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ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

SENATE ENERGY AND NATURAL RESOURCES COMMITTEE  
OVERSIGHT FIELD HEARING ON ENERGY TECHNOLOGY INNOVATION AND DEPLOYMENT  
**Opportunities for Alaska's Energy Future**

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Thank you for the opportunity to describe the activities of the Alaska Native Tribal Health Consortium (ANTHC) in regards to addressing the energy needs and demands of rural community-owned water and sewer infrastructure and the innovative methods employed to minimize the use of fossil fuel for those needs. My name is Michael Black. I am the Director of the Department of Rural Utilities Management Services for the Division of Environmental Health and Engineering within ANTHC.

Formed in 1997, ANTHC is dedicated to the vision that Alaska Native people are the healthiest people in the world. As the largest tribal health organization in the United States, the Consortium's well over 2,000 employees deliver world-class medical, community, and environmental health services to the more than 150,000 Alaska Native and American Indian people residing in Alaska. ANTHC provides comprehensive specialty medical services at the Alaska Native Medical Center; wellness and prevention programs; disease research and prevention; rural health provider training; telehealth services; and essential operational, technical, and logistical support for our tribal health partners in Alaska.

In addition, ANTHC's Division of Environmental Health and Engineering provides planning, design, construction, and operations support of public health infrastructure—including safe water, sanitary waste disposal, and energy efficiency upgrades—throughout Alaska. Providing vital public health facilities that provide clean water and sanitary sewer systems for remote communities with no road access and harsh climates makes for unique engineering challenges, including extremely high energy usage and high energy costs.

Sanitation facilities play a critical role in the health of rural communities. Infants in communities without adequate sanitation are eleven times more likely to be hospitalized for respiratory infections and five times more likely to be hospitalized for skin infections. In communities with very limited water service, one in three infants requires hospitalization each year for lower respiratory tract infections.

## **Rural Energy Initiative**

The high cost of energy coupled with the intensive energy needs of sanitation systems across rural Alaska directly threaten the important health benefits provided by clean water and sanitary sewer service. Unlike most systems in the United States, Arctic and sub-Arctic sanitation systems common to Alaska require the constant addition of heat from oil-fired boilers and electricity for pumps that maintain circulation of water in order to keep water and sewer systems running in regions that can see temperatures colder than minus fifty degrees. Energy costs make up, on average, 40 percent of the total cost of operating public sanitation in rural Alaska, where heating fuel costs over \$10 per gallon in some locations. The high price of fuel results in water and sewer bills in rural Alaska that range from \$80 to \$250 per month per household; that's five times the national average and well above the Environmental Protection Agency's (EPA) recommended median household income threshold for customer affordability. While some operating costs for rural sanitation systems, such as labor, regulatory compliance and replacement parts, remain relatively fixed; reducing the cost of energy represents the most significant opportunity to make water and sewer services more affordable and, therefore, more sustainable for rural communities in Alaska.

Recognizing the essential role affordable and sustainable energy plays in rural communities, ANTHC has developed the Rural Energy Initiative—a program focused on reducing operational costs of rural water and sewer systems through energy efficiency and renewable energy solutions. To date, ANTHC has completed energy projects in 45 rural Alaskan communities. Funding for these efforts has been provided by three primary sources: the Denali Commission, United States Department of Agriculture (USDA) Rural Development's Rural Alaska Village Grant Program 2% set-aside for technical assistance and training, and the State of Alaska. However, current funding levels will leave over 100 communities across rural Alaska with unfulfilled energy-saving potential, placing the health and the future of residents and their community in jeopardy.

The Rural Energy Initiative reduces water and sewer costs through a holistic, four-phased approach:

1. Conducting energy audits to model energy use and identify opportunities for savings
2. Implementing appropriate energy efficiency improvements and operator training
3. Reducing operating costs when possible using available renewable energy opportunities
4. Tracking performance and impacts of changes in the plant, operator behavior, and renewable energy approaches

The following sections outline each step of this process, which began in 2011, after audits funded by the Department of Energy found that energy comprises 40 percent of rural sanitation costs, making the long-term viability of these systems unsustainable.

1. *Step One: Identify energy use and potential energy projects by conducting energy audits.* ANTHC has conducted energy audits of 59 rural sanitation systems as well as completed detailed engineering analyses for renewable energy systems in 43 communities. These efforts both identify energy efficiency opportunities and develop specific renewable energy solutions to reduce dependence on fossil fuels and lower sanitation system operating costs. Using sanitation engineering and operation and maintenance expertise developed by ANTHC personnel familiar with the unique nature of Arctic water/sewer plants, distribution, and collection systems; ANTHC has provided a roadmap for needed energy upgrades in 59 communities in Alaska. Expanding that effort to the remaining 127 rural Alaskan communities is our goal. To continue assisting rural communities through energy auditing and feasibility analysis of renewable solutions over the next four years will require \$800,000. We intend to pursue that goal through private and public funding sources.
2. *Step Two: Implement energy efficiency retrofits and provide operator training.* Using the results of our completed energy audits, ANTHC has worked directly with rural communities across Alaska to acquire funding primarily from the EPA, the USDA, the Denali Commission, and the State of Alaska to implement energy efficiency improvements and provide training for rural water plant operators. The training of operators is critical to maintain energy efficiency benefits because human behavior and local capacity are central to maintaining long - term efficiency. The savings to rural sanitation systems from energy efficiency improvements completed by ANTHC to date in 34 communities is estimated at \$800,000 annually.

It is our goal to continue the implementation of energy efficiency improvements and operator training in 80 additional communities over the next four years. Between energy efficiency upgrades of equipment and proper training of operators, an additional \$7.3 million in funding will need to be identified. The savings to rural communities from these improvements are estimated at \$1.45 million annually.

3. *Step Three: Implement renewable energy solutions.* Integration of renewable energy as part of the solution often leads to more affordable and sustainable residential water and sewer service. A variety of approaches can be employed. ANTHC has found that using recovered heat from the commonly used diesel fired electric generators, capturing excess energy from wind turbine generators and converting it to heat, using ground source heat pumps, using micro-hydro energy when available, and using biomass boilers when standing or drift wood timber is available makes sense if these systems are maintained and operated correctly.

ANTHC works directly with Alaska's rural communities to identify, design, and construct renewable energy solutions to reduce the high cost of operating sanitation systems. The implementation of renewable energy has steadily increased each year as new opportunities are identified and innovative approaches are developed. ANTHC tailors its renewable solutions to meet the dramatic environmental diversity, location-specific renewable resource availability, and unique energy needs of the facilities served.

ANTHC has completed 24 renewable energy projects for rural Alaska sanitation systems since 2011 with funding provided by the U.S. Department of Energy, the EPA, and the State of Alaska's Renewable Energy Fund. This initial deployment of renewable energy systems has resulted in an estimated annual energy savings of \$1.25 million in 2015.

The most substantial contributor of resources has been the State of Alaska through the Renewable Energy Fund. This funding was designed to help Alaska become more reliant upon renewable energy. It uses a competitive award of funding that requires feasibility studies and favorable cost/benefit ratios. Unfortunately, the State's ability to continue funding renewable energy solutions has become highly questionable. The Renewable Energy Fund resources have dwindled from a high of \$100 million to its current level of \$5 million annually.

ANTHC has identified renewable energy solutions and completed feasibility analyses for several additional communities across Alaska, with many of these projects currently designed and shovel ready. To complete the identified renewable energy projects in 34 communities over the next four years, \$15 million will be needed. These projects are projected to save rural communities \$2.15 million in annual operating costs.

4. *Step Four: Monitor results and track effectiveness.* Monitoring the results of energy upgrades and ensuring that energy savings are realized and maintained is an important element of the Rural Energy Initiative's approach.

ANTHC is installing durable, off-the-shelf equipment to remotely monitor sanitation systems and maintain information on energy use via a web-based interface. These systems can be installed and maintained at a fraction of the cost of the previously used remote monitoring systems relying upon satellite bandwidth.

To date, this program has provided monitoring service to 20 communities, with 28 total communities expected to be served by the end of 2016 with existing funding. In addition to tracking energy performance, remote monitoring enables maintenance expertise outside the community to assist with identifying potential catastrophic failures, such as freeze-ups, and avert expensive and damaging emergencies. Many examples have occurred in the last four years where relatively inexpensive monitoring has saved millions of dollars in plant infrastructure and equipment that would have needed to be replaced if failure had occurred.

The benefits of remote monitoring can be easily extended to many more rural communities across Alaska. To install remote monitoring equipment for 80 additional rural sanitation systems during the next four years will require funding of \$1.45 million.

## **Additional Benefits**

The energy efficiency and renewable energy solutions carried out by ANTHC have many additional benefits that go beyond reducing sanitation system operating costs. Energy-focused improvements enable communities to reduce water and sewer service fees for homeowners, improve the sustainability of critical public infrastructure, reduce environmental impacts through reduction of fuel usage and carbon dioxide emissions, improve workplace safety in rural water plants, and increase overall access to the public health benefits of rural sanitation. In addition, use of local renewable energy sources such as wind power and locally harvested wood for heating acts to reduce community reliance on imported diesel fuel and keep money in the local economy. Finally, including operator training and education as part of the solution not only allows efficiency improvements to last, but also build local technical capacity as well as pride in ownership of public sanitation infrastructure.

**Continuation of ANTHC’s Rural Energy Initiative planned improvements over the next four years will require \$24.8 million in funding and result in a projected annual energy savings to rural Alaskan communities of \$3.6 million.**

We appreciate the Committee’s work to refine our nation’s energy priorities through the proposed “Energy Policy Modernization Act.” Most notably, we appreciate the legislation’s recognition of the important interconnection between energy and water through proposed programs like the “Nexus of Energy and Water for Sustainability” (Sec 4101), and the “Smart Energy and Water Efficiency Pilot Program” (Sec 4102). We also see progress for Alaska’s tribes and rural communities stemming from sections focused on energy efficiency for public and non-profit facilities (Sec 1004), and those focused on energy solutions for remote micro-grid communities like those seen across rural Alaska (Sec 2304). In addition, proposed programs focusing on capacity building through energy training and education (Secs 1007, 1008, and 3602) hold promise for rural communities where programs like the Rural Energy Initiative have proven the importance of including local capacity training as part of the solution.

As this legislation moves forward, we would ask that tribes and tribal consortia be specifically mentioned as eligible to participate in each proposed program. We also ask the committee to increase the legislation’s focus on assistance to communities like those across rural Alaska, where remoteness, high energy costs and intensive energy requirements act as barriers to implementation of already-identified energy saving solutions. Also, while research, planning and piloting of new ideas are important to paving our nation’s energy path forward, that path also demands direct support through programs that provide resources to enable our nation’s underserved areas to fulfill energy improvements that are ready to implement today.

Finally, we ask the Committee to consider Alaska’s present fiscal challenges and the devastating impacts that reduced resources pose to Alaska’s rural communities. By offering matching funds to state programs like Alaska’s Renewable Energy Fund, the federal government has an

opportunity to bolster a program that has been refined over the years and now offers an established mechanism for objectively prioritizing renewable opportunities. ANTHC has worked on behalf of dozens of rural communities over the past six years with funding from Alaska's Renewable Energy Fund to deliver renewable systems that are now producing real savings. We hope to continue serving our rural customer-owners by delivering future energy improvements, many of which are shovel ready, through added federal program support.

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