NEWTOK VILLAGE
TRIBAL HAZARD MITIGATION PLAN UPDATE

October 2015

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U.S. Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021-9796

FEMA

Honorable Paul Charles
President, Newtok Village
P.O. Box 5545
Newtok, Alaska 99559

Dear President Charles:

On October 26, 2015, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) approved the ***Newtok Village Tribal Hazard Mitigation Plan*** as a Tribal Mitigation Plan, in accordance with 44 CFR Part 201. The Newtok Village is now eligible to apply directly to FEMA as a grantee for Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) non-emergency programs through October 25, 2020. To continue eligibility, the plan must be reviewed, revised as appropriate and re-submitted for approval within five years from the date of this letter.

As a result of the Disaster Mitigation Act of 2000, states and tribes are required to develop and maintain hazard mitigation plans compliant with FEMA standards as a condition for receiving non-emergency Stafford Act assistance. Applicable Stafford Act assistance includes Public Assistance (Categories C-G), Fire Management Assistance, Hazard Mitigation Grant Program (HMGP), and Pre-Disaster Mitigation grants.

FEMA's approval of your plan as a Tribal Mitigation Plan provides the Tribe eligibility to apply for various Stafford Act programs. All requests for assistance, however, will be evaluated individually according to the specific eligibility and other requirements of the particular programs. For example, a mitigation action identified in the approved plan may or may not meet the eligibility requirements for HMGP funding.

We look forward to continuing a productive relationship between FEMA Region 10 and the Newtok Village. Please contact our Regional Tribal Liaison, Ramona Van Cleve, at 907-271-4302, or our Regional Mitigation Planning Manager, Kristen Meyers, at 425-487-4543 with any plan specific questions or for further assistance.

Sincerely,

Kenneth D. Murphy
Regional Administrator

cc: Ann Gravier, Alaska Division of Homeland Security and Emergency Management

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Acronyms/Abbreviations

°F	Degrees Fahrenheit
ACCIMP	Alaska Climate Change Impact Mitigation Program
ACWF	Alaska Clean Water Fund
ADWF	Alaska Drinking Water Fund
AEA	Alaska Energy Authority
AEEE	Alternative Energy And Energy Efficiency
AFG	Assistance To Firefighters Grant
AHFC	Alaska Housing Finance Corporation
AICC	Alaska Interagency Coordination Center
AIDEA	Alaska Industrial Development And Export Authority
AK	Alaska
ANA	Administration For Native Americans
ARC	American Red Cross
AVEC	Alaska Village Electric Cooperative
BIA	Bureau Of Indian Affairs
CCP	Citizen Corps Program
CDBG	Community Development Block Grant
CFR	Code Of Federal Regulations
CFP	Community Forestry Program
CGP	Comprehensive Grant Program
Village	Newtok Village
CP	Newtok Village's Comprehensive Plan
CVRF	Coastal Villages Region Fund
CWSRF	Clean Water State Revolving Fund
DCCED	Department Of Commerce, Community, And Economic Development
DCRA	Division Of Community And Regional Affairs
DEC	Department Of Environmental Conservation
Denali	Denali Commission
DHS	Department Of Homeland Security
DHS&EM	Division Of Homeland Security And Emergency Management
DHSS	Department Of Health And Social Services
DGGS	Division Of Geological And Geophysical Survey
DMA 2000	Disaster Mitigation Act Of 2000
DMVA	Department Of Military And Veterans Affairs
DNR	Department Of Natural Resources
DOE	Department Of Energy
DOF	Division Of Forestry
DOI	Division Of Insurance
DOL	Department Of Labor
DOT/PF	Department Of Transportation And Public Facilities
DSS	Division Of Senior Services

Acronyms/Abbreviations

EOC	Emergency Operations Center
EMPG	Emergency Management Performance Grant
EPA	Environmental Protection Agency
EQ	Earthquake
ER	Erosion
EWP	Emergency Watershed Protection Program
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FL	Flood
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention And Safety
ft.	Feet
FY	Fiscal Year
g	Gravity
GF	Ground Failure
GIS	Geospatial Information System
Hazus	Hazard United States – Multi-Hazard Software
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HSGP	Homeland Security Grant Program
HUD	Housing And Urban Development
IBHS	Institute For Business And Home Safety
ICDBG	Indian Community Development Block Grant
IGAP	Indian General Assistance Program
IHBG	Indian Housing Block Grant
IHLGP	Indian Home Loan Guarantee Program
INAP	Indian And Native American Programs
IRS	Internal Revenue Service
Kts	Knots
LEG	Legislative Energy Grant
LEPC	Local Emergency Planning Committee
MAP	Mitigation Action Plan
MGL	Municipal Grants And Loans
MMI	Modified Mercalli Intensity
mph	Miles Per Hour
msl	Mean Sea Level
NAHASDA	Native American Housing Assistance And Self Determination Act
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NOAA	National Oceanic And Atmospheric Administration
NPG	Newtok Planning Group

Acronyms/Abbreviations

NRF	National Response Framework
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
NVC	Newtok Village Council
NTC	Newtok Traditional Council
PCR	Parks Culture & Recreation Center
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
PNP	Private Non-Profits
RCASP	Remote Community Alert Systems
RD	Rural Development
RL	Repetitive Loss
RurALCAP	Rural Alaska Community Action Program Incorporated
SAFER	Staffing For Adequate Fire And Emergency Response
SBA	U.S. Small Business Administration
SHMP	Alaska State Hazard Mitigation Plan
SHSP	State Homeland Security Program
SOA	State Of Alaska
Sq.	Square
Stafford Act	Robert T. Stafford Disaster Relief And Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, And Environmental
URS	URS Corporation
US or U.S.	United States
USACE	United States Army Corps Of Engineers
USC	United States Code
USDA	United States Department Of Agriculture
USGS	United States Geological Survey
VFA-RFA	Volunteer Fire Assistance And Rural Fire Assistance Grant
VSW	Village Safe Water
WARN	Warning, Alert, And Response Network
WHIP	Wildlife Habitat Incentives Program
WX	Weather

1. Introduction

Section One provides a brief introduction to hazard mitigation planning, the grants associated with these requirements, and a description of this Hazard Mitigation Plan (HMP).

1.2 Hazard Mitigation Planning

In recent years, local and tribal hazard mitigation planning has been driven by Federal law. On October 30, 2000, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (Title 42 of the United States Code [USC] 5121 et seq.) by repealing the act's previous mitigation planning section (409) and replacing it with a new mitigation planning section (322). This new section emphasized the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. In addition, it provided the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation plan requirements for mitigation grant assistance.

Indian Tribal Government Defined:

For consistency and ease of reference, the term Indian Tribal government is used throughout this document. As defined in 44 Code of Federal Regulations (CFR) 201.2: *Indian Tribal government means any Federally recognized governing body of an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of Interior acknowledges to exist as an Indian tribe under the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a. This does not include Alaska Native corporations, the ownership of which is vested in private individuals.*

To implement these planning requirements, FEMA published an Interim Final Rule in the Federal Register on February 26, 2002 (FEMA 2002a), 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are described in detail in Section 2 and are identified in their appropriate sections throughout this HMP.

In October 2007 and July 2008, FEMA combined and expanded flood mitigation planning requirements with local and tribal hazard mitigation plans (44 CFR §201.6 and 201.7 respectively). Furthermore, all hazard mitigation assistance program planning requirements were combined eliminating duplicated mitigation plan requirements. This change also required participating National Flood Insurance Program (NFIP) communities' risk assessments and mitigation strategies to identify and address repetitively flood damaged properties. Local hazard mitigation plans now qualify communities for several Federal Hazard Mitigation Assistance (HMA) grant programs.

The mitigation planning process encourages coordination among Indian tribal authorities and other governmental agencies, tribal members, local residents, businesses, academia, and nonprofit groups and promotes their participation in the plan development and implementation process. This broad-based approach enables the development of mitigation actions that are supported by tribal members and other stakeholders and that reflect the needs of the Indian Tribal government as a whole.

This Tribal HMP complies with Title 44 CFR current as of March 11, 2015 and applicable guidance documents. (FEMA 2015a)

1.3 Authorities

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) 42 U.S.C. 5165, as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Indian Tribal governments, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning. The National Flood Insurance Act of 1968, 42 U.S.C. 4001 et seq., as amended, further reinforces the need and requirement for mitigation plans, linking flood mitigation assistance programs to State, Tribal, and Local Mitigation Plans.

In recognition of tribal sovereignty and the government-to-government relationship that FEMA has with Indian Tribal governments, FEMA amended 44 CFR Part 201 at 72 Fed. Reg. 61720, on October 31, 2007, and again at 74 Fed. Reg. 47471, on September 16, 2009, to consolidate and clarify the requirements for Indian Tribal governments, establish Tribal Mitigation Plans separately from State and Local Mitigation Plans, and finalize the Mitigation Planning rule.

Indian Tribal governments with an approved Tribal Mitigation Plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Indian Tribal government coordinates with the State for review of their Tribal Mitigation Plan, then the Indian Tribal government also has the option to apply as a subgrantee through a State or another tribe. A grantee is an entity such as a State, territory, or Indian Tribal government to which a grant is awarded and that is accountable for the funds provided. A subgrantee is an entity, such as a community, local, or Indian Tribal government; State-recognized tribe; or a private nonprofit (PNP) organization to which a subgrant is awarded and that is accountable to the grantee for use of the funds provided.

If the Indian Tribal government is eligible as a grantee or subgrantee because it has an approved Tribal Mitigation Plan and has coordinated with the State for review, it can decide which option it wants to take on a case-by-case basis with respect to each Presidential Disaster Declaration, and for each grant program under a Declaration, but not on a project-by-project basis within a grant program. For example, an Indian Tribal government can participate as a subgrantee for Public Assistance (PA), but as a grantee for the Hazard Mitigation Grant Program (HMGP) under the same Declaration. However, the Indian Tribal government would not be able to request grantee status under HMGP for one HMGP project, then request subgrantee status for another HMGP project under the same Declaration.

Under the Stafford Act and the National Flood Insurance Act, Indian Tribal governments must have an approved, adopted Tribal Mitigation Plan to meet the eligibility requirements for certain types of assistance, which may differ depending on whether the Indian Tribal government intends to apply as a grantee or subgrantee, as outlined in Table 1.

Table 1 Tribal HMP Authorities and Requirements

Program	Enabling Legislation	Funding Authorization	Tribal Mitigation Plan Requirement	
			Grantee Status	Subgrantee Status
Fire Management Assistance Grants	Stafford Act	Fire Management Assistance Declaration	--	No Plan Required
Hazard Mitigation Grant Program (HMGP) Planning Grant	Stafford Act	Presidential Disaster Declaration	--	No Plan Required
HMGP Project Grant	Stafford Act	Presidential Disaster Declaration	--	--
Pre-Disaster Mitigation (PDM) Planning Grant	Stafford Act	Annual Appropriation	No Plan Required	No Plan Required
PDM Project Grant	Stafford Act	Annual Appropriation	--	--
Flood Mitigation Assistance (FMA)	National Flood Insurance Act	Annual Appropriation	--	--
Severe Repetitive Loss (SRL)	National Flood Insurance Act	Annual Appropriation	--	--
Repetitive Flood Claims (RFC)	National Flood Insurance Act	Annual Appropriation	--	No Plan Required

1.4 Grant Programs with Mitigation Plan Requirements

FEMA HMA grant programs provide funding to States, Tribes, and local entities that have a FEMA-approved State, Tribal, or Local Mitigation Plan. Two of the grants are authorized under the Stafford Act and DMA 2000, while the remaining three are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act. Excerpts from FEMA's 2015 HMA Guidance, Part I, is as follows:

> *"The U.S. Department of Homeland Security (DHS) FEMA HMA programs present a critical opportunity to reduce the risk to individuals and property from natural hazards, while simultaneously reducing reliance on Federal disaster funds. On March 30, 2011, the President signed Presidential Policy Directive 8 (PPD-8): National Preparedness, and the National Mitigation Framework was finalized in May 2013. The National Mitigation Framework comprises seven core capabilities, including:*
>
> - *Threats and Hazard Identification*
> - *Risk and Disaster Resilience Assessment*
> - *Planning*
> - *Community Resilience*
> - *Public Information and Warning*
> - *Long-Term Vulnerability Reduction*
> - *Operational Coordination*
>
> *HMA programs provide funding for eligible activities that are consistent with the National Mitigation Framework's Long-Term Vulnerability Reduction capability. HMA programs reduce community vulnerability to disasters and their effects, promote*

individual and community safety and resilience, and promote community vitality after an incident. Furthermore, HMA programs reduce response and recovery resource requirements in the wake of a disaster or incident, which results in a safer community that is less reliant on external financial assistance.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards and their effects. This definition distinguishes actions that have a long-term impact from those that are more closely associated with immediate preparedness, response, and recovery activities. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage. Accordingly, States, territories, federally-recognized tribes, and local communities are encouraged to take advantage of funding that HMA programs provide in both the pre- and post-disaster timelines.

In addition to hazard mitigation, FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) Program provides communities with education, risk communication, and outreach to better protect its citizens. The Risk MAP project lifecycle places a strong emphasis on community engagement and partnerships to ensure a whole community approach that reduces flood risk and builds more resilient communities. Risk MAP risk assessment information strengthens a local community's ability to make better and more informed decisions. Risk MAP allows communities to better invest and determine priorities for projects funded under HMA. These investments support mitigation efforts under HMA that protect life and property and build more resilient communities.

The whole community includes children, individuals with disabilities, and others with access and functional needs; those from religious, racial, and ethnically diverse backgrounds; and people with limited English proficiency. Their contributions must be integrated into mitigation/resilience efforts, and their needs must be incorporated as the whole community plans and executes its core capabilities.

WHOLE COMMUNITY

A. HMA Commitment to Resilience and Climate Change Adaptation

FEMA is committed to promoting resilience as expressed in PPD-8: National Preparedness; the President's State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience; the Administrator's 2011 FEMA Climate Change Adaptation Policy Statement (Administrator Policy 2011-OPPA-01); and the 2014–2018 FEMA Strategic Plan. Resilience refers to the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies. The concept of resilience is closely related to the concept of hazard mitigation, which reduces or eliminates potential losses by breaking the cycle of damage, reconstruction, and repeated damage. Mitigation capabilities include, but are not limited to, community-wide risk reduction projects, efforts to improve the resilience of critical infrastructure and key resource lifelines, risk reduction for specific vulnerabilities from natural hazards and climate change, and initiatives to reduce future risks after a disaster has occurred.

FEMA is supporting efforts to streamline the HMA programs so that these programs can better respond to the needs of communities nationwide that are addressing the impacts of climate change. FEMA, through its HMA programs:

- *Develops and encourages adoption of resilience standards in the siting and design of buildings and infrastructure*
- *Modernizes and elevates the importance of hazard mitigation*

FEMA has issued several policies that facilitate the mitigation of adverse effects from climate change on the built environment, structures and infrastructure. Consistent with the 2014–2018

FEMA Strategic Plan, steps are being taken by communities through engagement of individuals, households, local leaders, representatives of local organizations, and private sector employers and through existing community networks to protect themselves and the environment by updating building codes, encouraging the conservation of natural and beneficial functions of the floodplain, investing in more resilient infrastructure, and engaging in mitigation planning. FEMA plays an important role in supporting community-based resilience efforts, establishing policies, and providing guidance to promote mitigation options that protect critical infrastructure and public resources.

FEMA encourages better integration of Sections 404 and 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (Stafford Act), Title 42 of the United States Code (U.S.C.) 5121 et seq., to promote more resilience during the recovery and mitigation process. FEMA regulations that implement Sections 404 and 406 of the Stafford Act allow funding to incorporate mitigation measures during recovery activities. Program guidance and practice limits Section 406 mitigation to the damaged elements of a structure. This limitation to Section 406 mitigation may not allow for a comprehensive mitigation solution for the damaged facility; however, Section 404 funds may be used to mitigate the undamaged portions of a facility.

Recognizing that the risk of disaster is increasing as a result of multiple factors, including the growth of population in and near high-risk areas, aging infrastructure, and climate change, FEMA promotes climate change adaptation by:

- *Incorporating sea level rise in the calculation of Benefit-Cost Analysis (BCA)*
- *Publishing a new HMA Job Aid on pre-calculated benefits for hurricane wind retrofit measures, see HMA Job Aid (Cost Effectiveness Determination for Residential Hurricane Wind Retrofit Measures Funded by FEMA)*
- *Encouraging floodplain and wetland conservation associated with the acquisition of properties in green open space and riparian areas*
- *Reducing wildfire risks*
- *Preparing for evolving flood risk*
- *Encouraging mitigation planning and developing mitigation strategies that encourage community resilience and smart growth*
- *Encouraging the use of building codes and standards (the American Society of Civil Engineers/Structural Engineering Institute [ASCE/SEI] 24-14, Flood Resistant Design and Construction) wherever possible.*

For additional information, see http://www.fema.gov/climate-change" (FEMA 2015b).

1.5 Hazard Mitigation Assistance (HMA) Grant Programs

HMA grant program activities include:

Table 2 HMA Eligible Activities

Activities	HMGP	PDM	FMA
1. Mitigation Projects	✓	✓	✓
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk Reduction Projects	✓	✓	
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	
Wind Retrofit for One- and Two-Family Residences	✓	✓	
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	
Post-Disaster Code Enforcement	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Miscellaneous/Other[(1)]	✓	✓	✓
2. Hazard Mitigation Planning	✓	✓	✓
Planning Related Activities	✓		
3. Technical Assistance			✓
4. Management Cost	✓	✓	✓

[(1)] Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

(FEMA 2015b)

The Hazard Mitigation Grant Program (HMGP) is a competitive, disaster funded, grant program. Whereas the other Unified Mitigation Assistance Programs: Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) programs although competitive, rely on specific pre-disaster grant funding sources, sharing several common elements. The 2015 HMA Guidance provides the following programmatic information:

> *"HMGP is authorized by Section 404 of the Stafford Act, 42 U.S.C. 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to*

reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster.

HMGP funding is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. Federally-recognized tribes may also submit a request for a Presidential major disaster declaration within their impacted areas (see http://www.fema.gov/media-library/assets/documents/85146). The amount of HMGP funding available to the Applicant is based on the estimated total Federal assistance, subject to the sliding scale formula outlined in Title 44 of the Code of Federal Regulations (CFR) Section 206.432(b) that FEMA provides for disaster recovery under Presidential major disaster declarations. The formula provides for up to 15 percent of the first $2 billion of estimated aggregate amounts of disaster assistance, up to 10 percent for amounts between $2 billion and $10 billion, and up to 7.5 percent for amounts between $10 billion and $35.333 billion. For States with enhanced plans, the eligible assistance is up to 20 percent for estimated aggregate amounts of disaster assistance not to exceed $35.333 billion.

The Period of Performance (POP) for HMGP begins with the opening of the application period and ends no later than 36 months from the close of the application period.

PDM is designed to assist States, territories, federally-recognized tribes, and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. Congressional appropriations provide the funding for PDM.

The total amount of funds distributed for PDM is determined once the appropriation is provided for a given fiscal year. It can be used for mitigation projects and planning activities.

The POP for PDM begins with the opening of the application period and ends no later than 36 months from the date of subapplication selection.

FMA is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994. The Biggert-Waters Flood Insurance Reform Act of 2012 (Public Law 112-141) consolidated the Repetitive Flood Claims and Severe Repetitive Loss grant programs into FMA. FMA funding is available through the National Flood Insurance Fund (NFIF) for flood hazard mitigation projects as well as plan development and is appropriated by Congress. States, territories, and federally-recognized tribes are eligible to apply for FMA funds. Local governments are considered subapplicants and must apply to their Applicant State, territory, or federally-recognized tribe.

The POP for FMA begins with the opening of the application period and ends no later than 36 months from the date of subapplication selection" (FEMA 2015b).

As the State Hazard Mitigation plan states:

> *"The [FMA] provides pre-disaster grants to State and Local Governments for planning and flood mitigation projects. Created by the National Flood Insurance Reform Act of 1994, its goal is to reduce or eliminate NFIP claims. It is an annual nationally competitive program. Residential and non-residential properties may apply for FMA grants through their NFIP community and are required to have NFIP insurance to be eligible. FMA grant funds may be used to develop the flood portions of hazard mitigation plans or to do flood mitigation projects. FMA grants are funded 75% Federal and 25% applicant.*
>
> *The Biggert-Waters Flood Insurance Reform Act of 2012 eliminated the Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) grant programs. Elements of these flood programs have been incorporated into FMA. The FMA program now allows for additional cost share flexibility:*
>
> - *Up to 100-percent Federal cost share for severe repetitive loss properties.*
> - *Up to 90-percent Federal cost share for repetitive loss properties.*
> - *Up to 75-percent Federal cost share for NFIP insured properties.*
>
> *The FMA program is available only to communities participating in the NFIP. In the State of Alaska, the Department of Commerce, Community, and Economic Development (DCCED) manages this program" (SHMP 2013).*

HMP Layout Description

The HMP consists of the following sections and appendices:

Section 1 Introduction

Section one defines what a hazard mitigation plan is, delineates federal requirements and authorities, and introduces the Hazard Mitigation Assistance program listing the various grant programs and their historical funding levels.

Section 2 Community Description

Section two provides a general history and background of the Native Village of Newtok (Village), including historical trends for population and the demographic and economic conditions that have shaped the area.

Section 3 Planning Process

Section three describes the HMP update's planning process, identifies the Planning Team Members, the meetings held as part of the planning process, and the key stakeholders within the Native Village of Newtok and the surrounding area. This section documents public outreach activities (support documents are located in Appendix D); including document reviews and relevant plans, reports, and other appropriate information data utilized for HMP development; actions the Village plans to implement to assure continued public participation; and their methods and schedule for keeping the plan current.

This section also describes the Planning Team's formal plan maintenance process to ensure that the HMP remains an active and applicable document throughout its 5-year lifecycle. The process includes monitoring, reviewing, evaluating (Appendix F – Maintenance Documents), updating the HMP; and implementation initiatives.

Section 4 HMP Adoption

Section four describes the community's HMP adoption process (support documents are located in Appendix C)

Section 5 Hazard Analysis

Section five describes the process through which the Planning Team identified, screened, and selected the hazards to for profiling in this version of the HMP. The hazard analysis includes the nature, previous occurrences (history), location, extent, impact, and future event recurrence probability for each hazard. In addition, historical impact and hazard location figures are included when available.

Section 6 Vulnerability Analysis

Section six identifies the Native Village of Newtok's potentially vulnerable assets—people, residential and nonresidential buildings (where available), critical facilities, and critical infrastructure. The resulting information identifies the full range of hazards that the Village could face and potential social impacts, damages, and economic losses. Land use and development trends are also discussed.

Section 7 Mitigation Strategy

Section seven defines the mitigation strategy which provides a blueprint for reducing the potential losses identified in the vulnerability analysis. This section lists the community's governmental authorities, policies, programs and resources.

The Planning Team developed a list of mitigation goals and potential actions to address the risks facing the Native Village of Newtok. Mitigation actions include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

Mitigation strategies were developed to address NFIP insured properties (if applicable) while encouraging participation with the NFIP and the reduction of flood damage to flood-prone structures.

Section 8 References

Section eight lists reference materials and resources used to prepare this HMP.

Appendices

Appendix A: Delineates Federal, State, and other potential mitigation funding sources. This section will aid the community with researching and applying for funds to implement their mitigation strategy.

Appendix B: Provides the FEMA Local Mitigation Plan Review Tool, which documents compliance with FEMA criteria.

Appendix C: Provides the adoption resolution for the Native Village of Newtok.

Appendix D: Provides public outreach information, including newsletters.

Appendix E: Contains the Benefit-Cost Analysis Fact Sheet used to prioritize mitigation actions.

Appendix F: Provides the plan maintenance documents, such as an annual review sheet and the progress report form.

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2. Community Description

2.1 Location

Newtok is on the Ninglick River north of Nelson Island in the Yukon-Kuskokwim Delta Region. It is 94 miles northwest of Bethel. The community lies at approximately °60.944444 North Latitude and -164.644167° (West) Longitude. (Sec. 24, T010N, R087W, Seward Meridian.) Newtok is located in the Bethel Recording District. The area encompasses 1.0 square mile of land and 0.94 square miles of water" (DCRA 20105).

Figure 1 Newtok Vicinity Map

2.2 Climate

Newtok is located within an area classified as the Transitional Climatic Zone of Alaska. This zone is typified by pronounced temperature variations throughout the day and year, and less cloudiness, lower precipitation and humidity than are found in a Maritime climate. Average precipitation is 17 inches, with annual snowfall of 22 inches. Summer temperatures range from 42 to 59 degrees Fahrenheit; winter temperatures range from 2 to 19 degrees Fahrenheit.

2.3 History and Culture

Newtok is a traditional Yup'ik Eskimo Village, with an active subsistence lifestyle. The people of Newtok share a strong cultural heritage with the Nelson Island communities; their ancestors have lived on the Bering Sea coast for at least 2,000 years. The people from the five villages in the area are known as Qaluyaarmiut, or "dip net people".

Relative isolation from outside influences has enabled the area to retain its traditions and customs; more so than more accessible parts of Alaska. The area had only brief and intermittent contact with Russians and Americans until the 1920s.

Around 1949, the Village was relocated from Old Kealavik three miles away, to its present location along the Newtok River and a school was built in 1958. The existing Village site was the farthest point up river the Bureau of Indian Affairs (BIA) barge could access to off-load the school building materials.

The residents of Newtok continued a migratory pattern through the 1960s, spending summers in fish camps on Nelson Island and wintering at the current Village site. After the fishing season, Newtok's men often traveled to Bristol Bay to work in the canneries. Thus Newtok remained primarily a winter residence for its people. By the 1970s, however, snow machines and modern housing projects had replaced dog teams and sod houses in Newtok; residents began to assimilate elements of American culture and to remain more stationary.

2.4 Population

The Village related that when issuing Tribal ID to residents the Newtok Village Council staff counted 450 residents. The Village asked that the number of 450 residents be used as their population for purposes of the Newtok HMP Update.

2.5 Government

Newtok was incorporated as a second-class Village within an unorganized borough in 1976. In 1997, the city government was dissolved. The BIA-federal recognized Newtok Village Council conducts local government affairs. The Newtok Native Corporation also serves the Village.

2.6 Economy

The school, health clinic, Traditional Council, Native Corporation, and commercial fishing provide most employment. Subsistence activities and trapping supplement income. Twenty residents hold commercial fishing permits.

According to the 2010 census, the median household income was $43,409 with 30.10% of residents living below the poverty line.

2.7 Facilities

The Newtok Health Clinic provides local health care. The Yukon-Kuskokwim Health Corporation (YKHC) operates the clinic, which was built in 2003.

School. A modular school was constructed in 2001. The school serves approximately 100 students, and is staffed by six certified teachers. The school has its own sewage lagoon.

Electricity. The Ungusraq Power Company provides electricity; they have a fuel storage capacity of 65,000 gallons. Fuel oil is barged to Newtok during the summer months and stored at fuel tank farms. The Newtok Native Corporation tank farm has a fuel storage capacity of 55,000 gallons and Tom's Store has a fuel storage capacity of 26,000 gallons for heating fuel and gasoline.

Water. Drinking water is pumped from a nearby lake into a water treatment plant and transferred to the Village water tank. Newtok residents haul water from watering points located in the Village. Residents supplement their water supply by collecting rainwater in the summer and by thawing ice in the winter.

Washeteria. The washers and dryers at the washeteria were closed down in 2000 because of obsolete power lines to the washeteria. Additionally, the washeteria power was turned off because the Village power generators are inadequate to accommodate all Village electrical needs. Laundry is now done by hand at home using hauled water and clotheslines. Private saunas are used for bathing.

Wastewater from Newtok's homes is collected in honey buckets and dumped along the Newtok River bank. There is no plumbing.

Landfill. The previous Village landfill, located on the south end of the Village, washed into the Ninglick River through erosion, in 1996. A temporary dumpsite was then established on the

other side of the Newtok River across from the Village. This has created problems because trash gets dropped off and piles up on the riverbank before it can be transported across the river. Transport across the river is only possible at high tide.

2.8 Transportation

Newtok is accessible by air and water; there are no roads connecting the community with any other communities in the area. Boats, skiffs, and all-terrain vehicles (ATVs) are used in the summer and snow machines are used in the winter for local transportation and subsistence activities.

Airport. A State-owned 2,180-foot gravel airstrip provides air access year-round; however, major improvements have been delayed due to the threat of erosion to the Village. The runway is gravel and is designated as being in a "poor" condition by DCRA. A seaplane facility is also available, but not widely used.

Barges deliver cargo twice per month during the summer. This is becoming more difficult as the Newtok River entrance to the boat landing becomes shallower.

Roads. There are no roads of any kind in the Village. There are approximately five to eight miles of boardwalks within the community that provide the means for foot and ATV transportation.

The Boardwalk (Figure 1) system in Newtok is a critical infrastructure and is approaching the end of its useful service life.

Figure 2 Boardwalks in Newtok (BPD 2014)

The 800-foot boardwalk connecting the airport to the system of boardwalks in the Village is eight feet wide, and in good condition. All other Village boardwalks vary between four and eight feet in width and are in poor condition. These boardwalks were built of wood, with most construction occurring in 1976 and 1981.

Right-of-Way. Despite its lack of road development, Newtok has five segments of dedicated right-of-way, including a 110-foot-wide tract containing the boardwalk to the airport. Other corridors, all of which are 40 feet wide, include undeveloped access for a housing area near the school site (in the southeast corner of town), and for a subdivision near the armory at the north edge of town.

Very little subdivision of the Village Corporation property has occurred and consequently, Newtok's boardwalks are wholly contained on land owned by the Newtok Corporation. The Newtok Native Corporation has an Alaska Native Claims Settlement Act (ANCSA) 12(a) entitlement to 92,160 acres but has not acted related to 14(c)(3) status.

2.9 Wildlife and Topography

Fish and wildlife are abundant in the vicinity of Newtok. The area is a prime habitat of mink, land otter, and beaver. There are occasional brown bear, moose, and caribou. Salmon found in local waters include Coho, Pink, Chum, Sockeye and Chinook. In addition, area waters host black fish, needlefish, white fish, smelt, pike, lush fish, and seal. Birds include swans, cranes, swallows, sandpipers, ravens, crows, seagulls, and a variety of geese.

Soils and Topography. Newtok is a coastal community situated on the west bank of the Newtok River, a slow-moving river draining the flat Yukon-Kuskokwim Delta. Approximately 735 feet to the south is the encroaching Ninglick River, eroding towards the Village at an average rate of 64 feet per year. The surrounding land is flat, low-lying, marshy tundra dotted with thousands of thaw-lakes and sloughs. Vegetation in this low area is primarily the mosses, lichens, hair grass, sedges, and berries typical of tundra.

The bedrock in the area is comprised of non-marine sandstone and siltstone overlaid by volcanic flows and capped with wind-deposited silt. A typical soil profile has deep frozen silt layered with peat at the surface. Permafrost continuously underlies a two-foot active layer (sometimes thicker when a greater layer of peat is present).

The shallow active layer combines with the continuous presence of permafrost and nearly flat surface slopes to yield extremely poor drainage conditions around Newtok. The permafrost is ice rich and, in thaw periods, the active layer is almost completely saturated and has virtually no bearing capacity.

Flooding and erosion raise additional concerns for Newtok. The shoreline is highly vulnerable to flooding, especially during spring ice jams in the river or in severe westerly windstorms on the Bering Sea. Thermal degradation of the riverbanks is causing shoreline sloughing.

3. Planning Process

Section Three provides an overview of the planning process; identifies the Planning Team Members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used to develop this HMP. Outreach support documents and meeting information regarding the Planning Team and public outreach efforts are provided in Appendix F.

The requirements for the planning process, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
Local Planning Process §201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: Element §201.6(b)(1): An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; §201.6(b)(2): An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. §201.6(c)(4)(i): The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. §201.6(c)(4)(iii): The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
1. Regulation Checklist
ELEMENT A. Planning Process
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1)) A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1)) A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3)) A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii)) A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle?) (Requirement §201.6(c)(4)(i))
Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process? (Not applicable until 2013 update).
Source: FEMA, March 2015.

3.1 Planning Process Overview

The State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) provided funding and project oversight to AECOM Corporation to facilitate and guide Planning Team development and updating their legacy HMP.

The planning process began at a meeting on December 4, 2014 with Newtok Village Council. AECOM explained how the Division of Homeland Security and Emergency Management 2013 Pre-Disaster Mitigation Grant award selected the update requirement to enable the Village to qualify for Hazard Mitigation Grant Program grants. The group then met form 10 a.m. to 11:30 a.m. with break-out sections with the Village Council to review sections of the 2008 HMP.

The Village was encouraged to develop a community Planning Team to assist the community's efforts to identify available resources and capabilities for updating their HMP. AECOM explained how the updating their legacy HMP differed from current emergency plans. The Planning Team will assist the Village by acting as an advocate for the planning process, assist with gathering information, and provide support during public participation opportunities. AECOM briefly discussed existing hazards that affect the community such as flooding, sediment deposition, and permafrost impacts, which are increasing in intensity due to climate changes.

3.2 Hazard Mitigation Planning Team

Table 3 lists the planning team which is the Newtok Village Council.

Table 3 Planning Team Members

Team Member	Title	Involvement
Romy Caliente	Relocation Coordinator	Team Leader, data gathering and plan review
Tom John	Tribal Administrator	HMP Team Member, plan review
Paul Charles	Tribal President	HMP Team Member, plan review
Louie Andy	Newtok Village Council	HMP Team Member, plan review
George Carl	Newtok Village Council	HMP Team Member, plan review
Katherine Charles	Newtok Village Council	HMP Team Member, plan review
Simeon Fairbanks, Jr.	Newtok Village Council	HMP Team Member, plan review
Scott Simmons	AECOM, Project Manager	HMP update manager, lead writer, and HMP project coordination.
Eileen Bechtol	BP&D/Community Planner	HMP update, project planner

3.3 Public Involvement & Opportunity for Interested Parties to participate

AECOM extended an invitation to all individuals and entities identified on the project mailing list described the planning process and announced the upcoming communities' planning activities. The announcement was emailed to relevant academia, nonprofits, and local, state, and federal agencies on November 20, 2014. The following agencies were invited to participate and review the HMP:

- University of Alaska Fairbanks, Geophysical Institute, Alaska Earthquake Information Center (UAF/GI/AEIC)
- Alaska Native Tribal Health Consortium-Community Development (ANTHC)
- Alaska Volcano Observatory (AVO)
- Association of Village Council Presidents (AVCP)
- Denali Commission
- Alaska Department of Environmental Conservation (DEC)
- DEC Division of Spill Prevention and Response (DSPR)
- DEC Village Safe Water (VSW)
- Alaska Department of Transportation and Public Facilities (DOT/PF)
- Alaska Department of Community, Commerce, and Economic Development (DCCED)
- DCCED, Division of Community Advocacy (DCRA)
- Alaska Department of Military and Veterans Affairs (DMVA)
- DMVA, Division of Homeland Security and Emergency Management (DHS&EM)
- US Environmental Protection Agency (EPA)
- National Weather Service (NWS) Northern Region
- NWS Southeast Region
- NWS Southcentral Region
- Natural Resources Conservation Service (NRCS)
- US Department of Agriculture (USDA)
- USDA Division of Rural Development (RD)
- US Army Corps Of Engineers (USACE)
- US Bureau of Indian Affairs (BIA)
- US Bureau of Land Management (BLM)
- US Department of Housing and Urban Development (HUD)
- US Fish & Wildlife Service (USFWS)

Legacy 2008 HMP Lifecycle Planning Team Meeting Recommendations

44 CFR requires communities to schedule HMP Planning Team meetings and teleconferences to review, discuss, and determine mitigation implementation accomplishments, track data relevance for future HMP update inclusion and document recommendations for future HMP updates.

Table 4 lists the community's public involvement initiatives focused to encourage participation and insight for the HMP Update effort.

Table 4 Public Involvement Mechanisms

Mechanism	Description
Initial kick off meting (December 4, 2014	The Newtok Village Council met with the AECOM staff at a regularly noticed meeting of the Newtok Planning Group. A planning team was formed and the Council went over the Legacy 2008 Plan.
Newsletter #1 Distribution (January 20, 2015)	In January and February 2015, the jurisdiction distributed a newsletter introducing the upcoming planning activity. The newsletter encouraged the Village and the communities to provide hazard and critical facility information. It was posted at Village offices, bulletin boards, shopping

Table 4 Public Involvement Mechanisms

Mechanism	Description
	centers, and Village website to enable the widest dissemination.
Agency Involvement eMail (November 20, 2014)	Invited agencies to participate in mitigation planning effort and to review applicable newsletters located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at: http://ready.alaska.gov/plans/localhazmitplans.htm
Planning Team Meeting (January 26, 2015)	The Planning Team Meeting, which was open to the public, went over the Legacy 2008 Plan and the 2015 Update infrastructure tables and mitigation tables.
Planning Team Meeting (May 13, 2015)	The Planning Team (open to the public) listed scared sites in Newtok and reviewed the draft HMP Update.

The Planning Team identified natural hazards: earthquake, flood, ground failure, severe weather, and wildland/tundra fire which periodically impact the Newtok. A few of the legacy HMP's hazards have been combined within broader categories to better reflect their impacts and relationships.

The risk assessment was completed after the community asset data was collected by the Planning Team during 2015, which identified the assets that are exposed and vulnerable to specific hazards.

The Planning Team evaluated these facilities and their associated risks to facilitate creating a viable or realistic risk analysis and subsequent vulnerability assessment for the Newtok and the communities.

The Planning Team held a public meeting May 13, 2015 to review the draft HMP for accuracy – ensuring it meets the Village's needs.

3.4 Review and analysis of the 2008 HMP.

The Legacy 2008 HMP document was revised as described below.

Section 1. ***Introduction***: added entire new section explaining the plan process.

Section 2. ***Community Description***: updated and expanded community information, including new census and State data.

Section 3. ***Planning Process***: updated this section to reflect 2015 public process including newsletters, public meetings and 2015 Planning Team.

Section 4. ***Plan Adoption***: 2015 resolutions and dates.

Section 5. ***Hazard Profile Analysis***: reviewed hazard identification and risk assessment for earthquake, flooding, severe weather and wildland/tundra fire adding 2008 to 2015 descriptions and data.. A new profile analysis of ground failure was added.

Section 6. ***Vulnerability Analysis***: added a new section to analyze vulnerability with 2015 critical facilities and infrastructure tables.

Section 7. ***Mitigation Strategy***: reviewed 2008 mitigation goals and actions and added new goals and actions for the 2015 Mitigation Action Plan.

Section 8. ***References***: revised to reflect 2015 Update.

The Planning Team did not complete their designated annual HMP reviews or plan maintenance activities. Therefore it became a primary consideration to update the existing 2008 HMP to include all hazards that have, or could potentially have, impacted the community during the legacy HMP's 5-year lifecycle.

Table 5 delineates Planning Team identified HMP components that necessitated information update. The Team determined how community changes, construction and infrastructure conditions, climate change impacts, and population increases or decreases have influenced hazard risks and/or facility vulnerabilities.

The 2015 HMP Update process included inviting new and existing stakeholders to review the existing HMP to determine what was accomplished versus what was intended to accomplish.

Pertinent section data are identified within Table 5, which provided the foundation for completing the 2015 HMP Update.

Table 5 HMP Review and Update Needs Determination

2008 FHMP Section	2008 HMP Items to be Updated	Status: F: Fulfilled NF: Not Fulfilled	2015 HMP Identified items for Deletion	Newly Identified Items to be Added for HMP Compliance	New Action Commitment
Planning Process	• Planning process • Planning team membership • Mitigation resource list • Public outreach initiatives • Plan Maintenance Activities • Plan Review Obligations	• NF: Did not meet or complete annual HMP review • NF: Adding Manmade/ Technological Hazards • NF: Continued Plan Development	• None	• Refine plan maintenance processes and responsibilities	• Planning Team will begin to hold annual review meetings and • Strive to integrate HMP initiatives into other plans, ordinances, and resolutions. • Planning Team will continue meetings and strive to integrate HMP initiatives into other plans, ordinances, and resolutions.
Hazard Profile Update	• Update hazard profile and new event history • Profile newly identified hazard risks	• NF: Update hazard profile and new event history	• Mitigation projects that were deleted or combined due to similarity	• Identify new hazards • Develop new Mitigation Action Plan (MAP) • Update existing hazards'	• Delineate new actions within the MAP

Table 5 HMP Review and Update Needs Determination

2008 FHMP Section	2008 HMP Items to be Updated	Status: F: Fulfilled NF: Not Fulfilled	2015 HMP Identified items for Deletion	Newly Identified Items to be Added for HMP Compliance	New Action Commitment
				impacts	
Risk Analysis and Vulnerability Assessment	• Asset inventory • Vulnerability analysis & summaries	• NF: Identify development and land use changes	• None	• Develop asset inventory • Determine infrastructure vulnerabilities • Determine residential structure vulnerabilities • Identify repetitive loss properties as appropriate	• Fill data gaps • Locate scientific information to augment these data. • Delineate climate change scenario future development analysis
Mitigation Strategy	• Determine existing mitigation actions status • Define mitigation action implementation successes or barriers	• NF: Did not track project implementation processes	• Delete completed, combined, or deleted actions • Implemented & non-relevant mitigation actions	• Identify existing (20xx) mitigation plan actions' status • Identify new mitigation actions for newly identified hazard implementation • Develop community specific capability assessment(s)	• Annually review action's status and feasibility

3.5 Incorporation of Existing Plans and Other Relevant Information

During the planning process, the Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP.

Table 6 lists existing plans and other documents that were available regarding the Newtok and were reviewed and used as references for the jurisdiction information and hazard profiles in the risk assessment of the HMP for the Village.

Table 6 Existing Plans and Other Relevant Information.

Existing plans, studies, reports, ordinances, etc.	Year of Plan
Newtok Village Hazard Mitigation Plan 2008	2008 Legacy HMP
Newtok Background for Relocation Report	2004 Provided background of relocation effort
Ceñaliulriit (Yukon-Kuskokwim) CRSA* Coastal Management Plan	2006 Provided scientific and biological information
State of Alaska, Department of Commerce, Community and Economic Development Community Profile	Provided historical and demographic information
State of Alaska Hazard Mitigation Plan (SHMP), 2013	Defined statewide hazards and their potential locational impacts
US Army Corps of Engineers, Erosion Information Paper, Newtok Village, Alaska, November 10, 2007	US Army Corps of Engineers, Erosion Information Paper, Newtok Village, Alaska, November 10, 2007
US Army Corps of Engineers, Alaska Baseline Erosion Assessment, 2009	Baseline Erosion Assessment, 2009
US Army Corps of Engineers, Floodplain	Describes floodplains in Alaska
US Army Corps of Engineers, geotechnical report Mertarvik townsite Newtok, Alaska	2008 Provided technical information for update.

3.6 Plan Maintenance

This section describes a formal plan maintenance process to ensure that the HMP remains an active and applicable document. It includes an explanation of how the Village's Planning Team intends to organize their efforts to ensure that improvements and revisions to the HMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail here:

1. Implementation into existing planning mechanisms
2. Continued public involvement
3. Monitoring, reviewing, evaluating, and updating the HMP

3.6.1 Implementation Into Existing Planning Mechanisms

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements
1. REGULATION CHECKLIST
Incorporation into Existing Planning Mechanisms §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
ELEMENT A Planning Process (Continued)
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?
Source: FEMA, March 2015.

Once the HMP is adopted and receives FEMA's final approval, each Planning Team Member ensures that the HMP, in particular each Mitigation Action Project, is incorporated into existing

planning mechanisms whenever possible. Each member of the Planning Team has undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in the following capability assessment section
- Work with pertinent community departments to increase awareness of the HMP and provide assistance in integrating the mitigation strategy (including the Mitigation Action Plan) into relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms

3.6.2 Continued Public Involvement

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
1. REGULATION CHECKLIST
Continued Public Involvement §201.6(c)(4)(iii): The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
ELEMENT A Planning Process (Continued)
A5. Is there discussion of how the community (ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))
Source: FEMA, March 2015.

The Village is dedicated to involving the public directly in the continual reshaping and updating the HMP. A paper copy of the HMP and any proposed changes would be available at the Village office. An address and phone number of the Planning Team Leader to whom people can direct their comments or concerns will also be available at the Village office.

The Planning Team will continue to identify opportunities to raise community awareness about the HMP and the hazards that affect the area. This effort could include attendance and provision of materials at Village-sponsored events, outreach programs, and public mailings. Any public comments received regarding the HMP will be collected by the Planning Team Leader, included in the annual report, and considered during future HMP updates.

3.6.3 Monitoring, Reviewing, Evaluating, and Updating the HMP

The requirements for monitoring, reviewing, evaluating, and updating the HMP, as stipulated in the DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
Monitoring, Evaluating and Updating the Plan §201.6(c)(4)(i): The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
1. REGULATION CHECKLIST
ELEMENT A. Planning Process (Continued)
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle?)
Source: FEMA, March 2015.

This section provides an explanation of how the Village's Planning Team intends to organize their efforts to ensure that improvements and revisions to the HMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail here:

1. Review and revise the HMP to reflect development changes, project implementation progress, project priority changes, and resubmit
2. HMP resubmittal at the end of the plan's five year life cycle for State and FEMA review and approval
3. Continued mitigation initiative implementation

Monitoring the HMP

The HMP was prepared as a collaborative effort. To maintain momentum and build upon previous Hazard Mitigation Planning efforts and successes, the Village will continue to use the Planning Team to monitor, review, evaluate, and update the HMP. Each authority identified in the Mitigation Action Plan (MAP) matrix (Table 7-8) will be responsible for implementing the Mitigation Action Plan and determining whether their respective actions were effectively implemented. The Director of Public Safety, the hazard mitigation Planning Team Leader, (or designee), will serve as the primary point of contact and will coordinate local efforts to monitor, evaluate, revise, and tabulate MJHMP actions' status.

Reviewing the HMP

The Village will review their success for achieving the HMP's mitigation goals and implementing the Mitigation Action Plan's activities and projects during the annual review process.

During each annual review, each agency or authority administering a mitigation project will submit a Progress Report (Appendix F) to the Planning Team. The report will include the current status of the mitigation project, including any project changes, a list of identified implementation problems (with appropriate strategies to overcome them), and a statement of whether or not the project has helped achieve the appropriate goals identified in the plan.

Evaluating the HMP

The Annual Review Questionnaire (Appendix F) provides the basis for future HMP evaluations by guiding the Planning Team with identifying new or more threatening hazards, adjusting to changes to, or increases in, resource allocations, and garnering additional support for HMP implementation.

The Planning Team Leader will initiate the annual review two months prior to the scheduled planning meeting date to ensure that all data is assembled for discussion with the Planning Team. The findings from these reviews will be presented at the annual Planning Team Meeting. Each review, as shown on the Annual Review Worksheet, will include an evaluation of the following:

- Determine Village authorities, outside agency, stakeholders, and resident's participation in HMP implementation success
- Identify notable risk changes for each identified and newly considered natural or human-caused hazards

- Consider land development activities and related programs' impacts on hazard mitigation
- Mitigation Action Plan implementation progress (identify problems and suggest improvements as necessary)
- Evaluate HMP local resource implementation for HMP identified activities

Updating the HMP

In addition to the annual review, the Planning Team will update the HMP every five years. The following section explains how the HMP will be reviewed, evaluated, and implementation successes described.

DMA 2000 Requirements
Reviewing, Evaluating, and Implementing the Plan §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit if for approval within 5 years in order to continue to be eligible for mitigation project grant funding.
ELEMENT D. Planning Process (Continued) *Update activities not applicable to the plan version*
D1. Was the Plan revised to reflect changes in development? (Requirement §201.6(d)(3))
D2. Was the Plan revised to reflect progress in local mitigation effort? (Requirement §201.6(d)(3))
D3. Was the Plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))
Source: FEMA, March 2015.

The Village will annually review the HMP as described in Section 3.5.3.2 and update the HMP every five years (or when significant changes are made) by having the identified Planning Team review all Annual Review Questionnaires (Appendix F) to determine the success of implementing the HMP's Mitigation Action Plan.

The Annual Review Questionnaire will enable the Team to identify possible changes in the HMP Mitigation Action Plan by refocusing on new or more threatening hazards, resource availability, and acquiring stakeholder support for the HMP project implementation.

No later than the beginning of the fourth year following HMP adoption, the Planning Team will undertake the following activities:

- Request grant assistance from DHS&EM to update the HMP (this can take up to one year to obtain and one year to update the plan)
- Ensure that each authority administering a mitigation project will submit a Progress Report to the Planning Team
- Develop a chart to identify those HMP sections that need improvement, the section and page number of their location within the HMP, and describing the proposed changes
- Thoroughly analyze and update the natural hazard risks
    - Determine the current status of the mitigation projects
    - Identify the proposed Mitigation Plan Actions (projects) that were completed, deleted, or delayed. Each action should include a description of whether the project should remain on the list, be deleted because the action is no longer feasible, or reasons for the delay

  - Describe how each action's priority status has changed since the HMP was originally developed and subsequently approved by FEMA
  - Determine whether or not the project has helped achieve the appropriate goals identified in the plan
  - Describe whether the community has experienced any barriers preventing them from implementing their mitigation actions (projects) such as financial, legal, and/or political restrictions and stating appropriate strategies to overcome them
  - Update ongoing processes, and to change the proposed implementation date/duration timeline for delayed actions the Village still desires to implement
  - Prepare a "new" MAP matrix for the Village.
- Prepare a new Draft Updated HMP
- Submit the updated draft HMP to the Division of Emergency Management (DHS&EM) and FEMA for review and approval

Formal State and FEMA HMP Review

Completed Hazard Mitigation Plans do not qualify the Village for mitigation grant program eligibility until they have been reviewed and adopted by the Village Assembly, and received State and FEMA final approval.

The Village of Newtok is represented in this HMP and meet the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000, and 44 CFR §201.6(c)(5) and§201.7. The Native Village of Newtok has participated with this HMP's development and it intends to follow and implement applicable tribal activities to qualify the Village Tribal Council for tribal grant opportunities. The Newtok Village Council supports 44 CFR 201 and assures compliance with all applicable Federal statutes and regulations. The Council, with assistance from the State Hazard Mitigation Officer (SHMO) and the State Hazard Mitigation Advisory Committee (SHMAC), is responsible for monitoring, evaluating, and updating the Newtok Hazard Mitigation Plan in accordance with 44 CFR §201.7.

The Village Council will monitor the plan continually, evaluate the plan annually and update the plan every five years, or within 90 days of a Presidential Declared Disaster (if required), or as necessary to reflect changes in State or Federal law. The Hazard Mitigation Plan Annual Progress Report and Hazard Mitigation Plan Annual Evaluation Forms are plan review tools. The Council, with advisement from the SHMO and FEMA, determines when significant changes warrant an update prior to the scheduled date.

The Village Council will submit the draft HMP to the Division of Emergency Management (DHS&EM) for initial review and preliminary approval. Once any corrections are made, DHS&EM will forward the HMP to FEMA for their review and conditional approval.

Once the plan has fulfilled all FEMA criteria, the Village will pass an HMP Adoption Resolution. Each of the incorporated cities will pass a resolution for their jurisdictions. Copies will be sent to FEMA for final HMP approval.

FEMA's final approval assures the Village is eligible for applying for appropriate mitigation grant program funding.

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4. Plan Adoption

Section Four is included to fulfill the Native Village of Newtok's formal HMP adoption requirements.

4.1 Adoption by Tribal Governing Body and Supporting Documentation

The requirements for the adoption of this HMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements	
Local Plan Adoption §201.7(c)(5): The plan must be formally adopted by the governing body of the Indian Tribal government prior to submitting to FEMA for final review and approval §201.7(c)(6): [The plan must include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.	
REGULATION CHECKLIST	
ELEMENT	
A.	Has the Indian tribal governing body formally adopted the new or updated plan?
B.	Is supporting documentation, such as a resolution, included with the new or updated plan?
C.	Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?
Source: FEMA, March 2015.	

The Village of Newtok is represented in this HMP and meets the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000, and 44 CFR §201.7(c)(5) & (6).

The Newtok Village Council formally adopted their Hazard Mitigation Plan on October 7, 2015 and submitted the final draft to FEMA for formal approval. A scanned copy of Newtok's formal adoption is attached (Appendix C).

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5. Hazard Profile

Section Five identifies and profiles the hazards that could affect the Native Village of Newtok and their identified relocation site Mertarvik, located on adjacent Nelson Island.

5.1 Mertarvik (North End of Nelson Island)

Because Newtok is in imminent danger of flooding and erosion, the Village, state and federal agencies are undertaking immediate efforts to relocate Newtok to a new site on Nelson Island, named Mertarvik. Therefore, the only mitigation projects of substantive benefit to the community are: (1) assistance in moving structures to the new site; and, (2) short term protection for infrastructure currently in Newtok.

The Newtok Planning Group (NPG) was formed in May 2006 when representatives from State and Federal agencies began meeting to coordinate assistance to the Village of Newtok in its relocation to Mertarvik.

The NPG meets on a regular basis and have a website set up with links to documents and current status reports at: http://commerce.state.ak.us/dcra/planning/npg/Newtok_Planning_Group.htm

The Mertarvik site is located approximately nine miles southeast of Newtok on the north end of Nelson Island, adjacent to the Baird Inlet. The site satisfied all relocation site criteria and was selected by the NTC (now Newtok Village Council) and the community in 1994 as the prime site for Village relocation. Newtok residents in several survey polls have approved this site, and the Village started moving to the site 2005.

The DCRA website describes the progress made by the NPG:

> *"The Village of Newtok is threatened by advancing erosion caused by the Ninglick River adjacent to the Village. This progressive erosion, in combination with permafrost degradation and flooding of the Village during seasonal storms has created a serious threat to the existence of the Village. Years of erosion studies have concluded that Newtok must relocate, as there is no permanent and cost-effective alternative for remaining at the current Village site.*
>
> *In 2006, the Newtok Traditional Council requested the assistance of the Division of Community and Regional Affairs, within the Department of Commerce, Community and Economic Development (DCCED) with Newtok's relocation effort. DCCED is tasked by two Alaska Administrative Orders (AO 231 and AO 239) "to act as the state coordinating agency to coordinate with the other state and federal agencies to propose long-term solutions to the ongoing erosion issues in... affected coastal communities..." To carry out this coordination, the Newtok Planning Group (NPG) was formed.*
>
> *The NPG has met regularly since its formation, working with Newtok and across agencies to leverage resources, secure funding and to establish a framework and strategy for moving the relocation process forward.*
>
> *Through this unique partnership, a range of initiatives, studies, and pioneer infrastructure projects have been completed or are currently underway at Mertarvik. Collaboration among Newtok and state and federal agencies has been behind the success of every project.*
>
> *Over the past six years, a community layout plan has been developed for the new townsite, a suite of emergency response plans has been completed, design of an evacuation shelter has been completed and construction initiated, and studies are underway for water/sewer and alternative*

energy infrastructure, housing, quarry development and a future airport. From 2009 to 2010, a barge landing facility and access road were completed. The NPG is currently working with a contractor to develop a Strategic Management Plan to guide the relocation of the Newtok community." (NPG 2015).

The Denali Commission, Village Safe Water, State of Alaska, National Wildlife Service and the U.S. Army Corps of Engineers, including others, have all been involved in the relocation effort. Draft community layouts of the new Village are in process of being developed and water/sewer systems are being designed. Preliminary layouts of the new site may be viewed at the above mentioned website.

The overall climate at Mertarvik is similar to Newtok with minor differences in because the topography at Mertarvik is drier and higher in elevation than at Newtok, and some localized areas might experience slightly warmer temperatures in the spring and summer because of solar absorption and protection from wind.

The Mertarvik site (Figures 3 and 5) is 600 feet above sea level and therefore not subject to flooding or erosion. The site vulnerability to other natural hazards is the same as for Newtok in Section 5 of this plan.

Figure 3 Mertarvik site on Nelson Island (DCRA 2014b)

The general location of the Mertarvik site relative to Newtok's existing location. Photo excerpt from the USGS Baird Inlet topographic map at 1:250,000 resolution.

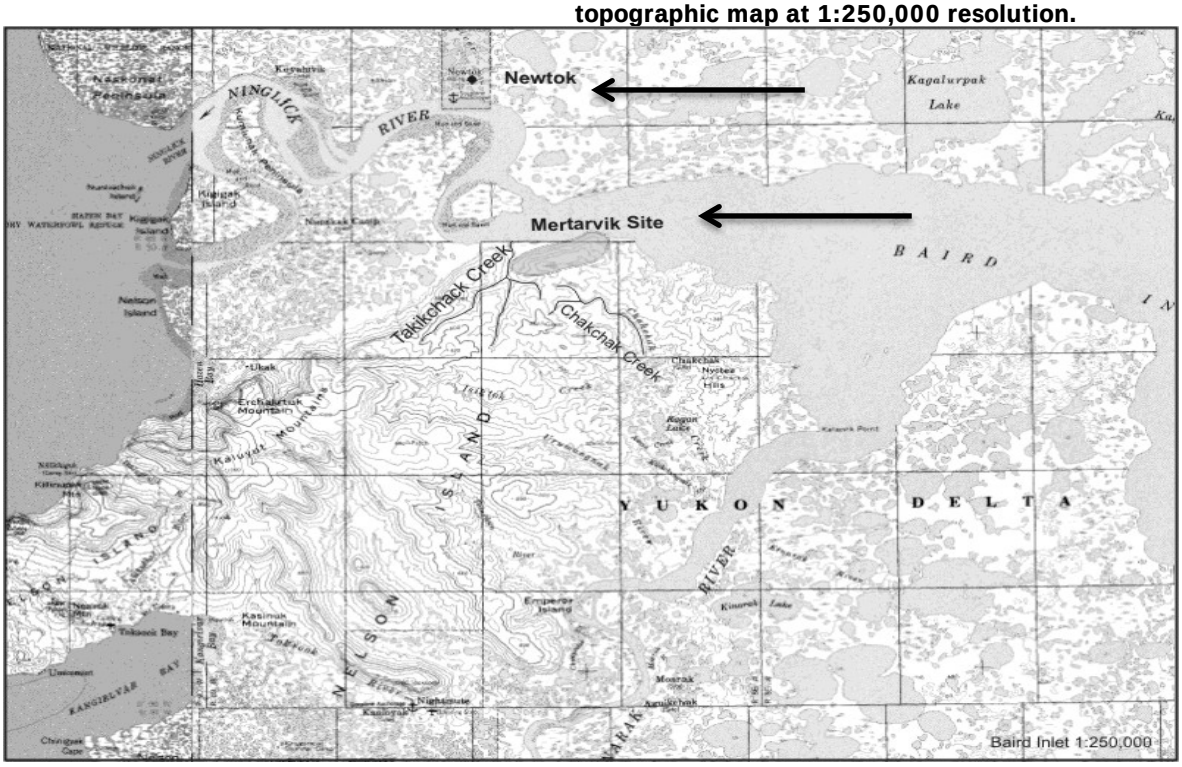

Figure 4Newtok's new relocation site – Mertarvik (USGS)

5.2 Overview of a Hazard Analysis

A hazard analysis includes the identification, screening, and profiling of each hazard. Hazard identification is the process of recognizing the natural events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human and Technological, and Terrorism related hazards are beyond the scope of this plan. Even though a particular hazard may not have occurred in recent history in the study area, all natural hazards that may potentially affect the study area are considered; the hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

Hazard profiling is accomplished by describing hazards in terms of their nature, history, magnitude, frequency, location, extent, and recurrence probability. Hazards are identified through historical and anecdotal information collection, existing plans, studies, and map reviews, and study area hazard map preparations when appropriate. Hazard maps are used to define a hazard's geographic extent as well as define the approximate risk area boundaries.

DMA 2000 Requirements
Risk Assessment: 201.7(c)(2): [The plan shall include a] risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian Tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. Identifying Hazards §201.7(c)(2)(i): The risk assessment shall include a] description of the type, location and extent of all natural hazards that can affect the tribal planning area. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events. §201.7(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
REQUIREMENTS CHECKLIST
ELEMENTS
A. Does the new or updated plan describe the tribal planning area? B. Does the new or updated plan include a description of the types of all natural hazards that affect the tribal planning area?
Source: FEMA, March 2015.

5.3 Hazard Identification and Screening

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations are described below.

For the first step of the hazard analysis, on December 4, 2014 the Planning Team reviewed eight possible hazards that could affect the Village of Newtok. They then evaluated and screened the comprehensive list of potential hazards based on a range of factors, including prior knowledge or perception of their threat and the relative risk presented by each hazard, the ability to mitigate the hazard, and the known or expected availability of information on the hazard (Table 7). The Planning Team determined that six hazards pose a great threat to the Village: earthquake, flood, ground failure, severe weather, and wildland/tundra fire; some of which are influenced by increasing changing climate conditions such as late ice formation, early thaw conditions, increased, lack, or inconsistent rain.

Table 7 Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	Explanation
Natural Hazards		
Earthquake	Yes	The Village has had one historical earthquake of M4.7 occurring on February 23, 2013.
Flood (Riverine and/or coastal related floods and resultant erosion)	Yes	Rainfall flooding occurs during spring thaw and the fall rainy season. Events occur from soil saturation. Several minor flood events cause damage. Severe damages occur from major floods. The Village experiences storm surge, coastal ice run-up, and coastal wind erosion along the shoreline and riverine erosion along the area's river, from high water flow, wind, and surface runoff.
Ground Failure (Thawing Permafrost)	Yes	Subsidence and thawing permafrost are the primary hazards causing houses to shift due to ground sinking and upheaval, and high ground water thawing the permafrost.
Severe Weather (Cold, Rain, Snow, Wind, etc.)	Yes	Severe weather impacts the community with climate change/global warming and changing El Niño/La Niña Southern Oscillation (ENSO) patterns generating increasingly severe weather events such as winter storms, heavy or freezing rain, thunderstorms and with subsequent secondary hazards such as riverine or coastal storm surge floods, landslides, snow, and wind etc.
Tsunami (Seiche)	No	This hazard does not exist for this location.
Volcano	No	This hazard does not exist for this location.
Tundra Fire	Yes	The community and the surrounding tundra area become very dry in summer months with weather (such as drought and lightening) and human caused incidents igniting dry vegetation in the adjacent area (burning trash outside their landfill's burn box, camp fires, etc.).

5.4 Hazard Profile

The requirements for hazard profiles, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
Profiling Hazards Requirement §201.7(c)(2)(i): [The risk assessment shall include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
REGULATION CHECKLIST
ELEMENTS
A. Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan? B. Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan? C. Does the new or updated plan provide information on previous occurrences of each hazard addressed in the plan? D. Does the new or updated plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the plan? E. Does the updated plan address data deficiencies, if any, noted in the previously approved plan?
Source: FEMA, March 2015.

The specific hazards selected by the Planning Team for profiling have been examined in a methodical manner based on the following factors:

- Nature (Type)
  - Potential climate change impacts are primarily discussed in the Severe Weather hazard profile but are also identified where deemed appropriate within each hazard profile.
- History (Previous Occurrences)
- Location
- Extent (to include magnitude and severity)
- Impact (Section 5 provides general impacts associated with each hazard.
- Recurrence Probability

NFIP insured Repetitive Loss Structures (RL) are addressed in Section 6, Vulnerability Analysis.

Each hazard is assigned a rating based on the following criteria for magnitude and severity (Table 8) and future recurrence probability (Table 9).

Estimating magnitude and severity are determined based on historic events using the criteria identified in the introductory narrative description of Section 5.4.

Table 8 Hazard Magnitude/Severity Criteria

Magnitude / Severity	Criteria
4 - Catastrophic	• Multiple deaths. • Complete shutdown of facilities for 30 or more days. • More than 50 percent of property is severely damaged.
3 - Critical	• Injuries and/or illnesses result in permanent disability. • Complete shutdown of critical facilities for at least two weeks. • More than 25 percent of property is severely damaged.
2 - Limited	• Injuries and/or illnesses do not result in permanent disability. • Complete shutdown of critical facilities for more than one week. • More than 10 percent of property is severely damaged.
1 - Negligible	• Injuries and/or illnesses are treatable with first aid. • Minor quality of life lost. Negligible. • Shutdown of critical facilities and services for 24 hours or less. • Less than 10 percent of property is severely damaged.

Similar to estimating magnitude and severity, probability is determined based on historic events, using the criteria identified above, to provide the likelihood of a future event (Table 9).

Table 9 Hazard Recurrence Probability Criteria

Probability	Criteria
4 - Highly Likely	• Event is probable within the calendar year. • Event has up to 1 in 1 year chance of occurring (1/1=100 percent). • History of events is greater than 33 percent likely per year. • Event is "Highly Likely" to occur.
3 - Likely	• Event is probable within the next three years. • Event has up to 1 in 3 years chance of occurring (1/3=33 percent). • History of events is greater than 20per cent but less than or equal to 33 percent likely per year. • Event is "Likely" to occur.
2 - Possible	• Event is probable within the next five years. • Event has up to 1 in 5 years chance of occurring (1/5=20 percent). • History of events is greater than 10 percent but less than or equal to 20 percent likely per year. • Event could "Possibly" occur.
1 - Unlikely	• Event is possible within the next ten years. • Event has up to 1 in 10 years chance of occurring (1/10=10 percent). • History of events is less than or equal to 10 percent likely per year. • Event is "Unlikely" but is possible to occur.

The hazards profiled for the Village of Newtok are presented throughout the remainder of Section 5.3. The presentation order does not signify their importance or risk level.

5.4.1 Earthquake

5.4.1.1 Nature

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and after only a few seconds can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

Ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. An earthquake causes waves in the earth's interior (i.e., seismic waves) and along the earth's surface (i.e., surface waves). Two kinds of seismic waves occur: P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back and forth oscillation along the direction of travel (vertical motion), and S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side to side (horizontal motion). There are also two types of surface waves: Raleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary natural hazards can occur from earthquakes such as:

Surface Faulting is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet [ft]), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures, including railways, highways, pipelines, and tunnels.

Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore water pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 ft, but up to 100 ft), flow failures (massive flows of soil, typically hundreds of ft, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.

Landslides/Debris Flows occur as a result of horizontal seismic inertia forces induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter.

The severity of an earthquake can be expressed in terms of intensity and magnitude. Intensity is based on the damage and observed effects on people and the natural and built environment. It varies from place to place depending on the location with respect to the earthquake epicenter, which is the point on the earth's surface that is directly above where the earthquake occurred. The severity of intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli Intensity (MMI) Scale. As shown in Table 8, the MMI Scale consists of 12 increasing levels of intensity that range from imperceptible to catastrophic destruction. Peak ground acceleration (PGA) is also used to measure earthquake intensity by quantifying how hard the earth shakes in a given location. PGA can be measured as acceleration due to gravity (g) (MMI 2006).

Magnitude (M) is the measure of the earthquake strength. It is related to the amount of seismic energy released at the earthquake's hypocenter, the actual location of the energy released inside the earth. It is based on the amplitude of the earthquake waves recorded on instruments, known as the Richter magnitude test scales, which have a common calibration (Figure 5).

UPSeis
an educational site for budding seismologists

Modified Mercalli Intensity Scale

Mercalli Intensity	Equivalent Richter Magnitude	Witness Observations
I	1.0 to 2.0	Felt by very few people; barely noticeable.
II	2.0 to 3.0	Felt by a few people, especially on upper floors.
III	3.0 to 4.0	Noticeable indoors, especially on upperfloors, but may not be recognized as an earthquake.
IV	4.0	Felt by many indoors, few outdoors. May feel like heavy truck passing by.
V	4.0 to 5.0	Felt by almost everyone, some people awakened. Small objects moved. trees and poles may shake.
VI	5.0 to 6.0	Felt by everyone. Difficult to stand. Some heavy furniture moved, some plaster falls. Chimneys may be slightly damaged.
VII	6.0	Slight to moderate damage in well built, ordinary structures. Considerable damage to poorly built structures. Some walls may fall.
VIII	6.0 to 7.0	Little damage in specially built structures. Considerable damage to ordinary buildings, severe damage to poorly built structures. Some walls collapse.
IX	7.0	Considerable damage to specially built structures, buildings shifted off foundations. Ground cracked noticeably. Wholesale destruction. Landslides.
X	7.0 to 8.0	Most masonry and frame structures and their foundations destroyed. Ground badly cracked. Landslides. Wholesale destruction.
XI	8.0	Total damage. Few, if any, structures standing. Bridges destroyed. Wide cracks in ground. Waves seen on ground.
XII	8.0 or greater	Total damage. Waves seen on ground. Objects thrown up into air.

Figure 5 **Modified Mercalli Intensity** (MMI 2015)

5.4.1.2 History

Accurate seismology for Alaska is relatively young with historic data beginning in 1973 for most locations. Therefore data is limited for acquiring long-term earthquake event data. The HMP's Alaska earthquake data is based on best available data; obtained from the US Geological Survey (USGS) and the State of Alaska, UAF Geophysical Institute's archives. Research included searching the US Geological Survey (USGS) earthquake database for events spanning from 1973 to present; none of which exceeded M4 located within 100 miles of the Village.

Therefore the Planning Team determined that based on available recorded data, the Village of Newtok has a minor concern for earthquake damages as they have not experienced damaging impacts from their historical earthquake events and only need to be concerned with earthquakes with a magnitude > M5.0. This is substantiated in Table 10 lists only two earthquake events within 100 miles of Newtok. Only one of which, an M4.7, occurred on February 23, 2013.

Table 10 Historical Earthquakes for Newtok

Date	Time	Latitude	Longitude	Depth	Magnitude	Distance
3/11/2013	9:58 PM	60.3679	-162.184	22.6	3.4	32.3 miles SSW of Bethel
2/23/2013	2:35 AM	60.3573	-162.454	0.5	4.7	38 miles SW of Bethel

(USGS 2015)

North America's strongest recorded earthquake occurred on March 27, 1964 in Prince William Sound measuring M9.2 and was felt by many residents throughout Alaska. Newtok experienced minimal ground motion from this historic event. Planning Team members further stated that the Village had experienced no ground shaking from the November 3, 2002 M7.9 Denali EQ.

5.4.1.3 Location, Extent, Impact, and Recurrence Probability

Location

The entire geographic area of Alaska is prone to earthquake effects. However, the City of Newtok is located within a relatively quiet seismic zone. Figure 5 shows the locations of active and potentially active faults in Alaska.

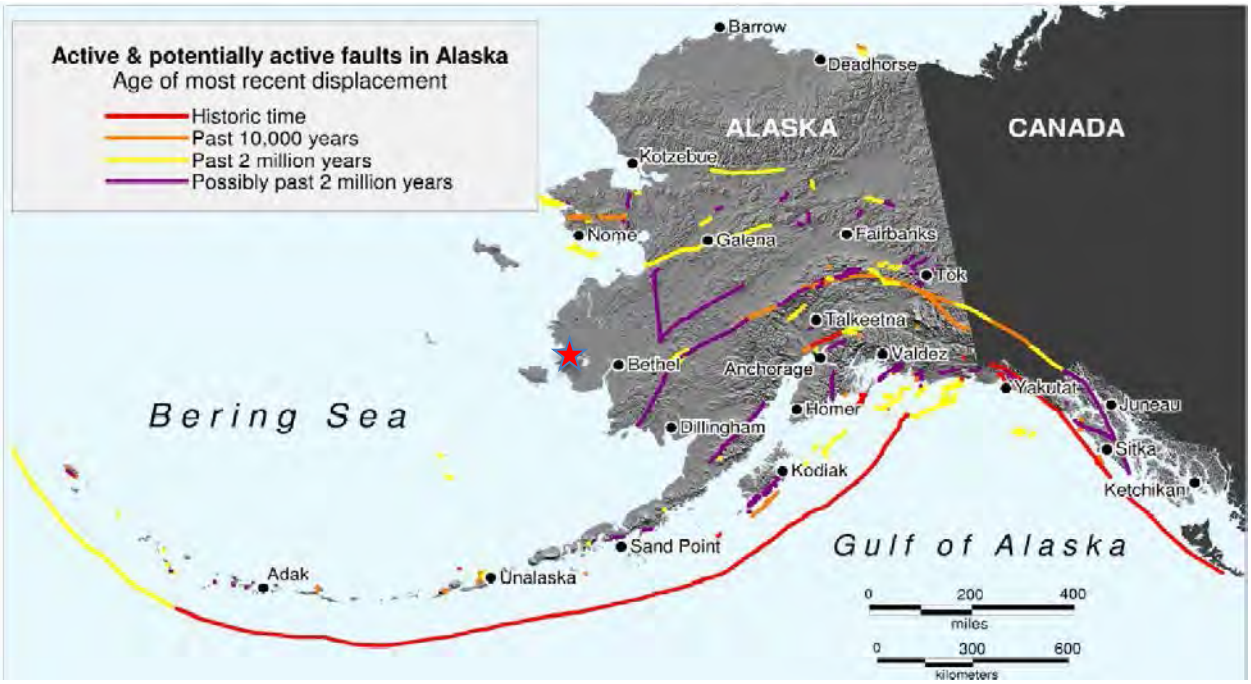

Figure 6 Active and Potentially Active Faults in Alaska (DGGS 2009)

Extent

There are no earthquakes that have occurred near the Village of over M5 since 1973. Based on historic earthquake events and the criteria identified in Table 7, the magnitude and severity of earthquake impacts in the Village are considered "Negligible" with potential injuries and/or illnesses that are treated with first aid and do not result in permanent disability; shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property is severely damaged.

Impact

Impacts to the community such as significant ground movement that may result in infrastructure damage are not expected. Minor shaking may be seen or felt based on past events. Impacts to future populations, residences, critical facilities, and infrastructure are anticipated to remain the same.

Recurrence Probability

This 2009 Shake Map (Figure 7) incorporates current seismicity in its development and is the most current map available for this area. Peter Haeussler, USGS, Alaska Region states; it is a viable representation to support probability inquiries.

> *"The occurrence of various small earthquakes does not change earthquake probabilities. In fact, in the most dramatic case, the probability of an earthquake on the Denali fault was/is the same the day before the 2002 earthquake as the day afterward. Those are time-independent probabilities. The things that change the hazard maps is changing the number of active faults or changing their slip rate" (Haeussler, 2009).*

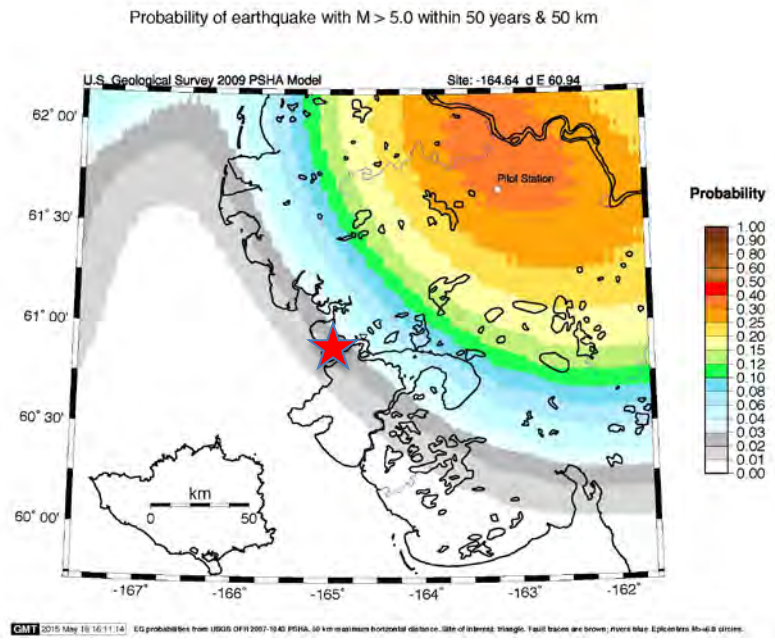

Figure 7 Newtok's Earthquake Recurrence Probability (USGS)

While it is not possible to predict when an earthquake will occur, The Shake Map indicates a M5.0 or greater earthquake occurring within 100 years and 100 miles of the Village is "Unlikely" within the next 10 years (1/10=10 percent) chance of occurring; due to an event history that is less than or equal to 10 percent likely per year.

5.4.2 Flood

5.4.2.1 Nature

Flooding is the accumulation of water where usually none occurs or the overflow of excess water from a stream, river, lake, reservoir, glacier, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Figure 8 photo was taken several months after a large regional flood in 2013; it depicts Newtok's critical situation.

Figure 8 2013 Newtok Flood (DHS&EM 2013)

Flood events not only impact communities with high water levels, or fast flowing waters, but sediment transport also impacts infrastructure and barge and other river vessel access limitations. Dredging may be the only option to maintain an infrastructure's viability and longevity.

Four primary types of flooding occur in the Village: rainfall-runoff, snowmelt, ice jam, storm surge, and ice override floods.

Rainfall-Runoff Flooding occurs in late summer and early fall. The rainfall intensity, duration, distribution, and geomorphic characteristics of the watershed all play a role in determining the magnitude of the flood. Rainfall runoff flooding is the most common type of flood. This type of flood event generally results from weather systems that have associated prolonged rainfall.

Snowmelt Floods typically occur from April through June. The depths of the snowpack and spring weather patterns influence the magnitude of flooding.

Ice-Jam floods occur when warming temperatures and rising water flows causes the ice to break-up and disconnect from the embankment. The large ice chunks begin to flow and move

down river. The ice does not flow easily, often impacting with adjacent blocks resulting in occasional ice jams. Some ice jams quickly break apart, however, larger jams occur which create small dams causing the water to exert increasing pressure on the jam creating a damming effect. Water subsequently begins to build depth and often overtops adjacent embankments, which flood upstream communities.

When the ice-jam breaks the built-up water rushes downstream with great force. Ice blocks scour the embankment, destroying infrastructure such as fuel headers, barge landings, and boat mooring structures. Large house sized ice blocks may even be driven above the embankment destroying any structure in its path. Communities are virtually helpless against such devastation.

Storm Surges, or coastal floods, occur when the sea is driven inland above the high-tide level onto land that is normally dry. Often, heavy surf conditions driven by high winds accompany a storm surge adding to the destructive-flooding water's force. The conditions that cause coastal floods also can cause significant shoreline erosion as the flood waters undercut roads and other structures. Storm surge is a leading cause of property damage in Alaska.

The meteorological parameters conducive to coastal flooding are low atmospheric pressure, strong winds (blowing directly onshore or along the shore with the shoreline to the right of the direction of the flow), and winds maintained from roughly the same direction over a long distance across the open ocean (fetch).

Communities that are situated on low-lying coastal lands with gradually sloping bathymetry near the shore and exposure to strong winds with a long fetch over the water are particularly susceptible to coastal flooding. Several communities and villages along the Bristol Bay coast, the Bering Sea coast, the Arctic coast, and the Beaufort Sea coast have experienced significant damage from coastal floods over the past several decades. Most coastal flooding occurs during the late summer or early fall season in these locations. As shore-fast ice forms along the coast before winter, the risk of coastal flooding abates, but, later freeze-ups greatly increase the risk of erosion, storm surge flooding and ice override events.

Ice Override (also known as an Ivu) is a phenomenon that occurs when motion of the sheet ice is initiated by wind stress acting on the surface of ice that is not confined. Onshore wind, coupled with conditions such as a smooth gradual sloping beach and high tides can cause ice sheets to slide up or "override" the beach and move inland as much as several hundreds of feet. Ice override typically occurs in fall and early winter (though events have been reported at other times) and is usually associated with coastal storms and storm surge but may also happen in calm weather.

Override advances are slow enough to allow people to move out of its path, and therefore poses little immediate safety hazard. Intact sheets of ice up to several feet thick moving into buildings or across roads and airports can however cause structural damage and impede travel. Shoreline protection in the form of bulkheads or other structures to break-up the ice can limit the movement of ice. In at least one occasion, a bulldozer was able to break-up the ice and prevent damage.

Coastal Scour (used interchangeably with erosion) rarely causes death or injury. However, erosion causes property destruction, prohibits development, and impacts community infrastructure. Erosion is typically gradual land loss through wind or water scour. However,

erosive scour can occur rapidly as the result of floods, storms or other event or slowly as the result of long-term environmental changes such as thawing permafrost. Erosion is a natural process, but its effects can be easily exacerbated by human activity.

Coastal and riverine scour threaten Newtok's infrastructure, built environment, and utilities adjacent embankments and shorelines.

Coastline attrition, sometimes referred to as tidal, bluff, or beach losses, may other times encompass different categories altogether. For this profile, tidal, bluff and beach losses will be nested within the term scour.

Coastal scour is the attrition of land resulting in loss of beach, shoreline, or dune material from natural activity or human influences. Coastal erosion occurs over the area roughly from the top of the bluff out into the near-shore region to about the 30 feet water depth. It is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. Bluff recession is the most visible aspect of coastal erosion because of the dramatic change it causes to the landscape. As a result, this aspect of coastal erosion usually receives the most attention.

Erosive high water flow sour forces are embodied in waves, currents, and winds; surface and ground water flow; freeze-thaw cycles may also play a role. Not all of these forces may be present at any particular location. Coastal erosion can occur from rapid, short-term daily, seasonal, or annual natural events such as waves, storm surge, wind, coastal storms, and flooding, or from human activities including boat wakes and dredging. The most dramatic erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions.

Coastal erosion may also be due to multi-year impacts and long-term climatic change such as sea-level rise, lack of sediment supply, subsidence, or long-term human factors such as aquifer depletion or the construction of shore protection structures and dams. Attempts to control erosion using shoreline protective measures such as groins, jetties, seawalls, or revetments can lead to increased erosion.

Riverine Scour results from the force of flowing water and ice formations in and adjacent to river channels. This scouring affects the river the channel, river bed and banks and can alter or preclude any channel navigation or riverbank development. In less stable braided channel reaches, scour, and material deposition are constant issues. In more stable meandering channels, scour episodes may only occasionally occur from human activities including boat wakes and dredging.

Attempts to control scour using shoreline protective measures such as groins, jetties, levees, or revetments can lead to increased embankment loss or damage.

Land surface loss results from high flowing surface water across roads due to poor or improper drainage. These events typically occur from rain and snowmelt run-off.

Event Recurrence Intervals

Many flood damages are predictable based on rainfall and seasonal thaw patterns. Most of the annual precipitation is received from April through October with August being the wettest. This rainfall leads to flooding in early/late summer and/or fall. Spring snowmelt increases runoff,

which can cause excessive surface flooding. It also breaks riverine winter ice cover, exacerbating localized ice-jam flood or coastal ice override damage impacts.

5.4.2.2 History

DHS&EM's 2015 Disaster Cost Index records the following flooding disaster events, which may have affected the Newtok area.

> *"**02 Interior Floods (AK-DR-1423) Declared May 29, 2002 by Gov. Knowles then FEMA Declared (DR-1423) on June 26 2002:** Flooding occurred in various interior and western Alaska river drainages, including the Tanana, Kuskokwim, Nushagak, Susitna and Yukon River drainages beginning on April 27, 2002 and continuing. The floods caused widespread damage to and loss of property in the Fairbanks North Star Borough (Tanana River drainage); in McGrath, Lime Village, Sleetmute, Red Devil, Crooked Creek, Newtok and Kwethluk (Kuskokwim River drainage); Ekwok and New Stuyahok (Nushagak River drainage); in the Susitna River drainage from Chase to Montana Creek; and in Newtok (Yukon River drainage). The following conditions existed as a result of this disaster: widespread damage to public facilities and infrastructure, including damage to public airports, roads, and buildings; to public utilities, including water, sewer, and electrical utilities; to personal residences, in some areas requiring evacuation and sheltering of residents; to commercial operations; and to other public and private real and personal property.*
>
> ***10-211 2004 Bering Strait Sea Storm declared October 28, 2004 by Governor Murkowski then FEMA declared (DR-1571) on November 15, 2004. Amended declaration to extend incident to October 24, 2004.** Between October 18 and 20, 2004, a severe winter storm with strong winds and extreme tidal surges occurred along the Western Alaska coastline, which resulted in severe damage and threat to life and property, specifically in the Bering Strait Regional Educational Attendance Area (REAA), including Elim, Nome, Koyuk, Shaktoolik, Unalakleet, and other communities; in the Northwest Artic Borough, including Kivalina, Kotzebue, and other communities; and in the City of Mekoryuk; with potentially unidentified damages in adjacent areas, and additional storm surges likely from continuing weather patterns in this area Alaska. Conditions that exist in the coastal communities of the Northwest Artic Borough as a result of this disaster: severe damage to roadways, power distribution systems, and drain fields. Conditions that exist in the coastal communities of the Bering Strait REAA as a result of this disaster: severe damage to gabions (used to protect shoreline), major damage to coastal highways and roads, damage to water and septic systems, damage to a bridge, damage to power distribution systems, damage to fuel storage tanks, fuel spills, and property damage. Conditions that exist in the City of Mekoryuk as a result of this disaster: major damage to sea wall and damage to roadways. On November 16, 2004, the declaration was amended to reflect a more accurate timeframe of the disaster. The City of St. George appealed the denial of funding decision for the breakwater. The appeal was granted, which increased the original estimate for total funding of this disaster by more than $3 million. The dates of the severe storm were changed to October 18 through October 24, 2004. Individual assistance totaled $1 million for 271 applicants. Public Assistance total $13 million for 60 potential applicants with 125 PW's. Hazard Mitigation totaled $800K. The total for this disaster is $17 million.*
>
> ***September 22 to 23, 2005.** A flood occurred that completely enclosed the Village, effectively making it an island for several days. Several houses were only connected to the Village via temporarily floating boardwalks.*

06-215 2005 West Coast Storm declared October 24, 2005 by Governor Murkowski then FEMA declared (DR-1618) on December 9, 2005: *Beginning on September 22, 2005 and continuing through September 26, 2005, a powerful fall sea storm produced high winds combined with wind-driven tidal surges resulting in severe and widespread coastal flooding and a threat to life and property in the Northwest Arctic Borough, and numerous communities within the Bering Strait (REAA 7), the Kashunamiut (REAA 55), the Lower Yukon (REAA 32) and the Lower Kuskokwim (REAA 31) Rural Education Attendance Areas including the cities of Nome, Kivalina, Unalakleet, Golovin, Tununak, Hooper Bay, Chevak, Mekoryuk and Napakiak. The following conditions existed as a result of this disaster: severe damage to personal residences requiring evacuation and sheltering of the residents; to businesses; to drinking water systems, electrical distribution systems, local road systems, airports, seawalls, and other public infrastructure; and to individual personal and real property; necessitating emergency protective measures and temporary and permanent repairs.*

06-216 2006 Spring Floods (AK-06-218) declared June 27, 2006 by Governor Murkowski then FEMA declared (DR-1657) on August 04, 2006*: Beginning May 5, 2006 continuing through May 30, 2006, the National Weather Service (NWS) issued flooding warnings and watches across the state as excessive snowmelt and ice jams caused flooding along the Yukon, Kuskokwim, and Koyukuk River drainages. The most serious impacts were reported in the communities of Hughes, Koyukuk, Kwethluk, Alakanuk, and Newtok, along with substantial damage to State-maintained airports, roads, and highways. In each community, large portions of the Village, Village infrastructure, and several roads were inundated and eroded by the floodwaters.*

12-236 2011 West Coast Storm declared by Governor Parnell on December 5, 2011 then FEMA declared December 22, 2011 (DR-4050). *On November 7, 2011 the National Weather Service (NWS) issued the first of several coastal flood warnings for the western coastline of Alaska from Hooper Bay to the North Slope. The NWS warned of "a rapidly intensifying storm…expected to be an extremely powerful and dangerous storm…one of the worst on record." Over the next three days additional warnings in response to the 942 millibar low pressure system were issued for coastal villages as the storm moved northerly from the Aleutian Islands into the Bering and Chukchi Seas. The west coast was impacted with hurricane force winds exceeding 85 mph, high tidal ranges, and strong sea surges up to 10-ft above mean sea level (msl). Before the first storm had passed, a second equally-low pressure system (e.g., 942 millibar) impacted the western coastline from the Yukon-Kuskokwim Delta south to Bristol Bay. This combined weather extended the incident period for the state to November 13, 2011. The FEMA declaration was limited to the incident period from November 8 – 10, 2011.*

13-S-244 2013 November Storm Disaster declared by Governor Parnell on November 16, 2013 then FEMA declared January 23, 2014 (DR-4162). *On November 5, 2013 the National Weather Service (NWS) issued the first of several coastal flood and winter storm warnings ranging from the central Aleutians to and including the western coastline of Alaska from Bristol Bay to the North Slope. In their published message the NWS warned of very strong low pressure system south of Shemya, moving to the central Bering and Chukchi Sea's bringing a combination of gale, high surf, high wind, freezing spray, coastal flooding and sea surge warnings and watches. The west coast was impacted with hurricane force winds exceeding 85 mph, high tidal ranges, and strong sea surges. The resultant impact culminated to, damage to public facilities including roads, seawalls, bridges, airports, and public buildings; damage to electrical distribution*

systems and drinking water systems; damages to private residences and the losses of personal and real property; and coastal flooding and power outages which necessitated evacuation and sheltering operations. Overall, the series of storms created a threat to life and property in 23 cities and villages in the Bering Strait Regional Educational Attendance Area (REAA), Lower Yukon REAA, and Lower Kuskokwim REAA, and the Fairbanks North Star Borough" (DHS&EM 2014)

Erosion Issues in Newtok

In 1983-84, Woodward-Clyde Consultants (now AECOM) conducted an assessment of Ninglick River erosion in proximity to the Village of Newtok. The purpose of the assessment was to evaluate the causes and rates of the erosion, as well as to examine potential mitigation of the impact of river advancement on the Village. This study is the only in-depth evaluation of this problem.

Figure 9 2013 Newtok Flood (DHS&EM 2013)

According to Woodward-Clyde, the main variables affecting erosion of the bank of the Ninglick River in the area around Newtok include a combination of temperature changes, wave action, and river current. Since the soils in the area have high ice content, the summer heating of the river edge and associated substrate results in the loss of soil structure caused by interstitial ice degradation.

This enhances erosion capability along the river and is coincident with periods of high potential scouring inputs from the unfrozen Ninglick River. Furthermore, Newtok is geographically situated in an area that is affected by both tidal activity and strong winds. This combination increases the likelihood of shoreline erosion by the impact of twice-daily tides as well as periods of intensified wave action from storm surges and winds.

According to Village residents, the recurring summer storms associated with winds from the south and southeast, result in the biggest wave action and tremendously accelerate the rate of riverbank erosion. NVC staff members have measured as much as 25 linear feet lost to erosion after a big storm with winds coming from the south and southeast.

The Ninglick River exhibits a sinuous, meandering pattern typical of rivers in areas of gentle topography. River morphology in general is defined by alternating stretches of erosion and deposition, while meandering rivers are typified by high erosion rates on the outside of bends with deposition on the inside and downstream of bends. Newtok is located on the outside, and slightly downstream, of a significant bend in the Ninglick River. Because of this, the river current in this region causes higher rates of erosion.

Statistical Analysis of the Erosion Rate

Woodward-Clyde performed field measurements over the course of their study from upstream and downstream locations, as well as collecting information from historic data. They concluded an average rate of 79 feet per year could be attributed for advancement of the Ninglick River on the Village of Newtok. This average was based on values ranging from 42 to 113 feet per year (excluding noted maximum values of 130 feet per year) along the extent of their study area.

During the summer of 2003, the Newtok Traditional Council (NTC, now Newtok Village Council) staff and WHPacific worked together to update and build on Woodward-Clyde's work in evaluating the impact of erosion from the Ninglick River on the Village of Newtok. An in-depth analysis of river channel dynamics and morphology was not possible due to the lack of needed data such as river discharge, sediment load, channel cross-sections, et cetera. However, by building on information compiled from the original Woodward-Clyde assessment, the observations of Council staff and Village residents, and the use of available mapping and air photos, WHPacific utilized gps to perform statistical analysis and reexamine historic rates of erosion in order to show the magnitude of erosion and model the potential future impact of erosion on the Village.

Newtok Shoreline Erosion Map

USGS topographic maps and digital aerial photos were brought into the GIS and aligned to geographic coordinates. This allowed for location of surface features for reference, for measurements to be made in real-world units, and for the digitization of historic shorelines. Shorelines for 1954, 1983, 1996, and 2002 were generated. The location of a portion of the current (2003) shoreline of the Ninglick River was obtained from GPS coordinates recorded on July 14, 2003. These coordinates were checked against oblique aerial photos taken at the same time and found to be accurate.

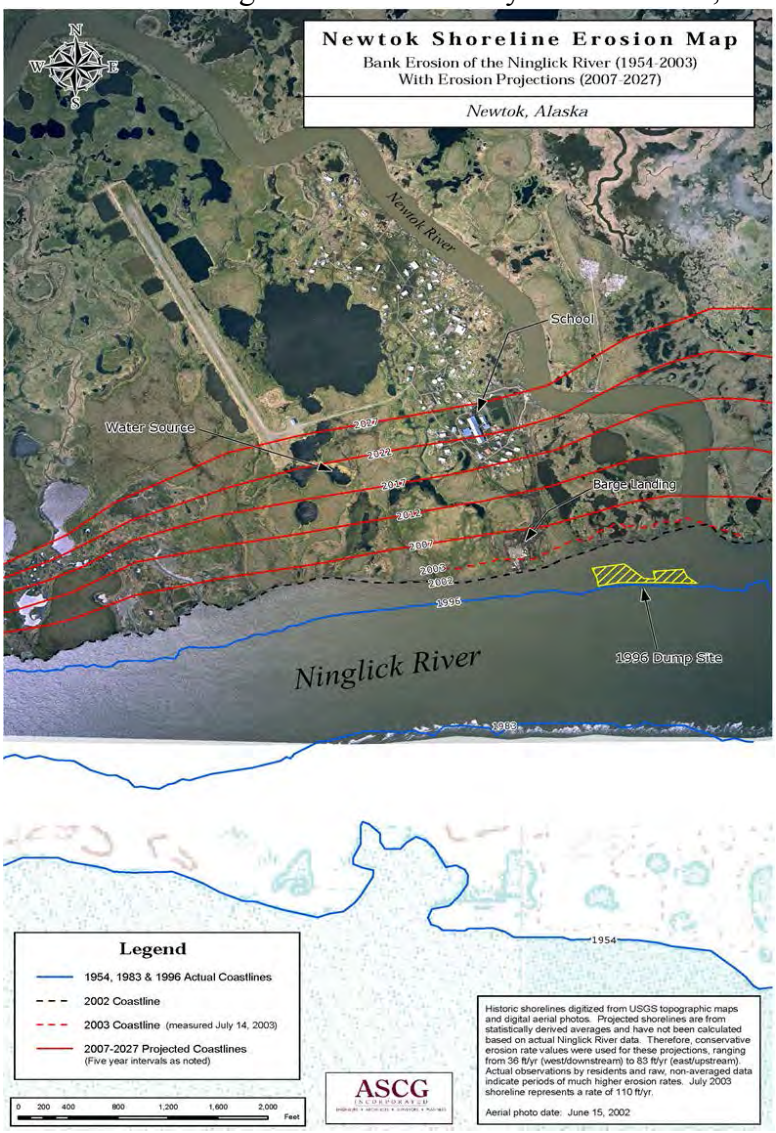

Figure 10 **Newtok Shoreline Erosion Map** (ASCG 2003)

Location of these historic shorelines provided the information necessary to calculate erosion rates over the 49-year data history. Measuring total linear foot retreat of the shoreline between record years and dividing the total loss by the number of intervening years accomplished this. Thus, a simple statistical average was attained for the erosion rate per year. Creating a grid pattern encompassing all digitized shorelines and then using database calculations of each individual polygon created performed additional analysis of area loss. This allowed for a "normalization" factor to be applied to the calculated linear rates to attempt to adjust for irregular shoreline patterns. The results of this process determined an apparent exponential erosion rate with significant increases in the eroding capability of the river experienced upstream. This pattern complied with typical river channel morphology that indicates higher rates of erosion nearer to the outside apex of a meander bend. It was found that average rates varied from 36 feet per year on the downstream reach to over 83 feet per year upstream. It was also observed that the average rate of erosion appears to be increasing in the upstream reaches. The average rate of erosion occurring directly in front of the Village (at the east end of the barge landing on the Ninglick River) between 1954 and 2003 was measured to be 68 feet per year.

As can be seen on the Newtok Shoreline Erosion Map (Figure 9) the erosion loss has been continuous from the base year of 1954. Residents concur that the erosion has been non-stop, year after year. Erosion has and continues to negatively impact the Village in the following areas:

- Loss of facilities
- Diminished river access to the Village
- Increased workload in providing services.
- Nuisance Problems
- Deferred community development
- Interrupted subsistence activities
- Social impacts

Erosion Rate Projections

Projected shorelines were determined using the average erosion rates along each of the examined stretches of river at five-year intervals. The projected annual erosion rate from 2002 is 64 feet per year. The results of this analysis can be seen in the attached Newtok Shoreline Erosion Map (Figure 9). As shown, the map projections indicate the following threatened facilities (Table 11).

Table 11 Projected Year of Erosion Impact on Newtok Facilities

THREATENED FACILITY	YEARS FROM 2003 UNTIL IMPACT	IMPACT YEAR
Steam houses and storage structures at south end of Village	12	2015
Four houses at the south end of the Village	13	2016
Water supply in a small lake just south of the airport	15	2018
High school and elementary school	17	2020
Airport	19	2022

(ASCG 2003)

It should be noted that since the five-year intervals are statistically derived averages and have not been calculated based on actual Ninglick River morphologic data, the most conservative erosion rate values were used in these projections. Actual observations by residents and raw, non-averaged data indicate periods of higher erosion rates. The data from 2003 (not included in this analysis) shows a loss of 110 feet prior to the middle of July. Basic river dynamics would indicate that advance of the Ninglick River on Newtok will be greatest from the upstream side with the rate increasing on average each year.

Of great concern to residents is the low-lying, marshy, pond area, southeast of the Village where the Ninglick River meets the Newtok River. Residents state that pond areas have eroded much more quickly than other areas in the past. They fear that the Ninglick River will overtake these pond areas faster than the stated erosion projection, and thus Village facilities would face erosion from the southeast as well as from the south.

The Village experiences severe road surface damages and erosion from heavy rainfall, snowmelt, and spring run-off flooding. Spring run-off causes the most damages to the community's road surfaces.

5.4.2.3 Location, Extent, Impact, and Recurrence Probability

Location

The entire Village of Newtok is in danger of flooding which is compounded by melting permafrost.

Extent

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related recurrence probability.

The following factors contribute to riverine flooding frequency and severity:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including terrain steepness, soil types, amount, vegetation type, and development density
- The attenuating feature existence in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The flood control feature existence, such as levees and flood control channels
- Flow velocity
- Availability of sediment for transport, and the bed and embankment watercourse erodibility
- Village location related to identified-historical flood elevation

The Village does experience severe riverine flooding and they experience severe high water flow flood erosion impacts. Therefore, based on past high water flow event history and the criteria identified in Table 7 the extent of flooding and resultant damages to infrastructure and their protective embankments in the Village are considered "Catastrophic" multiple deaths could occur, complete shutdown of facilities for 30 or more days is possible and more than 50 percent of property could be severely damaged.

Impact

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods includes the following:

- Structure flood inundation, causing water damage to structural elements and contents
- High water flow storm surge floods scour (erode) coastal embankments, coastal protection barriers, and result in infrastructure and residential property losses. Additional impacts can include roadway embankment collapse, foundations exposure, and damaging impacts
- Damage to structures, roads, bridges, culverts, and other features from high-velocity flow and debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, decreasing water conveyance and increasing loads which may cause feature overtopping or backwater damages
- Sewage, hazardous or toxic materials release, materials transport from wastewater treatment plant or sewage lagoon inundation, storage tank damages, and/or severed pipeline damages can be catastrophic to rural remote communities

Floods also result in economic losses through business and government facility closure, communications, utility (such as water and sewer), and transportation services disruptions. Floods result in excessive expenditures for emergency response, and generally disrupt the normal function of a community.

Impacts and problems also related to flooding are deposition as well as embankment, coastal erosion, and/or wind. Deposition is the accumulation of soil, silt, and other particles on a river bottom or delta. Deposition leads to the destruction of fish habitat, presents a challenge for navigational purposes, and prevents access to historical boat and barge landing areas. Deposition also reduces channel capacity, resulting in increased flooding or bank erosion. Embankment

erosion involves material removal from the stream or river banks, coastal bluffs, and dune areas. When bank erosion is excessive, it becomes a concern because it results in loss of embankment vegetation, fish habitat, and land, property, and essential infrastructure (BKP 1988).

Newtok's Erosion Impacts

Village Dump Site. The previous Village dumpsite and the boardwalk leading to it, located on the south end of the Village, washed into the Ninglick River in 1996 due to erosion. A temporary dumpsite was then established on the east side of the Newtok River, across from the Village. The dumpsite is accessible only at high tide, which means that garbage is often piled up on docks waiting to be transported.

Barge Landing and Container Storage Area. The existing barge landing and container storage area located south of the Village on the Ninglick River is being washed away. The advancing river continuously threatens containers and material at the site. There is no other location for the landing. According to Newtok Traditional Council staff, the site has and will continue to be moved back towards the Village as the advancement of the river dictates. Please see the pictures folder for a photo of the container area after the September 2005 flood.

Diminished River Access to the Village. The Newtok River forms the eastern boundary of the Village. The river was once busy with daily boat traffic in summer and provided easy access to residences and barge off-loading facilities. The Newtok River has become progressively shallower due to the encroachment of the Ninglick River in 1996 The encroachment of the Ninglick River has stopped the flow of the Newtok River, creating a build-up of silt. During low tide, the river becomes similar to a mud flat. It is now difficult for boat access to and from the two Village boat landings. Barge access in the Newtok River is now limited. Some barges can make it into the river; others can offload freight only at the barge landing 830 feet south of the Village on the banks of the Ninglick River. Smaller boats must then haul the freight up the Newtok River at high tide.

Increased Workload in Providing Services. After the Village dump located on the Ninglick River was washed away in 1996, a temporary dumpsite was established on the east side of the Newtok River, across from the Village. The workload for hauling trash to the new dump has now tripled:

Trash that has been hauled to the drop off point at the Newtok River piles up on the Village side of the river because transport across the river is only possible at high tide. The close proximity of the drop off point to the Village has created a nuisance to nearby residents because of the odor and scattered debris.

Deferred Community Development. The advancing erosion and the current and future loss and damage to facilities have caused agencies in the past to delay expending capital funds at Newtok. The concern among agencies and the NVC is the substantial investment required to provide much-needed new capital facilities, versus the risk involved considering the Ninglick River advancing upon the Village.

Airport improvements and a solid waste master plan have been deferred. The Yukon-Kuskokwim Health Corporation deferred the construction of a new health clinic for several years.

Recurrence Probability

Based on previous occurrences, and criteria in Table 8, a future flooding event in Newtok is "Highly Likely". An event is probable within the calendar year; event has up to 1 in 1 year (1/1=100 percent) chance of occurring. History of events is greater than 33 percent likely per year. Event is "Highly Likely" to occur.

5.4.3 Ground Failure

5.4.3.1 Nature

Ground failure describes avalanche, landslide, subsidence, and unstable soils gravitational or other soil movement mechanisms. Soil movement influences can include rain, snow, and/or water saturation induced avalanches or landslides; as well as from seismic activity, thawing permafrost, river or coastal embankment undercutting, or in combination with steep slope conditions.

Landslides are a dislodgment and fall of a mass of soil or rocks along a sloped surface, or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also be triggered or exacerbated by indiscriminate development of sloping ground, or the creation of cut-and-fill slopes in areas of unstable or inadequately stables geologic conditions.

Additionally, avalanches and landslides often occur secondary to other natural hazard events, thereby exacerbating conditions, such as:

- Earthquake ground movement can trigger events ranging from rock falls and topples to massive slides
- Intense or prolonged precipitation can cause slope over-saturation and subsequent destabilization failures such as avalanches and landslides.
- Climate change related drought conditions may increase wildfire conditions where a wildland fire consumes essential stabilizing vegetation from hillsides significantly increasing runoff and ground failure potential

Development, construction, and other human activities can also provoke ground failure events. Increased runoff, excavation in hillsides, shocks and vibrations from construction, non-engineered fill places excess load to the top of slopes, and changes in vegetation from fire, timber harvesting and land clearing have all led to landslide events. Broken underground water mains can also saturate soil and destabilize slopes, initiating slides. Something as simple as a blocked culvert can increase and alter water flow, thereby increasing the potential for a landslide event in an area with high natural risk. Weathering and decomposition of geologic material, and alterations in flow of surface or ground water can further increase the potential for landslides.

The USGS identifies six landslide types, distinguished by material type and movement mechanism including:

Slides, the more accurate and restrictive use of the term landslide, refers to a mass movement of material, originating from a discrete weakness area that slides from stable underlying material. A

rotational slide occurs when there is movement along a concave surface; a *translational slide* originates from movement along a flat surface.

Debris Flows arise from saturated material that generally moves rapidly down a slope. A debris flow usually mobilizes from other types of landslide on a steep slope, then flows through confined channels, liquefying and gaining speed. Debris flows can travel at speeds of more than 35 mph for several miles. Other types of flows include debris avalanches, mudflows, creeps, earth flows, debris flows, and lahars.

Lateral Spreads are a type of landslide generally occurs on gentle slope or flat terrain. Lateral spreads are characterized by liquefaction of fine-grained soils. The event is typically triggered by an earthquake or human-caused rapid ground motion.

Falls are the free-fall movement of rocks and boulders detached from steep slopes or cliffs.

Topples are rocks and boulders that rotate forward and may become falls.

Complex is any combination of landslide types.

In Alaska, earthquakes, seasonally frozen ground, and permafrost are often agents of ground failure. Permafrost is defined as soil, sand, gravel, or bedrock that has remained below 32°F for two or more years. Permafrost can exist as massive ice wedges and lenses in poorly drained soils or as relatively dry matrix in well-drained gravel or bedrock. During the summer, the surficial soil material thaws to a depth of a few feet, but the underlying frozen materials prevent drainage. The surficial material that is subject to annual freezing and thawing is referred to as the “active layer”.

Seasonal freezing can cause frost heaves and frost jacking. Frost heaves occur when ice forms in the ground and separates sediment pores, causing ground displacement. Frost jacking causes unheated structures to move upwards. Permafrost is frozen ground in which a naturally occurring temperature below 32ºF has existed for two or more years. (DHS&EM 2013).

Indicators of a possible ground failure include:

- Springs, seeps, or wet ground that is not typically wet
- New cracks or bulges in the ground or pavement
- Soil subsiding from a foundation
- Secondary structures (decks, patios) tilting or moving away from main structures
- Broken water line or other underground utility
- Leaning structures that were previously straight
- Offset fence lines
- Sunken or dropped-down road beds
- Rapid increase in stream levels, sometimes with increased turbidity
- Rapid decrease in stream levels even though it is raining or has recently stopped and
- Sticking doors and windows, visible spaces indicating frames out of plumb

The State of Alaska 2013 State Hazard Mitigation Plan provides additional ground failure information defining mass movement types, topographic and geologic factors, which influence ground failure, which may pertain to Newtok.

5.4.3.2 History

There are few written records defining ground failure impacts, however, the community of Newtok is experiencing thawing permafrost. The community has small melt ponding ponds forming where none previously existed and the ground overall is very soft and soggy.

5.4.3.3 Location, Extent, Impact, and Recurrence Probability

Location

According to permafrost and ice conditions map (Figure 11) developed for the National Snow and Ice Data Center/World Data Center for Glaciology shows that Newtok has isolated and sporadic permafrost pockets. Their dire condition is caused by their melting permafrost. (DHS&EM 2013)

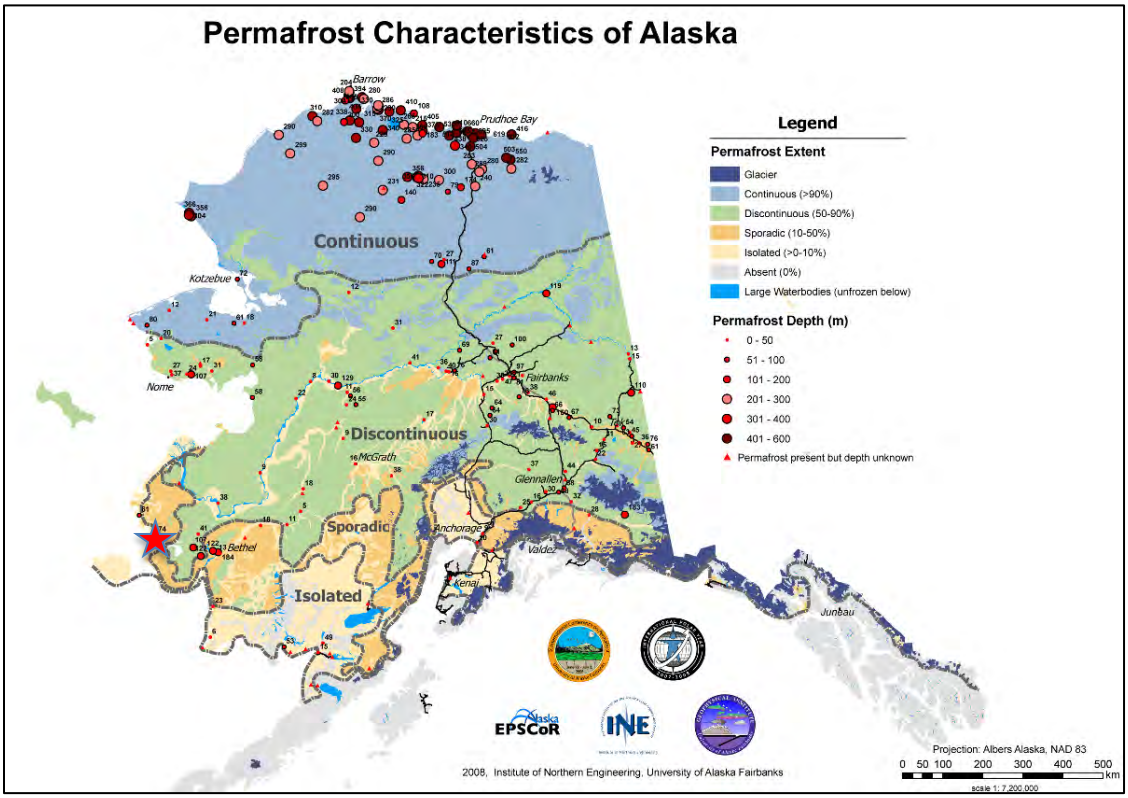

Figure 11 Permafrost Characteristics Map of Alaska (Jorgenson et al 2008)

Extent

The damage magnitude could range from minor with some repairs required and little to no damage to transportation, infrastructure, or the economy to major if a critical facility (such as the airport) was damaged and transportation was effected.

Based on research and the Planning Team's knowledge of past ground failure and various degradation events and the criteria identified in Table 7, the extent of ground failure impacts in the Village are considered "Limited". Impacts would not occur quickly but over time with warning signs. Therefore this hazard would not likely to cause injuries or death, neither would it shutdown critical facilities and services. However, 10 percent of property is could be severely damaged.

Impact

Impacts associated with ground failure include surface subsidence, infrastructure, building, and/or road damage. Ground failure does not typically pose a sudden and catastrophic hazard; however landslides and avalanches may. Ground failure damage occur from improperly designed and constructed buildings that settle as the ground subsides, resulting in structure loss or expensive repairs. It may also impact buildings, communities, pipelines, airfields, as well as road and bridge design costs and location. To avoid costly damage to these facilities, careful planning and location and facility construction design is warranted.

Recurrence Probability

Even though there are few written records defining ground failure impacts for the Village, the Planning Team has solid evidence of annually recurring thawing permafrost. The Planning Team stated the probability for ground failure follows the criteria in Table 7, the future damage probability resulting from ground failure is "Likely" in the next three years (event has up to 1 in 3 years (1/3=33 percent) chance of occurring) as the history of events is greater than 20 percent but less than 33 percent likely per year.

5.4.4 Severe Weather

5.4.4.1 Nature

Severe weather occur throughout Alaska with extremes experienced by the Village of Newtok that includes thunderstorms, lightning, hail, heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds. The Village experiences periodic severe weather events such as the following:

Climate Change influences the environment, particularly historical weather patterns. Climate change and El Niño/La Niña Southern Oscillation (ENSO) influences create increased weather volatility such as hotter summers (drought) and colder winters, intense thunderstorms, lightning, hail, snow storms, freezing rain/ice storms, high winds and even a few tornadoes within and around Alaska.

ENSO is comprised of two weather phenomena known as El Niño and La Niña. While ENSO activities are not a hazard, they can lead to severe weather events and large-scale damage throughout Alaska's varied jurisdictions. Direct correlations were found linking ENSO events to severe weather across the Pacific Northwest, particularly increased flooding (riverine, coastal storm surge) and severe winter storms. Therefore, increased awareness and understanding how ENSO events potentially impact Alaska's vastly differing regional weather.

Climate change is described as a phenomenon of water vapor, carbon dioxide, and other gases in the earth's atmosphere acting like a blanket over the earth, absorbing some of the heat of the sunlight-warmed surfaces instead of allowing it to escape into space. The more gasses, the

thicker the blanket, the warmer the earth. Trees and other plants cannot absorb carbon dioxide through photosynthesis if foliage growth is inhibited. Therefor carbon dioxide builds up and changes precipitation patterns, increases storms, wildfires, and flooding frequency and intensity; and substantially changes flora, fauna, fish, and wildlife habitats.

The governor's Alaska's Climate, Ecosystems & Human Health Work Group is tasked with determining how the changing ecosystems may impact human health and to identify, prioritize, and educate Alaskan's about the connection between their health and changing environmental patterns.

Heavy Rain occurs rather frequently over the coastal areas along the Bering Sea and the Gulf of Alaska. Heavy rain is a severe threat to Newtok**.**

Heavy Snow generally means snowfall accumulating to four inches or more in depth in 12 hours or less or six inches or more in depth in 24 hours or less.

Drifting Snow is the uneven distribution of snowfall and snow depth caused by strong surface winds. Drifting snow may occur during or after a snowfall.

Freezing Rain and Ice Storms occur when rain or drizzle freezes on surfaces, accumulating 12 inches in less than 24 hours. Ice accumulations can damage trees, utility poles, and communication towers, which disrupts transportation, power, and communications.

Extreme Cold is the definition of extreme cold varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme". In Alaska, extreme cold usually involves temperatures between -20 to -50°F. Excessive cold may accompany winter storms, be left in their wake, or can occur without storm activity. Extreme cold accompanied by wind exacerbates exposure injuries such as frostbite and hypothermia.

High Winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska's high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other hurricane characteristics.

Strong winds occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain, but the windiest places in Alaska are generally along the coastlines.

Winter Storms include a variety of phenomena described above and as previously stated may include several components; wind, snow, and ice storms. Ice storms, which include freezing rain, sleet, and hail, can be the most devastating of winter weather phenomena and are often the cause of automobile accidents, power outages, and personal injury. Ice storms result in the accumulation of ice from freezing rain, which coats every surface it falls on with a glaze of ice. Freezing rain is most commonly found in a narrow band on the cold side of a warm front, where surface temperatures are at or just below freezing temperatures. Typically, ice crystals high in the atmosphere grow by collecting water vapor molecules, which are sometimes supplied by evaporating cloud droplets. As the crystals fall, they encounter a layer of warm air where they particles melt and collapse into raindrops. As the raindrops approach the ground, they encounter a layer of cold air and cool to temperatures below freezing. However, since the cold layer is so shallow, the drops themselves do not freeze, but rather, are super cooled, that is, in liquid state at below-freezing temperature. These super cooled raindrops freeze on contact when they strike the ground or other cold surfaces.

Snowstorms happen when a mass of very cold air moves away from the polar region. As the mass collides with a warm air mass, the warm air rises quickly and the cold air cuts underneath it. This causes a huge cloudbank to form and as the ice crystals within the cloud collide, snow is formed. Snow will only fall from the cloud if the temperature of the air between the bottom of the cloud and the ground is below 40 degrees Fahrenheit. A higher temperature will cause the snowflakes to melt as they fall through the air, turning them into rain or sleet. Similar to ice storms, the effects from a snowstorm can disturb a community for weeks or even months. The combination of heavy snowfall, high winds and cold temperatures pose potential danger by causing prolonged power outages, automobile accidents and transportation delays, creating dangerous walkways, and through direct damage to buildings, pipes, livestock, crops and other vegetation. Buildings and trees can also collapse under the weight of heavy snow.

Winter storm floods are discussed in Section 5.4.2.

Figure 12 displays Alaska's annual rainfall map based on NOAA's and Natural Resources Conservation Service's (NRCS), Parameter-elevation Regressions on Independent Slopes Model (PRISM) that combines climate data from climate stations with a digital elevation model to generate annual, monthly, and event-based climatic element estimates such as precipitation and temperature.

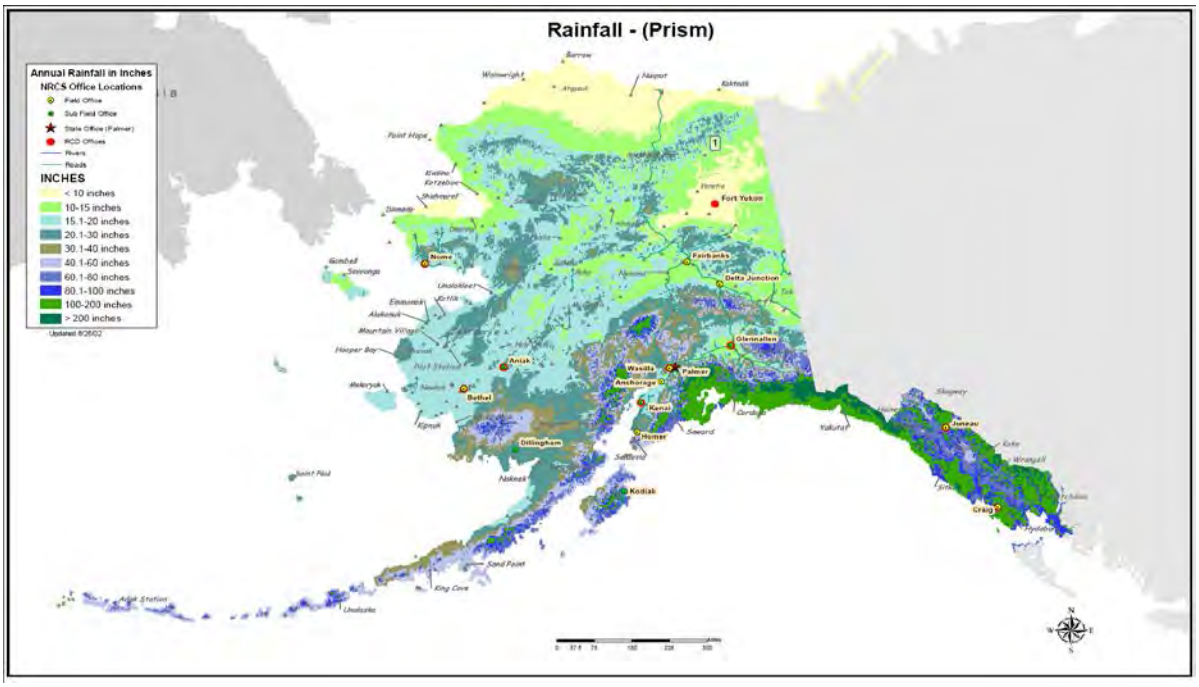

Figure 12 Statewide Rainfall Map (PRISM 2012)

5.4.4.2 History

The Village of Newtok is continually impacted by severe weather events. Hurricane force wind, storm surge, and cold typically have disastrous results.

Climate Change. The University of Alaska Fairbanks (UAF) Arctic Climate Impact Assessment describes recent weather changes and how they impact Alaska:

*"**18.3.3.1. Changes in climate***

Alaska experienced an increase in mean annual temperature of about 2 to 3 ºC between 1954 and 2003…Winter temperatures over the same period increased by up to 3 to 4 ºC in Alaska and the western Canadian Arctic, but Chukotka experienced winter cooling of between 1 and 2 ºC…

The entire region, but particularly Alaska and the western Canadian Arctic, has undergone a marked change over the last three decades, including a sharp reduction in snow-cover extent and duration, shorter river- and lake ice seasons, thawing of mountain glaciers, sea-ice retreat and thinning, permafrost retreat, and increased active layer depth. These changes have caused major ecological and socio-economic impacts, which are likely to continue or worsen under projected future climate change. Thawing permafrost and northward movement of the permafrost boundary are likely to increase slope instabilities, which will lead to costly road replacement and increased maintenance costs for pipelines and other infrastructure. The projected shift in climate is likely to convert some forested areas into bogs when ice-rich permafrost thaws. Other areas of Alaska, such as the North Slope, are expected to continue drying. Reduced sea-ice extent and thickness, rising sea level, and increases in the length of the open-water season in the region will increase the frequency and intensity of storm surges and wave development, which in turn will increase coastal erosion and flooding…

18.3.3.4. Impacts on people's lives

Traditional lifestyles are already being threatened by multiple climate-related factors, including reduced or displaced populations of marine mammals, seabirds, and other wildlife, and reductions in the extent and thickness of sea ice, making hunting more difficult and dangerous. Indigenous communities depend on fish, marine mammals, and other wildlife, through hunting, trapping, fishing, and caribou/reindeer herding. These activities play social and cultural roles that may be far greater than their contribution to monetary incomes. Also, these foods from the land and sea make significant contributions to the daily diet and nutritional status of many indigenous populations and represent important opportunities for physical activity among populations that are increasingly sedentary…" (ACIA 2014).

Table 12 displays the Western Regional Climate Center's (WRCC) Weather Summary for Newtok. These statistics were generated from Bethel Alaska's weather station; the nearest to Newtok.

Table 12 Newtok Weather Summaries, Bethel Weather Station

(Period of Record: 08/01/1923 to 01/20/2015)

	Jan	Feb	Mar	Apr	Ma	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	12.0	15.4	20.9	33.1	49.6	59.9	62.6	59.7	52.1	35.8	23.4	14.1	36.6
Average Min. Temperature (F)	-0.8	1.4	4.9	17.2	32.6	43.1	48.0	46.6	38.6	24.4	11.3	1.2	22.4
Average Total Precipitation (in.)	0.77	0.71	0.75	0.72	0.95	1.55	2.26	3.35	2.50	1.47	1.29	1.06	17.36
Average Total Snowfall (in.)	7.9	7.3	8.5	5.4	1.8	0.1	0.0	0.0	0.3	4.1	10.0	10.3	55.7
Average Snow Depth (in.)	No Data												

(WRCC 2015)

DHS&EM's 2015 Disaster Cost Index records the following severe weather disaster events, which may have affected the area:

> *"**83**. **Omega Block Disaster, January 28, 1989 & FEMA declared (DR-00826) on May 10, 1989** The Governor declared a statewide disaster to provide emergency relief to communities suffering adverse effects of a record breaking cold spell, with temperatures as low as -85 degrees. The State conducted a wide variety of emergency actions, which included: emergency repairs to maintain & prevent damage to water, sewer & electrical systems, emergency resupply of essential fuels & food, & DOT/PF support in maintaining access to isolated communities.*
>
> ***Note:** Additional storm events are identified in Flood Section 5.4.2.2.*

5.4.4.3 Location, Extent, Impact, and Recurrence Probability

Location

The entire Village area experiences periodic severe weather impacts. The most common to the area are high winds, heavy rainfall, and severe winter storms.

Extent

The entire Village is equally vulnerable to the severe weather effects. The Village experiences severe storm conditions and heavy rainfall; wind speeds exceeding 90 mph; and extreme low temperatures that reach -8ºF.

Based on past severe weather events and the criteria identified in Table 7, the extent of severe weather in the Village are considered "Limited" where injuries do not result in permanent disability, complete shutdown of critical facilities occurs for more than one week, and more than 10 percent of property is severely damaged.

Impact

The intensity, location, and the land's topography influence a severe weather event's impact within a community. Hurricane force winds, rain, snow, and storm surge can be expected to impact the entire Village of Newtok.

Heavy snow can immobilize a community by bringing transportation to a halt. Until the snow can be removed, airports and roadways are impacted, even closed completely, stopping the flow of supplies and disrupting emergency and medical services. Accumulations of snow can cause roofs to collapse and knock down trees and power lines. Heavy snow can also damage light aircraft and sink small boats. A quick thaw after a heavy snow can cause substantial flooding. The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on cities and towns.

Injuries and deaths related to heavy snow usually occur as a result of vehicle and or snow machine accidents. Casualties also occur due to overexertion while shoveling snow and hypothermia caused by overexposure to the cold weather.

Extreme cold can also bring transportation to a halt. Aircraft may be grounded due to extreme cold and ice fog conditions, cutting off access as well as the flow of supplies to communities. Long cold spells can cause rivers to freeze, disrupting shipping and increasing the likelihood of ice jams and associated flooding.

Extreme cold also interferes with the proper functioning of a community's infrastructure by causing fuel to congeal in storage tanks and supply lines, stopping electric generation. Without electricity, heaters and furnaces do not work, causing water and sewer pipes to freeze or rupture. If extreme cold conditions are combined with low or no snow cover, the ground's frost depth can increase, disturbing buried pipes. The greatest danger from extreme cold is its effect on people. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. The risk of hypothermia due to exposure greatly increases during episodes of extreme cold, and carbon monoxide poisoning is possible as people use supplemental heating devices.

Recurrence Probability

Based on previous occurrences and the criteria identified in Table 8, it is "Likely" a severe storm event will occur in the next three years with an event has up to 1 in 3 years (1/3=33 percent) chance of occurring as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.4.5 Wildland Fire

5.4.5.1 Nature

A wildland fire is a wildfire type that spreads through vegetation consumption. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as unattended burns or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as tundra fires, urban fires, interface or intermix fires, and prescribed burns.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

Topography describes slope increases, which influences the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread since fire spreads more slowly or may even be unable to spread downhill.

Fuel is the type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. Climate change is deemed to increase wildfire risk significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel load continuity, both horizontally and vertically, is also an important factor.

Weather is the most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. Climate change increases the susceptibility of vegetation to fire due to longer dry seasons. By contrast, cooling and higher humidity often signal reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires is also dependent on other hazards, such as lightning, drought, and infestations (such as the damage caused by spruce-bark beetle infestations). If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency water/food, evacuation, and shelter.

The indirect effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance rivers and stream siltation, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards.

5.4.5.2 History

The following map, Figure 13, from the 2013 Alaska State Hazard Mitigation Plan (SHMP) depicting Newtok as located within a "No Present" fire risk area.

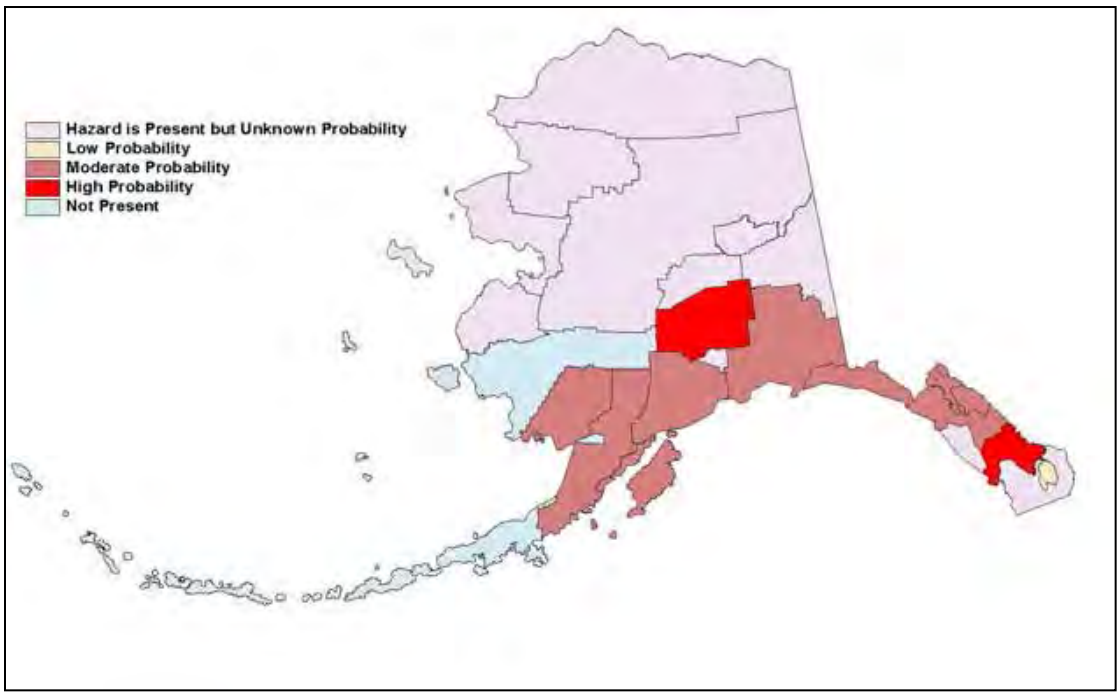

Figure 13 2013 SHMP – Fire Risk Map

Notwithstanding Figure 13, Newtok is located in the State Protection Option Areas as a "Full Protection Area." Full protection is suppression action provided on a wildland fire that threatens uninhabited private property, high-valued natural resource areas, and other high-value areas such as identified cultural and historical sites. The suppression objective is to control the fire at the smallest acreage reasonably possible. The allocation of suppression resources to fires receiving the full protection option is second in priority only to fires threatening a critical protection area.

As described in the *Ceñaliulriit Coastal Management Plan*, the vegetation of the Ceñaliulriit Coastal District is dominated by subarctic wet, moist, and alpine tundra underlain by permafrost. Vegetation communities on the mainland are adapted to permafrost, periodic flooding by tidal or riverine waters, and wind. The periodic flooding favors graminoid-dominated plant communities. Within the Yukon- Kuskokwim Delta National Wildlife Refuge, 38 percent of the vegetation cover is comprised of grass or sedge communities. Other significant vegetation classes in this area include dwarf scrub and peatland complexes; these communities are mixes of dwarf scrub, sphagnum mosses, and tussock-forming grasses. (CCRSA 2015)

Tundra Fire Hazard Vulnerability

As illustrated by the pictures shown in this document there are no tres in Newtok, the low lying ponds and the erosion of Ninglick River, and the generally wet conditions make fire risk very remote. However, surface and undergrowth tundra fire is always a concern in Alaska.

There are no previous occurrences of tundra fire in Newtok.

5.4.5.3 Location, Extent, Impact, and Recurrence Probability

Location

Under certain conditions tundra fires may occur near the Village when weather, fuel availability, topography, and ignition sources combine. Since fuels data is not readily available, for the purposes of this plan, all areas inside and outside Village limits are considered to be vulnerable to tundra/wildland fire impacts.

Extent

Generally, fire vulnerability dramatically increases in the late summer and early fall as vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type, and topography can contribute to the intensity and spread of wildland fires. The common causes of wildland fires in Alaska include lightning strikes and human negligence.

Fuel, weather, and topography influence tundra fire behavior. Fuel determines how much energy the fire releases, how quickly the fire spreads, and how much effort is needed to contain the fire. Weather is the most variable factor. High temperatures and low humidity encourage fire activity while low temperatures and high humidity retard fire spread. Wind affects the speed and direction of fire spread. Topography directs the movement of air, which also affects fire behavior. When the terrain funnels air, as happens in a canyon, it can lead to faster spreading. Fire also spreads up slope faster than down slope.

Based on the lack of past tundra fire events and the criteria identified in Table 7, the magnitude and severity of impacts in the Village of Newtok are considered "Negligible" with minor injuries, there is potential for critical facilities to be shut down for less than 24 hours, less than 10 percent of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

Impact

Impacts of a tundra fire that interfaces with the population center of the Village could grow into an emergency or disaster if not properly controlled. A small fire can threaten lives and resources and destroy property. In addition to impacting people, tundra or wildland fires may severely

impact livestock and pets. Such events may require emergency watering and feeding, evacuation, and alternative shelter.

Indirect impacts of tundra fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thus increasing flood potential, harming aquatic life, and degrading water quality.

Recurrence Probability

An important issue related to the tundra fire probability is development along the community's perimeter, accumulation of hazardous fuels, and the uncertainty of weather patterns that may accompany climate change. These three combined elements are reason for concern and heightened mitigation management of each community's tundra areas, natural areas, and open spaces.

Based on the lack of history of tundra fires in the Newtok area and applying the criteria identified in Table 8, it is "Unlikely" but possible a wildland fire event will occur within in the next ten years. The event has up to 1 in 10 years (1/10=10 percent) chance of occurring and the history of events is less than or equal to 10 percent likely each year.

Climate change and flammable vegetation species are prolific throughout Alaska's forests and tundra locations. Fire frequency may increase in the future as a result.

6. Vulnerability Assessment Overview

Section Six outlines the vulnerability process for determining potential losses for the community from various hazard impacts.

6.1 Vulnerability Analysis Overview

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis is divided into the following steps.

1. Vulnerability Analysis Overview
2. Vulnerability Overview to each Hazard
3. Cultural and Sacred Sites
4. Land Use and Development
    a. Land Use
    b. Existing Infrastructure
    c. Future Development
5. Repetitive Loss Properties
6. Methodology

This section provides an overview of the vulnerability analysis for current assets, and area future development initiatives.

DMA 2000 Recommendations
§201.7(c)(2)(ii):
Assessing Vulnerability: Overview §201.7(c)(2)(ii): [The risk assessment shall include a] description of the Indian Tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the tribe.
1. REGULATION CHECKLIST
ELEMENTS
A. Does the new or updated plan include an overall summary description of the Indian tribe's vulnerability to each hazard?
B. Does the new or updated plan address the impact of each hazard on the Indian tribe?
§201.7(c)(2)(ii)(A):
Assessing Vulnerability: Estimating Potential Losses §201.7(c)(2)(ii)(A): [The plan should describe vulnerability in terms of the] types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.
2. REGULATION CHECKLIST
ELEMENTS
A. Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings,

DMA 2000 Recommendations
infrastructure, and critical facilities located in the identified hazard areas?
B. Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?
§201.7(c)(2)(ii)(B):
Assessing Vulnerability: Analyzing Development Trends §201.7(c)(2)(ii)(B): [The plan should describe vulnerability in terms of the] types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.
3. REGULATION CHECKLIST
ELEMENTS
A. Does the new or updated plan estimate potential dollar losses to vulnerable structures?
B. Does the new or updated plan describe the methodology used to prepare the estimate?
C. Does the updated plan reflect the effects of changes in development on loss estimates?
§201.7(c)(2)(ii)(D):
Assessing Vulnerability: Assessing Cultural and Sacred Sites §201.7(c)(2)(ii)(D): [The plan should describe vulnerability in terms of] cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.
4. REGULATION CHECKLIST
ELEMENTS
A. Does the new or updated plan describe significant cultural and sacred sites that are located in hazard areas?
Source: FEMA, March 2015.

6.2 Vulnerability Overview to each Hazard

Table 13 lists the Village of Newtok's estimated infrastructures' hazard vulnerability.

Table 13 Vulnerability overview to each hazard

Hazard	Area's Hazard Vulnerability			
	Percent of Jurisdiction's Geographic Area	Percent of Population	Percent of Building Stock	Percent of Critical Facilities and Utilities
Earthquake	10	10	10	10
Flood	100	100	100	100
Ground Failure	100	100	100	100
Weather	100	100	100	100
Wildland Fire	10	10	10	10

6.3 Cultural and Sacred Sites

The Newtok Village Council related the following when asked about their cultural and sacred sites.

> *"The following sites possess a very important cultural significance for the Village of Newtok:*
> *The gravesite is a very important cultural site for our Village and would like it to be moved to the new location because of thawing permafrost and the fast eroding shoreline.*
> *We are in the process of identifying other unknown sites from the elders."*
>
> *(Romy Caliente, Relocation Coordinator).*

6.4 Land Use and Development Trends

6.4.1 Land Use

Land use in the Village is predominately residential with limited area for commercial services and community (or institutional) facilities. As noted throughout this plan Newtok is in critical and imminent danger from flooding.

> ***Note:*** *No new development is taking place in Newtok, except life and safety projects. Any new development is slated to occur at the Village's new Mertarvik site.*

6.4.2 Population and Building Stock

The Newtok Village Council estimates the Village population at 450 residents (Table 14).

The Planning Team stated that residential replacement values are generally understated because replacement costs exceed Census structure estimates due to material purchasing, barge or airplane delivery, and construction in rural Alaska. The Planning Team estimates an average 30ft by 40 ft. (1,200 sq. ft.) residential structure costs $350,000.

Table 14 Population and Housing Replacement Costs

Population	Residential Buildings	
Newtok Village Council Estimate	Total Occupied Housing Units	Total Value of Buildings
450	70	$24,500,000

6.4.3 Past Infrastructure Improvements

Table 15 list the Newtok's identified "completed" infrastructure improvement projects. They provide a depiction of the community's ongoing development trends and focus toward improving aging infrastructure.

Table 15 Infrastructure Improvement Projects

Grant Recipient	Project Name	Award Year	Grant Status	Award Amount	End Date
Newtok Traditional Council	Landfill Design Matching Funds	2011	Closed	$75,000	6/30/12
Newtok Traditional Council	Purchase Worker's Compensation Insurance	2010	Closed	$10,729	9/30/11
Newtok Traditional Council	Community Planning Grant: Mertarvik Evacuation Center-Design Analysis Report 35% Design Drawings	2009	Closed	$115,207	6/30/12
Newtok Traditional Council	Mertarvik Conceptual Community Layout Plan	2007	Closed	$30,000	6/30/08

(DCRA 2014)

6.4.4 Critical Facilities and Infrastructure

In February and March 2015, the Village took GPS readings, pictures and estimated values of many of the structures (private dwellings as well as public facilities) in Newtok. This information is found in Appendix G. ***The Village may elect to publish this information or keep it private.*** Table 16 lists the critical infrastructure facilities in the community susceptible to hazards.

Table 16 Critical Infrastructure Vulnerability Matrix

Facility Type	Occupants	Facilities	Street Address or Street Name	Picture Number	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra Fire
Tribal Government	8	Newtok Village Office	101 Hona Road	70	60.93745	-164.631184	$175,000	W1	X	X	X	X	X
	6	Tribal Council Office	101 Hona Road	71	60.937655	-164.630055	$225,000	W1	X	X	X	X	X
	8	Newtok Native Corporation/Office and Store	Hona Road	NA	Undefined	Undefined	$250,000	W1	X	X	X	X	X
	4	Post Office	Hona Road	67	0.938821	-164.630476	$150,000	W1	X	X	X	X	X
Emergency	0	Public Safety Building/Courthouse/VSPO Office (currently unoccupied)	Hona Road	NA	Undefined	Undefined	$125,000	W1	X	X	X	X	X
Education	180	Ayaprun School, P-12 grade	1 School Road	66	60.94278	-164.62944	$10,000,000	S2L	X	X	X	X	X
	5	Teacher Quarters	1 School Road	13	60.936188	-164.629078	$300,000	W1	X	X	X	X	X

Table 16 Critical Infrastructure Vulnerability Matrix

Facility Type	Occupants	Facilities	Street Address or Street Name	Picture Number	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra Fire
	2	Teachers' Quarters	1 School Road	14	60.936297	164.628767	$300,000	W1	X	X	X	X	X
	0	Teacher Quarters (unoccupied)	1 School Road	15	60.936391	-164.628451	$150,000	W1	X	X	X	X	X
Medical	4	Manguan Health Clinic	School Road	64	60.93783	-164.631688	$1,000,000	W1	X	X	X	X	X
Community	40	Quyurrvik Hall (Community Hall)	Unnamed Road	65	60.94278	-164.63333	$225,000	W1	X	X	X	X	X
	60	Catholic Church	Unnamed Road	63	60.940263	-164.631422	$350,000	W1	X	X	X	X	X
	10	NNC Rental House	Unnamed Road	NA	Undefined	Undefined	$200,000	W1	X	X	X	X	X
	0	Old BIA School w/ W&S Storage Condemned	Unnamed Road	1	60.939493	-164.630197	$2,500,000	W1	X	X	X	X	X
	0	Abandon Old BIA School 2	Unnamed Road	2	60.939498	-164.630229	$1,000,000	W1	X	X	X	X	X
	30	Playground	1 School Road	NA	Undefined	Undefined	$30,000	--	X	X	X	X	X
	5	C.V.R.F. Offices and Workshop	Unnamed Road	3	60.939025	164.630333	$500,000	S2	X	X	X	X	X
Bridge	0	Bridges 3' to 4' wide across shallow areas of 3' to 4' depths on boardwalk	20 bridges	NA	Various	Locations	Included below with boardwalk	W1	X	X	X	X	X
Transportation	4	Newtok Airport, 2,202 ft. x 35 ft	Airport area	NA	Undefined	Undefined	$1,500,000	G	X	X	X	X	X
	4	Airport Garage	Airport area	NA	Undefined	Undefined	$150,000	S2L	X	X	X	X	X
	5	Seaplane Base, 5,000 ft. x 400 ft	Kealavik River	NA	Undefined	Undefined	$500,000	W1	X	X	X	X	X
	5	Public Dock	Kealavik River	NA	Undefined	Undefined	$500,000	W1	X	X	X	X	X
	10	Barge Landing #1	Kealavik River	NA	Undefined	Undefined	$500,000	--	X	X	X	X	X
	0	Boardwalk system (five to eight miles)	Total estimated boardwalk miles	NA	Various	Locations	$500,000	W1	X	X	X	X	X
Utilities	4	Potable Water Production and Treatment Facility & Washeteria	1 PWS Road	69	60.94278	-164.62944	$3,000,000	PWSO	X	X	X	X	X
	4	GCI Communication Facility	2 PWS road	4	60.938331	-164.631677	$7,000,000	CCS1	X	X	X	X	X

Table 16 Critical Infrastructure Vulnerability Matrix

Facility Type	Occupants	Facilities	Street Address or Street Name	Picture Number	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra Fire
	4	Electric Utility Fuel Storage Tanks, Six tanks	1 mile north of Village	NA	60.94278	-164.62944	$1,500,000	OTF	X	X	X	X	X
	4	Lower Kuskokwim School Fuel Storage - Four tanks	Unnamed Road	NA	60.94278	-164.62944	$500,000	OTF	X	X	X	X	X
	1	School Generator	1 School Road	NA	Undefined	Undefined	$150,000	EPPS	X	X	X	X	X
	0	Old BIA School Tank Farm, Condemned	Unnamed Road	NA	Undefined	Undefined	$1,300,000	OTF	X	X	X	X	X
	0	Agayuvik Holy Family Church Fuel Storage	Unnamed Road	NA	60.94278	-164.62944	$150,000	OTF	X	X	X	X	X
	0	Toms Store Fuel Storage (20,000 gal Capacity)	Unnamed Road	NA	60.94278	-164.62944	$125,000	OTF	X	X	X	X	X
	4	Ungusraq Power CO. Office	Unnamed Road	72	60.939627	-164.629336	$225,000	W1	X	X	X	X	X
	0	Ungusraq Power CO. (65,000 Gal Capacity)	Unnamed Road	68	60.937825	-164.630798	$500,000	OTF	X	X	X	X	X
	1	Newtok Class III Muni Landfill	Unnamed Road	NA	60.92709	-164.63333	Undefined	--	X	X	X	X	X
	1	Sewage Lagoon	1 School Road	NA	60.94278	-164.62944	Undefined	--	X	X	X	X	X
	413	**Estimated Facility Occupants**				**Estimated Total Damages:**	**$35,580,000**						

(Newtok 2015)

Table 17 lists Newtok Facilities and their occupants potential hazard exposure

Table 17 Potential Hazard Exposure Analyses – Critical Facilities

Government and Emergency Response		Education	
# Bldgs./ # Occ	Values ($)	#Bldgs./ #Occ	Values ($)
4/26	$925,000	4/187	$10,750,000
Medical		**Community**	
# Bldgs./ # Occ	Values ($)	#Bldgs./ #Occ	Values ($)
1/4	$1,000,000	7/145	$4,805,000
Utilities		**Transportation**	
# Bldgs./ # Occ	Values ($)	# Bldgs./ # Occ	Values ($)
12/23	$14,405,000	7/28	$3,605,000

6.4.5 Future Development

Table 18 identifies Newtok's "active" infrastructure improvement projects. All of the projects are for Newtok community safety and development at Mertarvik.

Table 18 Active Infrastructure Improvement Projects

Grant Recipient	Project Name	Award Year	Grant Status	Award Amount	End Date
Newtok Traditional Council	Mertarvik Evacuation Road Construction	2013	Pending	$4,100,000	6/30/17
Newtok Traditional Council	Community Survey and Subdivision Design	2013	Pending	$75,000	7/1/12
Newtok Traditional Council	Metarvik Evacuation Shelter and Access Road	2012	Active	$2,500,000	6/30/16
Newtok Traditional Council	Newtok Evacuation Shelter and Access Road	2011	Active	$4,000,000	6/30/15
Newtok Traditional Council	Community Planning: Mertarvik Community Layout Revision	2009	Active	$30,000	6/30/13
Newtok Traditional Council	Equipment Purchase	2008	Active	$80,000	6/30/13

(DCRA 2014)

6.5 Repetitive Loss Properties

This section estimates the number and type of structures at risk to repetitive flooding. (Properties, which have experienced RL, the extent of flood depth, and damage potential.)

DMA 2000 Requirements
Repetitive Loss Strategy (Optional) §201.7(c)(3)(vi): An Indian Tribal government applying to FEMA as a grantee may request the reduced cost share authorized under 79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identifies actions the Indian Tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian Tribal government intends to reduce the number of such repetitive loss properties. [Note: While submittal of a Repetitive Loss Strategy is optional, if the Indian Tribal government wants to request the reduced cost share authorized under 44 CFR 79.4(c)(2) for the FMA and SRL programs as a grantee, then all of the following requirements must be met.]
1. REGULATION CHECKLIST
ELEMENTS
A. Does the new or updated plan address repetitive loss properties in its risk assessment (see 201.7(c)(2))?
B. Does the new or updated plan describe the Indian Tribal government's mitigation goals that support the selection of mitigation activities for repetitive loss properties (see 201.7(c)(3)(i))?
C. Does the new or updated plan identify mitigation actions for repetitive loss properties (see 201.7(c)(3)(iii))?
D. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?
E. Does the new or updated plan consider repetitive loss properties in its evaluation of the Indian Tribal government's hazard management laws, regulations, policies, programs, and capabilities and its general description of mitigation capabilities (see 201.7(c)(3)(iv))?
F. Does the new or updated plan identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities for repetitive loss properties (see 201.7(c)(3)(v))?
Source: FEMA, March 2015.

6.5.1 NFIP Participation

The Village of Newtok does not participate in the NFIP, therefore, they do not have a repetitive flood property inventory that meets NFIP criteria as the loss thresholds are substantially below FEMA values.

Their new relocation site on the lee side of Nelson Island; Mertarvik is well above flood the flood hazard area.

6.6 Vulnerability Analysis Methodology

The Community Planning Team determined their facility locations within identified hazard impact zones. This data was used to develop a vulnerability assessment for those hazards.

Combined replacement structure and contents values were determined by the community for their physical assets. The community's aggregate exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced) for each physical asset located within a hazard area. A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

Data Limitations

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in a risk approximation. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment as well as the use of approximations and simplifications that are necessary for a comprehensive analysis.

It is also important to note that the quantitative vulnerability assessment results are limited to the exposure of people, buildings, and critical facilities and infrastructure to the identified hazards. It was beyond the scope of this HMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses). Such impacts may be addressed with future updates of the HMP.

7. Mitigation Strategy

Section Seven outlines the six-step process for preparing a mitigation strategy including:

1. Identifying each jurisdiction's existing authorities for implementing mitigation action initiatives
2. Developing Mitigation Goals
3. Identifying Mitigation Actions
4. Evaluating Mitigation Actions
5. Implementing the Mitigation Action Plan (MAP)

DMA requirements for developing a comprehensive mitigation strategy include:

DMA 2000 Requirements
Identification and Analysis of Mitigation Actions §201.7(c)(3): [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. §201.7(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. §201.7(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. §201.7(c)(3)(iv): [For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. Requirement §201.7(c)(4): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.
ELEMENT C. Mitigation Strategy
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? *(Addressed in Section 6.4)*
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction?
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?
Source: FEMA, March 2015.

7.1 Village of Newtok's Capability Assessment

The Village's capability assessment reviews the technical and fiscal resources available to the community.

DMA 2000 Requirements
Tribal Capability Assessment §201.7(c)(3)(iv): [The mitigation strategy shall include a] discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of tribal funding capabilities for hazard mitigation projects.
REQUIREMENTS CHECKLIST
ELEMENT
A. Does the new or updated plan include an evaluation of the Indian Tribal government's pre-disaster hazard management laws, regulations, policies, programs, and capabilities?
B. Does the new or updated plan include an evaluation of the Indian Tribal government's post-disaster hazard management laws, regulations, policies, programs, and capabilities?
C. Does the new or updated plan include an evaluation of the Indian Tribal government's laws, regulations, policies, programs, and capabilities related to development in hazard prone areas?
D. Does the new or updated plan include a discussion of the Indian Tribal government's funding capabilities for hazard mitigation projects?
E. Does the updated plan address any hazard management laws, policies, programs, capabilities, or funding capabilities of the Indian Tribal government's that have changed since approval of the previous plan?
Source: FEMA, March 2015.

This section outlines the resources available to the Village of Newtok for mitigation and mitigation related funding and training. Tables 19, 20, and 21 delineate the Village's regulatory tools, technical specialists, and financial resources available for project management. Additional funding resources are identified in Appendix A.

Table 19 Newtok's Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Tribal Economic Development Plan	No	
Tribal Land Use Plan	No	
Emergency Response Plan	No	
Wildland Fire Protection Plan	No	
Building code	No	

Local Resources

The Village has a number of planning and land management tools that will allow it to implement hazard mitigation activities. The resources available in these areas have been assessed by the hazard mitigation Planning Team, and are summarized below.

Table 20 Newtok's Technical Specialist for Hazard Mitigation

Staff/Personnel Resources	Yes / No	Department/Agency and Position
Planner or engineer with knowledge of land development and land management practices	Yes	The Village hires planners and engineering consultants
Engineer or professional trained in construction practices related to buildings and/or infrastructure	Yes	The Village hires planners and engineering consultants
Planner or engineer with an understanding of natural and/or human-caused hazards	Yes	The Village hires planners and engineering consultants
Floodplain Manager	No	The Village does not have this capability
Surveyors	Yes	The Village hires planners and engineering consultants
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	Yes	The Village hires planners and engineering consultants
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazus-MH) software	Yes	The Village hires planners and engineering consultants
Scientists familiar with the hazards of the jurisdiction	No	Village can work with U.S. Fish & Wildlife Service (USFWS) and Fish & Game (ADF&G), and the Alaska Department of Transportation and Public Facilities, or other regulatory agencies
Emergency Manager	Yes	Tribal President, Administrator, or Clerk
Finance (Grant writers)	Yes	Tribal Bookkeeper as applicable
Public Information Officer	Yes	Tribal President, Administrator, or Clerk

DMA 2000 Requirements
Tribal Funding Sources §201.7(c)(3)(v): [The mitigation strategy shall include an] identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.
REQUIREMENTS CHECKLIST
ELEMENT
A. Does the new or updated plan identify current sources of Federal, tribal, or private funding to implement mitigation activities?
B. Does the new or updated plan identify potential sources of Federal, tribal, or private funding to implement mitigation activities?
C. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?
Source: FEMA, March 2015.

Table 21 Financial Resources Available for Hazard Mitigation

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
General funds	Can exercise this authority with Tribal approval process.
Indian Community Development Block Grants (ICDBG)	Can exercise this authority with Tribal approval processes.
Indian Capital Improvement Project Funding	Can exercise this authority with Tribal approval processes.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only
Flood Mitigation Assistance (FMA) grant program	*Newtok does not qualify for this funding source because they do not participate in the NFIP.*
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

7.2 Developing Mitigation Goals

The requirements for the local hazard mitigation goals, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
Local Hazard Mitigation Goals §201.7(c)(3)(i): The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
1. REGULATION CHECKLIST
ELEMENT C. Mitigation Goals
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
Source: FEMA, March 2015.

The Planning Team reviewed their legacy 2009 HMP's mitigation goals to determine if they appropriately addressed Section 5 identified potential hazard impacts for the Village of Newtok as well as its future Mertarvik relocation site.

The exposure analysis results were used as a basis for redefining the mitigation goals and actions. Mitigation goals are defined as general guidelines that describe what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. As such, their former goals were refined, Table 22 contains eight goals the Village developed to reduce or avoid long-term vulnerabilities to the identified hazards.

Table 22 Mitigation Goals

No.	Goal Description
Multi-Hazards (MH)	
MH 1	Provide **outreach** activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the Village of Newtok (Village).
MH 2	**Cross-reference** mitigation goals and actions with other Village planning mechanisms and projects.
MH 3	Develop **construction** activities that reduce possibility of losses from all natural and manmade hazards that affect the Village.
Natural Hazards	
EQ 4	Reduce structural vulnerability to earthquake (EQ) damage.
FL 5	Reduce flood and erosion (FL) damage and loss possibility.
GF 6	Reduce ground failure (GF) damage and loss possibility.
SW 7	Reduce structural vulnerability to severe weather (SW) damage.
WF 8	Reduce structural vulnerability to tundra/wildland fire (WF) damage.

7.3 Identifying Mitigation Actions

The requirements for the identification and analysis of mitigation actions, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements
Identification and Analysis of Mitigation Actions §201.7(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
1. REGULATION CHECKLIST
ELEMENT C. Mitigation Actions
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
Source: FEMA, March 2015.

After refining their mitigation goals, the Planning Team reviewed their legacy HMP's mitigation strategy as well as a comprehensive list of potential mitigation actions that were identified during the legacy HMP's update process. Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Mitigation actions are usually grouped into three broad categories: property protection, public education and awareness, and structural projects.

The Planning Team assessed their legacy and newly identified potential mitigation actions to carry forward into the mitigation strategy.

The 2008 legacy HMP identified earthquake, flood, severe weather, and tundra/wildland fire as natural hazards in Newtok. The 2015 Planning Team has added ground failure as an additional natural hazard directly impacting Newtok's residents. The following Mitigation Action Plan (MAP) includes actions to mitigate these natural hazards and strategies they desire to implement during the five-year life cycle of this HMP.

Legacy 2008 HMP Mitigation Actions listed in Table 24 carrying forward into the 2015 HMP Update. Current HMP Mitigation project's status is defined within the project review table below (Table 24). Current HMP projects were identified as: Completed, Deleted, Deferred, Re-Defined, or Ongoing.

Table 23 lists the communities newly refined strategic mitigation goals and actions, which form the foundation for the following processes and culminate within the Mitigation Action Plan (MAP) depicted in Table 27.

Table 23 Mitigation Goals and Potential Actions

(Blue text is actions from the 2005 Legacy Plan)
(Red Text designates complete/deleted projects)

Goals		Status		Actions
No.	**Description**	***Considered, Selected, Complete, Deferred, Deleted, or Ongoing***	**Explain Status**	**Description**
Multi-Hazards (MH)				
MH 1	Provide **outreach** activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the Village of Newtok	*Removed from list*	*Rewrote to better meet Village needs*	*Mertarvik Planning Group Projects. Support projects that provide mitigation measures from all natural hazards of Severe Weather, Earthquake, Tundra Fire at new Village site. Flooding and erosion hazards will not be a factor at new site.*
		Newly selected project that best reflects the Village's desires		Identify and pursue funding opportunities to implement mitigation actions.
		Newly selected project		Enhance public awareness of potential risk to life and personal property from all natural hazard events (EQ, Flood, Ground Failure, Severe Weather, Tundra Fire)
		Newly selected project		Encourage Village and individuals to apply mitigation measures in their properties immediate vicinity.
		Deferred/ Ongoing	*Awaiting Funding)*	*Research and consider instituting the National Weather Service program of "Storm Ready".*
		Deferred/ Ongoing	*Awaiting Funding*	*SW-2. Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.*
MH 2	**Cross-reference** mitigation goals and actions with other City/Tribal planning mechanisms and projects.	Newly selected project		Regularly discuss with community residents to identify best ways to assist mitigation efforts within the community, and add mitigation actions to City documents..
		Deferred/ Ongoing	*Awaiting funding*	*Develop or evaluate emergency plans to ensure consistency with tundra fire and other hazard's impact assessments.*
MH 3	Develop **construction** activities that reduce possibility of losses from all natural and manmade hazards that affect the	*Deferred/ Ongoing*	*Awaiting funding*	*Identify critical buildings and facilities that must be able to remain operable during and following a hazard impact events (Severe weather, EQ,).*
		Deferred/ Ongoing	*Awaiting funding*	*Strive to relocate structures and infrastructure to Mertarvik site as funding becomes available.*
		~~Completed~~	~~Deleted~~	~~*Acquire equipment and other tools to protect the existing structures and facilitate relocation efforts. (Bobcat, front-end loader, 4-wheelers, skiffs, etc.)*~~

Table 23 Mitigation Goals and Potential Actions

(Blue text is actions from the 2005 Legacy Plan)
(Red Text designates complete/deleted projects)

Goals		Status		Actions
No.	**Description**	***Considered, Selected, Complete, Deferred, Deleted, or Ongoing***	**Explain Status**	**Description**
	Village.			
EQ 4	Reduce vulnerability, damage, or loss of structures from earthquake damage	Newly selected project		Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.
		Newly selected project		Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, elderly, and pets.
		~~Completed~~	~~Deleted~~	~~Barge Landings~~ ~~The existing barge landings at Newtok need to be repaired and a new barge landing facility is needed at Mertarvik.~~
		Newly selected project		During Mertarvik relocation, continue to relocate vulnerable structures to the Newtok Village center, especially homes of elders.
GF 6	Reduce vulnerability, damage, or loss of structures from flooding.	Newly selected project		Promote permafrost sensitive construction practices in permafrost areas.
SW 7	Reduce structural vulnerability to severe weather (SW) damage.	Newly selected project		Install a siren to warn people of a severe weather or disaster event.
WF 8	Reduce structural vulnerability to tundra/wildland fire (WF) damage.	Newly selected project		Support efforts to reduce flammable materials near residences and critical facilities.

7.4 Evaluating and Prioritizing Mitigation Actions

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations are described below.

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions
Implementation of Mitigation Actions §201.7(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
ELEMENT C. MITIGATION STRATEGY

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.7(c)(3)(iv)); (Requirement §201.7(c)(3)(iii))
Source: FEMA, March 2015.

The Planning Team reviewed the simplified social, technical, administrative, political, legal, economic, and environmental (STAPLEE) evaluation criteria (Table 24) and the Benefit-Cost Analysis Fact Sheet (Appendix E) to consider the opportunities and constraints of implementing each particular mitigation action. For each action considered for implementation, a qualitative statement is provided regarding the benefits and costs and, where available, the technical feasibility. A detailed cost-benefit analysis is anticipated as part of the application process for those projects the Village chooses to implement.

Table 24 Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Social	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management.	Political support Local champion Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, State, and Federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a Federal Emergency Management Agency (FEMA) Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, state, and Federal laws

On May 13, 2015, the hazard mitigation Planning Team prioritized the natural hazard mitigation actions that were selected to carry forward into the Mitigation Action Plan (MAP).

The hazard mitigation Planning Team considered each hazard's history, extent, and recurrence probability to determine each potential actions priority. A rating system based on high, medium, or low was used.

- High priorities are associated with actions for hazards that impact the community on an annual or near annual basis and generate impacts to critical facilities and/or people.
- Medium priorities are associated with actions for hazards that impact the community less frequently, and do not typically generate impacts to critical facilities and/or people.
- Low priorities are associated with actions for hazards that rarely impact the community and have rarely generated documented impacts to critical facilities and/or people.

Prioritizing the mitigation actions within the MAP matrix (Table 26) was completed to provide the Village with an implementation approach.

7.5 Mitigation Action Plan

DMA 2000 Requirements
Tribal Funding Sources §201.7(c)(3)(v): [The mitigation strategy shall include an] identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.
REQUIREMENTS CHECKLIST
ELEMENT
D. Does the new or updated plan identify current sources of Federal, tribal, or private funding to implement mitigation activities?
E. Does the new or updated plan identify potential sources of Federal, tribal, or private funding to implement mitigation activities?
F. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?
Source: FEMA, March 2015.

Table 25 delineates the acronyms used in the Mitigation Action Plan (Table 27). See Appendix A for summarized agency funding source descriptions.

Table 25 Potential Funding Source Acronym List

Native Village of Newtok (Village)

Newtok Village Council (Tribe)

Federal Management Agency (FEMA) /
Hazard Mitigation Assistance Grant Programs (HMA)
Emergency Management Program Grant (EMPG)
Debris Management Grant (DM)
Flood Mitigation Assistance Grants (FMA)
National Earthquake Hazards Reduction Program (NEHRP)
Emergency Food and Shelter Program (EFSP)
National Dam Safety Program (NDS)

US Department of Homeland Security (DHS)
Citizens Corp Program (CCP)
Emergency Operations Center (EOC)
Homeland Security Grant Program (HSGP)
Emergency Management Performance Grant (EMPG)
State Homeland Security Program (SHSP)

US Department of Commerce (DOC) /
Remote Community Alert Systems Program (RCASP)
National Oceanic and Atmospheric Administration (NOAA)

Denali Commission (Denali)
Energy Program (EP
Solid Waste Program (SWP)

Alaska Department of Military and Veterans Affairs (DMVA), Division of Homeland Security and Emergency

Management (DHSEM)
Mitigation Section (for PDM & HMGP projects and plan development)
Preparedness Section (for community planning)
State Emergency Operations Center (SEOC for emergency response)

Alaska Department of Community, Commerce, and Economic Development (DCCED) Division of Community and Regional Affairs (DCRA) /
Community Development Block Grant (CDBG)
Alaska Climate Change Impact Mitigation Program (ACCIMP)
Flood Mitigation Assistance Grants (FMA)

Alaska Department of Transportation
State road repair funding

Alaska Energy Authority (AEA)
AEA/Bulk Fuel (ABF)
AEA/Alternative Energy and Energy Efficiency (AEEE)

Alaska Department of Environmental Conservation (DEC) /
V*illage Safe Water (VSW)*
DEC/Alaska Drinking Water Fund (ADWF)
DEC/Alaska Clean Water Fund [ACWF]
DEC/Clean Water State Revolving Fund (CWSRF)

US Army Corp of Engineers (USACE) /
Planning Assistance Program (PAP)
Capital Projects: Erosion, Flood, Ports & Harbors

Alaska Division of Forestry (DOF) /
Volunteer Fire Assistance and Rural Fire Assistance Grant (VFAG/RFAG)
Assistance to Firefighters Grant (AFG)
Fire Prevention and Safety (FP&S)
Staffing for Adequate Fire and Emergency Response Grants (SAFER)
Emergency Food and Shelter (EF&S)

US Department of Agriculture (USDA) /
Emergency Watershed Protection Program (EWP])
Emergency Conservation Fund (ECF)
Rural Development (RD)

US Geological Survey (USGS)
Alaska Volcano Observatory (AVO)

Assistance to Native Americans (ANA)
*Native American Housing Assistance and Self Determination Act (NA*FSMA),

Natural Resources Conservation Service (NRCS) /
Emergency Watershed Protection Program (EWP)
Wildlife Habitat Incentives Program (WHIP)
Watershed Planning

US Army Corps of Engineers (USACE) /
Planning Assistance Program

Lindbergh Foundation Grant Programs (LFGP)

Rasmussen Foundation Grants (LFG)

The Village's Mitigation Action Plan, Table 26, depicts how each mitigation action will be implemented and administered by the Planning Team. The MAP delineates each selected mitigation action, its priorities, the responsible entity, the anticipated implementation timeline, and provides a brief explanation as to how the overall benefits/costs and technical feasibility were taken into consideration.

Mertarvik Planning Group Projects. The Newtok Village Council supports all projects that provide mitigation measures from all natural hazards of earthquake, flood, ground failure, severe weather, and tundra fire at the current as well as the new Mertarvik Village site.

> ***Note:*** *It is important to note the new site will not be impacted by either flooding or erosion hazard impacts.*

Table 26 Village of Newtok's Mitigation Action Plan (MAP)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entities	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
Multi-Hazards (MH)						
MH 1.0	Identify and pursue funding opportunities to implement mitigation actions.	High Immediate	Village Council Office and Appropriate administrating/ funding agencies	DHS&EM, FEMA, DCRA, Denali Commission, USACE, NRCS	Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. T/F: This activity is ongoing demonstrating its feasibility.
MH 1.2	Enhance public awareness of potential risk to life and personal property from all natural hazard events (EQ, Flood, Ground Failure, Severe Weather, Tundra Fire)	Medium	Village Council Office	Village and appropriate funding agencies	0 – 5 years	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 1.3	Encourage Village and individuals to apply mitigation measures in their properties immediate vicinity.	Medium	Village Council Office and all Individuals	Village	Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. T/F: This activity is ongoing demonstrating its feasibility.
MH 1.4	*Research and consider instituting the National Weather Service program of "Storm Ready".*	*Medium*	*Village Council Office*	*Village and appropriate funding agencies*	*Ongoing*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *T/F: This low cost activity can be combined with recurring*

Table 26 Village of Newtok's Mitigation Action Plan (MAP)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entities	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
						community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 1.5	*Expand public awareness about NOAA Weather Radio for continuous weather broadcasts and warning tone alert capability.*	*Medium*	*Village Council Office*	*Village and appropriate funding agencies (NWS, NOAA, etc.)*	*Ongoing*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.*
MH 2.1	Regularly discuss with community residents to identify best ways to assist mitigation efforts within the community, and add mitigation actions to City documents.	Medium	Village Council Office	Village Council, DRCRA, DHS&EM, FEMA	Ongoing	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
MH 2.2	*Develop or evaluate emergency plans to ensure consistency with tundra fire and other hazard's impact*	*Medium*	*Village Council Office*	*Village Council, DCRA, DHS&EM, DOF, DOT,*	*Ongoing*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide*

Table 26 Village of Newtok's Mitigation Action Plan (MAP)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entities	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
	assessments.			*FEMA*		*capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.*
MH 3.1	*Identify critical buildings and facilities that must be able to remain operable during and following a hazard impact events (Severe weather, EQ,).*	*High*	*Tribal Council Office*	*Village Council, DHS&EM, DCRA, FEMA, Denali Commission, NWS, AEA, AVEC*	*Ongoing*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *T/F: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.*
MH 3.3	*Strive to relocate structures and Infrastructure to Mertarvik site as funding becomes available.*	*High Immediate*	*Tribal Council Office* *Newtok Planning Group and Appropriate administrating/ funding agencies*	*Village Council, DHS&EM, FEMA, DCRA, Denali Commission, USACE, NRCS*	*Ongoing*	*B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions.* *T/F: This activity is ongoing demonstrating its feasibility.*
Natural Hazards						
EQ 4.1	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted	High	Tribal Council Office	Village Council, HMA, NRCS, ANA, USACE, US USDA,	1=3 years	B/C: This project would ensure threatened infrastructures are available for use – their loss would exacerbate potential damages and

Table 26 Village of Newtok's Mitigation Action Plan (MAP)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entities	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
	Building Codes.			Lindbergh		further threaten survivability. T/F: This project is feasible using existing staff skills, equipment, and materials.
EQ 4.2	Install non-structural seismic restraints for large furniture such as bookcases, filing cabinets, heavy televisions, and appliances to prevent toppling damage and resultant injuries to small children, elderly, and pets.	High	Tribal Council Office	Village Council, HMA, NRCS, ANA, USACE, US USDA, Lindbergh	1=3 years	B/C: This project would ensure threatened infrastructures are available for use – their loss would exacerbate potential damages and further threaten survivability. T/F: This project is feasible using existing staff skills, equipment, and materials.
FL 5.1	Continue to relocate vulnerable structures to the Newtok Village center, especially homes of elders.	High Immediate	USACE	Village Council, USACE, EDA, Denali, DCCED	Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. T/F: This activity is ongoing demonstrating its feasibility.
GF 6.1	Promote permafrost sensitive construction practices in permafrost areas.	High	Tribal Council Office	Village Council, DCRA, DEC	0-5 years	B/C: This outreach project would decrease damage to facilities if they were sited and used the most appropriate construction practices. T/F: Technically feasible as the community is currently working with UAF and other entities to determine most viable permafrost construction practices.
SW 7.1	Install a siren to warn people of a severe weather or disaster event.	Medium	Tribal Council Office and DCRA	NWS, NOAA	2-4 Years	B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters. T/F: This low cost activity can be combined

Table 26 Village of Newtok's Mitigation Action Plan (MAP)

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Entities	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
						with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
WF 8.1	Reduce flammable materials near residences and critical facilities.	High	Tribal Council Office	Tribe ADOT, HMA, NRCS, USACE, USDA/EWP, USDA/ECP, DCRA/ ACCIMP	Ongoing	B/C: This action has a high/cost benefit ratio and result in less costly construction before a problem develops. T/F: Newtok has the skill to implement this action. Specialized skills may need to be contracted-out with materials and equipment barged in depending on the method selected.

7.6 Implementing Mitigation Strategy into Existing Planning Mechanisms

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described here.

DMA 2000 Requirements
Incorporation into Existing Planning Mechanisms §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
1. REGULATION CHECKLIST
ELEMENT C. Incorporate into Other Planning Mechanisms
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?
Source: FEMA, March 2015.

After the adoption of the HMP, each Planning Team Member will ensure that the HMP, in particular each Mitigation Action Project, is incorporated into existing planning mechanisms. Each member of the Planning Team will achieve this incorporation by undertaking the following activities.

- Review the specific regulatory tools to determine where to integrate the mitigation philosophy and implementable initiatives. These regulatory tools are identified in Section 7.1 capability assessment.

- Work with pertinent CBY departments to increase awareness for implementing HMP philosophies and identified initiatives. Provide assistance with integrating the mitigation strategy (including the Mitigation Action Plan) into relevant planning mechanisms (i.e. Comprehensive Plan, Capital Improvement Project List, Transportation Improvement Plan, etc.).
- Implementing this philosophy and activities may require updating or amending specific planning mechanism.

8. References

Section Eight provides a comprehensive reference list used to develop the HMP.

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9. Appendix A – Funding Resources

Appendix A – Funding Resources

The Federal government requires local governments to have a HMP in place to be eligible for mitigation funding opportunities through FEMA such as the UHMA Programs and the HMGP. The Mitigation Technical Assistance Programs available to local governments are also a valuable resource. FEMA may also provide temporary housing assistance through rental assistance, mobile homes, furniture rental, mortgage assistance, and emergency home repairs. The Disaster Preparedness Improvement Grant also promotes educational opportunities with respect to hazard awareness and mitigation.

- FEMA, through its Emergency Management Institute, offers training in many aspects of emergency management, including hazard mitigation. FEMA has also developed a large number of documents that address implementing hazard mitigation at the local level. Five key resource documents are available from FEMA Publication Warehouse (1-800-480-2520) and are briefly described here:
  - How-to Guides. FEMA has developed a series of how-to guides to assist states, communities, and tribes in enhancing their hazard mitigation planning capabilities. The first four guides describe the four major phases of hazard mitigation planning. The last five how-to guides address special topics that arise in hazard mitigation planning such as conducting cost-benefit analysis and preparing jurisdictional plans. The use of worksheets, checklists, and tables make these guides a practical source of guidance to address all stages of the hazard mitigation planning process. They also include special tips on meeting DMA 2000 requirements (http://www.fema.gov/hazard-mitigation-planning-resources#1).
  - Local Mitigation Planning Handbook, March 2013. This handbook explains the basic concepts of hazard mitigation and provides guidance to local governments on developing or updating hazard mitigation plans to meet the requirements of Title 44 Code of Federal Regulations (CFR) §201.6 for FEMA approval and eligibility to apply for FEMA Hazard Mitigation Assistance grant programs. (http://www.fema.gov/library/viewRecord.do?id=7209)
  - A Guide to Recovery Programs FEMA 229(4), September 2005. The programs described in this guide may all be of assistance during disaster incident recovery. Some are available only after a Presidential declaration of disaster, but others are available without a declaration. Please see the individual program descriptions for details. (http://www.fema.gov/txt/rebuild/ltrc/recoveryprograms229.txt)
  - The Emergency Management Guide for Business and Industry. FEMA 141, October 1993. This guide provides a step-by-step approach to emergency management planning, response, and recovery. It also details a planning process that businesses can follow to better prepare for a wide range of hazards and emergency events. This effort can enhance a business's ability to recover from financial losses, loss of market share, damages to equipment, and product or business interruptions. This guide could be of great assistance to a community's industries and businesses located in hazard prone areas. (https://www.fema.gov/media-library/assets/documents/3412)
  - The 2015 Hazard Mitigation Assistance (HMA) Guidance and Addendum, February 27 and March 3, 2015 respectively. Part I of the Hazard Mitigation Assistance (HMA) Guidance introduces the three HMA programs, identifies roles and responsibilities, and outlines the organization of the document. This guidance applies to Hazard Mitigation

Grant Program (HMGP) disasters declared on or after the date of publication unless indicated otherwise. This guidance is also applicable to the Pre-Disaster Mitigation (PDM) and Flood Mitigation Assistance (FMA) Programs; the application cycles are announced via http://www.grants.gov/. The guidance in this document is subject to change based on new laws or regulations enacted after publication.

- FEMA, http://www.fema.gov - includes links to information, resources, and grants that communities can use in planning and implementing community resilience and sustainability measures.
- FEMA also administers emergency management grants (http://www.fema.gov/help/site.shtm) and various firefighter grant programs (http://www.firegrantsupport.com/) such as
  - Emergency Management Performance Grant (EMPG). This is a pass through grant. The amount is determined by the State. The grant is intended to support critical assistance to sustain and enhance State and local emergency management capabilities at the State and local levels for all-hazard mitigation, preparedness, response, and recovery including coordination of inter-governmental (Federal, State, regional, local, and tribal) resources, joint operations, and mutual aid compacts state-to-state and nationwide. Sub-recipients must be compliant with National Incident Management System (NIMS) implementation as a condition for receiving funds. Requires 50% match. (https://www.fema.gov/fiscal-year-2015-emergency-management-performance-grant-program)
  - National Earthquake Hazards Reduction Program (NEHRP). The National Earthquake Hazards Reduction Program (NEHRP) seeks to mitigate earthquake losses in the United States through both basic and directed research and implementation activities in the fields of earthquake science and engineering. (https://www.fema.gov/national-earthquake-hazards-reduction-program)

    The NEHRP agencies pursue the goals of the program through collaboration with each other and numerous partners. In addition to other federal agencies, program partners include state and local governments, universities, research centers, professional societies, trade associations and businesses, as well as associated councils, commissions and consortia.

    NEHRP's work encompasses research, development and implementation activities. Program research helps to advance our understanding of why and how earthquakes occur and impact the natural and built environments. The program develops strategies, tools, techniques and other measures that can reduce the adverse effects of earthquakes and facilitates and promotes implementation of these measures, thereby strengthening earthquake resilience among at-risk communities.

    Detailed information about the program is available at NEHRP.gov, which is maintained by NIST, the lead agency for NEHRP. For additional agency-specific information, visit FEMA Earthquake, the USGS Earthquake Hazards Program, the NIST NEHRP Office and the National Science Foundation.
  - Assistance to Fire Fighters Grant (AFG), Fire Prevention and Safety (FP&S), Staffing for Adequate Fire and Emergency Response Grants (SAFER), and Assistance to Firefighters Station Construction Grant programs. Information can be found at: (http://forestry.alaska.gov/fire/vfa.htm).

- Department of Homeland Security (DHS) provides the following grants:
  - Homeland Security Grant Program (HSGP), State Homeland Security Program (SHSP) are 80% pass through grants. SHSP supports implementing the State Homeland Security Strategies to address identified planning, organization, equipment, training, and exercise needs for acts of terrorism and other catastrophic events. In addition, SHSP supports implementing the National Preparedness Guidelines, the NIMS, and the National Response Framework (NRF). Must ensure at least 25% of funds are dedicated towards law enforcement terrorism prevention-oriented activities. (https://www.dhs.gov/homeland-security-grant-program-hsgp)
  - Citizen Corps Program (CCP). The Citizen Corps mission is to bring community and government leaders together to coordinate involving community members in emergency preparedness, planning, mitigation, response, and recovery activities. (http://www.dhs.gov/citizen-corps)
  - Emergency Operations Center (EOC) Guidance. This program is intended to improve emergency management and preparedness capabilities by supporting flexible, sustainable, secure, strategically located, and fully interoperable Emergency Operations Centers (EOCs) with a focus on addressing identified deficiencies and needs. Fully capable emergency operations facilities at the State and local levels are an essential element of a comprehensive national emergency management system and are necessary to ensure continuity of operations and continuity of government in major disasters or emergencies caused by any hazard. Requires 25% match. (https://www.fema.gov/media-library/assets/documents/20622)
  - Emergency Alert System (EAS). Resilient public alert and warning tools are essential to save lives and protect property during times of national, state, regional, and local emergencies. The Emergency Alert System (EAS) is used by alerting authorities to send warnings via broadcast, cable, satellite, and wireline communications pathways. Emergency Alert System participants, which consist of broadcast, cable, satellite, and wireline providers, are the stewards of this important public service in close partnership with alerting officials at all levels of government. The EAS is also used when all other means of alerting the public are unavailable, providing an added layer of resiliency to the suite of available emergency communication tools. The EAS is in a constant state of improvement to ensure seamless integration of CAP-based and emerging technologies. (https://www.fema.gov/emergency-alert-system)
- U.S. Department of Commerce's grant programs include:
  - National Oceanic and Atmospheric Administration (NOAA), provides funds to the State of Alaska due to Alaska's high threat for tsunami. The allocation supports the promotion of local, regional, and state level tsunami mitigation and preparedness; installation of warning communications systems; installation of warning communications systems; installation of tsunami signage; promotion of the Tsunami Ready Program in Alaska; development of inundation models; and delivery of inundation maps and decision-support tools to communities in Alaska. (http://www.tsunami.noaa.gov/warning_system_works.html)
  - Remote Community Alert Systems (RCASP) grant for outdoor alerting technologies in remote communities effectively underserved by commercial mobile service for the

purpose of enabling residents of those communities to receive emergency messages. (http://www.federalgrants.com/Remote-Community-Alert-Systems-Program-11966.html) This program is a contributing element of the Warning, Alert, and Response Network (WARN) Act.

- Department of Agriculture (USDA). Provides diverse funding opportunities; providing a wide benefit range. Their grants and loans website provides a brief programmatic overview with links to specific programs and services. (http://www.rd.usda.gov/programs-services)
  - Farm Service Agency: Emergency Conservation Program, Non-Insured Assistance, Emergency Forest Restoration Program, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service. (http://www.fsa.usda.gov/FSA/stateoffapp?mystate=ak&area=home&subject=landing&topic=landing)
  - Natural Resources Conservation Service (NRCS) has several funding sources to fulfill mitigation needs. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/)
    - The Emergency Watershed Protection Program (EWP). This funding source is designed is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/)
    - Watershed Surveys and Planning. NRCS watershed activities in Alaska are voluntary efforts requested through conservation districts and units of government and/or tribes. The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wsp/)
- Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program. This program minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services such as an all-around safety check of major energy systems, including heating system modifications and insulation checks. (http://www1.eere.energy.gov/wip/wap.html)
  - The Tribal Energy Program offers financial and technical assistance to Indian tribes to help them create sustainable renewable energy installations on their lands. This

program promotes tribal energy self-sufficiency and fosters employment and economic development on America's tribal lands. (http://energy.gov/eere/wipo/tribal-energy-program)

- US Environmental Protection Agency (EPA). Under EPA's Clean Water State Revolving Fund (CWSRF) program, each state maintains a revolving loan fund to provide independent and permanent sources of low-cost financing for a wide range of water quality infrastructure projects, including: municipal wastewater treatment projects; non-point source projects; watershed protection or restoration projects; and estuary management projects. (http://dec.alaska.gov/water/MuniGrantsLoans/index.htm)
    - Public Works and Development Facilities Program. This program provides assistance to help distressed communities attract new industry, encourage business expansion, diversify local economies, and generate long-term, private sector jobs. Among the types of projects funded are water and sewer facilities, primarily serving industry and commerce; access roads to industrial parks or sites; port improvements; business incubator facilities; technology infrastructure; sustainable development activities; export programs; brownfields redevelopment; aquaculture facilities; and other infrastructure projects. Specific activities may include demolition, renovation, and construction of public facilities; provision of water or sewer infrastructure; or the development of stormwater control mechanisms (e.g., a retention pond) as part of an industrial park or other eligible project. (https://ofmpub.epa.gov/apex/watershedfunding/f?p=109:2:0::NO::P2_X_PROG_NUM,P2_X_YEAR:51,2015)
    - Indian Environmental General Assistance Program (IGAP). In 1992, Congress passed the Indian Environmental General Assistance Program Act (42 U.S.C. 4368b) which authorizes EPA to provide General Assistance Program (GAP) grants to federally-recognized tribes and tribal consortia for planning, developing, and establishing environmental protection programs in Indian country, as well as for developing and implementing solid and hazardous waste programs on tribal lands. (http://www.epa.gov/tribal/gap/)
- Department of Health and Human Services, Administration of Children & Families, Administration for Native Americans (ANA). The ANA awards funds through grants to American Indians, Native Americans, Native Alaskans, Native Hawaiians, and Pacific Islanders. These grants are awarded to individual organizations that successfully apply for discretionary funds. ANA publishes in the Federal Register an announcement of funds available, the primary areas of focus, review criteria, and application information. (http://www.acf.hhs.gov/grants/open/foa/)
- Department of Housing and Urban Development (HUD) provides a variety of disaster resources. They also partner with Federal and state agencies to help implement disaster recovery assistance. Under the *National Response Framework* the FEMA and the Small Business Administration (SBA) offer initial recovery assistance. (http://www.hud.gov/info/disasterresources_dev.cfm)
    - HUD, Office of Homes and Communities, Section 108 Loan Guarantee Programs. This program provides loan guarantees as security for Federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development

activities, and construction of certain public facilities and housing. (http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm)

- HUD, Office of Homes and Communities, Section 184 Indian Home Loan Guarantee Programs (IHLGP). The Section 184 Indian Home Loan Guarantee Program is a home mortgage specifically designed for American Indian and Alaska Native families, Alaska Villages, Tribes, or Tribally Designated Housing Entities. Section 184 loans can be used, both on and off native lands, for new construction, rehabilitation, purchase of an existing home, or refinance.
- Because of the unique status of Indian lands being held in Trust, Native American homeownership has historically been an underserved market. Working with an expanding network of private sector and tribal partners, the Section 184 Program endeavors to increase access to capital for Native Americans and provide private funding opportunities for tribal housing agencies with the Section 184 Program. (http://www.hud.gov/offices/pih/ih/homeownership/184/)
- Indian Housing Block Grant / Native American Housing Assistance and Self Determination Act (IHBG/NAHASDA) administration, operating & construction funds. The act is separated into seven sections:

  The Indian Housing Block Grant Program (IHBG) is a formula grant that provides a range of affordable housing activities on Indian reservations and Indian areas. The block grant approach to housing for Native Americans was enabled by the Native American Housing Assistance and Self Determination Act of 1996 (NAHASDA).

  Eligible IHBG recipients are Federally recognized Indian tribes or their tribally designated housing entity (TDHE), and a limited number of state recognized tribes who were funded under the Indian Housing Program authorized by the United States Housing Act of 1937 (USHA). With the enactment of NAHASDA, Indian tribes are no longer eligible for assistance under the USHA.

  An eligible recipient must submit to HUD an Indian Housing Plan (IHP) each year to receive funding. At the end of each year, recipients must submit to HUD an Annual Performance Report (APR) reporting on their progress in meeting the goals and objectives included in their IHPs.

  Eligible activities include housing development, assistance to housing developed under the Indian Housing Program, housing services to eligible families and individuals, crime prevention and safety, and model activities that provide creative approaches to solving affordable housing problems. (http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/ihbg)
- HUD/CDBG provides grant assistance and technical assistance to aid communities in planning activities that address issues detrimental to the health and safety of local residents, such as housing rehabilitation, public services, community facilities, and infrastructure improvements that would primarily benefit low-and moderate-income. persons (http://www.hud.gov/offices/cpd/communitydevelopment/programs/)
- National Disaster Resilience (NDR) grant is a HUD/CDBG. The grant opportunity is called the Community Block Development Grant-National Disaster Resilience (CDBG-NDR). HUD sponsors the National Disaster Resilience Competition (NDRC) to help eligible communities impacted by federally declared disasters in 2011, 2012

and 2013 become more resilient. The NDRC is a two-phase process that will competitively award nearly $1 billion in HUD Disaster Recovery funds to the most impacted, distressed and needy eligible communities. The grant opportunity is called the Community Block Development Grant-National Disaster Resilience (CDBG-NDR). The State of Alaska is one of many applicants nationwide eligible to apply on behalf of its impacted communities. (https://www.hudexchange.info/course-content/ndrc-nofa-phase-1-factors/NDRC-NOFA-Phase-1-Factors-Slides-2014-11-03.pdf)

    - HUD/Indian Community Development Block Grants (ICDBG) provide grant assistance and technical assistance to aid communities or Indian tribes in planning activities that address issues detrimental to the health and safety of local residents, such as housing rehabilitation, public services, community facilities, and infrastructure improvements that would primarily benefit low-and moderate-income. persons (http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/icdbg)

- Department of Labor (DOL), Employment and Training Administration, Disaster Unemployment Assistance (DUA). Provides weekly unemployment subsistence grants for those who become unemployed because of a major disaster or emergency. Applicants must have exhausted all benefits for which they would normally be eligible. (http://www.workforcesecurity.doleta.gov/unemploy/disaster.asp)
    - The Workforce Investment Act contains provisions aimed at supporting employment and training activities for Indian, Alaska Native, and Native Hawaiian individuals. The Department of Labor's Indian and Native American Programs (INAP) funds grant programs that provide training opportunities at the local level for this target population. (http://www.dol.gov/dol/topic/training/indianprograms.htm)
- U.S. Department of Transportation (DOT), Hazardous Materials Emergency Preparedness (HMEP) Grant. The Hazardous Materials Transportation Safety and Security Reauthorization Act of 2005 authorizes the U.S. DOT to provide assistance to public sector employees through training and planning grants to States, Territories, and Native American tribes for emergency response. The purpose of this grant program is to increase State, Territorial, Tribal, and local effectiveness in safely and efficiently handling hazardous materials accidents and incidents, enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), and encourage a comprehensive approach to emergency training and planning by incorporating the unique challenges of responses to transportation situations. (http://www.phmsa.dot.gov/hazmat/grants)
- Federal Financial Institutions. Member banks of Federal Deposit Insurance Corporation, Financial Reporting Standards or Federal Home Loan Bank Board may be permitted to waive early withdrawal penalties for Certificates of Deposit and Individual Retirement Accounts.
- Internal Revenue Service (IRS), Disaster Tax Relief. Provides extensions to current year's tax return, allows deductions for disaster losses, and allows amendment of previous year’s tax returns (http://www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Disaster-Assistance-and-Emergency-Relief-for-Individuals-and-Businesses-1).

- Small Business Administration (SBA) Disaster Assistance Loans and Grants program provides information concerning disaster assistance, preparedness, planning, cleanup, and recovery planning. (https://www.sba.gov/category/navigation-structure/loans-grants)
  - May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. (https://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans). Requests for SBA loan assistance should be submitted to DHS&EM.
- United States Army Corps of Engineers (USACE) Alaska District's Civil Works Branch studies potential water resource projects in Alaska. These studies analyze and solve water resource issues of concern to the local communities. These issues may involve navigational improvements, flood control or ecosystem restoration. The agency also tracks flood hazard data for over 300 Alaskan communities on floodplains or the sea coast. These data help local communities assess the risk of floods to their communities and prepare for potential future floods. The USACE is a member and co-chair of the Alaska Climate Change Sub-Cabinet.
  - Civil Works and Planning (http://www.poa.usace.army.mil/Missions/CivilWorksandPlanning.aspx)
  - Environmental Resources Section (http://www.poa.usace.army.mil/About/Offices/Engineering/EnvironmentalResources.aspx)
  - USACE Alaska District Grants (http://search.usa.gov/search?affiliate=alaska_district&query=grants)
- The Grants.gov program management office was established, in 2002, as a part of the President's Management Agenda. Managed by the Department of Health and Human Services, Grants.gov is an E-Government initiative operating under the governance of the Office of Management and Budget.

  Under the President's Management Agenda, the office was chartered to deliver a system that provides a centralized location for grant seekers to find and apply for federal funding opportunities. Today, the Grants.gov system houses information on over 1,000 grant programs and vets grant applications for 26 federal grant-making agencies.

State Funding Resources

- Department of Military and Veterans Affairs (DMVA): Provides damage appraisals and settlements for VA-insured homes, and assists with filing of survivor benefits. (http://veterans.alaska.gov/links.htm)
  - DHS&EM within DMVA is responsible for improving hazard mitigation technical assistance for local governments for the State of Alaska. Providing hazard mitigation training, current hazard information and communication facilitation with other agencies will enhance local hazard mitigation efforts. DHS&EM administers FEMA mitigation grants to mitigate future disaster damages such as those that may affect infrastructure including elevating, relocating, or acquiring hazard-prone properties. (http://ready.alaska.gov/plans/mitigation.htm)

DHS&EM also provides mitigation funding resources for mitigation planning on their Web site at http://ready.alaska.gov/grants.

- Division of Health and Social Services (DHSS): On this site you will find information intended to assist all who are interested in DHSS grants and services they support. (http://dhss.alaska.gov/fms/grants/Pages/grants.aspx and http://dhss.alaska.gov/fms/Documents/FY15GrantBook.pdf)
- Division of Health and Social Services (DSS): Provides special outreach services for seniors, including food, shelter and clothing. (http://dhss.alaska.gov/dsds/Pages/hcb/hcb.aspx)
- Division of Insurance (DOI): Provides assistance in obtaining copies of policies and provides information regarding filing claims. (http://commerce.state.ak.us/dnn/ins/Consumers/AlaskaConsumerGuide.aspx)
- DCRA within the DCCED administers the HUD/CDBG, FMA Program, and the Climate Change Sub-Cabinet's Interagency Working Group's program funds and administers various flood and erosion mitigation projects, including the elevation, relocation, or acquisition of flood-prone homes and businesses throughout the State. This division also administers programs for State's" distressed" and "targeted" communities. (http://www.commerce.state.ak.us/dca/)
    - DCRA Planning and Land Management staff provide Alaska Climate Change Impact Mitigation Program (ACCIMP) funding to Alaskan communities that meet one or more of the following criteria related to flooding, erosion, thawing permafrost, or other climate change-related phenomena: Life/safety risk during storm/flood events; loss of critical infrastructure; public health threats; and loss of 10% of residential dwellings. (http://commerce.state.ak.us/dnn/dcra/PlanningLandManagement/ACCIMP.aspx)

      The Hazard Impact Assessment is the first step in the ACCIMP process. The HIA identifies and defines the climate change-related hazards in the community, establishes current and predicted impacts, and provides recommendations to the community on alternatives to mitigate the impact. (http://commerce.alaska.gov/dca/planning/accimp/hazard_impact.html)
- Department of Environmental Conservation (DEC). DEC's primary roles and responsibilities concerning hazards mitigation are ensuring safe food and safe water, and pollution prevention and pollution response. DEC ensures water treatment plants, landfills, and bulk fuel storage tank farms are safely constructed and operated in communities. Agency and facility response plans include hazards identification and pollution prevention and response strategies. (http://dec.alaska.gov/)
    - The Division of Water's Village Safe Water (VSW) Program works with rural communities to develop sustainable sanitation facilities. Communities apply each year to VSW for grants for sanitation projects. Federal and state funding for this program is administered and managed by the VSW program. VSW provides technical and financial support to Alaska's smallest communities to design and construct water and wastewater systems. In some cases, funding is awarded by VSW through the Alaska Native Tribal Health Consortium (ANTHC), who in turn assist communities in design and construct of sanitation projects.

- Municipal Grants and Loans (MGL) Program. The Department of Environmental Conservation / Division of Water administer the Alaska Clean Water Fund (ACWF) and the Alaska Drinking Water Fund (ADWF). The division is fiscally responsible to the Environmental Protection Agency (EPA) to administer the loan funds as the EPA provides capitalization grants to the division for each of the loan funds. In addition, it is prudent upon the division to administer the funds in a manner that ensures their continued viability. (http://dec.alaska.gov/water/MuniGrantsLoans/loanoverview.html
- Under EPA's Clean Water State Revolving Fund (CWSRF) program, each state maintains a revolving loan fund to provide independent and permanent sources of low-cost financing for a wide range of water quality infrastructure projects, including: municipal wastewater treatment projects; non-point source projects; watershed protection or restoration projects; and estuary management, [and stormwater management] projects. (http://yosemite.epa.gov/R10/ecocomm.nsf/6da048b9966d22518825662d00729a35/7b68c420b668ada5882569ab00720988!OpenDocument)

  Alaska's Revolving Loan Fund Program, prescribed by Title VI of the Clean Water Act as amended by the Water Quality Act of 1987, Public Law 100-4. DEC will use the ACWF account to administer the loan fund. This Agreement will continue from year-to-year and will be incorporated by reference into the annual capitalization grant agreement between EPA and the DEC. DEC will use a fiscal year of July 1 to June 30 for reporting purposes. (http://www.epa.gov/region10/pdf/water/srf/cwsrf_alaska_operating_agreement.pdf)

- Department of Transportation and Public Facilities (DOT/PF) personnel provide technical assistance to the various emergency management programs, to include mitigation. This assistance is addressed in the DHS&EM-DOT/PF Memorandum of Agreement and includes but is not limited to: environmental reviews, archaeological surveys, and historic preservation reviews.
  - DOT/PF and DHS&EM coordinate buy-out projects to ensure that there are no potential right-of-way conflicts with future use of land for bridge and highway projects, and collaborate on earthquake mitigation.
  - Additionally, DOT/PF provides the safe, efficient, economical, and effective State highway, harbor, and airport operation. DOT/PF uses it's Planning, Design and Engineering, Maintenance and Operations, and Intelligent Transportation Systems resources to identify hazards, plan and initiate mitigation activities to meet the transportation needs of Alaskans, and make Alaska a better place to live and work. DOT/PF budgets for temporary bridge replacements and materials necessary to make the multi-modal transportation system operational following natural disaster events.
- DNR administers various projects designed to reduce stream bank erosion, reduce localized flooding, improve drainage, and improve discharge water quality through the stormwater grant program funds. Within DNR,
  - The Division of Geological and Geophysical Survey (DGGS) is responsible Alaska's mineral, land, and water resources use, development, and earthquake mitigation collaboration.

Their geologists and support staff are leaders in researching Alaska's geology and implementing technological tools to most efficiently collect, interpret, publish, archive, and disseminate information to the public. (http://dggs.alaska.gov/pubs/advanced-search)

- The DNR's Division of Forestry (DOF) participates in a statewide wildfire control program in cooperation with the forest industry, rural fire departments and other agencies. Prescribed burning may increase the risks of fire hazards; however, prescribed burning reduces the availability of fire fuels and therefore the potential for future, more serious fires. (http://forestry.alaska.gov/pdfs/08FireSuppressionMediaGuide.pdf)
- DOF also manages various wildland fire programs, activities, and grant programs such as the FireWise Program (http://forestry.alaska.gov/fire/firewise.htm), Community Forestry Program (CFP) (http://forestry.alaska.gov/community/), Assistance to Fire Fighters Grant (AFG), Fire Prevention and Safety (FP&S), Staffing for Adequate Fire and Emergency Response Grants (SAFER), and Volunteer Fire Assistance and Rural Fire Assistance Grant (VFA-RFA) programs (http://forestry.alaska.gov/fire/vfarfa.htm). Information can be found at http://forestry.alaska.gov/fire/current.htm.
- The Alaska Interagency Coordination Center (AICC) is the Geographic Area Coordination Center for Alaska. AICC serves as the focal point for initial attack resource coordination, logistics support, and predictive services for all state and federal agencies involved in wildland fire management and suppression in Alaska.

  Fire management planning, preparedness, suppression operations, prescribed burning, and related activities are coordinated on an interagency basis. DOF has cooperative agreements with the Departments of Agriculture and Interior, and numerous local government and volunteer fire departments to respond to wildland fires, reduce duplication of efforts, and share resources.

  In 1984 the State of Alaska adopted the National Interagency Incident Management System Incident Command System concept for managing fire suppression. The Incident Command System (ICS) guiding principles are followed in all wildland fire management operations. All State of Alaska Departments adopted ICS in 1996 through the Governor's administrative order.

Other Funding Resources

The following provide focused access to valuable planning resources for communities interested in sustainable development activities.

- Rural Alaska Community Action Program Inc. (RurAL CAP) In the nearly 50 years since it began, it is difficult to imagine any aspect of rural Alaskan lives which has not been touched in some way by the people and programs of RurAL CAP. From Head Start, parent education, adult basic education, and elder-youth programs, to Native land claims and subsistence rights, energy and weatherization programs, and alcohol and substance abuse prevention, RurAL CAP has left a lasting mark on the history and development of Alaska and its rural Peoples. (http://ruralcap.com/?page_id=334)
  - Weatherization Assistance Program assists low to moderate income households in weatherization needs. The program is available to homeowners as well as renters and

includes; single family homes, cabins, mobile homes, condominiums and multifamily dwellings. (http://ruralcap.com/?page_id=794)

- Solid Waste Management. RurAL CAP continues to host an expert solid waste liaison, Ted Jacobson, through funding provided by the Environmental Protection Agency (EPA) and Senior Services America, Inc. The liaison provides solid waste management technical assistance to rural communities through training, site visits, hands-on demonstrations, and remote contact. Resources are provided for dump management activities, collaborating with funders for funding and technical assistance on solid waste management, recycling, and backhaul. (http://ruralcap.com/?page_id=198

- American Planning Association (APA), http://www.planning.org - a non-profit professional association that serves as a resource for planners, elected officials, and citizens concerned with planning and growth initiatives.
- Institute for Business and Home Safety (IBHS), an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. (http://www.disastersafety.org/)
- American Red Cross (ARC). Provides for the critical needs of individuals such as food, clothing, shelter, and supplemental medical needs. Provides recovery needs such as furniture, home repair, home purchasing, essential tools, and some bill payment may be provided. (http://www.redcross.org/find-help)
- Catalog of Federal Domestic Assistance (DFDA) Crisis Counseling Program (CCP). Provides grants to State and Village Mental Health Departments, which in turn provide training for screening, diagnosing and counseling techniques. Also provides funds for counseling, outreach, and consultation for those affected by disaster. (http://dialoguemakers.org/Resourses4states+Nonprofits.htm)
- Denali Commission. Introduced by Congress in 1998, the Denali Commission is an independent federal agency designed to provide critical utilities, infrastructure, and economic support throughout Alaska. With the creation of the Denali Commission, Congress acknowledged the need for increased inter-agency cooperation and focus on Alaska's remote communities. Since its first meeting in April 1999, the Commission is credited with providing numerous cost-shared infrastructure projects across the State that exemplifies effective and efficient partnership between federal and state agencies, and the private sector. (http://www.denali.gov/grants)
  - The Energy Program primarily funds design and construction of replacement bulk fuel storage facilities, upgrades to community power generation and distribution systems, alternative-renewable energy projects, and some energy cost reduction projects. The Commission works with the Alaska Energy Authority (AEA), Alaska Village Electric Cooperative (AVEC), Alaska Power and Telephone and other partners to meet rural communities' fuel storage and power generation needs.
  - The goal of the solid waste program at the Denali Commission is to provide funding to address deficiencies in solid waste disposal sites which threaten to contaminate rural drinking water supplies.

- Lindbergh Foundation Grants. Each year, The Charles A. and Anne Morrow Lindbergh Foundation provides grants of up to $10,580 (a symbolic amount representing the cost of the Spirit of St. Louis) to men and women whose individual initiative and work in a wide spectrum of disciplines furthers the Lindberghs' vision of a balance between the advance of technology and the preservation of the natural/human environment. (http://www.thelindberghfoundation.org/awards)
- Rasmussen Foundation Grants. The Rasmussen foundation invests both in individuals and well-managed 501(c)(3) organizations dedicated to improving the quality of life for Alaskans.

  Rasmussen Foundation awards grants both to organizations serving Alaskans through a base of operations in Alaska, and to individuals for projects, fellowships and sabbaticals. To be considered for a grant award, grant seekers must meet specific criteria and complete and submit the required application according to the specific guidelines of each program. (http://www.rasmuson.org/index.php?switch=viewpage&pageid=5)

  - Tier 1 Awards: Grants of up to $25,000 for capital projects, technology updates, capacity building, program expansion, and creative works.
  - Tier 2 Awards: Grants over $25,000 for projects of demonstrable strategic importance or innovative nature.
  - Pre-Development Program: Guidance and technical resources for planning new, sustainable capital projects.

  The Foundation trustees believe successful organizations can sustain their basic operations through other means of support and prefer to assist organizations with specific needs, focusing on requests which allow the organizations to become more efficient and effective. The trustees look favorably on organizations which demonstrate broad community support, superior fiscal management and matching project support. (http://www.rasmuson.org/index.php)

10. Appendix B - FEMA Hazard Mitigation Plan (HMP) Review Tool

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Tribal Mitigation Plan Review and Approval Status

Tribe: Native Village of Newtok	**Title of Plan: Newtok Village Hazard Mitigation Plan**	**Date of Plan: September 2015**
Tribal Point of Contact: Romy Caliente **Title**: Relocation Coordinator **Agency:** Native Village of Newtok	**Address:** Native Village of Newtok P.O. Box 5596 Newtok, AK 99559	
Phone Number: 907.237.2202	**E-Mail:** Bunjing2@gmail.com	

State Reviewer (if applicable):	**Title:**	**Date:**
Scott Nelsen	Mitigation Planner	28 September 2015

FEMA Reviewer:	**Title:**	**Date:**
Jamie Mooney Kristen Meyers	CERC Mitigation Champion Mitigation Planner	10/21/15 10/23/15
Date Received in FEMA Region 10	**13 October 2015**	
Plan Not Approved		
Plan Approved	**X**	
Date Approved	**October 26, 2015**	

TRIBAL MULTI-HAZARD MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Planning Process	N	S
1. Documentation of the Planning Process: 201.7(b) and 201.7(c)(1)(i) and (ii)		X
2. Program Integration: 201.7(c)(1)(iii) and (iv)		X

Risk Assessment	N	S
3. Identifying Hazards: 201.7(c)(2)(i)		X
4. Profiling Hazards: 201.7(c)(2)(i)		X
5. Assessing Vulnerability: Overview: 201.7(c)(2)(ii)		X
6. Assessing Vulnerability: Identifying Structures: 201.7(c)(2)(ii)(A)		X
7. Assessing Vulnerability: Estimating Potential Losses: 201.7(c)(2)(ii)(B)		X
8. Assessing Vulnerability: Analyzing Development Trends: 201.7(c)(2)(ii)(C)		X
9. Assessing Vulnerability: Assessing Cultural and Sacred sites: 201.7(c)(2)(ii)(D)		X

Mitigation Strategy	N	S
10. Tribal Multi-Hazard Mitigation Goals: 201.7(c)(3)(i)		X
11. Identification and Analysis of Tribal Mitigation Actions: 201.7(c)(3)(ii)		X
12. Implementation of Tribal Mitigation Actions: 201.7(c)(3)(iii)		X
13. Tribal Capability Assessment: 201.7(c)(3)(iv)		X
14. Tribal Funding Sources: 201.7(c)(3)(v)		X

Plan Maintenance Process	N	S
15. Monitoring, Evaluating, and Updating the Plan: 201.7(c)(4)(i)		X
16. Monitoring Progress of Mitigation Activities: 201.7(c)(4)(ii) and 201.7(4)(v)		X
17. Incorporation into Existing Planning Mechanisms: 201.7(c)(4)(iii)		X
18. Continued Member and Stakeholder Involvement: 201.7(c)(4)(iv)		X

Prerequisites	NOT MET	MET
19. Adoption by the Tribal Governing Body : 201.7(c)(5) and (c)(6) ***[single Indian Tribal government only]***		X
20. Multi-Jurisdictional Plan Adoption: 201.7(a)(4), (c)(5) and(c)(6) ***[multi-jurisdictional only]***		N/A
21. Multi-Jurisdictional Planning Participation: 201.7(a)(4) ***[multi-jurisdictional only]***		N/A

Severe Repetitive Loss Strategy (Optional)	N	S
22. Repetitive Loss Strategy: 201.7(c)(3)(vi)		N/A

TRIBAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	X
See Reviewer's Comments	
PLAN APPROVED	X

PLANNING PROCESS: *201.7(b): An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.*

1. Documentation of the Planning Process

Requirement 201.7(c)(1): *[The plan **shall** document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was defined and involved. This **shall** include:*

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian Tribal government defined "public;" and

(ii) As appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process.

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative **description of the process** followed to prepare the new or updated plan?	Sections 3.1, and 3.2			X
B. Does the new or updated plan indicate **who was involved** in the current planning process?	Sections 3.1, and 3.2			X
C. Does the new or updated plan indicate **how the "public" was defined and involved**? How was the "public" defined? How was the "public" involved? Were they provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?	Section 3.3	Comment: For next plan update, please define "public" clearly and elaborate on comments received by the public. If no comments were received, re-evaluate outreach strategies to ensure feedback is received, addressed, and included in the plan.		X
D. Does the new or updated plan discuss the opportunity for other Indian Tribal governments, tribal and regional agencies, businesses, academia, nonprofits, neighboring communities, and other affected stakeholders and interested parties to be involved in the planning process?	Section 3.3			X
E. Does the updated plan document how the planning team reviewed and analyzed each section of the plan? ***[Updates only.]***	Section 3.4			X
F. Does the updated plan indicate for each section of the plan whether or not it was revised as part of the update process? ***[Updates only.]***	Section 3.4			X
		SUMMARY SCORE		X

2. Program Integration

Requirement 201.7(c)(1)(iii) and (iv): *[The plan **shall**:]*
[include] (iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and
(iv) Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the new or updated plan describe the review and incorporation, if appropriate, of existing plans, studies, and reports in the new or updated plan?	Sections 3.4 and 3.5			**X**
B. Does the new or updated plan describe how the Indian tribal mitigation plan is **integrated with other ongoing Indian tribal planning efforts**?	Sections 3.4 and 3.5			**X**
C. Does the new or updated plan describe how the Indian tribal mitigation planning process is **integrated with FEMA mitigation programs and initiatives**?	Sections 1.1, 1.2, 3.4 and 3.5			**X**
		SUMMARY SCORE		**X**

RISK ASSESSMENT: *201.7(c)(2): [The plan **shall** include a] risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian Tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

3. Identifying Hazards

Requirement 201.7(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the tribal planning area.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE N	SCORE S
A. Does the new or updated plan describe the **tribal planning area**?	Section 2	Great and thorough description of the planning area.		**X**
B. Does the new or updated plan include a description of the **types of all natural hazards** that affect the tribal planning area?	Section 5			**X**
		SUMMARY SCORE		**X**

4. Profiling Hazards

Requirement 201.7(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the tribal planning area. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?	Chapter 2, Sections 5.1, 5.2, 5.3			X
B. Does the risk assessment identify the **extent** (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?	Section 5.4			X
C. Does the new or updated plan provide information on **previous occurrences** of each hazard addressed in the plan?	Section 5.4			X
D. Does the new or updated plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	Section 5.4			X
E. Does the updated plan address data deficiencies, if any, noted in the previously approved plan?	Table 5 page 18			X
		SUMMARY SCORE		X

5. Assessing Vulnerability: Overview

Requirement 201.7(c)(2)(ii): *[The risk assessment **shall** include a] description of the Indian Tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the tribe.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan include an **overall summary** description of the Indian tribe's **vulnerability** to each hazard?	Chapter 6			X
B. Does the new or updated plan address the **impact** of each hazard on the Indian tribe?	Section 5.3, Chapter 6			X
		SUMMARY SCORE		X

6. Assessing Vulnerability: Identifying Structures

Requirement 201.7(c)(2)(ii)(A): *[The plan **should** describe vulnerability in terms of the] types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Tables 16 and 17	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		**X**
B. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Tables 16 and 17	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		**X**
		SUMMARY SCORE		**X**

7. Assessing Vulnerability: Estimating Potential Losses

Requirement 201.7(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan estimate **potential dollar losses** to vulnerable structures?	Tables 16 and 17	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		**X**
B. Does the new or updated plan describe the **methodology** used to prepare the estimate?	Section 6.4.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		**X**
C. Does the updated plan reflect the effects of **changes in development** on loss estimates?	Section 6.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		**X**
		SUMMARY SCORE		**X**

8. Assessing Vulnerability: Analyzing Development Trends

Requirement 201.7(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of a] general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe land uses and development trends within the tribal planning area?	Section 6.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		X
B. Does the updated plan reflect changes in development for tribal lands in hazard prone areas within the tribal planning area?	Section 6.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		X
		SUMMARY SCORE		X

9. Assessing Vulnerability: Assessing Cultural and Sacred Sites

Requirement 201.7(c)(2)(ii)(D): *[The plan **should** describe vulnerability in terms of] cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe significant cultural and sacred sites that are located in hazard areas?	Section 6.3	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		X
		SUMMARY SCORE		X

MITIGATION STRATEGY: *201.7(c)(3): [The plan **shall** include a] mitigation strategy that provides the Indian Tribal government's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

10. Tribal Multi-Hazard Mitigation Goals

Requirement 201.7(c)(3)(i): *[The mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the new or updated plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	Sections 7.2, 7.6			X
B. Does the updated plan demonstrate that the goals were evaluated and either remain valid or have been revised?	Table 23			X
		SUMMARY SCORE		X

11. Identification and Analysis of Tribal Mitigation Actions

Requirement 201.7(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	Sections 7.4, 7.6			X
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	Sections 6.3, 7.6	Comment: Prioritizing relocation of village center satisfies this.		X
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	Sections 6.3, 7.6			X
		SUMMARY SCORE		X

12. Implementation of Tribal Mitigation Actions

Requirement: 201.7(c)(3)(iii): *[The mitigation strategy **shall** include an] action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the Indian Tribal government.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the mitigation strategy in the new or updated plan include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	Section 7.5 Table 26			X
B. Does the mitigation strategy in the new or updated plan address how the actions will be **implemented and administered,** including the responsible agency, existing or potential resources, and the timeframe to complete each action?	Section 7.5 Table 26			X
C. Does the **updated** plan identify the completed, deleted, or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?	Section 7.3 Table 23			X
		SUMMARY SCORE		X

13. Tribal Capability Assessment

Requirement 201.7(c)(3)(iv): *[The mitigation strategy **shall** include a] discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: An evaluation of tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; and a discussion of tribal funding capabilities for hazard mitigation projects.*

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan include an evaluation of the Indian Tribal government's **pre-disaster hazard management** laws, regulations, policies, programs, and capabilities?	Tables 19-20			X
B. Does the new or updated plan include an evaluation of the Indian Tribal government's **post-disaster hazard management** laws, regulations, policies, programs, and capabilities?	Tables 19-20			X
C. Does the new or updated plan include an evaluation of the Indian Tribal government's laws, regulations, policies, programs, and capabilities **related to development** in hazard prone areas?	Tables 19-20			X
D. Does the new or updated plan include a discussion of the Indian Tribal government's **funding capabilities** for hazard mitigation projects?	Table 21, Appendix A			X

E. Does the updated plan address any hazard management laws, policies, programs, capabilities, or funding capabilities of the Indian Tribal government's that have changed since approval of the previous plan?	Appendix A, Section 7.1			N/A
		SUMMARY SCORE		**X**

14. Tribal Funding Sources

Requirement 201.7(c)(3)(v): *[The mitigation strategy **shall** include an] identification of current and potential sources of Federal, tribal, or private funding to implement mitigation activities.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the new or updated plan identify **current** sources of Federal, tribal, or private funding to implement mitigation activities?	Section 7.6, Appendix A			**X**
B. Does the new or updated plan identify **potential** sources of Federal, tribal, or private funding to implement mitigation activities?	Section 7.6, Appendix A			**X**
C. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?	Not present			N/A
		SUMMARY SCORE		**X**

PLAN MAINTENANCE PROCESS

15. Monitoring, Evaluating, and Updating the Plan

Requirement 201.7(c)(4)(i): *[The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the new or updated plan describe the method and schedule for **monitoring** the plan, including how, when, and by whom (e.g., the responsible agency)?	Section 3.6.3			**X**
B. Does the new or updated plan describe the method and schedule for **evaluating** the plan, including how, when, and by whom (e.g., the responsible agency)?	Section 3.6.3			**X**
C. Does the new or updated plan describe the method and schedule for **updating** the plan, including how, when, and by whom (e.g., the responsible agency), within the 5-year cycle?	Section 3.6.3			**X**

D. Does the updated plan include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed for the next 5 years?	Not present			N/A
		SUMMARY SCORE		**X**

16. Monitoring Progress of Mitigation Activities

Requirement 201.7(c)(4)(ii): *[The plan maintenance process **shall** include a] system for monitoring implementation of mitigation measures and project closeouts.*

Requirement 201.7(c)(4)(v): *[The plan maintenance process **shall** include a] system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the new or updated plan describe how mitigation measures and project closeouts will be **monitored**?	Section 3.6.3, Appendix F			**X**
B. Does the new or updated plan identify a **system for reviewing progress** on achieving goals and implementing activities and projects in the Mitigation Strategy?	Section 3.6.3, Appendix F			**X**
C. Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?	Not present			N/A
D. Does the updated plan discuss whether mitigation actions were implemented as planned?	Table 23			N/A
		SUMMARY SCORE		**X**

17. Incorporation into Existing Planning Mechanisms

Requirement 201.7(c)(4)(iii): *[The plan maintenance process **shall** include a] process by which the Indian Tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as reservation master plans or capital improvement plans, when appropriate.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the new or updated plan identify **other tribal planning mechanisms** available for incorporating the requirements of the mitigation plan?	Table 19			**X**
B. Does the new or updated plan include a **process by which the Indian Tribal government will incorporate the mitigation strategy** and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?	Sections 7.6			**X**
		SUMMARY SCORE		**X**

18. Continued Member and Stakeholder Involvement

Requirement 201.7(c)(4)(iv): *[The plan maintenance process **shall** include a] discussion on how the Indian Tribal government will continue public participation in the plan maintenance process.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Section 3.6.2			**X**
		SUMMARY SCORE		**X**

PREREQUISITES

19. Adoption by the Tribal Governing Body (*Single Indian Tribal government*)

Requirement 201.7(c)(5)**:** *The plan **must** be formally adopted by the governing body of the Indian Tribal government prior to submitting to FEMA for final review and approval.*

Requirement 201.7(c)(6): *[The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the Indian tribal governing body formally adopted the new or updated plan?	Section 4			**X**
B. Is supporting documentation, such as a resolution, included with the new or updated plan?	Appendix C			**X**
C. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?	Page 24 Formal State and FEMA HMP Review			**X**
		SUMMARY SCORE		**X**

20. Multi-Jurisdictional Plan Adoption (*Multiple Indian Tribal governments*)

Requirement 201.7(a)(4)**:** *Multi-jurisdictional plans (*e.g., *county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government…has officially adopted the plan.*

Requirement 201.7(c)(5)**:** *The plan **must** be formally adopted by the governing body of the Indian Tribal government prior to submittal to FEMA for final review and approval.*

Requirement 201.7(c)(6): *[The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	SCORE	
			NOT MET	**MET**
A. Does the new or updated plan indicate the specific Indian Tribal government(s) represented in the plan?				N/A
B. For each Indian Tribal government(s), has the governing body adopted the new or updated plan?				N/A
C. Is supporting documentation, such as a resolution, included for each participating Indian Tribal government(s)?				N/A
D. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?				N/A
		SUMMARY SCORE		N/A

21. Multi-Jurisdictional Planning Participation (*Multiple Indian Tribal governments*)

***Requirement 201.7(a)(4)*:** *Multi-jurisdictional plans (e.g., county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government has participated in the process... Indian Tribal governments must address all the elements identified in [44 CFR 201.7] to ensure eligibility as a grantee or as a subgrantee.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan describe **how** each Indian Tribal government participated in the plan's development?				N/A
B. Does the updated plan identify all participating Indian Tribal governments, including new and continuing Indian Tribal government(s) and any Indian Tribal government(s) that no longer participate in the plan?				N/A
C. Does each participating Indian Tribal government participating in the new or updated mitigation plan meet all of the elements identified in the *Tribal Multi-Hazard Mitigation Plan Review Crosswalk* for their tribal planning area? Has a separate crosswalk for participating Indian Tribal government(s) been completed, and are all elements "Met" or "S"?				N/A
		SUMMARY SCORE		N/A

REPETITIVE LOSS STRATEGY (OPTIONAL)

22. Repetitive Loss Strategy

Requirement 201.7(c)(3)(vi): *An Indian Tribal government applying to FEMA as a grantee may request the reduced cost share authorized under 79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identifies actions the Indian Tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian Tribal government intends to reduce the number of such repetitive loss properties.* ***[Note: While submittal of a Repetitive Loss Strategy is optional, if the Indian Tribal government wants to request the reduced cost share authorized under 44 CFR 79.4(c)(2) for the FMA and SRL programs as a grantee, then all of the following requirements must be met.]***

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan address repetitive loss properties in its risk assessment (see 201.7(c)(2))?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
B. Does the new or updated plan describe the Indian Tribal government's mitigation goals that support the selection of mitigation activities for repetitive loss properties (see 201.7(c)(3)(i))?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
C. Does the new or updated plan identify mitigation actions for repetitive loss properties (see 201.7(c)(3)(iii))?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
D. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
E. Does the new or updated plan consider repetitive loss properties in its evaluation of the Indian Tribal government's hazard management laws, regulations, policies, programs, and capabilities and its general description of mitigation capabilities (see 201.7(c)(3)(iv))?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
F. Does the new or updated plan identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities for repetitive loss properties (see 201.7(c)(3)(v))?		***[Note: Only required for SRL 90/10 under FMA & SRL]***		N/A
		SUMMARY SCORE		N/A

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11. Appendix C – Newtok Adoption Resolution

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RESOLUTION OF ADOPTION

Newtok Village, State of Alaska

WHEREAS the Newtok Village, Alaska is vulnerable to damages from natural hazard events which pose a threat to public health and safety and could result in property loss and economic hardship;

WHEREAS a Hazard Mitigation Plan (the Plan) was developed through the combined efforts of the Village's Planning Team, and interested parties within the Newtok area;

WHEREAS the Plan recommends hazard mitigation actions that will protect people and property affected by natural hazards that could potentially affect the area, could potentially reduce future public, private, community, and personal disaster response and recovery costs; and that will reinforce the Tribal Council's leadership in their emergency preparedness efforts;

WHEREAS the Disaster Mitigation Act of 2000 (P.L. 106-390) (DMA 2000) and associated Federal regulations published under 44 CFR Part 201.6 and 201.7 requires all jurisdictional participants to formally adopt a Hazard Mitigation Plan subject to the approval of the Federal Emergency Management Agency to be eligible for federal hazard mitigation projects and activities funds;

WHEREAS the Village's Planning Team held public meetings to receive Plan comment as required by DMA 2000;

NOW THEREFORE BE IT RESOLVED by the Newtok Village Tribal Council of that:

1. The Plan is hereby adopted as an official plan of the Newtok Village.

2. The Newtok Village Tribal officials identified in the Planning Process (Section 3) and the Mitigation Action Plan (Section 7) are hereby directed to implement the recommended actions assigned to them. These officials will report quarterly on their activities, accomplishments, and progress to the Tribal council.

3. The Newtok Village will provide annual progress reports on the status of their implemented Mitigation Action Plan's projects to their Tribal Planning Team Leader who shall submit this report to the Village Council annually by the Plan's adoption anniversary date.

4. The Newtok Planning Team members' will complete periodic updates of the Plan as indicated in the Plan Maintenance Section (Section 3), but no less frequently than every five years or as determined by the State and FEMA.

NOW THEREFORE, BE IT RESOLVED by the Newtok Village Council that the Tribe adopts the Newtok Village Hazard Mitigation Plan; dated October, 2015 as this Tribal Jurisdiction's Hazard Mitigation Plan, and resolves to execute and abide by all 44 CFR regulatory actions and requirements within the Plan.

ADOPTED this Oct 7, 2015

Paul M. Charles, President
Newtok Village Council Tribal Council

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12. Appendix D - Public Outreach Activities

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From:	Simmons, Scott
To:	"mewest@alaska.edu"; "hdenny@anthc.org"; "tneal@usgs.gov"; "swhite@avcp.org"; "steve.heppner.bia.ak@gmail.com"; "kato_howard@ak.blm.gov"; "jneimeyer@denali.gov"; "leslie.pearson@alaska.gov"; "ryan.anderson@alaska.gov"; "Alice.Edwards@alaska.gov"; "taunnie.boothby@alaska.gov"; "scott.nelsen@alaska.gov"; "alan.wien@alaska.gov"; "terri.lomax@alaska.gov"; "Soderlund.Dianne@epamail.epa.gov"; "john.lingaas@noaa.gov"; "joel.curtis@noaa.gov"; "sam.albanese@noaa.gov"; "meg.mueller@ak.usda.gov"; "merlaine.kruse@ak.usda.gov"; "greg.magee@alaska.gov"; "Anna_Plager@dnr.state.ak.us"; "kerry_walsh@dnr.state.ak.us"; "John_Dunker@dnr.state.ak.us"; "Steve_Clautice@dnr.state.ak.us"; "patricia_burns@dnr.state.ak.us"; "Steve_McGroarty@dnr.state.ak.us"; "Mac_McLean@dnr.state.ak.us"; "Margie_Goatley@dnr.state.ak.us"; "Bruce.R.Sexauer@poa02.usace.army.mil"; "colleen.bickford@hud.gov"; "ak_le@fws.gov"
Cc:	Eileen Bechtol (erbechtol@gmail.com); DHSEM Scott Nelsen; Evans, Jessica; Appleby, Elizabeth; URS Evan Wasserman
Subject:	Hazard Mitigation Plan Development Project Initial Notice
Date:	Thursday, November 20, 2014 11:18:00 AM
Attachments:	image002.png

Dear Potential HMP Development Participants,
URS Corporation has received a 2014 contract from the State Division of Homeland Security and Emergency Management (DHS&EM) to develop 21 Local/Tribal All-Hazard Mitigation Plans for the following communities:

New HMP Development

- Atmautlauk (Unorganized)
- Chitina (Unorganized)
- Copper Center (Unorganized)
- Grayling (Unorganized)
- Kongiganak (Unorganized)
- Kwigillingok (Unorganized)
- City of Merkoryuk (2nd Class City)
- City of Nightmute (2nd Class City)
- Tuntutuliak (Unorganized)
- Tununak (Unorganized)
- City of Wales (2nd Class city)

HMP Update Required

- Newtok (Unorganized)
- City of Aniak (2nd Class City)
- City of Dillingham (1st Class City)
- City of Golovin (2nd Class City)
- Lake and Peninsula Borough, MJHMP
- City of Hooper Bay (2nd Class City)
- City of Kivalina (2nd Class City)
- City of Saint Paul (2nd Class City)
- City of Unalakleet (2nd Class City)
- City and Borough of Yakutat

The Lake and Peninsula Borough (L&PB) Multi-Jurisdictional HMP (MJHMP) consists of six organized cities and 12 unorganized communities:

The Lake and Peninsula Borough, MJHMP

Organized Cities

- City of Chignik (2nd Class City)
- City of Egegik (2nd Class City)
- City of Newhalen (2nd Class City)
- City of Nondalton (2nd Class City)
- City of Pilot Point (2nd Class City)
- City of Port Heiden (2nd Class City)

Unorganized Communities

- Chignik Lagoon
- Chignik Lake
- Igiugig
- Iliamna
- Ivanof Bay
- Kokhanok

We invite you to participate in this important community planning effort during the development process. Community newsletters will be located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at:
http://ready.alaska.gov/plans/localhazmitplans as the communities finalize them.

Please feel free to contact me and to forward this email to the most appropriate person within your agency involved with hazard assessments, hazard mitigation plan development or community specific hazard information or planning suggestions. (Please cc me so I may update the contact list)

I encourage you to acknowledge receiving this invitation at your earliest convenience to allow me to include your participation (with appropriate acknowledgments) within the Draft and Final HMPs prior to State and FEMA review and subsequent approvals.

Kind Regards
-Scott-

R. Scott Simmons, CFM, CPM
AECOM + URS
700 G Street, Suite 500 | Anchorage, AK 99501
Ph: 907.261.9706 | 800.909.6787 | Personal Mobile: 841.1832 | Fax: 907.562.1297
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Subject: Newtok Hazard Mitigation Plan Update

Date: Tuesday, November 25, 2014 at 6:58:23 PM Alaska Standard Time

From: Eileen Bechtol

To: Paul Charles

CC: Simmons, Scott, Nelsen, Scott G (MVA), Sally Cox

Hello Newtok Tribal Administrator Paul Charles:

I am writing to introduce myself, Eileen R. Bechtol, I am a subcontractor for Scott Simons, AECOM+URS (formerly known as URS Corporation). AECOM+URS contracted by the Division of Homeland Security and Emergency Management (DHS&EM) to develop a Hazard Mitigation Plan Update for ten Alaska jurisdictions. The Village of Newtok is one of the selected jurisdictions.

I have attached the Newtok Hazard Mitigation Plan approved March 12, 2008. I was the lead planner for this HMP and look forward to working with you and the Village on the update.

It is important to note that the Village of Newtok does not have to pay anything for this project. This is an important project funded by FEMA through the DHS&EM. AECOM+URS have worked with rural communities to assist them with their hazard mitigation plan development needs. In fact, URS has been developing HMPs nationwide since 2000. Our Alaska office has completed approximately 90 State, Borough (County) and local community, State reviewed, and FEMA approved Hazard Mitigation Plans to-date. I also have written several Hazard Mitigation Plans in Alaska.

HMP updates require reviewing current plans to identify how conditions have changed since the plan was last approved. For example, the current plan's plan development activities may change such as planning team membership; new plans, reports, and studies reviewed, new hazards identified and newly disaster impacts annotated. These changes could directly change identified planning community vulnerabilities and risks. This requires that the current Mitigation Strategy be reviewed and updated to identify current project's status. Were any projects completed or do they need to be modified, merged with similar initiatives for the same impact or location; deleted because they are no longer deemed the most appropriate mitigation initiative, or changed to reflect new jurisdictional needs?

AECOM+URS's role in this project is to ensure that the Updated HMP meets state and federal requirements -- part of this requirement is to describe the process in which the community was involved. We are at the beginning stages of this project.

Our task is to write the plan while guiding you through the HMP Update process; maximizing your Planning Team's talent and local knowledge. AECOM+URS will write the plan. The Planning Team will assist the process by working with us to identify changes since the 2008 HMP implementation:

New Planning Team membership and processes

HMP update participation and plan reviewers,

Identify new hazards not formerly addressed,

Help us explain your hazard impacts since 2008,

Identify changes to new and existing participating community's critical facilities and their relative location within each identified hazard's impact area,

Determine their "estimated" replacement costs,

Define the community's population risk and critical facility vulnerabilities,

Review current and update the existing hazard mitigation goals if applicable,

Determine the current status of each project within the Mitigation Strategy; was it

completed, deleted, delayed, combined/changed, or is it still viable and ongoing? We will need to provide a brief explanation for any changes.

Update the HMP Maintenance section to reflect how the (City or Borough) completed HMP annual review commitments and identify whether it was effective or not, then update the process to make it more effective for future use.

There will be opportunities for the entire community to review the team's work during various public involvement processes because FEMA requires at least two public involvement activities. We will provide planning team meeting minutes and two newsletters for distribution or posting to enable community wide knowledge, providing information during Village Council Meetings or other public meetings, and working with us over the phone as we capture needed information.

AECOM+URS will provide two (2) newsletters. The first newsletter will introduce the project and explain the planning process, encourage public involvement; ask the community to identify known hazards, and to confirm their critical infrastructure as identified by DHS&EM's statewide small community Critical Facility Database. The second will introduce the updated draft HMP and encourage the community to review and provide comments to make the plan better or more usable to mitigate your hazards.

It is my understanding that most of the Village Council members will be attending a Newtok Planning Group meeting with Sally Cox on Friday, December 5th from 1:30 – 3:30 pm at the new Atwood Conference Center. Sally invited us to attend the meeting and we may have the opportunity to meet with the Council either before or after the Planning Group meeting. In any case, it will be great to meet with you and the Council and determine who should be on the Update Planning Team. We would like to introduce the project and the process letting you know what information we will need to allow us to proceed. In the future, you will be able to call into a teleconference using a speakerphone to simplify the discussions.

I look forward to working with you and your Team. Thank you for your time.

Make no little plans; they have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work."
— Daniel Hudson Burnham (1846-1912)

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Bechtol Planning & Development

SUBJECT: Newtok HMP Update – December 5, 2014 Newtok Village Council Kick-Off Meeting

Community: City of Newtok, Alaska

Date/Time: December 5, 2014

Attendees: Newtok Village Council, NVC, Paul Charles, Romy Cadiente, Louie Andy, George Carl, Katherine Charles, Simeon Fairbanks, Jr.,

AECOM, Scott Simmons

BP&D, Eileen R. Bechtol

The planning process began at a meeting on December 4, 2014 with Newtok Village Council. AECOM explained how the Division of Homeland Security and Emergency Management 2012 Pre-Disaster Mitigation Grant award selected their community. AECOM staff described the HMP development requirement to enable the Village to qualify for Hazard Mitigation Grant Program grants and the overall HMP development process. The group then met form 10 a.m. to 11:30 a.m. with break out sections with the Village Council to review sections of the 2009 HMP.

NEWTOK PLANNING GROUP MEETING NOTES
DECEMBER 5, 2014

IN ATTENDANCE:

- ***Newtok Village Council (NVC):*** Paul Charles, Romy Cadiente, Louie Andy, George Carl, Katherine Charles, Simeon Fairbanks, Jr.,
- ***Newtok Native Corporation (NNC):*** Jimmy Charles, Marla Fairbanks
- ***Alaska Division of Community and Regional Affairs (DCRA):*** Sally Russell Cox, Nathaniel Betz, Taunnie Boothby, Jimmy Smith
- ***Alaska Division of Homeland Security and Emergency Management (DHSEM):*** Ann Gravier, Scott Nelson, Brent Nichols, Michelle Torres,
- ***Alaska Energy Authority (AEA):*** Jed Drolet, Sandra Moller
- ***Association of Village Council Presidents (AVCP) Regional Housing Authority*:** Allen Joseph
- ***Bureau of Indian Affairs (BIA), Transportation:*** Julie Stoneking
- ***U.S. Army Corps of Engineers:*** Lorraine Cordova
- ***U.S. Housing and Urban Development (HUD):*** Colleen Bickford
- ***AECOM + URS:*** Scott Simmons
- ***Bechtol Planning and Development:*** Eileen Bechtol
- ***E.Consult:*** Elstun Lauesen
- ***Gazewood & Weiner PC:*** Mike Walleri *(attorney to NVC)*
- ***Law Office of Glen Price**:* Glen Price *(attorney to NNC)*

BY TELEPHONE:

- ***Village Safe Water Program (VSW):*** Greg Magee
- ***US Environmental Protection Agency (EPA):*** Tami Fordham
- ***Yukon-Kuskokwim Health Corporation (YKHC):*** Brian Lefferts

The meeting was facilitated by Sally Russell Cox.

1. RELOCATION PROJECT UPDATES

a. UPDATES FROM THE COMMUNITY: Romy Cadiente reported that he was recently hired as a Community Coordinator by the NVC to serve as a liaison between the tribe and State and federal agencies with special focus on the relocation effort. He reported that all five of the new water storage tanks have been connected by VSW.

Paul Charles, NVC president, thanked the state and federal agencies for the assistance they've been providing to Newtok.

Mike Walleri, attorney to the NVC, provided an update on activities regarding the lifting of the stay placed on Newtok's BIA funds due to an internal tribal conflict. The NVC now has access to its BIA funds and has been focused on getting the new tribal government up and running as a functional tribal government.

The majority of BIA funding for 2014 is carry-over funding and will provide resources for the tribe to coordinate the relocation effort. A compact agreement was recently solidified between AVCP and NVC; AVCP will take over Newtok's basic BIA 638 contracts for FY15. This will free up the NVC's time to focus on the relocation effort. The main issue the NVC is focusing on is the BIA Roads Program, specifically planning for community road location at Mertarvik. Funding is available to begin surveying the new roads. There are some concerns about the environmental and archeological review so that BIA will know if State Historic Preservation Office (SHPO) compliance has been received.

Sally responded that some of these studies were performed during the development of the barge landing and staging area project funded by the Economic Development Administration (EDA) and by Environmental Assessment (EA) and Finding of No significant Impact (FONSI) prepared by the Corps of Engineers for the Mertarvik Evacuation Shelter and access road. *(The Corps of Engineers EA and FONSI document is available on the Newtok Planning Group Website at http://commerce.state.ak.us/dnn/Portals/4/pub/2008_Newtok_Evacuation_Center_EA_&_FONSI.pdf)*

b. HOME RELOCATION/BUYOUT: Ann Gravier (Division of Homeland Security and Emergency Management (DHSEM)) reported that Newtok reported damages during a federally-declared disaster that took place in November 2013 (DR-4162). Whenever there is a federally-declared disaster in the State of Alaska, the State can request 15% of the total cost of disaster damages in mitigation dollars from FEMA. Typically, those dollars are offered competitively statewide to local jurisdictions that have FEMA-approved hazard mitigation plans and have submitted applications for mitigation projects. Newtok is among many communities who are eligible statewide to apply for these dollars. Recognizing the relocation issues in Newtok, the DHSEM hired contractors to help develop the Hazard Mitigation Grant Program (HMGP) application. Based on the structural survey conducted by DHSEM, the NVC ranked which homes in Newtok would be a priority for buyout or relocation and helped collect the Voluntary Information Forms signed by individual homeowners volunteering to have their home relocated or bought-out.

Newtok's HMGP project application was completed and submitted by the application deadline, October 1, 2014. DHSEM is now taking all the HMGP project applications submitted under DR-4162 and providing them to the interagency State Hazard Mitigation Advisory Committee (SHMAC) for prioritization. Recognizing the relocation issues Newtok is faced with as well as the significant investment of dollars and time into Newtok's application process; DHSEM will try to make the case to the SHMAC to prioritize Newtok's application for recommendation to the Governor's Disaster Policy Cabinet (DPC) for funding through FEMA. The SHMAC will probably meet within the next two weeks (approximately December 19, 2014), and the recommendation will then go to the DPC (approximately late December or early January). The application includes the relocation of 12 homes for $2.8 million and the acquisition of 5 homes for $1.24 million. It's less expensive to relocate homes than it is to buyout and demolish structures and fund the construction of new homes. The combined cost reflects what DHSEM anticipates in available mitigation dollars from this disaster (DR-4162).

If the DPC recommends Newtok's HMGP project application for FEMA funding, the application will be submitted to FEMA by the end of January. FEMA will take 60 to 90 days to review the application; and award would take place in late spring or early summer of 2015.

Ann reported that if the HMGP project application isn't funded by FEMA, there is another funding source, Pre-Disaster Mitigation (PDM) funding, that we could consider. If the HMGP project application is funded, the PDM funding could provide for the relocation/buyout of additional homes beyond the initial 17.

The question was asked if the four homes closest to the Ninglick River could be moved away from the Ninglick River with these funds. Ann clarified that this application was to move homes from Newtok to Mertarvik, and the funds couldn't be used to move homes within the current village. The Natural Resources Conservation Service (NRCS) was contacted about moving the homes away from the river but NRCS determined the homes didn't meet the imminent threat criteria of their program.

There was additional discussion about whether the homes closest to the river were among those prioritized to be moved, because there was at least one elder living in one of the homes and she would not be able to move to Mertarvik before support services such as a clinic and airport were available. Ann will send Sally the list of prioritized structures and the home owners to provide to the group.

Ann also reported that DHSEM has emergency generators that could be used to power the homes relocated or built at Mertarvik.

c. **PAPER PLAT:** Greg Magee (Department of Environmental Conservation, Village Safe Water Program (VSW)) explained that in preparation for relocating homes, we will need to bridge the gap between the conceptual community layout plan developed for the Mertarvik village site in 2011 *(see http://commerce.state.ak.us/dnn/Portals/4/pub/Newtok_CLP_Update_Final.pdf)* and work the USACE will do to complete a survey, subdivision design and recorded plat. VSW has resources that can be combined with funding from DHSEM to advance the community layout to a paper plat stage where land is subdivided and the location of community infrastructure and facilities is identified, such as the school, power plant, water and sewer, communication and housing. Preparation of a paper plat will be critical to the siting of the 17 homes that will be relocated or built at Mertarvik. Once the paper plat is completed, it can be handed over to the USACE for the survey, subdivision design and recorded plat. Ann Gravier and Brent Nichols clarified that it would be important to have the paper plat completed by the end of January, so that it can accompany the project application for home relocation/buyout submitted to FEMA. Greg plans to conduct a design charrette as part of the paper plat process. Sally can help with the planning portion of the design charrette through the work she does under her FEMA Risk MAP grant. Mike Walleri noted that the NVC has a planning obligation under the BIA IRR roads program and asked if the design charrette could include the community roads to fulfill this obligation. He asked if this could be coordinated by Sally with the Newtok Planning Group (NPG), as well as with Nelson Island villages. Sally agreed that she could do this and would coordinate with Romy.

d. **MERTARVIK SURVEY AND SUBDIVISION DESIGN:** Lorraine Cordova (U.S. Army Corps of Engineers (USACE)) attended the meeting on behalf of Dave Williams, who would not be back in state until January 15th. Lorraine said that she would relay any questions the NPG had to Dave.

Mike Walleri stated that the NVC was looking forward to getting the new cooperative agreement in place with the USACE. The old agreement with the Newtok Traditional Council had been terminated. As soon as the draft agreement and certification forms are ready, he would like to receive them.

e. **SANITATION MASTER PLAN:** Greg Magee reported that the Mertarvik Evacuation Center (MEC) currently has a septic system and drain field in place which will accommodate the wastewater/sewer needs of the additional 17 families at Mertarvik. There is also a water well drilled at the MEC site that can be used as a watering point for the 17 homes.

At Greg's request, Brian Lefferts, YKHC, explained that it would make sense for the community to decide what type of water-sewer systems they would like to have now. Once the systems have been decided, we can strategically place homes so the desired systems can be connected in the future.

Greg explained that the community layout was based on a gravity-fed piped system which was based on 5-foot topographic contours, but now we have 2-foot contours that provide more refined information on which to develop the paper plat. VSW has an obligation through the sanitation planning process to look at alternative water-sewer system but without going through further evaluation, including the design charrette process, we don't know what that system will be. VSW will be applying for more study money to look in depth at these alternatives. The money won't be available until after July 1, 2015.

An objective for the paper plat would be to avoid laying out the homes in a way that would eliminate any option for water and sewer. The design charrette process would help the community reach consensus on the type of water/sewer system before the paper plat was completed.

f. AIRPORT STATUS: Don Fancher (Department of Transportation and Public Facilities (DOT/PF)) reported that in June 2014 DOT/PF received FAA-approval of the Newtok Airport Layout Plan (ALP). *(The ALP is available on the Newtok Planning Group website at http://commerce.state.ak.us/dnn/Portals/4/pub/Newtok-Mertarvik_ALP.pdf).* The FAA placed a condition on this approval that the proposed landfill and sewage lagoon maintain a minimum separation requirement of 5,000 from the airport. Getting to this stage on the Newtok airport (at Mertarvik) took about 7.5 years and $1 million.

A few years ago, the military Innovative Readiness Training Program (IRT) laid out a temporary road leading up to the materials site at "Hill 460". This road was intended to follow the ridgeline, which was the most direct route from the barge landing area; however the road alignment now intrudes into the approved runway safety zone, so the road will need to be moved. *(This should not be a problem because the road has not yet been engineered. Durabase mat has been placed directly on the tundra along the temporary alignment, however this can be moved.)* Sheet 11 of 11 of the ALP shows the recommended alignment of the road.

An airport relocation report was completed in *2008 (see http://commerce.state.ak.us/dnn/Portals/4/pub/2008_Newtok_Recon_Report.pdf)*. Once the ALP was approved by FAA, DOT/PF went before the statewide Aviation Project Evaluation Board (APEB) to request that the Newtok airport be included in a statewide competition with other airport projects to be included on FAA's Airport Improvement Program (AIP). This program provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems. The Newtok airport project is now included on this list.

The Sherpa/Short SD 330 was selected as the design aircraft with a recommended design runway length of 4,000 feet. Approximately 200 acres of land will be needed for the project. The estimate for the 4,000 runway is about $25 million. A cross-wind runway would cost approximately $20 million more.

In order for the FAA to fund the final design and construction of the Newtok airport, the agency would like to see some form of power generation developed at Mertarvik to provide runway lighting, in addition to assurance that the sewage lagoon and landfill will be sited outside the 5,000 foot airport safety zone.

The timeline for the project can be expedited if conditions change (such as 15-17 families moving to Mertarvik). The NVC should contact Don once we learn that FEMA has approved the award for the home relocation/buyout project. The Newtok airport project would need to be re-ranked in the AIP.

Don also recommended that the NVC and NNC address land status issues such as completing the survey of the village site, getting agreements in place, making a commitment to DOT/PF that the land will be made available for the airport, and recording the plat.

In the best case scenario, if the FEMA application was approved and the airport project was elevated on the AIP, the airport could potentially be completed in 3 years.

g. NEWTOK HAZARD MITIGATION PLAN UPDATE: Scott Nelson (DHSEM) introduced the contractors preparing the update to Newtok's Local Hazard Mitigation Plan (LHMP), Scott Simmons with AECOM +URS and Eileen Bechtol with Bechtol Planning & Development. Eileen prepared Newtok's current LHMP *(available at DCRA's Community Plans Library at http://commerce.state.ak.us/DNN/Portals/4/Repository/Plans/Newtok_HMP.pdf)*.

Scott Nelson noted that in order to be eligible for the FEMA funding for home relocation/buyout, the community must have a FEMA-approved LHMP. Scott Simmons reported that he, Scott Nelson and Eileen met with the NVC that morning to go over the LHMP update, including information the NVC would need to provide and the forms the NVC would need to complete.

The purpose of the local hazard mitigation plan is to identify the community's policies and actions to reduce risk and future losses to hazards. LHMPs provide the framework for a community's long-term strategy to reduce disaster losses.

h. OTHER AGENCY UPDATES/INFORMATION: Sally reported that one of the federal grants she manages (the Newtok Environmental Site Inventory and Assessment) is being amended to include travel funding for the Newtok Village Council and the Newtok Native Corporation to make two trips to Anchorage over the next 18 months. She would like to coordinate these trips with NPG meetings to ensure the members of the NVC and NNC board have the opportunity to meet face-to-face with the agencies.

Jed Drolet (Alaska Energy Authority (AEA), Regional Energy Planning and Community Assistance Program) reported that in order for AEA to begin energy planning at Mertarvik, the NVC should send a letter to AEA requesting assistance. AEA will review their budget and project load to determine where assistance might begin. AEA is ready to help as best they can. There is a regional energy plan for the coastal region being developed by Municipal Light and Power (ML&P) through a direct appropriation. AEA is working closely with ML&P and they are using AEA's methods and procedures for the regional energy plan.

2. REVIEW OF ACTION ITEMS

- Ann Gravier will send Sally Russell Cox the list of prioritized structures and home owners to provide to the NPG.
- The NVC should send a letter to Alaska Energy Authority requesting assistance with energy planning at Mertarvik. This is especially important to keep the airport project moving along.
- Ann will let Sally know if the Governor's Disaster Policy Cabinet recommends the Newtok's HMGP project application for home relocation/buyout to FEMA. Sally will pass this information on to the NPG. If the project application isn't recommended, Sally will schedule an NPG meeting to discuss alternative approaches. FEMA Pre-Disaster Mitigation funding is another option.

- If the HMGP project application for home relocation/buyout is submitted to FEMA, Ann will let Sally know once award has been made and Sally will schedule the next NPG meeting to coordinate next steps. This will likely be in late spring or early summer.
- If FEMA approves/awards the home relocation/buyout project application, the NVC should contact Don Fancher to expedite the airport development process including having the project re-ranked in the AIP.
- The NPG needs to help Newtok come up with resources to move the 4 homes closest to the river further back into the village. The NVC needs to identify where these homes can be temporarily moved.
- The cooperative agreement between the USACE and the NVC should be executed as soon as possible.
- VSW will likely hold a design charrette in Newtok in January to support the paper plat being developed to support the home relocation/buyout project application to FEMA. The design charrette can include the location of community roads to fulfill the planning requirement of the BIA IRR Program.

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NATIVE VILLAGE OF NEWTOK HAZARD MITIGATION PLAN

Newsletter #1 **January 2015**

This newsletter describes the Native Village of Newtok's Hazard Mitigation Planning project development processes to all interested agencies, stakeholders, and the public and to solicit comments. It can also be viewed on the State of Alaska Division of Homeland Security and Emergency Management Website at http://ready.alaska.gov/plans/localhazmitplans.

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to Update your 2008 Hazard Mitigation Plan (HMP.

URS was contracted to assist Newtok with preparing a 2015 FEMA approvable HMP update.

The HMP will identify all natural hazards, such as earthquake, flood/erosion, severe weather, and wildland/tundra fire hazards, etc. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts. We will document the public participation and planning process as part of these project.

What is Hazard Mitigation?

Hazard mitigation projects eliminate the risk or reduce the hazard impact severity to people and property. Projects may include short- or long-term activities to reduce exposure to or the effects of known hazards. Hazard mitigation activities include relocating or elevating buildings, replacing insufficiently sized culverts, using alternative construction techniques, or developing, implementing, or enforcing building codes, and education.

Why Do We Need A Hazard Mitigation Plan?

Communities must have a State, FEMA approved, and community adopted mitigation plan to receive a project grant from FEMA's pre- and post- disaster grants identified in their Hazard Mitigation Assistance and other agency's mitigation grant programs. The Native Village of Newtok plans to apply for mitigation funds after our plan is complete.

A FEMA approved and community adopted HMP enables the Local government to apply for the Hazard Mitigation Grant Program (HMGP), a disaster related assistance program; the Pre-Disaster Mitigation (PDM), and the National Flood Insurance Program (NFIP) Flood Mitigation Assistance (FMA) grant programs.

The Planning Process

There are very specific federal requirements that must be met when preparing a FEMA approvable HMP. These requirements are commonly referred to as the Disaster Mitigation Act of 2000, or DMA2000 criteria. Information about the criteria and other applicable laws and regulations may be found at: http://www.fema.gov/mitigation-planning-laws-regulations-guidance.

The DMA2000 requires the plan to include and document the following topics:

- New Planning Team membership and processes
- HMP update participation and plan reviewers,
- Identify new hazards not formerly addressed,
- Help us explain your hazard impacts since 2008,
- Identify changes to new and existing participating community's critical facilities and their relative location within each identified hazard's impact area,
- Determine their "estimated" replacement costs,
- Define the community's population risk and critical facility vulnerabilities,
- Review current and update the existing hazard mitigation goals if applicable,
- Determine the current status of each project within the Mitigation Strategy; was it completed, deleted, delayed, combined/changed, or is it still viable and ongoing? We will need to provide a brief explanation for any changes.
- Update the HMP Maintenance section to reflect how the (City or Borough) completed HMP annual review commitments and identify whether it was effective or not, then update the process to make it more effective for future use.
- Provide a copy of the community's HMP Adoption Resolution

FEMA has prepared Local (available at: http://emilms.fema.gov/is318/assets/local_mtgtn_plan_gdnce_0708.pdf that explains how the HMP Update meets each of the DMA2000 requirements.

We are currently in the very beginning stages of preparing the plan update. We will be conducting a Planning Team Meeting to introduce the project and planning team, to gather comments from community residents update hazards lists, and collect data to refine the vulnerability assessment.

We Need Your Help

Please use the following tables to confirm the hazards AND identify new hazards not formerly addressed.

Newtok Hazard Worksheet		
Hazard	2008 HMP	Still Valid? Yes/No?
Earthquake (EQ)	Yes	
Flood (Erosion) (FL)	Yes	
Ground Failure (GF) Avalanche, Landslide, Melting Permafrost, and/or Subsidence	No	Change to Yes
Severe Weather (SW)	Yes	
Tsunami & Seiche (TS)	No	
Volcano (VO)	No	
Wildland/Tundra Fire	Yes	

The 2008 HMP identified critical facilities within Newtok, but the list needs to be reviewed and updated and the estimated value and location (latitude/longitude) determined.

Critical Facility	Current Natural Hazards			
	EQ	FL	SW	WS
1. Newtok Village Office	X	X	X	X
2. Tribal Council Office?	X	X	X	X
3. AVCP Office?	X	X	X	X
4. Newtok Native Corporation	X	X	X	X
5. National Guard Armory	X	X	X	X
6. Post Office	X	X	X	X
7. Public Safety Building?	X	X	X	X
8. VPSO Office?	X	X	X	X
9. Ayaprun School, P-12 grade	X	X	X	X
10. Teachers' Quarters	X	X	X	X

The Planning Team

Paul Charles is leading the planning team with assistance from Romy Bunjing and the Village Council and AECOM+URS (contracted by DHS&EM) providing assistance and guidance to the planning team throughout the planning process.

Next Teleconference will be held at 10 a.m. on January 26, 2015 in the Tribal Offices.

Public Participation

Public involvement will continue throughout the project. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas and to guide the community

We encourage you to take an active role in updating the Newtok Plan. Please contact your Planning Leader or Eileen Bechtol with any questions or comments.

Critical Facility	Current Natural Hazards			
	EQ	FL	SW	WS
11. Headstart	X	X	X	X
12. School Warehouse	X	X	X	X
13. Manguan Health Clinic	X	X	X	X
14. Quyurrvik Hall (Community Hall?)	X	X	X	X
15. Tom's Store	X	X	X	X
16. Catholic Church	X	X	X	X
17. Chatholic Church Rectory	X	X	X	X
18. NNC Rental House	X	X	X	X
19. Fathers House	X	X	X	X
20. Old BIA School w/ W&S Storage	X	X	X	X
21. Playground	X	X	X	X
22. Newtok Corporation Store	X	X	X	X
23. Graveyard	X	X	X	X
24. Is there a bridge?	X	X	X	X
25. Newtok Airport, 2,202 ft. x 35 ft.	X	X	X	X
26. Airport Garage	X	X	X	X
27. Seaplane Base, 5,000 ft.x400'	X	X	X	X
28. Public Dock	X	X	X	X
29. Barge Landing #1	X	X	X	X
30. Barge Landing #2	X	X	X	X
31. Old BIA Harbor	X	X	X	X
32. Potable Water Production and Treatment Facility	X	X	X	X
33. Phone Company	X	X	X	X
34. Washeteria	X	X	X	X
35. Newtok Water System	X	X	X	X
36. Electric Utility Fuel Storage	X	X	X	X
37. Lower Kuskokwim School Fuel Storage	X	X	X	X
38. Old BIA School Tank Farm	X	X	X	X
39. School Generators	X	X	X	X
40. Agayuvik Holy Family Church Fuel Storage	X	X	X	X
41. Army National Guard Fuel Storage	X	X	X	X
42. Toms Store Fuel Storage (2,600 gal Capacity)	X	X	X	X
43. Ungusraq Power CO. Office	X	X	X	X
44. Ungusraq Power CO. (65,000 Gal Capacity)	X	X	X	X
45. Ungusraq Power CO. Generator	X	X	X	X
46. Newtok Class III Muni Landfill	X	X	X	X
47. Newtok Landfill, Closed	X	X	X	X
48. Sewage Lagoon	X	X	X	X

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Bechtol Planning & Development

SUBJECT: Newtok HMP Update –Planning Group Team Meeting, Teleconference

Community: City of Newtok, Alaska

Date/Time: January 26, 2015

Attendees: Newtok Planning Team

BP&D, Eileen R. Bechtol

The Planning Team advertised that the HMP Update would be reviewed at the January 26, 2015 meeting. The Planning Team completed the Critical Facilities table and reviewed the mitigation tables and decided which actions should be forward to HMP Update.

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Bechtol Planning & Development

SUBJECT: Newtok HMP Update –Planning Group Team Meeting, Teleconference

Community: City of Newtok, Alaska

Date/Time: May 13, 2015

Attendees: Newtok Planning Team

BP&D, Eileen R. Bechtol

The Planning Team advertised that the HMP Update would be reviewed at the May 13, 2015 meeting. The Planning Team reviewed the plan for accuracy and directed Eileen Bechtol to send the plan on for preliminary approval.

13. Appendix E - Benefit–Cost Analysis Fact Sheet

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Appendix E - Benefit–Cost Analysis Fact Sheet

Hazard mitigation projects are specifically aimed at reducing or eliminating future damages. Although hazard mitigation projects may sometimes be implemented in conjunction with the repair of damages from a declared disaster, the focus of hazard mitigation projects is on strengthening, elevating, relocating, or otherwise improving buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters. In some cases, hazard mitigation projects may also include training or public-education programs if such programs can be demonstrated to reduce future expected damages.

A Benefit-Cost Analysis (BCA) provides an estimate of the "benefits" and "costs" of a proposed hazard mitigation project. The benefits considered are avoided future damages and losses that are expected to accrue as a result of the mitigation project. In other words, benefits are the reduction in expected future damages and losses (i.e., the difference in expected future damages before and after the mitigation project). The costs considered are those necessary to implement the specific mitigation project under evaluation. Costs are generally well determined for specific projects for which engineering design studies have been completed. Benefits, however, must be estimated probabilistically because they depend on the improved performance of the building or facility in future hazard events, the timing and severity of which must be estimated probabilistically.

All Benefit-Costs must be:

- Credible and well documented
- Prepared in accordance with accepted BCA practices
- Cost-effective (BCR $\geq$ 1.0)

General Data Requirements:

- All data entries (other than Federal Emergency Management Agency [FEMA] standard or default values) MUST be documented in the application.
- Data MUST be from a credible source.
- Provide complete copies of reports and engineering analyses.
- Detailed cost estimate.
- Identify the hazard (flood, wind, seismic, etc.).
- Discuss how the proposed measure will mitigate against future damages.
- Document the Project Useful Life.
- Document the proposed Level of Protection.
- The Very Limited Data (VLD) BCA module cannot be used to support cost-effectiveness (screening purposes only).
- Alternative BCA software MUST be approved in writing by FEMA HQ and the Region prior to submittal of the application.

Damage and Benefit Data

- Well documented for each damage event.
- Include estimated frequency and method of determination per damage event.
- Data used in place of FEMA standard or default values MUST be documented and justified.

- The Level of Protection MUST be documented and readily apparent.
- When using the Limited Data (LD) BCA module, users cannot extrapolate data for higher frequency events for unknown lower frequency events.

Building Data

- Should include FEMA Elevation Certificates for elevation projects or projects using First Floor Elevations (FFEs).
- Include data for building type (tax records or photos).
- Contents claims that exceed 30 percent of building replacement value (BRV) MUST be fully documented.
- Method for determining BRVs MUST be documented. BRVs based on tax records MUST include the multiplier from the County Tax Assessor.
- Identify the amount of damage that will result in demolition of the structure (FEMA standard is 50 percent of pre-damage structure value).
- Include the site location (i.e., miles inland) for the Hurricane module.

Use Correct Occupancy Data

- Design occupancy for Hurricane shelter portion of Tornado module.
- Average occupancy per hour for the Tornado shelter portion of the Tornado module.
- Average occupancy for Seismic modules.

Questions to Be Answered

- Has the level of risk been identified?
- Are all hazards identified?
- Is the BCA fully documented and accompanied by technical support data?
- Will residual risk occur after the mitigation project is implemented?

Common Shortcomings

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.
- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.

Use of incorrect Project Useful Life (not every mitigation measure = 100 years)

14. Appendix F - Plan Maintenance Documents

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Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action			
	Are there procedures (e.g. meeting announcements, plan updates) that can be done more efficiently?			
	Has the Planning Team undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or manmade/ technologically caused disaster occurred during this reporting period?			
	Are there natural and/or manmade/ technologically caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazard studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any critical facilities or infrastructure need to be added to the asset lists?			
	Have there been development patterns changes that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning within the City of Village as applicable?			
	Are the goals still applicable?			
	Should new mitigation actions be added to the Mitigation Action Plan (MAP)?			
	Do existing mitigation actions listed in the Mitigation Strategies' MAP need to be reprioritized			
	Are the mitigation actions listed in the MAP appropriate for available resources?			

MITIGATION ACTION PROGRESS REPORT

Progress Report Period: _____ **To** _____
(date) (date)

Project Title: _____ **Project ID#:** _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: **Title:**

Phone #(s): _____ **eMail Address(s):** _____

_____ _____

List Supporting Agencies and Contacts:

Total Project Cost: _____

Anticipated Cost Overrun/Underrun:

Project Approval Date: _____ **Project Start date:** _____

Anticipated completion date: _____

Description of Project (describe each phase, if applicable, and the time frame for completing each phase:

Milestones	Complete	Projected Completion Date

MITIGATION ACTION PROGRESS REPORT

Plan Goal(s) Addressed:

Goal:

Success Indicators:

Project Status

- ☐ **Project on schedule**
- ☐ **Project completed**
- ☐ **Project delayed***

*** explain:**

- ☐ **Project canceled**

Project Cost Status

- ☐ **Cost unchanged**
- ☐ **Cost overrun****

**** explain:**

Cost underrun***

***** explain:**

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What is/are the next step(s) to accomplish over the next reporting period?

Other Comments:

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15. Appendix G – Newtok Facilities and Residences

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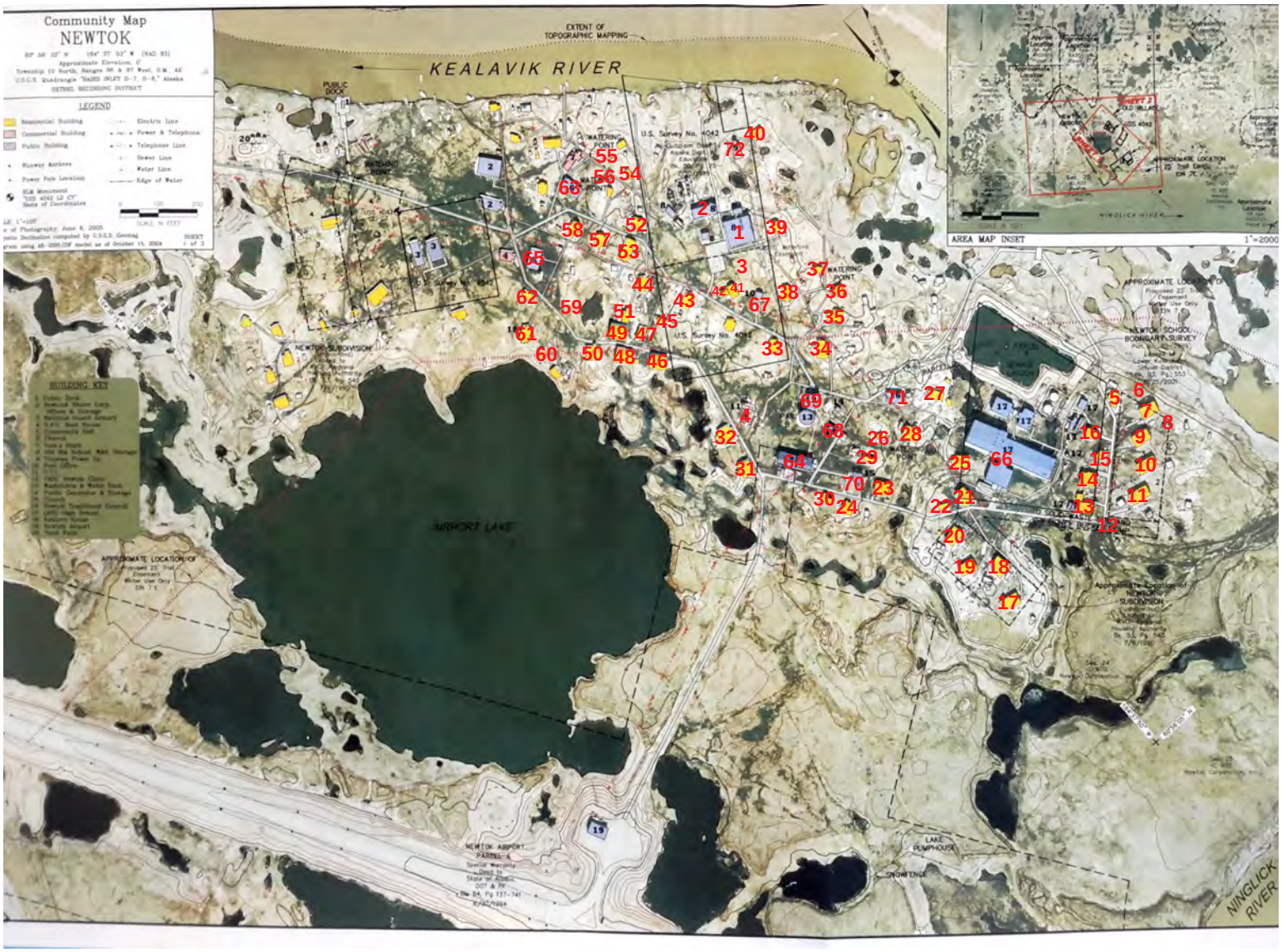
Community Map
NEWTOK
KEALAVIK RIVER
EXTENT OF TOPOGRAPHIC MAPPING
AREA MAP INSET
AIRPORT LAKE
NINGLICK RIVER
NEWTOK SUBDIVISION
LAKE PUMPHOUSE
NEWTOK AIRPORT PARCEL A
BUILDING KEY
LEGEND

Newtok Village Structure Coordinates

1. BIA School - Latitude 60.939493 Longitude -164.630197 Altitude 4 meters

2. BIA School 2 - Latitude 60.939498 Longitude -164.630229 Altitude 4 meters

3. CVRF Newtok - Latitude 60.939025 Longitude -164.630333 Altitude 4 meters

4. GCI Communication Facility - Latitude 60.938331 Longitude -164.631677 Altitude 3 meters

5. House - Latitude 60.936597 Longitude -164.62771 Altitude 5 meters

6. House - Longitude 60.93640554888159, Latitude -164.62721943855286 Altitude 5.7

7. House - Latitude 60.936362 Longitude -164.627485 Altitude 5 meters

8. House - Latitude 60.936271 Longitude -164.627571 Altitude 5 meters

9. House - Latitude 60.936261 Longitude -164.627812 Altitude 5 meters

10. House - Latitude 60.936107 Longitude -164.628021 Altitude 5 meters

11. House - Latitude 60.935997 Longitude -164.628397 Altitude 5 meters

12. House - Latitude 60.935945 Longitude -164.629051 Altitude 4 meters

13. House - Latitude 60.936188 Longitude -164.629078 Altitude 4 meters

14. House - Latitude 60.936297 Longitude -164.628767 Altitude 5 meters

15. House - Latitude 60.936391 Longitude -164.628451 Altitude 5 meters

16.House - Latitude 60.936516 Longitude -164.628311 Altitude 5 meters

17. House - Longitude 60.93609283604912, Latitude -164.63074922561646 Altitude 4.1 meters

18. House - Latitude 60.936308 Longitude -164.630521 Altitude 4 meters

19. House - Latitude 60.936477 Longitude -164.630886 Altitude 4 meters

20. House - Latitude 60.936688 Longitude -164.630741 Altitude 4 meters

21. House - Latitude 60.93682249454783, Longitude -164.63024497032166 Altitude 4 meters

22. House - Latitude 60.936881 Longitude -164.630575 Altitude 4 meters

23. House - Latitude 60.937277 Longitude -164.631074 Altitude 4 meters

24. House - Latitude 60.937337 Longitude -164.631605 Altitude 3 meters

25. House - Latitude 60.937393 Longitude -164.630229 Altitude 4 meters

26. House - Latitude 60.937538 Longitude -164.630596 Altitude 4 meters

27. House - Latitude 60.937452 Longitude -164.629572 Altitude 4 meters

28. House - Latitude 60.937389 Longitude -164.630237 Altitude 4 meters

29. House - Latitude 60.937483 Longitude -164.630934 Altitude 4 meters

30. House - Latitude 60.937476 Longitude -164.631731 Altitude 3 meters

31. House - Latitude 60.938023 Longitude -164.632289 Altitude 3 meters

32. House - Latitude 60.938289 Longitude -164.632182 Altitude 3 meters

33. House - Latitude 60.938485011104504 Longitude -164.63080286979675 Altitude 4 meters

34. House - Latitude 60.938242 Longitude -164.630347 Altitude 4 meters

35. House - Latitude 60.938336 Longitude -164.629896 Altitude 4 meters

36. House - Latitude 60.938456 Longitude -164.629617 Altitude 5 meters

37. House - Latitude 60.938649 Longitude -164.62965 Altitude 5 meters

38. House 33 - Latitude 60.93868 Longitude -164.630154 Altitude 4 meters

39. House - Latitude 60.939071 Longitude -164.62965 Altitude 5 meters

40. House - Latitude 60.939635 Longitude -164.628933 Altitude 5 meters

41. House - Latitude 60.938946 Longitude -164.630701 Altitude 4 meters

42. House - Latitude 60.939003 Longitude -164.630787 Altitude 4 meters

43. House - Latitude 60.939139 Longitude -164.63128 Altitude 4 meters

44. House - Longitude 60.93944391534958 Latitude -164.63159680366516 Altitude 4 meters

45. House - Latitude 60.939175 Longitude -164.631785 Altitude 4 meters

46. House - Latitude 60.938961 Longitude -164.632192 Altitude 4 meters

47. House - Latitude 60.939222 Longitude -164.632096 Altitude 4 meters

48. House - Latitude 60.93917 Longitude -164.632471 Altitude 3 meters

49. House - Latitude 60.939316 Longitude -164.6323 Altitude 3 meters

50. House - Latitude 60.939337 Longitude -164.632772 Altitude 3 meters

51. House - Latitude 60.939357 Longitude -164.632106 Altitude 4 meters

52. House - Latitude 60.939765 Longitude -164.631063 Altitude 4 meters

53. House 50 - Latitude 60.93969 Longitude -164.63139 Altitude 4 meters

54. House - Latitude 60.940049 Longitude -164.630704 Altitude 4 meters

55. House - Latitude 60.940185 Longitude -164.630677 Altitude 4 meters

56. House - Latitude 60.940143 Longitude -164.631085 Altitude 4 meters

57. House - Latitude 60.939863 Longitude -164.631613 Altitude 4 meters

58. House - Latitude 60.940066 Longitude -164.631806 Altitude 4 meters

59. House - Latitude 60.939753 Longitude -164.632654 Altitude 3 meters

60. House - Latitude 60.939588 Longitude -164.633332 Altitude 3 meters

61. House - Latitude 60.939768 Longitude -164.633338 Altitude 3 meters

62. House - Latitude 60.939956 Longitude -164.632935 Altitude 3 meters

63. Newtok Church - Latitude 60.940263 Longitude -164.631422 Altitude 4 meters

64. Newtok Clinic - Latitude 60.93783 Longitude -164.631688 Altitude 3 meters

65. Newtok Community Center - Latitude 60.940099 Longitude -164.632517 Altitude 3 meters

66. Newtok High School - Latitude 60.936732 Longitude -164.629792 Altitude 4 meters

67. Newtok PostOffice - Latitude 60.938821 Longitude -164.630476 Altitude 4 meters

68. Newtok PowerPlant - Latitude 60.937825 Longitude -164.630798 Altitude 4 meters

69. Newtok Public Water Facility - Latitude 60.938034 Longitude -164.630883 Altitude 4 meters

70. Newtok Tribal Court - Latitude 60.93745 Longitude -164.631184 Altitude 4 meters

71. OLD Newtok Traditional Council Building - Latitude 60.937655 Longitude -164.630055 Altitude 4 meters

72. Ungusraq Power Company - Latitude 60.939627 Longitude -164.629336 Altitude 5 meters

1

Abandoned Old BIA School
Value-$2,500,000

2

Abandon Old BIA School 2
Value: $1,000,000

3

***C.V.R.F.* Office & Workshop**
Value-$500,000

4

United Utilitie Company
Value-$7,000,000

1- Adult Occupant
Value - $150,000

6

1- Adult Occupant
Value: $125,000

7

5 - Adults
1- Child
Value - $300,000

1-Adult
Value: $100,000

9

2-Adults
Value: $300,000

10

2-Adults
Value: $300,000

11

3-Adults
Value: $300,000

12

Unoccupied
Value: $225,000

13

Teacher Housing
3- Adults
2- Children
Value: $300,000

14

Teacher Housing
2- Adults
Value: $300,000

15

Teacher Housing
UnOccupied
Value: $150,000

16

Teacher Housing
1 - Adult
Value: $200,000

17

3 - Adults
4 - Children
Value: $300,000

18

6 - Adults
5 - Children
Value: $300,000

19

7 - Adults
6 - Children
Value: $300,000

20

3-Adults
5-Children
Value- $300,000

Teacher Housing
3-Adults
3-Children
Value-$300,000

22

2-Adult
3-Children
Value-$150,000

23

4-Adults
Value-$300,000

24

2-Adults
3-Children
Value-$150,000

Teacher Housing
2-Adults
Value-$300,000

1-Adult
Value-$100,000

6-Adults
4-Children
Value-$225,000

28

4-Adults
Value-$300,000

29

1-Adult
1-Child
Value-$150,000

30

2-Adult
3-Children
Value-$200,000

5-Adults
Value-$300,000

2-Adults
2-Children
Value-$300,000

33

2-Adults
Value-$225,000

1-Adult
3-Children
Value-$225,000

4-Adult
2-Children
Value-$225,000

3-Adult
2-Children
Value-$225,000

37

1-Adult
Value-$175,000

38

3-Adult
7-Children
Value-$225,000

39

2-Adult
2-Children
Value-$200,000

40

1-Adult
Value-$150,000

1-Adult
Value-$200,000

42

1-Adult
Value-$150,000

43

4-Adults
1-Child
Value-$225,000

44

1-Adult
Value-$200,000

45

2-Adult
3-Children
Value-$150,000

46

1-Adult
3-Children
Value-$300,000

47

4-Adults
6-Children
Value-$175,000

48

2-Adults
5-Children
Value-$300,000

49

4-Adults
2-Children
Value-$300,000

50

5-Adults
3-Children
Value-$300,000

51

2-Adult
2-Children
Value-$175,000

1-Adult
Value-$175,000

53

3-Adults
Value-$225,000

54

1-Adult
Value-$125,000

55

2-Adult
3-Children
Value-$150,000

56

4-Adult
3-Children
Value-$225,000

57

1-Adult
2-Children
Value-$225,000

58

3-Adults
1-Child
Value-$225,000

59

5-Adult
3-Children
Value-$225,000

60

2-Adults
Value-$225,000

Holy Family Church Housing
1-Adult
Value-$225,000

3-Adults
9-Children
Value-$150,000

63

Holy Family Church
Value-$350,000

Newtok Clinic
Value-$1,000,000

Community Hall
Value-$225,000

Newtok School
Value-$10,000,000

67

Newtok Post Office
Value-$150,000

Newtok Power Plant
Value-$500,000

Newtok Water Facility
Value-$3,000,000

Newtok Tribal Court
Value-$175,000

Old Newtok Traditional Council
Value-$225,000

72

Ungusraq Power Company
Value-$225,000