1/26/12 8:36 Quarter Deck

Present at start:

Mike Black	Susanne Fleek	Ed Lohr	Cheryl Rosa
Carrie Bohan	Bill Griffith	Greg Magee	Tim Thomas
Steve Bolan	Larry Hartig	John Nichols	Dennis Wagner
Deb Caldera	Rachelle Hill	Nancy Nix	John Warren
Steve Colt	Steve Konkel	Denman Ondelacy	Dan White
Nancy Davidian	Brian Lefferts	Alan Parkinson	Bob White
Tasha Deardorff	Eric Lespin	Doug Poage	Emily Menard

C. Rosa: The 2012 USARC Goals Report includes Arctic Human Health as one of its five goals. USARC and CDC convened a workshop last year on research strategies to improve health through water and sewer innovations in rural Alaska. This year is a focused follow-up.

Presentation 1: Bill Griffith
Overall Capital Funding Needs for Water and Sanitation in Alaska

Of 6,000 unserved rural homes (30% in served communities), we only have funding to hook up 1,000, and over 2,000 are considered unserviceable. Systems all over the state are failing or out of compliance with regulations. Conservatively, to meet all the existing needs would cost over $700M, not counting the $200M for minor needs and improvements. In addition, existing, functioning systems are becoming unaffordable to use and maintain.

The funding situation is getting worse. Although our delegation had significant influence from 1990-2004, funding has declined since. In 2012, it was $65M, well below half of the funding 7 years ago. Funding through the State has decreased most. We estimate a 2013 gap between funding and unmet needs of $638M, more than double the 2006 gap of $316M.

The bottom line: Existing systems are unaffordable. We don't have funding to serve the 6,000 unserved homes and make other essential improvements. We need innovation now to prevent health problems. Innovation might mean applying our existing technology in new ways.

Panel 1: Commissioner Larry Hartig, Susanne Fleek, Dennis Wagner, Tasha Deardorff, Denman Ondelacy

Q1 to D. Ondelacy: What should the overall objectives be when trying to promote in-home water and sanitation service for optimal public health benefit in Alaska?

The IHS has five objectives: (1) Provide enough water and adequate facilities to ensure the minimum acceptable public health benefit. (2) Build maintainable, viable, affordable systems. (3) Ensure the systems are wanted, accepted, and culturally appropriate. (4) Meet basic needs like washing and bathing. (5) Provide waste disposal.

"Minimum" is a hard word, but with funding and capacity issues, it's our reality.

Q2 to D. Wagner: What policy changes are needed to achieve these objectives?

Regulations need to be flexible. National regulations don't fit Kipnuk. We need to build and maintain systems safely without being over-regulated.

S. Fleek: Senator Begich knows some regulations keep agencies from flexibly implementing culturally appropriate infrastructure. We also need to look at cross-agency regulatory conflicts.

Senator Begich and the delegation will take the Denali Commission's survey of agencies to the Administration and pursue the rest legislatively. We need flexibility and loosened regulations.

L. Hartig: From a State perspective, this will be tough. It requires changes to the CWA, which won't happen any time soon. Money can be forced the wrong direction by regulations, so health problems aren't addressed and funds are limited for other needs. Drinking water rules are adding complexity and cost to systems statewide, but are we really attacking public health needs?

Discussion: In an ideal world, all would have water and sewer. In reality, they have to be able to afford it. Systems have to be sustainable on their own. Addressing energy consumption is a major way to reduce O&M costs. For example, Minto has waste heat now and hasn't turned their boilers on all winter, even at -40 F.

Q3 to S. Fleek: What kind of information or arguments we're not using might be provided to people at the Federal Delegation or State Legislative level to support funding requests?

The backlash against our economic reality led to a ban on earmarks, a tool our delegation used well for many years, and we don't expect the financial outlook to change. We need to show our Senate colleagues that we use our money wisely and that Alaska is unique and faces conditions we don't see elsewhere in US. Innovation is key, especially to address costs for energy, transport, and design. It gives us something persuasive to share with funding committees.

One key piece is to get into the President's budget so legitimate requests won't be seen as earmarks. The other is to show that a community wants, needs, and will sustain their system.

We need to bring visitors up and show them our reality. They always leave truly moved.

Q4 to T. Deardorff: What support is available and what obstacles might be encountered when attempting to fund pilot projects of new concepts?

Technology must be proven in community use, either here or in the lower 48, so we can be sure the dire sanitation condition is addressed for long term. We don't want to go back in a year.

L. Hartig: The State wants to move forward with technology we know works somewhere or conceptually looks like it would work in Alaska. Legislators want remaining homes to be served.

Discussion: Pilot technology in 4-5 homes at a time. What if village problems could be solved in a cooperative framework? The ARUC program is a combined effort, led by ANTHC and started with seed money from the IHS. It provides a convincing argument to fund similar programs.

Q5 to L. Hartig: If a program similar to Power Cost Equalization (PCE) could be established for W&S utilities, what State agency would be best suited to advocate for funds from the legislature and administer the program? How could something like this get started?

The Legislature is paying attention to maintaining aging systems and is inclined to do more this year. Discussions should start with the Bush Caucus. Look at community needs holistically in the context of a community's needs and abilities in order to address overall needs well.

Discussion: To get a subsidy, we'll need a grassroots movement; agencies can't lobby the Legislature. Unlike PCE, this must be performance-based, with accountability for often ignored maintenance. The status quo rewards system failure and inefficient practices.

ANTHC's energy program has found that enhancing efficiencies, including energy, can significantly lower O&M costs. A subsidy could encourage education and accountability.

A long-forgotten program in the Northwest Arctic Borough, LUMP, provided a performance-based subsidy, and O&M improved enormously. We can't afford to forget successes like this.

Q6 to D. Wagner: Should O&M costs be a criterion for capital funding consideration?

Yes.

Discussion: Showing how sustaining communities makes sense economically will help make the case to the larger Alaskan audience.

Presentation 2: John Nichols
Operations and Maintenance (O&M) Incentives, Needs, and Subsidies

Engineering water and sewer systems is preventative healthcare, and O&M is one of the biggest keys for system success. We can maximize the health benefit with the available funding through three strategies, in this order: Revenue, long-term employees, and shared knowledge between managers and operators. Lack of revenue leads to deferred maintenance, which leads to failed systems and operator turnover. Constant employee turnover precludes success. When managers and operators can't see the big picture, efficiency won't happen; very few communities know how much fuel the WTP uses or the cost of making the water 4° warmer.

The Navajo know that politics and management must be separated, because a council member raising rates commits political suicide, even though rates have to be high enough to cover costs.

Discussion: Between cost-of-living increases, decreased funding, and climate issues, this is the most difficult period for water and sewer infrastructure in recent history. Agencies must cooperate cross-discipline to look at whole communities. ANTHC/VSW should design connections between others' buildings and the sanitation systems. Operator training is critical.

Panel 2: Bob White, John Nichols, Carrie Bohan, Mike Black, Ed Lohr, John Nickels

Q1 to Nickels: Are there additional challenges to O&M the panel is aware of?

A big problem RUBA finds is with community buy-in. Communities that have a sense of ownership take better care of their systems and everything else they manage.

Discussion: Communities do best when they run utilities as businesses. A model that seems to work is paid management separated from politics and with access to engineering and operational expertise. Each community may have a different O&M solution. Operator and city administrator positions are both overworked and underpaid in most cases' administrators run out of time for other city-wide responsibilities. Communities that partner with ARUC and RUBA are much stronger and have the resources they need.

Q2 to all: Funding agencies have established a sustainable threshold of 5% of MHI. Is that too high, too low, or appropriate?

It's difficult to establish a number that works for everyone when we have so little data on what it costs to run the systems and why, but it works as an upward limit. ARUC data shows that communities tend to subsidize rates when they exceed the threshold but not otherwise.

Q3 to E. Lohr: Besides providing funding to offset operational costs, what services could improve the sustainability of existing and planned systems?

Consistent, routine billing by an outside source takes out politics and increases payment rates.

Discussion: Get and keep skilled operators. Start by setting appropriate user fees and collecting them so we have funds to pay operators. Other possibilities include regional management, borough-level administrative support, or subsidized operator costs. Itinerant operators aren't feasible due to cost.

Q4 to B. White: How can we more effectively incentivize more effective O&M?

Stop rewarding failure! Create a subsidy tied to clearly documented performance.

Discussion: There's no reward for best practices; we have reverse incentives. This has been known for 25 years and discussed by S. Colt, but nobody has authority to fund the right

incentives. The IHS could ask Congress for funding, but only through the national tribal effort. Make the operator job more attractive.

Q5 to M. Black: How could we get a subsidy similar to PCE off the ground?

Create an education program demonstrating the overriding need for proper O&M, that it makes fiscal sense, and that $2B in infrastructure is at risk. Almost 20 years ago, S. Colt found that extending system life just one year was worth $2.4M. Those numbers get attention.

Q6 to C. Bohan: How would a subsidy be distributed among communities?

Each system has a different complexity level, cost, and community ability to pay. Maybe provide a larger subsidy in places where O&M costs are higher and economics are lower.

Discussion: Existing systems over 5% MHI should get a larger subsidy. Incentivize better O&M with bonuses for completing O&M and meeting certain objectives to extend system life. Anchorage needs to know that $.90 of every $1 spent rurally comes back to Anchorage. The State's existing revenue sharing could add an O&M incentive. Update S. Colt's work.

Presentation 3: Troy Ritter
Water & Health in Alaska: Considerations for Water Quantity

Water service has been proven to lower acute respiratory infections, skin infections, and invasive pneumococcal disease, and Alaska has the highest rates of these three diseases in the world. A third of babies are hospitalized in Alaska every year with acute respiratory infections. All three diseases are water-washed: their transmission is interrupted through hand washing.

How much water is needed for optimal health? Wide-ranging standards exist from WHO (26.4 gpcd for internal fixtures), the UN Refugee Agency (4-5 gpcd for refugees), and others. We can't use these to come up with one standard for Alaska's diverse communities and systems.

In a study collaborating with T. Hennessy and T. Thomas, we collected comparative data on 4 villages that started with self-hauled water and ended with pipes. Residents used and reused only about 2 gpcd in self-haul homes. In piped homes, residents reach their optimal water-to-soap-use ratio when their water use is 26 gpcd, which interestingly is in line with the WHO standard. The 3 communities with flat-fee water service achieved this level, but the community charging per gallon used less than 10 gpcd by the end of the study. Flat rates are very important.

Our study involved education about water use practices, which we've found to be crucial. A faucet nobody's using doesn't improve health.

Ultimately, there's no magic number for Alaska, but a simple modeling approach could be successful. We know how often people need to wash hands and bathe, and we know how much water each takes in a given system. We can achieve optimal health through an integrated approach that includes provision of infrastructure, proper O&M, and education to encourage healthy water use behaviors. Affordability is crucial, and user fees shouldn't be tied to use.

Discussion: Pipes have additional advantages: not everyone is able to haul water, and fluoridation is only possible in piped systems. Rural Alaska's kids have the worst dentition in the USA. We do need system parameters so engineers know what water needs they're designing for, and we should develop a target water use number in the planning stage of each project.

Presentation 4: Aaron Dotson (UAA)
Novel Technology in the Alaska Situation

Novel technology in rural Alaska could get National Science Foundation funding. Many trendy novel technologies aren't good for rural Alaska, and novel technologies have risks since they're

unproven, so we need to find realistically novel options. Two technologies proven in other industries could work well here. For water, Tubular Membranes are robust, create good water, and are easy to operate, but do use a little more energy. For wastewater, Subsurface Injection takes away open access to a lagoon. Very robust point-of-use systems can be effective, too.

Look at other industries like industrial engineering, which has technology to treat fluids far more challenging than water. Ask some questions: Does washing water need to be same quality as drinking water? Should we use a shorter design life? Can we connect treatment processes within a region to build a more robust regional system?

Presentation 5: Brian Lefferts
Ensuring R&D Addresses Local Considerations

To maximize health, systems must be sustainable, and designs must involve all stakeholders. They must be culturally relevant, wanted, and needed. Everyone should be involved throughout the process, including local end users, RUBA, ARUC, RMWs, etc., to bring all opinions together. Use the 4-day Charette process to get the buy-in needed with concepts, alternatives, refinement, and the final plan.

According to Oscar Alexie, a Yukon Eskimo instructor, while we tend to start point-first and build outward, the Yupik way starts with the issue and builds to the topic. Take the time to listen.

Discussion: Provide good education and clear, honest communication to get the community consensus we need to make systems successful. Ultimately, the decision should be up to the community; in the end, this is their health. To support our missions, support them with good information. It's easier the better we understand cultural practices, feelings about traditional water sources, community history, and who the key players are.