Graywater Reuse in Alaska: Part of the Solution?

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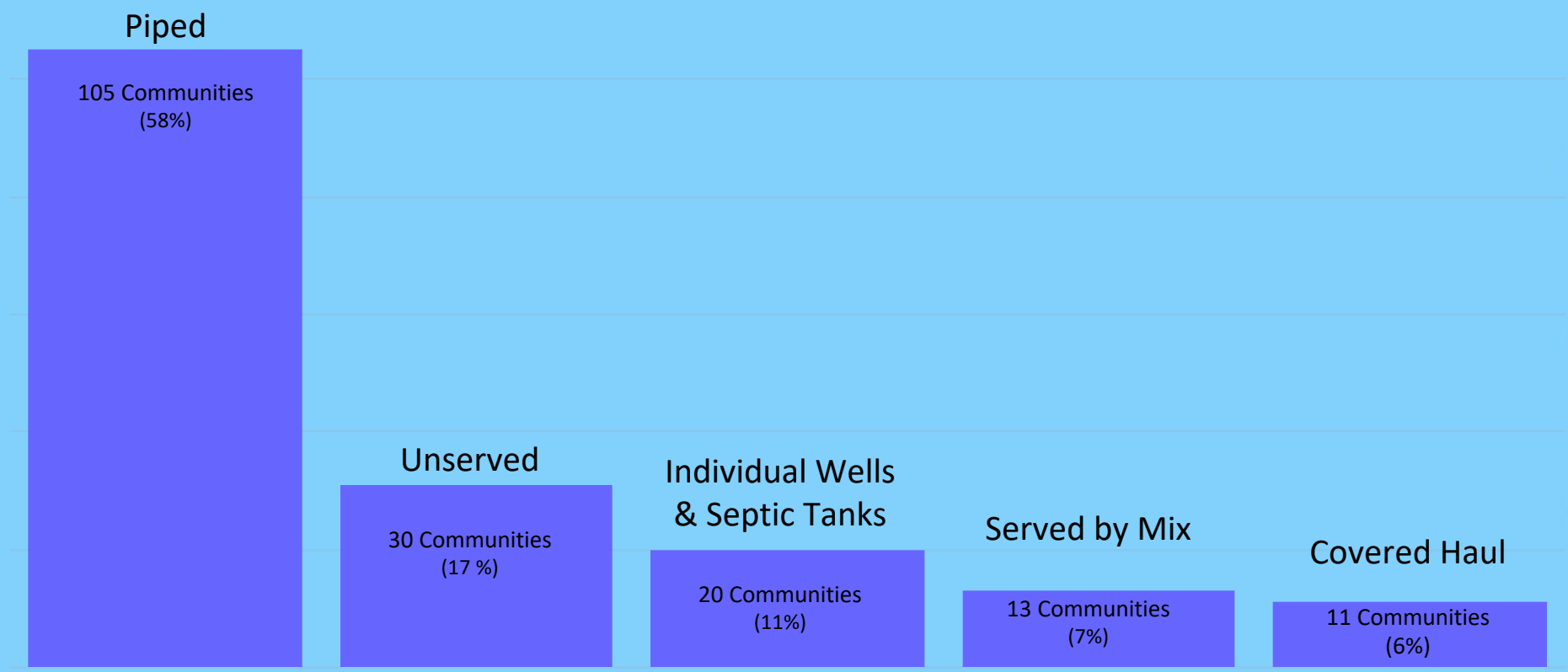
Progress in Alaska Village Sanitation

- For half a century, we've focused on getting rid of the honey bucket.
- Much progress has been made:
  - 30 years ago, fewer than 25% of rural Alaska households had running water and flush toilets.
  - In 1996, 55% of rural homes had piped or covered haul service.
  - Today, approximately 86% of rural homes have indoor plumbing (over 90% if regional hubs are included in the calculation).

Water & Sewer System Types in Rural Alaska by number of communities

August, 2015



“Centralized” Approach Since 1970:

- 100% water treatment to full regulatory compliance (regardless of ultimate use)
- Storage of large quantities of water, usually requiring heat addition
- Distribution of treated water to individual homes via pipes or haul vehicle, usually requiring heat addition
- Collection of all household sewage for lagoon disposal, usually requiring heat addition

However…

- Conventional, community-wide piped systems and truck haul systems are expensive to construct, maintain and replace (*over $1 billion to build piped systems in remaining unserved villages*)
- Many communities cannot afford the high operation and maintenance costs associated with piped or haul systems.
- Available funding is not adequate to serve remaining homes and make needed improvements. (*Annual funding amount is about 7% of funding need.*)
- Innovative approaches were needed in order to address health problems associated with water and sewer system deficiencies.

Unserved Homes in 2019: Where are they?

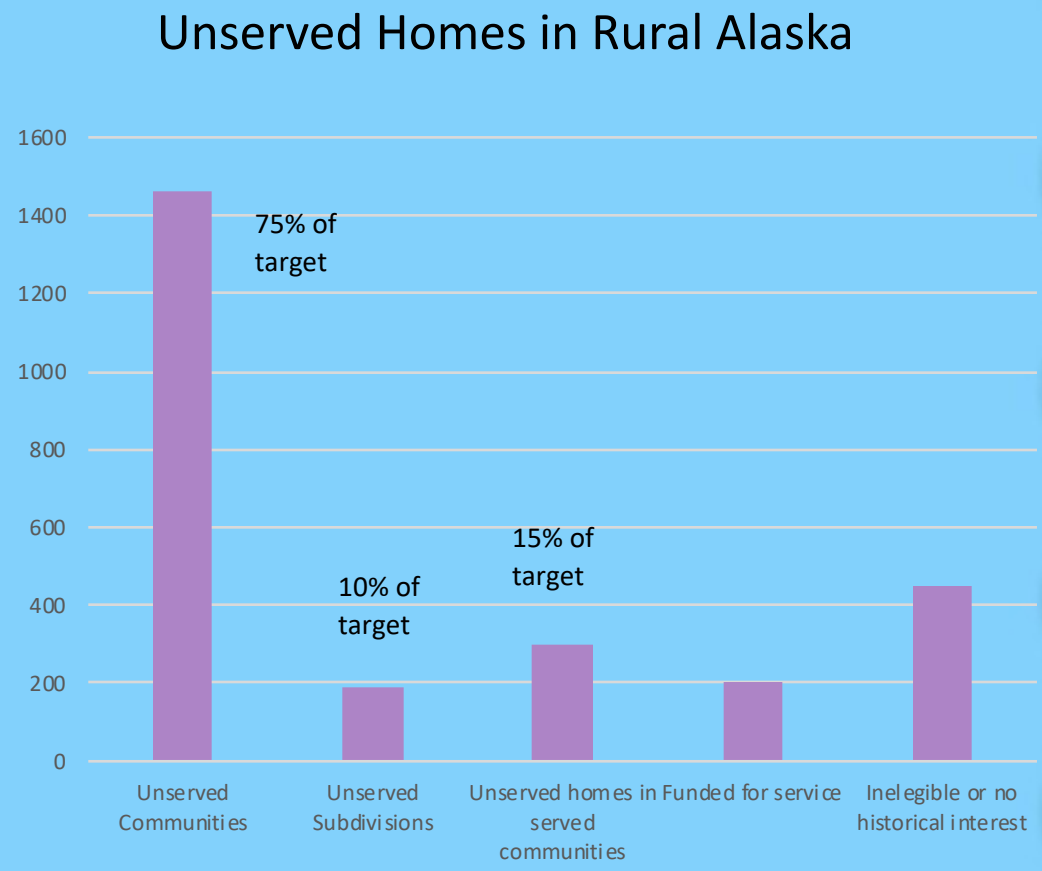
Total Unserved Homes = 2,610

Targeted for future service = 1,960

- Homes in 24 unserved communities = 1,460
- Homes in 8 unserved subdivisions (in “served” communities) = 200
- Individual homes in 33 served communities = 300

Not targeted for future service = 650

- Currently funded for service in 6 communities = 200
- Ineligible or no historical interest in services (31 communities) = 450



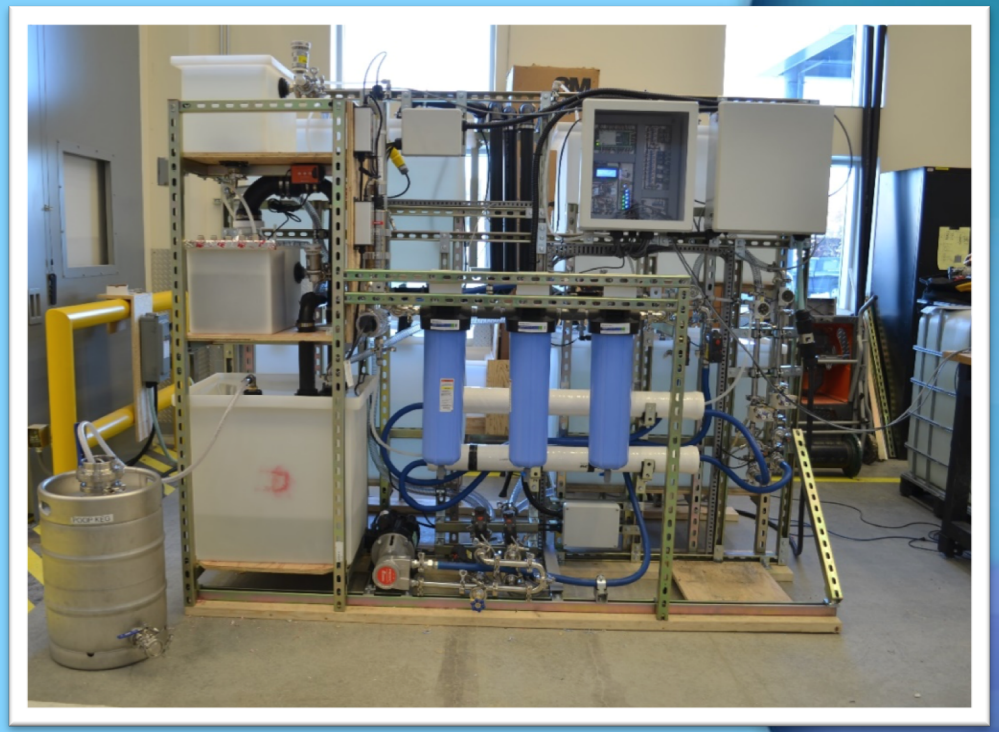
Different approaches will be needed to serve remaining homes, including:

Centralized approaches:

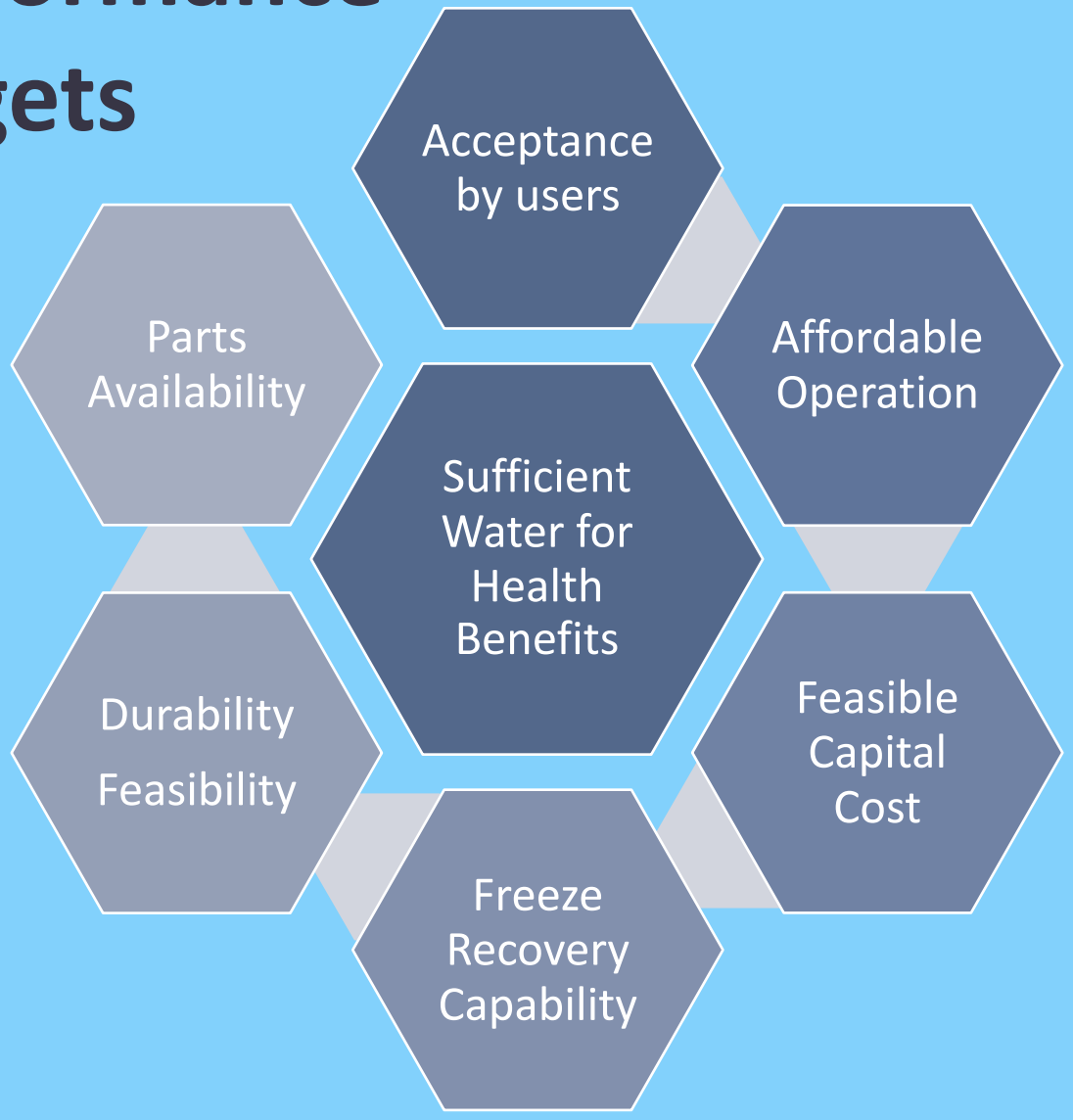
- Connecting individual homes or subdivisions to existing systems (in served communities)
- New centralized piped systems – where capital and operating costs are affordable for funding agencies and communities

Decentralized approaches (Requiring technical support through local cooperatives):
Individual wells and sewage systems with on-site treatment requirements

Decentralized approaches: Household graywater treatment and reuse systems – Alaska Water & Sewer Challenge



Alaska Water and Sewer Challenge: Performance Targets



Project Timeline

Phase	Approximate Timeframe
Team Formation	Fall 2013 – Spring 2014
Proposal Development + Presentation	Fall 2014 – Summer 2015
Prototype Development + Pilot Testing	Fall 2015 – Spring 2018
Field System Development + Testing	Fall 2018– Fall 2020
Technology Refinement + Improvement	2021 and beyond

Alaska Water and Sewer Challenge: Ongoing Activities…

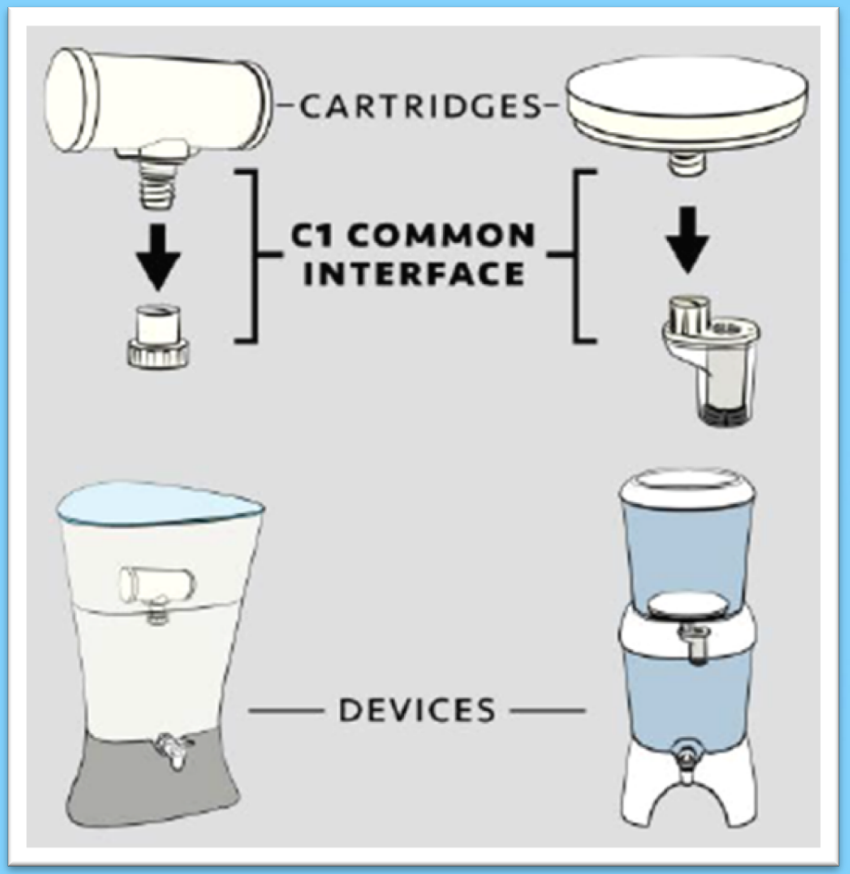
- Development of Log Reduction Targets (virus, protozoa, bacteria) for graywater treatment and re-use
- Study to determine water use by fixture in rural Alaska homes
- Development of program to oversee, monitor and manage decentralized water systems in rural Alaska communities

Ongoing Activities…

Pilot project to evaluate different dry separating toilets, one component of decentralized approaches

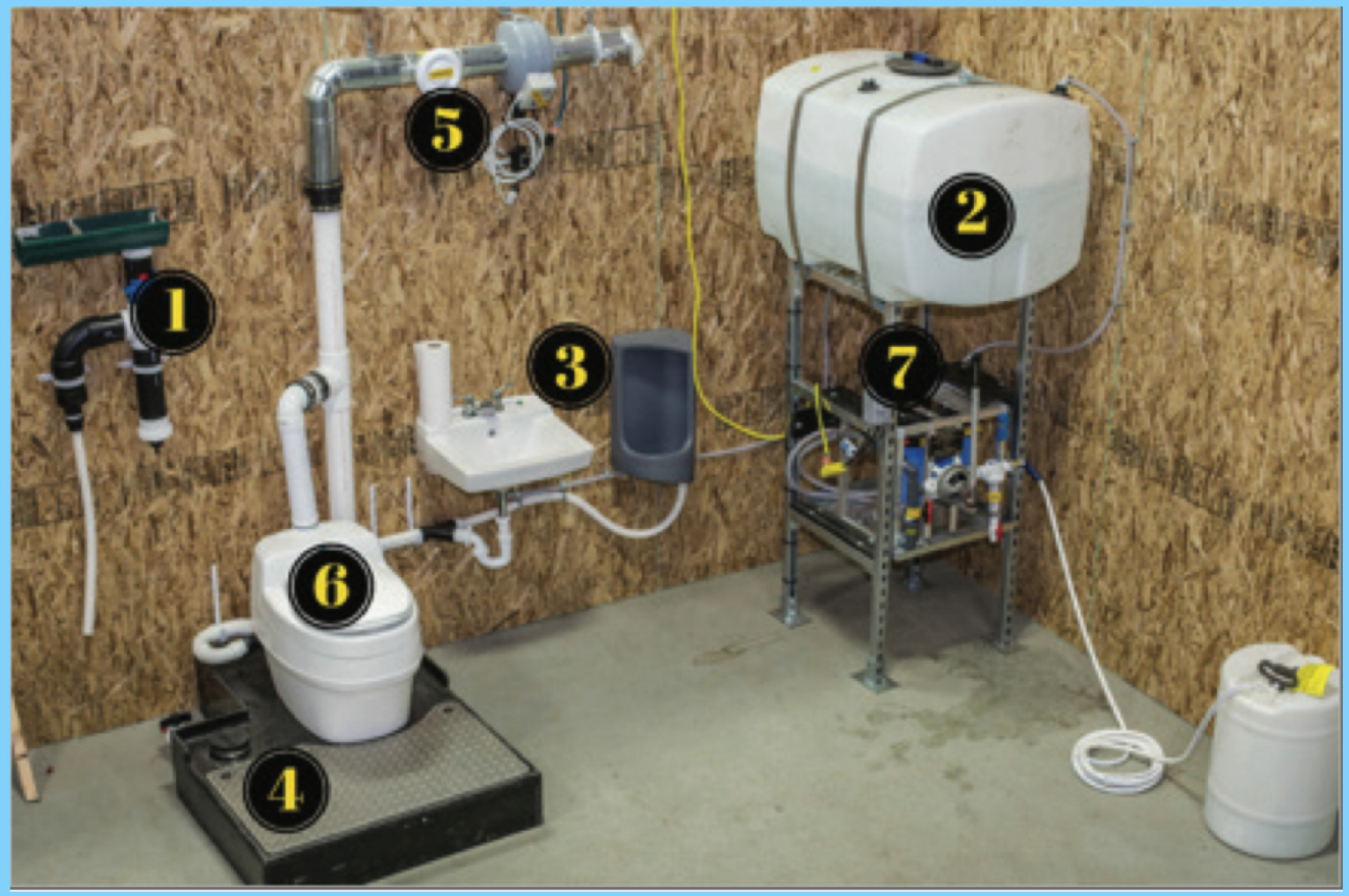
Ongoing Activities…

Pilot project to evaluate countertop drinking water treatment – another component of decentralized approaches



Another Decentralized approach: Portable Alternative Sanitation System (PASS)

Introduced by the Alaska Native Tribal Health Consortium



THANK YOU!

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