and environmental benefits of displacing oil with hybrid, plug-in hybrid, battery, and fuel cell electric vehicles.

Oil provides 93% of the energy used for transportation in the United States. Around one-third of the oil we use is imported, costing our economy roughly \$192 billion annually. The U.S. Department of Energy estimates that the cost of oil dependence to the U.S. economy was about \$3 trillion from 2005 to 2010.

Even with reduced imports, our energy and economic security continue to be threatened by oil dependence. Our transportation sector is still almost wholly fueled by a single commodity, whose price is set by the global market and whose availability is subject to significant geopolitical uncertainty. As the Department of Energy (DOE) documents, the majority of the world's oil reserves are concentrated in the Middle East; approximately 73% of those reserves are controlled by the Organization of the Petroleum Exporting Countries (OPEC) members.

Diversifying transportation with domestic alternatives will enhance our energy security, protect consumers and the economy from price volatility, and increase U.S. competitiveness in the global clean energy markets. DOE's Vehicle Technologies program is a critical element of the national effort to address oil dependence, leveraging private sector investments to promote innovation in advanced vehicle and infrastructure technology and manufacturing chains.

EDTA supports the requested increase for the work of the Vehicle Technologies program, including the EV Everywhere Grand Challenge. This program advances critical research in batteries and power electronics, electric drive motors and components, and charging technologies that will reduce vehicle costs and increase range and charging capabilities. Batteries and Electric Drive Technology activities are achieving battery performance improvements and cost reductions. Vehicle Systems Simulation & Testing activities are developing next generation and wireless charging, systems integration, and codes and standards for communication with the grid.

1250 Eye Street, NW / Suite 902 / Washington, DC 20005 / 202-408-0774 / 202-408-7610 fax / www.electricdrive.org

The program also includes the effective Workplace Charging Challenge established to promote private investment in electric drive infrastructure. EDTA is a participant in this program, which encourages employers to provide charging options for their employees.

The Vehicle Technologies program is also advancing alternatives in commercial vehicles. With heavy-duty vehicles projected to experience the fastest increases in energy demand among all transportation modes from 2010 to 2040, greater fuel diversity and efficiency in this segment is critically important. We support the new focus on regional haul in the proposed SuperTruck2 program and recommend wider overall eligibility, including Class 7 and Class 8a vehicles. The program should also include a wider segment of the truck manufacturing chain, including chassis original equipment manufacturers, intermediate and final stage manufacturers, including hybrid suppliers who are essential contributors to efficiency advances in this segment.

Additionally, with EPA's Phase 2 regulations currently being promulgated, we would recommend that the Vehicle Technologies Program support research, demonstration, and deployment of combination tractors, heavy-duty pickup trucks and vans, and vocational vehicle technologies' systems and components.

In the Fuel Cell Technologies program, DOE is working with industry to accelerate the availability of fuel cell electric vehicles, which began entering the commercial market last year with increasing market entrants planned over the next five years. Fuel cell electric vehicles (cars, trucks and non-road vehicles), are crucial "zero emission/zero petroleum" options in the alternative fuel transportation portfolio.

We ask that the committee continue its strong support for the program, particularly in the areas of vehicles and infrastructure deployment activities and in early market development, including education, validation and enabling activities. Public/private collaborations, including H2USA, that speed technology development and infrastructure deployment are especially critical in this very early market entry phase.

The Batteries and Energy Storage Hub, in the Office of Science, is also a vital public/private partnership that is accelerating transportation electrification and grid modernization through next generation energy storage solutions.

Finally, we strongly support DOE's deployment programs, including the Clean Cities program's work with local and regional coalitions to expand deployment of electric drive vehicles (hybrid, plug-in hybrid, battery, and fuel cell electric vehicles), other alternative fuel vehicles, and recharging/fueling infrastructure as a path to increased energy security. These efforts have a demonstrated record of success, including the cumulative displacement of more than 6.5 billion gallons of petroleum with alternative fuels.

Realizing the budget constraints faced by the committee, we respectfully request that funding for vehicle and fuel diversity programs reflect their critical importance to our national efforts to reduce oil dependence, protect American consumers from price volatility and increase U.S. manufacturing competitiveness.

We thank you for your consideration.



**Written Statement
Submitted by Thomas R. Kuhn
President
Edison Electric Institute
Regarding Fiscal Year 2016 Appropriations
For the Department of Energy
To the Subcommittee on Energy and Water Development
House Committee on Appropriations
March 16, 2015**

The Edison Electric Institute (EEI) respectfully submits this written testimony for Fiscal Year (FY) 2016 to the House Appropriations Subcommittee on Energy and Water Development. We appreciate this opportunity to share our views on Department of Energy (DOE) programs and priorities that address the resiliency of the electric power grid.

EEI is the association of U.S. shareholder-owned electric companies. Our members provide electricity for 220 million Americans, directly employ more than 500,000 workers, and operate in all 50 states and the District of Columbia.

Importance of Fuel Diversity

EEI's member companies rely on a wide range of generation resources to produce electricity, including coal, nuclear, natural gas and renewables. Embracing a diverse and balanced energy portfolio is crucial to maintaining an affordable, reliable supply of electricity for consumers. Diversification also is essential for economic stability and national security. Consequently, EEI has long advocated for an all-of-the-above energy policy.

Significant Industry Investment in the Electric Grid

The electric power industry is the most capital-intensive industry in the United States – a \$910 billion industry representing more than 2 percent of gross domestic product. In 2014, our industry was projected to spend \$103 billion in total capital expenditures, which would set another record. With our industry's continued focus on infrastructure, spending on transmission and distribution is expected to increase steadily over the next few years.

With regard to transmission, EEI projects industry investments will total \$58 billion over the next three years. Transmission projects provide a wide array of benefits and allow our members to serve growing

electricity demand; connect new generation resources, including an increasing amount of renewable energy; and decrease congestion and increase market efficiency.

In formulating a FY 2016 budget that addresses our nation's economic, environmental and security goals, EEI respectfully requests Subcommittee support for the following activities.

Unprecedented Industry-DOE Partnership

The level of coordination among senior government officials and the electric power sector to better protect the grid from potential threats, whether natural or man-made, physical or cyber, is unprecedented. In fact, the electric power industry's engagement with senior government officials has become a model for other critical infrastructure sectors and is winning praise at the highest levels of government.

As the electric sector-specific agency (SSA), DOE has the mission and expertise to work with industry to help mitigate the risk resulting from cyber and physical threats. DOE's long history of collaboration with industry has created integral relationships that expand situational awareness and information sharing to reduce risk.

Within DOE, the Office of Electricity's (OE) Cybersecurity for Energy Delivery Systems (CEDS) program supports cyber risk and incident management activities. Working closely with the energy sector and government partners, the FY 16 request supports research on cutting-edge cybersecurity solutions, information sharing and coordinated cyber incident management capability. National laboratory participation in CEDS helps to ensure that critical skill sets remain current in the energy sector, guaranteeing support for our companies in the event of an attack.

To these ends, EEI requests full support for the CEDS program as well as the following three OE cyber security initiatives:

Accelerating Information Sharing to Enhance Situational Awareness

- *Cybersecurity Risk Information Sharing Program*

The Cybersecurity Risk Information Sharing Program (CRISP) is a government-energy sector collaboration to facilitate the timely bi-directional sharing of classified and unclassified threat information. Importantly, the program also develops and deploys situational awareness tools to enhance the sector's ability to identify and mitigate threats and coordinate the protection of critical infrastructure. CRISP has transitioned from a small DOE-funded electric sector pilot program to a sector-wide program primarily funded and managed by the North American Electric Reliability Corporation (NERC) and the electricity sector owners and operators that participate in the program. NERC expanded its Electricity Sector Information Sharing and Analysis Center (ES-ISAC) duties to include the management of the unclassified elements of CRISP.

- *Widening implementation of the Cybersecurity Capability Maturity Model and Risk Management Process*

OE is expanding online access to the Cybersecurity Capability Maturity Model (C2M2) and Risk Management Process (RMP) guidelines, as well as conducting data analytics of C2M2 evaluation tool results. C2M2 was developed with federal and industry partners to encourage best practice adoption and inform cybersecurity investments, while RMP was developed with industry partners to enable effective and efficient risk management decisions. Both C2M2 and RMP help utilities improve their organizational and process-level cybersecurity posture.

- *Exercising and Refining the Energy Sector's Cyber Incident Response Capabilities*

OE is leading the Energy Sector-Cybersecurity Incident Management Capability effort in the energy sector. In collaboration with ES-ISAC, the Department of Homeland Security (DHS), the Federal Energy Regulatory Commission (FERC) and industry, OE is leveraging governmental and non-governmental resources to increase information sharing and enhance technologies for cybersecurity for energy delivery systems. With adequate funding, OE will also enhance situational awareness with relevant local and federal agencies and informational analysis centers through collaborative regional exercises.

Infrastructure Security and Energy Restoration

The infrastructure Security and Energy Restoration (ISER) program leads national efforts, in cooperation with public and private-sector stakeholders, to enhance the reliability and resiliency of the U.S. energy infrastructure. The program's goals are to drive an efficient restoration process when emergencies occur and minimize disruptions to electricity consumers. ISER relies on public-private partnerships to upgrade, restore and secure critical energy infrastructure.

EI strongly supports continued development and maintenance of real-time monitoring, visualization, and information sharing capabilities that will be available for integration into ISER's Response and Operations Center (DOE-ROC). Located within DOE's Washington, D.C., headquarters, DOE-ROC will receive and analyze real-time threat and energy-sector status and then coordinate and share this information with all energy-sector stakeholders. During emergencies, the DOE-ROC will serve as the collaboration hub for DOE, other federal agencies, and energy-sector partners, including critical infrastructure owners and operators. DOE-ROC will support the continued presence of DOE's deployed Emergency Support Function 12 (ESF 12) personnel at the National Response Coordination Center, as well as applicable Regional Response Coordination Centers, during events.

Transformer Resilience and Advanced Components

Transformer Resilience and Advanced Components (TRAC) is a new proposed budget line for addressing unique challenges facing transformers and other critical grid components. The FY 16 request expands the study of geomagnetic induced current (GIC) impacts on large power transformers to include electromagnetic pulses and supports power electronics R&D. Activities will be expanded upon the initial

work funded in OE's ISER program to monitor and analyze GIC impacts on the electric infrastructure and support power electronics activities.

In addition to R&D, TRAC will support the Administration's strategy on resilience and physical security. Working with the National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, U.S. Geological Survey, National Institute of Standards and Technology, and National Science Foundation, OE will examine transformer failure mechanisms through modeling and reduced- and full-scale physical testing. Assessing mitigation options such as testing of blocking devices, conducting system-wide analyses, and monitoring GICs will be included. This program will also address the research opportunities for additional components and power electronics systems identified as critical to the grid and necessary for increasing system resilience.

R&D for Grid Resilience

EEl's member companies are constantly investing in improving the resiliency of the electric grid, but technical challenges remain, requiring continued federal R&D investment. These challenges include accommodating greater amounts of customer-owned distributed generation, including solar photovoltaics; supporting the shift towards the electrification of the transportation sector; enabling greater customer control over electricity consumption; responding to extreme weather events such as Superstorm Sandy; reducing the length and number of outages overall; and, at the same time, maintaining affordability.

EEl supports Resilient Electric Delivery Infrastructure (REDI) R&D activities and related DOE initiatives with U.S. cities that encourage smart grid deployment. As part of REDI, we support the National laboratory R&D that leverages models developed under the DHS National Infrastructure Simulation and Analysis Center to enable distribution grid planners to determine and prioritize system upgrades and expansions needed for enhanced resiliency. With tools like the Electric Resilience Assessment Program-Distribution (ERAP-D) prototype, distribution utilities will soon be able to conduct holistic assessments of grid resilience through the synthesis of physical infrastructure information, as well as company plans, policies, and procedures. The ERAP-D tool builds on the resilience assessment tool developed under the DHS Regional Resiliency Assessment Program.

Conclusion

Mr. Chairman, EEl has developed a close working partnership with federal agencies to address physical and cybersecurity threats to our electric infrastructure. The result of these public-private partnerships is now a high level of collaboration between the electric power industry, DOE, FERC, DHS and key federal law enforcement agencies to help secure U.S. energy infrastructure against hazards, whether natural or man-made, physical or cyber.

EEl truly values the partnership that we share with your Subcommittee to protect the grid and make it more resilient. We look forward to continuing our dialogue with you and your staff on these and other issues throughout the year.

Submitting Organization: The Energy Efficiency Strategy Group
Appropriations Subcommittee: House Energy and Water Development
Department: Department Of Energy

**TESTIMONY OF THE ENERGY EFFICIENCY STRATEGY GROUP BEFORE THE
HOUSE OF REPRESENTATIVES ENERGY AND WATER DEVELOPMENT
APPROPRIATIONS SUBCOMMITTEE IN SUPPORT OF FY2016 DEPARTMENT OF
ENERGY FUNDING**

March 30, 2015

On behalf of a coalition of energy efficiency organizations, trade associations, and public interest groups, the undersigned are writing to urge you to support key energy efficiency priorities at the Department of Energy. We recognize the significant challenges facing the federal government to reduce spending and spur economic growth, yet we strongly believe that failing to fund EERE energy efficiency investments at these levels would undermine our national economic, environmental and security interests. These programs have resulted in exceptional value for American consumers and businesses as a source of savings that are spent in other economic sectors, yielding benefits far beyond their nominal outlays.

Energy efficiency is our nation's most abundant energy source. Economy-wide improvements in energy efficiency, along with structural changes in our economy, have supplied more energy over the last 30 years than domestic coal, natural gas, and oil combined. The energy productivity of the U.S. economy—the amount of energy it takes to produce one dollar's worth of goods—has increased by 50% over the past three decades. The economic productivity improvements over this period reduced our national energy bill by about \$700 billion.

Besides lowering expenditures for those who implement efficiency measures, relatively modest energy efficiency investments also lessen dependence on imported energy sources, reduce pollution and its health and environmental impacts, improve America's competitiveness in the global marketplace, alleviate stress to the electric grid and water infrastructure, and forestall the need for costly new electricity generating capacity. The DOE's efficiency research, development, and deployment (RD&D) activities, pursued in concert with American manufacturers, builders, and other important facets of our economy has been the foundation upon which these savings can accrue.

To that end, **we request funding of \$264 Million for the Building Technologies Office (BTO).** The Building Technologies Program continues to successfully provide substantive and technical assistance to guide the development of more efficient codes and appliance standards, as well as research emerging technologies that could help transform the market by making buildings more efficient.

Within the Building Technologies Office, we respectfully request that the funds be allocated in this manner:

\$264 Million for the Building Technologies Office with the following priorities within the

account:

- **\$70 M for Equipment and Building Standards**, with an emphasis on ramping up support for states and local jurisdiction building code activities. For building energy codes, this should include (1) Providing consistent and clear priorities and goals to the model code bodies and to states; (2) providing assistance to states and local jurisdictions on energy code adoption and enforcement; (3) providing assistance to states and local jurisdictions with updated strategies for benchmarking; and (4) methodologies to establish a state baseline, and measurement of energy savings associated with state building code adoption and compliance. For the appliance standards program, DOE has recently caught up on rulemakings that were running behind legal deadlines and continues to work on more than a dozen products as required by statute. DOE is considering new commercial and industrial products. As well, DOE created an effective certification, compliance and enforcement regime, which until now did not exist and has increased its use of negotiated rulemaking process. We support these and the efforts underway to promote transparency and engagement within the process.
- **\$48 M for Residential Building Integration**, with the focus on accelerating the development and adoption of advanced building energy technologies and practices in new and existing homes. The Residential Building Integration program has the capacity to fundamentally transform homebuilding and renovation in this country but must stay focused on meeting the appropriate and laudable goals of development and adoption of advanced building energy technologies and practices for 70% efficiency improvements. Funding should be concentrated with the Industry Teams that can facilitate research, demonstrate and test new systems, and facilitate widespread deployment through their partnerships with builders, the construction trades, equipment, smart grid technology and systems suppliers, integrators and state and local governments. We strongly support the increased funding in the President's request for the expanded residential building energy efficiency retrofit program supporting all residential building types and income levels. Direct engagement with builders, contractors, and business is crucial to the success of buildings programs. Sufficient funding should be provided primarily for the industry teams that have the capability to bring all actors to the table and transform the market.
- **\$32 M for Commercial Building Integration**, with a need for DOE to not only facilitate the research and development on systems integration but also promote the widespread adoption of comprehensive deep retrofits to existing buildings and 50-100% energy reductions in new construction relative to the 2001 model code. We support a program of core research and development of more cost effective integration techniques and technologies could help the move towards both deep retrofits and zero net energy ready buildings. In addition, DOE needs to better engage with the stakeholders developing market transforming policies and investing in retrofits (e.g., private firms, state and local governments, non-profits) by coordinating with and working through them.
- **\$112 M for Emerging Technologies**, which should be focused on building envelope technologies and building equipment technologies with an increasing focus on building management technologies. Advanced heating, ventilation, and air conditioning (HVAC) research should increase and focus on innovative technologies that can provide reductions in primary energy use. Work should continue on advanced water heating and appliance technologies and systems. The program should intensify efforts to increase

efficiencies with nano-based lubricants, advanced fluids, and next generation alternatives. Advanced envelope technologies, including windows research and development should continue, as should research into building energy management capability. We also urge DOE to fund innovative new technologies that will move us towards efficiency reductions consistent with achieving net zero energy ready buildings, consider resiliency and extreme weather events, and coordinate with the private and public sectors.

In addition to the funding for the BTO, **we respectfully request \$404 M for the Advanced Manufacturing Office**, divided as follows: at least 25% of the budget should support deployment activities (including \$8-10 million for the Industrial Assessment Centers); 25% should target research and development cost-shared with energy-intensive manufacturing; and at least 15% should target combined heat & power (CHP) research and deployment, including continued support for the regional technical application partnerships.

We respectfully request \$43 M for the Federal Energy Management Program, which retains the budget request. FEMP provides project and policy expertise to all federal agencies, assisting them to meet Congressional and Executive energy management goals: reducing waste in federal agency energy use, leading by example, and spurring innovation and the commercialization of efficient technologies. From 2009 to 2011, FEMP arranged energy savings performance contracts (ESPCs) that leveraged almost \$1.2 billion in project investment to save more than \$3.5 billion in energy and water costs.

We respectfully request \$230 M for Weatherization Assistance Program, a proven energy savings program which enables low-income families, seniors and individuals with disabilities to receive long term efficiency improvements to their homes. More than 7.4 million homes have been weatherized over the 38 year life of the program, which supports 10,000 living wage jobs. Highly trained weatherization workers are the largest energy efficiency workforce in the county. Weatherization is also the pathway to improved health and safety in low income homes, because the program is typically the only opportunity for trained professionals to enter a home and diagnose problems like carbon monoxide and mold and moisture which threaten the well-being of the occupants. For every \$1 invested in the Weatherization program, \$2.51 is returned to the households (in the form of energy savings) and to society.

We respectfully request \$70 M for the State Energy Program, which allows states to assist with the development of energy efficiency and renewable energy projects. According to an Oak Ridge National Laboratory study, of the State Energy Program for every federal dollar invested, \$7.22 in energy savings is achieved. Every federal dollar also leverages almost \$11.00 in non-federal funds. This program supports economic development activities in all sectors of the economy, from industry to agriculture to residential and commercial buildings.

We respectfully request \$175 M for a State Energy Productivity Innovation Challenge (identified in previous Budget Request as "Race to the Top") with monetary awards to states to promote the goal of doubling electric and thermal energy. Such improvements will stimulate innovation, job creation and economic growth in the private sector without mandates. States can enhance their productivity by adopting policies related to building efficiency, combined heat and power, demand response, and smart grid.

We respectfully request \$444 M for the Vehicle Technologies Program, which supports a number of aggressive vehicle technology goals that can greatly reduce transportation fuel use in the nation including: enhanced battery energy storage at substantially lower cost, improvements in lightweight materials performance, and major gains in freight truck efficiency. The SuperTruck project has already exceeded its initial goal of tractor-trailer technology advances demonstrating a 50% improvement in freight efficiency, and the energy storage projects have achieved a cost reduction milestone for lithium-ion battery production of \$300 per kWh (modeled).

Additionally, we strongly urge you to exclude any provision from the Energy and Water Development Appropriations bill that would prohibit DOE from enforcing the lighting energy efficiency standards that were enacted in 2007. Lighting remains one of the least expensive efficiency upgrades to consumers, and the standards, which manufacturers are already investing to meet, are expected to save the average household \$100 or more a year and increase consumer choice by bringing innovative lighting options to market. Preventing the enforcement of the lighting standards will only drive up costs for efficient lighting, spur greater uncertainty in the marketplace, prevent job growth, waste energy, and diminish consumer choice.

Conclusion

In closing, we commend you for your important work and are fully aware of the difficult decisions required over the coming weeks. Energy efficiency offers solutions that drive the U.S. economy by creating jobs and saving energy. Energy efficiency investments also lessen dependence on imported energy sources, reduce pollution and its health and environmental impacts, improve America's global competitiveness, and alleviate stress to the electric grid and water infrastructure.

We urge the Appropriations Energy and Water Subcommittee to provide robust funding to these important DOE programs in FY2016. Thank you for your consideration of our requests.

Submitted on behalf of:

Alliance to Save Energy
 American Council for an Energy-Efficient Economy
 ASHRAE
 Big Ass Solutions
 Conservation Services Group
 Cree
 Danfoss
 Efficiency First
 Environmental and Energy Study Institute
 Habitat for Humanity International
 Home Performance Coalition
 Illuminating Engineering Society
 Institute for Market Transformation

International Association of Lighting Designers
 Large Public Power Council
 National Association for State Community Services Programs
 National Association of Energy Service Companies
 National Association of State Energy Officials
 National Community Action Foundation
 Natural Resources Defense Council
 Seattle City Light
 U.S. Green Building Council



Representing Over 120,000 Researchers

301.634.7000
www.faseb.org

9650 Rockville Pike
Bethesda, MD 20814

March 25, 2015
Contact: Meghan McCabe
Legislative Affairs Analyst
mmccabe@faseb.org

Testimony of the
Federation of American Societies for Experimental Biology
On
FY 2016 Appropriations for the Department of Energy Office of Science
Submitted to the
House Committee on Appropriations
Subcommittee on Energy and Water Development
Representative Mike Simpson, Chairman
Representative Marcy Kaptur, Ranking Member

The Federation of American Societies for Experimental Biology (FASEB) respectfully requests a fiscal year (FY) 2016 appropriation of a minimum of \$5.34 billion for the Department of Energy Office of Science. This increase represents a commitment to the critical research supported by the agency, and would preserve the capacity of our National Labs and User Facilities.

The American Physiological Society • American Society for Biochemistry and Molecular Biology • American Society for Pharmacology and Experimental Therapeutics
American Society for Investigative Pathology • American Society for Nutrition • The American Association of Immunologists • American Association of Anatomists
The Protein Society • Society for Developmental Biology • American Peptide Society • Association of Biomolecular Resource Facilities
The American Society for Bone and Mineral Research • American Society for Clinical Investigation • Society for the Study of Reproduction • The Teratology Society
The Endocrine Society • The American Society of Human Genetics • International Society for Computational Biology • American College of Sports Medicine
Biomedical Engineering Society • Genetics Society of America • American Federation for Medical Research • The Histochemical Society • Society for Pediatric Research
Society for Glycobiology • Association for Molecular Pathology • Society for Free Radical Biology and Medicine

FASEB, a federation of 27 scientific societies, represents more than 120,000 life scientists and engineers, making it the largest coalition of biomedical research associations in the United States. Our mission is to advance health and welfare by promoting progress and education in biological and biomedical sciences.

The Department of Energy Office of Science (DOE SC) is the lead federal sponsor of fundamental energy research and the largest supporter of basic physical sciences research. DOE SC awards competitive, merit-based grants to researchers in all 50 states, operates ten of the seventeen world-class National Laboratories, and manages state-of-the-art facilities used by more than 29,000 scientists and engineers annually. Researchers supported by DOE SC have been awarded 115 Nobel Prizes.

The entire research community benefits from the unmatched scientific and technological instrumentation maintained by DOE SC, such as supercomputers, x-ray light sources, and particle accelerators. Discoveries made possible by such technologies improve health, spur economic growth, and support a secure and sustainable energy future.

Examples of DOE SC-funded research include:

- *Building Devices to Detect Cancer:* Researchers at Argonne National Laboratory, in partnership with scientists at the University of South Florida, have made a dramatic advance in surface acoustic wave (SAW) biosensors, which are used to detect ovarian cancer and other diseases. The new model improves the device's sensitivity, while simultaneously reducing power consumption. The next step in development will enable SAW sensors to be battery-operated and small enough to be hand-held.¹
- *Novel Method to Target Influenza Virus:* A team of researchers working at DOE's Stanford Linear Accelerator Center National Accelerator Laboratory has identified an antibody that binds to a wide variety of influenza strains. Because the antibody is conserved in so many strains, it provides a new target for structure-based drug discovery as well as potential innovative methods for vaccine design.²
- *Visualizing Fragile Biological Samples:* Using two DOE SC User Facilities, engineers have combined X-ray lasers and robotics to visualize the structure of nanoscale proteins and other biological molecules. The new system, the Linac Coherent Light Source (LCLS), helps scientists determine the structure of molecules that are too small or too delicate for conventional analysis. LCLS has immediate applications in the burgeoning field of nanotherapeutics.³

¹ <http://www.anl.gov/articles/researchers-develop-new-acoustic-sensor-chemical-and-biological-detection>

² <https://www6.slac.stanford.edu/news/2014-12-08-study-may-help-slow-spread-flu.aspx>

³ <https://www6.slac.stanford.edu/news/2014-11-21-robotics-meet-x-ray-lasers-cutting-edge-biology-studies.aspx>

- *Discovering Treatments for Hepatitis C*: DOE SC-funded researchers from Rutgers University and Emory University School of Medicine, in partnership with the Brookhaven National Laboratory, have determined the three-dimensional structure of the hepatitis C virus. Using the National Synchrotron Light Source, the team developed a model of the exterior structure of the virus, the first step in vaccine development for this infectious disease that affects more than 160 million people worldwide.⁴

Protecting the World-Class Infrastructure for Discovery Research

Discovery science provides a stable foundation for innovation, driving the frontiers of knowledge and generating the industries of the future. Instrumentation, visualization platforms, and many other tools at the National Labs and User Facilities provide a nexus where nearly every field of science and engineering converge. The large-scale scientific technologies at DOE SC labs are also critical to the research and development capabilities of major companies in the automotive, healthcare, and pharmaceutical industries, as well as dozens of small businesses.

Opportunities for advancement in energy research are countless. Stable and predictable funding growth for DOE SC will provide the agency with additional resources to deliver scientific discoveries and tools to transform our understanding of nature and strengthen our national security. Increased investment will also allow DOE SC to support ongoing efforts to upgrade the infrastructure of the National Labs and maintain U.S. leadership in the physical and life sciences.

To promote sustainable growth, FASEB recommends a minimum of \$5.34 billion for DOE SC in FY 2016. This increase represents a commitment to the critical research supported by the agency, and would preserve the capacity of our National Labs and User Facilities.

Thank you for the opportunity to offer FASEB's support and recommendations for the DOE SC.

⁴ <http://www.bnl.gov/newsroom/news.php?a=25256>

STATEMENT PRESENTED BY:

Reynold S. Minsky, President
Board of Commissioners
Fifth Louisiana Levee District
102 Burnside Drive
Tallulah, LA 71282
Email: fifthld@bellsouth.net

STATEMENT PRESENTED TO:

House Subcommittee on Energy and
Water Development
Fiscal Year 2016

The Board of Commissioners for the Fifth Louisiana Levee District respectfully requests of the U.S. House of Representatives Appropriations Subcommittee on Energy and Water Development an appropriation in the sum of 500 million dollars for the Mississippi River and Tributaries Project.

The Flood of 2011 exceeded most records for gauge readings and volumes of water – surpassing the 1927 and 1937 Floods. The investment protected by the Mississippi River and Tributaries (MR&T) system during this flood was \$234 billion with cumulative damages prevented by the MR&T system being \$612 billion and a return on federal investment of \$44 to \$1. The hydraulic improvements made by the construction of dikes, cutoffs and channel improvement that allowed a record flood by volume to flow at a lower elevation, are the same improvements that allowed barge traffic to move during the near record lows experienced throughout the Mississippi River in 2012.

Countless lives have been spared due to the construction of the MR&T project, also our nation receives nearly One Billion dollars of navigational benefits each year due to this project. Truly this is a wise investment for this country and it is good for our economy. This investment provides benefits far beyond their actual cost to the taxpayer by offering protection to over 4 million citizens and allows people to live and work throughout a 35,000 square mile area in seven states.

Local interests have done their part in providing rights of way, roads, utilities and the like. Our government now needs to fulfill their obligatory part of the project and bring it to completion as quickly as possible. We believe the Corps could adequately use 500 million dollars each year for maintenance and construction within the MR&T.

With the help of Congress, great progress has been made in the Mississippi River Valley over the years, but there is still much to be done, and because of that, we urge Congress to increase funding to the Corp of Engineers in Fiscal Year 2016, to insure that the Corp is not forced to halt or delay contracts for levee construction essential to the well being of this Nation. It is vital that the MR&T project(s) be completed at the earliest possible date.

TESTIMONY

Energy and Water Development Subcommittee on Appropriations
Honorable Mike Simpson, Chairman

Fort Peck Reservation Rural Water System (PL 106-382)
 Assiniboine and Sioux Rural Water System
 Dry Prairie Rural Water System

Bureau of Reclamation

1. FY 2016 Budget Request

The Assiniboine and Sioux Tribes of the Fort Peck Reservation and Dry Prairie Rural Water respectfully request FY 2016 appropriations of \$26.488 million for this project, part of the Bureau of Reclamation Rural Water Program (Table 1).

Because the President's budget has reduced construction funding for the rural water program from \$51.578 million in FY 2013 to \$18.546 million in FY 2016, the project requests \$40 million for discretionary allocation by Reclamation to restore funding within the program to more reasonable levels. This would provide \$58.546 million in FY 2016 or \$10.235 million more than the average of FY 2014 and 2015 appropriations of \$48.311 million (Table 2).

TABLE 1

FY 2016 FUNDING REQUEST
 FORT PECK RESERVATION RURAL WATER SYSTEM (PL 106-382)

Sponsor	Project Feature	Federal	Non-Federal	Total
Fort Peck Tribes				
	US 2 North to Reservation Boundary Main Branch	\$4,765,000	\$0	\$4,765,000
	US 2 North to Reservation Boundary Secondary Branches	3,906,000	0	3,906,000
	Brockton to Big Muddy Zone 1 Branches	707,000	0	707,000
	Wolf Point to Frazer Zone 1 Branches	2,742,000	0	2,742,000
	Frazer to Porcupine Creek Zone 1 Branches	538,000	0	538,000
	Service Connections	425,000	0	425,000
	FP Electrical, Meters, Easements	1,026,000	0	1,026,000
	Subtotal	\$14,109,000	\$0	\$14,109,000
Dry Prairie (Main Transmission Pipelines and Branches)				
	E Medicine Lake	\$1,542,000	\$164,000	\$1,706,000
	FP Boundary to Scobey	8,826,000	935,000	9,761,000
	Nashua to Glasgow	1,441,000	153,000	1,594,000
	DP Electrical, Meters, Easements	570,000	61,000	631,000
	Subtotal	\$12,379,000	\$1,313,000	\$13,692,000
Total		\$26,488,000	\$1,313,000	\$27,801,000

The request is \$14.109 million for the Assiniboine and Sioux Rural Water System (ASRWS) and \$12.379 million for the Dry Prairie Rural Water System (DPRWS). The request is the average funding needed to complete the two systems in 2020, the year scheduled for completion by the Consolidated Appropriations Act, 2014, PL 113-76, Division D, Title II, Sec. 209.

FY 2016 funds will be used to construct critical elements of the Fort Peck Reservation Rural Water System, Montana, (PL 106-382, October 27, 2000). The request is within the capability to spend funds in FY 2016. Design of all proposed project features is complete by the Tribes and approved by Reclamation, and all cultural resource surveys have been completed and are pending approval. Dry Prairie will complete all design, cultural surveys and approvals in 2015 and in advance of the use of FY 2016 funds.

2. President's Budget is Progressively Inadequate

Table 2 summarizes funding by the Administration for the rural water program since FY 2013. Four years ago the Administration was budgeting construction funding of \$51.578 million, which was reduced to \$16.283 million in FY 2015 and \$18.546 in FY 2016. Recognizing that these projects are meeting a basic drinking water need of highest importance to the health and welfare of the people served, the Administration has shifted the funding burden to Congress to supplement the President's budget. Congress has stepped forward with its perception of the need and has consistently added funds before and after FY 2013.

TABLE 2
HISTORY OF CONSTRUCTION FUNDING BUDGETED BY THE ADMINISTRATION AND
SUPPLEMENTED BY CONGRESS

Project	Region	Construction Funding			
		FY 2013	FY 2014	FY 2015	FY 2016
President's Budget					
Mni Wiconi Project	GP	\$35,200	\$12,000	\$12,000	\$12,000
Non-construction OMR		-12,200	-12,000	-12,000	-12,000
Pick-Sloan Missouri Basin Program - Garrison Diversion Unit (Rural Water component only)	GP	15,900	14,492	12,296	13,400
Non-construction OMR		-5,800	-5,800	-5,800	-6,000
Rocky Boy's/North Central MT Rural Water System	GP	4,000	5,400	4,059	4,625
Fort Peck Reservation / Dry Prairie Rural Water System	GP	7,500	4,300	3,249	3,700
Jicarilla Apache Rural Water System	UC	500	0	0	0
Lewis and Clark Rural Water System	GP	4,500	3,200	2,432	2,774
Eastern New Mexico Water Supply -Ute Reservoir	UC	1,978	649	47	47
Rural Water Programs - Total		\$51,578	\$22,241	\$16,283	\$18,546
Congressional Addition					
Requested for Rural Water Program Construction		\$0	\$27,098	\$31,000	--
Enacted Funding		\$51,578	\$49,339	\$47,283	--
Requested for Rural Water Program Construction					\$58,546

Even with the supplemental funding of \$40.000 million as requested, funding for ASRWS and DPRWS would only total \$13.700 million or half of the amount needed to complete the project on its statutory schedule ending in 2020.

3. Project Status and Funding Needs

As shown in Table 3 below, the project will be 52% complete at the end of FY 2015. ASRWS will be 60% complete, and DPRWS will be 34% complete. The Assiniboine and Sioux Tribes have built the regional intake, water treatment plant and main transmission pipelines that serve both the Tribes and Dry Prairie. The building of the regional construction features accounts for the differences in percentage of completion. At the Budget request, the Project stakeholders cannot complete the Project within the current authorization, which will result in overall increased cost to American taxpayers. Our request would complete the Project in 2020 in today's dollars including future inflation. See the Project Map (Attachment A) and the Master Plan (Attachment B).

4. Proposed Activities

The FY 2016 request (\$26.277 million) is virtually the average annual appropriations needed to complete the project in FY 2020 and is urgently needed to properly utilize the newly completed water treatment plant and distribute water to all communities along the main transmission line within the Fort Peck Indian Reservation. The FY 2016 funds will:

Fort Peck Indian Reservation (ASRWS)

- complete the main transmission pipelines along the southern boundary of the project between Frazer and Nashua and complete the second connection between the Assiniboine and Sioux Rural Water System (ASRWS) and Dry Prairie,
- complete about 33% of the main pipeline from north to south across the Reservation to Dry Prairie's connection to Scobey, the third and last connection to Dry Prairie, and complete about 30% of the Reservation's distribution system in that area
- serve all Reservation communities and all rural homes within the first pressure zone along the main transmission throughout the Reservation,
- permit delivery of water within the Reservation and outside the Reservation to improve water quality and operation by
 - reducing flushing that wastes water and costs
 - reducing disinfection requirements and costs
 - reducing potential for formation of carcinogenic disinfectant by-products

Dry Prairie (DPRWS)

- continue East Medicine Lake Project south of Plentywood
- begin connection from Nashua to Glasgow, the latter is the largest community in the project with 10% of population
- initiate construction of pipeline from northern boundary of Reservation to Scobey, from the third and last connection to the ASRWS regional water treatment plant

Jobs

- create an estimated 79 full-time equivalent (FTE) construction jobs in an area of Montana with low per capita income, high unemployment and high under-employment (based on 3 FTE's per \$1 million).

5. Master Plan

The project master plan is provided for review as Attachment B. The request for FY 2016 is shown in relation to project components remaining to be completed after FY 2016.

6. Administration's Support

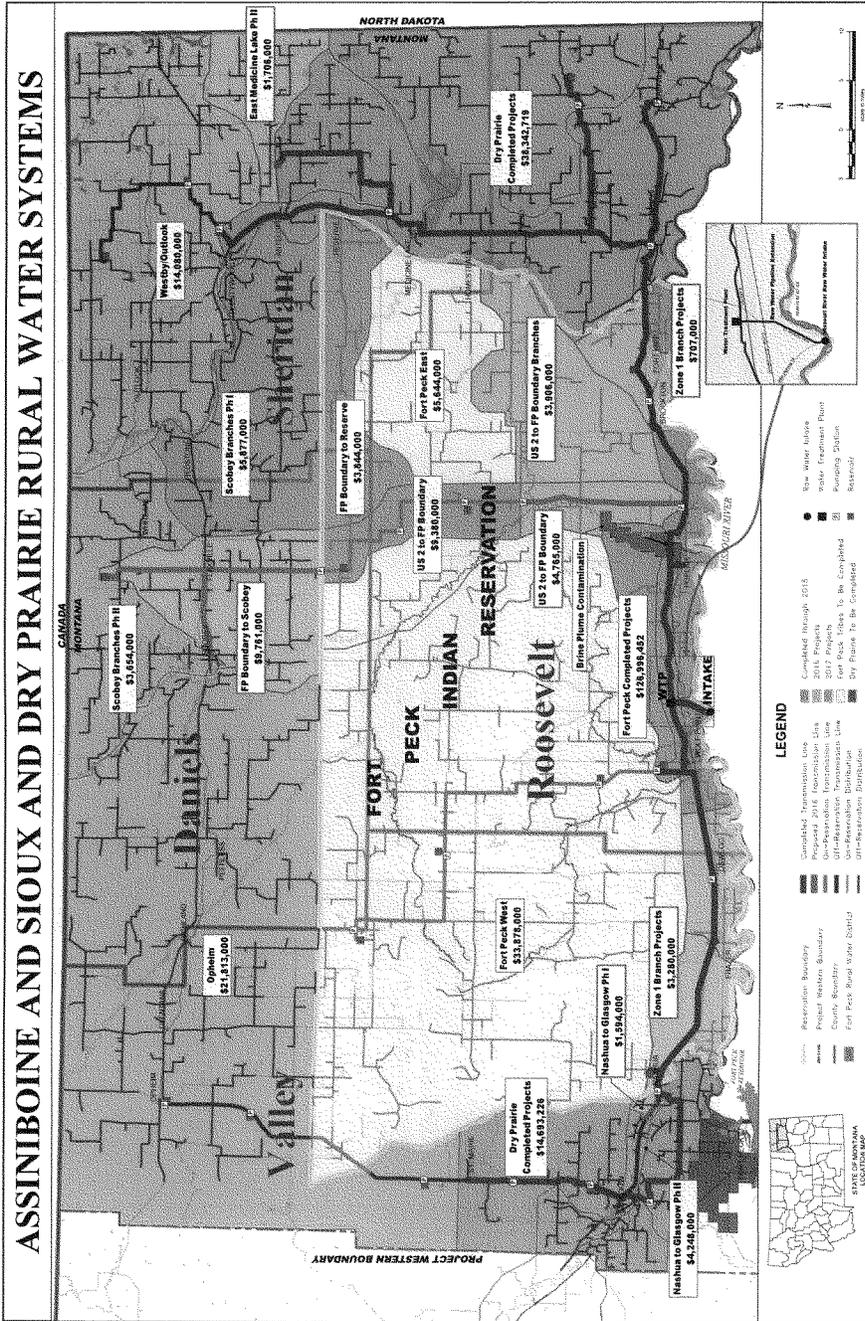
The project has reached 52% completion over a period of 15 years (averaging about 3% annually). The Administration's budget included the project at the \$5.0, \$4.0, \$2.0, \$9.9, \$7.5 \$4.3, \$3.2 and \$ 3.7 million levels in FY 2009 through FY 2016, respectively, not counting ARRA and discretionary funds allocated by Congress. Continued Congressional support is needed for the Reclamation Rural Water Program to complete the currently authorized projects in a timelier manner to avoid the erosion of construction capability as fixed, annual overhead costs reduce authorized construction funds because the project has been required to build significantly longer than anticipated at authorization.

The Tribes and Dry Prairie have worked extremely well and closely with the Bureau of Reclamation since the authorization of the project in FY 2000. The Commissioner, Regional and Area Office of the Bureau of Reclamation have been consistently in full agreement with the need, scope, total costs, and the ability to pay analysis that supported the federal and non-federal cost shares. The project budget is currently under federally authorized ceiling by \$11.508 million (Attachment B).

Cooperative agreements have been developed and executed between the Bureau of Reclamation and the Tribes and between the Bureau of Reclamation and Dry Prairie. Those cooperative agreements carefully set out goals, standards and responsibilities of the parties for planning, design and construction. All plans and specifications are subject to review by the Bureau of Reclamation pursuant to the cooperative agreements. The sponsors collaborate to undertake activities that assure proper oversight and approval by the Bureau of Reclamation. Each year the Tribes and Dry Prairie, in accordance with the cooperative agreements, develop a work plan setting out the planning, design and construction activities and the allocation of funding to be utilized on each project feature.

The Fort Peck Reservation Rural Water System is well supported by the Bureau of Reclamation. Congress authorized the project based on the *Final Engineering Report* that was formulated in full cooperation and collaboration with the Bureau of Reclamation, and major project features have been successfully completed with excellent oversight by the Agency.

ATTACHMENT A



ATTACHMENT B													
ASSINIBOINE SIOUX AND DRY PRAIRIE RWS													
MASTER PLAN, OCTOBER 2014 \$													
Segment	Authorized Funds			FY 2015 Work Plan			Future Use of Funds by Construction Year						
	Original Cost (Oct 1999 \$)	Indexed Cost (Oct 2014 \$)	Fort Pick Cost	Spent thru 9/30/2014	Remaining Carryover	Use of Funds FY 2015	To Complete	13 2016	14 2017	15 2018	16 2019	17 2020	Total
Missouri River Raw Water Intake	2,880,000	3,164,416	4,047,000	4,047,000	0	0	0	0	0	0	0	0	4,047,000
Intake Extension	16,734,000	21,949,821	2,800,000	2,800,000	1,161,407	0	0	0	0	0	0	0	1,161,407
Treatment Plant	22,881,000	44,979,225	13,031,000	13,031,000	27,287,852	0	0	0	0	0	0	0	2,800,000
Sludge Lagoons	14,332,051	18,505,000	11,332,051	11,332,051	1,229,465	0	0	0	0	0	0	0	14,332,051
Water Treatment Plant Phase I	9,247,000	18,579,064	11,847,000	11,847,000	3,892,333	7,664,687	0	0	0	0	0	0	11,847,000
Poplar to Big Muddy Mainline	11,320,000	11,320,000	591,000	591,000	3,264,000	3,264,000	1,264,000	1,264,000	0	0	0	0	11,320,000
US 2 North to Reservation Boundary Main Branch	591,000	591,000	672,397	672,397	0	0	0	0	0	0	0	0	591,000
Brookton to Big Muddy Zone 1 Branches	38,998,000	76,982,394	5,867,190	5,867,190	0	0	0	0	0	0	0	0	5,867,190
Fort Kipp	7,208,392	7,208,392	6,053,448	6,053,448	3,202,481	0	0	0	0	0	0	0	7,208,392
WTP to Poplar	2,985,000	2,985,000	2,985,000	2,985,000	0	0	0	0	0	0	0	0	2,985,000
WTP to Wolf Point	4,482,660	4,482,660	4,482,660	4,482,660	0	0	0	0	0	0	0	0	4,482,660
ARRA Mainline	2,985,000	2,985,000	2,985,000	2,985,000	0	0	0	0	0	0	0	0	2,985,000
Wolf Point to Frazer	3,116,000	3,116,000	3,116,000	3,116,000	0	0	0	0	0	0	0	0	3,116,000
Remaining Mainline	22,382,000	22,382,000	22,382,000	22,382,000	0	0	0	0	0	0	0	0	22,382,000
Wolf Point to Frazer Zone 1 Branches	7,190,000	7,190,000	7,190,000	7,190,000	0	0	0	0	0	0	0	0	7,190,000
US 2 North/Laurel Main Branch	900,000	900,000	900,000	900,000	0	0	0	0	0	0	0	0	900,000
US 2 North/Laurel Secondary Branches	2,990,000	2,990,000	2,990,000	2,990,000	0	0	0	0	0	0	0	0	2,990,000
Frazer to Porcupine Creek	3,811,270	3,811,270	3,811,270	3,811,270	0	0	0	0	0	0	0	0	3,811,270
Frazer to Porcupine Creek Zone 1 Branches	1,000,000	1,000,000	1,000,000	1,000,000	0	0	0	0	0	0	0	0	1,000,000
FP OM Buildings	4,164,000	4,164,000	4,164,000	4,164,000	0	0	0	0	0	0	0	0	4,164,000
FP Electrical Meters Easements	65,804,000	172,116,411	166,624,962	166,624,962	8,800,976	5,051,378	61,677,443	11,781,426	13,391,254	11,653,307	12,667,587	16,824,962	65,804,000
Subtotal	124,000,000	212,213,381	207,705,990	207,705,990	8,899,979	6,979,000	111,007,476	14,376,135	16,270,145	14,167,136	14,909,850	14,939,007	200,705,990
Planning Design Admin	3,813,000	5,765,288	4,423,000	4,423,000	151,000	151,000	400,000	400,000	400,000	400,000	400,000	400,000	4,423,000
Reclamation Oversight	489,000	759,415	759,415	759,415	0	0	0	0	0	0	0	0	759,415
Environmental Mitigation	6,744,000	9,356,170	8,140,513	8,140,513	482,827	1,174,417	482,827	277,008	225,666	139,360	151,893	151,893	8,140,513
Administration	2,821,000	4,070,401	3,455,775	3,455,775	455,775	2,500,000	500,000	500,000	500,000	500,000	500,000	500,000	3,455,775
Easement Acquisition	7,582,000	10,282,485	9,228,015	9,228,015	6,275,440	4,502,575	2,500,000	500,000	500,000	500,000	500,000	500,000	9,228,015
Design	6,847,000	9,643,211	7,875,900	7,875,900	625,300	2,750,000	650,000	550,000	550,000	550,000	550,000	550,000	7,875,900
Inspection	28,198,000	40,096,970	33,880,618	33,880,618	20,032,306	2,184,477	11,683,852	2,564,710	2,978,891	2,307,548	2,241,263	2,171,420	33,880,618
Subtotal	124,000,000	212,213,381	207,705,990	207,705,990	8,899,979	6,979,000	111,007,476	14,376,135	16,270,145	14,167,136	14,909,850	14,939,007	200,705,990
Total	124,000,000	212,213,381	207,705,990	207,705,990	8,899,979	6,979,000	111,007,476	14,376,135	16,270,145	14,167,136	14,909,850	14,939,007	200,705,990

Segment	Original Cost		Authorized Funds		Spent thru 9/30/2014	Remaining 9/30/2014 Carryover	Use of Funds 9/30/2014	Future Use of Funds by Construction Year							Total	
	(Oct 1988 \$)		(Oct 2014 \$)					Complete	2016	2017	2018	2019	2020			
	Cost	Indev	Cost	Indev												
Big Muddy to Plentywood	19,433,000	33,811,694	0	0	4,292,456	0	0	0	0	0	0	0	0	0	0	4,292,456
Cullerton to Medicine Lake	6,534,303	0	0	0	6,534,303	0	0	0	0	0	0	0	0	0	0	6,534,303
A-Branches and Meters	3,669,442	0	0	0	3,669,442	0	0	0	0	0	0	0	0	0	0	3,669,442
N Bannville	6,396,269	0	0	0	6,396,269	0	0	0	0	0	0	0	0	0	0	6,396,269
E Medicine Lake	5,204,171	0	0	0	5,204,171	0	0	0	0	0	0	0	0	0	0	5,204,171
ML to Plentywood	1,612,096	0	0	0	1,612,096	0	0	0	0	0	0	0	0	0	0	1,612,096
Big Muddy to Cullerton	181,824	0	0	0	181,824	0	0	0	0	0	0	0	0	0	0	181,824
Fort Kipp	12,665,000	0	0	0	12,665,000	0	0	0	0	0	0	0	0	0	0	12,665,000
Westby/Quilok	17,146,000	0	0	0	17,146,000	0	0	0	0	0	0	0	0	0	0	17,146,000
FP Boundary to Scobey	21,808,000	43,814,255	0	0	0	0	0	0	0	0	0	0	0	0	0	21,808,000
Porcupine Creek to Opheim	7,980,000	13,319,823	0	0	0	0	0	0	0	0	0	0	0	0	0	7,980,000
VC Phase I	4,012,026	0	0	0	4,012,026	0	0	0	0	0	0	0	0	0	0	4,012,026
VC Phase II	1,470,867	0	0	0	1,470,867	0	0	0	0	0	0	0	0	0	0	1,470,867
VC Areas B & D	3,832,199	0	0	0	3,832,199	0	0	0	0	0	0	0	0	0	0	3,832,199
Porcupine Creek to Nashua	667,000	0	0	0	667,000	0	0	0	0	0	0	0	0	0	0	667,000
Nashua to Glasgow	4,069,000	0	0	0	4,069,000	0	0	0	0	0	0	0	0	0	0	4,069,000
VC Area F, BPS & Reservoir	1,872,000	0	0	0	1,872,000	0	0	0	0	0	0	0	0	0	0	1,872,000
Opheim	19,621,000	0	0	0	19,621,000	0	0	0	0	0	0	0	0	0	0	19,621,000
DP OM Buildings	1,000,000	1,374,804	0	0	1,121,485	0	0	0	0	0	0	0	0	0	0	1,121,485
DP Electrical, Meters, Easements	2,632,000	3,926,623	0	0	3,696,307	0	0	0	0	0	0	0	0	0	0	3,696,307
Subtotal	52,283,000	96,246,998	98,980,746	0	36,536,491	789,454	3,721,891	58,922,923	32,026,310	11,482,179	11,631,227	11,917,727	11,896,477	98,980,746	0	98,980,746
Planning, Design, Admin	2,108,000	3,163,310	1,765,000	0	1,916,000	0	122,000	625,000	125,000	125,000	125,000	125,000	125,000	1,765,000	0	1,765,000
Reclamation Oversight	264,000	395,493	360,000	0	216,000	0	24,000	120,000	24,000	24,000	24,000	24,000	24,000	360,000	0	360,000
Environmental Mitigation	3,947,000	5,672,849	7,991,509	0	5,236,000	0	799,919	1,436,591	555,316	427,522	276,769	151,836	25,148	7,991,509	0	7,991,509
Administration	769,000	1,165,904	224,000	0	134,000	0	265,289	100,000	20,000	20,000	20,000	20,000	20,000	224,000	0	224,000
Easement Acquisition	4,066,000	6,032,037	8,140,804	0	3,239,000	0	1,124,904	841,772	802,353	814,196	854,241	832,053	814,804	8,140,804	0	8,140,804
Design	3,698,000	5,937,776	1,835,000	0	1,258,000	0	190,906	500,000	100,000	100,000	100,000	100,000	100,000	1,835,000	0	1,835,000
Inspection	14,662,000	22,021,340	19,884,314	0	11,640,000	0	1,336,119	1,536,335	1,686,188	1,438,875	1,336,365	1,255,077	1,129,201	19,884,314	0	19,884,314
Subtotal	67,105,000	118,268,337	118,865,060	0	47,176,491	789,454	5,070,000	65,929,116	13,691,368	12,361,054	12,991,182	13,172,804	13,012,878	118,865,060	0	118,865,060
Tribes (All Federal)	124,000,000	212,213,384	200,706,580	0	111,007,476	9,999,976	7,249,879	73,951,273	14,476,195	15,270,145	14,167,136	14,309,890	14,859,037	200,706,580	0	200,706,580
DNR	67,100,000	16,484,347	118,865,060	0	47,176,491	9,999,976	7,249,879	65,232,352	13,691,368	12,361,054	12,991,182	13,172,804	13,012,878	118,865,060	0	118,865,060
Federal	61,000,000	8,483,786	80,337,446	0	45,201,979	8,483,786	6,439,439	2,193,000	36,992,677	9,463,921	9,463,921	9,463,921	9,463,921	80,337,446	0	80,337,446
Non-Federal	15,100,000	28,384,401	28,327,614	0	15,974,512	1,483,655	1,010,440	10,440,355	1,730,350	1,730,350	1,730,350	1,730,350	1,730,350	28,327,614	0	28,327,614
Total Project	191,105,000	330,481,719	200,706,580	0	158,183,967	9,880,456	13,375,655	138,763,666	28,167,533	28,231,149	27,958,317	28,981,664	27,851,896	319,870,640	0	319,870,640
Federal	176,000,000	302,027,318	200,706,580	0	143,209,955	9,486,406	9,430,955	130,464,070	23,855,939	24,763,995	23,855,937	24,362,672	24,362,672	281,105,695	0	281,105,695
Non-Federal	16,105,000	28,384,401	28,327,614	0	14,973,992	1,483,655	1,010,440	10,440,355	1,730,350	1,730,350	1,730,350	1,730,350	1,730,350	38,764,945	0	38,764,945
Funds Over: Federal Ceiling																
Federal																
Non-Federal																

**House Appropriations: Subcommittee on Energy and Water Development
Outside Witness Testimony
April 6, 2015**

David Culp, Legislative Representative, Friends Committee on National Legislation
Bradley Harris, Program Assistant, Friends Committee on National Legislation

The following seven organizations, **Campaign for Liberty, Coalition to Reduce Spending, Friends Committee on National Legislation, National Taxpayers Union, Niskanen Center, Taxpayers for Common Sense** and **Taxpayers Protection Alliance**, endorse this testimony. We would like to bring an urgent issue regarding the National Nuclear Security Administration's budget to the Subcommittee's attention. We would also like to recognize the Subcommittee's long, bipartisan history of providing oversight on the nuclear weapons' budget.

NNSA's B61 Nuclear Bomb Life Extension Program

We urge the Subcommittee to either seek a cost-sharing arrangement with our NATO allies or reduce the number of nuclear warheads in the B61 Life Extension Program.

There are approximately 180 B61 nuclear bombs stationed in Europe. These weapons, which ostensibly provide for the security of our allies, are to be refurbished at the sole cost of the American taxpayer.

If the B61 contributes to the security of Europe, then our NATO partners should be willing to pay for a portion of the refurbishment. We believe it is appropriate to ask partners to contribute to a weapon system stationed on their territory.

If our allies refuse to contribute, this is evidence that these weapons do not contribute to the security of Europe, as many former U.S. military officials have suggested. We therefore urge you to refrain from refurbishing the B61 nuclear warheads stationed in Europe.

Thank you for your consideration.

Norm Singleton, Vice President of Policy
Campaign for Liberty

Jonathan Bydlak, President
Coalition to Reduce Spending

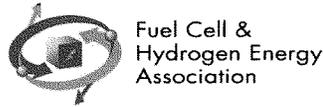
David Culp, Legislative Representative, and
Bradley Harris, Program Assistant
Friends Committee on National Legislation

Pete Sepp, President
National Taxpayers Union

Matt Fay, Foreign and Defense Policy Analyst
Niskanen Center

Ryan Alexander, President
Taxpayers for Common Sense

David Williams, President
Taxpayers Protection Alliance



House Appropriations Committee
 Subcommittee on Energy and Water Development
 Regarding Fuel Cell Programs at the Department of Energy

Outside Testimony for Fiscal Year 2016 Appropriations from Morry Markowitz, Executive
 Director of the Fuel Cell and Hydrogen Energy Association

Chairman Simpson Ranking Member Kaptur:

On behalf of the members of the Fuel Cell and Hydrogen Energy Association, I am writing to urge strong support for programmatic funding for fuel cell and hydrogen energy programs managed by the Department of Energy (DOE) for Fiscal Year 2016 contained in the Energy and Water Appropriations bill. In total, we are requesting **\$125 million for the fuel cell and hydrogen energy programs managed by the Office of Energy Efficiency and Renewable Energy (EERE); and \$50 million for Solid Oxide Fuel Cells (SOFC) under the Advanced Energy Systems program within the Office of Fossil Energy (FE).**

As we outline in this testimony, all categories of our industry continue to enjoy positive momentum, however, we are at a critical time where our ultimate, long-term success depends on the continued partnership we have with the Department of Energy.

Our industry request (below) maintains a research and development core, while placing greater emphasis on early market activities that fall under the auspices of the Market Transformation subprogram. Overall, we feel that the request recognizes the advancements that have been made, and the work that must continue.

The Market Transformation program, managed by EERE's Fuel Cell Technology Office (FCTO), has been successful in overcoming market obstacles for fuel cell-powered material handling equipment and backup power systems.

Specifically, we ask Congress to provide funds and direction to the Department to support cost-shared deployments and advanced demonstrations of fuel-cell powered ground-support equipment at aviation and maritime ports and the associated hydrogen infrastructure, as well as hybrid-vehicle range extenders. The Department should also examine hydrogen storage projects to support base load renewable energy projects, as well as microgrid deployments to improve resiliency. Finally, the Department should provide formula grants that leverage state efforts to develop hydrogen infrastructure to support fuel cell electric vehicles (FCEVs).

Within the Department's Office of Fossil Energy, the SOFC program has the potential to increase the efficiency of clean coal power generation systems and create new opportunities for the efficient use of natural gas.

The program is a competitively bid, successful collaboration between the DOE, private industry,

universities, and national labs. It is on track to develop low-cost, modular, fuel-flexible and clean SOFC technology for a variety of power generation applications, and to provide a commercially viable pathway for next generation central power systems with Carbon Capture and Sequestration (CCS). The funding preserves U.S. leadership in SOFC technology. We ask Congress to continue to support a focused R&D program as well as advanced demonstration and deployment activities that validate commercial viability.

Fuel Cell Technology

Fuel cells are a unique set of clean, efficient, and resilient energy technologies for stationary power generation, backup power, material handling equipment, and motor vehicles. Fuel cells generate electricity electrochemically, and therefore are more efficient than traditional power-generation technologies.

The DOE programs that have helped reduce cost, improve durability and performance, and prepare products for the marketplace.

As the committee considers this program within the Energy and Water Appropriations bill, we would note that the programs managed by DOE continue to complement the significant private sector investments in fuel cells and hydrogen.

Continued Progress

Our industry proudly recognizes numerous market studies outlining how fuel cells are competing against traditional stationary, portable, automotive, and material handling applications.

For example, the largest stationary fuel cell project in the country was placed in service by a major utility last year. This news was followed by a series of high-profile announcements by Fortune 500 companies choosing fuel cells for their power needs, both for the positive environmental impact, and because they make a real difference on a company's bottom line.

Companies like Apple, Google, eBay, Walmart, Microsoft, Verizon, Sprint, Staples, FedEx, AT&T, Sprint, Sysco, Whole Foods, and many others have all adopted fuel cells to provide reliable, clean, and efficient power for their datacenters, telecommunications networks, buildings, and warehouses.

Warehouses and other logistic-based businesses continue to acquire fuel cell forklifts and material handling equipment to replace traditional platforms. The transition has helped businesses streamline operations, improve productivity, and make better use of warehouse space.

Automobile companies including Toyota, Hyundai, Honda, General Motors Daimler, Nissan, and BMW have invested billions of dollars in fuel cell technology, resulting in a new generation of electric vehicles that completely replicate the driving experience of today's vehicle technology. By 2016 three automobile manufacturers will offer FCEVs for sale in U.S. showrooms.

Our industry is an active participant in H₂USA, a public-private collaboration which aims to bring FCEVs to market more quickly by developing hydrogen infrastructure in the United States. This collaboration comes on the heels of an eight-state Memorandum of Understanding committed to facilitating the deployment of 3.3 million Zero Emission Vehicles (ZEV), including FCEVs, on the road by 2025. California has led this effort by dedicating \$200 million to building a network of at least 100 hydrogen refueling stations by 2024.

Efficient Use of Domestic Fuels - Power Generation

Power generation from natural gas represents an increasing share of our energy mix, and fuel cells have the ability to use these resources more effectively. According to the Energy Information Administration and the Pacific Northwest National Lab (PNNL), fuel cells outperform other technologies in key areas such as electrical efficiency. Continued support of the technologies managed by the Office of Fossil Energy will not only allow us to improve the efficiency of our power generation, but will have the added benefit of providing export opportunities for generation equipment as well as CCS technologies.

Efficient Use of Domestic Fuels - Transportation

Fuel cell electric vehicles are zero-emission vehicles with water vapor as the only tailpipe emission. FCEVs are two to three times as efficient as a traditional internal combustion vehicle which results in dramatically reduced emissions on a well-to-wheels basis. For example, FCEVs using hydrogen generated from natural gas via steam methane reformation to reduce CO₂ emissions by more than 60 percent compared to gasoline powered vehicles.

Hydrogen generated from renewable resources is also an extremely promising option that can also have a significant impact on CO₂ emissions. When processing biogas generated from wastewater or landfills, hydrogen is being delivered at very competitive prices, and in some cases producing negative GHG emissions.

The state of California is committed to prepare the market for ZEVs, including FCEVs, with strategies and funding commitments in place to bring 1.5 million vehicles to the state by 2025. Currently, ten public fueling stations are now operating, with plans for at least 100 stations.

Seven other states, including Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island, and Vermont, have signed a memorandum of understanding to bring 3.3 million ZEVs on the road by 2025.

Improved Resiliency and Reliability

Utilities are deploying multi-megawatt fuel cell systems at substations to decrease the load on the grid through distributed generation, while telecommunications companies are adopting fuel cells for primary and backup power for cellular towers and data centers.

Fuel cells offer an efficient, independent and extremely reliable power source for critical infrastructure that can easily be installed, maintained and shielded against disruption. Since many of these systems are directly connected to natural gas infrastructure, they are protected from disruptions that plague grid-provided power. Additionally, the lack of moving parts and durability give fuel cell stacks the long term lifespan and ease of maintenance essential to reliable back-up power, exhibiting upwards of 99.99% reliability.

Conclusion

Our industry appreciates the support this committee has shown for these technologies over the years. We also note that fuel cells and hydrogen are a key component of an 'all of the above' strategy, which recognizes the complexity of energy markets and diversity of our national resources. We look forward to continuing our conversation with you and your colleagues as our industry introduces cleaner, more efficient energy technologies to the market.

Department of Energy

EERE sub-program recommendations

Sub Program	Activity	FY 2015 Industry Recommendations (in thousands)
1. Fuel Cell R&D	Research	\$ 33,000
2. Hydrogen Fuel R&D	Research	\$ 36,000
3. Technology Validation (D)	Deployment	\$ 10,000
4. Safety, Codes & Standards (D)	Deployment	\$ 7,000
5. Systems Analysis (D)	Deployment	\$ 5,000
6. Manufacturing R&D	Research	\$ 7,000
7. Market Transformation (D)	Deployment	\$ 26,000
8. NREL Support (D)	Deployment	\$ 1,000
9. Education		\$ -
10. SBIR/STTR		\$ -
		\$ 125,000

Written testimony from the Executive Committees of the High Energy Physics Users Organizations and the American Physical Society's Division of Particles and Fields to the U.S. House of Representatives Appropriations Committee, Subcommittee on Energy and Water Development in support of the Department of Energy's Office of Science

We urge the House to provide \$788 M in funding for the Department of Energy Office of High Energy Physics (DOE-OHEP) within the DOE Office of Science. That funding level is \$22M above the FY2015 enacted appropriation, and consistent with the Administration's request. High energy physics research is a key part of the DOE Office of Science, and yields valuable benefits to our nation as described below. We are the Executive Committees of the Users Organization of the Fermi National Accelerator Laboratory¹ (Fermilab), located outside of Chicago, Illinois, the US LHC Users Association², the SLAC National Accelerator Laboratory³ in Palo Alto, CA and the American Physical Society's Division of Particles and Fields⁴. We represent the over 3,500 scientists who perform research at Fermilab, the US' premier particle-physics laboratory, at the Large Hadron Collider (LHC) at CERN in Geneva Switzerland, at the SLAC National Accelerator Laboratory, on cosmic and astrophysical experiments located around the world, as well as the theoretical physicists who develop the underlying ideas. Also known as high energy physics (HEP), our field is the study of the particles that are the building blocks of the universe, and how they come together to create the cosmos and influence its evolution. Much of the technology we have invented to facilitate these studies, such as the World Wide Web, have proved to be extremely beneficial to our society as a whole.

The U.S. Department of Energy (DOE) Office of Science and the National Science Foundation support high energy physics research at U.S. national laboratories and universities. **More than 190 U.S. institutions in 45 states host physicists, astrophysicists, engineers, students and accelerator scientists who work in high energy physics.** More than half of these institutions are funded through the DOE Office of Science. We urge the Committee to provide \$788 M for the DOE Office of High Energy Physics for FY2016.

Our field is international by its nature, since no single nation can afford to carry out the full fundamental physics research program. We are working with our international partners toward a worldwide program, where complementary, unique world-leading facilities will exist in the United States, in Europe and in Asia.

To develop a US HEP Community-wide vision of our future, the US HEP community went through a thorough self study over the past three years. The first step laid out all of the

¹ **The Fermilab Users Executive Committee:** Sandra Biedron (Colorado SU), Tulika Bose (Boston U) Fernanda G. Garcia (Fermilab), André de Gouvêa (Northwestern U), Fabio Happacher (INFN Frascati, Italy), Bill Lee (Fermilab), Bill Louis (Chair, LANL), Vivian O'Dell (Fermilab), Jesus Orđuna (Brown U), B. Lee Roberts (Boston U), Marcelle Soares-Santos (Fermilab), Linda Spentzor (IIT), Thomas Strauss (U Bern, Switzerland).

² **US LHC Users Executive Committee:** Kevin Black (Boston U), Sridhara Dasu (U Wisconsin), John Harris (Yale U), Harvey Newman (Chair, Caltech), Philip Michael Tuts (Vice Chair, Columbia U), Gordon Watts (U Washington), Darin Acosta (U. Florida), Jahred Adelman (U. Chicago), Toyoko Orimoto (Northeastern U), Usha Mallik (U Iowa), Sheldon Stone (Syracuse U), Julia Thom (Cornell U).

³ **SLAC Users Executive Committee:** Sunil Golwala (Caltech), Anna Goussiou (U Washington), Lisa Kaufman (Indiana U), Mike Kelsey (SLAC), Maria Elena Monzani (SLAC), Patric Muggli (MPI), Homer Neal (SLAC), Nicola Omodei (Stanford U), Michael Peskin (SLAC), Ian Shipsey (Purdue U), Michael Sokoloff (U Cincinnati)

⁴ **DPF Executive Committee:** Nicholas Hadley (U. Maryland), Joanne Hewett (SLAC) Marcela Carena (Fermilab), Ian Shipsey (Oxford), Philip Michael Tuts (Columbia U.), Howard Haber (UC Santa Cruz), Robert Bernstein (Fermilab), Sally Seidel (U, New Mexico), Robin Erbacher (UC Davis), Laura Reina (Florida State U), Mirjam Cvetič (U Penn), Karsten Heeger (Yale U).

opportunities for discovery that the field *could* pursue. This was followed by the formation of the Particle Physics Project Prioritization Panel (P5) that was charged with setting priorities for support, assuming realistic budget scenarios provided by the DOE-OHEP. The report presented clear priorities for what *should* be funded, and it was strongly supported by the HEP community. A letter of support for the P5 plan from the US HEP community to DOE Secretary Ernest J. Moniz and NSF Director France A. Córdova garnered over 2,300 signatures in less than two weeks, demonstrating an unprecedented support for this long-range plan for our field.

This self study and the P5 report were essential since US HEP has been in transition for almost a decade. First came the closure of the SLAC B-factory in 2008 after nine successful years, followed by the closing of the Fermilab Tevatron in 2011 after 30 years, where the top quark was discovered and hints of the Higgs boson were found. Fermilab is now the sole HEP accelerator laboratory in the US. It is quickly becoming the center for discovery experiments using the most intense muon beams in the world, as well as a rich program in neutrino physics. The muon program facilities are now under construction at Fermilab. An international collaboration is being formed to study neutrinos using an intense neutrino beam created at Fermilab and directed toward an enhanced facility at the Sanford Underground Research Facility in South Dakota. Significant resources are expected to come from our international partners for neutrino detectors. This transition comes at a critical time for our field in the US, and requires sustained funding to maintain the United States' strong leadership role in world HEP program.

US physicists played important leadership roles in the construction of the Large Hadron Collider in Geneva Switzerland, and in the construction and execution of the experiments that provided the definitive discovery of the Higgs boson in 2012, and the Nobel Prize for the theoretical underpinnings of the discovery. Our leadership in the upgraded program that begins later this year, and will extend over the next 20 years, is a top priority in the P5 report.

The Office of High Energy Physics has also been tasked with the stewardship of the continued development of particle accelerator science. While particle accelerators were invented by particle physicists, today there are more than 30,000 particle accelerators throughout the world, with only a handful dedicated to high energy physics. Computers, cell phones, car engine wiring, shrink-wrap plastic, cancer treatment and the production of medical isotopes for diagnosis all depend on this key technology sector. Beams from a specialized electron accelerator can be used to sterilize medical materials or foods. The beam of electrons eliminates dangerous microbes without damaging equipment or packaging, without the use of harmful chemicals, making a more efficient, more environmentally-friendly method of sterilization. The tire industry now uses particle accelerators to treat their tires, reducing both the amount of rubber needed (by three pounds per tire) and the amounts of chemicals used in the production process.

After its HEP program was closed, the SLAC accelerator facility has been transformed into LCLS-I, a powerful x-ray free-electron-laser light source that enables new studies such as those in structural biology and material science. This transition provides an excellent example of the importance of accelerator science to our society, whose stewardship resides in DOE-OHEP. Advancements in structural biology at light sources can lead to new pharmaceuticals.

This is a perfect example of the broader importance of HEP-developed accelerator technology as an important new tool for the Basic Energy Sciences community in the DOE Office of Science. In fact, LCLS-I is so much in demand by its applied-science user community that a new, even more capable version, LCLS-II is under construction at SLAC. This much more powerful facility will employ superconducting radio frequency technology developed by the HEP community for the next generation of large electron positron-colliders, thus demonstrating

how society as a whole benefits directly from the development of new accelerator techniques that push the state-of-the-art in accelerator design.

The quest to understand the composition of our universe, especially the dark matter that modifies the motion of stars in galaxies and the dark energy that appears to be driving the expansion of the universe, is also part of our field. Three important experiments with significant participation from high energy physicists are the Dark Energy Survey, using the Dark Energy Camera built at Fermilab, the Large Synoptic Survey Telescope whose camera is being built at SLAC, and the Large Area Telescope on the Fermi Gamma Ray Space Telescope spacecraft, which was funded by the DOE, NASA and foreign partners. High energy experimenters are also searching for evidence of dark matter particles in several underground laboratories, where the detectors are shielded from cosmic radiation by their depth in the earth. They will continue the hunt for dark-matter particles at the higher energy soon to be available at the LHC. These fundamental questions capture the imagination of young people and the general public.

Value of High Energy Physics Research

In our modern economy, science and technology (S&T) drive growth, as detailed in the 2010 National Academies' report, *Rising Above the Gathering Storm Revisited*, the recent book, *Knowledge and the Wealth of Nations*; and many other publications. Continued leadership in S&T fields is critical to our nation's economic growth, national security, scientific and overall position in the world community. Innovation by a highly trained workforce is the key.

Technological developments within the U.S. will drive our economy so we can maintain our international leadership. Revolutionary technologies require revolutions in our fundamental knowledge and understanding, and are invented in the course of research activities of our most talented minds in pursuit of testing, measuring, and understanding new ideas and concepts. No one could have predicted the nature of our present society from the first studies of electrons at the dawn of the 20th century; however, without these pioneering studies we would not be communicating via email, fax, cellphone, or text messages today. Revolutionary technologies arise from new ways of thinking about society's problems—often derived from experiments that ask new questions that cannot be answered using existing technology.

High energy physics strives to understand the most fundamental aspects of nature. While we can rarely predict the outcome, the quest for knowledge has *always* led to numerous technological advances, a few of which are described below. What *is* predictable is that our continuing quest will educate and train some of the best and brightest students, who will contribute to our nation in many different arenas.

Value of Technology Development

Our high energy physics discovery science demands the development of new technologies to accomplish our goals. The World-Wide-Web, first developed by high energy physicists, now underpins commerce, social media, and the communication tools that we rely on today. Our researchers spend a significant part of their careers advancing high-tech particle detectors, developing complex computing algorithms and processing one of the largest volumes of Big Data on the grid, or pushing the limits of high-speed electronics. Once these advances are made, they are adopted in fields as diverse as medicine, materials research, and manufacturing.

The camera built for the Dark Energy Survey, led by Fermilab physicists, and that being built for the Large Synoptic Survey Telescope, led by SLAC physicists, are pushing the limits of today's technology. These technological developments will ultimately influence the digital cameras available at your local electronics store as well as devices no one has yet dreamed up. An ongoing R&D effort by a university/national laboratory collaboration is inventing new, cost-

effective particle detectors with the unique power to resolve events on trillionth-of-a-second time-scale. These will also doubtless lead to new industrial, research, and medical applications

Value of Science Education

The US has long been the destination of choice for the best science students from around the world. Our universities provide an education that is second to none. Our National Laboratories provide unique research opportunities. Fermilab is an excellent example of this. Numerous students from foreign institutions travel here to complete their Ph.D. thesis research. Many of them choose to stay in the U.S. afterwards, working in a range of fields. **Over 90% of the young scientists who were trained in our high energy physics experiments now work in telecommunications, software development, aerospace, education, medicine, government, and finance, to name a few.** Having been trained to work effectively in large teams (20 to 3000 scientists) that are international in composition, with strongly developed technical skills in computing, electronics, data management and analysis, along with computer simulation of complex problems, they become valuable members in our technical, medical, and financial sectors. They learn leadership skills, how to take a project from start to finish, how to write a document detailing their work and present it to an audience. The complex analytical thinking necessary to solve problems in fundamental science cannot be taught in a classroom, but is nonetheless crucial for solving problems in business and industry in the 21st century.

Private businesses are the largest and most diverse employers of scientists trained in high energy physics. Several former HEP researchers have founded or led small and large companies. These include Bill Graves, the first CEO of CISCO systems, a pioneer in computer networking and one of the Global Top 100 companies based on capitalization; Richard Wellner, chief scientist at Univa UD, a cloud management software company; Francisco Vaca, CEO of Vaca Capital Management LLC; George Coutrakon, now Technical Director of the Northern Illinois Proton Treatment and Research Center; Homaira Akbair, former CEO of SkyBitz, a satellite-based tracking company; and Nagesh Kulkarni, CEO of Quarkonics Applied Research Corp., a business and technology consulting company.

Our researchers are engaged in education at all levels and understand the importance of scientific literacy in our society. For example, hundreds of public lectures are given around the country by high energy physicists each year. Our scientists visit local schools to share the excitement of science through physics demonstrations or presentations of their work. More than 38,000 students attend Fermilab education activities each year.

Summary

Scientific research in general, and high energy physics in particular, provides value to our nation. It will be lost without sustained funding from the U.S. government. The knowledge gained doing this research will lead to future innovation that will maintain our world-class scientific capabilities. The path to that knowledge will lead to advances in technology and help sustain our economic recovery. The education of students from the U.S. and abroad will provide the knowledgeable workforce that will carry us through the next half-century.

It is critically important to maintain our world-class position in scientific research. High Energy Physics has played a central role in training scientists, and in developing instruments and technology that have significantly benefitted society as a whole. Our field has put in place an exciting long-range plan that guarantees world-leading science in the US focused on muons and neutrinos, and continued leadership the important experiments at the energy frontier at the LHC. We urge the House Appropriations Subcommittee on Energy and Water Development to support the DOE Office of Science's Office of High Energy Physics at the \$788 M level in FY2016.



Home
Performance
Coalition

Steven Cowell, Chair
Brian Castelli, President & CEO
Home Performance Coalition

House Appropriations Committee
Subcommittee on Energy and Water Development

Fiscal Year 2016 Department of Energy Funding for
Residential Energy Efficiency Programs

April 6, 2015

As a leader in the performance industry, the Home Performance Coalition urges your support for funding to advance programs at the Department of Energy that invest in residential energy efficiency and whole-house initiatives, as outlined in this testimony, in the Fiscal Year (FY) 2016 Energy and Water Development Appropriations bill. On behalf of our stakeholders, thank you for this opportunity to express our support for these important programs and initiatives.

The Home Performance Coalition is a national non-profit 501c3 organization that works with governmental agencies, utilities, state programs, contractors, and other stakeholders to strengthen and advance the whole-home energy efficiency upgrades through standards development, stakeholder engagement, policy analysis, research, and education.

The Home Performance Coalition offers its strong support for whole-home residential efficiency programs and initiatives. By looking at a home as a system, customers make better energy choices. For example, installing a high-efficiency HVAC unit in a home without adequate insulation in its attic will result in the home owner receiving much less heating and cooling savings, nor the comfort expected. Home performance contractors and professionals help home owners make smart energy decisions by making home assessments, recommendations, and improvements based on building science and the whole-home structure. Yet, as building science has developed, so has the home performance industry which is still on the cutting edge as it strives to serve and educate homeowners around the country about the ways and means for reducing their energy use. Public programs that support this industry are vital as it continues to develop and serve the American consumer.

The following programs at the Department of Energy, in the Energy Efficiency and Renewable Energy Office and Office of Weatherization & Intergovernmental Assistance, deserve the support of the American taxpayer as these programs, by supporting an American-based industry and American jobs that will strengthen the economy, the electric grid, and our national security; will provide a significant return on their investment.

\$48M for Residential Building Integration, with the focus on accelerating the development and adoption of advanced building energy technologies and practices in new and existing homes. The Residential Building Integration program has the capacity to fundamentally transform homebuilding and renovation in this country. However, we recommend that the funding be

focused on research, development and the widespread deployment of whole-house energy efficiency through their partnerships with builders, the construction trades, equipment, smart grid technology and systems suppliers, integrators and state and local governments. We encourage the direct engagement with builders, contractors, and business, which are crucial to the success of buildings programs. To that end we strongly support the increased funding for the expanded residential building energy efficiency retrofit program supporting all residential building types and income levels. The increased funding to DOE will allow for the residential buildings program to work with national organizations and companies specializing in home performance and/or weatherization to generate policy recommendations leading to the development of a new residential energy efficiency retrofit program to support increased energy efficiency in all residential buildings and income levels.

\$100 M Energy Productivity Innovation Challenge. In the President's Budget Request for the Department of Energy last year (Race to the Top for Energy - FY 2015) this program would provide for awards to support state governments that implement innovative and effective policies such as those that would advance residential energy efficiency upgrades. A September 2013 study by ACEEE on a similar proposal notes that the program could result in estimated net savings of \$11.8 billion and cut energy by 1.30 Quads and carbon dioxide emissions by 71.25 MMT by 2030. These results are a great investment for the American taxpayer, returning \$8.40 in energy savings for every \$1 invested. We believe funding for this initiative should be placed in addition (plus up) in the Energy Efficiency and Renewable Energy accounts.

\$70 M for State Energy Program. We urge the Committee to provide funding at the level of \$70 million for the State Energy Program, which allows states to assist with the development of energy efficiency and renewable energy projects, and support funding a state competitive grant programs with monetary awards to states to use to improve their energy productivity programs.

\$230 M for Weatherization Assistance Program. We ask the Committee to return funding to historical levels for the Weatherization Assistance Program, which helps low-income families, seniors, and individuals with disabilities make lasting energy efficiency improvements to their homes. Moreover, Weatherization has a proven track record of creating new jobs and contributing to the economy through the program's large supply chain of vendors, suppliers, and manufacturers.

The Home Performance Coalition believes that energy efficiency is vital to our economic growth and international competitiveness. Again, thank you for providing this opportunity to submit testimony. We would also appreciate the opportunity to brief you or your staff on these important programs and initiatives and the successful energy savings we anticipate they will achieve. We look forward to working with you.

Contact Information

Kara Saul Rinaldi
 Vice President, Policy and Government Affairs, Home Performance Coalition
 717 Kennebec Ave, Takoma Park MD 20912
 Phone: (202) 276.1773, Fax: (202)747-7725
 Ksaul-rinaldi@homeperformance.org

STATEMENT OF MARK TILLY
PARTNER AND CHIEF EXECUTIVE OFFICER
IBACOS
SUBMITTED TO THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
HOUSE COMMITTEE ON APPROPRIATIONS
MARCH 30, 2015

IBACOS (Integrated Building And Construction Solutions) urges the Subcommittee on Energy and Water Development to provide \$26 million for Building America in the Residential Buildings Integration Subprogram in Buildings Technologies in the Office of Energy Efficiency and Renewable Energy at the Department of Energy.

DOE's Building America Program: Leading the Way to 50% Energy Savings and Beyond

Residential buildings currently consume approximately 22% of the primary energy in the U.S. Of the over 134 million housing units in the US, more than 17 million were built between 2000 and 2011. The Department of Energy's (DOE) Building America Program has a proven industry-driven research approach that can reach the DOE's long term goal of 50% energy savings in new and existing houses by 2030 and near-term goal to deploy zero net energy ready homes with industry partners. Appropriate research investments in systems integration and evaluation are necessary to upgrade the performance of our housing stock and achieve these goals. Significant benefits to homeowners include reduced utility bills and improved comfort, and to the U.S. economy by maintaining housing as a major source of technological innovation, jobs and economic growth.

While one key DOE strategy is to "Deploy the Technologies We Have," the Pacific Northwest National Laboratory has stated, *"It is not clear that 50% improvement [to the 2006 energy code] can be achieved prescriptively."* The competitively-selected industry Teams in the Building America Program continue to be *the* key element to solve the challenges associated with reducing energy consumption in new and existing residential buildings through whole building systems integration. Each team is comprised of a wide cross-section of industry stakeholders, including builders, energy upgrade contractors, utilities, designers, engineers, building scientists, manufacturers, and suppliers. The unique nature of the Teams enable the development of advanced energy saving strategies that can be implemented by builders and energy upgrade contractors on a production basis, while meeting consumer safety, comfort, and cost requirements and other essential building performance criteria.

Achieving 50% Savings in New and Existing Residential Buildings

The next level of energy savings cannot be cost effectively achieved by simply adding "more" of the individual technologies that we already know will work. The Building America Teams are charged with finding energy savings in ways that do not put builders and homeowners at greater risk of building durability problems, while maintaining occupant health, safety and comfort. Finally, these solutions must be cost effective for the builder and ultimately for the consumer. The work the Teams undertake is analogous to the work manufacturers perform to join individual components into working systems and unite those systems into a finished, functional product. For example, carmakers have to integrate how a brake system and engine in a hybrid car charges the battery to enhance fuel efficiency, while providing good handling and keeping the passengers safe. In the same way, a builder integrates framing, insulation, window, and heating and cooling components into a balanced whole-house system that maximizes energy efficiency, improves comfort and enhances durability while providing a safe home for

the occupants. Whereas manufacturers, however, typically invest significant R&D expense into developing and testing new products, the building industry shies away from investigating new technologies and construction strategies because the perceived payoff does not outweigh the real cost of “failure” for the following reasons:

- The housing market is highly fragmented with close to 500,000 contractors and builders; typical industry has less than 10,000 actors.
- The housing industry has little ability to drive common research in new or existing homes. In fact, industry spends less than 0.4% on R&D which is significantly lower than other industries.
- Builders and energy upgrade contractors do not readily change what they have done for fear of a lawsuit, and need proven and risk-free systems-integrated solutions they can implement with confidence.

The research done by the Building America Teams also has great benefits:

- Successful strategies that are widely adopted can create jobs and help further economic growth, while lowering costs for homeowners.
- Successful systems integration research that simultaneously looks at new construction and retrofit can accelerate the adoption and more rapidly grow the market for perceived “high risk” emerging technologies.
- Houses that properly use systems integration strategies can be more resilient.

Builders need the systems-integrated, whole-house performance solutions the Building America Teams provide in order for any future energy code to be developed, be adopted by jurisdictions, and implemented by builders. At the same time, the Teams work to transfer whole house solutions to the retrofit market to significantly improve the performance of existing homes. Building America provides the systems-integrated strategies for new construction programs such as DOE’s Zero Energy Ready Home and EPA’s ENERGY STAR, and technical approaches for energy upgrade programs such as Home Performance with Energy Star and the DOE Weatherization Assistance Program.

Technical Research vs. Market Priming

The DOE’s Quadrennial Technology Review states:

“The Department undertakes three types of activities related to building efficiency: codes and standards, R&D, and market priming (listed in order of decreasing impact and leverage). Codes, standards, and market-priming activities are primarily directed at reducing non-technological barriers to increased energy productivity, while R&D addresses technological challenges.”

Building America is a key residential systems integration research program, and should not be confused with other programs designed to overcome market barriers. An ancillary benefit of the industry partnerships developed through Building America Team research activities, however, is greater acceptance by builders to adopt and utilize the technologies being demonstrated and validated. These “proven” technologies are more readily adopted as standard practice because the perceived risk to partner builders and contractors is significantly reduced.

Program Status

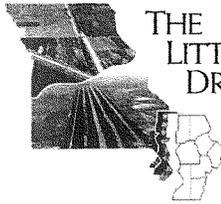
As one of the most effective programs that engage industry stakeholders to further DOE’s goals, it is critical to increase the level of funding to Teams in FY16. Teams are undertaking a wide range of research activities across a spectrum of technologies related to building enclosures, mechanical systems, and ventilation and indoor air quality in new and existing buildings, and are working closely with industry partners to integrate these technologies at the whole house and community scale. While

potentially up to 30% of the nation's builders and energy upgrade contractors could reasonably achieve a 30% energy saving target, it is estimated that less than 1% can achieve the 50% savings goal and beyond to zero net energy ready homes. To develop solution sets to help the industry move forward to the 50% level and beyond, all areas of energy use in the house must be addressed. Greater understanding of building sub-system and component interactions must be achieved and used to develop effective guidance for the new construction builder and all associated trade partners; the energy upgrade contractor; and suppliers and manufacturers. This translates to significantly more effort on the part of each Building America Team lead. More than 40,000 homes have been constructed or retrofitted in over thirty-four states with energy savings up to 50%. Building America has significantly increased the output of valuable guidance to the building industry, which is available through the Building America Solution Center and publications websites. Building America proven innovations often become the justification for energy code changes leading to higher levels of energy efficiency and performance for all new homes and renovations. Continued robust funding is needed to research how residential buildings can contribute to DOE's energy efficiency goals, through Building America research with builders, contractors, suppliers, and other industry stakeholders.

Additionally, funding should be focused with the Industry Teams that can facilitate research, demonstrate and test new systems, and facilitate widespread deployment through their partnerships with builders, the construction trades, equipment and systems suppliers and integrators. Fewer teams, with sufficient funding each, would be a better model than the current one of providing too little funds to many players.

Recommendation for FY16 Funding

\$26 million for Building America, which is level with the President's Budget Request, in the Residential Buildings Integration Subprogram in Buildings Technologies in the Office of Energy Efficiency and Renewable Energy at the Department of Energy



**THE
LITTLE RIVER
DRAINAGE DISTRICT**

FLOOD CONTROL & DRAINAGE
SINCE — 1907

BOARD OF SUPERVISORS

Sam M. Hunter, *DVM*, President
Paul T. Combs, Vice-President
A.C. Riley James
Gaylon M. Lawrence, Jr.
Tim W. Martin

STAFF

Larry D. Dowdy
Executive Vice-President
Secretary/Treasurer
W. Dustin Boatwright
Chief Engineer
Belinda G. Welker
Assistant Treasurer
Stephanie L. Hosey
Assistant Secretary

**Statement of
Dr. Sam M. Hunter, President
The Little River Drainage District
March 19, 2015**

**HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
U.S. Army Corps of Engineers, Civil Works, Mississippi River and Tributaries**

My name is Sam M. Hunter, D.V.M. I am a veterinarian, landowner, and farmer, and I reside in Sikeston, Missouri. I am the President of the Board of Supervisors of The Little River Drainage District, the largest such entity in the nation. Our district serves as a drainage outlet and provides flood control to parts of seven counties in southeast Missouri. We also provide flood protection to a sizable portion of northeast Arkansas. Our district is funded solely by the annual assessment of benefits of more than 3,500 landowners. Today, I would like to discuss funding for the U.S. Army Corps of Engineers, more specifically the Mississippi River and Tributaries (MR&T) which is a line item in the Civil Works budget.

First, let me thank the Congress for the support and funding you have provided in the past. This funding proves your awareness of the importance of flood control projects throughout the Mississippi River Valley and the value it provides this great Nation.

The Mississippi River and Tributaries Project was authorized following a record flood in 1927 that inundated more than 26,000 square miles of the Mississippi River Valley. Over 700,000 people were left homeless and many lives were lost. Most, if not all, East-West commerce was stopped and it adversely affected the economy and the environment of our great nation. After that devastating event Congress in its infinite wisdom passed a bill and established the Mississippi River and Tributaries Project and authorized the U.S. Army Corps of Engineers to develop a plan to prevent such a disaster in the future. This project currently is a separate line item in the budget. To remove it will destroy the continuity of this high value, high return, and much needed national investment.

To date the MR&T Project has prevented flood damages and provided other benefits resulting in a current benefit/cost ratio of over \$46 to \$1. Truly this is a wise investment for our nation. Likewise, countless lives have been spared due to the construction of this great system. Also, our nation receives three billion dollars of transportation rates savings each year largely due to the current reliability of a navigation channel afforded by the MR&T System. It is readily seen this project had merit from the beginning and continues to reward the citizens not only of the valley itself but the citizens of the entire nation. It is a wise investment for this country and it is good for our economy. It will be a vital link to the defense of our nation in the event of an attack by our enemies. This project must be targeted for swift completion and proper maintenance. What an example of federal and local partnership and investment for our great

E.B. Gee, Jr., Honorary Supervisor
Ocala, FL

Glenn O. Petersen, Honorary Supervisor
Wardell, MO

nation this project has been and continues to be! I challenge you to find any other project of any nature which approaches the benefits of this system.

The performance of the comprehensive Mississippi River and Tributaries system and the Ohio Valley reservoir system during the 2011 flood on the lower Mississippi River validates the wise investment the nation made to prevent another calamitous natural disaster like the 1927 flood, the devastating event that changed America and forcibly unified its people to support protection of lives and property from the fury of the river. The MR&T system performed as designed, despite rainfall exceeding 600 to 1,000 percent of the normal average rainfall in a two-week period from April 21-May 3 over a significant portion of six states that coincided with the arrival of the upper Mississippi spring snowmelt crest. The significant flood event established many new record discharges and stages along the lower Ohio and Mississippi rivers. Unlike the 2011 flood, the Mississippi River during the benchmark and calamitous Great Flood of 1927 inundated most of the alluvial valley. Like the toppling of a series of dominoes, one overmatched levee after another burst under the unprecedented pressure exerted by the swollen river from excessive rainfall.

At a time when we need to stimulate our economy, at a time that safety from terrorist activities needs to be enhanced and at a time that many in our nation are concerned about cleaner air, cleaner water, etc., we have a great opportunity to meet those needs. We must make sound investments into our infrastructure which will give back more monies to the taxpayers of this country than was invested while at the same time increasing our defense capabilities should our nation be attacked from an outside force (the system provides an inner coast unexposed to arrival by sea).

Local interests have done their part in providing rights of way, roads, utilities and the like. Our government now needs to fulfill the federal obligation and "infrastructure investment" part of the system and bring it to completion as quickly as possible.

We believe the Corps could effectively deliver \$500 million each year (as a start) for maintenance and construction within the MR&T. We realize there are budgetary restraints this year and respectively request Congress to approve funding for maintenance and construction for the MR&T. The MR&T improvements I have talked about thus far have been the benefits for flood control. However, these benefits were also realized during the low flow event experienced on the Mississippi River. The hydraulic improvements that allowed a record flood event to pass at a 0.8 foot lower elevation in 2011 than in 1937, also allow barge traffic and a near record low event experienced in 2012-2013. If it were not for the MR&T system improvements barge traffic during the low water event would have been nonexistent.

We also thank you again for the understanding of our needs and the importance of the MR&T system by not allowing FEMA to charge mandatory flood insurance as defined below:

SEC. 107. MANDATORY COVERAGE AREAS.

(a) Special Flood Hazard Areas- Not later than 90 days after the date of enactment of this Act, the Director shall issue final regulations establishing a revised definition of areas of special

flood hazards for purposes of the National Flood Insurance Program.
 (b) Residual Risk Areas- The regulations required by subsection

(a) shall-- (2) require the expansion of areas of special flood hazards to include areas of residual risk, including areas that are located behind levees, dams, and other man-made structures.

(c) Mandatory Participation in National Flood Insurance Program-

(2) LIMITATION- The mandatory purchase requirement under paragraph (1) shall have no force or effect until the mapping of all residual risk areas in the United States that the Director determines essential in order to administer the National Flood Insurance Program, as required under section 19, are in the maintenance phase.

Thank you for understanding the tremendous negative impact this piece of legislation would have had on the entire Mississippi River Valley. Billions of dollars already spent on flood control structures would be negated because of needless MANDATORY flood insurance premiums. Please remember the 1928 flood control act recognizes the investment of the local people by initial construction and taxation of themselves for maintenance. This investment was over 200 million dollars in 1928 and totals more than 14 billion dollars today. Making the total federal and local investment in the MR&T system over 30 billion dollars. Because of this, it is still necessary to discuss the new policies being implemented by the Federal Emergency Management Agency in their Map Modernization Program.

The policy creates a New Zone "X" (shaded) designated area. This new designation shows all areas behind a levee as an unsafe place to live and recommends, among other things, an evacuation plan and flood insurance.

This designation renders all work done by local and federal organizations for the last 100 years, useless. Even if our levees are Federal Levees, have obtained the highest achievable maintenance rating and the passing of a record flood in 2011 this Zone "X" (shaded) designation will be placed on all new flood maps. Furthermore, the recommendations from the National Levee Safety Committee, if used, force unachievable maintenance standards and predatory flood plain management tactics. This will needlessly destroy economic development for over 22,000,000 acres of land in this country. Please do not use a "one size fits all" approach and place false fear in the minds of people living behind levees. We can inform without fear! These flood insurance premiums, because of the support of Congress, the hard work of the U.S. Army Corps of Engineers and local levee and drainage districts across this country, are not necessary but do create a nice funding mechanism for future disasters.

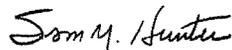
The Mississippi Valley Flood Control Association also asks the Congress to support the Upper Mississippi River Comprehensive Plan (UMRCP). The impact of the flood of 1993 on the Upper Mississippi was devastating leaving \$15 Billion in damages, loss of life and damage to 72,000 homes. In 2008 the Upper Mississippi was again ravaged by catastrophic flooding and again in 2011 flooding costs top \$360 Million in infrastructure damage. The Upper Mississippi River Comprehensive Plan's system approach and the Mississippi River and Tributaries Project needs to be properly funded for protection of the entire Mississippi River Valley.

The Mississippi Valley Flood Control Association also asks the Congress to support the Authorization and Appropriations for the dredging of MR&T and Non-MR&T Ports and Harbors. Flood Control and Navigation interests go hand in hand and you cannot have Flood Control without Navigation.

With the tragedy that struck the Gulf Coast and East Coast, we must now turn our attention to the future and attempt to make certain that at least the flooding does not take place again. We can prevent that; the Dutch, the English and the Italians have done it and so can we if we treat flood control as something that we must do. The citizens of this great nation deserve it and a productive economy must have the reliability for production and exports.

There are four anomalies of nature that cause death and destruction to our nation. They are (1) earthquakes, (2) hurricanes, (3) tornadoes and (4) floods. The first three we can do very little if anything about except to prepare for the worst. We can build protection against floods, against the "maximum probable flood", one that has an "improbable occurrence but nevertheless a remotely possible one".

In order to provide such protection we believe that four things must be done. First, the environmental laws, or at least the way they are interpreted for flood control projects, must be changed or we stand to lose more lives and have another absolute environmental catastrophe such as the one we have witnessed in New Orleans and along the Gulf Coast. Second, cancel all cost-sharing for flood control projects unless we do intend to only protect those that can afford it and ignore those that cannot. Third, relax the requirements for the benefit to cost ratio for flood control projects for one reason, it is impossible to assign a dollar value to a human life. Fourth, investment in infrastructure throughout the Mississippi River watershed. The United States has the largest inland waterway navigation/commerce system in the world. This water commerce system is positioned in the center of the country and the infrastructure is the envy of the civilized world. This system keeps us competitive in the world market and must be properly maintained and operated. It is our opinion that these things must be done, for without flood control, nothing else really matters. I close with a simple reminder. The MR&T system is not complete and therefore will not pass the Project Design Flood! Thank you for your leadership and the resulting \$100's of billions of dollars in damages averted because you supported and funded the greatest civil works project on the planet ... the MR&T!



Dr. Sam M. Hunter, President
The Little River Drainage District
Cape Girardeau, Missouri

**TESTIMONY OF JEFFREY KIGHTLINGER, GENERAL MANAGER,
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

**BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT,
AND RELATED AGENCIES**

**ON CONTINUED FISCAL YEAR 2016 FUNDING FOR THE
COLORADO RIVER BASIN SALINITY CONTROL PROGRAM,
TITLE II – BASINWIDE PROGRAM**

MARCH 30, 2015

CHAIRMAN SIMPSON, RANKING MEMBER KAPTUR, AND MEMBERS OF THE
SUBCOMMITTEE:

The Metropolitan Water District of Southern California (Metropolitan) encourages the Subcommittee's support for fiscal year 2016 federal funding of \$11.2 million for the U.S. Bureau of Reclamation's Colorado River Basin Salinity Control Program (Salinity Control Program), Title II – Basinwide Program to prevent further degradation of Colorado River water quality and increased economic damages.

The concentrations of salts in the Colorado River cause over \$382 million in damages to water users each year. While this figure is significant, had it not been for the efforts of the Salinity Control Program, salinity concentrations of Colorado River water today would have been about 90 milligrams per liter (mg/L) higher, which has avoided additional damages of approximately \$200 million per year.

Metropolitan is the regional water supplier for most of urban southern California, providing supplemental water to retail agencies that serve over 18 million people. Water imported via the Colorado River Aqueduct has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L since 1976, which leads to economic damages. For example, damages occur from:

- A reduction in the yield of salt sensitive crops and increased water use for leaching in the agricultural sector;
- A reduction in the useful life of galvanized water pipe systems, water heaters, faucets, garbage disposals, clothes washers, and dishwashers, and increased use of bottled water and water softeners in the household sector;
- An increase in the cost of cooling operations, and the cost of water softening, and a decrease in equipment service life in the commercial sector;

- An increase in the use of water and the cost of water treatment, and an increase in sewer fees in the industrial sector;
- A decrease in the life of treatment facilities and pipelines in the utility sector;
- Difficulty in meeting wastewater discharge requirements to comply with National Pollutant Discharge Elimination System permit terms and conditions, and an increase in desalination and brine disposal costs due to accumulation of salts in groundwater basins, and fewer opportunities for recycling due to groundwater quality deterioration; and
- Increased cost of desalination and brine disposal for recycled water in the municipal sector.

Concern over salinity levels in the Colorado River has existed for many years. To deal with the concern, the International Boundary and Water Commission signed Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River in 1973, and the President signed into law the Colorado River Basin Salinity Control Act in 1974 (Act). High total dissolved solids in the Colorado River as it enters Mexico and the concerns of the seven Colorado River Basin states regarding the quality of Colorado River water in the United States drove these initial actions. To foster interstate cooperation and coordinate the Colorado River Basin states' efforts on salinity control, the seven Basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system, and enter the River through both natural and anthropogenic sources.

The Salinity Control Program reduces salinity by preventing salts from dissolving and mixing with the River's flow. Irrigation improvements (sprinklers, gated pipe, lined ditches) and vegetation management reduce the amount of salt transported to the Colorado River. Point sources such as saline springs are also controlled.

The Salinity Control Program, as set forth in the Act, benefits the Upper Colorado River Basin water users through more efficient water management, increased crop production, benefits to local economies through construction contracts, and through environmental enhancements. The Salinity Control Program benefits Lower Basin water users, hundreds of miles downstream from salt sources in the Upper Basin, through reduced salinity concentration of Colorado River water. California's Colorado River water users are presently suffering economic damages in the hundreds of millions of dollars per year due to the River's salinity.

In recent years, funding for the Bureau of Reclamation's Title II – Basinwide Program has dropped to as low as \$6.1 million. In the judgment of the Forum, this amount is inappropriately low. Water quality commitments to downstream United States and Mexican water users must be

honored while the Upper Basin states continue to develop their Colorado River Compact apportioned waters from the Colorado River and its tributaries.

These federal dollars will be augmented by the state cost sharing of 30 percent with an additional 25 percent provided by the agricultural producers with whom the U.S. Department of Agriculture contracts for implementation of salinity control measures. Over the past years, the Salinity Control Program has proven to be a very cost effective approach to help mitigate the impacts of increased salinity in the Colorado River. Adequate federal funding of this important Basin-wide program is essential.

Metropolitan urges the Subcommittee to fund the Bureau of Reclamation's Salinity Control Program, Title II – Basinwide Program for fiscal year 2016 in the amount of \$11.2 million.

OUTSIDE WITNESS TESTIMONY

**House Energy and Water Development Subcommittee on Appropriations
Honorable Mike Simpson, Chairman**

Mni Wiconi Project (PL 100-516, as amended), testimony submitted by
 Oglala Sioux Rural Water Supply System (OSRWSS), Frank Means, Core System
 Director
 Oglala Sioux Rural Water Supply System (OSRWSS), Willard Clifford,
 Distribution System Director
 Rosebud Sioux Rural Water System (RSRWS), Syed Huq, Director
 Lower Brule Sioux Rural Water System (LBSRWS), Jim McCauley, Manager

Agency: Bureau of Reclamation

1. FY 2016 OMR Request

The Mni Wiconi Project respectfully requests \$13.5 million in appropriations for operation, maintenance and replacement (OMR) activities in FY 2016, including \$1.7 million for the Bureau of Reclamation (Reclamation). Report language is also requested (below). There are no requests for construction funding.

OMR funds will be used as summarized in Table 1 the Oglala Sioux Rural Water Supply System (OSRWSS), Rosebud Sioux Rural Water System (RSRWS) and Lower Brule Sioux Rural Water System (LBSRWS).

The OSRWSS Core System is the heart of the Mni Wiconi Project and serves the three Indian Reservations and the West River/Lyman-Jones Rural Water System (WRLJ) in 9 counties off-reservation in southwestern South Dakota.

Public Law 100-516, as amended, our authorizing legislation, found that:

...the United States has a trust responsibility to ensure that adequate and safe water supplies are available to meet the economic, environmental, water supply, and public health needs of the Pine Ridge Indian Reservation, Rosebud Indian Reservation and Lower Brule Indian Reservation...

The request as presented in Table 1 will meet the purposes of the Act, and the appropriation by Congress of adequate funds will fulfill the fiduciary responsibilities of the United States as articulated in the Act.

The project has been treating and delivering more water each year from the OSRWSS Water Treatment Plant near Fort Pierre. The population will continue to grow within the service area and will reach the design population late in the next decade. The OMR budget must be adequate to keep pace with the system and its growing population to protect and preserve the \$470 million investment held by the United States in trust for the Tribes.

The concern with the President's Budget for FY 2016 is the lack of attention to the need for an increasing level of funding. The FY 2013 through FY 2016 budgets were nearly identical at \$12 million annually (\$12.2 million in FY 2013). The FY2016 and budgets since 2012 do not reflect the increase in water deliveries, aging facilities in need of repair and maintenance (since start of construction in 1994), need for existing

community upgrades and other funding drivers. It is critical that project features do not fall into disrepair.

TABLE 1

MNI WICONI PROJECT FY 2016 OMR FUNDING NEED

FY 2016 APPROPRIATIONS REQUEST

Cost Item	OSRWSS		RSRWS	LBSRWS	Reclamation	Total
	Core	Distribution				
Number of Employees	19	33	22	12	8.9	94.9
Labor and Fringe Benefits	\$1,081,187	\$1,534,414	\$1,192,000	\$758,250	\$856,165	\$5,422,016
Labor Overhead Costs	411,283	583,077	294,900	180,000	387,390	1,856,650
Non-Labor Costs						0
Electricity/Natural Gas/Propane	385,000	471,960	240,000	120,000	462,000	1,678,960
Telephone/Communications	30,000	34,182	21,115	35,000		120,297
Water Treatment Chemicals/Supplies	415,000	145,585	55,000	90,000	10,000	715,585
Wells, Pumps, Motors & Replacement	200,000	82,800	90,000	87,500		460,300
Water Testing	100,000	31,050	2,000	10,000		143,050
Vehicle OMR	103,000	353,970	98,000	100,000	27,000	681,970
Water Service Providers	--		230,000			230,000
Travel & Training:	40,000	96,000	17,880	46,600	56,700	257,180
Other	207,100	129,000	112,250	144,400	68,500	661,250
Extraordinary Replacements						
Intake/High Service pump rebuilds	68,580				--	68,580
South Core 1 pump upgrades	71,376				--	71,376
South Core 2 valve upgrades	158,413				--	158,413
Trucks and equipment				200,000		200,000
Priority Community System Upgrades	--		--		--	0
Valve and Tee Replacements, Pine Ridge	--	255,000	--	--	--	255,000
Valve and Hydrant Replacement, Parmalee	--	--	429,000	--	--	429,000
	\$3,270,939	\$3,717,038	\$2,782,145	\$1,771,750	\$1,867,755	\$13,409,627

The West River/Lyman-Jones facilities are the only facilities not held in trust by the United States. Those facilities receive OMR funding through user fees but rely on the OSRWSS for diversion of water from the Missouri River, treatment at the regional plant and delivery through the OSRWSS core pipeline system.

Continued upgrade to community water systems is a critical priority and a prerequisite to transfer of those facilities to the three Indian rural water systems in the Mni Wiconi Project. The following report language is requested (see Senate Report 113-47 of the last Congress for similarity):

Mni Wiconi Project, South Dakota.—Within the funds provided for the operation and maintenance of the project, Reclamation shall use not less than \$700,000 for upgrading existing community water systems that have always been intended as part of the project.

Reclamation has not been willing to use OMR funds for repairs of community systems without specific congressional authorization, direction and specific funding amount. There are no construction funds for the purpose. The budget narrative of Reclamation in earlier budget requests properly included the following:

...The project consists of new systems to be constructed, as well as 40 existing Mni Wiconi community systems. Responsibilities of the Secretary under the Act include the operation and maintenance of existing water systems and appurtenant facilities on the Pine Ridge, Rosebud, and Lower Brule Indian Reservations. (FY 2012-16 Budget Justifications, p. GPR-49)

Reclamation is systematically resisting the 40 existing community systems and is requiring upgrades before "transferring" the 40 existing community systems into the Mni Wiconi Project. According to Reclamation, "transfer" is a condition of eligibility for OMR budgeting by Reclamation. Reclamation does not fulfill the trust responsibility to the Tribes and their membership or the needs of the other residents of the respective Indian Reservations without transferring the 40 existing community systems to the Project to make those systems eligible for OMR funding. Therefore, our request for FY 2016 includes \$275,000 to replace valves in Pine Ridge Village and \$479,000 for similar replacements in the village of Parmalee. These replacements have been identified by Reclamation as necessary maintenance activities before transfer of the community systems to the Project. Specific report language in any additional funds provided by Congress for "Facility Operation, Maintenance and Replacement" (\$2.931 million in FY 2015) is also requested for use by Mni Wiconi for community upgrades

The Subcommittee is asked to consider the circular logic that Reclamation has created by its policy: that funding (\$20 million) outside the authority of the Mni Wiconi Project Act is required to repair and replace existing facilities in 40 communities on the Reservations before "transfer" to the Project, but the communities, which have existing systems that are functioning successfully at present, are not eligible for OMR funding until they are "transferred." The communities cannot receive OMR funding until they are "transferred" and there are no construction funds available to upgrade systems before transfer. OMR funding, therefore, is needed to conduct the extraordinary repairs that Reclamation requires before "transfer." By its actions and policies, Reclamation is preventing the transfer of and denying OMR funds for the 40 existing systems in the Project. This is contrary to the Act's objective to include the community systems in the Project; without such inclusion, the Project is not complete.

2. OSRWSS Regional Core Facilities

The staff of the OSRWSS core system includes 19 employees. The staff operates and maintains the 14 million gallon per day regional water treatment plant, 203 miles of main transmission pipeline from 12 inches to 27 inches in diameter, nine major pumping stations (4 Megawatt total capacity), nine reservoirs (4.2 million gallons of capacity) and supervisory control and data acquisition (SCADA) system, necessary to deliver safe and adequate drinking water to the service areas of OSRWSS, RSRWS, LRSRWS and WRLJ.

3. OSRWSS Distribution on Pine Ridge Indian Reservation

The staff of the OSRWSS Distribution (DWMC) numbers 33 employees. The staff operates and maintains over 407 miles of main transmission pipeline, 33 major pumping stations, reservoirs and SCADA system.

The modest request of \$275,000 for repairs to valves and related facilities in Pine Ridge Village in FY 2016 will advance toward "transfer" the largest community on the Pine Ridge Indian Reservation.

4. Rosebud Sioux Rural Water System (RSRWS)

The staff of the RSRWS or Sicangu Mni Wiconi will total 22 full-time employees in FY 2016. The staff operates and maintains over 425 miles of mainline, 15 major pumping stations, 20 water storage reservoirs, 11 supply wells and associated chlorination facilities, and SCADA system. As shown in Table 1, wages and fringes total \$1.192 million.

The RSRWS budget includes water service contracts with the city of Mission and the Tripp County Water Users District (TCWUD) at a total cost of \$240,000 which reflects a reduction due less pumping for the Mission system. In 1995 the citizens of Mission voted to transfer their municipal system to the Mni Wiconi project and in 2003 a final agreement between the Tribe, city of Mission and Reclamation was consummated and the former municipal system is now held in trust for the Tribe as part of the RSRWS. The inclusion and OM&R of the Mission system are authorized by Section 3A (a)(8) of the Mni Wiconi Project Act, as amended.

5. Lower Brule Rural Water System

The completed Lower Brule Rural Water System (LBRWS) consists of a water treatment plant, six booster stations, three tanks/reservoirs, approximately 75 miles of core pipeline and approximately 300 miles of distribution pipeline. LBRWS has a staff of 12 full-time employees to provide the operation and maintenance of these facilities.

The budget includes \$200,000 for the replacement of trucks and equipment that are nearing the end of their useful life. LBRWS will continue to work with the Bureau of Reclamation and the other sponsors to prioritize their needs and ensure that their system is operating to the standards that have been established over the past several years.

6. Bureau of Reclamation

The Bureau of Reclamation budget is for oversight of operation and maintenance activities for all tribal systems, including the employment of an equivalent 8.9 persons. Reclamation also pays the Western Area Power Administration for project preference power used by the OSRWSS core system. Reclamation costs have increased progressively since 2013 and are expended before funds reach the project. This has the effect since 2013 of progressively reducing the remaining budget available to perform direct project functions on the OSRWSS core and on the respective Indian Reservations. The contradiction of an increasing oversight budget and decreasing direct OMR budget further demonstrates the need for an increasing total appropriation.



TESTIMONY OF JENAE BJELLAND, EXECUTIVE DIRECTOR
 NATIONAL ASSOCIATION FOR STATE COMMUNITY SERVICES PROGRAMS
 (NASCSP), BEFORE THE HOUSE ENERGY AND WATER DEVELOPMENT
 APPROPRIATIONS SUBCOMMITTEE IN SUPPORT
 OF FY 2016 DEPARTMENT OF ENERGY FUNDING
 April 6, 2015

The National Association for State Community Services Programs (NASCSP) urges the U.S. Senate Committee on Appropriations Subcommittee on Energy and Water Development to fund the Department of Energy's (DOE) Weatherization Assistance Program (WAP) in fiscal year (FY) 2016 at no less than \$230 million. NASCSP also urges the Committee to support base-formula appropriations of \$70 million for the State Energy Program (SEP) in FY 2016.

The WAP is proven, cost-effective, and successful, delivering savings to low-income Americans as well as creating thousands of new jobs. Last year alone, approximately 100,000 homes were weatherized by the DOE WAP network, and a total of 7.4 million homes have been weatherized under the program since its inception in 1976.

Weatherization provides the foundation for residential clean energy investments that create jobs, increase American competitiveness, saves families and businesses money through improved energy efficiency, and reduces pollution. We appreciate your Committee's past support for these important programs and respectfully request that you fund the WAP at \$230 million for FY 2016.

For more than three decades, the WAP has helped low-income families, seniors, and individuals with disabilities make lasting and cost-effective energy efficiency improvements to their homes. Weatherization also supports thousands of high quality jobs. NASCSP estimates that there are more than seven thousand highly skilled jobs in the weatherization network, with countless more supported in the related business supply chain including materials suppliers, vendors, and manufacturers. Weatherization is a significant contributor to the economy, has helped the construction industry and has given a boost to American manufacturers and small businesses during challenging economic times.

In addition, electric and gas utilities in many states depend on the WAP delivery network to carry out low-income residential efficiency initiatives, which leverage resources and increase the impact of the WAP in these states. Funding the WAP at \$230 million, closer to historic funding levels, will ensure that states have the resources to support weatherization programs that help reduce the burden of high energy prices on low-income families.

LEADERSHIP	LEADERSHIP	ADDRESS AND PHONE	WEBSITES
Jenae Bjelland, Executive Director	Joelle Hoeft, Secretary, MN	111 K ST NE, Suite 300	www.nascsp.org
Bill Brand, President, IA	Verna Best, Treasurer, NC	Washington, D.C. 20002	www.waptac.org
Willie Fobbs, Vice President, VA	Pamela Harrison, CSBG Program Chair, CA	(202) 624-5866	www.wxplushealth.org
Vaughn Clark, Ex-Officio, OK	Katrina Metzler, WAP Program Chair, OH		



Some examples of the Program’s accomplishments include:

- Returns \$2.51 for every dollar spent in energy and non-energy benefits over the life of the weatherized home;
- Serves as a foundation and catalyst for the entire Home Performance industry, as a leader in residential energy efficiency retrofit standards, technical skills, and workforce training;
- Impacts communities through local purchasing and jobs, supporting approximately 7,000 local, American businesses nationwide;
- Reduces residential and power plant emissions of carbon dioxide by 2.65 metric tons per year per home; and
- Decreases national energy consumption by the equivalent of 24.1 million barrels of oil annually.

Weatherization is still as relevant now as it was when it was formed in response to the energy crisis of more than 35 years ago. The savings to America’s most vulnerable citizens make a significant and immediate difference in their lives. These families have an average energy burden – the percentage of their income needed to pay residential energy bills – of around 15% of their income as compared to around 4% for non-low-income households. That means the energy burden on these families is five times greater than the average. The lowest income families are the most affected by energy burden. When energy bills are reduced, these families have more usable income to buy other essentials like food, shelter, clothing, medicine, and health care and thus invest in local businesses and communities. The WAP provides a positive return on investment to meet its primary objectives of making homes warmer in winter and cooler in summer, creating safer and healthier indoor environments.

Because of the advanced diagnostics and technology developed in the WAP, the program is the foundation for the growing home performance industry and green energy efficiency retrofit workforce. Approximately 10,000 living-wage jobs are supported by the Weatherization network, and many more in related businesses, such as material suppliers. Workers are highly trained and receive on-going instruction to further develop their skills. The WAP is at the core of the larger energy efficiency retrofit market, and its technology and training curricula play an integral role in developing the standards and workforce for the broader home performance industry. The WAP managers, trainers, and technical experts figured prominently in the development of the Guidelines for Home Energy Professionals and continue to play a key role in the development of standard work specifications, standardized training curricula, worker certifications, and training facility accreditations.

NASCSP urges the Subcommittee to fund the WAP at not less than \$230 million for FY 2016, the funding level necessary to sustain a national program to serve low-income families in all

LEADERSHIP	LEADERSHIP	ADDRESS AND PHONE	WEBSITES
Jenae Bjelland, Executive Director	Joelle Hoeft, Secretary, MN	111 K ST NE, Suite 300 Washington, D.C. 20002 (202) 624-5866	www.nascsp.org www.waptac.org www.wxplushealth.org
Bill Brand, President, IA	Verna Best, Treasurer, NC		
Willie Fobbs, Vice President, VA	Pamela Harrison, CSBG Program Chair, CA		
Vaughn Clark, Ex-Officio, OK	Katrina Metzler, WAP Program Chair, OH		



local communities as it has traditionally done. This is a program that has proved its worth and effectiveness for more than thirty years. NASCSP looks forward to working with Committee members in the future to ensure that this program continues as a sustainable national program to benefit low-income Americans. NASCSP also supports base-formula appropriations of \$70 million in FY 2016 for the State Energy Program.

Respectfully submitted,

Jenae Bjelland
Executive Director

LEADERSHIP	LEADERSHIP	ADDRESS AND PHONE	WEBSITES
Jenae Bjelland, Executive Director	Joelle Hoeft, Secretary, <i>MN</i>	111 K ST NE, Suite 300 Washington, D.C. 20002 (202) 624-5866	www.nascsp.org www.waptac.org www.wxplushealth.org
Bill Brand, President, <i>IA</i>	Verna Best, Treasurer, <i>NC</i>		
Willie Fobbs, Vice President, <i>VA</i>	Pamela Harrison, CSBG Program Chair, <i>CA</i>		
Vaughn Clark, Ex-Officio, <i>OK</i>	Katrina Metzler, WAP Program Chair, <i>OH</i>		

**TESTIMONY OF DAVID TERRY, EXECUTIVE DIRECTOR, THE NATIONAL
ASSOCIATION OF STATE ENERGY OFFICIALS, BEFORE THE HOUSE ENERGY
AND WATER DEVELOPMENT APPROPRIATIONS SUBCOMMITTEE IN SUPPORT
OF FY'16 DEPARTMENT OF ENERGY FUNDING**

April 6, 2015

Chair Simpson, Ranking Member Kaptur and members of the Subcommittee, I am David Terry, Executive Director of the National Association of State Energy Officials (NASEO). NASEO is submitting this testimony in support of funding for a variety of U.S. Department of Energy (DOE) programs. Specifically, we are testifying in support of no less than \$70 million for the U.S. State Energy Program (SEP). SEP is the most successful program supported by Congress and DOE in this area, as I will discuss later in my testimony. This request in support of SEP should be for the *base program formula funding* that allows states to set and target their energy opportunities, rather than utilizing DOE-directed competitive awards focused primarily on DOE's internal priorities. States utilize SEP funds to work with local businesses to help facilitate direct energy project development and demonstrations that leverage local resources, spur private investment, and create jobs. SEP has set the standard for state-federal-private cooperation and matching funds to achieve critical federal and state energy goals. The base SEP funds are the critical linchpin to help states build on these activities and expand energy-related economic development, much as SEP has done for over 30 years. We support not less than \$230 million for the Weatherization Assistance Program (WAP). Approximately half of the 56 State and Territory Energy Offices operate WAP and leverage private, utility, and other federal funds to deliver energy efficiency and cost savings to low income citizens. This program not only helps low-income homeowners, it stretches state, federal and private utility bill payment assistance funds by permanently lowering energy demand in weatherized homes. Both SEP and WAP are successful and have a strong record of delivering savings to homeowners, businesses, and industry. In addition, we support FY'16 funding for the following DOE offices and programs: \$131 for the U.S. Energy Information Administration; \$270 million for DOE Office of Electricity Delivery and Energy Reliability (DOE-OE); \$404 million for DOE's Office of Energy Efficiency and Renewable Energy's (EERE) Advanced Manufacturing program; \$264 million for DOE-EERE's Buildings Technologies Office; and \$49 million for DOE-EERE's Clean Cities Program.

EIA's state-by-state data is essential to a number of state and private energy efforts and has continuously improved over the years. For example, EIA's expertise is a critical piece of energy emergency preparedness and response, and there are significant EIA responsibilities under the Energy Independence and Security Act. In this area, states and companies utilize EIA data to prepare for and respond to energy supply disruptions, such as those associated with Super Storm Sandy. Also, EIA's operation of the State Heating Oil and Propane Program which partners with states and the private sector on the collection of weekly heating oil and propane prices during the heating season – an essential function during the 2013-2014 propane crisis.

NASEO strongly supports funding of \$270 million for DOE-OE. Within this amount, NASEO supports the request to provide \$63 million in energy reliability and assurance grants for state, local, and tribal governments to address grid modernization, enhance resiliency, and bolster energy assurance (energy emergency) planning, response, and training. In addition, funding should be provided to DOE-OE's Division of Infrastructure Security and Energy Restoration at

no less than \$14 million, which provides critical energy emergency preparedness and response activities. Moreover, this office's actions were essential to enabling state and private efforts to mitigate and avoid the threat to life, safety, and damaging economic impacts during the propane disruptions in the Midwest and New England during the winter of 2014-15. NASEO also strongly supports DOE-OE's R&D function, cyber security work, as well as the smart grid and grid integration activities of the National Electricity Delivery Division. NASEO also supports DOE-OE's innovative work under the Division of Energy Infrastructure Modeling and Analysis, which focuses on energy systems risk analysis predictive capability.

I would like to return to and expand upon our early statement in support of not less than \$70 million for the U.S. State Energy Program (SEP). This unique federal-state partnership program is the only DOE program that provides funding directly to the states to target unique local energy needs and opportunities and creates a support linkage with the private sector back to DOE's R&D activities. Formula SEP funding provides states with the flexible means to implement the state-directed programs that advance national energy technology and policy goals. Following are a few examples of sectors addressed by the states using SEP:

- Developing comprehensive state energy plans, on behalf of governors, which identify untapped local energy resources and energy efficiency opportunities, promote energy-related economic development, and open new energy technology markets for businesses;
- Assisting small- and medium-sized manufacturers in increasing energy efficiency to improve competitiveness and support business incubators;
- Incentivizing private-sector businesses to work with consumers (e.g., home energy efficiency measures) and local governments (e.g., public facilities retrofits) to implement energy efficiency measures that save money; and
- Establishing public-private energy efficiency financing programs (e.g., revolving loans, utility on-bill programs, energy savings performance contracting) that leverage private sector expertise and delivery capabilities. In every case, these financing programs are aimed at bridging market gaps and transitioning to private sector financing solutions that support new energy technologies areas such as high performance commercial and residential buildings, advanced materials, and grid and distributed energy technologies.

In 2005, Oak Ridge National Laboratory (ORNL) completed a second study of SEP and concluded, "The impressive savings and emissions reductions numbers, ratios of savings to funding, and payback periods . . . indicate that the State Energy Program is operating effectively and is having a substantial positive impact on the nation's energy situation." ORNL found that \$1 in SEP funding yields: 1) \$7.22 in annual energy cost savings; 2) \$10.71 in leveraged funding from the states and private sector in 18 types of project areas; 3) annual energy savings of 47,593,409 million source BTUs; and 4) annual cost savings of \$333,623,619. Energy price volatility and the need for growth-oriented economic development makes SEP essential as businesses and states work together to maintain our competitive edge.

Examples of Successful U.S. State Energy Program (SEP) Activities: The states have implemented thousands of projects and programs through SEP, and here are a few examples:

California: SEP contributes substantially to a number of California's energy efficiency initiatives. The State Property Revolving Loan Fund Program supported energy upgrades in more than 60 buildings located throughout the state. The Municipal and Commercial Building Targeted Measure Retrofit (MCR) program has provided energy audits and energy efficiency

improvements at non-residential buildings in California. MCR installations at over 7,400 project sites in California are estimated to realize over 85.8 GWh in electricity savings, 8.6 MW in demand reductions, and 950,000 therms in natural gas savings.

Idaho: The Idaho Office of Energy Resources (OER) is working with rural cities and counties to save energy in existing public buildings. The seven approved applicants received energy audits on a total of 13 city/county buildings, and OER is working with the audit recipients to provide cost-share funding for implementation of the identified energy efficient measures.

Indiana: The state is focused on biofuels, and is working with the state universities to improve conversion efficiencies. They also operate an industrial grant program. They have helped 25 companies become more energy efficient.

Kentucky: The Kentucky Department of Energy Development and Independence helps teams of designers, architects, and school administrators develop and construct cost-effective, zero-net energy capable schools – Kentucky has the nation's first three zero-net energy capable schools. The energy use reductions and cost savings are dramatic, and the training efforts, accomplished through SEP funding, played a pivotal role in Kentucky achieving its market transformation goals, while simultaneously encouraging other states (e.g., VA, MD, NC) to do the same.

Mississippi: The Mississippi Energy Office used SEP funds to support programs aimed at reducing energy consumption and costs in public buildings at the state and local levels. The office partnered with the Mississippi Department of Finance and Administration to implement a "Lead by Example" program which, to date, has conducted 278 building audits. The public buildings program is financing energy-saving upgrades through energy savings performance contracts at 10 institutions. Under the program, 149 public buildings, totaling 3 million square feet of space, have been completed.

Nebraska: SEP funding supports the Nebraska Dollar and Energy Saving Loan Program—a revolving loan fund that reduces the interest rate for energy-related projects meeting minimum efficiency standards. Active since 1990, it is one of the longest standing and highest volume energy efficiency loan programs in the country. To date, the program has financed 28,362 projects with low-interest loans, mainly in the residential sector, totaling more than \$317 million from the energy office and participation by 267 lenders at more than 906 locations throughout the state. Over 25 years, the program's extraordinarily low write-off level is just \$150,158.

New Jersey: SEP funds have advanced five combined heat and power projects including a 9.5 MW cogeneration unit at the DSM Nutritional Products facility in Belvidere, two 7.65 MW facilities serving a hotel and two casinos in Atlantic City, 1.1 MW gas engine generator at Ocean City College, and a 4.6 MW cogeneration plant for the University Medical Center at Princeton. All totaled, nearly 35 MW of clean energy production has resulted from SEP funds.

New York: Utilizing SEP funding, the Port Jefferson School District implemented a lighting retrofit project in five schools across the district, installing 94 occupancy sensors and 1,361 energy efficient lamps and ballasts. An estimated 396,000 kWh and \$74,000 is saved each year. They have aggressively moved forward on energy financing programs.

Ohio: Using SEP funding, the Ohio Energy Office has established the Energy Efficiency Program for Manufacturers. This multi-phase energy efficiency program provides facilitation services and financial assistance to Ohio manufacturers to diagnose, plan, and implement cost-effective energy improvements. The program was developed to provide Ohio's manufacturers with a tool to reduce costs through implementation of identified energy measures.

Tennessee: The Tennessee State Energy Office oversees the state's contribution to the Pathway Lending Energy Efficiency Loan Program, a public-private \$50 million revolving loan fund established by the state, TVA, Pinnacle Bank, and Pathway Lending in 2010 to benefit businesses and industry. The state and other partners hope to expand the program to local governments and quasi-governmental entities by spring 2015.

Washington: The Washington Department of Commerce (the state energy office) selected a local company's plan for the Pasco area canal for funding from SEP. A grant in the amount of \$898,175 was awarded to the project developers, Green Energy Today, of Kennewick, Washington. The grant is one of thirty-six grants funded through the Energy Efficiency and Renewable Energy Grant and Loan Program offered by the Department's State Energy Office.

Contact Information: NASEO Executive Director (dterry@naseo.org) (phone 703-299-8800)(Fax 703-299-6208) (2107 Wilson Boulevard, Suite 850, Arlington, VA 22201). Jeff Genzer, NASEO Counsel (jcg@dwgp.com)(202-467-6370).



NATIONAL CONGRESS OF AMERICAN INDIANS

U.S. House of Representatives Committee on Appropriations Subcommittee on Energy and Water Development, and Related Agencies

April 6, 2015

EXECUTIVE COMMITTEE

PRESIDENT
Brian Cladoosby
Swinomish Tribe

FIRST VICE-PRESIDENT
Randy Noka
Nanagansett Tribe

RECORDING SECRETARY
Aaron Payment
*Sault Ste. Marie Tribe of Chippewa
Indians of Michigan*

TREASURER
Dennis Weisti, Jr.
Colorado River Indian Tribes

REGIONAL VICE- PRESIDENTS

ALASKA
Jerry Isaac
Native Village of Tanacross

EASTERN OKLAHOMA
S. Joe Crittenden
Cherokee Nation

GREAT PLAINS
Leander McDonald
Spirit Lake Nation

MIDWEST
Roger Rader
Potawatomi band of Potawatomi

NORTHEAST
Lance Gumbs
Shinnecock Indian Nation

NORTHWEST
Fawn Sharp
Quinalt Indian Nation

PACIFIC
Rosemary Morillo
Salado Band of Luiseno Indians

ROCKY MOUNTAIN
Ivan Posey
Shoshone Tribe

SOUTHEAST
Ron Richardson
Halwa-Saponi Indian Tribe

SOUTHERN PLAINS
Stephen Smith
Koowa Tribe

SOUTHWEST
Manuel Heart
Ute Mountain Ute Tribe

WESTERN
Arlan Melendez
Reno Sparks Indian Colony

EXECUTIVE DIRECTOR
Jacqueline Johnson Pata
Tlingit

NCAI HEADQUARTERS
1516 P Street, N.W.
Washington, DC 20005
202.466.7767
202.466.7797 fax
www.ncai.org

Background

On behalf of the National Congress of American Indians (NCAI), we thank you for accepting and considering testimony regarding the Fiscal Year (FY) 2016 Budget for the Department of Energy (DOE). As the most representative organization of American Indian and Alaska Native tribes, NCAI serves the broad interests of tribal governments across the nation. As Congress considers the FY 2016 budget and beyond, leaders of tribal nations call on decision-makers to ensure that the promises made to Indian Country are honored in the federal budget. If you have any questions regarding this testimony, feel free to contact Colby Duren, staff attorney, at the National Congress of American Indians.

Department of Energy

Tribal lands contain abundant and largely underdeveloped conventional and renewable energy resources that hold great promise for current and future generations of Native peoples. Nevertheless, tribes and Native communities face many of the same challenges in developing their energy resources and infrastructure that state and local governments and non-Indian communities face. Tribes also face additional challenges—including special laws, regulations, and policies that are completely unique to Indian Country and often to a specific tribe—as well as grossly inadequate physical infrastructure, limited access to capital, and high workforce training and development needs. In addition, tribes need access to the capacity and technical assistance necessary to advance the 150-plus energy projects that they are currently moving into the development, financing, and construction stages.

Recommendations

NCAI's testimony supports the Department of Energy's FY 2016 budget request and identifies authorized energy programs that, if adequately funded, would provide innovative, important new tools to spur new investment in tribal energy development and meet critical analysis and planning, capacity building, and resource management needs. Further development of tribal energy would contribute significantly to national energy security, clean energy development to reduce greenhouse gas emissions, as well as tribal economic development and job creation.

Department of Energy – Office of Indian Energy Policy and Programs

- Provide \$3.510 million for the Office of Indian Energy Policy and Programs
- Provide \$16.480 for the Tribal Energy Program
- Provide \$11 million the Tribal Indian Energy Loan Guarantee Program

NCAI supports the Department of Energy's FY 2016 budget request that the Office of Indian Energy Policy and Programs (IE) be moved out of the Departmental Administration (DA) account and be established as a new stand-alone office with a separate appropriation under Energy Programs. The Energy Efficiency and Renewable Energy's Tribal Energy Program and the DA's Office of Indian Energy Policy and Programs would be consolidated under the new IE appropriation to promote alignment of the Department's Indian energy policies and financial assistance programs. Consolidation will result in more efficient and effective administration and management of tribal activities and programs via a single program office.

Further, the NCAI requests \$11 million for the Tribal Indian Energy Loan Guarantee Program which is authorized under Section 2602(c) of the Energy Policy Act of 2005. This program would provide or expand electricity services on Indian lands.

For FY 2016, the Office of Indian Energy Policy & Programs would receive \$3.5 million and the Tribal Energy Programs would receive \$16.48 million, for a total of \$20 million for the Office of Indian Energy Policy & Programs.

National Hydropower Association – Jeffrey Leahey, Deputy Executive Director
Phone 202.682-1700, ext.150; email: Jeff@hydro.org
Committee on Appropriations - Subcommittee on Energy and Water Development
Department of Energy (Water Power Program); Corps of Engineers; Bureau of Reclamation

The National Hydropower Association (NHA)¹ respectfully submits this statement in support of \$100 million for the U.S. Department of Energy's (DOE) Water Power Program and its research and development (R&D) activities and initiatives for Fiscal Year 2016.

In addition, NHA also strongly advocates directing additional resources to the operations and maintenance (O&M) programs of the U.S. Army Corps of Engineers (USACE) and Bureau of Reclamation (BuRec) to increase both capacity and generation at these federal hydropower facilities, as well as to those programs that fund the engagement and review of applications for non-federal hydropower development at USACE's and BuRec's water infrastructure.

Requesting \$100 million in FY 2016 funding for the DOE Water Power Program

The Water Power Program's R&D efforts focus on improving the performance, lowering the cost, and accelerating the deployment of cutting-edge technologies that generate clean, renewable, environmentally responsible, and cost-effective electricity from the nation's hydropower and marine energy resources.

Funds should be directed across all water power technology sectors – hydropower, pumped storage, marine and hydrokinetic, and conduit power. The DOE divides funding generally across two main technology areas: hydropower/pumped storage and marine and hydrokinetic. **For FY 2016, NHA supports funding \$40 million for the hydropower program area and \$60 million for the marine and hydrokinetic program area.** These investments support production of advanced technologies and accelerate adoption in the marketplace.

For both hydropower and marine energy, the Water Power program is also working to reduce the time and costs associated with siting, permitting and licensing projects; to better quantify the potential magnitude, costs, and benefits of generation; and to identify and address other barriers to deployment. The program has released reports and maps that assess the nation's hydropower resources along with initial estimates of the nation's wave and current (tidal, river and ocean) resources.

In the hydro sector, the program has embarked on a Hydropower Vision Report, a first-of-its-kind roadmap for the industry designed to usher in a new era of growth in hydropower over the next half century. NHA supports a similar report for the marine energy industry.

¹ NHA is the national association dedicated to advancing the interests of hydropower, pumped storage, conduit power and marine energy technologies. NHA's membership includes over 200 organizations including utilities, independent power producers, developers, equipment manufacturers and service providers. In 2014, NHA established a Marine Energy Council (MEC) in support of the ocean wave, tidal, current and ocean thermal technologies.

Making the case for increased R&D investment in water power technologies²

In Fiscal Year 2008, the Committee reestablished the DOE Water Power program with an initial investment of \$10 million after the program had been zeroed out. Unfortunately, the Water Power program remains one of the smallest of the Office of Energy Efficiency and Renewable Energy (EERE), particularly when compared to the funding levels for other EERE programs, such as wind and solar.³⁴ However, NHA appreciates and is encouraged by the Committee's growing investments in the DOE's Water Power program activities in recent years,⁵ along with the Administration's FY 2016 budget request which recommended total funding at a historic level - \$67 million. We believe there is a growing recognition for the need to expand our underutilized hydropower and marine energy resources and capture the substantial grid services and clean air benefits they can provide.

The Water Power Program support of cutting-edge research, development, demonstration and deployment efforts for innovative new technologies and operations will generate cost-effective renewable electricity from across the water power sector and improve the security and reliability of the electric grid. Federal R&D support also stimulates private investments in the construction, manufacturing, engineering and environmental science sectors and strengthens the thousands of businesses that make up the U.S. supply chain. The support of these industries can expand and employ an already sizable skilled U.S. workforce.⁶

NHA's request for increased support for the DOE Water Power Program is in line with the "all-of-the-above" energy strategy supported by both Congress and the Administration. These investments will also spur domestic industries that create well-paying jobs and economic opportunities for localities.

Hydropower's role in America's energy portfolio and future growth potential

Hydropower is America's single largest source of domestic renewable electricity, providing clean, affordable generation in every region of the country. In 2014, hydropower accounted for approximately 6.5 percent of total electricity generation and just under half of all renewable electricity generation.

The key strengths of hydropower, and potentially marine energy, versus other renewables are base load power, dispatchability, grid stability and reliability, and low cost of electricity. In

² NHA notes that historically, the DOE's R&D budget for all energy technologies has declined precipitously. See "Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs" (GAO-07-106)

³ See Wind Program Budget History: <http://energy.gov/eere/wind/wind-program-budget>

⁴ See FY2016 Solar Program Request P.102-103:

http://energy.gov/sites/prod/files/2015/02/f19/FY2016BudgetVolume3_7.pdf

⁵ See Water Power Program Budget History: <http://energy.gov/eere/water/water-power-program-budget>

⁶ The U.S. hydropower industry employs upwards of 300,000 workers with a domestic supply chain that spans the country. <http://www.hydro.org/why-hydro/available/industrynapshot/>

addition, generation from the existing hydropower system avoids approximately 200 million metric tons of carbon emissions each year. In fact, regions that rely on hydropower as a primary electricity source reap the benefits of significantly cleaner air as well as the lowest electricity prices in the country.

While a proven renewable resource, hydropower is also a resource for our future having a tremendous growth potential. One myth about hydropower is that there are no new opportunities for growth in the industry. Several new reports demonstrate significant areas for growth including: expanding capacity at existing hydro projects, adding generation to existing non-powered dams, new pumped storage facilities, and new stream-reach development.⁷

The work to realize this potential is happening now. New projects are under construction. Bloomberg New Energy Finance reports over 1GW of new capacity added over the last 5 years.⁸ In addition, the Federal Energy Regulatory Commission has nearly 200 preliminary permits to investigate conventional hydropower and pumped storage projects.⁹ However, to maximize the potential of our hydropower resources, expanded funding support for the Water Power Program is critical to develop and deploy advanced technologies, improve operational procedures, and provide rigorous engineering, environmental and market analysis.

Potential of marine energy to be the nation's most robust, clean power resource

Marine renewable energy technologies generate power from predictable and forecastable ocean currents, waves, tidal flows and in-stream sources. By any measure, the U.S. has significant marine energy resources. The DOE has estimated that the technically extractable resource potential is almost 900 TWh/yr for wave energy and 400 TWh/yr for tidal and ocean current.¹⁰ This represents up to 25 percent of projected U.S. electricity generation needs by 2050. With more than 50 percent of our population living within fifty miles of coastlines, there is significant potential to provide power from marine energy systems to these coastal communities.

Looking to Europe, a recent study predicted that by 2050 the British marine energy sector could be worth £76 billion to the U.K. economy, support 68,000 jobs, and total generation capacity could reach 27.5 GW, enough to supply more than a fifth of the U.K.'s current electricity demand.¹¹ It predicted that Britain could capture almost a quarter of the global market if it builds on its technology development leadership position. The majority of the jobs would result from the growing export markets into countries that have substantial resources. The E.U. has made this sector a priority and invested over \$1 billion on marine energy development over the past ten years.¹² Early funding support, along with development of full-scale device testing

⁷ http://www1.eere.energy.gov/water/pdfs/npd_report.pdf and <http://nhaap.ornl.gov/nsd>

⁸ <http://www.bcse.org/images/2015%20Sustainable%20Energy%20in%20America%20Factbook.pdf>

⁹ <http://ferc.gov/industries/hydropower/gen-info/licensing.asp>

¹⁰ http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=1574a931-2233-4f98-9d0c-4bd683bbe1e1

¹¹ <http://www.carbontrust.com/resources/reports/technology/accelerating-marine-energy>

¹² http://www.siocean.eu/en/upload/docs/SIOcean_Market_Deployment_Strategy-Web.pdf

centers (still unavailable in the U.S.), demonstrates that the significant technological advances and competitive advantages are taking place in Europe.

The Water Power program facilitates R&D for internationally competitive systems approaching commercial viability. These investments are the key mechanism available to U.S. companies facing overseas competitors that receive significant support. Increased program investments will enable the U.S. to leverage its superiority in shipbuilding and related service sectors, create jobs and diversify these maritime industries toward developing new domestic energy supplies and capturing an emerging export market.

The establishment of a U.S.-based marine energy industry would secure our nation's place in developing offshore renewable energy systems, thereby ensuring that the United States is an exporter, not an importer, of these technologies.

Appropriations support for additional important federal programs

- **EPAct 2005 Section 242 hydropower production incentive** – In the FY 2014 and FY 2015 omnibus appropriations bills, report language included funding for this incentive designed to help bring down costs that in turn can determine the viability of a given project. NHA supports continued funding for the program, which DOE is currently in the process of implementing.¹³
- **Funding support for hydropower development at federal facilities** – NHA also urges the Committee to direct support to the Army Corps of Engineers Civil Works and the Bureau of Reclamation efforts to operate, maintain, and upgrade their existing hydropower projects, as well as to build on their existing non-powered infrastructure.¹⁴

Conclusion

NHA thanks the Committee for the increased level of support provided to the DOE Water Power Program over the past several years. For FY 2016, the association urges Congress to adopt this funding request of \$100 million for the DOE Water Power Program as well as to adequately fund the hydropower programs of the Corps of Engineers and the Bureau of Reclamation.

These investments will increase not only the amount of renewable power generation from water resources, but also the grid services needed to expand the use of other intermittent, variable energy resources, such as wind and solar, while also ensuring that American families and businesses continue to benefit from this low-cost, reliable source of clean power.

¹³ DOE issued Final Guidance for the Section 242 program in January 2015. Applications were due February 2015.

¹⁴ DOE and other studies show that 12 GW of new capacity exist at U.S. non-powered dams, including Army Corps of Engineers' dams, as well as significant growth potential at existing Bureau dams, canals and conduits.



Kameran Onley
 Director, U.S. Government Relations
 konley@tnc.org

4245 North Fairfax Drive
 Arlington, VA 22203
 (703) 841-4229

March 24, 2015

**Testimony for the House Appropriations Subcommittee on Energy And Water
 Development on the FY 2016 Appropriations for the U.S. Army Corps of Engineers
 and the Bureau of Reclamation Submitted by The Nature Conservancy**

Mr. Chairman and members of the Subcommittee,

Thank you for the opportunity to present The Nature Conservancy's testimony on the FY 2016 appropriations for the U.S. Army Corps of Engineers (Corps) and Bureau of Reclamation.

The Nature Conservancy recognizes the critical importance of our water resources and the benefits these resources provide to the economy, the quality of life in our communities, and the health of our people. We also understand the difficulty in managing these resources given the confluence of pressing issues: scarcity throughout the West, aging infrastructure, changing weather patterns, and challenges to quality. Yet, in these challenges we see opportunity.

We believe the nation must invest wisely with an integrated watershed scale approach to solving the problems that are being exacerbated by changing weather patterns that are testing our assumptions about the design of water resources infrastructure; we are seeing more droughts, more floods, and larger coastal storms than in previous years. Additionally, the demands on water use are increasing from growing populations and agricultural production.

Fortunately, we now understand the very real value and cost-effectiveness of natural infrastructure (wetlands, floodplains, healthy forests, coastal barrier islands, oyster and coral reefs) in solving water resource management problems. Ecosystem restoration projects pay dividends through natural flood control, higher quality water, sustaining commercial fisheries, and supporting recreation and tourism. With impacts stretching out for decades to come, the projects and proposals that follow reap high returns on investment. The Nature Conservancy is focused on supporting the programs and investments needed to ensure economic and environmental benefits are enhanced today and made sustainable for tomorrow.

The Conservancy would like to thank the Subcommittee for supporting the restoration of large scale restoration programs over the last decade. These programs have been essential to restoring and maintaining some of America's most precious and imperiled ecosystems. We also appreciate past support for smaller-scale projects that provide cumulative benefits and serve as powerful demonstrations of effective restoration.

Sincerely,

Kameran L. Onley
 Director, U.S. Government Relations

USACE General Investigation

Interbasin Control of Great Lakes and Mississippi River Aquatic Nuisance Species: The Nature Conservancy encourages Congress to address the urgent problem of invasive species. The Conservancy requests no less than \$500,000 in the FY 2016 budget.

Illinois River Basin Restoration Program: This federal-state partnership sustains the health of the entire Illinois River Basin through projects that restore habitats, species, and the natural processes that sustain them. It complements other federal programs such as the Illinois Conservation Reserve Enhancement Program and Environmental Management Program of the Upper Mississippi, yet is unique in its basin-wide approach to restoration. The Conservancy supports the \$400,000 funding proposed for this program in FY 2016.

Lower Mississippi River Resource Assessment: Commercial navigation channelization and flood control have accelerated erosion, channel incision and the loss of floodplain connection along the Lower Mississippi River and its tributaries. Working with a cost share partnership that includes The Nature Conservancy, the Department of Interior, and six basin states, the Corps will evaluate river management, habitat, and public access to recommend actions for addressing current and future needs. The Conservancy and partners will provide to Congress the Watershed Report in FY 15 with recommendations to implement actions for habitat and recreation measures and the need for better understanding of the Lower Mississippi River through monitoring. The Conservancy will seek a legislative resolution to move recommendations forward to feasibility.

Willamette River Floodplain Restoration Study: The Corps and the Conservancy are working together to identify ecological flow requirements downstream of Corps dams on the Willamette River and incorporate those flows into dam operations to improve fish and wildlife habitat and community flood protection. Additionally, this study has assessed the potential for floodplain restoration in the Middle Fork and Coast Fork tributaries of the Willamette River to reduce flood damage while restoring natural wetlands and promoting ecosystem restoration. The Conservancy requests \$350,000 in funding.

Dungeness River Ecosystem Restoration Study: The Conservancy supports this study as budgeted at \$700,000.

USACE Construction

Navigation and Ecosystem Sustainability Program (NESP): The Nature Conservancy supports this program that recognizes the dual purpose navigation revitalization and river ecosystem protection as authorized in WRDA 2007. The Conservancy requests \$10,000,000 for this program for FY 2016.

Upper Mississippi River Environmental Management Program (EMP): Authorized in 1986, this program supports coordinated habitat rehabilitation and enhancement projects in the Upper Mississippi River system. Over the 25 years of the program, the Corps has completed more than 55 projects, benefiting over 107,000 acres of aquatic and floodplain habitat. Currently, 35 projects in the program are in planning, design, or under construction. Completion of these projects will benefit an additional 75,000 acres of aquatic and floodplain habitat. The program has the capacity to perform at the full funding level, which was granted for the first time for FY 2015. The Conservancy would like to see funding, currently at \$19,787,000 for FY 2016, restored to the FY 2015 level of \$33,170,000.

Chesapeake Bay Oyster Recovery: This project will build on recent progress and continue to increase the scale of oyster restoration in the Chesapeake Bay. Scientists in Maryland have estimated that oysters in just one Chesapeake tributary - the Choptank River – remove pollution that would otherwise cost waste water treatment systems \$300,000/year to remove. The current funding, \$1,970,000, threatens the success of this project and is the lowest of the past five years. The Conservancy would like to see funding restored to the FY 2012-2015 levels of \$5,000,000.

Missouri River Fish and Wildlife Recovery Program (MRRP): Within the Missouri River basin, MRRP activities assist with recovery and to species listed under the Endangered Species Act and the ecosystems on which they depend, address the effects of the operation of the Missouri River Mainstem Reservoir System, the Missouri River Bank Stabilization and Navigation Project (BSNP), and the Kansas River Project. The Conservancy would like to see funding, currently at \$52,563,000, restored to FY 2015 levels of \$56,471,000 and requests any re-allocation of funding within the program be used for mitigation real estate acquisition.

Louisiana Coastal Area Ecosystem Restoration-The Nature Conservancy supports this construction as budgeted at \$10,000,000 and the coordinating feasibility study budgeted at \$50,000.

Chicago Sanitary and Ship Canal Dispersal Barrier: Invasive plants, invertebrates and fish pose serious threats to the biodiversity and fisheries of the Great Lakes and Mississippi River basins, which are home to nearly 50% of our nation’s freshwater fish species and support sport and commercial fisheries worth billions of dollars. This project seeks to prevent the immediate invasion of the Great Lakes by Asian carp by completing three electronic barriers in the Construction phase. The Nature Conservancy supports the President’s request of \$28,000,000 for FY 2016.

South Florida Ecosystem Restoration Program: The federal government has made substantial progress on Everglades’ projects, and we encourage continued funding for authorized CERP projects. The Conservancy supports the \$130,923,000 proposed for the South Florida Ecosystem Restoration Program for construction in FY 2016.

Hamilton City Flood Damage Reduction and Ecosystem Restoration: The fact that the Corps selected Hamilton City for a new start construction project in FY 2014 is a testament to the innovative dual nature of the project: increasing flood protection for Hamilton City while restoring approximately 1,500 acres of riparian habitat. The Conservancy strongly supports the \$15,000,000 proposed in the FY 2016 budget.

USACE Operations & Maintenance

Sustainable Rivers Project (SRP) is an initiative to modernize the operations of the nation’s reservoirs to enhance water supply, flood protection, hydropower generation, and recreation, while restoring critical ecosystems and the economically valuable services they provide. Launched by the Corps, this is an initiative to work with the states, other federal agencies, and The Conservancy to update decades-old water management practices to better meet society’s needs today and in the coming decades. The Conservancy supports full funding of reservoir operations and maintenance, with an additional \$15,000,000 for the updates to operation manuals per Section 1046 of WRRDA 2014.

Other

Continuing Authorities Program (CAP): Section 1135, provides project modifications for improvement of the environment and Section 206 for aquatic ecosystem restoration. Adequate recent funding for the CAP programs has been critical for model floodplain restoration and reconnection projects. Demand for these valuable programs continues to outstrip funding, which is why the Conservancy supports the increase contained in the President's Budget for these programs that invite private/public partnerships.

Water Infrastructure Finance and Innovation Act (WIFIA): Section 5021 of WRRDA 2014 provides authority for low-cost credit that can leverage private investment for water infrastructure. The criteria includes whether a project protects against extreme weather events or helps maintain the environment. The Nature Conservancy supports funding of \$25,000,000 as authorized in Section 5033 of WRRDA.

Bureau of Reclamation

The Nature Conservancy supports continued funding as requested in the President's Budget for the following programs:

Upper Colorado River Endangered Fish Recovery and San Juan River Basin Recovery Programs: These programs take a balanced approach to restore four endangered fish species by implementing a range of basin-wide strategies, including improved management of federal dams, river and floodplain habitat improvement, stocking of endangered fish, and management of non-native fish species.

Basin Studies and WaterSMART: The basin study programs and WaterSMART grant programs. These programs support sustainable water use and management by focusing on water conservation, reuse and recycling, and on environmental protection and restoration. We also support the proposed funding for the Bureau's environmental restoration work, including the programs in the California Bay Delta and Colorado River.



March 20, 2016

Congressman Mike Simpson, Chairman
 Subcommittee on Energy and Water
 Development
 Committee on Appropriations
 2312 Rayburn House Office Building
 Washington, DC 20510

Congresswoman Marcy Kaptur, Ranking
 Member
 Subcommittee on Energy and Water
 Development
 Committee on Appropriations
 2186 Rayburn House Office Building
 Washington, DC 20510

Dear Chairman Simpson and Ranking Member Kaptur,

The Nicollet Island Coalition (Coalition) is a group of environmental, conservation and taxpayer non-profits who are working to protect and restore the Upper Mississippi River by reforming navigation. The Coalition urges the Committee on Appropriations Subcommittee on Energy and Water Development to provide the US Army Corps of Engineers \$33.17 million for the Upper Mississippi River (UMR) Restoration Program, \$800,000 for disposition of completed projects, and no funding for the Navigation and Ecosystem Sustainability Program.

Army Corps of Engineers Rock Island District, Construction, Environmental Management Program

The members of the Coalition have supported the UMR Restoration (subaccount for the Environmental Management Program) since its inception and continue to support this vital restoration initiative. We urge the Subcommittee to provide \$33.17 million for the UMR Restoration Program.

The UMR Restoration Program has received more than \$30 million in each of the past two fiscal years and fully executed the funding to promote science and monitoring and construct habitat rehabilitation and enhancement projects. We were disappointed to see the President's fiscal year 2016 budget request reduced below \$20 million for the Restoration Program.

The Coalition agrees with the Administration's position that the Navigation and Ecosystem Sustainability Program should not receive any appropriation in fiscal year 2016. The large-scale navigation modifications included in the Recommended Plan for the Upper Mississippi

American Rivers · Izaak Walton League of America
 Missouri Coalition for the Environment · National Wildlife Federation · Prairie Rivers Network
 River Alliance of Wisconsin · Sierra Club · Taxpayers for Common Sense

[Type text]

Navigation and Ecosystem Sustainability Program (NESP), as authorized by the Water Resources Development Act of 2007, have not been justified by the Corps and should not be pursued. Previous reviews by the National Academy of Sciences and the Assistant Secretary of the Army, Civil Works found that the navigation construction component of NESP was not economically justifiable. A report released in 2010 by the Nicollet Island Coalition provides additional evidence that proposed locks and dams in this region are not a good investment for American taxpayers. With this in mind, the Coalition supports the Corps' decision not to request funding for NESP in fiscal year 2016.

The Upper Mississippi River is one of the most complex ecosystems on earth. It provides habitat for 50 species of mammals, 45 species of reptiles and amphibians, 37 species of mussels and 241 species of fish. The need for ecosystem restoration is unquestionable. As the Corps stated in its study of navigation expansion, this ecosystem is "significantly altered, is currently degraded, and is expected to get worse." Researchers from the National Academy of Sciences have determined that river habitat is disappearing faster than it can be replaced through existing programs such as the Upper Mississippi River Restoration Program, which was authorized at \$33.2 million annually by Congress. As habitat vanishes, scientists warn that many species will decline and some will disappear.

Our nation relies on a healthy Mississippi River for commerce, recreation, drinking water, food and power. Annually, more than 12 million people recreate on and along the UMR spending \$1.2 billion and supporting 18,000 jobs. More people recreate on the Upper Mississippi annually than visit Yellowstone National Park, and each of the more than 50 completed restoration projects generates half of its labor from local workers living near the sites. During construction, each of these projects infuse an average of \$750,000 into the local economies and small towns. While restoration and recreation economic benefits become more important, barge traffic has been declining over the past decade.

In addition to funding habitat restoration on the Mississippi River, the UMR Restoration Program funds valuable scientific research. This research is essential for understanding the Upper Mississippi River ecosystem and guiding the decisions of managers to minimize the impacts of the locks and dams on native fish and wildlife. When the program was established in 1986, Congress intended for one-third of the program funding to be dedicated for scientific research and long-term monitoring of ecosystem trends.

In assembling the UMR-IWW navigation study, the Corps recognized the critical need for ecosystem restoration and encouraged Congress to invest approximately \$130 million annually in Upper Mississippi River habitat restoration efforts. With this need in mind, the Coalition strongly encourages the Subcommittee to prioritize investment in ecosystem restoration by appropriating the full authorized amount for the Upper Mississippi River Restoration Program

[Type text]

in fiscal year 2016. Additional funding for restoration will support economic development and job creation in communities along the UMR and provide long-term conservation and economic benefits for the region and the nation.

US Army Corps of Engineers Headquarters, Investigations

The US Army Corps of Engineers has finally recognized that many of the structures they previously built have outlived their usefulness. The President requested \$800,000 for fiscal year 2016 to develop a process for disposing of outdated infrastructure and prioritize projects to be considered for disposition. The Coalition members are requesting and working to include outdated infrastructure on the UMR on the disposition priority study list and encourage you to provide the US Army Corps of Engineers with the requested \$800,000 for fiscal year 2016.

These funds will help set up a process for considering projects for disposition eligibility, like Upper St. Anthony Falls Lock and Dam. In the Water Resources Reform and Development Act of 2014, Congress authorized the closure of Upper St. Anthony Falls Lock. With the closure of this lock, commercial navigation no longer has access to any private terminals or municipal harbors above Lock and Dam 1. Recreation vessel lockages are also declining as more people become aware of the threat posed by invasive carp that can lock through with boats.

It is likely that the three pieces of infrastructure, Lock and Dam1, Lower St. Anthony Falls Lock and Dam and Upper St. Anthony Falls Lock are no longer in the federal interest. Disposition studies are warranted to determine whether some or all the infrastructure should be released, modified or removed. A disposition study would also evaluate the best alternatives to prevent the establishment of carp and promote native flora and fauna.

The St Paul District has requested a disposition study at Upper St. Anthony Falls Lock. However, the US Army Corps of Engineers must develop a prioritization process before conducting additional disposition studies. We urge you to provide the request \$800,000 to the US Army Corps of Engineers for the disposition of completed projects.

Thank you for considering our testimony and we hope that you will provide full funding for the Upper Mississippi River Restoration Program, \$800,000 for disposition studies, and no funding for the Navigation and Ecosystem Sustainability Program. If you have any questions, please contact me at odorothy@americanrivers.org or (217)390-3658.

Sincerely,
Olivia Dorothy, Facilitator
American Rivers
3018 22nd Ave
Rock Island, IL 61201

Testimony for the Record
Marvin S. Fertel
President and Chief Executive Officer, Nuclear Energy Institute
House Appropriations Subcommittee on Energy and Water Development
April 6, 2015

The Nuclear Energy Institute¹ (NEI) appreciates the opportunity to provide testimony on Department of Energy and Nuclear Regulatory Commission programs to the Senate Appropriations Subcommittee on Energy and Water Development.

Given the recommendations of the Project AIM 2020 report and Congressionally-directed independent assessments, NRC must significantly improve the efficiency and transparency of its regulatory processes consistent with its own principles of good regulation. Regulatory activities and rulemakings must be prioritized based on these principles, which should result in the deferral or cessation of numerous activities and rulemakings that have low or negligent safety impact. Importantly, the NRC's resources and staff levels should be reduced to reflect the reduced demand for agency activities in some areas and the reduction in the number of operating reactors and material licensees from fiscal year 2015.

In the coming fiscal year, DOE should focus on (1) developing technologies and other solutions that can improve the reliability, sustain the safety, and extend the operation of current reactors; (2) developing small modular reactors and new reactor designs that will enable nuclear energy to help meet the nation's energy and environmental goals; (3) developing a sustainable used fuel management program; and (4) minimizing the risks of nuclear proliferation.

Specifically, the nuclear energy industry makes the following recommendations:

- Given the progress NRC has made in closing out certain activities and the significant reduction in new plant licensing activities, freeze NRC's budget at the fiscal year 2008 level;
- Oppose reinstating a tax on nuclear power plant operators to pay the cost of decontaminating and decommissioning the federal government's uranium enrichment plants;
- Provide funding for DOE and NRC to complete the licensing of the proposed Yucca Mountain repository;
- Develop a sustainable strategy for used nuclear fuel management;
- Provide robust funding for the DOE Office of Nuclear Energy, including the small modular reactor program;
- Fund completion of the Mixed Oxide (MOX) Fuel Facility at the Savannah River Site;
- Fund timely and efficient cleanup of all DOE defense-related facilities;
- Fund the DOE loan guarantee program for clean energy technologies, including advanced nuclear power plants and;
- Retain the Integrated University Program at DOE and NRC.

¹ NEI is responsible for establishing nuclear industry policy on matters affecting the nuclear energy industry, including regulatory, financial, technical and legislative issues. NEI members include all companies licensed to operate commercial nuclear power plants in the U.S., nuclear plant designers, engineering/construction firms, fuel facilities, and other organizations and individuals involved in the nuclear energy industry.

Nuclear Regulatory Commission

The level of detail and transparency in the NRC budget justification has declined in recent years, making it difficult for stakeholders to provide detailed analysis and recommendations. For example, it appears the FY 2016 budget request would provide funding for the NRC to continue a large number of current rulemakings and other requirements, but it is unclear which rulemakings would be funded. This lack of transparency is unacceptable, as is the agency's failure to (1) establish priorities among rulemakings and (2) justify the expenditure of agency resources on developing the technical basis for future rules. The industry encourages the committee to direct the commission to set priorities in its activities in a more transparent manner, and to manage its rulemaking process more efficiently.

The industry applauds the NRC's Project AIM initiative to improve the agency's agility, effectiveness and efficiency and to be more responsive to anticipated changes in its workload over the next five years. However, many of the report's recommendations should be implemented on a more aggressive timetable, particularly improvements in the planning and budget formulation process. These recommendations can and should be implemented without compromising the shared NRC and industry commitment to safety.

Uranium Enrichment D&D Tax

Although the industry fully supports the complete D&D of the gaseous diffusion plants, NEI strongly opposes any recommendation to reinstate a uranium enrichment decontamination and decommissioning tax on the industry. Producers and consumers of electricity should not be forced to bear the additional financial burden of this unwarranted tax. The Obama administration continues to propose reinstatement of this tax as a means of raising revenue despite the fact that industry has paid its share of the cleanup costs twice—first as part of the price for government uranium enrichment services and again as required by the Energy Policy Act of 1992. Under the 1992 law, the tax on electric utilities was to end after 15 years or the collection of \$2.25 billion, adjusted for inflation. The industry paid this amount in full. The three uranium enrichment plants in question operated for 25 years as Department of Defense facilities and were irretrievably contaminated long before any sales of enrichment services to the commercial nuclear industry.

Used Nuclear Fuel Management

Consistent with the Nuclear Waste Policy Act (NWPA), Congress should provide sufficient funds to DOE and NRC to make progress toward completing the license for the proposed Yucca Mountain repository. Specifically, NRC and DOE should be funded to prepare a plan for resuming the review of the Yucca Mountain license application. The plan should identify an optimal funding level, and the estimated time for completion of the review and the impacts of suboptimal funding. The plan also should address legislative action that may be necessary to support the issuance of the construction authorization.

The industry supports comprehensive reform of the federal program by establishing a new organization dedicated solely to implementing the nuclear waste management program and empowered with the authority and resources to succeed. This new management entity should have direct access to future revenues in the Nuclear Waste Fund and access to the balance of the fund. The program should focus on developing one or more consolidated storage facilities for used nuclear fuel (which might be an early receipt facility at the repository) while making substantial progress toward developing a repository for ultimate disposal of this material. Recognizing the challenges of immediate comprehensive reform, NEI requests the DOE be funded to develop and implement a transportation plan, including acquisition of hardware for moving used fuel in existing storage containers from shutdown reactor sites no later than 2021. This effort would support the Yucca Mountain repository program and efforts to develop a consolidated interim storage facility.

Likewise, delays in the government program to manage used fuel have resulted in extended use of dry container storage systems at commercial nuclear reactor sites. DOE's demonstration program on high-burnup used fuel dry storage will provide technical data to support the continued container storage of high-burnup used fuel as well as the transportation of this fuel to a repository or consolidated storage facility. The industry fully supports this important project and further recommends funding for DOE to pursue multiple options to develop the capability to open a commercial dry transportation container for detailed fuel examination in a hot cell facility. Such a facility will support the development of DOE's used fuel management system by providing vital data that cannot otherwise be obtained.

Small Modular Reactors (SMRs)

The industry supports the continuation of the SMR program in partnership with the private sector. Continued investment by the federal government as a cost-sharing partner is necessary and prudent to prepare SMRs for early development in the United States and to ensure U.S. leadership in the global market.

Developing this technology will help U.S. companies claim a large portion of the international market for smaller, carbon-free energy sources. In the U.S., the electricity generation sector is undergoing significant changes: expansion of intermittent resources like wind and solar, which create operational challenges for grid operators; continued expansion of natural gas-powered generation; retirement of as much as 20 percent of our coal-fired generating capacity; competitive market structure challenges; and proposed new EPA regulations on limiting carbon emissions. SMRs will provide energy companies with an additional low-carbon electric generating option as they respond to these market forces and will complement large, advanced reactor designs. Given the benefits to domestic job creation, export value and domestic clean electricity supply, the development of SMR technology today is an investment in our future. SMRs should receive sufficient support—both through the continuation of the six-year SMR

Licensing Technical Support program and investment to achieve NRC design certifications. Doing so will help provide America new low-carbon energy technology that is scalable while enhancing the international competitiveness of the domestic industry.

Advanced Reactor and Fuel Cycle Technologies

NEI supports programs managed by DOE's Office of Nuclear Energy that seek to accelerate the commercial use of new reactor technologies, sustain safe operation of existing reactors that provide two-thirds of American's carbon-free electricity and develop advanced fuel cycles to manage used nuclear fuel. The industry has formed a senior working group on advanced reactors and will provide additional insights as we develop them.

Mixed-Oxide (MOX) Fuel Fabrication Facility

NEI supports the timely completion and operation of the Mixed Oxide (MOX) Fuel Fabrication Facility at the Savannah River Site. Construction of the MOX facility is 65 percent complete, employs 1,800 people directly and uses more than 4,000 American contractors and suppliers in 43 states. Under the Plutonium Management Disposition Agreement, the United States committed to transform 34 metric tons of U.S. weapons-grade plutonium (enough plutonium for 17,000 nuclear weapons) into fuel for commercial power reactors. The administration's proposed fiscal year 2016 budget of \$345 million for the Mixed Oxide Fuel Fabrication Facility will ensure that construction continues at this critical national security project.

Environmental Management (EM)

NEI supports DOE's mission to complete the safe cleanup of legacy sites resulting from five decades of nuclear weapons development and government-sponsored nuclear technology research. NEI commends EM's footprint reduction to date of 91 of the original 107 sites across the country. The remaining sites represent significant challenges that the department must address for it to meet its commitments to affected communities and states. Adequate and reliable funding is essential to meeting these challenges.

The Department of Energy spends approximately 90 percent of its budget on contracts and large capital projects. In particular, the EM program relies on an array of contractors to carry out its diverse cleanup mission. It is critical that the department work in concert with industry to identify barriers to the effective execution of its objectives: risk reduction and the successful planning, construction and operation of large, often first-of-a-kind projects and facilities. Although DOE has made improvements, more progress can be made by encouraging robust competition from qualified firms through a transparent process that provides an appropriate balance of risk and reward and aligns contractor and taxpayer interests. The lessons learned from this engagement should be applied to future procurement projects so that the department can safely and reliably meet its commitments.

Testimony of April Snell, Executive Director, Oregon Water Resources Congress
Submitted to the United States House Appropriations Committee,
Subcommittee on Energy and Water Development

March 18, 2015

RE: FY 2016 Budget for the U.S. Army Corps of Engineers, Civil Works

The Oregon Water Resources Congress (OWRC) is concerned about continued reductions to the U.S. Army Corps of Engineers (USACE) Civil Works budget and is requesting that appropriations for this program be increased to at least **\$5.5 billion** in FY 2016. The USACE Civil Works program addresses vital water resource needs throughout the nation, and in Oregon, the USACE Northwestern Division operates on our two largest river systems, the Columbia River and the Willamette River, as well as maintaining Oregon's coastal rivers for navigation. OWRC is concerned that the proposed FY 2016 budget for the USACE Civil Works budget is woefully inadequate to meet the growing water infrastructure needs of Oregon and our nation as a whole. Increased funding would help support and leverage collaborative state level planning efforts that USACE is engaged in Oregon and nationwide. However, we are troubled by the efforts of USACE and the U.S Environmental Protection Agency (EPA) to increase regulatory authority under the Clean Water Act and the controversial "Waters of the US" draft rule. We urge the Subcommittee to direct funding towards addressing the critical infrastructure needs under the Civil Works program rather than provide funding to support counterproductive jurisdictional overreach.

OWRC was established in 1912 as a trade association to support the protection of water rights and promote the wise stewardship of water resources statewide. OWRC members are local governmental entities, which include irrigation districts, water control districts, drainage districts, water improvement districts, and other agricultural water suppliers that deliver water to roughly 1/3 of all irrigated land in Oregon. These water stewards operate complex water management systems, including water supply reservoirs, canals, pipelines, and hydropower production.

FY 2016 Appropriations

We recognize that our country is facing difficult economic times and that we must make strategic investments with scarce resources. The USACE Civil Works program is a perfect example of a budget that should have funding increased because the water infrastructure it encompasses directly contributes to the economy as well protecting public safety and the environment. The Civil Works program includes the development, management and restoration of water resources related to supply, navigability, flood control, hydropower, recreation, and fish and wildlife habitat across the nation. The Administration's proposed FY 2016 budget for the USACE Civil Works programs is only \$4.732 billion, which is a reduction from the FY 2015 enacted budget of \$5.455 billion. That amount is only a drop in the bucket compared to the numerous unmet water infrastructure needs nationally. OWRC feels strongly that USACE needs substantial increased funding to provide critical repairs on our nation's aging water infrastructure to prevent catastrophic failure, as well as address routine operations and maintenance on other infrastructure before it becomes unrepairable.

Willamette Basin Reservoir Study

OWRC is currently collaborating with a broad water resources constituency in support an ongoing effort to explore options related to the reallocation of stored water in the Willamette Basin dams operated by the USACE. The USACE Northwestern Division operates 13 dams and reservoirs in the Willamette Basin, with a combined storage capacity of over 1.6 million acre feet. Currently, only a small portion of the stored water is under contract for irrigation. Since the construction of the dams in the 1930s, Oregon has seen an increase in population, which in turn has spurred increased development, agriculture and a whole host of new demands on the reservoirs. Additionally, there are Endangered Species Act concerns and related fish restoration needs that were not contemplated when the facilities were constructed. As a result, there is strong interest within Oregon to complete the Willamette Basin Reservoir Study, and determine how the reservoirs can help meet the myriad of current and future water demands in the Willamette Basin.

The Oregon Water Resources Department (OWRD) has secured a 50% funding match (up to \$1.5 million) to support the study and that match was included as part of the Oregon's 2013-2015 budget. In February, USACE received notification that a match of \$450,000 was approved as part of their FY 2015 work plan. OWRC would like to see an additional match included in the USACE civil works budget FY 2016, and the Willamette Basin Reservoir Study incorporated into the USACE FY 2016 work plan. Federal funding would not only leverage scarce state resources but also the in-kind and direct contributions of other stakeholders participating in the project.

Planning Assistance to States

OWRC strongly supports providing funding for states to undertake planning activities to meet their water needs. Oregon is the model for watershed planning and does not need a new federal agency or Executive Branch office to oversee planning, however, federal funding and technical assistance is needed. Planning activities are conducted through local watershed councils, volunteer-driven organizations that work with local, state and federal agencies, economic and environmental interests, agricultural, industrial and municipal water users, local landowners, tribes, and other members of the community. There are over 60 individual watershed councils in Oregon that are already deeply engaged in watershed planning and restoration activities. Watershed planning in Oregon formally began in 1995 with the development of the Oregon Plan for Salmon Recovery and Watershed Enhancement, a statewide strategy developed in response to the federal listing of several fish species. This strategy led to the creation of the Oregon Watershed Enhancement Board (OWEB), a state agency and policy oversight board that funds and promotes voluntary and collaborative efforts that "help create and maintain healthy watersheds and natural habitats that support thriving communities and strong economies" in 1999.

Additionally, OWRC has been an active participant and supporter of the Integrated Water Resources Strategy (IWRS) adopted by the Oregon Water Resources Commission in August 2012. The IWRS is an important step forward in planning for the various water needs of Oregon but there is much more work to be done and little funding to implement. Providing funding for state-level planning activities will help support important efforts like the IWRS, and maximize the leveraging of state and federal resources, as well as providing viable models for other states

to replicate. This approach will help leverage scarce financial resources at both the state and federal level while promoting cooperation and collaborative solutions to complex water resources challenges.

Regulatory Guidance

Addressing our nation's critical water infrastructure requires a collaborative and long-term approach that needs to encompass a workable regulatory structure as well as adequate funding. There needs to be greater clarity about when and how the various regulations covering water infrastructure are applied. As previously stated, OWRC has concerns about the proposed WOTUS rule and would like to the USACE to include language from their Regulatory Guidance Letter (RGL 07-02 from July 4th, 2007) in the final WOTUS rule. This language would provide greater clarity and alleviate much of the concern and confusion our members have with the proposed rule. Without further clarity, the proposed rule will undoubtedly be increased litigation that will detract from efforts to address critical water infrastructure.

Conclusion

In conclusion, we respectfully request the appropriation of at least \$5.5 billion for the USACE Civil Works budget for FY 2016. The critical nature of the water infrastructure services the USACE provides requires a budget that matches the seriousness of the national need and the importance of the water supply, navigation, public safety, and other natural resources benefits it provides. Thank you for the opportunity to provide testimony regarding the FY 2016 budget for the U.S. Army Corps of Engineers.

Sincerely,

April Snell, Executive Director

Phone: 503-363-0121 Address: 437 Union St. NE, Salem, OR 97301

April Snell, Executive Director, Oregon Water Resources Congress
Testimony submitted to the United States House Appropriations Committee,
Subcommittee on Energy and Water Development

March 18, 2015

RE: U.S. Department of the Interior's FY 2016 Budget for the Bureau of Reclamation

The Oregon Water Resources Congress (OWRC) continues to support increased funding for the Bureau of Reclamation's (Reclamation) Water and Related Resources program and requests that a minimum of \$1 billion be included in the FY 2016 Budget. While we are encouraged by and supportive of the Administration's proposed \$58.1 for the WaterSMART program, we are concerned that the proposed FY 2016 budget of \$805.2 million for the Water and Related Resources program is woefully insufficient to meet the diverse water supply and infrastructure needs in the 17 Western States that Reclamation serves. Additional funding would help leverage other resources and collaborative partnerships through Reclamation's WaterSMART Initiative, as well as support increased coordination between other federal agencies on ecosystem restoration, climate change adaptation, and other water related challenges.

OWRC was established in 1912 as a trade association to support the protection of water rights and promote the wise stewardship of water resources statewide. OWRC members are local governmental entities, which include irrigation districts, water control districts, drainage districts, water improvement districts, and other agricultural water suppliers that deliver water to roughly 1/3 of all irrigated land in Oregon. These water stewards operate complex water management systems, including water supply reservoirs, canals, pipelines, and hydropower production. About one-half of our members are in Reclamation Projects. Additionally, most of our members have contracts with Reclamation or have been awarded grants under the WaterSMART program which has been greatly beneficial to districts meeting agricultural needs.

WaterSMART Initiative

OWRC strongly supports Reclamation's ongoing WaterSMART Initiative and increased funding for the WaterSMART Grants and Water Conservation Field Services Programs—the two programs used the most by Oregon's irrigation districts to support water conservation activities. These programs are an important part of the overall funding package for water resources projects collaboratively developed by local communities, supported with local and state funding, and designed to meet those communities' unique needs while still meeting the goal of water conservation.

Water Conservation Field Services Program (WCFSP)

The WCFSP is a key component in supporting irrigation districts' and similar water delivery systems' water conservation efforts. In the past the WCFSP has provided a breadth of technical assistance to irrigation districts and provided partial funding for materials used to pipe and line canals, measurement and other technology, and water conservation plans—all supporting water conservation efforts being implemented by these districts. While we are supportive of exploring innovative ways to utilize reclaimed and reused water, we continue to be concerned about funding a few expensive projects in limited areas while there are large unmet needs in the other

WaterSMART programs. Providing increased funding for WCFSP projects will yield more immediate and cost-effective water conservation measures in all 17 Western States.

The planning projects and technical assistance funded under the WCFSP are key components that help our member districts identify opportunities for water conservation through improved water management and capital investments. A lack of funding for the feasibility phase of projects is an impediment to the districts' ability to move forward with implementing water conservation projects like those listed below. This program provides seed money for both short and long term planning by districts and water users that results in helping Oregon meet the competing demands for water in basins throughout the state. Furthermore, technical assistance under this program can help water suppliers plan for and adapt to potential impacts from climate change.

Additionally, we believe the management of the WCFSP should remain with the Regional Offices in order to retain the close connection between Reclamation and Project managers and ensure that Reclamation's resources are used to best support the management of its Projects. The WCFSP is one of the Reclamation services most appreciated by our members. The regional staff, and particularly the local area office staff, understand the unique operating and delivery challenges of the various Projects, and therefore provide very meaningful support to the managers of those Projects.

WaterSMART Grants

WaterSMART cost-share grants have supported Oregon districts' efforts to improve water delivery systems, conserve water, and implement innovative projects to meet the water needs in our state. These projects have been a key ingredient to the districts' cooperative efforts with other stakeholders in their respective river basins to address in-stream, water quality, and water supply needs of their basins, without reducing the amount of land to which the districts deliver water, and avoiding regulatory actions by Federal or State agencies. There continues to be more applicants than available funding and additional financial resources are needed to enable local water suppliers to continue their work to conserve water and help meet the Secretary's water conservation goal. With a return of over \$5 for every \$1 of Federal investment, and non-federal match generally exceeding the required amount, this program far surpasses the results of other partnerships between the Federal government and local project sponsors.

Examples of Oregon Projects Funded through the WaterSMART Initiative

The following projects are examples of how Reclamation's WaterSMART Initiative is helping Oregon districts. More projects like these could be developed and implemented with additional federal support through the WaterSMART Program.

- ***Deschutes Basin Board of Control, Upper Deschutes Basin Study***- Reclamation will collaborate with the Deschutes Basin Board of Control and the Basin Study workgroup to complete a WaterSMART Basin Study. The study builds upon past work to update groundwater and surface water models, develop a basin specific climate analysis, update supply and demand projections and identify specific actions that can be taken to resolve water issues in the basin. Basin study results will be used to develop a long term basin-wide water management plan to guide sustainable water management actions in the future.
Reclamation Funding: \$750,000 State of Oregon Funding: \$750,000

- **Central Oregon Irrigation District, Juniper Ridge Phase II Piping Project** - The Central Oregon Irrigation District will convert 4,500 linear feet of the Pilot Butte canal to spiral wound, coated steel pipe, an improvement expected to result in water savings of 2,552 acre-feet each year. Through a partnership with the Deschutes River Conservancy, 2,000 acre-feet of conserved water will be allocated as a permanent instream flow to support water quality and habitat improvements in a reach of the Crooked River that is critical for endangered Middle Columbia Steelhead. The remaining 552 acre-feet of conserved water will be allocated for permanent instream flow in the middle Deschutes River. The District estimates that 543,343 kilowatt hours of energy savings annually will result from reduced pumping and also estimates that completion of the project will allow for as much as 3,727,545 kilowatt hours of additional power generation annually from the existing Juniper Ridge Hydroelectric Plant. **Reclamation Funding: \$1,500,000 Total Project Cost: \$6,531,166**
- **Vale Oregon Irrigation District, Willow Creek Pipeline Project** - The Vale Oregon Irrigation District will convert 61,439 linear feet of lateral canals to enclosed pipe to address seepage losses. The project is expected to result in 5,450 acre-feet of water savings annually, which will remain in Beulah Reservoir, benefitting threatened bull trout. Completion of a new pressurized system is expected to facilitate steps by landowners to convert from flood irrigation to sprinkler irrigation in the future. **Reclamation Funding: \$1,258,200 Total Project Cost: \$2,516,400**
- **Talent Irrigation District, Jasmine Water Conservation Project** - The Talent Irrigation District in Oregon will convert 1.3 miles of the open Talent Canal to pipelines to address seepage losses. This project is the last phase of an overall conservation project to pipe the lower 4.9 miles of the Talent Canal. The project is expected to result in water savings of 792 acre-feet annually. Conserved water will be stored in nearby reservoirs to enhance deliveries and make more water available for future use. **Reclamation Funding: \$205,643 Total Project Cost: \$411,287**

Additional innovative projects like the ones above could be developed and implemented in Oregon if more funding is made available through the WaterSMART Initiative.

Ecosystem Restoration

Additional funding to support collaborative ecosystem restoration efforts that align with the environmental aspects of Reclamation's mission is also important to OWRC and its members. Funding for the Columbia and Snake River Salmon Recovery Program is essential as Reclamation, the Bonneville Power Administration, the U.S. Army Corps of Engineers, and NOAA Fisheries prepare to implement reasonable and prudent alternatives to mitigate impacts to Columbia-Snake river salmon and steelhead under the new Federal Columbia River Power System Biological Opinion. We strongly encourage Reclamation to consider funding for fish passage and fish screening projects that can help meet these requirements. This type of funding could be leveraged with state and local efforts to maximize cost effectiveness and environmental benefits.

Furthermore, funding for the Klamath Project and the Klamath Basin Restoration Agreement will help support ongoing efforts to improve water supplies to meet the myriad of agricultural and environmental needs that depend upon it. Providing funding for these types of collaborative restoration efforts will lead to implementable, cost-effective water resources solutions that help reduce conflict and expensive litigation.

Climate Change Adaptation and Aging Infrastructure

OWRC is supportive of developing strategies to address potential climate change related impacts to water resources. It is imperative that the nation's water infrastructure is capable of handling more frequent and severe weather events, changes in precipitation/snowpack, and other climate related impacts to water resources. Reclamation needs additional funding to coordinate and leverage state, local and other federal resources to support necessary evaluations and improvements of water infrastructure in the 17 Western States related to potential climate change impacts. Many of the 824 dams and reservoirs that Reclamation manages (and associated delivery systems) were built 50 to 100 years ago and are already in dire need of improvement. These improvements are costly and deferred maintenance leads to reduced system efficiency, water conservation, and in some instances catastrophic failure.

Providing funding to evaluate and improve water infrastructure in the face of climate change will ensure that Reclamation reservoirs and associated delivery systems can continue to provide essential water supplies used to grow food and other agricultural crops—a vital part of our local, state, and national economy, as well as ensuring food security. Reclamation's WaterSMART Basin Study program has proved to be an effective tool for analyzing the effects of climate change and drought and should be utilized more to address climate change. Past and future studies will prepare river basins throughout the 17 Western States for developing solutions to water shortages through conservation as well as building innovative new storage facilities, large and small.

We respectfully request the appropriation of at least \$1 billion for Reclamation's Water and Related Resources program for FY 2016. Providing increased funding for the WaterSMART Initiative and other related programs is a wise investment that will yield benefits for our nation's economy, environment, and communities that depend on water resources. Thank you for the opportunity to provide testimony regarding the FY 2016 budget for the U.S Bureau of Reclamation.

Sincerely,
April Snell, Executive Director
Phone: 503-363-0121 Address: 437 Union St. NE, Salem, OR 97301

OUTSIDE WITNESS TESTIMONY OF PHYLLIS CUTTINO
DIRECTOR, CLEAN ENERGY INITIATIVE, THE PEW CHARITABLE TRUSTS

April 3rd, 2015

Chairman Simpson, Ranking Member Kaptur, and members of the Subcommittee on Energy and Water Development, thank you for the opportunity to submit testimony on the Fiscal Year 2016 Energy and Water Appropriations bill. I represent The Pew Charitable Trusts' Clean Energy Initiative, which is focused on accelerating the transition to a clean energy economy so that the United States can take advantage of the economic, national security, and environmental benefits of these technologies. My testimony today addresses the Department of Energy's (DOE) FY'16 budget.

Pew is a non-profit, non-partisan organization dedicated to informing the public, improving public policy, and invigorating civic life. Pew's Clean Energy Initiative closely monitors clean energy investment around the world, U.S. competitiveness in the sector and the relationship between energy, climate, and national security, particularly as it relates to Department of Defense (DOD) operations and installations. We also highlight clean energy innovation and the importance of energy research and development (R&D) investments in addressing the challenges we face today.

As the members of this Subcommittee know, the American economy does not stand still. Our country has always been at the forefront of technological innovation. Research, development, and demonstration of new technologies have helped make the United States one of the strongest, most innovative, and entrepreneurial countries in the world. Innovation in telecommunications, transportation, manufacturing, and advanced military technology helped fuel economic progress in the 20th century and will be vital to our competitive position in the future.

However, the energy sector has been a bit slower to innovate. For more than 100 years, we have relied on gasoline and internal combustion engines in the transportation sector and centralized power plants for electricity. In the aftermath of the Arab oil embargoes, the U.S. government began to lead a major effort to encourage energy innovations. Research and development takes a long time – 30 years or more – to move from the laboratory to the living room. In the 1970s, the National Renewable Energy Laboratory was created and other national labs took up the energy innovation challenge. And we are reaping the rewards of those efforts.

Dramatic change in the energy sector is now occurring as an array of new technologies – many of them initiated through Department of Energy research initiatives – penetrate the marketplace. Energy efficiency research has helped the United States reduce consumption and save hundreds of billions of dollars as Americans have adopted LED lightbulbs, better windows, and enhanced heating and cooling technologies. Even though our economy is expanding, there has been virtually no increase in electricity use since 2008. Gasoline consumption for cars is down 8.5 percent since 2005 thanks to efficiency improvements and alternative fuels development.

Neither fracking nor the dramatic gains in renewable energy would have been possible without government-funded energy research. Since 2007, the U.S. clean energy sector has attracted more than \$380 billion in private investment, technology prices have come down dramatically and between one-third and one-half of all new electric generating capacity has been renewable.

Wind and solar capacity has tripled since 2008. Looking ahead, the Department of Energy projects that wind and solar will account for well over half of the new generating capacity installed in 2015.

Mr. Chairman, America's patient, persistent, and creative investment in clean energy technologies is paying off. We are witnessing a golden age of energy innovation.

All of these trends are producing positive impacts for the American people. Economically, we've seen our balance of trade improve because we are importing less oil. Stable and relatively low energy prices are good for consumers and have spurred increased manufacturing activity. Our reduced reliance on imported petroleum is enhancing our national security and distributed generation has increased the resilience in our electricity system and provided consumers with additional choices. And we are making progress toward national goals in terms of doing our part to reduce carbon emissions.

In short, our economy is stronger, our country is more secure, and the environment is cleaner. The lesson is clear – diversification and advanced energy technologies achieved through renewable and other energy research and development programs must be cornerstones of U.S. energy policy.

My testimony today is in support of the President's Fiscal Year 2016 Budget Request of \$2.7 billion for energy R&D investment within the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) and a recommendation to increase the Advanced Research Projects Agency- Energy's (ARPA-E) funding levels to \$1 billion.

Investments in clean energy not only create domestic opportunities by creating jobs, enhancing our manufacturing base, and reducing carbon pollution, but also aid in exporting technologies into developing markets and improving our competitive position in one of the most significant global growth sectors of this century. Between today and 2030, 70 percent of the new power capacity worldwide is expected to come from renewable sources. And, America has been at the leading edge of innovation. U.S. firms excel in the production and sale of complex, high-margin, and performance-critical goods necessary for the development of wind, solar, and energy smart technologies. Strengths in our nation's innovation and entrepreneurship have yielded a \$1.63 billion clean energy trade surplus over China. Funding decisions made by the Subcommittee will impact how our country fairs in the race to win the global clean energy market.

I would like to highlight a few EERE R&D programs and initiatives that are contributing to improvements we see in the marketplace today.

Encouraging Renewable Energy Deployment

As mentioned, the United States has seen tremendous growth in the solar and wind industry in response to successful federal programs and incentives that have driven down costs and encouraged deployment of new technologies. Partnerships among researchers, industry, and the Department of Energy are crucial in continuing to foster breakthroughs in technology maturation and deployment. R&D collaborations and incentives have already helped to double the nation's solar power capacity between 2008 and 2012, reduce costs by more than 56 percent since 2010, and stimulate job growth. Power generation from wind in the U.S. is enough to supply over 15

million homes, while supporting 550 domestic manufacturing facilities and over 50,000 full-time jobs.

The SunShot Initiative within DOE is well on its way towards the goal of making the solar industry cost-competitive with conventional electricity sources by 2020. This initiative alone is projected to help create 390,000 more solar jobs and lower consumer energy costs by 14 percent, or about \$20 billion annually, by 2050. The DOE's Wind Program has made tremendous strides by providing financial support and expertise in creating first-of-its-kind facilities to test and certify new turbine blades and components, supporting domestic developers. The program is also now in the midst of facilitating the first offshore wind demonstration project, helping to open-up brand new markets here in the U.S. while increasing our competitiveness globally.

Other programs within EERE are contributing to a cleaner, cost-effective power sector but substantive R&D investments are critical if the U.S. is to continue innovating and lead these industries.

Supporting Sustainable Transportation

Through R&D funding, DOE's Vehicles Technologies Office is finding new ways to make cars and trucks more fuel efficient, allowing consumers to travel further on a gallon of gas and reducing our nation's dependence on foreign oil. Various initiatives and challenges have lowered the costs of electric vehicle components and helped to remove market barriers with a goal of making the U.S. the first country to produce a wide array of plug-in vehicle models that are as affordable and convenient as gasoline-powered cars by 2022.

Rising economic activity in the U.S. is expected to increase fuel demand in medium and heavy-duty trucks by 40 percent by the year 2040 – making efficiency improvements for these vehicles critical for our national security and the freight shipping industry. EERE is collaborating with national laboratory experts and major truck and engine manufacturers to create efficiency gains and has already demonstrated over a 70 percent improvement in Class 8 tractor-trailers. The program hopes to build on its success by launching additional initiatives to capture further improvements.

The Bioenergy Technology Office, through a Memorandum of Understanding (MOU) with the Department of Defense and the U.S. Department of Agriculture (USDA), provides critical support for advanced biofuels for use by the military under the Defense Production Act. Last September, DOE, USDA, and DOD jointly announced \$210 million in funding to accelerate the construction of three bio-refineries for cost-competitive, advanced biofuels production with the capability of producing drop-in, military-compatible fuels that can be used in our most advanced warfighting platforms and by commercial industry. These investments are expected to attract more than \$700 million of private sector funds. Pew supports DOE's request for \$45 million in FY'16 appropriations to continue contributing to its commitment of \$170 million under the MOU.

Advancing Domestic Manufacturing

Through the Clean Energy Manufacturing Initiative, government investment supports manufacturing partnerships that create and deploy new capabilities, products, and processes – improving overall production. The Advanced Manufacturing Office supports four existing Clean Energy Manufacturing Innovation Institutes which work to address significant technological

challenges the private sector is unable to do without government support. With the help of Congress, this initiative can be further expanded in FY'16.

The recently announced Institute for Advanced Composites Manufacturing Innovation, led by the University of Tennessee, is set to help lower manufacturing costs of advanced composites by 50 percent while also reducing energy intensity over the next ten years. These could help manufacturers deliver more advanced and affordable products such as lightweight vehicles, longer wind turbine blades, and more efficient industrial equipment. With \$70 million in federal funds, the Institute will leverage more than \$180 million in private funds and the expertise of over 120 companies, universities, laboratories, and consortia members in order to help pioneer this new manufacturing industry.

These are only a few examples of the DOE programs that are helping to reduce technology costs, remove market barriers, and leverage public-private partnerships across clean energy sectors. Still, significant work remains if our country is to be the leader in this global competitive market.

Spurring Innovation

The Subcommittee should fund ARPA-E at the \$1 billion level in Fiscal Year 2016. This program invests in high-risk, high-reward projects that require investments in order to demonstrate viability in the marketplace but are too early in the development stage to attract private sector capital. Since its initial funding in 2009, the agency has proven successful in developing new start-up companies, enhancing government partnerships with the private sector, and attracting follow-on commercial investments in advanced energy technologies.

To date, the program has invested over \$1.1 billion across more than 400 transformative energy projects ranging from lightweight metals, to robust battery chemistries, and new plant-derived fuels. More than 67 projects have either resulted in the formation of new companies or partnerships with other government agencies to advance the technologies. Additionally, 34 ARPA-E projects have attracted more than \$850 million in private-sector follow-on funding after ARPA-E's investment of approximately \$135 million.

With additional federal support, ARPA-E can build on its momentum – strengthening investments in the next generation of technologies that will power the U.S. and signal the nation's commitment to continued leadership in energy innovation.

Conclusion

For the U.S. to compete in the global marketplace, significant investments in the way we generate, use, and store energy must be made now in order to create and lead the industries of tomorrow. U.S. Government investment in energy R&D has spurred new domestic markets that are observable today. However, current clean energy R&D investments are simply insufficient to generate the economic, national security, and environmental benefits our children and grandchildren need for a prosperous, secure and healthful future. If the U.S. is to regain the lead in this rapidly expanding sector – one that is expected to receive \$7 trillion globally in investments by 2030 – U.S. government funding in the clean energy technologies of today must be substantially increased. I urge the subcommittee to support the President's Budget Request of \$2.7 billion for The Department of Energy's Office of Renewable Energy and Energy Efficiency and strive to provide \$1 billion for the Advanced Research Projects Agency – Energy.

**Testimony of the Puyallup Tribe of Indians
Tribal Chairman Bill Sterud
House Committee on Appropriations on
Energy and Water Development and Related Agencies
Army Corps of Engineers
Fiscal Year 2016
April 6, 2015**

The Puyallup Tribe of Indians, a federally recognized Indian tribe with a reservation in Tacoma, Washington, appreciates the opportunity to provide written testimony in support of the U.S. Army Corps of Engineers Fiscal Year 2016 appropriations.

Specifically, the Puyallup Tribe of Indians requests that the Subcommittee on Energy and Water Development provide funding in the Fiscal Year 2015 budget for the U.S. Army Corps of Engineers for the replacement of the Buckley Barrier Dam and the Fish Trap associated with the dam to allow the Army Corps to meet its obligations under the Endangered Species Act and the U.S. to cease violation of the Tribe's Treaty Rights. Funding for replacement of the dam and fish trap is an urgent need as further delay will cause irreparable harm to a variety of species of salmon in the Northwest which the Puyallup Tribe relies on for food, economic, and cultural purposes.

Background

The Puyallup Tribe is a federally recognized Indian Tribe located in Tacoma, Washington. The Tribe's Reservation includes the Puyallup River, and its usual and accustomed fishing area includes both the Puyallup and White Rivers. For time immemorial, the Tribe has fished salmon species on these rivers. The Tribe has relied on salmon, three species of which are listed under the Endangered Species Act, for food and cultural purposes, as well as an economic provider for Tribal members.

The Buckley Fish Trap and Diversion Dam (collectively "the Facility") is located in Buckley, Washington on the White River, which empties into the Puyallup River in Sumner, Washington, downstream of the Facility. The Facility is two separate components, a Diversion Dam that diverts water in Lake Tapps and the Fish Trap. The Diversion Dam was constructed in the early 1900's as part of the hydroelectric facility operated by Puget Sound Energy which created Lake Tapps and generated electricity from a no longer operating hydro power facility.

The Fish Trap was constructed in the 1940's as part of the construction of Mud Mountain Dam, which was built by and continues to be operated by the Army Corps of Engineers. The Fish Trap was constructed to allow the Corps of Engineers to execute its responsibility of moving migrating fish, in particular salmon, above Mud Mountain dam because the construction of Mud Mountain Dam completely blocked fish migration to their spawning grounds. The Fish Trap operation is a function of the Corps' responsibility to move fish above Mud Mountain Dam to prevent extinction of fish species. The continued operation of Mud Mountain Dam, which serves as a major flood control structure protecting key economic areas from flooding in the Puget

Sound Region, requires the Corps of Engineers to comply with the Endangered Species Act (“ESA”).

In 2007, the Army Corps was obligated to upgrade and repair the aging facility in a biological opinion issued under the ESA. In fact, the Army Corps had already been working with Tribes and other stakeholders for at least 5 years before the 2007 biological opinion to design Facility replacement and repair, including a new fish trap. In June of 2012 the Services reinitiated consultation under the Endangered Species Act because for 5 years since the initial Biological Opinion, the Corps of Engineers had failed to make any meaningful progress with Facility upgrades and repair. In October of 2014, the National Marine Fisheries issued its final Biological Opinion which included the replacement of the Buckley Fish Trap. To meet the deadline in the Biological Opinion for replacement, the Corps has been working to develop a design plan and design for the new barrier dam and fish trap facility.

Current Condition of the Facility

The Diversion Dam is deteriorated to the point of metal rebar and wood spears on the apron sticking out into flows where fish are repeatedly injured or killed trying to pass the diversion dam. The design and condition of the dam fails to provide adequate flows into the fish trap at the most critical time, increasing wait time and forcing fish to attempt to move past the dam, thereby impaling themselves on the disintegrating apron. As part of the early measures to be implemented in the Biological Opinion, work will be conducted on the dam to alleviate some of the damaged areas to prevent take of species.

The Fish Trap is too small to handle the fish returning to spawn, particularly in years where a growing pink salmon population returns, which occurs every two years. This past year, fish were backed up at the facility for over a mile, which causes delay in spawning, and an estimated 20% mortality for fish listed under the Endangered Species Act. The Trap itself is outdated in design, and often leads to endangered species being ripped in two during operation of the Trap.

Impacts to Fish from the Facility

1. **Fish Mortality.** Endangered Species, particularly spring Chinook salmon, are delayed in spawning, which leads to not only less efficient reproduction, but mortality before spawning, because the Diversion Dam injures or kills them as they repeatedly try to move past the dam. The Fish Trap is simply not able to accomplish the job of moving fish adequately as required as part of the Corps Operation of Mud Mountain Dam. It is estimated that there is a 20% mortality for fish listed under the ESA. This is too high to meet standards for incidental take and results in a violation of the Endangered Species Act.
2. **Loss of Fishing Opportunity and the Economic Benefits from Fishing.** The impacts to fish cause a loss of fish for both Tribal and Sport Fisherman. The Sports Fishing industry is a multi-million dollar industry in the region, and continued decline due to the Facility is heavily impacting a large economic opportunity for the region. Furthermore, the Corps of Engineers is interfering with the Tribes Treaty Right to fish by impacting the species survival and availability.

3. Diminishing Costly Restoration Efforts. Millions of dollars are spent in attempts to recover salmon species in Puget Sound yearly as a result of the listings of salmonid species under the Endangered Species Act. However, such efforts are diminished or completely rendered useless if the species cannot return to their spawning habitat due to the Facility's failure to move fish above Mud Mountain Dam.
4. Liability under the Endangered Species Act. The failures of the Army Corps of Engineers could lead to substantial liability for the agency under the Endangered Species Act. Such liability will be costly in federal dollars both in time to litigate such liability and implement any forced remedies as a result of such liability. Failure to comply with the Biological Opinion, and the timelines set therein, will give rise to additional liabilities. The Corps must maintain accountability, with interim milestones being met, to insure compliance with the Biological Opinion. There are concerns that the Corps is already behind its implementation.

Status of the Consultation Under the Endangered Species Act

The Corps is required, from the Biological Opinion, issued in October 2013, to replace the barrier dam and fish trap by 2020. The Biological Opinion sets out several criteria as to what the final facility should contain and the standards by which its operations will be measured.

The Tribe, Corps, and other interested parties have been working for almost a year to develop a basic facility design. The Corps has issued an Environmental Assessment as part of its obligations under the National Environmental Policy Act ("NEPA"). Yet, at this time, the Corps has not yet even decided on which bank the fish trap will be located. While the Corps is leaning towards the right bank, it has not performed, nor does it intend to perform, a model of the river to in fact determine if such a placement is feasible. Numerous Tribal Experts have communicated the need for hydrologic studies to properly evaluate the placement of the fish trap facility. Absent such information, time could prove that the placement of the facility, due to hydrologic conditions, on the opposite side of the river might not allow the facility to meet the performance criteria set forth in the biological opinion. The Corps has repeatedly argued that a study is not necessary and funds are not available for such a study. Yet it is moving forward with NEPA compliance.

Litigation Status

Two parties have initiated the litigation process for take under the Endangered Species Act with notices of intent to sue and the subsequent filing of complaints. While the Biological Opinion has responded to some of the issues in the lawsuits, additional issues are being discussed through the settlement process.

Basis for ESA Liability

Section 7 of the ESA requires that federal activities not result in jeopardy under the ESA. Jeopardy is an action that "reduce[s] appreciably the likelihood of both the survival and recovery of a listed species in the wild." 50 C.F.R. § 402.02. The Biological Opinion under Section 7 found that the operation of Mud Mountain Dam jeopardized listed species and called for

replacement of the dam and fish trap to avoid jeopardy. The Corps already failed to carry out the requirements of the 2007 biological opinion. If the new facility fails due to inadequate design and planning, the Corps could fail to meet its performance standards in the Biological Opinion and continue to be liable under the ESA. Failure under the Biological Opinion will be costly in both replacement cost and litigation costs.

The Corps is also violating Section 9 of the ESA which prohibits the taking of listed species. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, trap, capture, or collect." By operating Mud Mountain Dam, the Corps blocked migratory routes of listed fish. The Corps utilizes the Buckley Dam and Fish Trap to move fish above Mud Mountain Dam, but in doing so, the current facility causes significant delay and injures and wounds the fish. Harm includes delays or impairment of essential behavioral patterns. Continuing to take fish if this design fails by the deadline imposed will lead to additional, and illegal, take of listed species.

In addition to the take associated with upstream migration of fish, the facility also currently takes listed species due to the repeated maintenance that is required to maintain the dam. Frequent repairs require the Corps to restrict releases at Mud Mountain Dam. The repeated dewatering of the system during maintenance periods harms or kills reds of listed species and oftentimes leads to stranding of listed species. There is no time to realize a flawed basis for the design and start again. In the current design plans, answers remain as to whether maintenance for mechanical difficulties will again be required forcing restricted releases and insufficient water for fish.

Request for Funding

The Army Corps of Engineers 2015 Budget did not contain ANY funding for this project. While we have been assured by the Corps that additional funding will be available after a document is submitted this spring, there are no identified sources for this funding. In addition, it appears there is also no funding for any of the preliminary hydrologic studies required for a proper design and placement of the facility. We respectfully request that the Army Corps of Engineers budget include clearly identified funding for this project that is sufficient to ensure the facility design is adequate to meet the obligations imposed by the Biological Opinion. To short change the funding now leaves an unacceptable risk that the already costly project proves wholly ineffective in complying with the Biological Opinion and Endangered Species Act.

TESTIMONY OF
THE RED RIVER VALLEY ASSOCIATION
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
FY 2016 'CIVIL WORKS' – CORPS OF ENGINEERS
U.S. HOUSE OF REPRESENTATIVES

Mr. Chairman and members of the Committee, I am Dan York, RRVA President, and pleased to represent the Red River Valley Association, 629 Spring St., Shreveport, Louisiana. Our organization was founded in 1925 with the express purpose of uniting the citizens of Arkansas, Louisiana, Oklahoma and Texas to develop the land and water resources of the Red River Basin.

The resolutions contained herein were adopted by the Association during its 90th Annual Meeting in Shreveport, Louisiana, on February 19, 2015, and represent the combined concerns of the citizens of the Red River Basin area as they pertain to the goals of the Association.

The President's FY 2016 budget includes \$4.732 billion for the civil works programs, which is \$735 million less than what Congress enacted in FY 2015! What other agency was cut 14%? The Administration fails to recognize the Corps' critical role as stewards of our nation's water resources, and the vital importance of our water resources infrastructure to our nation's economic well-being. It is obvious that the intent of Congress is to fund civil works projects, but the Administration has ignored Congress. This funding level does not come close to the real needs of our nation. A more realistic funding level to meet the existing needs of the civil works program is \$6 billion for FY 2016.

The traditional civil works programs remain at the low, unacceptable level as in past years. These projects are the backbone to our nation's infrastructure for waterways, flood risk reduction, water supply, recreation and ecosystem restoration. We remind you that civil works projects are a true 'jobs program' in that up to 85% of project development funding is contracted to the private sector; 100% of the construction, as well as much of the architect and engineering work. Not only do these projects provide jobs, but provide economic development opportunities for our communities to grow and prosper, creating permanent jobs. We encourage Congress to increase the 'water' share of the total Energy and Water Bill closer to the \$6 billion appropriation for civil works projects.

We want to express our appreciation to the Appropriation Subcommittee on Energy & Water for including in the FY2015 Omnibus; Consolidated and Further Continuing Appropriations Act, the provisions for 'Additional Funds'. These provision, in the GI, CG & O&M accounts, provided the opportunity for underfunded projects to receive critical additional funding, such as O&M maintenance dredging for waterways. With the disappointing budget submitted by the Administration this may be the only process to receive needed funding to remain operational. We strongly encourage Congress to pass a FY 2016 Appropriation Bill with these provisions.

We have great concerns over the issue of the 'earmark ban'. Civil Works projects are not earmarks and should be redefined! Civil Works projects go through a vetted process; reconnaissance study, feasibility study, benefit to cost ratio test, EIS, peer review, review by

agencies, public review and comment, final Chief of Engineer approval, authorization by Congress in a WRDA bill and signed into law by the President. No other federal program goes through such a rigorous approval process. Each justified project ‘stands alone’ and is proven to be of national interest and should be funded by project. For most projects there is local sponsor cost sharing during the feasibility study, construction and for O&M. Those who have contributed, in most cases – millions of dollars – to the process, must have the ability to have a say for their projects to get funded. That voice is through their Congressional delegation. We believe that true earmarks are not in the national interest, but it does not pertain to the civil works program. For civil works it is an issue of priority of projects to be funded and who will determine that priority, OMB or Congress! We hope Congress takes back their responsibility to determine civil works priorities and to determine how its citizens’ tax dollars are spent. The energy & water appropriation bill is not an earmark bill, it is a project bill.

I would now like to comment on some of our specific issues for the future economic well being of the citizens residing in the four state Red River Basin region.

Navigation: The J. Bennett Johnston Waterway is living up to the expectations of the benefits projected. We are proud of our public ports, municipalities, private industry and state agencies that have created this success. This upward ‘trend’ in usage will continue as new industries commence operations. A major German company, Benteler Steel/Tube, has construction on a \$900 million pipe manufacturing facility at the Caddo-Bossier Port and will be operational August 2015. The facility will have 675 permanent employees. Cool Planet has commenced construction for a bio-refinery at the Alexandria Regional Port, with a second refinery expected at the Natchitoches Parish Port. These plants will use wood waste and forest byproducts from the timber industry in the region. American Specialty Alloys announced a \$2.4 billion aluminum mill for automotive and aerospace products. Their plant will hire 1,400 full time employees over a five year period and much of their in-coming cargo will be on the Waterway. These projects are proof of the Waterway growth as is the fact that there are many more industries considering using our Waterway and locating at the public ports, as well as consideration for private terminals.

We have a serious issue with the J. Bennett Johnston Waterway O&M in the President’s budget. The FY 2016 budget proposal of \$8,782,000, for O&M for the J. Bennett Johnston Waterway, is \$1,919,450 less than enacted in FY 2015 (\$10,701,450). This is far short of the \$11 million basic, minimum O&M requirement to maintain the Waterway at the authorized 9’ by 200’ channel. If the required basic funding level is not appropriated the Waterway may actually shut down to all traffic and industry will see the Waterway as unreliable and choose alternative modes of transportation, impacting jobs.

The Inland Marine Transportation System (IMTS), an internal Corps program, is implementing a ‘lock level of service’ mandate. This mandate will determine the hours of operations at each lock based on annual commercial lockages and we question what benefits are realized as compared to the negative impact on industry. This mandate will impact the reliability of waterways creating a downward spiral of users insuring the failure of tributary waterways. The J. Bennett Johnston Waterway was authorized into law and required to operate 24 hours, 7 days a week, 365 days a year, with a 9’ by 200’ channel. We believe the federal government has an obligation to operate

and maintain this Waterway as directed by law. We do appreciate that the USACE, Vicksburg District has considered the growth potential and that this is a young Waterway in terms of economic development and has maintained our locks at full service levels.

The only metrics used by the Corps of Engineers is tons moving on inland waterways. This is unrealistic. It does not reflect the true benefits of waterways. Using these metrics to determine 'high' and 'low' use waterways may be the Corps' way to determine where to apply budget cuts, but it is sending the message that our waterways are failures! Since navigation projects are 100% federal responsibility, it is the Corps that has failed. We believe railroads are using these metrics of failure and drastic budget cuts to convince industry that waterborne transportation is unreliable and undependable. Waterborne transportation is the only competition to long haul rail.

The primary justification for navigation projects was the national benefit of reduced transportation costs, known as 'water compelled' rates. If waterways are threatened or closed then railroads will have a monopoly and transportation rates will greatly increase for all industries. Cargos will shift back to highways, putting more trucks on our already congested highways. Reducing reliability of waterways has a negative impact on transportation costs, highway congestion and increased air pollution and fuel consumption. Issues the Administration states they want to avoid.

Flood Risk Reduction: What will happen when we ignore our levee systems? We know the Red River levees in Arkansas do not meet federal standards, which is why we have the authorized project, 'Red River Below Denison Dam, TX, AR & LA'. Now is the time to bring these levees up to standards, before a major flood event, which one day will occur.

We continue to consider flood risk reduction a major objective and request continue funding the levee rehabilitation projects ongoing in Arkansas. Five of eleven levee sections have been completed and brought to federal standards. Approximately one third of the Red River Levee District (Lafayette County, AR) has been completed. The completion of this project has ceased due to the lack of Administration support. Congress cannot provide funding due to the earmark ban.

The levees in Louisiana have been incorporated into the Federal system; however, they do not meet current safety standards. These levees do not have a gravel surface roadway, threatening their integrity during times of flooding. It is essential for personnel to traverse the levees during a flood event to inspect them for problems. Without the gravel surface the vehicles will cause rutting, which can create conditions for the levees to fail. A gravel surface will insure inspection personnel can check the levees during the saturated conditions of a flood. This project is also authorized in the existing authorization.

There is an authorized project, Red River Below Denison Dam; AR & LA, which funds these levee projects and should be supported by the Administration and Congress.

Bank Stabilization: One of the most important, continuing programs, on the Red River is bank stabilization in SW Arkansas and North Louisiana under the authorized project - Red River Emergency Bank Protection. We must stop the loss of valuable farmland that erodes down the river and interferes with the navigation channel. In addition to the loss of farmland is the threat

to public utilities such as levees, roads, electric power lines and bridges, as well as increased dredging cost in the navigable waterway in Louisiana. These bank stabilization projects are compatible with subsequent navigation into Arkansas and we urge that they be continued in those locations designated by the Corps of Engineers to be the areas of highest priority.

The first phase of Dickson Revetment was completed before funding ceased due to the no earmark ban. The river is eroding the work that has been completed, since the lower end has been left unprotected and incomplete. It is difficult to understand that the millions of dollars spent will be lost, if the whole revetment project is not completed. The remaining project funding required is \$16,000,000; however, it could be completed in phases over a number of years.

The authorized project, Red River Emergency Bank Protection, which funds these bank stabilization projects should be supported by both the Administration and Congress.

Water Quality: The Assistant Secretary of the Army (Civil Works), in October 1998, agreed to support a re-evaluation of the Wichita River Basin tributary of the Chloride Control Project. The re-evaluation report was completed and the Director of Civil Works signed the Environmental Record of Decision. The plan was found to be economically justified. Then the ASA (CW) directed that construction would not proceed until a local sponsor was found to assume 100% of the O&M for the project. The 2007 WRDA Bill included language that clarified that all aspects of this project will be at full federal expense, to include O&M. Over the past years there has been a renewed interest by the Lugart-Altus Irrigation District to evaluate construction of Area VI, of the Chloride Control Project, in Oklahoma. They have obtained the support of many State and Federal legislators, as well as the Oklahoma Governor in support of a re-evaluation report.

The authorized project; Chloride Control Project, TX, OK, AR & LA, has the capability to continue construction in the Wichita River Basin in Texas and the re-evaluation study at Area VI in Oklahoma.

A private company, Good Earth Mechanics (GEM) has proposed a private venture to install 'solar ponds' to generate base load, renewable energy. They are working with the US Air Force and US Army to secure long term power contracts. This initiative (no government funding) could use all the salt water from the Texas and Oklahoma sources, which would greatly reduce the overall project cost. It is truly a win-win proposition.

The western areas of Texas and Oklahoma are water deprived and sorely need the Chloride Control Project. The need for water quality and quantity will increase over time and this project will assist in meeting those needs, as long as federal funding is appropriated to keep the project moving forward.

Thank you for the opportunity to present this testimony for the Red River Valley Association on behalf of the industries, organizations, municipalities and citizens we represent throughout the four state Red River Valley region. The Civil Works program directly relates to national security by investing in economic infrastructure. If waterways are closed companies will not relocate to other parts of the country – they will move over seas. If we do not invest now there will be a negative impact on our ability to compete in the world market threatening our national security.

Please direct your comments and questions to our Executive Director, Richard Brontoli, (318) 221-5233, E-mail: redriverva@hotmail.com, P.O. Box 709, Shreveport, LA 71162.

**TESTIMONY OF
THE RED RIVER WATERWAY COMMISSION
STATE OF LOUISIANA**

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES

FY 2016 'CIVIL WORKS' – U.S. ARMY CORPS OF ENGINEERS

Mr. Chairman and members of the Committee, I am Kenneth P. Guidry, Executive Director of the Red River Waterway Commission (RRWC), headquartered in Natchitoches, Louisiana. I thank you for the opportunity to submit this written testimony addressing FY 2016 'CIVIL WORKS' – U.S. ARMY CORPS OF ENGINEERS.

The RRWC, created in 1968, is a political subdivision of the State of Louisiana, and is the local sponsor for the U.S. Army Corps of Engineers (USACE) J. Bennett Johnston Waterway (Red River) Navigation Project. The RRWC boundaries include seven (7) Northwest and Central Louisiana parishes: Caddo, Bossier, Red River, Natchitoches, Grant, Rapides and Avoyelles; and, currently five (5) ports operating along the JBJWW (Red River).

First and foremost, thank you for passing the 2015 Omnibus Bill including the provisions for 'additional funds' for ongoing work that combined to provide critical funding for essential USACE functions such as O&M channel maintenance (dredging) on the JBJWW. Failure to do so would have been detrimental to the viability and success of the JBJWW which is why we respectfully urge you to pass a FY 2016 Appropriations Bill with similar 'additional funds' to bridge the funding shortfalls contained in the President's FY 2016 budget. These 'additional funds' are essential for the JBJWW to remain viable, operational, and successful. I feel certain, as in 2015, that our Congressional delegation will stand united to support this cause. The following two (2) items are absolutely essential to the JBJWW to be operational and successful: 1) annual O&M channel maintenance (dredging), and, 2) all five (5) of the Locks and Dams remain operating at a '24/7/365' Level of Service.

We are also pleased to report the findings of a December 2013 update on the Economic Impact of the Red River Waterway performed by LSU Professor Emeritus of Economics, Dr. Loren C. Scott of Loren C. Scott & Associates, Inc. The update statistically, empirically, and professionally confirms the positive impacts from the JBJWW. The RRWC, working together with others along the JBJWW, have brought over \$7.1B to the 7-parish region it serves. Outstanding as that dollar amount is, when adjusted for inflation and put into 2013 dollars, the figure jumps to almost \$9.9B. Said another way, ignoring the impacts of casinos, the Red River Waterway region benefited with over \$32 of new state and federal spending, over \$47 of new business sales, and over \$16 of new household earnings, for every \$1 of property tax collected. In terms of jobs, over 120,000 jobs have been created, directly and indirectly, because of the Red River Waterway.

By making the JBJWW navigable, new industries have been attracted to the region. In most cases, the newly attracted industries actually use the river to ship inbound or outbound cargo. Others do not directly use the river but still benefit from water-compelled rates (i.e., they use the option of barge transportation to get more favorable rates from other modes of transportation such as rail and trucking). Metrics that only consider the tons or number of lockages captures a miniscule part of the benefits associated with a waterway. It neglects the benefits from water-compelled rates – the number one benefit used to originally justify the navigation project. When rail rates dropped to match barge rates, companies did not use the waterway; however, they have realized the anticipated savings. This is not captured as a benefit or credited to the waterway being available and reliable. Rail and trucking freight rates would increase sharply without waterborne competition. Waterborne transportation is the only competition for long haul rail. When JBJWW Locks & Dams 4 & 5 were completed in 1995 rail rates fell to compete. Companies can use a reliable Waterway as leverage to keep rail rates down. If waterborne transportation became unreliable rail rates would increase having a negative, national impact.

What was once an unpredictable waterway is now a dynamic thoroughfare for commerce and economic development. With its prime location, the JBJWW remains a top choice for industrial and commercial businesses, visitors, and major fishing events. Recent developments include a \$1B project from CLECO near the Port of Alexandria, a \$900M project by Benteler Steel at the Caddo-Bossier Port, anticipated projects totaling \$170M from Cool Planet Energy Systems at the Ports of Alexandria and Natchitoches, and a recently announced \$2.4B aluminum-plate mill in Rapides Parish (ASA Project), as well as, the 2009 and 2012 BASS Bassmaster Classics and the 2013 FLW Forrest Wood Cup.

A note of concern is warranted regarding Giant Salvinia (*Salvinia molesta*). This aquatic fern, native to Brazil, is destructively invasive and a threat to the JBJWW and other bodies of water throughout the United States. It can double in biomass in as little as 2-3 days and is extremely detrimental to aquatic life and could threaten navigation along the JBJWW. Although it is recognized as a federally noxious weed, little or no regulatory action is taken to prevent the spread of this plant. We will continue our work addressing this matter and collaborating with local, state, and federal agencies. We recently became aware of, and plan to engage, the National Invasive Species Council (NISC) under the U.S. Department of the Interior.

In conclusion, the RRWC will continue to promote the JBJWW by raising awareness, identifying and developing opportunities for increased and enhanced lockages and tonnages, economic development, and recreational use. The JBJWW is a valuable resource for commerce, job creation, and recreation to our state, region, and nation, and we will work with the existing ports, carriers, shippers, agencies, and other users to support them in their missions.

Again, we thank you for the opportunity to submit our written testimony to you for consideration. Should you have any questions or require any additional information, please contact me: Kenneth P. Guidry, Executive Director, Red River Waterway Commission, (318) 352-7446, KenGuidry@RedRiverWaterway.com, P.O. Box 776, Natchitoches, LA 71458, www.redriverwaterway.com.



SOCIETY for INDUSTRIAL and APPLIED MATHEMATICS

3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA
Phone +1-215-382-9800
Fax +1-215-386-7999
www.siam.org • siam@siam.org

Official Written Testimony for Fiscal Year 2016

Submitted by: Dr. Pam Cook
President, Society for Industrial and Applied Mathematics (SIAM)
&
Dr. C. David Levermore, Vice President for Science Policy, SIAM

Submitted to: Subcommittee on Energy and Water Development
Committee on Appropriations, United States House of Representatives

Testimony on: Department of Energy Office of Science,
FY 2016 Appropriations

April 6, 2015

Summary: This written testimony is submitted on behalf of the Society for Industrial and Applied Mathematics (SIAM) to ask you to continue your support of the Department of Energy (DOE) Office of Science in fiscal year (FY) 2016 at the highest possible funding level. In particular, we urge you to provide robust support for the Applied Mathematics Program within the Office of Advanced Scientific Computing Research (ASCR) within the Office of Science. We also emphasize the importance of support for graduate students through the Computational Sciences Graduate Fellowship.

Written Testimony

We are Dr. Pam Cook, President, and Dr. David Levermore, Vice President for Science Policy, of the Society for Industrial and Applied Mathematics (SIAM). On behalf of SIAM, we are submitting this written testimony for the record to the Subcommittee on Energy and Water Development of the Committee on Appropriations of the U.S. House of Representatives.

SIAM has approximately 14,000 members, including applied and computational mathematicians, computer scientists, numerical analysts, engineers, statisticians, and mathematics educators. They work in industrial and service organizations, universities, colleges, and government agencies and laboratories all over the world. In addition, SIAM has over 500 institutional members—colleges, universities, corporations, and research organizations. SIAM members come from many different disciplines, but have a common interest in applying mathematics in partnership with computational science towards solving real-world problems.

First, we would like to emphasize how much SIAM appreciates your Committee's continued leadership on and recognition of the critical role of the Department of Energy (DOE) Office of Science and its support for mathematics, science, and engineering in enabling a strong U.S.



SOCIETY for INDUSTRIAL and APPLIED MATHEMATICS

3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA
Phone +1-215-382-9800
Fax +1-215-386-7999
www.siam.org - siam@siam.org

economy, workforce, and society. DOE was one of the first federal agencies to champion computational science as one of the three pillars of science, along with theory and experiment, and SIAM deeply appreciates and values DOE activities.

Today, we submit this testimony to ask you to continue your support of the DOE Office of Science in FY 2016 and beyond. In particular, ***we request that you provide the Office of Science with the budget request level of \$5.34 billion in funding for FY 2016.*** SIAM recognizes the challenging fiscal situation; however, we also face an “innovation deficit,” the widening gap between the actual level of federal government funding for research and what the investment needs to be if the U.S. is to remain the world’s innovation leader. Federal investments in mathematics, science, and engineering remain crucial as they power innovation and economic growth upon which our economy and fiscal health depend.

The Role of Mathematics in Meeting Energy Challenges

The nation faces critical challenges in energy, including in energy efficiency, renewable energy, improved use of fossil fuels and nuclear energy, future energy sources, and reduced environmental impacts of energy production and use. As DOE and the research community design a long-term strategy to tackle these issues, the tools of mathematics and computational science (theory, modeling, and simulation) have emerged as a central element in designing new materials, predicting the impact of new systems and technologies, and better managing existing resources.

To tackle many of these challenges, DOE must be able to understand complex systems such as the US power grid, the dispersion of nuclear radiation after a disaster, and the Earth’s climate system. These and other complex systems have high levels of uncertainty, lack master plans, and are susceptible to breakdowns that could have catastrophic consequences. Understanding complex systems helps mitigate these risks and facilitate the development of controls and strategies to make systems more efficient.

Applied mathematics and computational science play a key role in predictive modeling and analysis to understand complex systems. Already, mathematical and computing researchers using these tools have made substantial progress in improving our understanding across fields such as genomics, biofuels, materials fabrication, and nuclear security. Extreme-scale computing, or exascale, will allow predictive modeling and simulation of complex systems far more comprehensively and accurately than is possible today. While achieving exascale computing has the potential to allow for revolutionary advances in many fields critical to solving our energy challenges, getting to exascale and realizing its benefits requires overcoming significant computing challenges, including in applied mathematics.



SOCIETY for INDUSTRIAL and APPLIED MATHEMATICS

3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA
Phone +1-215-382-9800
Fax +1-215-386-7999
www.siam.org · siam@siam.org

Department of Energy Office of Science

Activities within the Office of Advanced Scientific Computing Research (ASCR) play a key role in supporting research that begins to fulfill the needs described above. Particularly critical programs include: the Applied Mathematics program, the Scientific Discovery through Advanced Computing (SciDAC) program, and programs to maintain the pipeline of the mathematical workforce. For FY 2016, we ask that you provide the President's budget request of \$621 million for ASCR.

SIAM supports ASCR's new all-in approach on research to develop exascale computing, noting that investments in mathematical modeling, algorithm research, and software development are essential to realizing the full benefits of this next generation of high performance computers and to transferring their capabilities to industry for broad economic benefit.

SIAM also supports Office of Science plans to fund research to manage ever-growing data volumes in science. The explosion in data available to scientists from advances in experimental equipment, simulation techniques, and computer power is well known, and applied mathematics has an important role to play in developing the methods and tools to translate this shower of numbers into new knowledge.

In addition to the critical research within ASCR, SIAM endorses the Administration's proposal to provide \$12 million for Computational Materials Sciences within the Office of Basic Energy Sciences (BES). This initiative brings together computational approaches with experimental research to improve our ability to design new materials with key properties for energy uses.

Supporting the Pipeline of Mathematicians and Scientists

SIAM is grateful to Congress for funding the Computational Sciences Graduate Fellowships (CSGF) in FY 2015 and supports the Administration's proposal to provide \$10 million in FY 2016 for this critical program that maintains the pipeline of the mathematical workforce. Researchers trained in computational science and working in universities, national laboratories, and industry are central to DOE's mission and essential to propel advances in DOE mission-critical fields such as nanotechnology, biofuels, genomics, and materials fabrication. CSGF helps ensure the existence of an adequate supply of scientists and engineers with strong computational research experience and close ongoing ties to DOE to meet future national workforce needs. ***We urge Congress to provide the President's budget request of \$10 million for CSGF in FY 2016.***

The CSGF has a long history of success at DOE. Connections to the national labs are integral to CSGF's success, as fellows train at DOE national labs and program requirements are closely tied to DOE mission needs. A 2011 Committee of Visitors (COV) report¹ evaluating CSGF found that the program has been highly successful at producing alumni with strong computational research experience and close ongoing ties to DOE. CSGF is a valuable program and a unique

¹ http://science.energy.gov/~media/ascr/ascac/pdf/reports/ASCAC_CSGF_Report_2011-Final.pdf



SOCIETY for INDUSTRIAL and APPLIED MATHEMATICS

3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA
Phone +1-215-382-9800
Fax +1-215-386-7999
www.siam.org · siam@siam.org

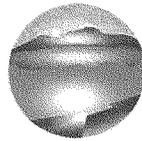
source of talent in the area of computational science where high performance computing is applied to challenging and important science and engineering problems.

Conclusion

The programs in the Office of Science, particularly those discussed above, are important elements of DOE's efforts to fulfill its mission. They contribute to the goals of dramatically transforming our current capabilities to develop new sources for renewable and low-carbon energy supplies and improve energy efficiency to ensure energy independence and facilitate DOE's effort to increase U.S. competitiveness by training and attracting the best scientific talent into DOE headquarters and laboratories, the American research enterprise, and the clean energy economy.

We would like to conclude by thanking you again for your ongoing support of the DOE Office of Science and the actions you have already taken to enable DOE and the research and education communities it supports, including thousands of SIAM members, to undertake the activities that contribute to the health, security, and economic strength of the U.S. The DOE Office of Science needs sustained annual funding to maintain our competitive edge in science and technology, and therefore we respectfully ask that you continue your support of these critical programs.

We appreciate the opportunity to provide testimony to the Committee on behalf of SIAM and look forward to providing any additional information or assistance you may ask of us during the FY 2016 appropriations process.



SOUTHEASTERN COLORADO
Water Conservancy District

"Your investment in water"

**Statement of James Broderick, Executive Director,
 Southeastern Colorado Water Conservancy District
 to the
 Subcommittee on Energy and Water Development,
 Appropriations Committee,
 U.S. House of Representatives**

**Regarding FY 2016 Appropriations
 for the
 Bureau of Reclamation,
 U.S. Department of the Interior**

April 6, 2015

Introduction

This statement is submitted in support of FY 2016 appropriations for the Bureau of Reclamation (Reclamation) by the Southeastern Colorado Water Conservancy District (District). The District is the repayment entity for the Bureau of Reclamation's Frypan-Arkansas Project (Fry-Ark Project) in Colorado. The Fry-Ark Project is a multi-purpose water supply project (irrigation, M&I, power, and fish and wildlife) consisting of several authorized features, some of which have yet to be constructed.

Appropriations Request

In the appropriation bills for fiscal years 2012, 2014, and 2015, Congress increased the total funding for Reclamation's water and related resources account over that in the President's request by \$50 million, \$44.3 million, and \$96.9 million, respectively. Congress included this unallocated increase to the water and related resources account in a line item titled "Additional Funding for Ongoing Work," with the increase distributed among several general "funding categories."

The District urges the committee to again increase the total funding for the water and related resources account for FY 2016. The President's budget request simply is not adequate to carry forward Reclamation's on-going work in a timely and efficient manner given the urgent need for, among other things, improved water supplies, extraordinary maintenance and replacement of aging infrastructure, and drought relief actions in much of the West.

In particular, the District urges the committee to change the title of the funding category called "Water Conservation and Delivery" to "Water Supply, Delivery, and Conservation Projects" so that it includes water supply projects. This would broaden the range of projects eligible for consideration by Reclamation when it allocates the money in this funding category. The District

further urges the committee to provide a meaningful increase in funding levels for this funding category, well above the \$8 million which was included in the FY 2015 appropriations.

The District also requests that new language be included in the committee report on the bill which makes it clear that on-going work on authorized Reclamation projects that would provide new sources of supply or additional water supplies fit within the retitled funding category and will be eligible for consideration by Reclamation. The suggested new language, embedded in the explanatory statement which accompanied the FY 2015 omnibus bill reported out by the conference committee of the House and the Senate, is as follow (proposed new language is underlined):

Additional Funding for Water and Related Resources Work—The agreement includes funds in addition to the budget request for Water and Related Resources studies, projects, and activities. Priority in allocating these funds should be given to advance and complete ongoing work; improve water supply reliability; improve water deliveries; enhance national, regional, or local economic development; promote job growth; advance tribal and nontribal water settlement studies and activities; or address critical backlog maintenance and rehabilitation activities. Funding provided under the heading “Water Supply, Delivery, and Conservation Projects” may be utilized for ongoing work, including pre-construction activities, on projects which provide new or existing water supplies through additional infrastructure; provided, however, that priority should be given in allocating funds to ongoing work on authorized projects for which environmental compliance has been completed. Funding provided under the heading “Western Drought Response” may be allocated to any authorized purposes.... This additional funding may be used alone or in combination with any other funding provided in a program, project, or activity.

Reclamation has projects underway which address the need for new sources of supply, or additional water supplies, for both irrigation and M&I purposes. The “Water Supply, Delivery, and Conservation Projects” funding category would encompass these projects, along with projects which conserve existing water supplies and improve the efficiency of delivering existing supplies.

On-Going Work on the Arkansas Valley Conduit

The Arkansas Valley Conduit (AVC) was included in the original 1962 authorizing legislation for the Fry-Ark Project. It is a regional surface water supply project which will deliver treated drinking water to nearly 40 small water providers serving farming and ranching communities in the lower Arkansas River Valley from east of Pueblo, Colorado, to the Colorado/Kansas state line. It will replace existing groundwater sources, the quality of which is inadequate.

Lower Arkansas River communities currently use groundwater wells to supply their drinking water. More and more towns have found that their groundwater contains naturally occurring cancer-causing radioactive contaminants, such as radium and uranium. 14 towns have water supplies containing radioactive elements in concentrations that exceed primary drinking water standards, as mandated by the federal Safe Drinking Water Act.

The Colorado Department of Health and Environment (CDPHE) has notified these water providers (via enforcement actions) that they must treat water supplies to remove these contaminants or find a better quality water source. Seven additional water providers have elevated levels of naturally occurring radioactive elements, but do not currently violate CDPHE standards.

In addition, water providers in the lower Arkansas are generally having difficulty meeting non-mandatory secondary drinking water standards for salts and sulfate. The median salts concentration over the past 40 years has been about 3,400 mg/L in lower Arkansas River Basin groundwater, which is nearly 7 times greater than the secondary drinking water standard. Like radionuclides, salts and sulfate are not removed by conventional water treatment methods.

Finally, some AVC water providers also are not meeting the secondary drinking water standard for iron. In 2014, one water provider was notified by CDPHE that it has "Industrial Wastewater Unpermitted Discharges", and that a Colorado Discharge Permit System may be required for its discharge of backwash water from iron removal filters. Simply replacing contaminated groundwater supplies with local surface water from the Arkansas River is problematic because the river downstream of Pueblo also contains high levels of selenium, sulfates, uranium, and salts.

To evaluate how best to address these circumstances, Reclamation prepared appraisal level plans and completed an EIS which evaluated several alternatives. A record of decision was issued in February, 2014. It concluded that individual community systems diverting from the Arkansas River would not secure a reliable long-term water supply for water providers to help meet projected future demands. Thus, a regional system was selected to take advantage of existing water treatment facilities at Pueblo and economies of scale. The selected regional system will be less costly than any of the alternatives in the draft EIS.

In 2009, the Fry-Ark authorizing act was amended to provide that 35 percent of the construction cost of the AVC would be allocated to local beneficiaries for repayment. This legislation further provided that miscellaneous revenues derived from payments made by non-federal entities pursuant to contracts executed after July 1, 2007, for the use of excess capacity in, and for water right exchanges using, Pueblo Reservoir will be applied to repay this 35 percent. Miscellaneous revenues will also be available to repay the remaining 65 percent of the cost of the AVC after the local share is repaid. Annual operation and maintenance costs will be borne by the AVC users.

**Statement of Rob Rash PE PLS
CEO/Chief Engineer
St. Francis Levee District of Arkansas
to the
U.S. House of Representative's Committee on Appropriations
Subcommittee on Energy and Water Development
on Behalf of the
Appropriation for Flood Control
Mississippi River and Tributaries Project
Request for Fiscal Year 2016**

March 20, 2015

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

My name is Rob Rash and I am the CEO/Chief Engineer of the St. Francis Levee District of Arkansas and the Executive Vice President of the Mississippi Valley Flood Control Association and I would like to respectfully request FY16 Mississippi River and Tributaries (MR&T) Appropriations in the amount of \$500 Million and to remember and remind you of the MR&T system performance in 2011 and 2012 AND for the last 86 years. The investment by the MR&T system in preparation for the 2011 flood ... resulted in more than \$246 billion worth of damages prevented by the MR&T system ... a return on federal investment of over 46 to 1. These prevented damages do not include the return for low water benefits. The hydraulic improvements made by the construction of dikes, cutoffs and channel improvements that allowed a record flood by volume to flow at a lower elevation, are the same improvements that allowed barge traffic to move during the near record low water experienced throughout the Mississippi River in 2012-2013.

First, let me thank the Congress for the support and funding you have provided in the past. This funding proves your awareness of the importance of flood control projects throughout the Mississippi River Valley and the value it provides this great Nation.

The Mississippi River and Tributaries Project was authorized following a record flood in 1927 that inundated more than 26,000 square miles of the Mississippi River Valley. Over 700,000 people were left homeless and many lives were lost. Most, if not all, East-West commerce was stopped and it adversely affected the economy and the environment of our great nation. After that devastating event Congress in its infinite wisdom passed a bill and established the Mississippi River and Tributaries Project and authorized the U. S. Army Corps of Engineers to develop a plan to prevent such a disaster in the future. This project currently is a separate line item in the budget. To remove it will destroy the continuity of this high value, high return, and much needed national investment.

To date the MR&T Project has prevented flood damages and provided other benefits resulting in a current benefit/cost ratio of over \$46 to \$1. Truly this is a wise investment for our nation. Likewise, countless lives have been spared due to the construction of this great system. Also, our nation receives three billion dollars of transportation rates savings each year largely due to

the current reliability of a navigation channel afforded by the MR&T System. It is readily seen this project had merit from the beginning and continues to reward the citizens not only of the valley itself but the citizens of the entire nation. It is a wise investment for this country and it is good for our economy. It will be a vital link to the defense of our nation in the event of an attack by our enemies. This project must be targeted for swift completion and proper maintenance. What an example of federal and local partnership and investment for our great nation this project has been and continues to be! I challenge you to find any other project of any nature which approaches the benefits of this system.

The performance of the comprehensive Mississippi River and Tributaries system and the Ohio Valley reservoir system during the 2011 flood on the lower Mississippi River validates the wise investment the nation made to prevent another calamitous natural disaster like the 1927 flood, the devastating event that changed America and forcibly unified its people to support protection of lives and property from the fury of the river. The MR&T system performed as designed, despite rainfall exceeding 600 to 1,000 percent of the normal average rainfall in a two-week period from April 21-May 3 over a significant portion of six states that coincided with the arrival of the upper Mississippi spring snowmelt crest. The significant flood event established many new record discharges and stages along the lower Ohio and Mississippi rivers. Unlike the 2011 flood, the Mississippi River during the benchmark and calamitous Great Flood of 1927 inundated most of the alluvial valley. Like the toppling of a series of dominoes, one overmatched levee after another burst under the unprecedented pressure exerted by the swollen river from excessive rainfall.

At a time when we need to stimulate our economy, at a time that safety from terrorist activities needs to be enhanced and at a time that many in our nation are concerned about cleaner air, cleaner water, etc., we have a great opportunity to meet those needs. We must make sound investments into our infrastructure which will give back more monies to the taxpayers of this country than was invested while at the same time increasing our defense capabilities should our nation be attacked from an outside force (the system provides an inner coast unexposed to arrival by sea).

Local interests have done their part in providing rights of way, roads, utilities and the like. Our government now needs to fulfill the federal obligation and "infrastructure investment" part of the system and bring it to completion as quickly as possible.

We believe the Corps could effectively deliver \$500 million each year (as a start) for maintenance and construction within the MR&T. We realize there are budgetary restraints this year and respectively request Congress to approve funding for maintenance and construction for the MR&T. The MR&T improvements I have talked about thus far have been the benefits for flood control. However, these benefits were also realized during the low flow event experienced on the Mississippi River. The hydraulic improvements that allowed a record flood event to pass at a 0.8 foot lower elevation in 2011 than in 1937, also allow barge traffic and a near record low event experienced in 2012-2013. If it were not for the MR&T system improvements barge traffic during the low water event would have been nonexistent.

We also thank you again for the understanding of our needs and the importance of the MR&T system by not allowing FEMA to charge mandatory flood insurance as defined below:

SEC. 107. MANDATORY COVERAGE AREAS.

(a) Special Flood Hazard Areas- Not later than 90 days after the date of enactment of this Act, the Director shall issue final regulations establishing a revised definition of areas of special flood hazards for purposes of the National Flood Insurance Program.

(b) Residual Risk Areas- The regulations required by subsection

(a) shall-- (2) require the expansion of areas of special flood hazards to include areas of residual risk, including areas that are located behind levees, dams, and other man-made structures.

(c) Mandatory Participation in National Flood Insurance Program-

(2) LIMITATION- The mandatory purchase requirement under paragraph (1) shall have no force or effect until the mapping of all residual risk areas in the United States that the Director determines essential in order to administer the National Flood Insurance Program, as required under section 19, are in the maintenance phase.

Thank you for understanding the tremendous negative impact this piece of legislation would have had on the entire Mississippi River Valley. Billions of dollars already spent on flood control structures would be negated because of needless MANDATORY flood insurance premiums. Please remember the 1928 flood control act recognizes the investment of the local people by initial construction and taxation of themselves for maintenance. This investment was over 200 million dollars in 1928 and totals more than 14 billion dollars today. Making the total federal and local investment in the MR&T system over 30 billion dollars. Because of this, it is still necessary to discuss the new policies being implemented by the Federal Emergency Management Agency in their Map Modernization Program.

The policy creates a New Zone "X" (shaded) designated area. This new designation shows all areas behind a levee as an unsafe place to live and recommends, among other things, an evacuation plan and flood insurance.

This designation renders all work done by local and federal organizations for the last 100 years, useless. Even if our levees are Federal Levees, have obtained the highest achievable maintenance rating and the passing of a record flood in 2011 this Zone "X" (shaded) designation will be placed on all new flood maps. Furthermore, the recommendations from the National Levee Safety Committee, if used, force unachievable maintenance standards and predatory flood plain management tactics. This will needlessly destroy economic development for over 22,000,000 acres of land in this country. Please do not use a "one size fits all" approach and place false fear in the minds of people living behind levees. We can inform without fear! These flood insurance premiums, because of the support of Congress, the hard work of the U.S. Army Corps of Engineers and local levee and drainage districts across this country, are not necessary but do create a nice funding mechanism for future disasters.

The Mississippi Valley Flood Control Association also asks the Congress to support the Upper Mississippi River Comprehensive Plan (UMRCP). The impact of the flood of 1993 on the Upper Mississippi was devastating leaving \$15 Billion in damages, loss of life and damage to 72,000 homes. In 2008 the Upper Mississippi was again ravaged by catastrophic flooding and again in 2011 flooding costs top \$360 Million in infrastructure damage. The Upper Mississippi River Comprehensive Plan's system approach and the Mississippi River and Tributaries Project needs to be properly funded for protection of the entire Mississippi River Valley.

The Mississippi Valley Flood Control Association also asks the Congress to support the Authorization and Appropriations for the dredging of MR&T and Non-MR&T Ports and Harbors. Flood Control and Navigation interests go hand in hand and you cannot have Flood Control without Navigation.

With the tragedy that struck the Gulf Coast and East Coast, we must now turn our attention to the future and attempt to make certain that at least the flooding does not take place again. We can prevent that; the Dutch, the English and the Italians have done it and so can we if we treat flood control as something that we must do. The citizens of this great nation deserve it and a productive economy must have the reliability for production and exports.

There are four anomalies of nature that cause death and destruction to our nation. They are (1) earthquakes, (2) hurricanes, (3) tornadoes and (4) floods. The first three we can do very little if anything about except to prepare for the worst. We can build protection against floods, against the "maximum probable flood", one that has an "improbable occurrence but nevertheless a remotely possible one".

In order to provide such protection we believe that four things must be done. First, the environmental laws, or at least the way they are interpreted for flood control projects, must be changed or we stand to lose more lives and have another absolute environmental catastrophe such as the one we have witnessed in New Orleans and along the Gulf Coast. Second, cancel all cost-sharing for flood control projects unless we do intend to only protect those that can afford it and ignore those that cannot. Third, relax the requirements for the benefit to cost ratio for flood control projects for one reason, it is impossible to assign a dollar value to a human life. Fourth, investment in infrastructure throughout the Mississippi River watershed. The United States has the largest inland waterway navigation/commerce system in the world. This water commerce system is positioned in the center of the country and the infrastructure is the envy of the civilized world. This system keeps us competitive in the world market and must be properly maintained and operated. It is our opinion that these things must be done, for without flood control, nothing else really matters. I close with a simple reminder. The MR&T system is not complete and therefore will not pass the Project Design Flood! Thank you for your leadership and the resulting \$100's of billions of dollars in damages averted because you supported and funded the greatest civil works project on the planet ... the MR&T!

Testimony Submitted By

The Village of Islamorada, Florida
The City of Marathon, Florida
The Key Largo Wastewater Treatment District

To the House Subcommittee on
Energy and Water Appropriations

March 20, 2015

The Village of Islamorada, the City of Marathon, and the Key Largo Wastewater Treatment District request that \$50,000,000 be added to the President's proposed FY16 budget in support of United States Army Corps of Engineers, Construction account, Environmental Infrastructure funding. Our three entities are the local sponsors for the Florida Keys Water Quality Improvement Program [FKWQIP] that is one of the efforts benefitting from the funding that this Subcommittee has provided for the Army Corps Environmental Infrastructure Program. Please be assured that we are not requesting an earmark for our local effort but are instead advocating that this Subcommittee provide funding for the total Environmental Infrastructure program. Under current policies, this allows local sponsors such as our three entities to compete for a share of the funds added by the Congress and awarded by the Corps each year via the Annual Work Plan.

Over the years and thanks to funding provided by this Subcommittee, the FKWQIP has received over \$47,000,000 in Corps Environmental Infrastructure funding. These funds are being used to construct advanced wastewater treatment systems in the Florida Keys that are protecting our Near Shore Waters including the only barrier reef in the continental US. These waters have been imperiled by thousands of septic systems and by storm water runoff which not only threaten their environmental health but also the tourism and fishing industries which are the economic engine that supports those living in the Florida Keys. Although only recently brought on line, our Advanced Wastewater Treatment Systems are already having an impact on our Near Shore waters in terms of decreases in pollutants such as phosphors and an increasingly healthy fish population.

All of this progress was set in motion by the creation of the Florida Keys National Marine Sanctuary in 1990 and was carried on through the authorization of the FKWQIP in the FY01 Consolidated Appropriation Act. The National Marine Sanctuary led to a mandate from the USEPA and the State of Florida that septic systems and package wastewater treatment plants must be replaced by Advanced Wastewater Treatment systems in order to protect our Near Shore Waters. The FKWQIP provided for a local/Federal funding partnership with the Army Corps of Engineers to help construct sewers. This partnership now includes the State of Florida that is providing additional funding assistance. Cooperation on funding is an essential part of

the FKWQIP process since providing sewers for the Florida Keys comes carries with it a price tag of over \$1 billion.

It is important to remember that only about 80,000 people live permanently in all the Keys despite the more than 4 million tourists visit each year. The cost of sewers including construction of plants, laying pipelines, connection to individual homes and businesses, the removal of old septic systems, and ongoing O&M is being borne by this small population. Indeed, the population of the Village of Islamorada, the City of Marathon, and the service area of the Key Largo Wastewater Treatment District totals fewer than 28,000 people. It is also important to remember that well over 90% of the Florida Keys is owned by either the Federal government or the State of Florida. Despite this fact, the burden of sewer construction and O&M, all for the purpose of protecting the Near-Shore Waters of the Keys, is being borne by only a few tens of thousands of people who own less than one-tenth of the area where they live.

The awarding of Corps Infrastructure Funding is put to work immediately constructing sewer treatment systems. But we also wish to call your attention to the longer-term implications for jobs in the Keys. Our economy is tourist based and depends upon clear, unpolluted waters that attract divers, fishermen, and all sorts of other visitors who come to enjoy our unique marine environment. When this resource is protected, the result is that visitors will continue to come to the Florida Keys and this in turn creates an economy that provides our local residents with over 30,000 jobs and billions in tourism related dollars.

The funding provided in your final bill in past years for Corps Environmental Infrastructure program represents a true investment for local sponsors such as us having both an immediate impact with regard to construction jobs which in turn lead to long-term gains in both environmental protection and our economy. We know that some suggest that local governments with needs such as ours should look to other, more traditional programs such as USEPA's Clean Water State Revolving Fund. But the Administration is proposing a more than 23% reduction in FY16 EPA Clean Water SRF funding. So heavily oversubscribed traditional sources of sewer funding do not represent the alternative that many suppose it to be.

Thank you again for your consideration of adding \$50,000,000 to the Corps of Engineers FY16 Construction Account for Section 219 Environmental Infrastructure. We hope that our testimony with regard to how Islamorada, Marathon, and the Key Largo Wastewater Treatment District have benefited from this program helps to support our request.



**Washington Suburban
Sanitary Commission**

14501 Sweitzer Lane • Laurel, Maryland 20707-5901

COMMISSIONERS
Omar M. Boulware, Chair
Hon. Adrienne A. Mandel, Vice Chair
Gene W. Courihan
Mary Hopkins-Navies
Chris Lawson
Dr. Roscoe M. Moore, Jr.

GENERAL MANAGER
Jerry N. Johnson

April 6, 2015

The Honorable Michael Simpson
Chairman
House Appropriations Committee
Energy and Water Subcommittee
2362-B Rayburn HOB
Washington, DC 20515-6020

The Honorable Marcy Kaptur
Ranking Member
House Appropriations Committee
Energy and Water Subcommittee
2362-B Rayburn HOB
Washington, DC 20515-6020

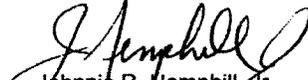
**RE: Washington Suburban Sanitary Commission (WSSC) Written
Testimony on Fiscal Year 2016 Budget**

Dear Chairman Simpson and Ranking Member Kaptur:

On behalf of WSSC General Manager and CEO, Jerry N. Johnson, I am pleased to transmit to you Mr. Johnson's statement in support of the \$2.7 billion proposed funding level for the Office of Energy Efficiency and Renewable Energy.

Thank you for providing the Washington Suburban Sanitary Commission the opportunity to submit a statement and for your continuing leadership.

Sincerely,


Johnnie R. Hemphill, Jr.
Chief of Staff

Attachment

cc: Jerry N. Johnson, General Manager/CEO, WSSC



**U.S. House Appropriations Committee
Energy and Water Subcommittee**

**Statement in Support of the US Department of Energy
Office of Energy Efficiency and Renewable Energy**

APRIL 2015

**STATEMENT OF: JERRY N. JOHNSON
GENERAL MANAGER/CEO
WASHINGTON SUBURBAN SANITARY
COMMISSION
14501 SWEITZER LANE
LAUREL, MARYLAND 20707**

I am Jerry N. Johnson, the General Manager and Chief Executive Officer of the Washington Suburban Sanitary Commission (WSSC).

I want to thank you, Chairman Simpson, and you Congresswoman Kaptur, on behalf of WSSC, for the opportunity to express our support for robust funding for the clean technology and renewable energy programs within the Department of Energy. In particular, we would like to highlight the need for full funding of the Department's Office of Energy Efficiency and Renewable Energy (Office). The federal grants, loans and loan guarantees that are funded out of this Office help create good, high-paying clean energy and green energy jobs across the United States, while at the same time protecting the environment for future generations.

As I will describe, WSSC received a grant from the Office in 2009 which is helping to facilitate the construction of a new facility that will use an advanced technology, anaerobic digestion, to help the environment while saving our ratepayers money. This is symbolic of the types of programs supported by the Office. **We therefore strongly encourage the Subcommittee to fund the Department of Energy's Office of Energy Efficiency and Renewable Energy at approximately \$2.72 billion – the level contained in the President's FY 2016 budget.**

Background on WSSC

By way of background, WSSC was established in 1918 and is the largest water and wastewater utility in Maryland and the Washington Metropolitan area and is also one of the largest in the nation with 11,000 miles of pipeline. Our service area spans nearly 1,000 square miles in Prince George's and Montgomery counties in Maryland, serving 1.8 million residents through approximately 460,000 customer accounts. WSSC manages two water filtration plants, seven wastewater treatment plants, nearly 5,600 miles of water mains and more than 5,400 miles of sewer mains. WSSC performs this work 24 hours a day, seven days a week, and always meets or exceeds federal standards for drinking water.

WSSC's goal is to be a leader in wastewater management, and a world class provider of safe, reliable water/wastewater services that protects the health, safety and quality of life for its customers. Wastewater is a broadly descriptive term generally used to mean any water that has been used by people and discharged into a sewer system. Wastewater management is the process of safely and effectively collecting and treating wastewater and returning it to the environment in a form that will have the least impact on people and the environment.

WSSC is able to accomplish this mission by being on the leading edge of leveraging clean technology and green technology. Wind power, hydropower, and energy efficient pumps are just a few of the technologies WSSC employs to efficiently use energy during the water and wastewater processes. This allows us to fulfill our goal of being good stewards of the environment, while simultaneously working to keep costs as low as possible for our ratepayers.

Three areas where WSSC is particularly active in leveraging clean and green technology are anaerobic digestion, wind power and solar power.

Anaerobic Digestion – WSSC aims to be a leader in anaerobic digestion, which is the natural decomposition of organic materials by microbes that thrive in an oxygen free environment. It is a biological process that converts a portion of the waste sludge to methane gas. This methane is in turn used to power clean-burning engines, producing electricity and heat needed for the digestion process.

In order to make this a reality, WSSC has proposed building a new facility at the Piscataway Wastewater Treatment Plant in Southern Prince George's County that will convert its biosolids plus biosolids received from other WSSC plants into electricity. The creation of this plant will accomplish four key goals:

- **Provide a Source of Renewable/Green Power.** WSSC's advanced wastewater treatment plants (AWWTPs) are large energy consumers. The upgrade would reduce the net energy consumption at the Piscataway AWWTP to zero.
- **Reduce the Amount of Biosolids Produced.** Anaerobic digestion would further cut biosolids production in half and eliminate chemical lime purchases, currently required for biosolids treatment. This has a positive effect on the environment.
- **Improve the Quality of Biosolids Produced.** Anaerobic digestion improves the quality of the biosolids that are produced, and results in a "Class A" biosolid (which has a higher standard of treatment and doesn't require special management practices to protect the public) rather than the currently produced "Class B lime stabilized" product, which is prone to odors and relies on a combination of treatment and best management practices to protect public health. In addition, anaerobic digesters can also convert restaurant grease waste for additional power – providing an environmentally sound reuse opportunity for a nuisance waste that currently clogs County sewers and causes overflows.
- **Significantly Reduce WSSC's Carbon Footprint.** The upgrades will dramatically reduce the electricity WSSC is required to purchase as well as the truckloads of biosolids leaving WSSC plants, while simultaneously eliminating current lime purchases. All of these improvements reduce the carbon footprint of each AWWTP, cutting the overall carbon-dioxide-equivalent emissions approximately in half.

One of the primary reasons that the proposed facility has progressed as far and as quickly as it has is that WSSC received a \$570,900 grant from the Department of Energy's Office of Energy Efficiency and Renewable Energy in 2009. The DOE grant allowed WSSC to conduct a feasibility study, create the initial conceptual design and determine the project's economic, environmental, and financial viability. It also allowed WSSC to investigate the feasibility of the anaerobic digestion/combined heat and power technology, which led WSSC to conclude that the Piscataway plant project was in fact feasible and make the final decision to move forward.

Had it not been for the DOE grant, WSSC might still be trying to do its initial feasibility study and the project would no doubt be well behind the current schedule.

Wind Power - In the spring of 2008, WSSC began using electricity generated by a wind farm in southwestern Pennsylvania, providing it with approximately 65,000-megawatt hours of power a year. In recent years, wind power has accounted for nearly 30% of WSSC's total electricity consumption. WSSC now receives approximately 85% of the energy generated from the wind farm and, *according to the U.S. Environmental Protection Agency, WSSC is the largest local government direct purchaser of renewable wind power in the United States.*

Importantly, the annual environmental benefits from WSSC's use of wind power include reductions of over 71 million lb./year of carbon dioxide, 500,000 lb./year of sulfur dioxide and over 161,000 lb./year of nitrogen compounds that lead to ozone production. This is the equivalent of taking 100,000 cars off the Capital Beltway.

Solar Power – Almost 17,000 solar panels are providing green power to two WSSC wastewater treatment plants. The two 2-megawatt (MW) ground-mounted installations, each with nearly 8,500 solar panels spanning several acres, were commissioned November 6, 2013 at the Western Branch Wastewater Treatment Plant in Upper Marlboro, Md., and the Seneca Wastewater Treatment Plant in Germantown, MD. Both facilities are the result of a public-private partnership. Solar power will provide on average 17 percent of the electricity required to operate the two plants, saving ratepayers approximately \$3.5 million over the life of the agreement. The systems are also expected to help reduce carbon dioxide emissions by 7 million lb. each year.

The Department of Energy's Office of Energy Efficiency and Renewable Energy Should Receive the Full Funding Proposed in the President's FY 2016 Budget

The Office of Energy Efficiency and Renewable Energy is at the center of creating the clean energy economy today. This office leads the U.S. Department of Energy's efforts to develop and deliver market-driven solutions for energy-saving homes, buildings, and manufacturing; sustainable transportation; and renewable electricity generation. WSSC's 2009 Energy Efficiency grant is a prime example of how even modest funding by the Office can provide enormous benefits to a community.

The President has proposed a FY 2016 budget of approximately \$2.7 billion for the Office of Energy Efficiency and Renewable Energy. We strongly urge the Subcommittee to fund the Office at the level requested by the President, particularly the technologies identified in WSSC's statement.

Again, thank you for the opportunity to share our views.



Office of the Director
National Research Center For Coal and Energy
Richard A. Bajura

April 6, 2015

Written Statement by Richard Bajura, Director
National Research Center for Coal and Energy
West Virginia University

Submitted to House of Representatives Committee on Appropriations
Subcommittee on Energy and Water Development

Testimony on FY 2016 Budget Request
US Department of Energy Fossil Energy Program

Chairman Simpson, Ranking Member Kaptur, and Members of the Subcommittee:

Coal is essential to the U.S. power generation mix and is similarly important in the global energy economy. Coal's popularity derives from its abundance, accessibility, and stable low cost that assures electricity consumers of affordable, reliable power even during times of volatile price swings by other fuel sources.

Numerous studies have confirmed that fossil energy - coal, oil and natural gas - will be a mainstay of the energy supply for both the United States and globally for at least the next several decades. We will of necessity continue to rely on coal and natural gas for electricity generation in the near term even though concerns have been raised about the effects of carbon emissions on global climate change. These concerns can be mitigated by deploying advanced technologies made available through strategic investments by our nation in our own future, and by the efforts of many other nations working collaboratively on our collective global future.

We make the following recommendations about the US DOE Fossil Energy coal, oil, and natural gas research programs. Unless otherwise noted, program elements not addressed in our testimony are recommended at the level of the Administration request.

Coal CCS & Power Systems R&D

Recommendations for specific elements of the Coal CCS & Power Systems R&D program are provided below.

Suite 113 385 Evansdale Drive West Virginia University P. O. Box 6064 Morgantown, West Virginia 26506
NRCCE Director's Office Phone: 304 / 293-7030 Bajura Direct Line: 304 / 293-6034
NRCCE Director's Office Facsimile: 304 / 293-3749 Web Address: <http://www.nrcce.wvu.edu>
NRCCE Main Switchboard Telephone Number 304 / 293 2667

Carbon Capture – We recommend support at the Administrative request level of \$116.3 million, with specific emphasis that the funding be focused on coal programs and that natural gas programs in the area of carbon capture requested by the Administration be supported by additional funds.

Carbon Storage – We recommend funding at \$113.8 million, five million dollars over the Administration request, and specifically cite the need to complete the programs of the Regional Carbon Sequestration Partnerships and for field projects in saline reservoir CO2 injection. The added funding should be directed toward scoping studies to characterize sites for future storage so that we can have proven sites more readily available with reduced permit delays for new projects.

Advanced Combustion – We recommend funding at \$26.4 million, \$16 million over the Administration request. The additional funding should be directed toward support for large pilot projects, dynamic modeling of combustion, and plant integration for efficiency improvements.

Gasification – We recommend funding at \$31 million, \$20 million over the Administration request, to provide increased support for oxygen separation technologies, modularization of gasifier components, development of efficient CO2 compressors, and support of the National Carbon Capture Center.

Coal and Biomass to Liquids – This important program should be retained at the FY 2015 enacted level of \$5 million to enable the US to compete in the global market for the production of transportation fuels and chemicals obtained from coal. This funding level would enable development of smaller scale conversion units with lower capital costs that will hasten commercial deployment.

Plant Optimization Technology - The following increased funding levels are recommended: (1) - provide an additional \$2 million for the sensors and controls sub-element to \$6.5 million to address issues with coal plants converted from base load operations into load-following operations due to the incorporation of renewable energy into the power generation mix; (2) - provide an additional \$14 million for a new project, the Component Test facility (COMTEST), to support the development of high temperature materials for steam powered generation cycles; and (3) – provide an additional \$4 million in water management R&D to a level of \$10 million to enable existing plants meet increasingly stringent regulations regarding water discharge and to reduce the amount of water used in power generation, especially in arid areas. We also recommend the addition of \$5 million for a program directed toward existing plants that focuses on improved pollution control, fuel flexibility, and improved reliability under load following operation conditions.

University Coal Research – Funding is recommended at a level of \$5 million, \$2 million above the Administration request, to support the development of advanced research in coal technologies and to educate our future energy work force.

Breakthrough Technologies - This is a new program recommended at a level of \$16 million to undertake innovative, breakthrough R&D programs focused on novel approaches to develop technologies to advance our capability to continue to use coal, an abundant resource, in our national energy mix. It is expected that programs would be conducted mostly by academic and research institutions. We further recommend increasing coordination between the ARPA-E and Fossil Energy programs in the area of technology development that can further decarbonize fossil fuels to take advantage of our nation's abundant energy resources.

Natural Gas & Oil

Funding is recommended at a level of \$100 million for natural gas and oil research and development, \$56 million above the Administration request. Focal areas include: (1) environmental and related issues associated with production of unconventional natural gas and oil, including shale gas, gas hydrates and oil shale; and, (2) for advanced research on oil shale directed toward increasing the efficiency of recovery technologies to produce more of the original oil or natural gas in place in a given formation. Funding is also recommended for the environmentally safe recovery of oil and natural gas resources from deepwater and ultra-deepwater offshore environments. In addition, programs are needed for emissions control technologies for natural gas fired systems.

Program Direction

Funding for program direction should be re consolidated into this line item element at a level of \$171 million to provide support for the salaries and the operation of the Office of Fossil Energy and its National Energy Technology Laboratory. Funding proposed for NETL Coal R&D would be moved from the CCS & Power Systems R&D Program into this Program Direction account.

Other Programs

Funding for environmental restoration should be increased to \$11 million, \$3 million above the Request. This account is an important functional area of the Fossil Energy program and has not received funding increases commensurate with the additional requirements placed on restoration programs. The remaining programs not cited in this testimony should be funded at requested levels.

Thank you for the opportunity to offer testimony on these programs.

Willie Gregory, President
Bruce Cook, Chief Engineer
Yazoo-Mississippi Delta Levee Board

House Appropriations Committee
Subcommittee on Energy and Water Development

This statement is prepared by Bruce Cook, Chief Engineer for the Board of Commissioners for the Yazoo-Mississippi Delta Levee District, Clarksdale, Mississippi, and submitted on behalf of the Board and the citizens of the Levee District. The Board of Commissioners for the Yazoo-MS Delta Levee District is comprised of 12 elected commissioners representing the counties of Tunica, Coahoma, Quitman, Leflore, Sunflower and parts of Humphreys, Holmes, Desoto, Tallahatchie and Yazoo counties in the Lower Yazoo Basin in Mississippi. The Board of Commissioners for the Yazoo-MS Delta Levee District is charged with the responsibility of providing protection to the Mississippi Delta from flooding of the Mississippi River and maintaining major drainage outlets for removing the flood waters from the area. These responsibilities are carried out by providing the local sponsor requirements for the Congressionally authorized projects in the Mississippi Levee District. **The Yazoo-Mississippi Delta Levee Board and the Mississippi Valley Flood Control Association support an appropriation of \$500 Million for FY 2016 for the Mississippi River & Tributaries Project.** This is the minimum amount that we consider necessary to allow for an orderly completion of the remaining work in the Valley and to provide for the operation and maintenance, as required, to prevent further deterioration of the completed flood control and navigation work.

The Mississippi River & Tributaries Project (MR&T) provides protection to the Lower Mississippi Valley from waters generated across 41% of the Continental United States. These waters flow from 31 states and 2 provinces of Canada and must pass through the Lower Mississippi Valley on its way to the Gulf of Mexico. The Mississippi River & Tributaries Project is one of, if not the most cost effective projects ever undertaken by the United States government. The foresight of the Congress in their authorization of the many features of this project is exemplary.

In 2011 the MR&T Project successfully passed the greatest flood on the Mississippi River. Every feature of the MR&T Project including levees, floodways and reservoirs were utilized. Not one acre of land was flooded that was not designed to flood. Not one life was lost. The MR&T system prevented \$262 Billion in damages in 2011 alone. All together since 1928, Congress has invested \$14 Billion in the MR&T Project and it has prevented \$644 Billion in damages! This is a 46:1 benefit to cost ratio. The flow carried by the Mississippi River in 1927 was 66% of a Project Design Flood. The flow carried by the Mississippi River in 2011 was 85% of a Project Design Flood. There is a larger flood on the horizon. In fact, stages will be 8' higher than 2011 when we have the Project Design Flood. The MR&T Project is only 89% complete. Congress must be proactive and fully fund the MR&T Project until it is completed. If not, the MR&T Project will not pass the Project Design Flood.

For the past few years the President's Budget has not included funding for any construction projects within the Yazoo Basin. These are all projects authorized and funded so wisely by the Congress. All of these projects are encompassed in the footprint of the Delta Regional Authority, an area recognized by the Congress as requiring special economic assistance to keep pace with the rest of our great Nation. We cannot lose sight of the fact that all of these projects are required to return more than a dollar in benefits for each dollar spent.

The Upper Yazoo Project has received no funding in the President's FY 2016 Budget. The project provides much needed flood protection by decreasing flood stages up to 3 feet in most areas. The project began in 1976 near Yazoo City and had advanced to near Sidon, Mississippi before the project was reformulated in 1994. Reformulation resulted in approximately 130.3 miles of channel enlargement in nine segments from Sidon to Darling, Mississippi. The project focuses on cleaning out and restoring channel capacity to the Yazoo River and its tributaries. Absence of funding will delay remaining flood control and economic benefits to the area by not allowing the initiation of any new construction items. Currently there are 29,000 people protected in the 100-year flood plain. In the past five years there has been significant bank caving in these channels which greatly diminishes the conveyance and increases the flooding in the area. Funds in the amount of \$600,000 could be used in FY 2016 to request new surveys and begin real estate efforts for item 7c Phase II and development and reforestation of mitigation tract.

The Delta Headwaters Project is another construction project within the Yazoo Basin that has received no funding in the President's FY 2016 Budget. The project is vital to the ongoing erosion prevention in the 16 authorized watersheds. Completing the much needed work will reduce the risk of flooding in the Yazoo Basin. The project will also reduce the sediment deposited in downstream reservoirs and streams, reduce the need for maintenance dredging, and improve degradation of wildlife habitat in and along the streams. FY 2016 funds in the amount of \$6,750,000 could be used to fully fund one bank stabilization contract (\$2,000,000), two riser pipe contracts (\$3,000,000), planning, engineering and design, real estate efforts, construction management, and monitoring of future riser pipe and bank stabilization projects (\$750,000) and completion of Flood Water Retarding Structure 35 (\$1,000,000).

We are requesting more money for maintenance of the Mainline Mississippi River Levees in the Lower Mississippi Valley Division which will provide for repair of levee slides, slope repair, and repair of the gravel maintenance roadway which is so vital to access during high water.

Waters of the United States (WOTUS) - The Environmental Protection Agency (EPA) has introduced its Proposed Rule and it is a significant expansion of the Clean Water Act (CWA) that will affect every American, and have a significant impact on my community due to the proposed increased jurisdiction over all waters. The definitions provided in the Proposed Rule are very broad and do not provide clarity to which waters could be considered "waters of the United States" under CWA jurisdiction. Under current CWA section 404(a), any person engaging in activities that result in the "discharge of dredged or fill material into navigable waters" must obtain a permit from the Corps of Engineers (Corps). The term "navigable waters" is defined broadly by statute to mean "waters of the United States." The Proposed Rule uses

terms such as “adjacent”, “neighboring”, and “tributary” to expand the CWA reach to ditches, ephemeral ditches, ponds and other waters that are too small, too far removed, with too speculative and insubstantial an effect on traditionally navigable waters, to allow any meaningful connection to navigability. The Proposed Rule would make the very drainage ditches considered in *Rapanos vs. United States* jurisdictional when the U.S. Supreme Court ruled that they were not! Furthermore, the majority of the U.S. House of Representatives and the U.S. Senate object to the Proposed Rule which would expand CWA jurisdiction. On May 1, 2014 a bipartisan group of 231 Members of Congress wrote EPA and the Corps a request “that this rule be withdrawn.” On May 14, 2014 52 Senators voted in favor of an amendment to prohibit the EPA and Corps from implementing the Proposed Rule’s guidance and from using it. On September 9, 2014 the House passed (262-152) H.R. 5078, the Waters of the United States Regulatory Overreach Protection Act of 2014, a bipartisan bill to prohibit the EPA and Corps from finalizing the Proposed Rule. **The EPA and the Corps should withdraw its Proposed Rule and keep "navigable" as the defining term for "waters of the U.S." under CWA jurisdiction.**

Federal Flood Risk Management Standard (FFRMS) - FFRMS originated in 2011 with President Barack Obama’s March 30, 2011 issuance of Presidential Policy Directive - PPD-8 - National Preparedness. FFRMS seeks to improve flood risk management by directing agencies to “update” their flood-risk reduction standards for all federally-funded projects. In April, 2013 the Hurricane Sandy Rebuilding Task Force called for minimum flood risk reduction standard and announced that all federally funded buildings projects needed to be 1' above the base flood elevation (BFE)(the 100-year flood). President Obama’s Climate Action Plan - released in June, 2013 - directs agencies to incorporate the most recent science on expected rates of sea-level rise. FFRMS is looking at 3 options to establish revised Elevation and Flood Hazard Areas: (1) Climate-informed science approach (the “preferred” option); (2) Freeboard - BFE + 2' or BFE + 3' for critical infrastructure; or (3) the 500-year elevation. This process included no public involvement. They did not perform a benefit-cost analysis for “significant action”. We believe FFRMS will affect PL84-99 (federal assistance to repair levees after being damaged) and will eventually affect Flood Insurance (FIRM). FEMA is trying to expand the floodplain vertically and horizontally. This will affect millions of Americans by forcing them to purchase flood insurance and it will discourage industry and businesses from locating to the Mississippi Delta. On December 16, 2014 President Obama signed into law the Consolidated and Further Continuing Appropriations Act, 2015 funding the federal agencies through the fiscal year. It included a provision to prohibit the use of funds to implement a new Federal Flood Risk Management Standard (FFRMS). Despite this provision on January 30, 2015 President Obama signed EO 13690! He is making laws without due process or the consent of Congress! **We need Congress to stop FFRMS!**

Section 408 Permits - When someone plans an activity close to the levee we review the plans and submit them to the Corps for their evaluation and no objection. Once we get a no objection letter from the Corps we issue the applicant a Levee Board Permit. If there is an activity located off the right-of-way but might affect the integrity of the levee we review the plans and give them to the Corps for their review. If this activity might impact the levee we have the right to stop any activity that might jeopardize a flood control project under: The Rivers and Harbors Act of 1899 Section 14 states “that it shall not be lawful for any person to ... impair the usefulness of any ... levee.” Also in the Vicksburg District Regulations (DR1130-2-530) FAQ

(Appendix G) and CFR33 Part 208.10 (Appendix H) covers the permit process. In CRF33 Part 208.10 - "This authority extends beyond the project rights-of-way to the extent that any activity which might endanger the project integrity is subject to review by and control of the Corps of Engineers." This authority exists in Section 9 of the Flood Control Act of 15 May 1928 (33 U.S.C.A.702i) and Sections 14 and 16 of the River and Harbor Act of 3 March 1899 (33 U.S.C.A. 404 and 411). It has come to our attention that Corps Headquarters issued guidance in July, 2014 that the Corps District Engineer shall start issuing Permits for work on the levee right-of-way. This guidance also said that the Corps has no authority to regulate activities off the right-of-way. To perform this, the Corps will have to inspect construction and follow NEPA guidelines. This is a big problem! The Levee Board owns the levee right-of-way, and we issue the permits. If the Corps starts issuing permits for activities on our levee there will be two permits for the same proposed work. **We need Congress to intervene and stop the Corps from issuing Permits on levees owned and operated by Levee Boards and keep the permitting process in the hands of the levee owners.**

As members of the Congress representing the citizens of our nation who live with the Mississippi River every day, you clearly understand both the benefits provided by this resource and the destructive force that must be controlled during a flood. On behalf of the Yazoo-Mississippi Delta Levee Board, I cannot express enough, our appreciation for your efforts in providing adequate funding over the last several years that has allowed construction to continue on our much needed projects and thank you in advance for your kind consideration of our requests for fiscal year 2016.

WITNESSES

	Page
Anderson, K. E	23
Bajura, Richard	169
Barnett, D. A	49
Berginnis, Chad	36
Bjelland, Jenae	105
Boland, Maeve	4
Bradley, Jim	19
Broderick, James	155
Burbank, Richard	56
Cook, Dr. Pam	151
Cowell, Steven	89
Cullen, Genevieve	58
Culp, David	79
Cuttino, Phyllis	136
Dorothy, Olivia	122
Eklund, James	54
Fertel, M. S	125
Gregory, Willie	172
Guidry, K. P	149
Harris, Bradley	79
Hemphill, J. R., Jr	164
Howes, John	11
Hunter, Dr. S. M	94
Johnson, J. N	165
Kightlinger, Jeffrey	98
Kuhn, T. R	60
Leahey, Jeffrey	114
Markowitz, Morry	81
Martinsen, R. S	1
Minsky, R. S	71
Modeer, D. V	38
Onley, K. L	118
Raap, Dr. M. B	15
Rash, Rob	158
Snell, April	129
Sterud, Bill	140
Terry, David	108
Tilly, Mark	91
Trujillo, Tanya	52
Yamagata, Ben	45
York, Dan	144