



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

OUR VISION:

Alaska Native people are the healthiest people in the world.



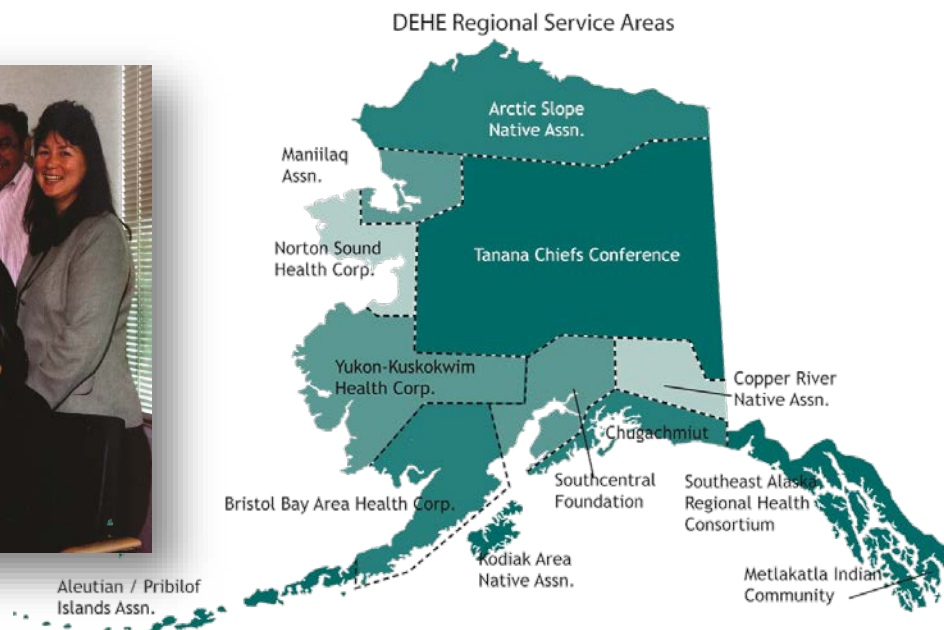
Adaptation and Affordability of Rural Water and Sewer

Mike Black, Director of Community Infrastructure Development
Division of Environmental Health and Engineering
4500 Diplomacy Drive, Anchorage AK 99508



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Alaska Native Tribal Health Consortium



In 1998, the Alaska Native Tribal Health Consortium (ANTHC) signed a contract to assume responsibility for many of the Indian Health Service's Alaska Area office programs. Later that year, ANTHC also became a Title III Self-Governance entity by signing the Alaska Tribal Health Compact through the Alaska Tribal Health System (ATHS).



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Division of Environmental Health and Engineering (DEHE)



Sanitation



Health Facilities and Clinics



Operations and Maintenance (O&M) and Training



Alaska Rural Utility Collaborative (ARUC)

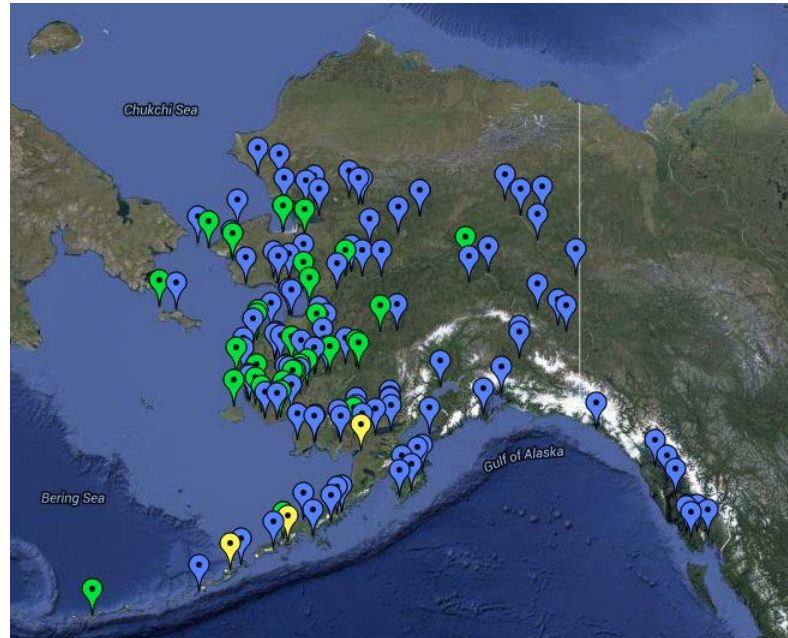


Environmental Health



Energy

ANTHC Active Projects



Active Projects in Water & Sewer by Lead

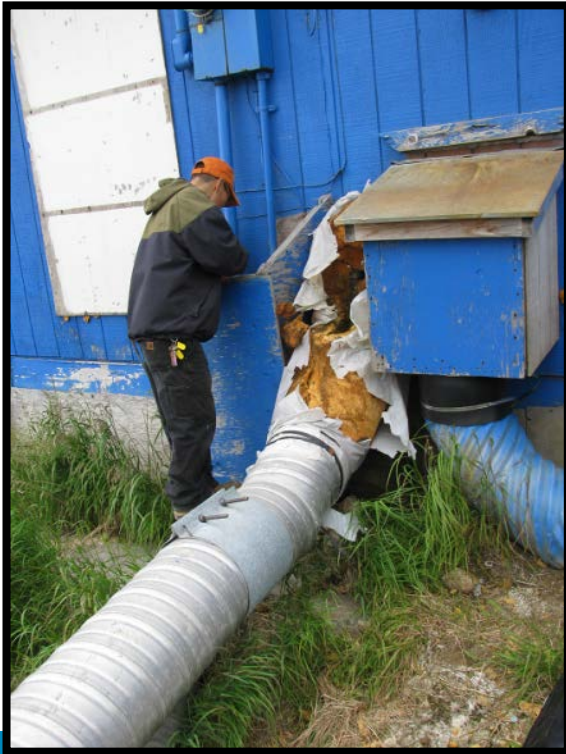
-  Alaska Native Tribal Health Consortium
-  State of Alaska Village Safe Water
-  Municipal Grants and Loans

Adapting Infrastructure: The Changing Arctic

- Water and Sewer along with Transportation Infrastructure is estimated to be most vulnerable to a clearly warming Arctic.
- Cost of not adapting infrastructure has been estimated to shorten the useful life of water and sewer infrastructure by 3.5 years.
- This adds Billions of dollars to preserving the sanitation utility. Estimated to add \$3-6 B (rebuilding) by 2030 for Alaskan villages.

Failed Arctic Boxes

Box Pulled from Building

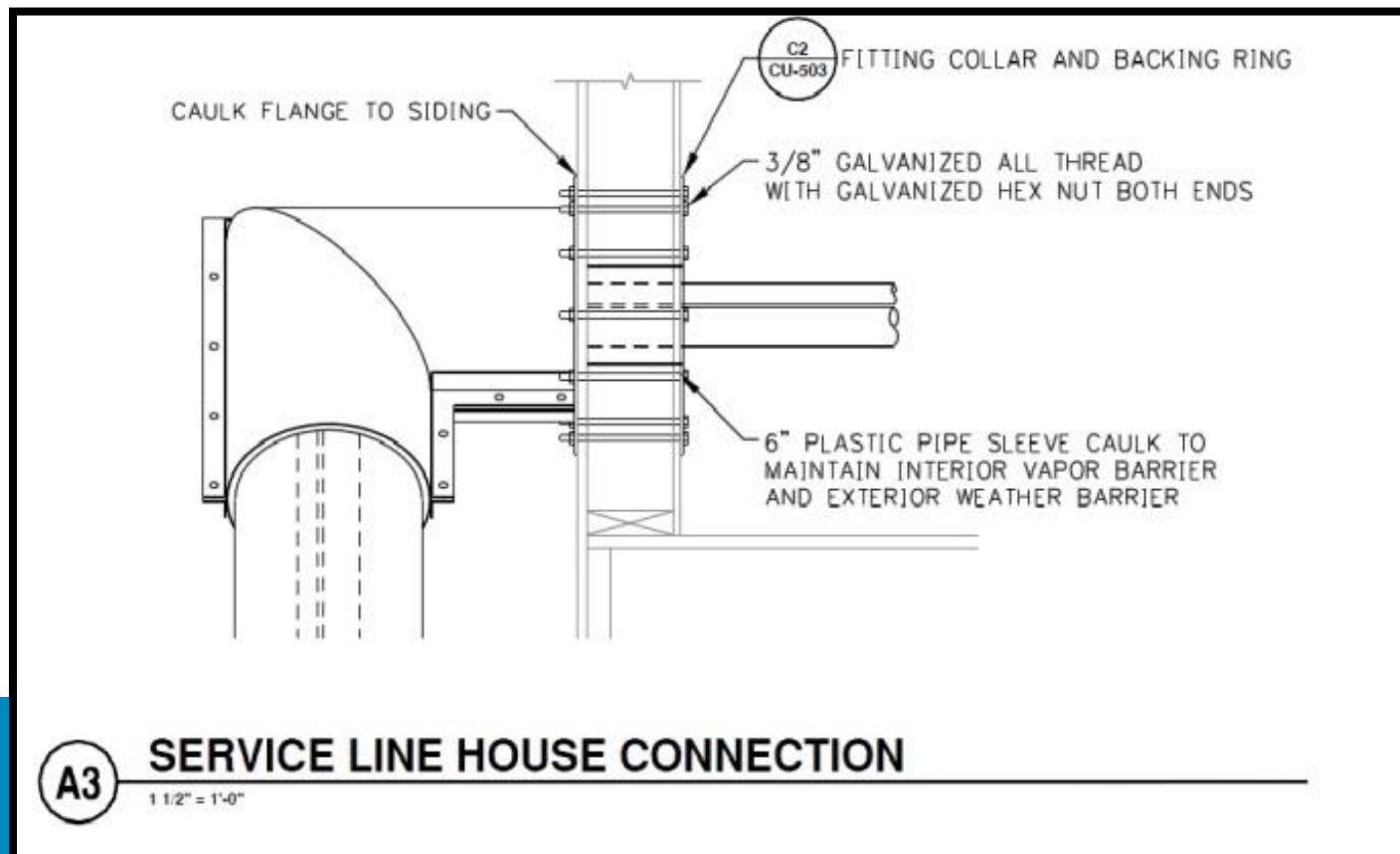


Insulation Wet/Removed



Flexible Service

SOLID connection to the house.



Arctic Box Adaption



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Structural Health Monitoring Systems

Massive ice formation exist in permafrost soil beneath many communities and structures.

When ice melts, the soils subside and the structures above the ice experience settlement that can be up to several feet, damaging foundations and pipelines.





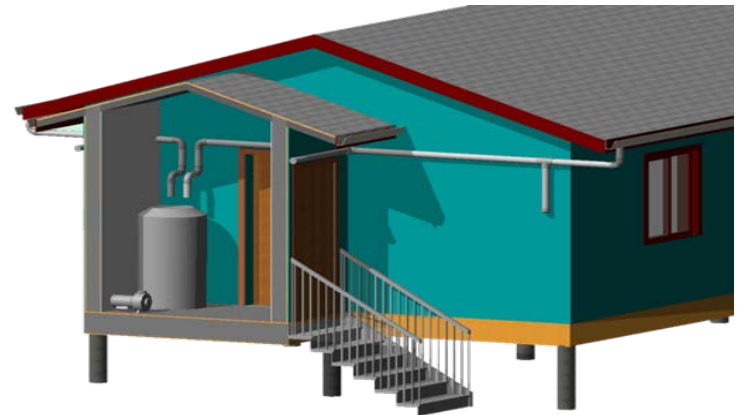


Portable Alternative Sanitation System (PASS) in Kivalina

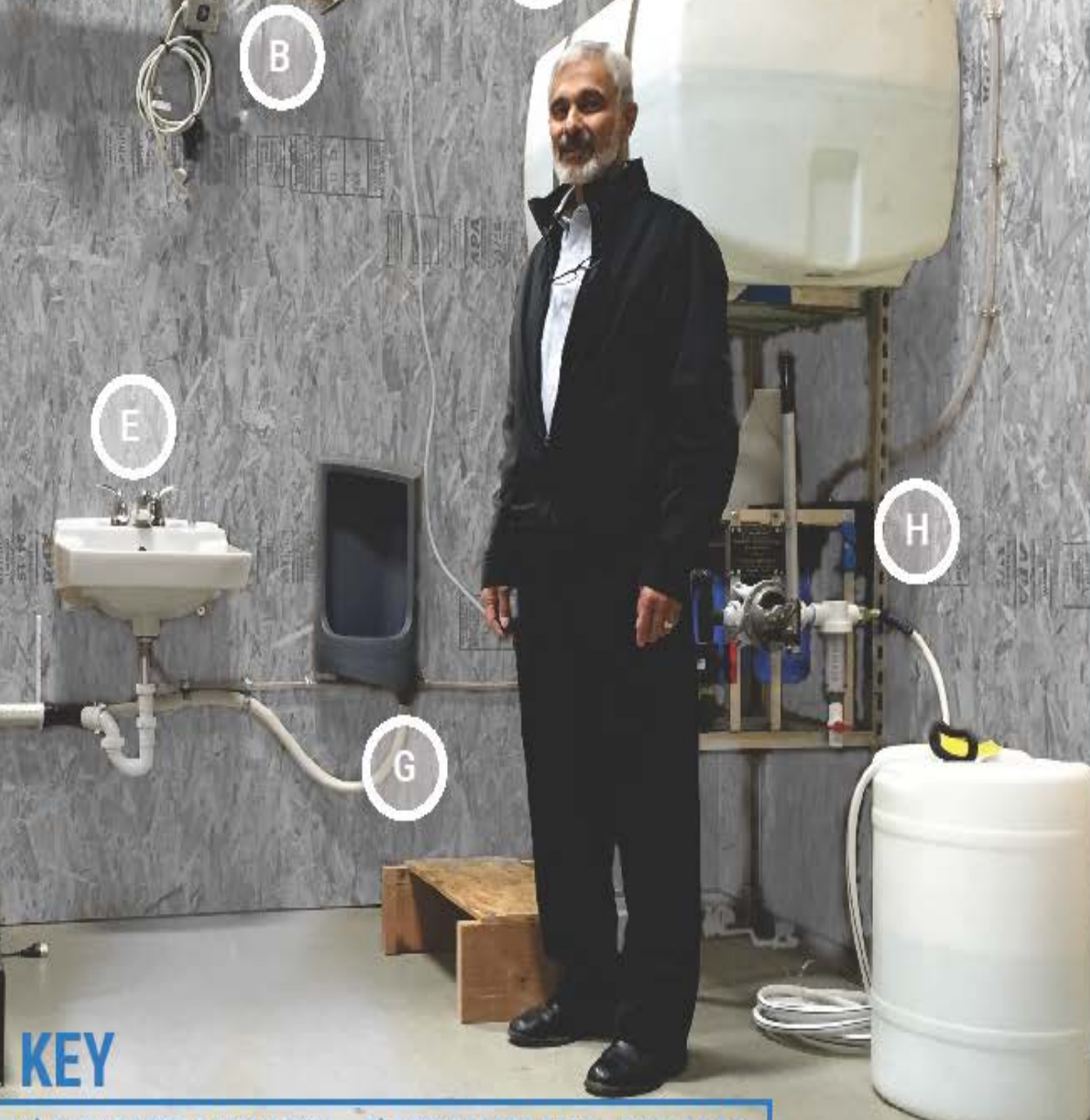
ANTHC has developed a small demonstration project in Kivalina. This system is designed to address the most basic sanitation needs and is portable so it can be moved to a new location.



Typical system layout



Rain catchment system



Sanitation System for the community of Kivalina, located on a small island in the Chuckchi Sea in Northwest Alaska. Kivalina residents currently ration water and use a self-haul honeybucket system for sewage, but they do not have an approved location for the honey bucket disposal. The village is threatened by erosion and plans to move to the mainland in the future, which means they cannot get funding for a permanent piped sewer system.

The system developed for Kivalina will be tested in ten volunteer homes over the course of 2015-2016. The systems are designed to use rainwater catchment, on-site water purification and safe disposal of waste. The systems are also 'stand-alone' models meaning that as homes are moved to the new village site away from the eroding coastline, they can bring the clean water and safe sewer with them.



KEY

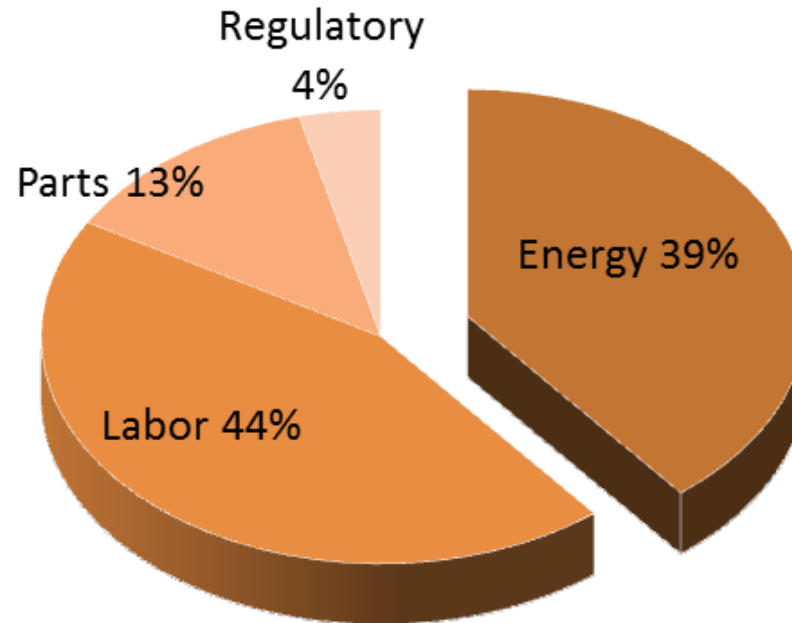
How is ANTHC Addressing the affordability of water and sewer in rural communities?

Recognizing the importance of energy and its high cost to Alaskans living in rural communities, in 2010 the Alaska Native Tribal Health Consortium started a Rural Energy Initiative to implement innovative energy projects that help lower costs and keep money otherwise spent on fuel in the local economy.



What does Energy have to do with Water and Sewer?

Breakdown of operating costs of an average water/sewer plant in rural Alaska:



How Can We Save Energy Costs

ANTHC's Approach:

Renewable Energy Projects

- Biomass
- Heat Recovery
- Wind to Heat

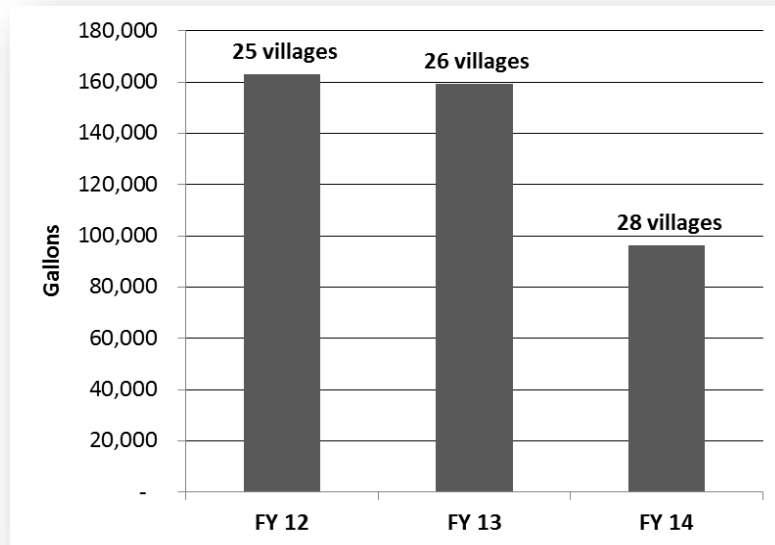
Energy Efficiency Projects

- Retrofit
- Remote Monitoring
- Training

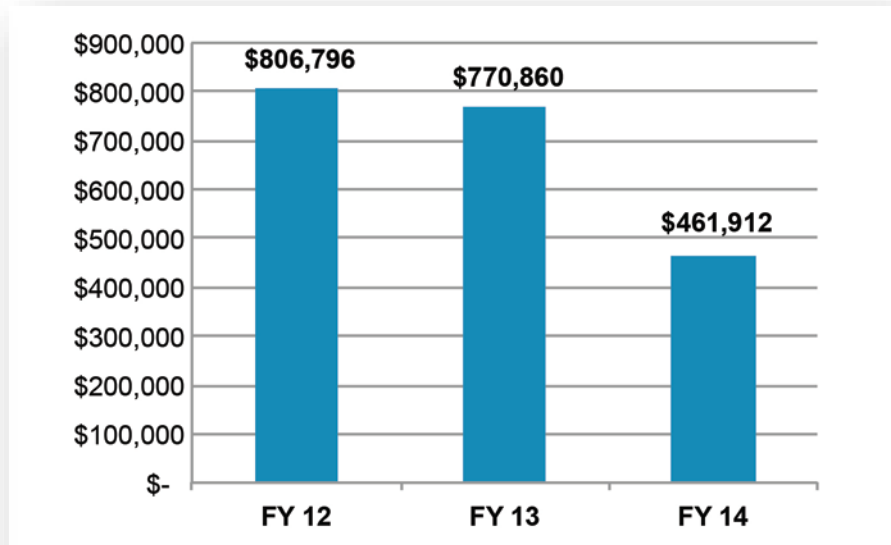


ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Value of Energy Efficiency in Water and Sewer Systems



ARUC Fuel Purchases



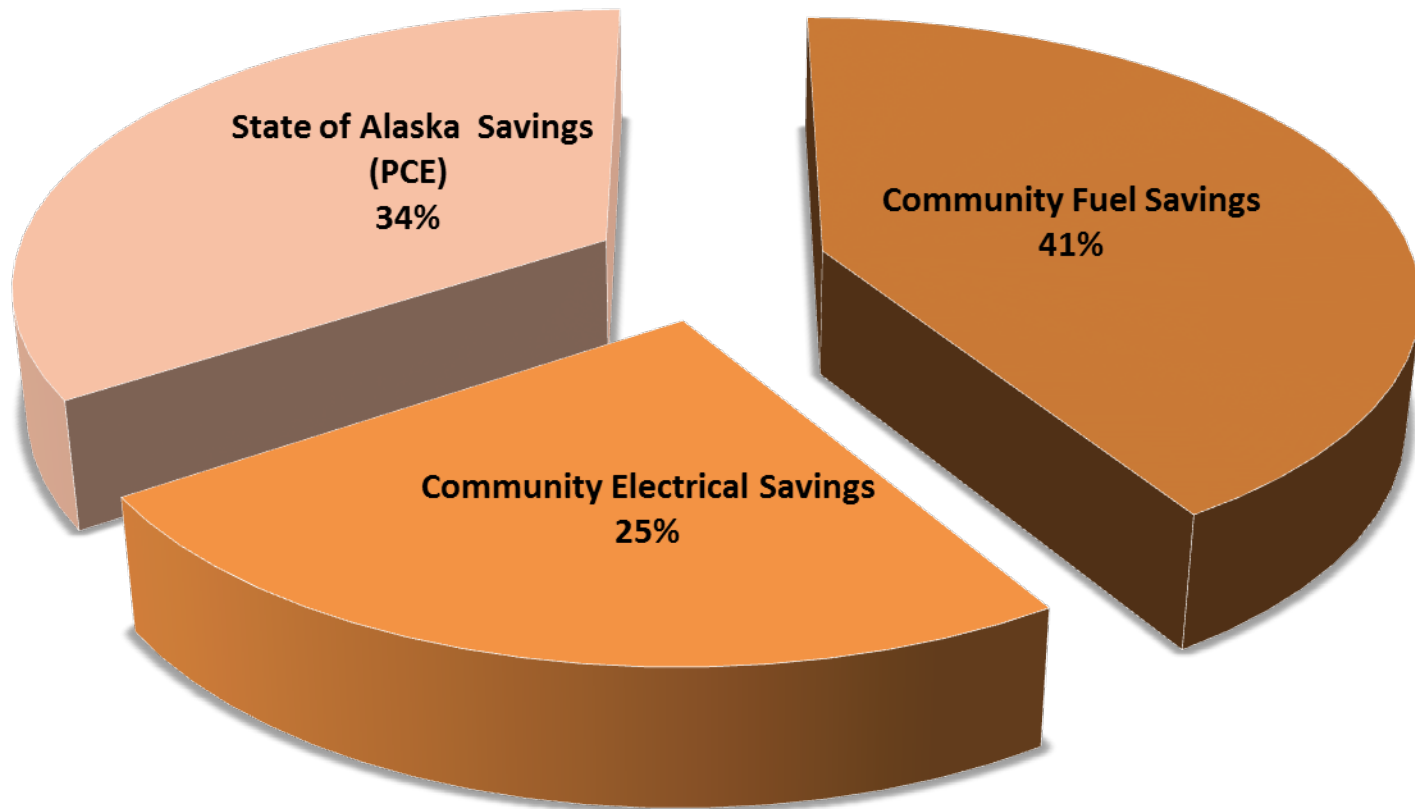
Cost of Fuel Purchased by Fiscal Year

*data based off ARUC financial information



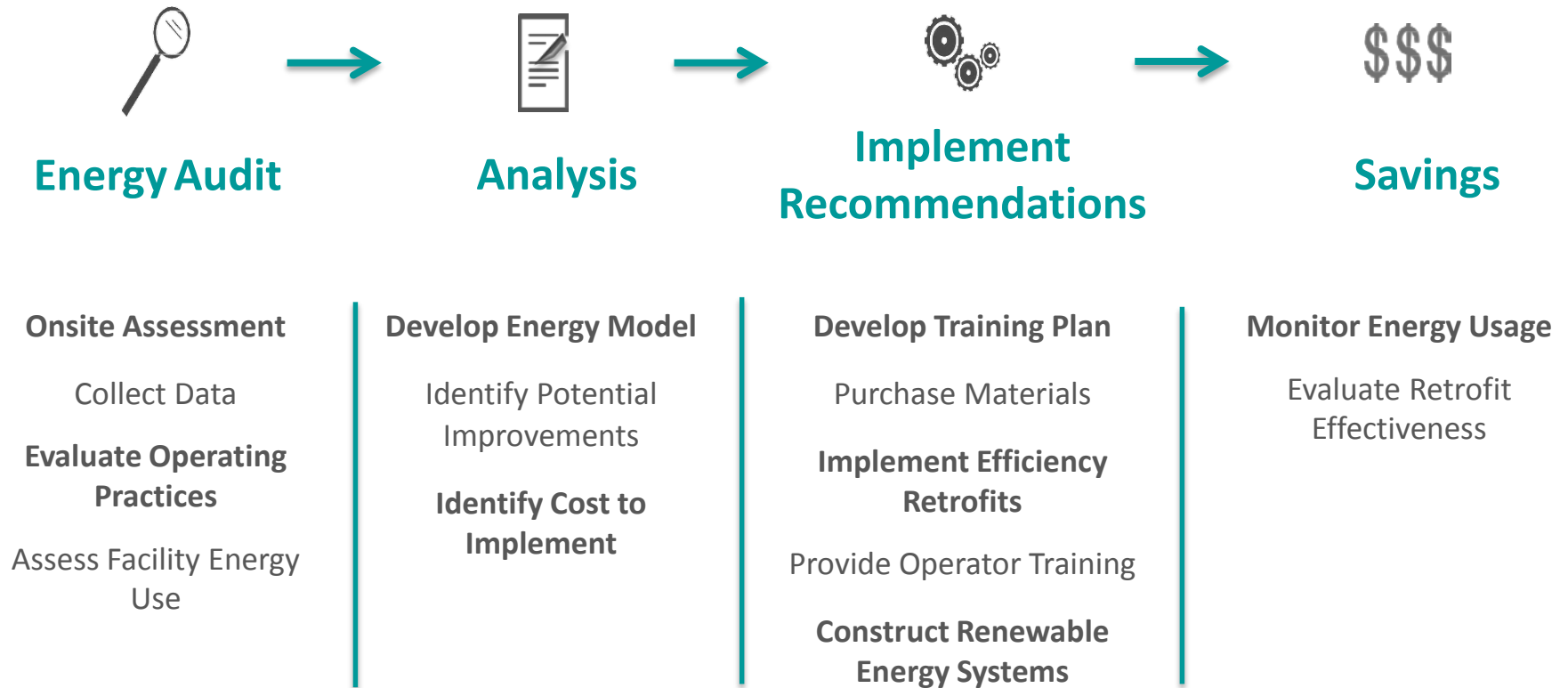
ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Who Benefits From Energy Efficiency Projects



ANTHC Rural Energy Initiative

Our Path: A Comprehensive and Collaborative Approach



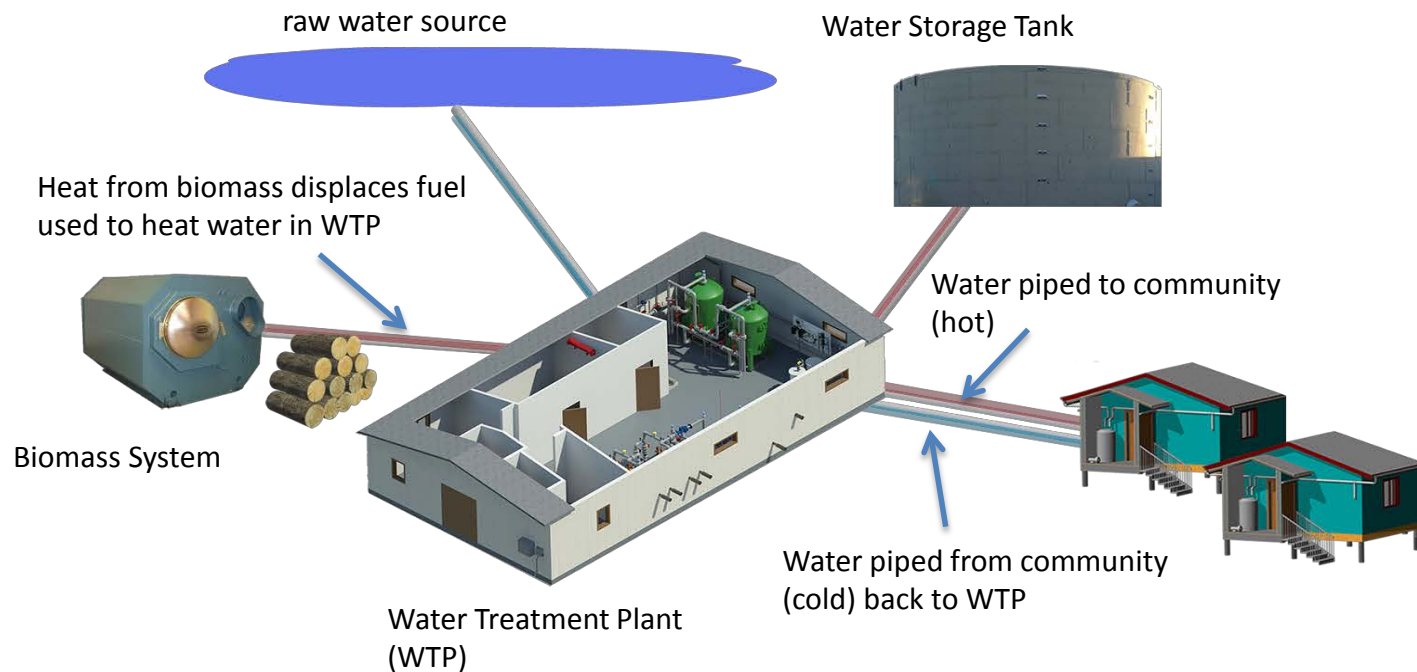
We believe basic sanitation should be efficient, sustainable and affordable



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Renewable Energy: Biomass

Locally sourced cord wood is used to create heat and is then redistributed to heat water in the water treatment plant.



Elim Biomass



Elim has been in operation since 2013 and is saving 16,000 gallons of fuel oil or almost \$83,200 annually in fuel.

*Savings based off 2012 dollars

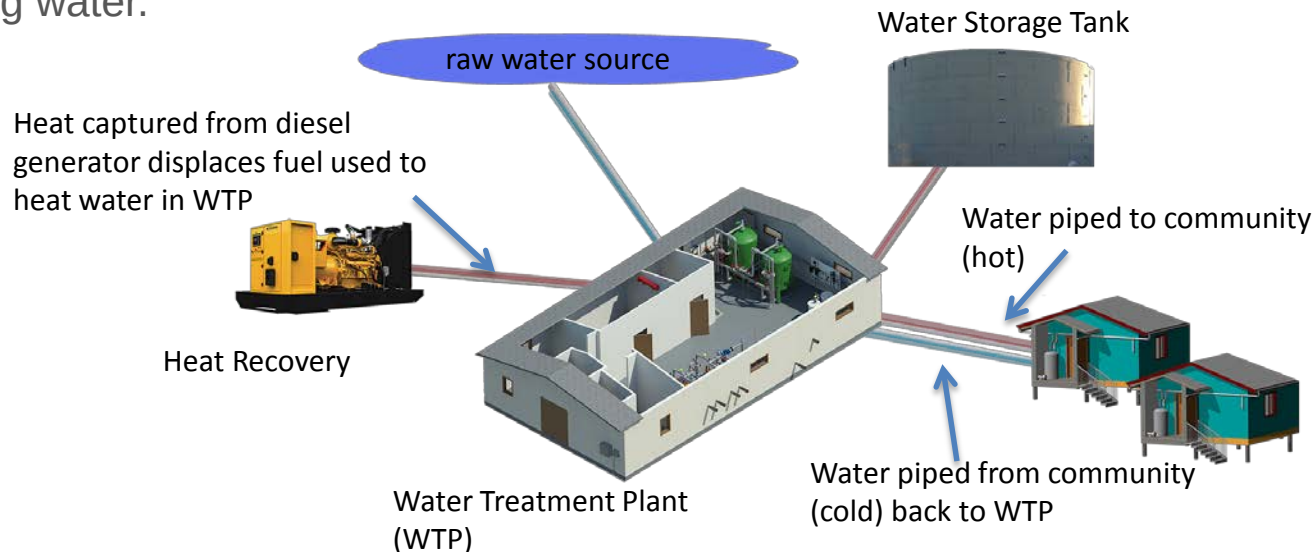


ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

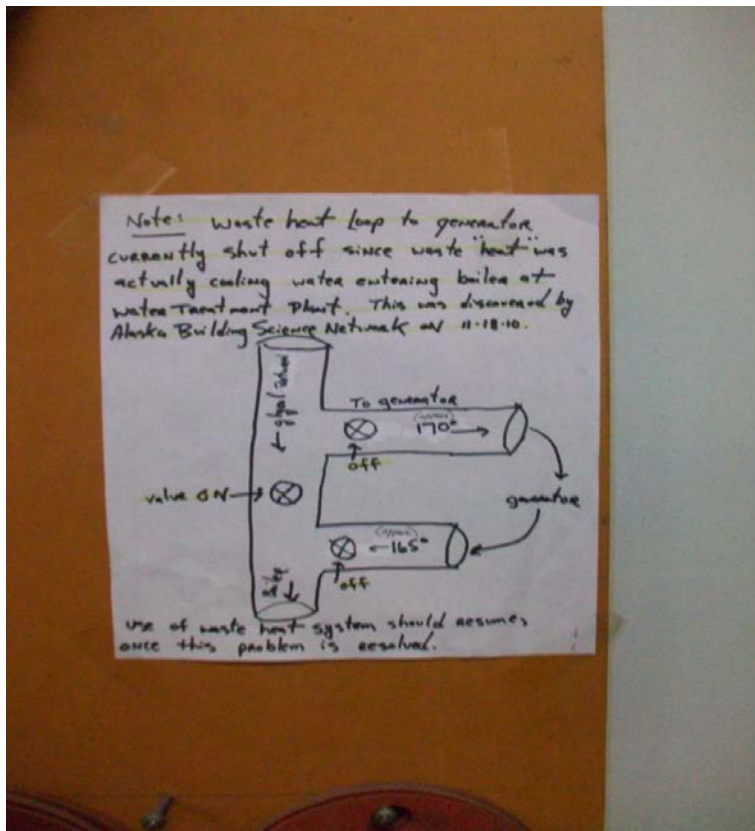
Renewable Energy: Heat Recovery

Diesel generators expel up to 70% of the energy from fuel inputs as heat. Only 30% goes towards creating electricity.

ANTHC has partnered with the Alaska Village Electric Cooperative and local power companies to recover the “waste heat” and redistribute it for heating water.



Deering Heat Recovery



ARUC rebuilt the recovered heat system in the winter of 2013 and **reduced fuel costs by \$48,934.86.**

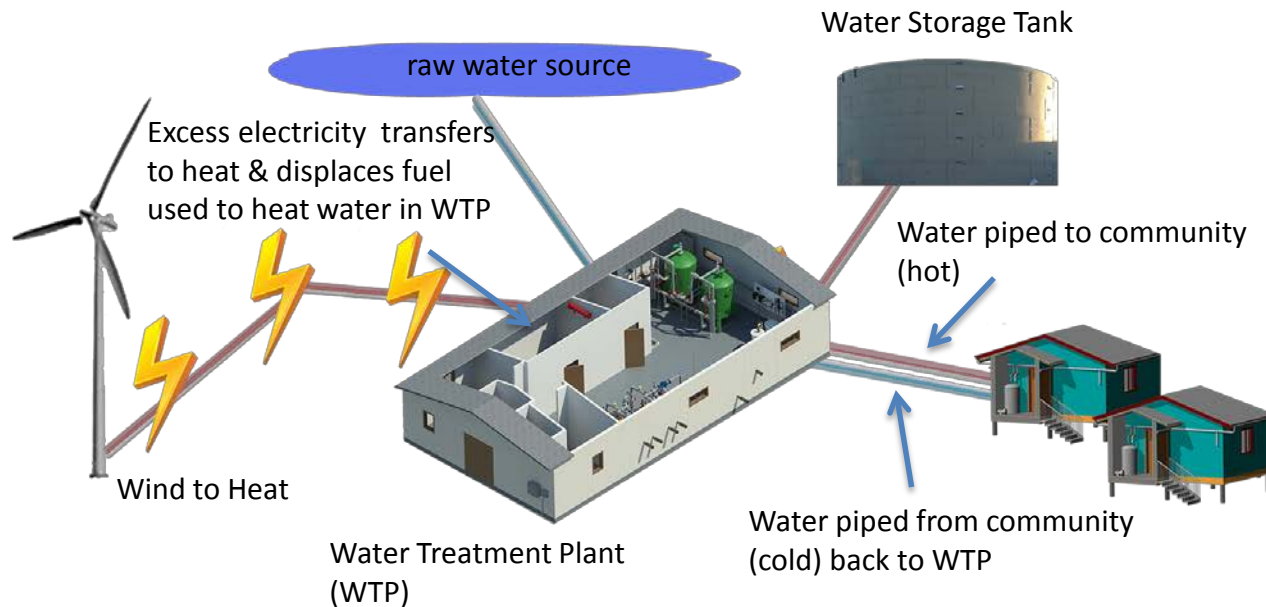
Each household was able to save \$150/month due to the reduced fuel use.



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Renewable Energy: Wind to Heat

Wind to Heat systems use the surplus electricity generated from wind turbines during peak wind events to heat water for use in arctic sanitation systems.



Mekoryuk Wind to Heat



- Potential fuel savings of \$40,000 annually
- Cost of \$0.05 per KWH equivalent to fuel oil at \$1.46 per gallon
- Stabilizes village power grid
- Completed December 2014.
- Three similar systems in construction for: Gambell, Shaktoolik, and Chevak.



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Selawik Energy Improvements



Obsolete and inefficient pumps, controls, lighting, boilers, glycol systems and associated plumbing were replaced.

State funding was used to attract \$702,427 in US Department of Energy funding and \$50,000 in US Environmental Protection Agency funding to improve the recovered heat system and install more efficient boilers.

Selawik Water System Energy Improvements

	% Saved	Annual Savings, \$
Electricity Savings	68%	\$146,719
Fuel Oil Savings	50%	\$40,352
Labor Savings	15%	\$30,156
Total O&M Savings	32%	\$217,227



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

Thank you

Mike Black

Director of Community Infrastructure Development
mlblack@anthc.org

For more information, please visit:
www.anthctoday.org/dehe/cbee.html
or Like us on Facebook
ANTHCenergy



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM