

ExhibitDNeed

State of Alaska

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The State of Alaska is focusing on the threats of damage to infrastructure, public buildings, and disruption of food supply; the hazards of storm surges, erosion, severe winds, flooding and permafrost degradation; and vulnerabilities to climate change, lack of cash economy, dependence on wild food supplies, high rates of domestic violence, low quality housing stock, and severe weather. Due to the nature of qualifying events, the focus of this application is on the effects of the flood hazard. Related erosion affects 86% of Alaska Native Villages (Dropbox-AK-133 pg. 6). This application will also address the observed effects of climate change, its secondary and tertiary effects such as permafrost melting, effects on residential homes and infrastructure; and frequency and intensity of erosion and flooding. For overall resiliency, this application will address “all hazards” resiliency projects.

Target Area #1: The Association of Village Council Presidents (AVCP) Region

See Exhibit B, page 1 for description of the AVCP region. This region includes the Yukon-Kuskokwim River Delta region of coastal western Alaska, the middle and lower Yukon River and Kuskokwim River areas. These areas are characterized by impacts from annual ice jam flooding (riverine), fall sea storms, storm surge, thawing permafrost and reduction of sea ice. Communities in this region were settled by Alaska Native peoples in proximity to subsistence sources near coastlines and rivers. In addition to being an economically fragile area (tribal), the region, especially communities impacted by qualifying disasters (Alakanuk, Kotlik, Emmonak and Newtok), are further characterized by low- and moderate-income households and prior documented environmental distress (Dropbox: AK-112 through 117). Disaster-related Unmet Needs include local match for completion of road, boardwalk, water/sewer system, mooring and city building repair projects (Dropbox: AK-0). These unmet needs continue to impact communities, yielding substandard living conditions and exacerbating already distressed environmental community conditions (Dropbox: AK-126 and 127). Infrastructure repair

conducted with an overall resiliency perspective would go great lengths in improving quality of life in impacted communities and their regions. Resilient repairs to Alakanuk, Kotlik and Emmonak would mitigate future repeated flood damages and their impacts to community life, health, safety, and subsistence activities. Roads, boardwalks, and mooring points should be designed to account for degrading local permafrost and erosion conditions. Water/sewer systems should be designed to upgrade from haul water and honeybuckets to environmentally friendly, flood resistant, resilient running water systems. Damaged buildings should be flood-proofed, elevated, relocated and/or otherwise protected. Newtok has identified community relocation to a selected site called Mertarvik. Resilient solutions could include alternate projects at the new site.

Target Area #2: The Tanana Chiefs Conference (TCC) Region

See Exhibit B, page 2 for description of the TCC Region. This region includes most of the Yukon River Valley, Kuskokwim River, and Tanana River regions of interior Alaska. These areas are characterized by impacts from annual ice jam flooding and thawing permafrost. Communities in this region were settled by Alaska Native peoples in proximity to subsistence sources near rivers. In addition being an economically fragile area (tribal), the region, especially those communities impacted by qualifying disasters (Galena, Fort Yukon and Hughes), are further characterized by low- and moderate-income households (except Galena) (Dropbox: AK-128) and prior documented environmental distress (Dropbox: AK-129 through 131).

Disaster-related (DR 4122) Unmet Needs include local match for completion of road, building and power infrastructure, and levee repair projects (Dropbox: AK-96 and 131). These unmet needs continue to impact communities, yielding substandard living conditions and exacerbating already distressed environmental community conditions (Dropbox: AK-132 p. 27). Infrastructure repair conducted with an overall resiliency perspective significantly would mitigate future damages and their

impacts to community life, health, safety, and subsistence activities. Roads should be designed to account for degrading local permafrost and erosion conditions. Damaged buildings and power infrastructure should be flood-proofed, elevated, and/or relocated. Finally, the Galena levee should be reinforced and repaired to protect against future ice-jam flooding.

Future risks are repetitive and worsening flooding impacts to housing, infrastructure and environment due to progressive coastal and riverine erosion and exacerbating conditions of the climate. Recently documented warming in the Arctic, resulting in permafrost thaw, increases the effects of coastal and riverine erosion. Additionally, the decrease in Alaskan Arctic sea ice concentration leaves coastal communities exposed to the effects of fall and winter storm surges, increasing the coastal erosion rate. All impacted communities are native subsistence communities with limited cash economies. Increased exposure to future events threatens Alaska Native subsistence cultures. These already economically, socially, and environmentally distressed communities struggle to recover from disaster events and sustain themselves due to impacts their capability to fish, hunt and gather berries and fuel. Environmental impacts such as damage to fuel storage tanks, landfills, and infrastructure also negatively affect public health and national food stock (fish, wildlife, berries). The referenced coastal and riverine communities and their native cultures are at risk from extinction without resilient recovery assistance.

The SIWG identified the risk and vulnerability of eligible Alaskan communities from cultural extinction from historical stakeholder involvement (past working groups), scientific studies (State, NOAA, BLM, FEMA, etc.), National Climate Assessment, NOAA Coastal Vulnerability Report, ongoing stakeholder input received during regular monitoring trips by agencies throughout the year and stakeholder surveys and outreach during the development of Phase I application. Qualitative studies such as the USACE Environmental Assessments and the Waste Erosion Assessment and Review (WEAR) Reports also support the SIWG's conclusions (Dropbox: AK-132 and 135). See ANTHC's

ethnographic research—Climate Change in the Bering Strait Region (Dropbox: AK-134). Other studies that were helpful were Comprehensive Plans, Local and State Hazard Mitigation Plans, FEMA Project Worksheets and FEMA Individual Assistance (IA) Data (Dropbox: AK-136 through 144). This information is the best data for our region as it was sourced from regional tribal partners, state and federal agencies with experience working directly with impacted communities. Collectively, these agencies consult technical experts in a cross disciplinary approach to analyze data to identify the risks of climate change.

Given the history of our target areas, climate change projections, demographic and development trends, Alaska Native communities are facing the ultimate risk of individual community identity and cultural extinction. Repetitive and increased exposure to flooding degrades the natural environment; damage residential housing and public infrastructure; damage landfills and sewage lagoons and spread debris and hazardous materials; contaminate freshwater sources; and threaten harvested and stored subsistence food stores and food sources. Climate changes such as warming temperatures and resulting thawing permafrost and decreased sea ice extent and concentration have been noted to increase community risk to hazards (Dropbox: AK-145 pg. 517(4)).

Our approach is a regional approach based on tribal area. The risks these regions face are clear; economic, structural and cultural. The regional areas are predominately occupied by 93 federally recognized tribes. Climate change, erosion, permafrost degradation are impacting their ability to live, hunt and fish in the place they have lived for thousands of years. These alterations in hunting, fishing and gathering practices undermine their intergenerational transfer of culture, skill and wisdom”. (Dropbox: AK-145 pg. 536 (23)). Their economies are part cash and part subsistence. State budgets which have been robust in the past are under pressure because of the decline in world oil prices. These stresses increase the physical and economic risks, as they limit public investments needed to build local

resiliency. According to the NCA,” Coastal erosion is destroying infrastructure. Impacts of climate change on river ice dynamics and spring flooding are threats to river communities”. (Dropbox: AK-145 pg. 523 (10))

The risks to Alaska coastal communities are serious and very likely. The risks not only threaten housing and critical local infrastructure, but the very existence of unique Alaskan Native cultures, including their subsistence way of life. Alaska is warming at twice the rate of the continental US (Dropbox-AK-146). Alaska experienced seven eligible disaster events in 2011, 2012 and 2013. The NCA supplemental material of traceable accounts indicates that lack of sea ice causes storms to produce larger waves and more coastal erosion (Dropbox: AK-145 pg. 534(21)). “Known unknowns” include future frequency and intensity of events, and unanticipated secondary and tertiary effects.

The risks to Alaska’s riverine communities have been recently demonstrated in Galena during the qualifying disaster DR-4122. As described in Exhibit B, Most Impacted Characteristics section, page 3 for Galena, the current FIS established the BFE at 131.5 feet. After the event, the USACE assessed a more accurate BFE of 135.5 feet, taking event high-water mark data from NWS and USACE and ice-jam flooding into account. This is an example of updated best available data from partner agencies. The serious risk to Galena was realized during DR-4122. It is unknown whether there will be a near-term recurrence while the community is still in recovery, slowing recovery and exacerbating the effects of a future event, as there remain unmet needs in establishing resiliency of housing, such as elevations and acquisitions; and protection of public buildings, roads, the dump, and the power and utility complex.

The lack of residents and local jurisdictions capacity to obtain flood insurance in NFIP participating communities has led to a reliance of these communities on limited state, local and volunteer resources. Most Alaska communities do not participate in the NFIP due to reasons of economy and lack of local capacity to manage the program and regulate land use. Alaska Native

Villages such as Newtok have no land use authority and do not qualify for NFIP participation. A former FEMA Region X Administrator testified in 2007 that FEMA's mitigation programs have insufficient funds to comprehensively address the Alaska Native villages' erosion problem (Dropbox-AK-147 pg. 28). State, regional and local engagement in resilience planning needs to realistically take the lack of robust cash economy and other unique aspects of Alaska Native communities into account, and leverage other resiliency options.

Alakanuk, Kotlik, Hughes and Newtok are not National Flood Insurance Program (NFIP) participating communities. Although Galena, Fort Yukon and Emmonak are NFIP participating communities, flood insurance is not a widely used source of homeowner mitigation in Alaska rural villages due to the largely subsistence-based economy of these largely tribal communities. However, NFIP participating communities may have flood insurance on locally-owned public infrastructure and meet local NFIP ordinance requirements.

A representative Alaskan scenario of Alaskan homeowners living in the SFHA occurred in Emmonak in after federally declared flooding disasters in 2009 and 2013. After the 2009 flood, residents of the City of Emmonak in the SFHA, who received IA grant assistance, were required to carry NFIP insurance. Homeowners carried Group Flood Insurance Policies (GFIP) paid by their IA grants. In 2013, when Emmonak flooded again, six homeowners were impacted again, but had failed to obtain standard NFIP policies after their GFIP expired in 2012. These homeowners were found ineligible for 2013 FEMA IA.

There is a close tie to subsistence communities, lack of cash economy and resultant lack of general capacity to pay for flood insurance. Even what may be considered a smallest flood insurance premium is not generally affordable to most residents of these communities. The choice between obtaining flood insurance to mitigate risk from future flooding or the paying for the ability to heat

homes, with fuel prices ranging anywhere from \$5.40-\$9.00 per gallon, is a real decision that many rural Alaskans face.

For Galena, Alakanuk, Emmonak, Kotlik, Fort Yukon and Hughes, mitigating local threats and hazards through resiliency actions such as property acquisition and deed restriction; flood-proofing; land-use planning and capacity building; structure elevation and relocation; roads, embankment and levee stabilization; and other innovative mitigation solutions can address specific unmet disaster recovery needs and enhance build local and regional cultural resiliency. For the Newtok, the solution is to fund the planned move to their relocation site of Mertarvik (Dropbox-AK-137).

Building resistance to the effects of erosion and repetitive flooding, through the aforementioned projects protects reduces the community public health risks from hazardous material spills; contamination of drinking water; contamination from landfill; and exposure to mold and debris. Building properly designed resilience against these threats can also reduce environmental impacts to local food harvest sources and loss of the few vital businesses which support local communities. A secondary effect of building local resilience is that these communities can act as regional resilience centers for less robust regional communities, providing food, shelter and aid to evacuated neighbors.

There are risks with disproportionate effects to the elderly, functional needs, and young. These groups are at higher risk when lack of resiliency leads to home and/or community evacuation; affects access to emergency and medical care, prescription medication supplies; and access to cultural food and routine supplies such as baby formula, diapers and clothing.

In the AVCP and TCC target areas, disproportionate effects are related to both household income and being a member of a protected class. Household income is based both on cash and subsistence gathering of food. When stored subsistence food is lost as a result of a disaster, or other means, this food is not easily replaced, as “store-bought” food purchased by cash is not suitable for these cultures as a

mainstay to replace subsistence foods. Cash is a limited household resource due to lack of local cash economy (jobs and services). Subsistence activities such as fishing, hunting and gathering are seasonal, making local replacement of subsistence food difficult. Local, regional or state agencies usually solicit donations of stored subsistence food such as fish, moose, seal or whale. The vast majority of the populations in these tribal areas are Alaska Natives. The percentage by census area targeted ranges from 71-93%. Most of the people affected are in protected class, particularly in the lower income groups.

Some risks will disproportionately affect those with accessibility challenges. Individuals in need of additional response assistance include children, the elderly, disabled; those from diverse cultures and with limited English proficiency. Increasing overall resiliency will reduce risks to these groups. Resiliency solutions will also benefit those with functional needs, providing them with additional protection from hazards, and ensuring access to needed services, support and supplies.

A good example of vulnerabilities offering opportunities for recovery, economic revitalization and resilience to current and future risk is the Newtok relocation effort. As discussed in exhibit C, page 5, the NPG created a Strategic Management Plan – Newtok to Mertarvik which charted the course for the village to relocate to Mertarvik. The relocation will accomplish disaster-resistant housing and infrastructure through the move to a less exposed location out of a floodplain. The relocation will result in new, more efficient and robust water, sewer and power; create future jobs for locals; create temporary jobs through building projects, home relocation, temporary sheltering, and demolition and debris removal projects; and create more resilient, fuel efficient, spacious and available housing.

Addressing the risk related to vulnerability of coastal communities threatened by erosion is important because many Alaska rural communities face the same risks. Coastal communities threatened by erosion need to relocate, address significant shoreline stabilization or face inevitable physical and cultural disbandment and eventual extinction. Addressing the risk related to one community become a

pilot program with lessons learned for future projects in the state, and well as build regional resiliency to support neighboring coastal communities until they progress to relocation or stabilization. The State supports sustainability of Alaska Tribes, particularly through resiliency actions.

Newtok is an example of one community where existing conditions that exacerbate vulnerability. There is no year-round potable water supply. A fill and draw system provides potable water, most years, from June through January. Residents obtain potable water from the community water point and self-haul it to their homes. Once the potable water supply is exhausted, ice-melt or untreated surface water is obtained from three tundra ponds, two of which are located 40 minutes round-trip via four-wheeler from the village. Many prefer the more distant water sources due to risk of contamination of the nearest pond, which is prone to fall flooding. Shower facilities are not available and laundry facilities are available only during summer and early fall. (Dropbox: AK-148 pg.3-6). Erosion and filling have rendered the main barge landing inaccessible and secondary landing accessible only during high tides. Erosion threatens residences, the school and fuel tanks.

Little quantitative information was available to determine the extent of water-related disease in Newtok. ANTHC obtained infant hospitalization rates for various acute respiratory infections. ANTHC's data review found that between 1994 and 2004, 29 percent of Newtok infants were hospitalized at a rate of 20 percent for pneumonia, 18 percent for RSV, and 11 percent for pneumonia RSV. While Newtok's small population prevents making statistically valid comparisons to other populations, these numbers are strikingly high. (Dropbox: AK-148 pg.3-4).

Most homes lack modern sewage disposal. Honeybuckets (a 5-gallon bucket with toilet lid) are utilized. A wastewater disposal lagoon is not available. As the primary method of disposal, raw sewage is dumped directly into the Newtok River, which now has little to no flow due to erosion. A team of public health professionals also noted a substantial amount of honeybucket spillage within the village, as

well as evidence that honeybuckets were being dumped at multiple places around the village. See Attachment E, AVCP. Also, since the previous solid waste disposal site was lost to erosion, a new landfill has been constructed across the Newtok River from the village. The garbage disposal site is a non-permitted Class III landfill. Access to the disposal site is very limited, as it is located across the Newtok River from the village.

Although sanitation conditions in the YK Delta region lag behind other US regions, most communities in Alaska have access to a year-round potable water supply, a contained location to dump raw sewage, and reasonable access to a solid waste disposal site. We know of no US community other than Newtok that lacks all three. Although this is a 2006 report, conditions have not changed.

(Dropbox: AK-148)

The NPG is making progress in planning, obtaining funding for, and implementing village relocation. In collaboration with DH&EM, the NPG has developed and submitted hazard mitigation project applications for housing relocation and acquisition and debris removal for funding. The NPG, USACE, DHS&EM and DEC are also collaborating on a plat development project for Mertarvik.

Project funding is the primary barrier keeping the state, regional and local governments from completing a solution. The interagency groups, including local jurisdictions largely have planning capability and capacity but lack the general funding to conduct specific project design and engineering, project and construction management, and construction. Funding cycles, narrow programmatic grant guidelines, and competition for funding are also other barriers.