

**CITY OF NIGHTMUTE, ALASKA**  
**DRAFT HAZARD MITIGATION PLAN**

DRAFT

*Prepared by  
The City of Nightmute  
Hazard Mitigation Planning Team  
May 2015 Draft Review*

City of Nightmute  
Draft Hazard Mitigation Plan

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**Acronyms/Abbreviations**

°F	Degrees Fahrenheit
ACCIMP	Alaska Climate Change Impact Mitigation Program
AECOM	AECOM
ACWF	Alaska Clean Water Fund
ADWF	Alaska Drinking Water Fund
AEA	Alaska Energy Authority
AEED	Alternative Energy And Energy Efficiency
AEIC	Alaska Earthquake Information Center
AFG	Assistance To Firefighters Grant
AICC	Alaska Interagency Coordination Center
AK	Alaska
AMF	Airport Maintenance Facility
ANA	Administration For Native Americans
ANTHC	Alaska Native Tribal Health Consortium
ARC	American Red Cross
ARW	Airport Runway
AVCP	Association of Village Council Presidents
AVEC	Alaska Village Electric Cooperative
B/C	Benefit vs. Cost or Benefit/Cost
BCA	Benefit-Cost Analysis
BIA	US Bureau Of Indian Affairs
BLM	Bureau of Land Management
BRV	Building Replacement Value
CBO	Communication Building-Other
CCP	Citizen Corps Program
CDBG	Community Development Block Grant
CFR	US Code Of Federal Regulations
CFP	Community Forestry Program
City	City of Nightmute
CP	City of Nightmute's Comprehensive Plan
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
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

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**Acronyms/Abbreviations**

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
DSPR	Division of Spill Prevention and Response
ECP	Emergency Conservation Program
EFSP	Emergency Food and Shelter Program
EMPG	Emergency Management Performance Grant
ENSO	El Niño/La Niña Southern Oscillation
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPPS	Energy Power Production-Small
EQ	Earthquake
ER	Erosion
EWP	Emergency Watershed Protection Program
FEMA	Federal Emergency Management Agency
FFE	First Floor Elevation
FireWise	FireWise residential fire safety program
FL	Flood
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention And Safety
ft	Feet
FY	Fiscal Year
g	Gravity
GF	Ground Failure
GI	Geophysical Institute
GIS	Geospatial Information System
Hazus	Hazard United States – Multi-Hazard Software
HIA	Hazard Impact Assessment
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HRD	Hazus Road Classification (one lane)
HSGP	Homeland Security Grant Program
HUD	Housing And Urban Development
IBHS	Institute For Business And Home Safety
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

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**Acronyms/Abbreviations**

Lindberg	Lindberg Foundation Grant Program
M	Magnitude
MAP	Mitigation Action Plan
MMI	Modified Mercalli Intensity
mph	Miles Per Hour
NAHASDA	Native American Housing Assistance And Self Determination Act
NEHRP	National Earthquake Hazards Reduction Program
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NOAA	National Oceanic And Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRF	National Response Framework
NWS	National Weather Service
OTF	Oil Tank Farm
P	Primary
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
POP	Period Of Performance
PPD-8	Presidential Policy Directive Eight
PWTS	Potable Water Treatment (Plant)-Small
RAGP	Rural Assistance Grant Program
Rasmuson	Rasmuson Foundation Grants
RD	Rural Development
RCASP	Remote Community Alert Systems
RFC	Repetitive Flood Claims
Risk MAP	Risk Mapping, Assessment, and Planning
RL	Repetitive Loss
RurALCAP	Rural Alaska Community Action Program Incorporated
S	Secondary
SAFER	Staffing For Adequate Fire And Emergency Response
SBA	U.S. Small Business Administration
SHMO	State Hazard Mitigation Officer
SHMP	Alaska State Hazard Mitigation Plan
SHSP	State Homeland Security Program
SRL	Severe Repetitive Loss
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
SW	Severe Weather
TF	Technical Feasibility
UAF	University of Alaska Fairbanks

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**Acronyms/Abbreviations**

US or U.S.	United States
USACE	United States Army Corps Of Engineers
USC	United States Code
USDA	United States Department Of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VEP	VISTA Energy Program
VFAG-RFAG	Volunteer Fire Assistance And Rural Fire Assistance Grant
Village	Native Village of Nightmute
VSW	Village Safe Water
WARN	Warning, Alert, and Response Network
WSO	Weather Service Office or Officer
WX	Weather



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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).

## 1.1 OVERVIEW

In recent years, local hazard mitigation planning has been driven by a new 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.

To implement these planning requirements, FEMA published an Interim Final Rule in the Federal Register on February 26, 2002 (FEMA 2002), 44 Code Of Federal Regulations (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 hazard mitigation plans (44 CFR §201.6). 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 City of Nightmute does not currently participate in the NFIP and is therefore ineligible for National Flood Insurance Act Grant Programs until they become a NFIP participant.

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

## 1.2 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).*

### 1.2.1 Hazard Mitigation Assistance (HMA) Grant Programs

HMA grant program activities include:

**Table 1-1 HMA Eligible Activities**

Activities	HMGP	PDM	FMA
<b>1. Mitigation Projects</b>	✓	✓	✓
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 <sup>(1)</sup>	✓	✓	✓
<b>2. Hazard Mitigation Planning</b>	✓	✓	✓
Planning Related Activities	✓		
<b>3. Technical Assistance</b>			✓
<b>4. Management Cost</b>	✓	✓	✓
<sup>(1)</sup> 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” (DHS&EM 2013).*

## **HMP Layout Description**

The HMP consists of the following sections and appendices:

### **Section 1 Introduction**

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**

Provides a general history and background on the City of Nightmute, including historical trends for population and the demographic and economic conditions that have shaped the area.

### **Section 3 Planning Process**

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 City and surrounding area. This section documents public outreach activities (support documents are located in Appendix D); the review and incorporation of relevant plans, reports, and other appropriate information; actions the City of Nightmute 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.

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**Section 4      HMP Adoption**

Describes the community’s HMP adoption process (support documents are located in Appendix C)

**Section 5      Hazard Analysis**

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**

Identifies the City of Nightmute’s potentially vulnerable assets—people, residential and nonresidential buildings, critical facilities, and critical infrastructure. The resulting information identifies the full range of hazards that the City could face and potential social impacts, damages, and economic losses. Land use and development trends are also discussed.

**Section 7      Mitigation Strategy**

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 City of Nightmute. 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**

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 City of Nightmute.

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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Section Two provides the City and Native Village of Nightmute's location, geography, history, and demographic information.

## 2.1 LOCATION, GEOGRAPHY, AND HISTORY

*Negtemiut* (Calista 2014).

Nightmute is located on Nelson Island, in western Alaska along the Toksook River. It is 18 miles east and upriver of the neighboring village of Toksook Bay, and about 100 miles west of Bethel. (DCRA 2014a) (see Figure 2-1).

The City census-designated place covers approximately 101.5 square miles of land and water, and is located in an area influenced by a marine climate. The City's annual precipitation is 22 inches on average, with 43 inches of snowfall. Temperatures range from 41 to 57 degrees Fahrenheit (°F) in summer to around 6 to 24 °F in winter. (DCRA 2014a, WRCC 2015).



Figure 2-1 Nightmute's Location Map

The population according to 2010 estimates is 280, with the majority of the people being of Yupik Eskimo descent. Nelson Island has been inhabited by the Qaluyaarmiut ("dip net people") for 2,000 years, and the current residents are direct descendants of this group. The area was relatively isolated from outside contact and has kept its traditions and culture. Umkumiut is the traditional fish camp. In 1964, several residents moved to Toksook Bay to obtain more cost-effective goods. The city was incorporated in 1974.



Figure 2-2 City of Nightmute Boardwalk 1997

Photo Credit: DCC&ED; DCRA Community Photo Library

## 2.2 DEMOGRAPHICS

The 2010 census recorded 280 residents, of which the median age was 22 indicating a relatively young population. The population of Nightmute is expected to remain steady because over half of the population is under the age of 30. The City population is principally of Yup'ik heritage. The male and female composition is approximately 53% and 43% respectively. The 2010 census revealed that there are 59 households with the average household having approximately 5 individuals (DCRA 2014a). The most recent 2012 DCCED certified population is 281. Figure 2-3 illustrates the City's historic population (DCRA 2014a).

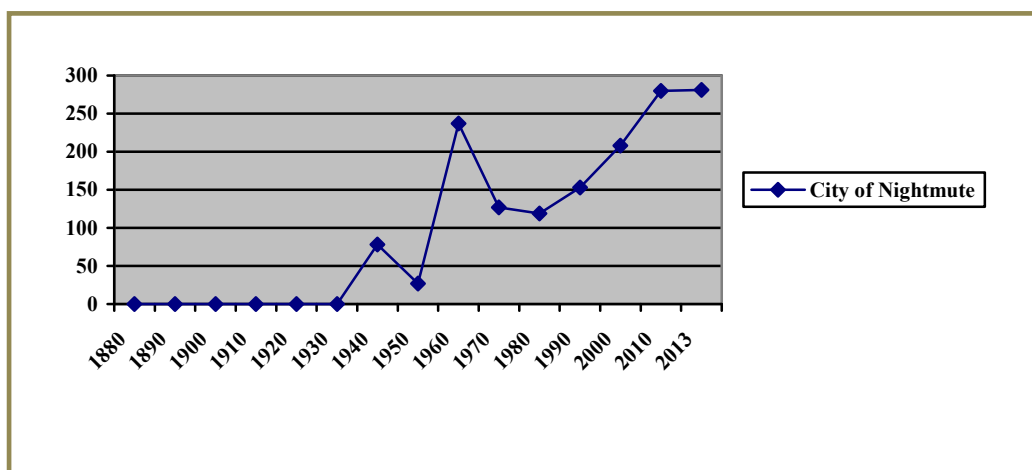


Figure 2-3 Nightmute's Historic Population (DCRA 2014a)

## 2.3 ECONOMY

The City's economy is primarily based on subsistence. Employment is primarily with the school, City or Tribe. Other income generating activities include commercial fishing and construction. 31 residents hold commercial fishing permits for herring roe, salmon or halibut fisheries.

Current services managed by the City, which was incorporated in 1974, include: public safety, a city operated water and sewer haul system and a central watering point for residents to obtain their drinking water. Power service is provided by Alaska Village Electric Cooperative (AVEC). The community has a 1600' state owned airport. Flights are made daily between Bethel and the community. The community also receives goods by barge, although there are no docking facilities (NTC 2004)

According to the 2010 census, the median household income in Nightmute was \$53,750 with a per capita income of \$12,726. Approximately 22.40 % were reported to be living below the poverty level. The potential work force (those aged 16 years or older) in the City was estimated to be 161, of which 123 were actively employed in 2013. From the 2010 Census data the number of unemployment insurance claims in the City was 32; however, practical unemployment or underemployment is likely to be significantly higher. Figure 2-4 depicts an aerial photograph of the City taken in June 2005.





Figure 2-4 Aerial Photograph of the City of Nightmute (DCRA 2014b)

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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.

DMA 2000 and its implementing regulations for the planning process:

DMA 2000 Requirements
<p><b>Local Planning Process</b></p> <p><b>§201.6(b):</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:</p> <p><b>Element</b></p> <p><b>§201.6(b)(1):</b> An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;</p> <p><b>§201.6(b)(2):</b> 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</p> <p><b>§201.6(b)(3):</b> Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.</p> <p><b>§201.6(c)(1):</b> [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.</p> <p><b>§201.6(c)(4)(i):</b> 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.</p> <p><b>§201.6(c)(4)(iii):</b> The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.</p>
1. REGULATION CHECKLIST
ELEMENT A. Planning Process
<p>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))</p> <p>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))</p> <p>A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))</p> <p>A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))</p> <p>A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))</p> <p>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))</p> <p><i>Does the <u>updated plan</u> 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).</i></p> <p><i>Source: FEMA, March 2015.</i></p>

3

### 3.1 OVERVIEW

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



The planning process began on November 21, 2014 with the City Administrator, Noah Lawrence, selected as the Team Leader. Mr. Lawrence organized a planning team to begin HMP development on January 6, 2015 after beginning the process and initiating correspondence in November 2014.

The Planning Team identified applicable City resources and capabilities during the meeting. AECOM explained how the HMP differed from current emergency plans. The Planning Team then discussed the City's rolls such as: acting as an advocate for the planning process, assisting with gathering information, and supporting public participation opportunities. There was also a brief discussion about hazards that affect the community such as embankment scour, sediment deposition, and permafrost impacts, which are increasing in intensity.

The Planning Team further discussed the hazard mitigation planning process, asking participants to help identify hazards that affect the City, to identify impacts to residential and critical facilities, and for assisting the Planning Team with identifying and prioritizing mitigation actions for potential future mitigation project funding

A second meeting was conducted over the phone, by staff from AECOM with the City of Nightmute on March 6, 2015. Staff conducted a conference call arranged by Mayor Wiseman, and the City Council on the evening of March 6, 2015. The community members were asked to help identify hazards that directly affected them, and brainstorm ideas about what could be done to limit damage from those hazards. Goals and potential mitigation projects were discussed for the community. The Planning Team was asked to identify impacts to residential and critical facilities, and for assisting the Planning Team with identifying and prioritizing mitigation actions for potential future mitigation project funding.

In summary, the following five-step process took place from November 2014 through April 2015.

1. Organize resources: Members of the Planning Team identified resources, including staff, agencies, and local community members, who could provide technical expertise and historical information needed in the development of the hazard mitigation plan.
2. Monitor, evaluate, and update the plan: The Planning Team developed a process to ensure the plan was monitored to ensure it was used as intended while fulfilling community needs. The team then developed a process to evaluate the plan to compare how their decisions affected hazard impacts. They then outlined a method to share their successes with community members to encourage support for mitigation activities and to provide data for incorporating mitigation actions into existing planning mechanisms and to provide data for the plans five year update.
3. Assess risks: The Planning Team identified the hazards specific to Nightmute and with the assistance of a hazard mitigation planning consultant (AECOM), developed the risk assessment for seven identified hazards. The Planning Team reviewed the risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy.
4. Assess capabilities: The Planning Team reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards.

5. Develop a mitigation strategy: After reviewing the risks posed by each hazard, the Planning Team developed a comprehensive range of potential mitigation goals and actions. Subsequently, the Planning Team identified and prioritized the actions for implementation.

### 3.2 PLANNING TEAM

The local Planning Team members are Noah Lawrence (Planning Team Leader), with Clement George, **Timothy Armstrong**, Jay Dall Sr., and Janet Lawrence. Table 3-1 identifies the complete hazard mitigation Planning Team.

**3-1 Hazard Mitigation Planning Team**

Name	Title	Organization	Key Input
Kevin Wiseman	Mayor	City of Nightmute	Contact for Organizing HMP development
Noah Lawrence	City Administrator (Ended March 4 <sup>th</sup> , 2015)	City of Nightmute	Planning Team Lead, and HMP review. (Ended March 4, 2015)
Clement George	Community Member	City of Nightmute	Planning Team Member, data input and HMP review.
Timothy Armstrong	Community Member	City of Nightmute	Planning Team Member, data input and HMP review.
Jay Dall Sr.	Community Member	City of Nightmute	Planning Team Member, Tribal data input and HMP review.
Janet Lawrence	Community Member	City of Nightmute	Planning Team Member, Tribal data input and HMP review.
Paul Tulik	President	Tribal Council	Planning Team Member, Tribal data input and HMP review.
Sandra Tulik	City Clerk	City of Nightmute	Planning Team Member, Tribal data input and HMP review.
Scott Simmons	Emergency Management, Hazard Mitigation, and Climate Change Planner	AECOM, Alaska	Temporary Team Member, Responsible for HMP development, lead writer, project coordination.
Evan Wasserman	Hazard Mitigation Planner	AECOM, Alaska	Team Member, Responsible for assisting HMP development, lead writer, project coordination.

### 3.3 PUBLIC & AGENCY INVOLVEMENT

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 August 6, 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)

Table 3-2 lists the community's public involvement initiatives focused to encourage participation and insight for the HMP effort.

**Table 3-2 Public Involvement Mechanisms**

Mechanism	Description
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: <a href="http://ready.alaska.gov/plans/localhazmitplans.htm">http://ready.alaska.gov/plans/localhazmitplans.htm</a>
Public meeting (November 21, 2014)	On November 21, 2014, the Planning Team conducted a public meeting teleconference to introduce the community to the planning process, and solicit input.
Newsletter #1 Distribution (November 21, 2014)	In November 2014, the jurisdiction distributed a newsletter introducing the upcoming planning activity. The newsletter encouraged the whole community to provide hazard and critical facility information. It was posted at City Offices, bulletin boards, shopping centers, and <b>Nightmute's websites to enable the widest dissemination.</b>
Newsletter #2 Distribution (April, 2015)	In May 2015, the jurisdiction distributed a newsletter describing the HMPs availability and present potential HMP projects for review. The newsletter encouraged the whole community to provide comments or input. It was posted at the City Office, and distributed to each postal box to ensure everyone was aware of the meeting.

AECOM made initial contact with City Administrator Lawrence on November 21, 2014; he was very excited that Nightmute was included within DHS&EM's Pre-Disaster Mitigation grant and the prospects of completing the hazard mitigation plan. He was able to begin forming the Planning Team and began directing HMP data acquisition efforts. He introduced the hazard mitigation planning project and introductory newsletter describing the planning process during the City Council Meeting in December 2014.

The newsletter was distributed throughout the community (post offices, public bulletin boards, etc.) announcing the Hazard Mitigation Plan meetings' agenda and brought up for discussion at numerous City Council Meetings.

The Planning Team identified four natural hazards: earthquake, flood/scour, ground failure, and severe weather which periodically impact the City.

AECOM described the specific information needed from the Planning Team to assess critical facility vulnerability and population risk by the location, value, and population within residential properties and critical facilities.

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 City of Nightmute.

A Planning Team meeting was held on January 19, 2015 to review and prioritize the mitigation actions identified based on the results of the risk assessment. A second newsletter was prepared and delivered on February 19, 2015 describing the process to date, presenting the prioritized mitigation actions, and announcing the availability of the draft HMP for public review and comment.

The Planning Team held a special meeting in May 2015 to review the draft HMP for accuracy – ensuring it meets the City's needs. The meeting was productive with the Team highlighting several minor corrections or refinements. Changes were specifically targeted to plan development information, hazard impacts, community vulnerability analysis, and the mitigation strategy.

### **3.4 EXISTING DATA INCORPORATION**

During the planning process, the Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP. The following were available from the DCRA website and were reviewed and used as references for the jurisdiction information and hazard profiles in the risk assessment of the HMP for the City (Table 3-3).

**Table 3-3 Documents Reviewed**

<b>Existing plans, studies, reports, ordinances, etc.</b>	<b>Contents Summary (How will this information improve mitigation planning?)</b>
2004 Nightmute Traditional Council Action Plan	Defined the community's opinions on current services, facilities, and infrastructure.
US Army Corps of Engineers, Erosion Information Paper, - Nightmute Alaska, October, 2011	Defined the community's erosion impacts
US Army Corps of Engineers, Floodplain Manager's Reports, Community Specific 2011	Defined the area's historical flood impacts
The 2004 Solid Waste Management Plan and Feasibility Study (SWMPs)	Provided land use and infrastructure 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

A complete list of references list is provided in Section 8.

### 3.5 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 City'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

#### 3.5.1 Implementing HMP Precepts

DMA 2000 and its implementing regulation for HMP implementation through existing planning mechanisms

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

Once the HMP is adopted by the community 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 undertaken 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

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### 3.5.2 Continued Public Involvement

DMA 2000 and its implementing regulation for continued public involvement:

DMA 2000 Requirements
<b>1. REGULATION CHECKLIST</b>
<b>Continued Public Involvement</b>
<b>§201.6(c)(4)(iii):</b> The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
<b>ELEMENT A Planning Process (Continued)</b>
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 City 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 will be available at the City 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 City 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 City-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.

### 3.5.3 Monitoring, Reviewing, Evaluating, and Updating the HMP

DMA 2000 and its implementing regulation for monitoring, reviewing, evaluating, and updating the HMP:

DMA 2000 Requirements
<b>Monitoring, Evaluating and Updating the Plan</b> <b>§201.6(c)(4)(i):</b> The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT A. Planning Process (Continued)</b>
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 Nightmute’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

### **3.5.3.1 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 City 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 HMP actions’ status.

### **3.5.3.2 Reviewing the HMP**

The City 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 an appropriate strategies to overcome them), and a statement of whether or not the project has helped achieve the appropriate goals identified in the plan.



### **3.5.3.3 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 City 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

3

### **3.5.3.4 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
<b>Reviewing, Evaluating, and Implementing the Plan</b>
<b>§201.6(d)(3):</b> 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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT A. Planning Process (Continued)</b>
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 efforts? (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 City of Nightmute 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 City of Nightmute still desires to implement
  - Prepare a "new" MAP matrix for the City of Nightmute
- 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

#### **3.5.3.5 Formal State and FEMA HMP Review**

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

The Native Village of Nightmute's participation is in lieu of completing a 44 CFR §201.7 tribal specific hazard mitigation plan due to limited available funding needed for the Tribe to meet Tribal HMP project funding match requirements.

The City of Nightmute 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 City will pass an HMP Adoption Resolution. A copy will be sent to FEMA for final HMP approval.

FEMA's final approval assures the City is eligible for applying for appropriate mitigation grant program funding. AECOM will send a final copy of the FEMA approved HMP to the City of Nightmute.

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Section Four is included to fulfill the City of Nightmute HMP adoption requirements.

### 4.1 JURISDICTIONAL ADOPTION

DMA 2000 and its implementing regulations for governing body formal HMP adoption:

DMA 2000 Requirements
<b>Local Plan Adoption</b> <b>§201.6(c)(5):</b> [The plan shall include...] Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.
1. REGULATION CHECKLIST
ELEMENT E. Plan Adoption
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval??) (Requirement §201.6(c)(5))
Source: FEMA, March 2015

4

The City of Nightmute 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 §201.6(c)(5).

The Nightmute City Council adopted the HMP on , 2015 and submitted the final draft HMP to FEMA for formal approval.

Tribal participation is in lieu of completing a 44 CFR §201.7 Tribal Specific Hazard Mitigation Plan due to limited available funding needed for the Tribe to meet Tribal HMP project funding match requirements.

A scanned copy of the City’s intended Letter of Compliance and Assurances are included in Appendix C.

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Section Five identifies and profiles the hazards that could affect the City of Nightmute.

## 5.1 OVERVIEW

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 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 and its implementing regulations for hazard identification:

DMA 2000 Requirements
<b>Identifying Hazards</b> <b>§201.6(c)(2)(i):</b> The risk assessment shall include a) description of the type, 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. <b>§201.6(c)(2)(iii):</b> 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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT</b>
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction? B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?
Source: FEMA, March 2015

## 5.2 HAZARD IDENTIFICATION AND SCREENING

This is the first step of the hazard analysis. On November, 2014 the Planning Team reviewed seven possible hazards that could affect the Lower Kuskokwim REAA. 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 5-1). The Planning Team determined that five hazards pose a great threat to the City: earthquake, erosion/flood, ground failure, and severe weather; some of which are influenced by

increasing changing climate conditions such as late ice formation, early thaw conditions, increased, lack of, or inconsistent rains.

**Table 5-1 Identification and Screening of Hazards**

Hazard Type	Should It Be Profiled?	Explanation
<b>Natural Hazards</b>		
Earthquake	Yes	<p>Periodic, unpredictable occurrences. The Nightmute area experienced no damage from the 11/2003 Denali EQ, but has experienced minor shaking from earthquakes and aftershocks, from the 1975 to the present. The 1964 Good Friday Earthquake was not felt as significantly as other areas of Alaska.</p> <p>The City has experienced 25 earthquakes below M5.0 with epicenters located from 0 to 200 miles from the area since 1975.</p>
Flood (Riverine and/or coastal related floods and resultant erosion)	Yes	<p>Snowmelt run-off and 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.</p> <p>The City experiences storm surge, river embankment ice run-up, and wind erosion along the river shoreline and riverine scour <b>along the area's rivers</b>, streams, and creek embankments from high water flow, riverine high water ice flows, wind, and surface runoff.</p>
Ground Failure (Permafrost, Subsidence)	Yes	<p>Ground Failure occurs throughout Alaska from avalanches, landslides, melting permafrost, and ground subsidence. However subsidence and permafrost are the primary hazards causing houses to shift due to ground sinking and upheaval, and high ground water melting the permafrost.</p>
Severe Weather (Cold, Drought, Rain, Snow, Wind, etc.)	Yes	<p>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.</p> <p>Severe weather events cause fuel price increases and frozen pipes. Heavy snow loads potentially damage house roofs. Winds potentially remove or damage roofs and moved houses off their foundations.</p>
Tsunami (Seiche)	No	This hazard has a low probability of occurrence at this location.
Volcano	No	This hazard has a low probability of occurrence at this location.
Wildland (Tundra) Fire	No	This hazard has a low probability of occurrence at this location.

### 5.3 HAZARD PROFILING

DMA 2000 and its implementing regulations for hazard profiles:

DMA 2000 Requirements
<b>Profiling Hazards</b>
<b>Requirement §201.6(c)(2)(i):</b> [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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT</b>
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction?
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 (breadth, magnitude, and severity)
- Impact (Section 5 provides general impacts associated with each hazard. Section 6 provides detailed impacts to Nightmute’s residents and critical facilities)
- Recurrence Probability

NFIP insured Repetitive Loss Structures (RL) are addressed in Section 6.0, Vulnerability Analysis.



Each hazard is assigned a rating based on the following criteria for magnitude/severity (Table 5-2) and future recurrence probability (Table 5-3).

Estimating magnitude and severity are determined based on historic events using the criteria identified in the introductory narrative description of Section 5.3.

**Table 5-2 Hazard Magnitude/Severity Criteria**

Magnitude / Severity	Criteria
4 - Catastrophic	<ul style="list-style-type: none"> <li>Multiple deaths.</li> <li>Complete shutdown of facilities for 30 or more days.</li> <li>More than 50 percent of property is severely damaged.</li> </ul>
3 - Critical	<ul style="list-style-type: none"> <li>Injuries and/or illnesses result in permanent disability.</li> <li>Complete shutdown of critical facilities for at least two weeks.</li> <li>More than 25 percent of property is severely damaged.</li> </ul>
2 - Limited	<ul style="list-style-type: none"> <li>Injuries and/or illnesses do not result in permanent disability.</li> <li>Complete shutdown of critical facilities for more than one week.</li> <li>More than 10 percent of property is severely damaged.</li> </ul>
1 - Negligible	<ul style="list-style-type: none"> <li>Injuries and/or illnesses are treatable with first aid.</li> <li>Minor quality of life lost.</li> <li>Shutdown of critical facilities and services for 24 hours or less.</li> <li>Less than 10 percent of property is severely damaged.</li> </ul>

Similar to estimating magnitude and severity, recurrence probability is determined based on historic events, using the criteria identified above, to provide the likelihood of a future event (Table 5-3).

**Table 5-3 Recurrence Probability Criteria**

Probability	Criteria
4 - Highly Likely	<ul style="list-style-type: none"> <li>Event is probable within the calendar year.</li> <li>Event has up to 1 in 1 year chance of occurring (1/1=100 percent).</li> <li>History of events is greater than 33 percent likely per year.</li> <li>Event is "Highly Likely" to occur.</li> </ul>
3 - Likely	<ul style="list-style-type: none"> <li>Event is probable within the next three years.</li> <li>Event has up to 1 in 3 years chance of occurring (1/3=33 percent).</li> <li>History of events is greater than 20per cent but less than or equal to 33 percent likely per year.</li> <li>Event is "Likely" to occur.</li> </ul>
2 - Possible	<ul style="list-style-type: none"> <li>Event is probable within the next five years.</li> <li>Event has up to 1 in 5 years chance of occurring (1/5=20 percent).</li> <li>History of events is greater than 10 percent but less than or equal to 20 percent likely per year.</li> <li>Event could "Possibly" occur.</li> </ul>
1 - Unlikely	<ul style="list-style-type: none"> <li>Event is possible within the next ten years.</li> <li>Event has up to 1 in 10 years chance of occurring (1/10=10 percent).</li> <li>History of events is less than or equal to 10 percent likely per year.</li> <li>Event is "Unlikely" but is possible to occur.</li> </ul>

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

### 5.3.1 Earthquake

#### 5.3.1.1 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:

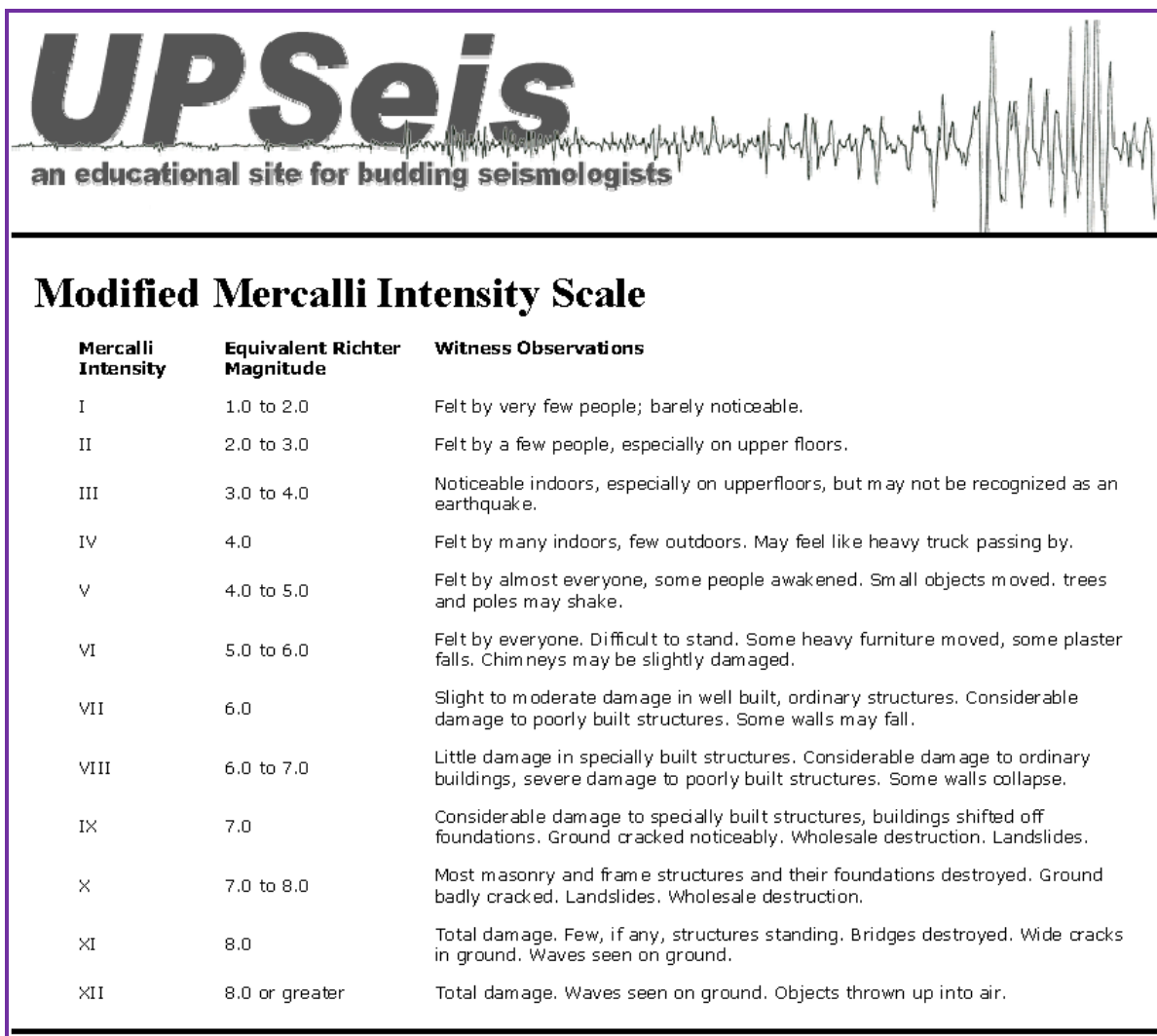
- **Surface Faulting** is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet [ft]), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting 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 5-4, 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 2012).

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 5-1).

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**Figure 5-1 Modified Mercalli Intensity (MMI 2014)**

### 5.3.1.2 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, University of Alaska Fairbanks (UAF) Geophysical Institute's archives. Research included searching the USGS earthquake database for events spanning from 1973 to present; none of which exceeded M4.7 located within 200 miles of the City.

Therefore the Planning Team determined that based on available recorded data, the City of Nightmute 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 5-4 which lists 25 historical earthquakes with the largest one (M4.7) occurring on February 22, 2013. (USGS 2014)

**Table 5-4 Historical Earthquakes for Nightmute**

Year	Month	Day	Time	Latitude	Longitude	Magnitude	Distance (Miles)
2014	March	6	04:51:40	61.595°N	159.690°W	3.9	185
2014	April	7	20:19:28	61.086°N	168.723°W	3.7	141
2013	February	22	17:35:34	60.357°N	162.454°W	4.7	78
2013	March	11	12:58:09	60.368°N	162.184°W	3.4	87
2013	December	23	19:09:35	61.290°N	160.113°W	2.3	165
2011	January	26	04:07:02	61.341°N	159.529°W	2.5	184
2010	June	1	08:31:31	61.037°N	160.863°W	3.5	143
2009	April	22	08:42:39	61.516°N	160.267°W	3.4	166
2009	April	25	07:30:39	59.920°N	159.037°W	2.8	199
2009	September	9	21:15:09	60.626°N	159.214°W	2.9	187
2008	February	29	00:21:55	62.883°N	167.680°W	2.6	192
2008	April	13	08:44:36	63.043°N	163.001°W	2.7	186
2008	August	3	13:39:18	62.599°N	162.732°W	2.9	160
2007	June	13	05:24:31	59.823°N	159.356°W	2.6	190
2005	March	21	03:50:12	62.748°N	165.082°W	3.0	157
2004	April	3	18:35:11	61.441°N	159.669°W	3.8	182
1997	March	20	06:04:15	60.901°N	159.357°W	3.8	184
1997	May	30	10:39:31	62.795°N	168.174°W	4.6	196
1994	February	08	22:55:50	59.771°N	159.614°W	4.0	183
1994	February	10	12:35:42	59.856°N	159.327°W	4.4	190
1992	May	15	17:55:59	58.987°N	160.279°W	4.2	186
1984	February	15	05:01:35	62.285°N	167.725°W	4.1	159
1983	January	30	13:08:52	61.105°N	159.217°W	4.6	191
1980	December	12	07:00:09	60.382°N	160.990°W	Undefined	127
1976	September	06	15:16:24	60.373°N	159.598°W	Undefined	175

(USGS 2014)

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. Nightmute experienced minimal ground motion from this historic event. Planning Team members further stated that Nightmute did not experience any ground shaking from the November 3, 2002 M7.9 Denali EQ.

Figure 5-2 depicts those earthquakes within close proximity (50 to 80 miles) of Nightmute.



**Figure 5-2 Earthquakes Adjacent to Nightmute (AECOM 2015)**

The largest recorded earthquake that has occurred within 100 miles of the City measured M4.7, was 78 miles away, occurring on February 22, 2013. This earthquake did not cause any damage to critical facilities, residences, non-residential buildings, or infrastructure.

### **5.3.1.3 Location, Extent, Impact, and Recurrence Probability**

#### **Location**

The entire geographic area of Alaska is prone to earthquake effects. As such, the City of Nightmute has experienced 25 earthquakes since 1973 with an average of approximately one earthquake every two years.

Figure 5-3 shows the locations of active and potentially active faults in Alaska.

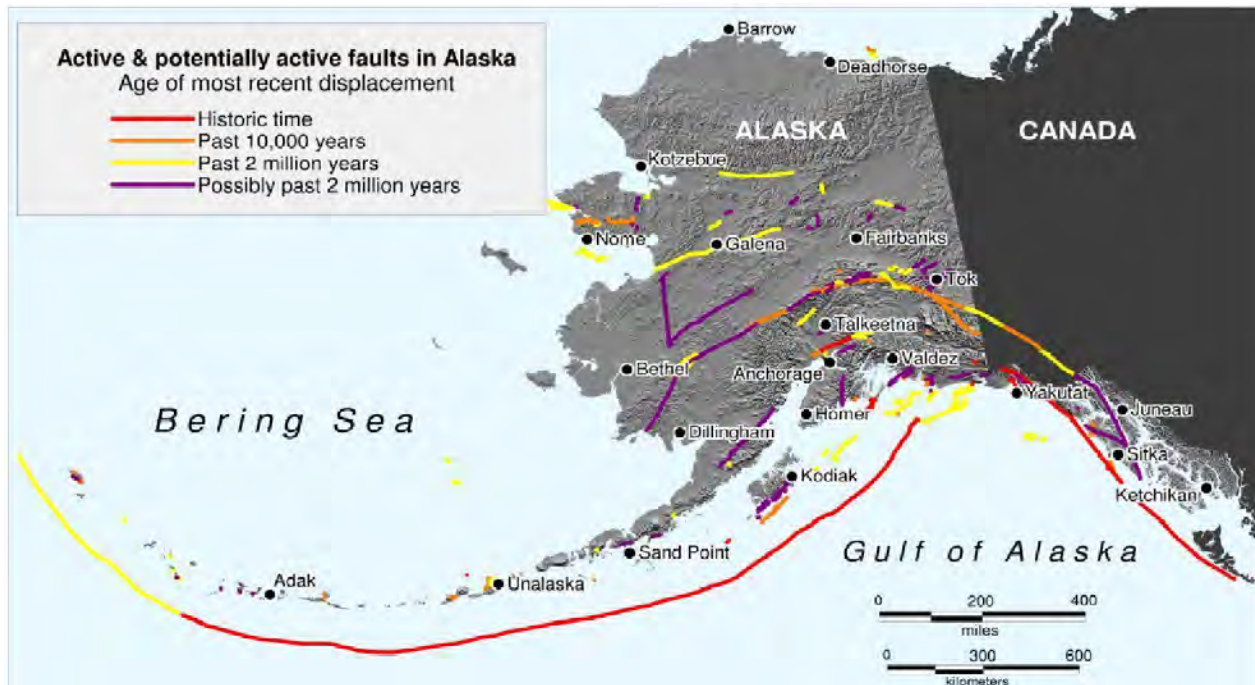


Figure 5-3 Active and Potentially Active Faults in Alaska

### Extent

There are no recorded earthquakes within 200 miles that exceeded M5.0, and the average distance of the 25 recorded earthquakes that were below M5.0 was about 168 miles (with a range from 78 to 199) miles from the City.

Based on historic earthquake events and the criteria identified in Table 5-2, the magnitude and severity of earthquake impacts in the City are considered “Negligible” with injuries treatable with first aid; critical facilities could expect to be shut-down for more 24 hours or less; and less than 10 percent of property severely damaged with limited damage to transportation, infrastructure, or the economy.

The City is located approximately 180 miles from the Denail Fault, Togika-Tikchik, Ataskansouvluk-Holukuk Fault Zone, the intersection of the Thompson Creek and the Iditarod-Nixon Fork Faults, as well as approximately 140 miles from smaller, unnamed faults as depicted in Figure 5-4.



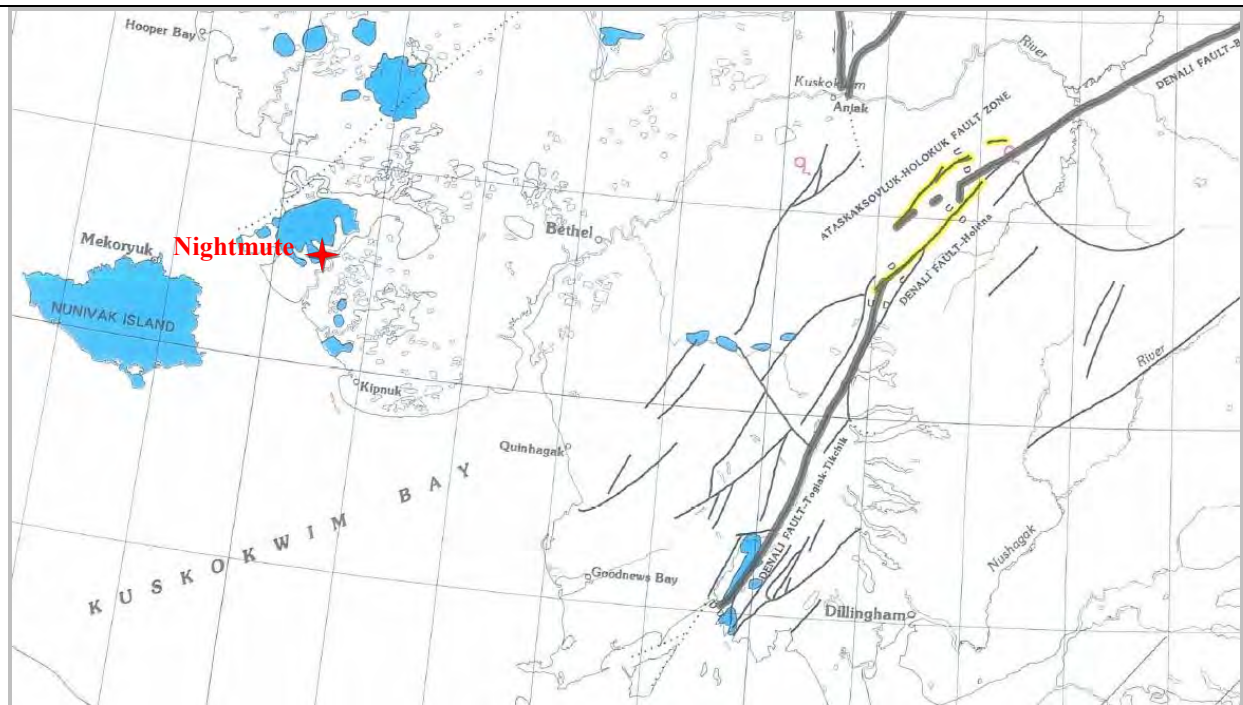


Figure 5-4 Earthquake Fault Proximity to Nightmute. (Plafker et al 1993)

### 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.

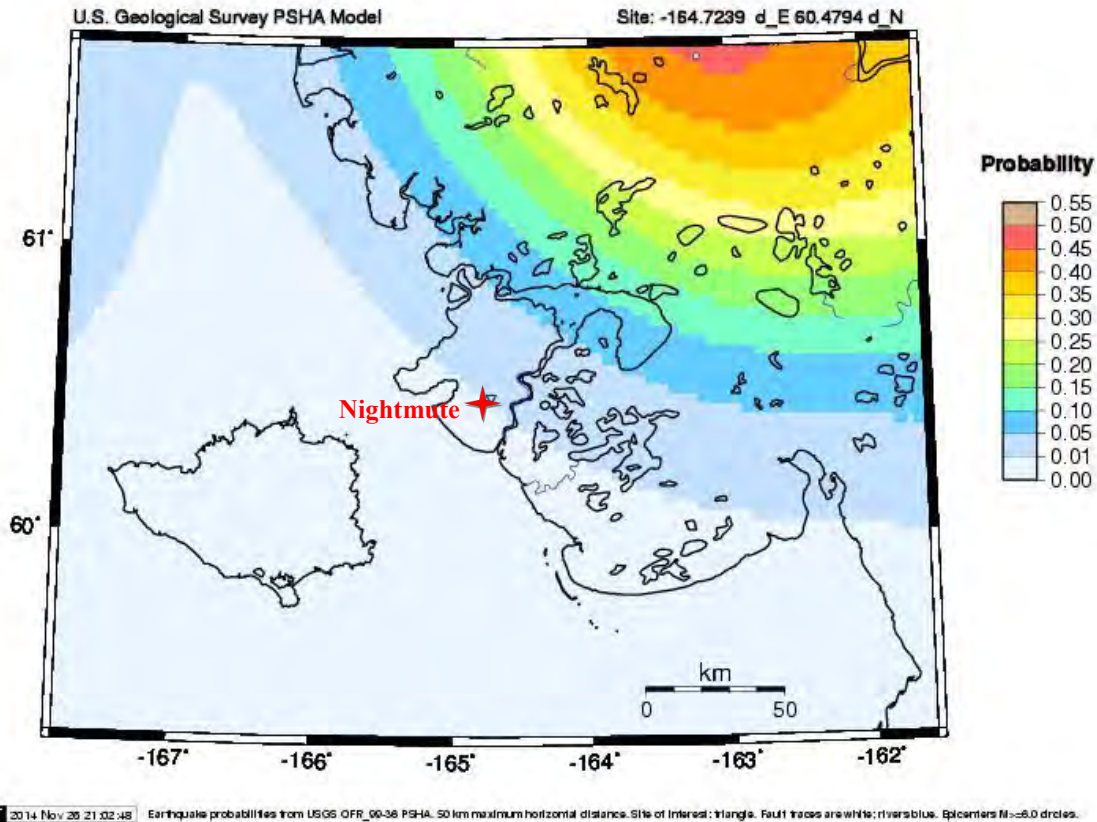
### Recurrence Probability

This 2009 Shake Map 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).*

As indicated in Figure 5-5, while it is not possible to predict when an earthquake will occur. The Shake Map was generated using the United States Geological Survey (USGS) Earthquake Mapping Model.

Pr[Earthquake with  $M \geq 5.0$  within 50 years & 50 km]



**Figure 5-5 Nightmute's Earthquake Probability (USGS 2014)**

The Shake Map indicates a M5.0 or greater earthquake occurring within 50 years and 50 miles of the City is "Possible." Within the next 10 years; the chance of an earthquake of M5.0 or greater is "Unlikely" (1/10=10 percent) chance of occurring; due to an event history that is less than or equal to 10 percent likely per year.

## **5.3.2 Flood**

### **5.3.2.1 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.

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 City: rainfall-runoff, snowmelt, ice jam, storm surge, and ice override floods. Riverine and coastal erosion also are a concern for the community.

**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.

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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.

**Riverine or Coastal Scour** rarely causes death or injury. However, embankment scour causes property destruction, prohibits development, and impacts community infrastructure. Erosion is typically gradual land loss through wind or water scour. However, 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 melting permafrost. Riverine scour is a natural process, but its effects can be easily exacerbated by human activity.

**Riverine Erosion** results from the force of flowing water and ice formations in and adjacent to river channels. This erosion 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, erosion, and material deposition are constant issues. In more stable meandering channels, erosion 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 during rain and snowmelt run-off which typically result from fall and winter sea storms.

### 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 floods or coastal ice override damages.

### 5.3.2.2 History

The City experiences severe flood and river scour from heavy rainfall, storm surge, ice jams, snowmelt, and spring run-off flooding. Spring run-off causes the most damages to the community's road surfaces and creates ponding throughout the community.

The HMP planning team noted that the community floods on an annual basis and about 25% of the residences are affected. Erosion threatens damage to a number of facilities, including the barge landing, the fuel header, fuel tanks, the airport, some power lines, a few homes, and at least one boardwalk. The airstrip has also had damage from flooding and erosion in the past, and is scheduled for upgrades in the upcoming years.

The DHS&EM Disaster Cost Index delineates historical flood events affecting the City. The index lists the following events:

**91-120. Lower Kuskokwim, September 4, 1990:** *A severe storm compounded by high tides caused extensive flooding in coastal communities of the Kuskokwim and Bristol Bay areas and along the lower Kuskokwim River. The flooding caused damage to both public and private property. The disaster declaration authorized assistance to local governments, individuals and families affected by the flooding.*

**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. On October 25, 2005, a request for a federal time extension was submitted. On December 9, 2005 a presidential disaster was declared (DR-1618) for Public Assistance for the Northwest Arctic Boro, Bering Strait REAA, Kashunamiut REAA (Chevak) and the Lower Kuskokwim REAA however, they failed to include the Lower Yukon REAA in the federal declaration. The State will write Project Worksheets for the Lower Yukon REAA under or State Public Assistance Declaration. Individual Assistance total is estimated at \$209K, with 220 applicants. Public Assistance is around \$3.63 million for 16 potential applicants with around 20 PW's. Hazard Mitigation total is \$254K. The total cost for disaster is estimated at \$5.33 million.*

**09-227, 2009 Spring Flood declared by Governor Palin on May 6, 2009 then FEMA declared under DR-1843 on June 11, 2009:** *Extensive widespread flooding due to snow melt and destructive river ice jams caused by rapid spring warming combined with excessive snow pack and river ice thickness beginning April 28, 2009 and continuing. The ice jams and resultant water backup along with flood waters from snow melt left a path of destruction along 3,000 miles of interior rivers, destroying the Native Village of Eagle and forcing the evacuation of multiple communities. The following jurisdictions and communities in Alaska*

have been impacted: Alaska Gateway Rural Regional Educational Attendance Area (REAA) including the City of Eagle and Village of Eagle; the Copper River REAA including the Village Community of Chisotchina; the Matanuska-Susitna Borough; the Yukon Flats REAA including the City Community of Circle, and City of Fort Yukon, the Villages Communities of Chalkyistik, Beaver, Stevens Village, and Rampart; the Yukon-Koyukuk REAA including the Cities of Tanana, Ruby, Galena, Koyukuk, Nulato, and Kaltag; the Iditarod Area REAA including the Cities of McGrath, Grayling, Anvik, and Holy Cross; the Northwest Arctic Borough including the Cities of Kobuk, and Buckland; the Lower Yukon REAA including the Cities of Russian Mission, Marshall, Saint Mary's, Mountain Village, Emmonak, Alakanuk and Pilot Station and the Community of Ohogamiut; the Lower Kuskokwim REAA including the Cities of Bethel, Kwethluk, Napakiak, Napaskiak, and the Village Community of Oscarville; the Yupiit REAA including the City of Akiak, and the Villages of Akiachak, and Tuluksak; the Kuspuk REAA including the Cities of Aniak, Upper Kalskag, Lower Kalskag, and the Villages Communities of Stony River, Sleetmute, Red Devil, Crooked Creek, and Napaimute; the Fairbanks North Star Borough including the City of North Pole and Community of Salcha; the Bering Strait REAA including the City of Nome area.

**13-S-244, 2013 November Storm Disaster declared by Governor Parnell on November 16, 2013:** 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.

(DHSEM 2014)

The National Weather Service delineates the following historical storm related flood events (Table 5-5) that could potentially have impacted the Nightmute area due to its close proximity to their identified Lower Kuskokwim location. Nightmute may or may not have received damage from these weather related events.

**Table 5-5 Historic Flood Events and impacts**

Date	Event Type	Magnitude
2000	Flood, High Wind	Flood, Wind: mph (53Kts) (\$5K Damages): One of the first major Bering Sea storms of the year moved into the southern Bering Sea Sunday, ... for those residing along coastal areas of Bristol Bay and the Kuskokwim Delta, residents had ample lead time (nearly 48 hours) to prepare for the impending situation. Gusts above 60 mph were recorded along the south and southwest side of the storm. Moderately large areas of open water in the south Bering, combined with the strong onshore winds, presented the possibility of coastal flooding across low lying areas of the southwest coast. In fact, high water levels were observed around Bethel, along with a few boats swamped. There were also reports of beach erosion and high water at several coastal villages, along with at least one report of damaged boardwalks. Fortunately, the onset of the strong southwest winds did not directly correspond to the high tide. In fact, most areas were just coming off of low tide when the strong winds hit. The prolonged blow, however, did manage to keep water high into the following high tide period, when damage developed.
2003	Storm Surge/Tide	Storm Surge, Tide: 104 mph (90 Kts): Strong wind across the Alaska Peninsula on the morning of the 8th. A ship outside of Cold Bay reported measured wind gusts of 104 mph. The strong long southwest fetch across the Bering Sea resulted in a coastal storm surge along the Yukon and Kuskokwim Delta and northern Bristol Bay.
2004	Flood	Storm Surge Flood: A strong storm in the Bering Sea created a long fetch with high wind. This produced a coastal storm surge resulting in minor coastal flooding along the Kuskokwim Delta.
2006	Coastal Flood	Storm Surge Flood: The Remnants of super typhoon Loke moved into the Bering Sea... Strong west wind across the Bering Sea that produced seas in excess of 30 feet; this surge coincided with very high astronomical tides along the Bristol Bay coast and the coast of the Kuskokwim Delta. The combination of the storm surge and the very high tides produced minor coastal flooding along the Bristol Bay coast and the Kuskokwim Delta coast.
2013	Coastal Flood	An intense and large storm in the Bering Sea produced a long fetch of strong wind across the Bering Sea aligned with the Kuskokwim Delta coast November 6th through the 9th. This produced a surge of up to 5 feet along the Kuskokwim Delta Coast.

(NWS 2014, DHS&EM 2014a)

### **Flood or high water flow induced erosion events**

USACE completed an erosion survey for the City of Nightmute during their 2009 Baseline Erosion Assessment. The report listed the community as having “bank erosion reported” and determines that it’s an erosion threat is classified as “Monitor Conditions”. The October 10, 2008 Erosion Information Paper – Nightmute Alaska describes their threat as:

#### ***“Description of Erosion Problem***

*The Toksook River bank erodes at Nightmute. Fluctuations in river levels and flow, flooding, storms, high winds, ice jams, spring break up, melting permafrost resulting in ground subsidence, high tides from the bay and boat wakes reportedly cause and contribute to erosion. Turning propellers churn up areas at the landing dock and across from the school. Bank erosion is reported along the whole length of the community affecting homes, schools, boardwalks, fuel pumps, store, storage and steam bath structures. Areas of the communities’ boardwalks are about 5 feet from the river and tilting/sinking towards the river. There were a few big storms in the 1970s and 80s, but big storms reportedly have become more frequent in recent years. River erosion*



*protection was the 3rd highest priority set by the tribal council and strategic planning participants in the Nighthmute Traditional Council Action Plan and was included on the list of potential new strategic initiatives for 2004-2024.*

*The river bank below the High School between 2006-2007 has eroded about 15-20 feet and is about 50 feet or less from the kindergarten building. The fuel pump delivery coupling is about 15-20 feet away from the river bank and since 2006-2007 about 10-15 feet has eroded away. Barge landing/docking area has eroded 10-15 feet and STG Contractor has placed rocks to allow them to unload the barge. The drain pipes are exposed and sitting on the land and is only draining water during the spring melting season. The Corporation Store is sinking towards the river and is about 5 feet to the river banks” (USACE 2008).*

The paper noted the last flood event as occurring in 1985; however, community residents reported a significant flood event in November 2013. Damage to bridges and other structures were recorded during the 2013 event. No lives were lost (USACE 2011). Figure 5-6 depicts the City’s typical flood impact areas.

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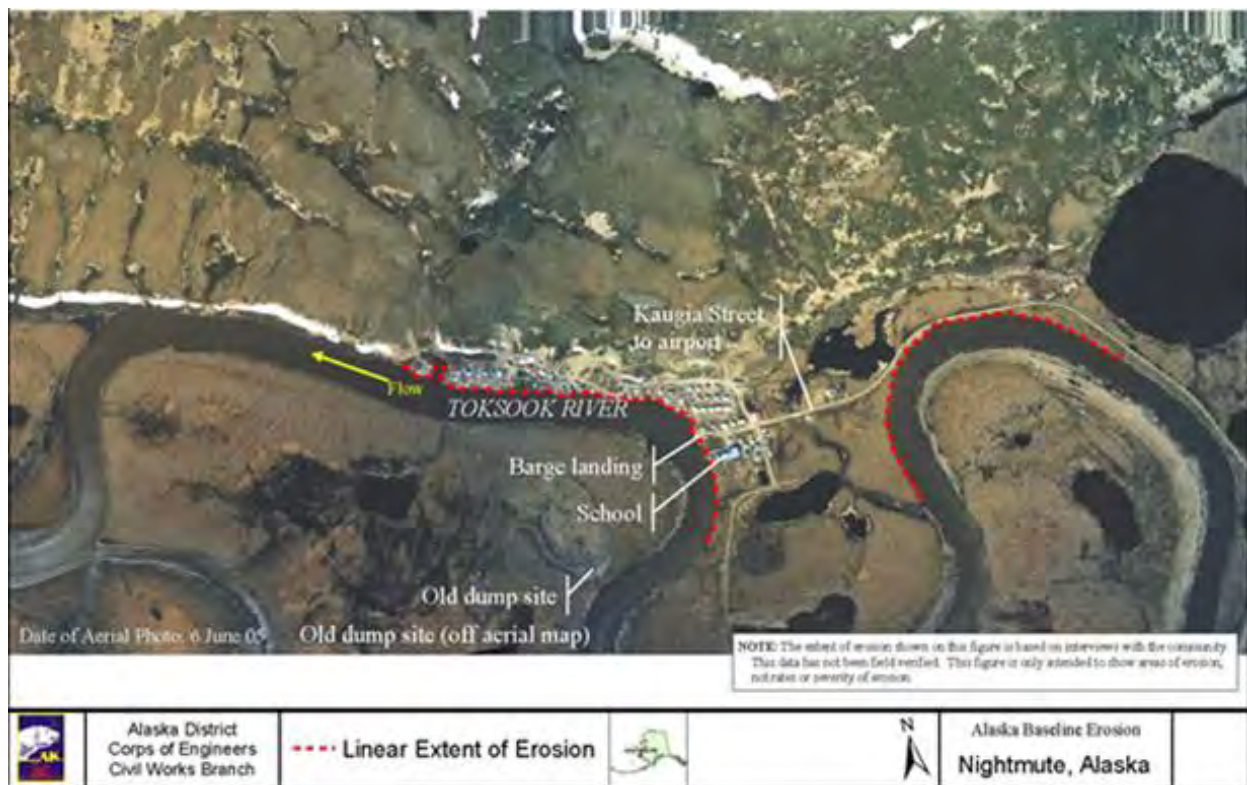
**Figure 5-6 City of Nighthmute Extent of Flooding and Scour (USACE 2008)**

### 5.3.2.3 Location, Extent, Impact, and Future Events Probability

#### Location

The Planning Team indicated that Nightmute has minor flooding impacts; most of which occur from rainfall and snowmelt run-off into the Toksook River. Water fills the river with additional water or it is collected in low terrain depressions and may rise to just below structures; most homes and buildings are on pilings. The Erosion Information Paper – Nightmute, Alaska dated 2008 reported the following erosion problems or issues associated with the Toksook River “Bank erosion is reported along the whole length of the community affecting homes, schools, boardwalks, fuel pumps, store, storage and steam bath structures. Areas of the communities’ boardwalks are about 5 feet from the river and tilting/sinking towards the river” (USACE 2008).

Figure 5-7 depicts the City’s USACE generated aerial photograph and their identified flood or high water flow induced erosion impact locations.



**Figure 5-7 Nightmute’s Scour Locations (USACE 2005)**

The City stated they experience scour along the Toksook River, along with severe road top gravel damage from rain and snow-melt resulting in high water flows throughout the community. High water flow removes riverine embankment, and damages to residences, the school, and the clinic. Rain and snow melt run-off removes the road topping material, creates severe pot holes, and other damages. The roads become extremely muddy once the topping has been removed.

## Extent

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

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
- City location related to identified-historical flood elevation

The City does experience severe riverine flooding and severe high water flow flood scour impacts. Therefore, based on past high water flow event history and the criteria identified in Table 5-2, the extent of flooding and resultant damages to infrastructure and their protective embankments in the City are considered “Critical” where critical facilities would shut-down for at least two weeks with more than 25 percent of property 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).

The 2008 Erosion Information Paper describes Nightmute's potential impacts as:

***“Potential Damages***

*Utility poles and lines have been moved toward the mountain and are now safe. The State of Alaska Department of Transportation and Public Facilities (DOT/PF) has been monitoring the condition of the airport access road, which was damaged by erosion. DOT/PF, in cooperation with the Federal Aviation Administration, issued a public notice in October 2006 for proposed improvements to the airport including rehabilitation and stabilization of the existing airport access road. Funding for the Nightmute the airport reconstruction and access road rehabilitation was included in the Governor's 2007 supplemental budget.*

*A series of 55 gallon drums filled with dirt and with holes punched in them were placed along the Toksook River bank on the east end of the community to slow erosion a number of years ago. This measure apparently helped, but most of the drums have rusted out. The tide takes mud out of the remaining drums and erodes the bank around them...*

*Residences at the west end of the community are about 15 feet from the high water mark. Rising water reaches their steps during fall storm events. The fuel tanks are in an area where high water can reach them and the sewer lines get swamped from high water during storms. High water and erosion have been getting closer to the school in the last few years. There are plans to relocate the tank farm farther up on the hill” (USACE 2008).*

**Recurrence Probability**

Based on previous occurrences, USACE Floodplain Manager's report, and criteria in Table 5-3, there is a 1 in 3 year ( $1/5=33$  percent) chance of occurring. History of events is greater than 20 percent but less than or equal to 33 percent likely per year. There is no data identifying a 500-year (0.2 percent chance of occurring in a given year) flood threat in Nightmute.

**5.3.3 Ground Failure**

**5.3.3.1 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, melting



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 stable 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 32°F has existed for two or more years. (DHS&EM 2010).

5

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 2010 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 Nightmute.

#### 5.3.3.2 *History*

There are few written records defining ground failure impacts. However, residents of Nightmute have been monitoring ground subsidence and recognize the impacts.

### 5.3.3.3 Location, Extent, Impact, and Recurrence Probability

#### Location

There are various ground failure locations throughout Nightmute. Land subsidence such as melting permafrost and floodwater soil saturation are the most common ground failure impacts.

Residents of the City describe ground failure impacts such as homes and facilities sinking on their pilings, and subsidence of farm tank facilities and airport facilities. This can also include events such as creeping and sliding soil, flows, landslides, avalanches, and development.

The City of Nightmute's Solid Waste Management Plan/Feasibility Study (SWMPS), August 2004, developed by Summit Consulting Services Inc. provides a little insight into the community's soil conditions:

#### 2. Geology & Soil Conditions

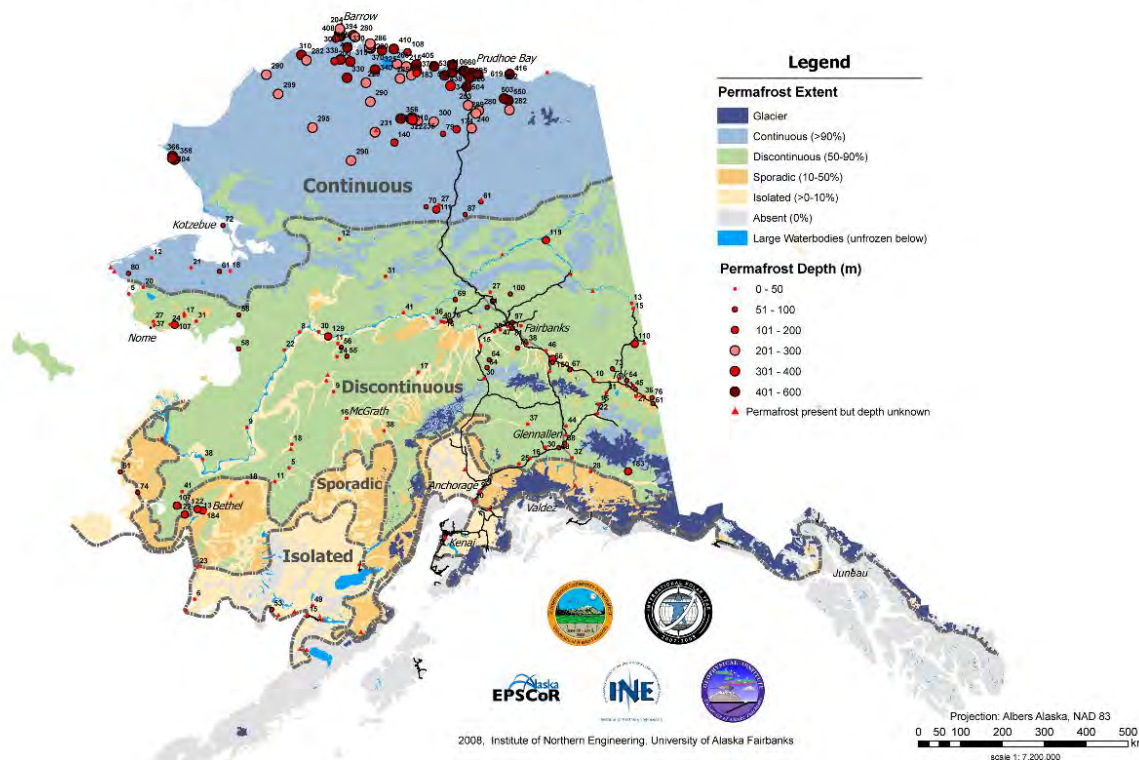
*Nightmute is located at the contact point between the folded basalt hills to the north and the flat tidal plain to the south. The hills that form the upper Toksook River catchment are a series of anticline and syncline terrain. The tidal flat is composed of interbedded marine deposits and fluvial sediments deposited by the Yukon-Kuskokwim River deltas. Additional details can be found in the trip report by Natural Resources Conservation Service (NRCS) Geologist Terril Stevenson (see Appendix F).*

*Several geotechnical reports describe the soils, especially on the flat plain where development such as the airport, road, school, and lagoon has occurred. In October 1994, Duane Miller and Associates probed the soil in four locations along the alignment of the then proposed road to the lagoon and at the lagoon. The soils were found to be fine grained, with low-to-moderate salinity, and with a temperature close to the thaw point. The salinities measured in the soil samples could depress the freezing point by approximately 0.5° F. Although no massive ice was discovered, the report advises that thaw settlement will occur where the natural ground cover is disturbed because the annual thaw depth will deepen.*

*In November 2003, ADTPF performed a geotechnical survey of the proposed road alignment to Toksook Bay. The test holes were located above the bluff at the base of Toksook Mountain, and test holes TH03-503 through TH03-505 are located near the proposed location for Alternative Landfill Site #2. The test-hole results indicate that landfill construction on the hillside could be complicated by frozen soils with high moisture contents. An analysis for moisture content at TH03-503 and from two depths at TH03-505 reported values of 350 percent, 64 percent, and 46 percent respectively. (TH03-502 and TH03-504 were not analyzed)" (SWMPS 2004).*

According to permafrost and ice conditions map (Figure 5-8) developed for the National Snow and Ice Data Center/World Data Center for Glaciology located in the State Hazard Mitigation Plan (SHMP), shows that Nightmute has discontinuous permafrost as supported by soil investigations during the 2004 SWMPS development process identified various locations with frozen ground and potential permafrost encountered throughout the City. This location specific data substantiates Jorgensen et al's research.

## Permafrost Characteristics of Alaska



**Figure 5-8 Permafrost and Ground Ice 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) were damaged and transportation was effected.

Based on research and the Planning Team's knowledge of past ground failure and a variety of degradation events and the criteria identified in Table 5-2, the potential severity of ground failure impacts in the community are classified as "Limited." Impacts would not occur quickly but over time with some potential warning signs. Therefore, this hazard would not cause permanent disability with critical facility shutdown could last for more than a week, with more than 10 percent of properties with the experiencing severe damage.

### 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 damages 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.

Subsidence has been recorded in the City and throughout the community, including homes, fuel tank sites, the school, and at the airport. The community has noted that about 100% of all the buildings in the community are affected by structural issues due to permafrost.

### **Recurrence Probability**

Even though there are few written records defining ground failure impacts for the City, the Planning Team has solid evidence of their recurring ground failure damages throughout the community – to structures, roads, barge landing areas, and the airport based on infrastructure feasibility studies and community member testimony. The probability for ground failure follows the criteria in Table 5-3, the future damage probability resulting from ground failure is “Likely” in the next three 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.

## **5.3.4 Severe Weather**

### **5.3.4.1 Nature**

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Severe weather occur throughout Alaska with extremes experienced by the City of Nightmute that includes thunderstorms, lightning, hail, heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds. The City 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 phenomena 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 Nightmute.

**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 less than -40°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. (DHS&EM 2013)

**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. In Alaska, high winds (winds in excess of 60 mph) occur rather frequently over the coastal areas along the Gulf of Alaska, the Kuskokwim Bay, Nelson Island, and the Bering Sea. High winds are a threat to Nightmute.

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.

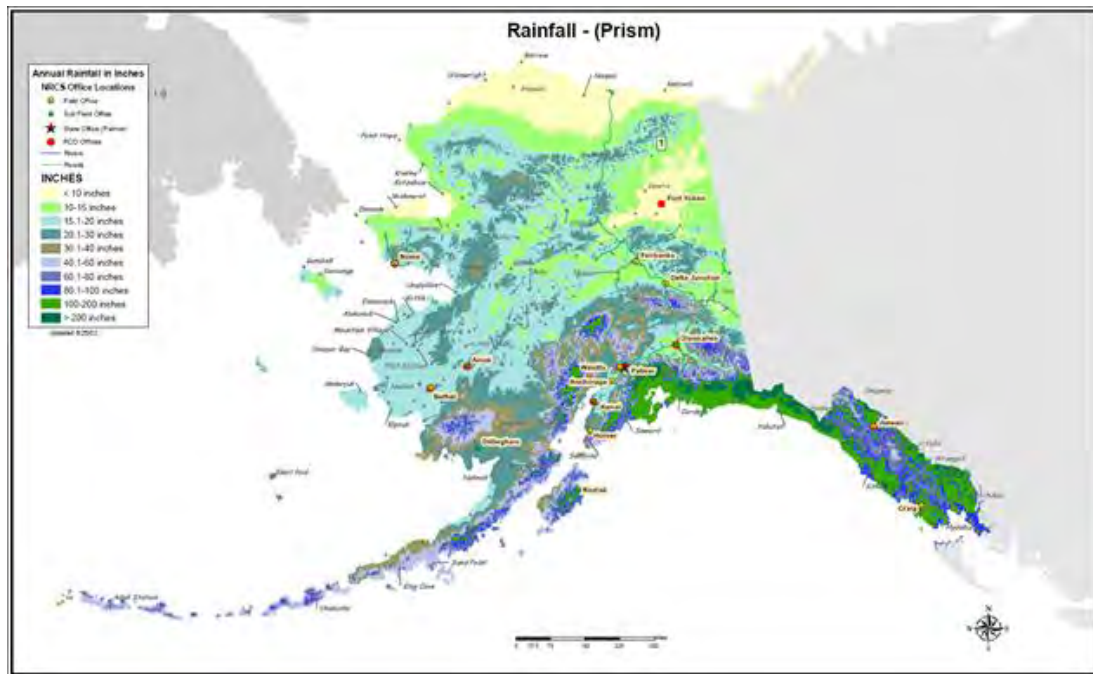
**Winter Storms** include a variety of phenomena described above and as previously stated may include several components; wind, snow, and ice storms. Ice storms, which include freezing rain, sleet, and hail, can be the most devastating of winter weather phenomena and are often the cause of automobile 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 supercooled, that is, in liquid state at below-freezing temperature. These supercooled 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 cloud bank 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 5.3.3.

Figure 5-9 displays Alaska's annual rainfall map based on Parameter-elevation Regressions on Independent Slopes Model (PRISM) that combines climate data from the National Oceanic And Atmospheric Administration (NOAA) and Natural Resources Conservation Service (NRCS) climate stations with a digital elevation model to generate annual, monthly, and event-based climatic element estimates such as precipitation and temperature.



**Figure 5-9 Statewide Rainfall Map (NOAA 2015, NRCS 2015)**

### **5.3.4.2 History**

The City of Nightmute is continually impacted by severe weather events. Hurricane force wind, storm surge, and cold typically have disastrous results. Residents reported events in 2013, 2012, 2011, 2009, 2000, 1999, 1998 with winds over 80mph in the 2011 event.

Table 5-6 summarizes precipitation and snowfall trends for the Bethel area providing a representation of the typical weather events which may have impacted Nightmute. Table 5-7 delineates the Weather Service Office's (WSO) temperature trends. Actual community temperatures and depths may vary due to their relative proximity to the WSO.

**Table 5-6 Precipitation Trends: BETHEL WSO AIRPORT; Station:500754**

From Year=1949 To Year=2012													
Precipitation											Total Snowfall		
Month	Mean (in.)	High (in.)	Year	Low (In.)	Year	1 Day Max. (dd-mm-yyyy)	>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean (in.)	High (in.)	Year
January	0.77	6.48	1952	0.04	2004	1.76 01-03-1952	9	2	0	0	7.9	57.4	1952
February	0.71	3.41	1951	0	1984	1.03 02-27-1996	8	2	0	0	7.3	35.8	1951
March	0.75	3.44	1991	0	1986	0.85 03-15-1951	9	2	0	0	8.5	36.1	1951
April	0.72	3.89	1979	0.02	1985	0.92 04-18-1983	10	2	0	0	5.4	28.7	2006
May	0.95	3.63	2002	0.02	1954	1.35 05-02-2012	11	3	0	0	1.8	7.7	1998
June	1.55	4.30	1999	0.25	1974	1.36 06-11-1981	13	5	0	0	0.1	2.2	1963
July	2.26	4.19	2001	0.49	1957	1.43 07-27-1952	16	7	1	0	0	0	1950
August	3.35	12.37	1951	0.99	1976	2.30 08-12-1951	18	9	2	0	0	0	1950
September	2.50	7.05	2007	0.42	1968	1.97 09-28-1971	16	7	1	0	0.3	5.5	2004
October	1.47	4.45	2006	0.11	1965	1.37 10-04-74	12	5	0	0	4.1	12.8	1978
November	1.29	4.23	2003	0.04	1969	1.45 11-08-2000	12	4	0	0	10.0	34.7	1994
December	1.06	6.17	1951	0.05	1956	1.18 12-23-1970	11	3	0	0	10.3	47	1951
Annual	17.36	40.42	1951	7.29	1976	2.30 08-12-1951	145	52	6	1	55.7	149.5	1951
Winter	2.54	14.90	1952	0.45	1974	1.76 01-03-1952	28	7	1	0	25.5	123.6	1952
Spring	2.41	6.36	1951	0.74	1966	1.35 05-02-2002	30	8	0	0	15.7	53.2	2006
Summer	7.16	16.91	1951	2.71	1976	2.30 08-12-1951	47	21	3	0	0.1	2.2	1963
Fall	5.26	10.43	2007	1.69	1969	1.97 09-28-1971	41	16	2	0	14.4	36.2	1994

Table updated on Oct. 31, 2012

For monthly and annual means, thresholds, and sums:  
Months with 5 or more missing days are not considered

Years with 1 or more missing months are not considered

Seasons are climatological not calendar seasons

Winter =  
Dec., Jan., and Feb.  
Summer =  
Jun., Jul., and Aug.

Spring =  
Mar., Apr., and May  
Fall =  
Sep., Oct., and Nov.

Source: WRCC 2012



**Table 5-7 Temperature Trends: Station:500754; BETHEL WSO AIRPORT**

From Year=1949 To Year=2012															
Month	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp		Min. Temp	
	Max. (°F)	Min. (°F)	Mean (°F)	High (°F)	Year	Low (°F)	Year	Highest Mean (°F)	Year	Lowest Mean (°F)	Year	>= 90 (°F) #Days	<= 32 (°F) #Days	<= 32 (°F) #Days	>= 0 (°F) #Days
January	12.0	-0.8	5.6	48	1963	-48	1989	25.7	1985	-17.3	2012	0.0	25.4	30.4	16.3
February	15.4	1.4	8.5	46	1970	-39	1954	26.1	1989	-13.2	1984	0.0	21.7	27.7	13.3
March	20.9	4.9	12.9	48	1954	-42	1956	29.4	1981	-3.1	1966	0.0	22.5	30.6	12.9
April	33.1	17.2	25.1	63	2004	-31	1956	35.7	2007	8.3	1985	0.0	12.1	27.9	4.4
May	49.6	32.6	41.1	80	1993	4	1965	48.1	1981	31.0	1964	0.0	1.3	15.3	0.0
June	59.9	43.1	51.5	86	1959	28	1960	57.8	1957	45.1	1978	0.0	0.0	0.6	0.0
July	62.6	48.0	55.3	86	1951	31	1959	61.1	2004	50.5	1959	0.0	0.0	0.0	0.0
August	59.7	46.6	53.1	87	2003	28	1984	59.4	2004	49.0	1969	0.0	0.0	0.1	0.0
September	52.1	38.6	45.3	72	1979	18	1957	50.2	1995	37.6	1992	0.0	0.1	5.5	0.0
October	35.8	24.4	30.1	65	1954	-6	2001	38.5	2006	20.9	2008	0.0	10.4	25.3	0.4
November	23.4	11.3	17.4	51	2002	-26	2008	27.4	1970	2.8	1963	0.0	20.8	28.5	6.7
December	14.1	1.2	7.6	49	2007	-41	1957	25.3	1985	-10.7	1999	0.0	25.0	30.5	15.4
<i>Annual</i>	36.6	22.4	29.5	87	2003	-48	1989	34.3	2002	24.7	1956	0.0	139.4	222.5	69.5
<i>Winter</i>	13.8	0.6	7.2	49	2007	-48	1989	21.8	2001	-2.7	1965	0.0	72.1	88.6	45.0
<i>Spring</i>	34.5	18.2	26.4	80	1993	-42	1956	36.6	1981	16.5	1972	0.0	36.0	73.8	17.3
<i>Summer</i>	60.7	45.9	53.3	87	2003	28	1960	58.8	2004	50.1	1965	0.0	0.0	0.7	0.0
<i>Fall</i>	37.1	24.8	30.9	72	1979	-26	2008	36.4	2002	25.1	2008	0.0	31.2	59.3	7.2

Table updated on Oct. 31, 2012

For monthly and annual means, thresholds, and sums:  
Months with 5 or more missing days are not considered  
Years with 1 or more missing months are not considered  
Seasons are climatological not calendar seasons

Winter =  
Dec., Jan., and Feb.  
Summer =  
Jun., Jul., and Aug.

Spring =  
Mar., Apr., and May  
Fall =  
Sep., Oct., and Nov.

Source: WRCC 2012

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

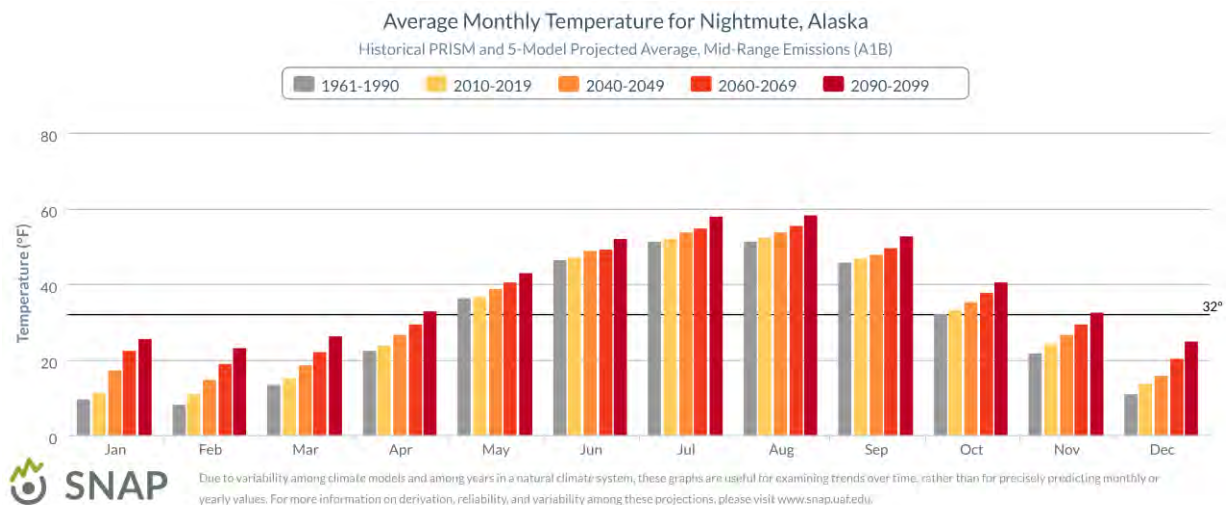
**“83. Omega Block Disaster, January 28, 1989 & FEMA declared (DR-00826) on May 10, 1989** The Governor declared a statewide disaster to provide emergency relief to communities suffering adverse effects of a record breaking cold spell, with temperatures as low as -85 degrees. The State conducted a wide 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: Section 5.3.2.2 provides additional storm related flood disaster events. This information was not repeated here for brevity.*

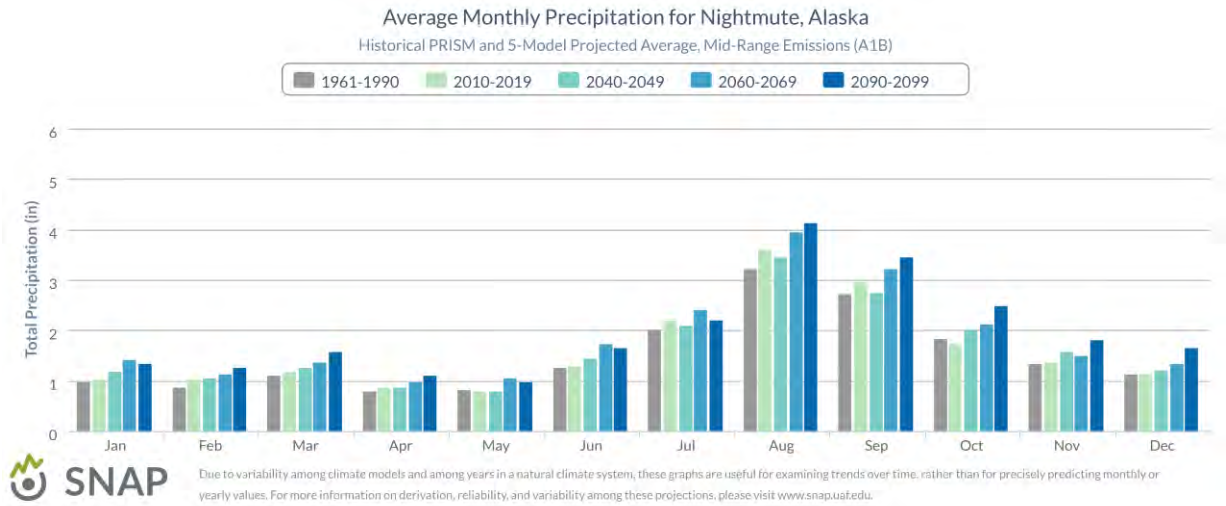
Figures 5-10 and 5-11 depict the City's historic and future predicted precipitation and temperatures.

\* Note: The projected decreasing precipitation due to climate changes. Increased rain and snow could dramatically increase flooding and erosion.

5



**Figure 5-10 Nightmute's Historic and Predicted Precipitation (UAF SNAP 2014).**



**Figure 5-11 Nightmute’s Historic and Predicted Temperatures (UAF SNAP 2014)**

**5**

Table 5-8 lists a representative sample of Nightmute’s major storm events the National Weather Service (NWS) identified for the Kuskokwim Delta’s Weather Zone. Each weather event may not have specifically impacted the Nightmute area. These storm events are listed due to their close proximity to listed communities or by location within the identified zone.

**Table 5-8 Severe Weather Events**

Location	Date	Event Type	Magnitude
Kuskokwim Delta (Zone)	3/9/2013	Blizzard	A fast moving low crossed the Eastern Bering Sea and passed just north of the Kuskokwim Delta on March 9th. The strong south to southwest gradient over the region in conjunction with the lifting from the low produced blizzard conditions in a number of communities in Southwest Alaska.
Kuskokwim Delta (Zone)	12/20/2009	High Wind	Blizzard, Snow, Wind: 78 mph (68 knots [Kts]): An intense Bering Sea Storm produced localized high wind along the Kuskokwim Delta and Bristol Bay coast of Alaska. The peak wind was 78 mph in this region. Platinum measured a peak gust of 68 KT. Based upon this observation it is estimated gust were at least this high in Kuskokwim Bay.
Kuskokwim Delta (Zone)	10/13/2000	Ice Storm	Ice Storm: (\$5K Damages): Freezing rain...reported around Bethel by the observer at the Weather Service Office. Indications were that freezing rain was also falling in other parts of the Kuskokwim Delta. The event lasted a little over 7 hours. Temperatures rose above freezing into the upper 30s in the afternoon. A coating of ice was reported on structures such as buildings and also on cars. Several vehicles sustained minor damage.
Kuskokwim Delta (Zone)	1/2/2000	Extreme Cold/Wind Chill	Extreme Cold, Wind Chill: -70 F. Wind chills reached -70°F along the coastal areas of the Kuskokwim Delta several times during the period.
Kuskokwim Delta (Zone)	12/25/1999	Winter Storm	Blizzard, Snow, Extreme Cold, Wind Chill: -70°F: Blizzard conditions were reported across much of the southwest Alaskan coast, Bristol Bay, the eastern Aleutians and Pribilofs

**Table 5-8 Severe Weather Events**

Location	Date	Event Type	Magnitude
			Sunday. Wind gusts reached close to 50 mph in places, with local wind chills to -70°F calculated in the southwest interior. By Sunday morning, freezing rain was locally reported across the Bristol Bay and Kuskokwim Valley zones. Two snow machiners died in the Kuskokwim Delta on their way to Bethel, where warnings for wind chills to -75°F were in effect. Rain and freezing rain were preceded by locally heavy snows across much of the southern third of the Alaska mainland from Saturday afternoon through midday Sunday...
Kuskokwim Delta (Zone)	12/10/1999	Cold/Wind Chill	Extreme Cold, Wind Chill: -65°F, 50 mph (43 Kts): Brisk northerly winds brought wind chills down to 65 below across many areas of the Kuskokwim Delta and Bristol Bay. Local wind chills to -65°F were also observed along higher terrain of the Kuskokwim Valley. Brisk northeast winds, gusting to 50 mph locally around Cantwell and out of the passes of the western Alaska Range Saturday and Sunday, also brought wind chills down as low as -65°F. Local winds around Whittier reached 63 mph Sunday evening.
Kuskokwim Delta (Zone)	4/29/1999	High Wind	High Wind: 67 mph (58 Kts). Across the Kuskokwim Delta, windy conditions were more widespread. Brisk south winds preceded the front, affecting nearly all reporting stations in the zone. Highest winds were recorded at the Saint Mary's ASOS, where adjusted gusts reached 67 mph. At Bethel, adjusted ASOS gusts reached 56 mph Thursday afternoon, with frontal passage occurring just prior to 6 pm Thursday.
Kuskokwim Delta (Zone)	3/30/1998	High Wind	Wind: 70 mph (58 Kts). Very strong southeast winds preceded the storm...generally reaching gusts from 40 to 55 mph. Strongest winds, however gusts reached close to 70 mph.
Kuskokwim Delta (Zone)	3/9/2013	Blizzard	A fast moving low crossed the Eastern Bering Sea and passed just north of the Kuskokwim Delta on March 9th. The strong south to southwest gradient over the region in conjunction with the lifting from the low produced blizzard conditions in a number of communities in Southwest Alaska.
Kuskokwim Delta (Zone)	12/20/2009	High Wind	Blizzard, Snow, Wind: 78 mph (68 knots [Kts]): An intense Bering Sea Storm produced localized high wind along the Kuskokwim Delta and Bristol Bay coast of Alaska. The peak wind was 78 mph in this region. Platinum measured a peak gust of 68 KT. Based upon this observation it is estimated gust were at least this high in Kuskokwim Bay.

(WRCC 2015)

### 5.3.4.3 Location, Extent, Impact, and Recurrence Probability

#### Location

The entire Kuskokwim Delta area, which is the closest and most similar designated area that includes the City of Nightmute, experiences periodic severe weather impacts. The most common

to the area are high winds and severe winter storms. Table 5-8 depicts weather events that have impacted the area since 2006 and are provided as a representative sample.

### **Extent**

The entire City is equally vulnerable to the severe weather effects. The City experiences severe storm conditions with moderate snow depths; wind speeds exceeding 75 mph; and extreme low temperatures that reach -30°F.

Based on past severe weather events and the criteria identified in Table 5-2, the extent of severe weather in the City 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 topography of the land influence a severe weather event on a community as well as future land use planning decisions. Hurricane force winds, rain, snow, and storm surge can be expected to impact the entire City of Nightmute.

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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 5-3, it is likely a severe storm event will occur in the next year with an event having up to 1 in 1 years (1/1=100%) chance of occurring as the history of events is greater than 33% likely per year.

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

## 6.1 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 eight steps:

1. Asset Inventory
2. Exposure Analysis For Current Assets
3. Repetitive Loss Properties
4. Land Use and Development Trends
5. Vulnerability Analysis Methodology
6. Data Limitations
7. Vulnerability Exposure Analysis
8. Future Development

6

DMA 2000 and its implementing regulations for current assets, and area future development initiative vulnerability assessment:

DMA 2000 Recommendations	
<b>Assessing Risk and Vulnerability, and Analyzing Development Trends</b>	
<p><b>§201.6(c)(2)(ii):</b> The risk assessment shall include a] description of the jurisdiction'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 community. <i>All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods.</i> The plan should describe vulnerability in terms of:</p> <p><b>§201.6(c)(2)(ii)(A):</b> The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;</p> <p><b>§201.6(c)(2)(ii)(B):</b> An estimate of the potential dollar losses to vulnerable structures identified in ... this section and a description of the methodology used to prepare the estimate.</p> <p><b>§201.6(c)(2)(ii)(C):</b> Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.</p> <p><b>§201.6(c)(2)(iii):</b> 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.</p>	
1. REGULATION CHECKLIST	
ELEMENT B. Risk Assessment, Assessing Vulnerability, Analyzing Development Trends	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	
B4. Does the Plan address NFIP insured structures within each jurisdiction that have been repetitively damaged by floods?	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	
Source: FEMA, March 2015	

The requirements for a vulnerability analysis as stipulated in DMA 2000 and its implementing regulations are described here.

- A summary of the community’s vulnerability to each hazard that addresses the impact of each hazard on the community.
- Identification of the types and numbers of RL properties in the identified hazard areas.
- An identification of the types and numbers of existing vulnerable buildings, infrastructure, and critical facilities and, if possible, the types and numbers of vulnerable future development.
- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.

Table 6-1 lists the City of Nightmute’s infrastructure hazard vulnerability.

**Table 6-1      Vulnerability Overview**

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	100	100	100	100
Flood(and Scour)	100	100	100	100
Ground Failure	100	100	100	100
Severe Weather	100	100	100	100

## 6.2 LAND USE AND DEVELOPMENT TRENDS

### 6.2.1 Land Use

Land use in the City is predominately residential with limited area for commercial services and community (or institutional) facilities. Suitable developable vacant land is in short supply within the boundaries of the City, and open space and various hydrological bodies surround the community. One area of town is classified as airport land use.

The 2004 Solid Waste Management Plan and Feasibility Study (SWMPS) describes their land use capability as limited:

*“Developed land in Nightmute can be divided into two areas. The original townsite located west of AVEC power plant, and the newer development located to the east of the power plant. The oldest portion of the community was built along a narrow strip of flat land situated between the base of Toksook Mountain and the Toksook River. The minimal amount of land available in this area is low-lying and flood-susceptible.” (SWMPS. 2004).*



## 6.3 CURRENT ASSETS EXPOSURE ANALYSIS

### 6.3.1 Asset Inventory

Asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population (for community-wide hazards), residential buildings (where data is available), and critical facilities and infrastructure. The critical facility and infrastructure assets and associated values throughout the City of Nightmute are addressed in Section 6.3.1.3. and Appendices E and F.

#### 6.3.1.1 Population and Building Stock

Population data for the City were obtained from the 2010 U.S. Census and the DCRA. The US Census reports the City's total population for 2010 as 280 and 2013 Alaska Department of Labor (DOL) data reported a population of 281 (Table 6-2) (DOL 2014).

**Table 6-2 Estimated Population and Building Inventory**

Population		Residential Buildings	
2010 Census	DCCED 2013 Data	Total Building Count	Total Value of Buildings <sup>1</sup>
280	281	59 (2014)	US Census \$7,251,100 City: \$ 17,700,000

<sup>1</sup> Sources: U.S. Census 2010, and 2012 Nightmute population data. US Census listed housing value at \$122,900. The Project Team determined that the average structural replacement value of all single-family residential buildings is \$300,000.

Estimated replacement values for those structures, as shown in Table 6-2, were obtained from the 2010 U.S. Census, and 2014 DCCED/DCRA identified Department of Labor's estimates.

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 \$300,000. A total of 59 single-family residential buildings were considered in this analysis.

#### 6.3.1.2 Existing Infrastructure

The City's SWMPS. describes their 2004 infrastructure capacity as:

##### ***E. Power Generation & Fuel Storage Facilities***

*AVEC operates two, 100-kW and one, 148-kW diesel generators. Electricity is subsidized by Power Cost Equalization (PCB) and residents pay \$0.257 per kWh. Currently, AVEC is in the planning stage for a new power plant and a consolidated tank farm. Bulk fuel storage facilities are owned and operated by Chinuruk Inc. The fuel storage facilities for the entire community include: four 40,400-gallon tanks owned by Chinuruk; eleven 89,900-gallon tanks owned by AVEC; one 3,000-gallon tank owned by the Army National Guard; four 27,500-gallon tanks owned by the Kuskokwim School District; and two 1,650-gallon tanks owned by the Catholic Church. The total bulk fuel storage capacity approaches 1.27 million gallons.*

### ***F. Public Facilities & Housing***

*The City operates a water treatment plant and a sewage haul service. Well water is chlorinated and distributed at a watering point. Water delivery is also available to residents who are unable to haul water. The City water and wastewater utility operates this service for \$15 per haul. Because of the expense and the close proximity of the houses, this service is infrequently used. Residents generally haul their water, and there is no water utility fee. Each house is plumbed to an individual wastewater storage tank. When the tank is full, residents call the wastewater operator to pump the tank and transport the wastewater to the wastewater lagoon. The fee for this service is \$25 per haul.*

*Nightmute does not currently have a washeteria. Many residents travel by boat, snowmachine, or plane to Toksook Bay, approximately 18 miles to the west, to do laundry. The Nightmute Water & Sewer Improvements Feasibility Study, a sister study to this report, examines the feasibility of a local washeteria (see Section ILB.). There are showers at the school, but they are not intended for public use.*

*There are 54 housing units. Most of the homes are located between the base of Toksook Mountain and the Toksook River. Many of the houses are connected by a boardwalk that parallels the river. During the 2003 summer the School District constructed two new houses. Areas for future housing development are limited and may develop toward the airport" (SWMPS 2004).*

The City of Nightmute has benefited from numerous funding opportunities to assist them with upgrading their infrastructure. Table 6-3 lists the City's identified "completed" infrastructure improvement projects. They provide a depiction of the community's ongoing development trends and focus toward improving aging infrastructure.

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**Table 6-3 Nightmute's Completed Capital Improvement Project List**

<b>Recipient</b>	<b>Award Year</b>	<b>Project Description/Comments</b>	<b>Project Status</b>	<b>Award Amount</b>	<b>End Date</b>
Nightmute Traditional Council	1992	Water/Sewer Improvements	Closed	\$75,000	6/30/1996
Nightmute Traditional Council	1993	Boardwalk Safety	Closed	\$70,000	8/31/1994
City of Nightmute	1996	Community Hall Improvement	Closed	\$25,000	6/30/2000
City of Nightmute	1997	Community Hall Extension	Closed	\$25,000	6/30/2001
City of Nightmute	1998	Dump Site Fencing	Closed	\$30,000	9/30/2008
City of Nightmute	1999	River Erosion Improvement	Closed	\$25,000	6/30/2010
City of Nightmute	1988	Riverfront Improvements	Closed	\$30,000	--
City of Nightmute	1981	Health Clinic, Medical Equipment and Boardwalks	Closed	\$200,000	--
City of	1981	Generator	Closed	\$140,000	--

**Table 6-3 Nightmute's Completed Capital Improvement Project List**

Recipient	Award Year	Project Description/Comments	Project Status	Award Amount	End Date
Nightmute					
City of Nightmute	1984	Bulk Fuel Storage	Closed	\$95,500	--
City of Nightmute	1985	Electrification Upgrade	Closed	\$290,000	--
City of Nightmute	1986	Water and Sewer Improvements	Closed	\$200,000	--
City of Nightmute	1986	Riverfront Improvements	Closed	\$200,000	--
City of Nightmute	1987	Water/Waste Disposal Improvements	Closed	\$1,175,000	--
City of Nightmute	2002	Safe Communities	Closed	\$3,730	3/31/2003
City of Nightmute	2005	Community Projects & Improvements	Closed	\$26,545	6/30/2010
City of Nightmute	2004	Temporary Fiscal Relief Grant	Closed	\$40,000	--
City of Nightmute	2003	State Revenue Sharing	Closed	\$25,745	3/31/2004
City of Nightmute	2002	Payment in Lieu of Taxes	Closed	\$13,252	6/30/2002
City of Nightmute	2002	Shared Fisheries Business Tax	Closed	\$86	6/30/2002
City of Nightmute	2003	Payment in Lieu of Taxes	Closed	\$13,718	6/30/2003
City of Nightmute	2003	CP&I/Community Facilities & Equipment	Closed	\$53,997	8/29/2008
City of Nightmute	1994	Facility Improvements/Boardwalks and settlement of outstanding community debts to the federal government	Closed	\$70,000	6/30/2000
City of Nightmute	1998	Heavy Equipment Upgrade	Closed	\$23,171	6/30/2003
City of Nightmute	2010	Purchase Insurance Coverage	Closed	\$7,483	3/25/2011
City of Nightmute	2000	Emergency Response Equipment	Closed	\$25,000	6/30/2009
City of Nightmute	2003	Safe Communities	Closed	\$3,651	3/31/2004
City of Nightmute	2002	State Revenue Sharing	Closed	\$25,546	3/31/2003
City of Nightmute	1994	Jailhouse Construction for VPSO	Closed	\$25,000	6/30/1998

(DCRA 2013)

### **6.3.1.3 Existing Critical Facilities**

A critical facility is defined as a facility that provides essential products and services to the general public, such as preserving the quality of life in the City and fulfilling important public

safety, emergency response, and disaster recovery functions. The critical facilities profiled in this plan include the following:

- Government facilities, such as city and tribal administrative offices, departments, or agencies
- Emergency response facilities, including police department and firefighting equipment
- Educational facilities, including K-12
- Care facilities, such as medical clinics, congregate living health, residential and continuing care, and retirement facilities
- Community gathering places, such as community and youth centers
- Utilities, such as electric generation, communications, water and waste water treatment, sewage lagoons, landfills.

The City's critical facilities and infrastructure are listed in Table 6-4.

**Table 6-4 Nightmute's Critical Facilities and Infrastructure**

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Scour	Ground failure	Severe Weather
<b>Government</b>	6	City Office	Changtak Street/Boardwalk to Homes	60.479985	-164.73008	\$600,000	W1 50'75	X	X	X	X
	5	Tribal Office	Changtak Street	60.479128	-164.72748	\$800,000	W1 50'x150'	X	X	X	X
		Nightmute Traditional Council	Changtak Street	60.4798	-164.72943	\$600,000	W1	X	X	X	X
		National Guard Armory?	Kuuralaria Street	60.479716	-164.72495	\$600,000	W1 50'x70'	X	X	X	X
	3	Post Office	Changtak Street/Boardwalk to Homes	60.479666	-164.72909	\$300,000	W1 40'x70'	X	X	X	X
<b>Emergency Response</b>	2	Police Station	Changtak Street/Boardwalk to Homes	60.479907	-164.72968	\$75,000	W1 24'20'	X	X	X	X
	0	Fire Station	Changtak Street/Boardwalk to Homes	60.479907	-164.72968	\$40,000	W1 8'x8'	X	X	X	X

**CITY OF NIGHTMUTE**  
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**6**

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Scour	Ground failure	Severe Weather
<b>Educational</b>	15	LKSD Nightmute HS & Elem	Kaugia Street	60.476973	-164.722244	\$5,500,000	S1L 250'x200'	X	X	X	X
<b>Medical</b>	4	Nightmute Health Clinic	Kuuraralria Street	60.478331	-164.721188	\$1,000,000	W2 75'x100'	X	X	X	X
<b>Community</b>	2	Church	Changtak Street	60.478573	-164.724134	\$300,000	W2 60'x75'	X	X	X	X
	5	Community Hall	Changtak Street/Boardwalk to Homes	60.480076	-164.731495	\$600,000	W2 50'x100'	X	X	X	X
	0	Community Storage Shed	Changtak Street/Boardwalk to Homes	60.478331	-164.721188	\$50,000	W2 20'x30'	X	X	X	X
	1	City Shop	Kaugia Street	60.476882	-164.720727	\$600,000	W2	X	X	X	X
	1	School Shop	Kaugia Street	60.477038	-164.721543	\$100,000	W2	X	X	X	X
	1	Chinurak Store	Kaugia Street	60.477551	-164.720781	\$400,000	W2	X	X	X	X
	1	Store/Residence (General)	Airport Road	60.477599	-164.717562	\$200,000	W2	X	X	X	X
	0	Kuuraralria Street	1/5 mile(.20) long dirt road	N/A	N/A	\$2,000,000	HRD1	X	X	X	X
<b>Roads / Boardwalk</b>	0	Airport Road	1 mile long dirt road					X	X	X	X
	0	Changtak Street	1/3 mile (.33) long dirt road					X	X	X	X
	0	Amaralria Street	1/12 mile (.08) long dirt road					X	X	X	X
	0	Kaugia Street	1/12 mile (.08) long dirt road					X	X	X	X

**CITY OF NIGHTMUTE**  
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Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Scour	Ground failure	Severe Weather
	0	Boardwalk to Homes	1/5 mile (.20) long boardwalk	Undefined	Undefined	270,000	Undefined	X	X	X	X
Bridges		None									
Transportation	3	Nightmute Airport Maintenance Building	Airport Road	60.473359	-164.700681	\$1,000,000	AMF	X	X	X	X
	0	Airport Runway	Airport Road	60.46769	-164.68877	\$5,000,000	ARW	X	X	X	X
Utilities	1	AVEC Power Generation Facility	Changtak Street	60.478923	-164.726136	\$500,000	EPFS 12'X8'	X	X	X	X
	0	LKSD Nightmute HS & Elem Reservoir/Water Supply	Kaugia Street	60.476973	-164.722244	\$3,000,000	PWTS 75'X150'	X	X	X	X
	0	Catholic Church Fuel Storage (>500gal)	Changtak Street	60.47857	-164.723739	\$500,000	OTF 16'X16'	X	X	X	X
	0	Chinurak, Inc. Fuel Storage (>500gal)	Boardwalk	60.480708	-164.735029	\$500,000	OTF16' X16'	X	X	X	X
	0	Nightmute Power Co. Fuel Storage (>500gal)	Kuuraralria Street	60.478923	-164.726172	\$500,000	OTF 50'x100'	X	X	X	X
	0	Fuel Storage Tanks (>500gal)	Kuuraralria Street	60.478756	-164.720749	\$500,000	OTF 50'x100'	X	X	X	X
	0	National Guard Fuel Storage (>500gal)	Kuuraralria Street	60.479704	-164.724829	\$200,000	OTF 16'X16'	X	X	X	X
	0	Sewage Lagoon	Undefined	60.473183	-164.722279	\$1,450,000	250'x100'	X	X	X	X
	0	Nightmute Class III Muni Landfill	Undefined	60.471325	-164.731361	\$700,000	150'x100'	X	X	X	X

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Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood/Scour	Ground failure	Severe Weather
	0	Community Telephone	Changtak Street and Boardwalk to Homes	60.480073	-164.731263	\$100,000	CBO	X	X	X	X
<b>Total Occ</b>	<b>136</b>				<b>Total Damages</b>	\$27,985,000					

(Nightmute 2015, DHS&EM 2014b, DCRA 2015)

\*Note: Location information based on best available data collected from Nightmute Planning Team, DCRA Community Profile Maps, as well as approximate longitudes and latitudes from web mapping, and GIS tools; coordinates not to be used as exact locations – for planning purposes only.

## 6.4 REPETITIVE LOSS PROPERTIES

DMA 2000 and its implementing regulations for estimating the number and type of structures at risk to repetitive flooding:

6

DMA 2000 Requirements
<p><b>Addressing Risk and Vulnerability to NFIP Insured Structures</b></p> <p><b>§201.6(c)(2)(ii):</b> The risk assessment shall include a] description of the jurisdiction'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 community. <b><i>All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:</i></b></p> <p><b>§201.6(c)(2)(ii)(A):</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;</p> <p><b>§201.6(c)(2)(ii)(B):</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;</p> <p><b>§201.6(c)(2)(ii)(C):</b> The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.</p> <p><b>§201.6(c)(3)(ii):</b> 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.</p>
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT B. NFIP Insured Structures</b>
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?
Source: FEMA, March 2015



#### **6.4.1.1 NFIP Participation**

The City of Nightmute does not participate in the NFIP neither do they have a repetitive flood property inventory that meets NFIP criteria as the loss thresholds are substantially below FEMA values.

### **6.5 VULNERABILITY ASSESSMENT METHODOLOGY**

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. This analysis is a simplified assessment of the potential effects of the hazards on values at risk without consideration of probability or level of damage.

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 structure and contents replacement 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.

### **6.6 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.

### **6.7 VULNERABILITY EXPOSURE ANALYSIS**

There is limited GIS data available for the City of Nightmute. The following discussion contains data obtained from the Project Team and their subsequent analysis. The results of the exposure analysis for loss estimations in the community are summarized in Tables 6-5 and 6-6.

**Table 6-5 Potential Hazard Exposure Analysis – Critical Facilities**

		Government and Emergency Response		Educational		Medical		Community	
Hazard Type	Methodology	* # Bldgs/ # Occ	Value (\$)	* # Bldgs/ # Occ	Value (\$)	* # Bldgs/ # Occ	Value (\$)	* # Bldgs/ # Occ	Value (\$)
Earthquake	Descriptive	3/5	\$415,000	1/15	\$5,500,000	1/4	\$1,000,000	3/7	\$950,000
Flood	Descriptive	3/5	\$415,000	1/15	\$5,500,000	1/4	\$1,000,000	3/7	\$950,000
Ground Failure	Descriptive	3/5	\$415,000	1/15	\$5,500,000	1/4	\$1,000,000	3/7	\$950,000
Severe Weather	Descriptive	3/5	\$415,000	1/15	\$5,500,000	1/4	\$1,000,000	3/7	\$950,000

**Table 6-6 Potential Hazard Exposure Analysis – Critical Infrastructure**

		Roads		Bridges		Transportation Facilities		Utilities	
Hazard Type	Methodology	Miles	Value (\$)	No.	Value (\$)	# Bldgs/ # Occ	Value (\$)	# Bldgs/ # Occ	Value (\$)
Earthquake	Descriptive	2	\$2,000,000	0	\$0	1/3	\$1,000,000	9/18	\$8,200,000
Flood	Descriptive	2	\$2,000,000	0	\$0	1/3	\$1,000,000	9/18	\$8,200,000
Ground Failure	Descriptive	2	\$2,000,000	0	\$0	1/3	\$1,000,000	9/18	\$8,200,000
Severe Weather	Descriptive	2	\$2,000,000	0	\$0	1/3	\$1,000,000	9/18	\$8,200,000

### **6.7.1 Exposure Analysis – Narrative Summaries**

#### ***Earthquake***

The City and surrounding area can expect to experience limited earthquake ground movement that may result in infrastructure damage. Intense shaking may be seen or felt based on past events. Although all structures are exposed to earthquakes, buildings within the City constructed with wood have slightly less vulnerability to the effects of earthquakes than those with masonry. Based on earthquake probability (PGA) maps produced by the USGS, the entire City area is not at risk of experiencing moderate or significant earthquake impacts as a result of its distant proximity to known earthquake faults.

The probability is unlikely (see Section 5.3.1.3) that impacts to the community from ground movement may result in infrastructure damage and personal injury.

The entire existing, transient, and future Nightmute population, residential structures, and critical facilities are exposed to the effects of “negligible” earthquake events. This includes approximately:

- 281 people in 59 residences (approximate value \$17,700,000 total)
- 5 people in 3 government and emergency response facilities (approximate value \$415,000)
- 15 people in 1 educational facilities (approximate value \$5,500,000)
- 4 people in 1 medical facility (approximate value \$1,000,000)
- 7 people in 3 community facilities (approximate value \$950,000)
- 2 road system miles (approximate value \$2,000,000)
- 0 bridges (approximate value \$0)
- 3 people in 1 transportation facilities (approximate value \$1,000,000)
- 18 people in 9 utility facilities (approximate value \$8,200,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same historical impact level.

#### ***Flood/Erosion***

Typical flood impacts associated include structures and contents water damage, roadbed, embankment, and coastal erosion, boat strandings, areas of standing water in roadways. Flood events may also damage or displace fuel tanks, power lines, or other infrastructure. Buildings on slab foundations, not located on raised foundations, and/or not constructed with materials designed to withstand flooding events (e.g., cross vents to allow water pass-through an open area under the main floor of a building) are more vulnerable to flood impacts (see Section 5.3.2.3).

No detailed 100 year flood analysis has been prepared for the City. The USACE provided an erosion assessment for Nightmute. This includes approximately:

- 281 people in 59 residences (approximate value \$17,700,000)
- 5 people in 3 government and emergency response facilities (approximate value \$415,000)
- 15 people in 1 educational facilities (approximate value \$5,500,000)
- 4 people in 1 medical facility (approximate value \$1,000,000)
- 7 people in 3 community facilities (approximate value \$950,000)
- 2 road system miles (approximate value \$2,000,000)
- 0 bridges (approximate value \$0)
- 3 people in 1 transportation facilities (approximate value \$1,000,000)
- 18 people in 9 utility facilities (approximate value \$8,200,000)

The City anticipates that impacts to future populations, residential structures, critical facilities, and infrastructure will be at the same historical impact level.

### **Ground Failure**

Impacts associated with ground failure include surface subsidence, infrastructure, structure, and/or road damage. Buildings that are built on slab foundations and/or not constructed with materials designed to accommodate the ground movement associated with building on permafrost and other land subsidence and impacts are more vulnerable damage.

The potential ground failure impacts from avalanches, landslides, and subsidence can be widespread. Potential debris flows and landslides can impact transportation, utility systems, and water and waste treatment infrastructure along with public, private, and business structures located adjacent to steep slopes, along riverine embankments, or within alluvial fans or natural drainages. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

USGS elevation datasets were used to determine the ground failure hazard areas within Nightmute. Risk was assigned based on slope angle. A slope angle less than 14 degrees was assigned a low risk, a slope angle between 14 and 32 degrees was assigned a medium risk, and a slope angle greater than 32 degrees was assigned a high risk.

Ground Failure hazards periodically cause structure and infrastructure displacement due to ground shifting, sinking, and upheaval. According to mapping completed by the DGGS, Nightmute has discontinuous permafrost (see Section 5.3.3.3). There have been periodic landslides and other ground failure incidents in Nightmute. Threatened facilities include:

- 281 people in 59 residences (approximate value \$17,700,000)
- 5 people in 3 government and emergency response facilities (approximate value \$415,000)

- 15 people in 1 educational facilities (approximate value \$5,500,000)
- 4 people in 1 medical facility (approximate value \$1,000,000)
- 7 people in 3 community facilities (approximate value \$950,000)
- 2 road system miles (approximate value \$2,000,000)
- 0 bridges (approximate value \$0)
- 3 people in 1 transportation facilities (approximate value \$1,000,000)
- 18 people in 9 utility facilities (approximate value \$8,200,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

### **Severe Weather**

Impacts associated with severe weather events includes roof collapse, trees and power lines falling, damage to light aircraft and sinking small boats, injury and death resulting from snow machine or vehicle accidents, overexertion while shoveling all due to heavy snow. A quick thaw after a heavy snow can also cause substantial flooding. Impacts from extreme cold include hypothermia, halting transportation from fog and ice, congealed fuel, frozen pipes, utility disruptions, frozen pipes, and carbon monoxide poisoning. Additional impacts may occur from secondary weather hazards or complex storms such as extreme high winds combined with freezing rain, high seas, and storm surge. Section 5.3.4.3 provides additional detail regarding severe weather impacts. Buildings that are older and/or not constructed with materials designed to withstand heavy snow and wind (e.g., hurricane ties on crossbeams) are more vulnerable to the severe weather damage.

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Based on information provided by the City of Nightmute and the National Weather Service, the entire existing, transient, and future City population, residential structures, and critical facilities are exposed to future severe weather impacts. This includes approximately:

- 281 people in 59 residences (approximate value \$17,700,000)
- 5 people in 3 government and emergency response facilities (approximate value \$415,000)
- 15 people in 1 educational facilities (approximate value \$5,500,000)
- 4 people in 1 medical facility (approximate value \$1,000,000)
- 7 people in 3 community facilities (approximate value \$950,000)
- 2 road system miles (approximate value \$2,000,000)
- 0 bridges (approximate value \$0)
- 3 people in 1 transportation facilities (approximate value \$1,000,000)
- 18 people in 9 utility facilities (approximate value \$8,200,000)

Impacts to future populations, residential structures, critical facilities, and infrastructure are anticipated at the same impact level.

## **6.8 FUTURE DEVELOPMENT**

Table 6-7 delineates Nightmute's future, planned, and funded projects as well as their tentative completion status, as of the beginning of 2015.

**Table 6-7      Planned and Funded Projects**

<b>Grant Recipient</b>	<b>Award Year</b>	<b>Project Description/Comments</b>	<b>Project Status</b>	<b>Award Amount</b>	<b>End Date</b>
City of Nightmute	2011	Mini Grant: Hazard Impact Assessment	Active	\$50,000	6/30/2015
Lower Kuskokwim School District	2014	Nightmute School Renovations	Active	\$4,000,000	Not Specified

(DCRA 2014c, City of Nightmute 2015)

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Section Seven outlines the HMP mitigation strategy.

## 7.1 OVERVIEW

The mitigation strategy provides the blueprint for implementing desired activities that will enable the community to continue to save lives and preserve infrastructure by systematically reducing hazard impacts, damages, and community disruption. A vulnerability analysis is divided into six steps:

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

DMA 2000 and its implementing regulations for comprehensive mitigation strategy development:

DMA 2000 Requirements
<p><b>Identification and Analysis of Mitigation Actions</b></p> <p><b>§201.6(c)(3):</b> [The plan shall include the following:] A <i>mitigation strategy</i> 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.</p> <p><b>§201.6(c)(3)(i):</b> [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.</p> <p><b>§201.6(c)(3)(ii):</b> [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.</p> <p><b>§201.6(c)(3)(iii):</b> [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.</p> <p><b>§201.6(c)(3)(iv):</b> [For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.</p> <p><b>Requirement §201.6(c)(4):</b> [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.</p>
1. REGULATION CHECKLIST
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)

DMA 2000 Requirements
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.

## 7.2 NIGHTMUTE'S CAPABILITY ASSESSMENT

The City's capability assessment reviews the technical and fiscal resources available to the community. DMA 2000 and its implementing regulations for technical and fiscal resources available to the community for HMP project implantation and management:

DMA 2000 Requirements
<b>Incorporation into Existing Planning Mechanisms</b> §201.6(c)(3): [The plan shall include the following:] A <i>mitigation strategy</i> 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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT C. Incorporate into Other Planning Mechanisms</b>
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?
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.

This section outlines the resources available to the City of Nightmute for mitigation and mitigation related funding and training. Tables 7-1, 7-2, and 7-3 delineate the City's regulatory tools, technical specialists, financial and training resource available for project management. Appendix A provides a detailed list of potential funding resources.

**Table 7-1 Nightmute's Regulatory Tools**

Regulatory Tools (ordinances, codes, plans)	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Comprehensive Plan	No	Explains the City 's land use initiatives and natural hazard impacts.
Land Use Plan	No	Explains the City's land use goals and initiatives.
Tribal Land Use Plan	No	Describes the Village's community development goals and initiatives.
Emergency Response Plan	Yes	Not updated yet. Believe to have been completed in 2009, but ongoing process to update. Working with Susan King of the Yukon Kuskokwim Health Corporation to update this plan.

**Table 7-1 Nightmute’s Regulatory Tools**

<b>Regulatory Tools (ordinances, codes, plans)</b>	<b>Existing Yes/No?</b>	<b>Comments (Year of most recent update; problems administering it, etc.)</b>
Wildland Fire Protection Plan	No	
Building code	No	The City can exercise this authority.
Zoning ordinances	No	The City can exercise this authority.
Subdivision ordinances or regulations	No	The City can exercise this authority.
Special purpose ordinances	No	The City can exercise this authority.

### Local Resources

The City 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 7-2 Nightmute’s Technical Specialists for Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Yes / No</b>	<b>Department/Agency and Position</b>
Planner or engineer with knowledge of land development and land management practices	No	The City hires planners and engineering consultants
Engineer or professional trained in construction practices related to buildings and/or infrastructure	No	The City hires engineering consultants
Planner or engineer with an understanding of natural and/or human-caused hazards	No	The City hires planners and engineering consultants
Floodplain Manager	No	The City does not have this capability
Surveyors	No	The City does not have staff with this knowledge
Staff with education or expertise to assess the <b>jurisdiction’s vulnerability to hazards</b>	No	The City does not have staff with this knowledge
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazard-MH) software	No	The City hires consultants when they need a surveyor.
Scientists familiar with the hazards of the jurisdiction	No	City can work with U.S. Fish & Wildlife Service (USFWS) and Fish & Game (ADF&G), and the Alaska Department of Transportation and Public Facilities
Emergency Manager	Yes	The City Mayor
Finance (Grant writers)	Yes	The City has staff with this knowledge
Public Information Officer	Yes	The City Mayor

**Table 7-3 Financial Resources Available for Hazard Mitigation**

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
General funds	Can exercise this authority with voter approval
Payment in Lieu of Taxes (PILT)	Provides operating support funding
Municipal Energy Assistance Program (MEAP)	Provides operating support funding
Community Development Block Grants (CDBG)	Can exercise this authority with voter approval
Capital Improvement Project Funding	Can exercise this authority with voter approval
Authority to levy taxes for specific purposes	Can exercise this authority with voter approval
Incur debt through general obligation bonds	Can exercise this authority with voter approval
Incur debt through special tax and revenue bonds	Can exercise this authority with voter approval
Incur debt through private activity bonds	Can exercise this authority with voter approval
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	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures. <b><i>Nightmute does not qualify for this funding source because they do not participate in the NFIP.</i></b>
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.

The Planning Team developed the mitigation goals and potential mitigation actions to address identified potential hazard impacts for the City of Nightmute within Section 5.3.

### 7.3 DEVELOPING MITIGATION GOALS

DMA 2000 stipulated and implementing regulations for developing hazard mitigation goals:

DMA 2000 Requirements
<b>Local Hazard Mitigation Goals</b>
<b>§201.6(c)(3)(i):</b> The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT C. Mitigation Goals</b>
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?
Source: FEMA, March 2015.

The exposure analysis results were used as a basis for developing 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, seven goals were developed to reduce or avoid long-term vulnerabilities to the identified hazards (Table 7-4).

**Table 7-4 Mitigation Goals**

No.	Goal Description
Multi-Hazards (MH)	
MH 1	Provide <b>outreach</b> activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the City of Nightmute (City) and/or the Native Village of Nightmute (Village).
MH 2	<b>Cross-reference</b> mitigation goals and actions with other City planning mechanisms and projects.
MH 3	Develop <b>construction</b> activities that reduce possibility of losses from all natural and manmade hazards that affect the City.
Natural Hazards	
EQ 4	Reduce structural vulnerability to earthquake (ER) 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.

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## 7.4 IDENTIFYING MITIGATION ACTIONS

DMA 2000 requirements and implementing regulations for identifying and analyzing mitigation actions:

DMA 2000 Requirements
<b>Identification and Analysis of Mitigation Actions</b>
<b>§201.6(c)(3)(ii):</b> [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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT C. Mitigation Actions</b>

DMA 2000 Requirements
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 developing mitigation goals, the Planning Team reviewed a comprehensive list of potential mitigation actions that were identified during this HMP development process with each hazard type included.

The Planning Team assessed the potential mitigation actions to carry forward into the mitigation strategy. 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.

Table 7-5 breaks out the project criteria as considered, selected, and ongoing. The community identified numerous “ongoing” mitigation actions currently in-process or those that were listed in other City planning documents.

On May 5, 2015, the Planning Team’s nine “ongoing” and three newly identified natural hazard, mitigation actions for Mitigation Action Plan (MAP) implementation during the five-year life cycle of this HMP as funding becomes available. The Planning Team placed particular emphasis on projects and programs that reduce the effects of hazards on both new and existing buildings and infrastructure as well as facilities located in potential flood zones to comply with NFIP requirements should the City join the NFIP.

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**Table 7-5 Potential Mitigation Actions**

*(Ongoing and newly selected items will be carried forward into the MAP implementation)*

Supports Goal No.	Hazard	Criteria <i>Considered</i> <i>Selected</i> <i>Ongoing</i>	Action Description
Multi- Hazards (MH)			
MH 1	Provide <b>outreach</b> activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the City of Nightmute and The Native Village of Nightmute.	<b>S</b>	Identify and pursue funding opportunities to implement mitigation actions.
		C	Update public emergency notification procedures and develop an outreach program for potential hazard impacts or events.
		C	Build a self-sustaining evacuation center, away from danger of heavy flooding and ice barriers moving inland.
		<b>O</b>	Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.
		<b>S</b>	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
		<b>O</b>	Acquire emergency warning methods to communicate critical emergency warnings and alerts.
		<b>O</b>	Investigate benefits of, and potentially join the National Flood Insurance Program to reduce monetary losses to individuals and the community.
MH 2	<b>Cross-reference</b> mitigation goals and actions with other City planning	C	Develop and incorporate mitigation provisions and recommendations into all community plans and community development processes to maintain protect critical infrastructure, residences, and population from natural hazard impacts.
		<b>O</b>	Update or develop, implement, and maintain jurisdictional debris



**Table 7-5 Potential Mitigation Actions**  
*(Ongoing and newly selected items will be carried forward into the MAP implementation)*

Supports Goal No.	Hazard	Criteria <i>Considered</i> <i>Selected</i> <i>Ongoing</i>	Action Description
	mechanisms and projects.		management plans.
		C	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
MH 3	Develop <b>construction</b> activities that reduce possibility of losses from all natural and manmade hazards that affect the City/Village.	<b>O</b>	Acquire (buy-out), demolish, elevate, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.).
		<b>O</b>	Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.
Natural Hazards			
EQ 4	Reduce vulnerability of structures to earthquake damage.	C	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.
		<b>S</b>	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.
FL 5	Reduce the possibility of damage and losses from flooding and erosion.	C	Elevate residential, public, or critical facilities at least two feet above the base flood elevation, on gravel pads or pilings.
		C	Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
		C	Protect wastewater treatment systems flood protection to prevent erosion damage and sewage lagoons out-wash.
		S	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide river bank protection along the Toksook River to protect the tank farm, boardwalks, fuel header, and powerlines.
GF 6	Reduce possibility of damage and losses from ground failure.	<b>O</b>	Complete a ground failure (avalanche, landslide, permafrost etc.) location inventory; identify (and map) threatened critical facilities, residential buildings, infrastructure, and other essential buildings.
		<b>S</b>	Identify and map existing ground failure areas with associated damage to assist in new critical facility siting and existing facility relocation siting.
		<b>S</b>	Promote permafrost sensitive construction practices in permafrost areas.
SW 7	Reduce vulnerability of structures to severe weather damage.	S	Reinforce buildings and homes against high winds to reduce damage to roofs and shaking.
		<b>O</b>	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms (snow load, ice, and wind).

## 7.5 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

DMA 2000 stipulated and implementing regulations for evaluating and implementing mitigation actions:

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions
<b>Implementation of Mitigation Actions</b> <b>§201.6(c)(3)(iii):</b> [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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT C. MITIGATION STRATEGY</b>
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 §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
Source: FEMA, March 2015.

The Planning Team evaluated and prioritized each of the mitigation actions on May 5, 2015 to determine which actions would be included in the Mitigation Action Plan. The Mitigation Action Plan represents mitigation projects and programs to be implemented through the cooperation of multiple entities in the City. To complete this task, the Planning Team first prioritized the hazards that were regarded as the most significant within the community (earthquake, erosion, flood, ground failure, and severe weather).

7 The Planning Team reviewed the simplified social, technical, administrative, political, legal, economic, and environmental (STAPLEE) evaluation criteria (Table 7-6) and the Benefit-Cost Analysis Fact Sheet (Appendix G) 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 City chooses to implement.

**Table 7-6 Evaluation Criteria for Mitigation Actions**

Evaluation Category	Discussion "It is important to consider..."	Considerations
<u>S</u> ocial	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
<u>T</u> echnical	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
<u>A</u> dministrative	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

**Table 7-6 Evaluation Criteria for Mitigation Actions**

<b>Evaluation Category</b>	<b>Discussion "It is important to consider..."</b>	<b>Considerations</b>
<u>P</u> olitical	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
<u>L</u> egal	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
<u>E</u> conomic	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
<u>E</u> nvironmental	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 5, 2015, the hazard mitigation Planning Team prioritized seven 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 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 7-8) was completed to provide the City with an implementation approach.

## 7.6 MITIGATION ACTION PLAN

Like most rural-remote Alaskan communities there is a limited budget; therefore funding can typically be less available for developing and maintaining departmental or other infrastructure responsibilities. Cities or Villages are managed by their mayoral led City Council or tribal president/chief led Tribal Council respectively. This process enables the each jurisdiction to maximize governance capacity, coordinate project prioritization, and closely monitor their limited budget constraints.

Table 7-7 delineates the acronyms used in the Mitigation Action Plan (Table 7-8). See Appendix A for summarized agency funding source descriptions.

**Table 7-7 Potential Funding Source Acronym List**

*(See complete funding resource description in Appendix A)*

7	<b>City of Nightmute (City Mayor's Office)</b>
	<b>Native Village of Nightmute's Tribal Council (Tribal Council Office)</b>
	<b>US Department of Homeland Security (DHS)</b>
	<i>Citizens Corp Program (CCP)</i>
	<i>Emergency Operations Center (EOC)</i>
	<i>Homeland Security Grant Program (HSGP)</i>
	<i>Emergency Management Performance Grant (EMPG)</i>
	<i>State Homeland Security Program (SHSP)</i>
	<b>Federal Management Agency (FEMA)/</b>
	<i>Hazard Mitigation Assistance Grant Programs (HMA)</i>
	<i>Emergency Management Program Grant (EMPG)</i>
	<i>Debris Management Grant (DM)</i>
	<i>Flood Mitigation Assistance Grants (FMA)</i>
	<i>National Earthquake Hazards Reduction Program (NEHRP)</i>
	<i>National Dam Safety Program (NDS)</i>
	<b>US Department of Commerce (DOC)/</b>
	<i>Remote Community Alert Systems Program (RCASP)</i>
	<i>National Oceanic and Atmospheric Administration (NOAA)</i>
	<b>US Department of Agriculture (USDA)/</b>
	<b>USDA, Farm Service Agency</b>
	<i>Emergency Conservation Program (ECF)</i>
	<i>Rural Development (RD)</i>
	<b>USDA, Natural Resources Conservation Service (NRCS)</b>
	<i>Emergency Watershed Protection Program (EWP)</i>
	<i>Watershed Planning (WSP)</i>
	<b>US Geological Survey (USGS)</b>
	<i>Alaska Volcano Observatory (AVO)</i>
	<b>Assistance to Native Americans (ANA)</b>
	<i>Native American Housing Assistance and Self Determination Act (NAFSMA),</i>
	<b>US Army Corp of Engineers (USACE)/</b>
	<i>Planning Assistance Program (PAP)</i>
	<i>Capital Projects: Erosion, Flood, Ports &amp; Harbors</i>
	<b>Alaska Department of Military and Veterans Affairs (DMVA), Division of Homeland Security and Emergency Management (DHSEM)</b>
	<i>Mitigation Section (for PDM &amp; HMGP projects and plan development)</i>
	<i>Preparedness Section (for community planning)</i>
	<i>State Emergency Operations Center (SEOC for emergency response)</i>
	<b>Alaska Department of Community, Commerce, and Economic Development (DCCED) Division of Community and Regional Affairs (DCRA)/</b>

*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)/**

*Village Safe Water (VSW)*

*DEC/Alaska Drinking Water Fund (ADWF)*

*DEC/Alaska Clean Water Fund (ACWF)*

*DEC/Clean Water State Revolving Fund (CWSRF)*

**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)*

**Denali Commission (Denali)**

*Energy Program (EP)*

*Solid Waste Program (SWP)*

**Lindbergh Foundation Grant Programs (LFGP)**

**Rasmuson Foundation Grants (LFG)**

The City's Mitigation Action Plan, Table 7-8, 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 benefit/costs and technical feasibility were taken into consideration.

**Table 7-8 City of Nightmute’s Mitigation Action Plan (MAP)**

(See acronym and abbreviations list for complete titles)

<b>Goal/ Action ID</b>	<b>Description</b>	<b>Priority</b> (High, Medium, Low)	<b>Responsible Department</b>	<b>Potential Funding Source(s)</b>	<b>Timeframe</b> (1-3 Years 2-4 Years 3-5 Years)	<b>Benefit-Costs (BC) / Technical Feasibility (T/F)</b>
MH 1.1	Identify and pursue funding opportunities to implement mitigation actions.	High	City of Nightmute, Nightmute Tribal Council	City, Tribe, (See Appendix A)	Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.
MH 1.5	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.	High	City of Nightmute, Nightmute Tribal Council	City, Denali Commission, DCRA	1-3 years	B/C: This project will ensure the community looks closely at their hazard areas to ensure they can safely evacuate their residents and visitors to safety during a natural hazard event. TF: This is technically feasible using existing tribal resources.
MH 1.6	Acquire emergency warning methods to communicate critical emergency warnings and alerts.	Medium	City of Nightmute, Nightmute Tribal Council	Tribe, AFG, FP&S, SAFER	3-5 years	B/C: Sustained emergency response planning and mitigation outreach programs have minimal cost and will help build and support community capacity enabling the public to prepare for, respond to, and recover from disasters. TF: This project is technically feasible using existing City staff and radio communications
MH 1.7	Investigate benefits of, and possibly join the National Flood Insurance Program (NFIP) to reduce monetary losses to individuals and the community.	High	City of Nightmute, Nightmute Tribal Council	City, Tribe	1-3 years	B/C: NFIP participation while one of <b>FEMA’s highest priorities also enables</b> communities with an effective program focus on repetitive flood loss properties and other priority flood locations and projects. TF: City is not currently a member, this is an ongoing process and will be

**Table 7-8 City of Nightmute's Mitigation Action Plan (MAP)**

(See acronym and abbreviations list for complete titles)

<b>Goal/ Action ID</b>	<b>Description</b>	<b>Priority</b> (High, Medium, Low)	<b>Responsible Department</b>	<b>Potential Funding Source(s)</b>	<b>Timeframe</b> (1-3 Years 2-4 Years 3-5 Years)	<b>Benefit-Costs (BC) / Technical Feasibility (T/F)</b>
						considered further.
MH 2.2	Update or develop, implement, and maintain jurisdictional debris management plans.	Medium	City of Nightmute, Nightmute Tribal Council	City, HMA, AFG, FP&S, SAFER, ANA, EFSP	1-4 years	B/C: Debris management plans are an essential disaster management tool. Focused and coordinated planning enables effective damage abatement and ensures proper attention is assigned to reduce losses, damage, and materials management.  TF: This action is feasible with limited fund expenditures.
MH 3.1	Acquire (buy-out), demolish, elevate, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.).	Medium	City of Nightmute, Nightmute Tribal Council	City, HMA, NRCS, ANA, USACE, USDA, Lindbergh Grants Program	1-5 years	B/C: This project would remove threatened structures from hazard areas, such as the old BIA school, eliminating future damage while keeping land clear for perpetuity.  TF: This project is feasible using existing staff skills, equipment, and materials. Acquiring contractor expertise may be required for large facilities.
MH 3.2	Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.	Medium	City of Nightmute, Nightmute Tribal Council	City, HMA, ANA, DOT/PF, Denali Commission, NRCS, USACE, USDA/EWP, USDA/ECP, DCRA/ ACCIMP	3-5 years	B/C: Hardening infrastructure to reduce erosion and flood damages reduces potential future damages and replacement costs.  TF: The City has the technical capability to manage and conduct this project.
EQ 4.2	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.	Low	City of Nightmute, Nightmute Tribal Council	City, HMA, ANA, EFSP, DOT/PF	2-4 years	B/C: Retrofit projects can be very cost effective methods for bush communities as materials and shipping costs are very high. Project viability is depending on the cost and extent of the modifications. A



**Table 7-8 City of Nightmute’s Mitigation Action Plan (MAP)**

(See acronym and abbreviations list for complete titles)

<b>Goal/ Action ID</b>	<b>Description</b>	<b>Priority</b> (High, Medium, Low)	<b>Responsible Department</b>	<b>Potential Funding Source(s)</b>	<b>Timeframe</b> (1-3 Years 2-4 Years 3-5 Years)	<b>Benefit-Costs (BC) / Technical Feasibility (T/F)</b>
						comprehensive Benefit Cost Analysis needs to be conducted to validate this activity.  TF: The City will need phase funding to obtain engineering and design expertise to determine project viability.
FL 5.4	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet piling, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide river bank protection along the Toksook River to protect the tank farm, boardwalks, fuel header, powerlines, and residences.	High	Village of Nightmute, Nightmute Tribal Council	Village, HMA, ANA, NRCS, USACE	3-5 years	B/C: Improving embankment and slope stability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities. TF: The community 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.
GF 6.2	Identify and map existing ground failure areas with associated damage to assist in new critical facility siting and existing facility relocation siting.	Medium	City of Nightmute, Nightmute Tribal Council	City, Tribe, ANA, NRCS, Denali Commission, DCRA, USACE	2-4 years	B/C: Identifying ground failure locations is a minimal cost project which would decrease damage to facilities if they were sited appropriately. Project must be associated with an eligible relocation or construction project. TF: Technically feasible as the community currently has identified permafrost locations but they have not created a map defining the area and they dig test holes to determine permafrost depth prior to construction.
GF 6.3	Promote permafrost sensitive construction practices in permafrost areas.	High	City of Nightmute, Nightmute Tribal	City, HMA, ANA	2-4 years	B/C: This outreach project would decrease damage to facilities if they were sited and used the most appropriate

**Table 7-8 City of Nightmute's Mitigation Action Plan (MAP)**

(See acronym and abbreviations list for complete titles)

<b>Goal/ Action ID</b>	<b>Description</b>	<b>Priority</b> (High, Medium, Low)	<b>Responsible Department</b>	<b>Potential Funding Source(s)</b>	<b>Timeframe</b> (1-3 Years 2-4 Years 3-5 Years)	<b>Benefit-Costs (BC) / Technical Feasibility (T/F)</b>
			Council			construction practices. TF: Technically feasible as the community currently has identified permafrost locations but they have not created a map defining the area and they dig test holes to determine permafrost depth prior to construction.
SW 7.2	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms (snow load, ice, and wind).	Medium	City of Nightmute, Nightmute Tribal Council	City, FEMA AFG, FP&S, SAFER DOF: VFAG, RAGP, FireWise	Ongoing	B/C: This mitigation activity will reduce severe winter storm damages caused by heavy snow loads and icy rain by avoiding damage to structures and infrastructure. TF: This type activity is technically feasible within the community by implementing existing programs such as Fire Wise and other State and Federal agency programs.

## 7.7 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
<b>Incorporation into Existing Planning Mechanisms</b>
<b>§201.6(c)(4)(ii):</b> [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.
<b>1. REGULATION CHECKLIST</b>
<b>ELEMENT C. Incorporate into Other Planning Mechanisms</b>
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 community-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 community 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 mechanisms.

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**S**ection Eight provides a comprehensive reference list used to develop the HMP.

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## Appendix A

### Funding Resources



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### Federal 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 multi-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/plan/mitplanning/resources.shtm#1>).
  - Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments. FEMA DAP-12, September 1990. This handbook explains the basic concepts of hazard mitigation and shows state and local governments how they can develop and achieve mitigation goals within the context of FEMA's post-disaster hazard mitigation planning requirements. The handbook focuses on approaches to mitigation, with an emphasis on multi-objective planning.
  - 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.
  - The FEMA Hazard Mitigation Assistance (HMA Unified Guidance, June 1, 2010. The guidance introduces the five HMA grant programs, funding opportunities, award



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information, eligibility, application and submission information, application review process, administering the grant, contracts, additional program guidance, additional project guidance, and contains information and resource appendices(FEMA 2009).

- 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.
  - 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.

The NEHRP is the Federal Government's coordinated approach to addressing earthquake risks. Congress established the program in 1977 (Public Law 95-124) as a long-term, nationwide program to reduce the risks to life and property in the United States resulting from earthquakes. The NEHRP is managed as a collaborative effort among FEMA, the National Institute of Standards and Technology, the National Science Foundation, the United States Geological Survey, and the Department of Interior.

The four goals of the NEHRP are to:

- Develop effective practices and policies for earthquake loss-reduction and accelerate their implementation.
- Improve techniques to reduce seismic vulnerability of facilities and systems.
- Improve seismic hazards identification and risk-assessment methods and their use.
- Improve the understanding of earthquakes and their effects.

Information may be found at:

<http://www.fema.gov/plan/prevent/earthquake/nehrrp.shtm>, and  
[http://www.ehow.com/info\\_7968511\\_disaster-research-grant-funding.html](http://www.ehow.com/info_7968511_disaster-research-grant-funding.html)

- 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/vfarfa.htm>).

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- 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.
    - 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.
    - Emergency Operations Center (EOC) 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.
  - U.S. Department of Commerce's grant programs include:
    - 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. This program is a contributing element of the Warning, Alert, and Response Network (WARN) Act.
    - 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.
  - Department of Agriculture (USDA). Disaster assistance provided includes: 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/webapp?area=home&subject=diap&topic=landing>)
  - Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program (<http://www1.eere.energy.gov/wip/wap.html>). 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

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as an all-around safety check of major energy systems, including heating system modifications and insulation checks.

- 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://www1.eere.energy.gov/wip/tribal.html>)
- 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://yosemite.epa.gov/R10/ecocomm.nsf/6da048b9966d22518825662d00729a35/7b68c420b668ada5882569ab00720988!OpenDocument>)
- 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.  
([http://cfpub.epa.gov/fedfund/program.cfm?prog\\_num=51](http://cfpub.epa.gov/fedfund/program.cfm?prog_num=51))
- 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 the method of application.  
([http://www.acf.hhs.gov/programs/ana/programs/program\\_information.html](http://www.acf.hhs.gov/programs/ana/programs/program_information.html))
- 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:
  - Title I: Block Grants and Grant Requirements
  - Title II: Affordable Housing Activities
  - Title III: Allocation of Grant Amount
  - Title IV: Compliance, Audits, and Reports
  - Title V: Termination of Assistance for Indian Tribes Under Incorporated Programs
  - Title VI: Federal Guarantees for Financing for Tribal Housing Activities

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- Title VII: Other Housing Assistance for Native Americans

To receive grants through this program both a one and a five year plan are required. Together they must include a mission statement, list of goals and objectives, an activities plan, a statement of needs, financial resources, and of affordable housing resources, and a certification of compliance. Once funds have been awarded grantees must meet a standard of wages, comply with the National Environmental Policy Act of 1969, keep rents at or below 30% of the residents' monthly adjusted income, set eligibility requirements for admission, and secure a management that efficiently maintains and operates the units.

([http://en.wikipedia.org/wiki/Native\\_American\\_Housing\\_Assistance\\_and\\_Self-Determination\\_Act\\_of\\_1996](http://en.wikipedia.org/wiki/Native_American_Housing_Assistance_and_Self-Determination_Act_of_1996))

- 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](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/>)
  - 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/>)
- Department of Labor (DOL), Employment and Training Administration, Disaster Unemployment Assistance. 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>)

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- 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 Grant. DOT increases State, Territorial, Tribal and local effectiveness in safely and efficiently handling hazardous materials accidents and incidents, enhances implementation of the Emergency Planning and Community Right-to-Know Act of 1986, and encourages a comprehensive approach to emergency training and planning by incorporating the unique challenges of responses to transportation situations, through planning and training. Requires a 20% local match.
  - 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/newsroom/article/0,,id=108362,00.html>).
  - Natural Resources Conservation Service (NRCS) has several funding sources to fulfill mitigation needs. Further information is located at: <http://www.ak.nrcs.usda.gov/sitemap.html>
    - 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.
    - Wildlife Habitat Incentives Program (WHIP). This is a voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and Indian land.
    - Watershed Planning. NRCS watershed activities in Alaska are voluntary efforts requested through conservation districts and units of government and/or tribes. The watershed activities are lead locally by a "watershed management committee" that is comprised of local interest groups, local units of government, local tribal representatives and any organization that has a vested interest in the watershed planning activity. This committee provides direction to the process as well as provides the decision-making necessary to implement the process. Technical assistance is provided to the watershed management committee through a "technical advisory committee" comprised of local, state and federal technical specialist. These specialists provide information to the watershed management committee as needed to make sound decisions. NRCS also provides training on watershed planning organization and process.

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- U.S. Small Business Administration (SBA) Disaster Assistance provides information concerning disaster assistance, preparedness, planning, cleanup, and recovery planning. (<http://www.sba.gov/category/navigation-structure/starting-managing-business/managing-business/running-business/emergency-preparedness-and-disaster->)
    - May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. (<http://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 (<http://www.poa.usace.army.mil/en/cw/index.htm>). The USACE is a member and co-chair of the Alaska Climate Change Sub-Cabinet.
  - Grants.gov. was established as a governmental resource named the E-Grants Initiative, part of the President's 2002 Fiscal Year Management Agenda to improve government services to the public. The concept has its origins in the Federal Financial Assistance Management Improvement Act of 1999, also known as Public Law 106-107. The Grants Policy Committee (GPC), a committee of the U.S. Chief Financial Officers (CFO) Council consisting of grants policy experts from across the federal government assumed responsibility for implementing P.L. 106-107, working to enhance federal financial assistance even after P.L. 106-107 expired in November 2007. The Council on Financial Assistance Reform (COFAR), created in October 2011, continues to assist the Federal financial assistance community with delivery, management, coordination, and accountability of Federal grants and cooperative agreements.

Today, [www.Grants.gov](http://www.Grants.gov) is a central storehouse for information on over 1,000 grant programs and provides access to approximately \$500 billion in annual awards.

### **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://www.ak-prepared.com/plans/mitigation/localhazmitplan.htm>.

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- Division of Senior Services (DSS): Provides special outreach services for seniors, including food, shelter and clothing. (<http://www.hss.state.ak.us/dsds/seniorInfoResources.htm>)
  - Division of Insurance (DOI): Provides assistance in obtaining copies of policies and provides information regarding filing claims. (<http://www.dced.state.ak.us/insurance/>)
  - 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, melting 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.

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. The community may then pursue these recommendations through an ACCIMP Community Planning Grant. ([http://commerce.alaska.gov/dca/planning/accimp/hazard\\_impact.html](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 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 State of Alaska's Village Safe Water (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, who in turn assist communities in design and construct of sanitation projects.
    - Municipal Grants and Loans 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



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is prudent upon the division to administer the funds in a manner that ensures their continued viability.

- 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](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 its 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. Information is available at: ([http://www.dggs.dnr.state.ak.us/index.php?menu\\_link=publications&link=publications\\_search#](http://www.dggs.dnr.state.ak.us/index.php?menu_link=publications&link=publications_search#))

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- 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>.

### **Other Funding Resources**

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

- FEMA, <http://www.fema.gov> - includes links to information, resources, and grants that communities can use in planning and implementation of sustainable measures.
- 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](http://ruralcap.com/?page_id=334))

From its earliest days to the present, RurAL CAP's success can be attributed to the direct involvement of rural Alaskans in its programs and in the decision making processes which affect their lives, and to the belief in and respect for those Peoples by the board and staff of RurAL CAP.

- 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.

Services *may* include improvements such as; air sealing, caulking and insulation, doors and windows, exterior paint, heating system test and tune, ventilation and moisture control. Major home repairs are not classified under weatherization and thus are not eligible under the program.

(<http://www.weatherizeme.org/Applications/RUR/Wx%20app%20Rural%2004-13.pdf>)

- Energy Programs. VISTA Energy Program (VEP) Members work on projects like energy efficiency education, planning and capacity building for renewable energy

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options, and home energy efficiency education. VEP helps rural Alaskan communities reduce their energy bills.

VEP Members build partnerships, developed funding proposals, and worked with their sponsoring council to raise money and in-kind resources for energy projects in their communities.

- Environment. RurAL CAP has several interwoven projects under the Environmental Program. All of these projects were created to respond to the needs rural Alaskans reported in community assessments conducted by AmeriCorps members. All of these interconnected projects address local environmental issues with local solutions, connect rural Alaskans to each other to share resources, and are connected to the RAVEN AmeriCorps program.

RurAL CAP's environmental programs surround issues of solid waste, backhaul efforts, the RAVEN AmeriCorps program, subsistence and indoor air quality. The programs include the Denali Solid Waste Grants, EPA Community Environmental Demonstration Projects, Solid Waste Management Technical Assistance, RAVEN AmeriCorps Members, Subsistence in Alaska, and Alaska Village Indoor Air Quality.

- 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.
- 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), <http://ibhs.org> - an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters.
- 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.
- Crisis Counseling Program. Provides grants to State and Borough 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/Resources4states+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

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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/index.php?option=com\\_content&view=section&id=1&Itemid=3](http://www.denali.gov/index.php?option=com_content&view=section&id=1&Itemid=3))

- 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.lindberghfoundation.org/docs/index.php/our-grants>)
- Rasmuson Foundation Grants. The Rasmuson foundation invests both in individuals and well-managed 501(c)(3) organizations dedicated to improving the quality of life for Alaskans.

Rasmuson 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 seeks to support not-for-profit organizations that are focused and effective in the pursuit of their goals, with special consideration for those organizations that demonstrate strong leadership, clarity of purpose and cautious use of resources.

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>)

Appendix B  
FEMA Hazard Mitigation Plan (HMP) Review Tool



To be FEMA provided and inserted after Final Review and Approval.





Appendix C  
Community HMP Adoption Resolution



To be inserted after City adoption.



Appendix D  
Public Outreach Activities

**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](#)

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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

eMail Address: [scott.simmons@urs.com](mailto:scott.simmons@urs.com)

*This e-mail and any attachments contain URS Corporation confidential information that may be proprietary or privileged. If you receive this message in error or are not the intended recipient, you should not retain, distribute, disclose or use any of this information and you should destroy the e-mail and any attachments or copies.*



Hello Mayor Matthias and City Administrator Tulik,

I am writing to introduce myself, Evan Wasserman, as well as our project manager, Scott Simons, of URS Corporation. We were contracted by the Division of Homeland Security and Emergency Management (DHS\* &EM) to develop a Hazard Mitigation Plan for eleven communities. The City of Nightmute is one of the eleven communities selected.

It is important to note that Nightmute does not have to pay anything for this project. This is an important project for your community, funded by FEMA through the DHS&EM. URS worked with your neighboring communities Tooksook Bay, Newtok, Chefornek, Kipnuk, and Scammon Bay during hazard mitigation plan development projects in the past.

URS has been developing HMPs nationwide since 2000. Our Alaska office has completed approximately 60 State, Borough (County) and local community, State reviewed, and FEMA approved Hazard Mitigation Plans to-date.

Mitigation is defined as “any sustained action taken to reduce or eliminate long-term risk to life and property from natural hazards and their impacts.”

Hazard Mitigation plans identify hazards which routinely impact a community, defines those hazards so community members understand their nature, hazard impact location within the community, and their potential impact extent.

URS's role in this project is to ensure that the Plan 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, and it is our experience that successful plans are a result of an involved community.

Our task is to write the plan while guiding you through the hazard mitigation plan development process using a community planning team process. URS will write the plan. The community Planning Team will assist the process by working with URS to:

- Describe the plan's development process, include interested community members as plan participants or plan reviewers,
- Identify which hazards routinely impact your community,
- Help us explain your historical damages,
- Identify the community's critical facilities and their location within each identified hazard's impact area,
- Determine their “estimated” replacement costs,
- Define the community's population risk and critical facility vulnerabilities,
- Develop hazard mitigation goals,
- Select a few potential projects which could reduce or eliminate future disaster related damages,
- We will provide a detailed list of agency and other potential funding sources with their websites,

Our first goal for the community is to encourage you to select a planning team leader and a few team members. Who do you recommend? Team members should have knowledge of natural hazards that continually cause damages; what facilities are critical for protection from these hazards; as well as, what Nightmute resources and capabilities are available within the community to mitigate those hazards.

We suggest you look for team members from the City, Village elders, the health clinic, school, volunteer fire fighters, law enforcement, and other potential members. We suggest no more than four or five members on this team.

There will be opportunities for the entire community to review the team's work during the public involvement process because FEMA requires at least two public involvement activities. These activities can include distributing or posting newsletters to enable community wide knowledge, providing information during City Council Meeting or other public meetings, and working with us over the phone as we capture needed information.

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 draft HMP and encourage the community to review and provide comments to make the plan better or more usable to mitigate your hazards. I have attached the draft Newsletter for your review. Please write me back with the names of the team leader and members so I can update the draft and return it to you for distribution throughout your community.

I would like to schedule an introductory meeting with the team leader and team members to introduce the project and the process letting you know what information we will need to allow us to proceed. You will be able to call into a teleconference using a speaker phone to simplify the discussions.

We would like to schedule this teleconference by the end of next week if feasible. Please let me know which day and time is convenient for you. We will then provide you the toll-free number which you can pass to each essential participant.

- Please provide us a list of names for your Planning Team to include on the first newsletter and the name of the Planning Team Leader.
- Please also provide a date that we can schedule the project Kick-Off Teleconference to enable us to begin the plan's development.

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

Kind Regards,

**Evan Wasserman | Environmental Planner, MCP | URS Corporation, Alaska**  
700 G Street, Suite 500 | Anchorage, AK 99501  
Office: 907.562.3366 | Direct: 907.375.9020

## Wasserman, Evan

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**From:** Wasserman, Evan  
**Sent:** Friday, November 21, 2014 11:15 AM  
**To:** 'nmeclerk@yahoo.com'  
**Cc:** Simmons, Scott  
**Subject:** Nightmute Hazard Mitigation Plan  
**Attachments:** Newsletter 1\_Nightmute\_20Nov2014\_EW.pdf

Hello Mayor Matthias and City Administrator Tulik,

I am writing to introduce myself, Evan Wasserman, with AECOM/URS, as well as our project manager, Scott Simons. We were contracted by the Division of Homeland Security and Emergency Management (DHS&EM) to develop a Hazard Mitigation Plan for eleven communities. The City of Nightmute is one of the communities selected. We have previously worked with the neighboring communities of Tooksook Bay, Newtok, Chefnak, Kipnuk, and Scammon Bay during hazard mitigation plan development projects in the past.

Your Hazard Mitigation Plan will identify hazards which routinely impact your community, locate facilities that could be impacted, and list potential projects to reduce impacts before they occur. It is important to note that Nightmute does not have to pay anything for this project. This is an important project for your community, funded by FEMA through the DHS&EM.

Our task is to write the plan while guiding you through the hazard mitigation plan development using a community planning team process. URS will write the plan. The community Planning Team will assist the process by working with AECOM/URS to identify hazards, and provide information on historic damage and facilities. As a team we can come up with projects to reduce risk, and develop mitigation goals. We will provide a list of potential funding sources for projects.

AECOM/URS's role in this project is to ensure that the Plan 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, and it is our experience that successful plans are a result of an involved community.

Our first goal for the community is to encourage you to select a planning team leader and a few team members. Team members should have knowledge of natural hazards that continually cause damages; what facilities are critical for protection from these hazards. We suggest you look for team members from the City, Village elders, the health clinic, school, volunteer fire fighters, law enforcement, and other potential members. We suggest no more than four or five members on this team.

I am attaching a draft newsletter to encourage public involvement. When it is final, you can distribute it to the community. It will ask the community to identify known hazards, and confirm critical infrastructure. When the Planning Team is selected, I will update the draft and return it to you for distribution to your community.

I would like to schedule an introductory meeting with your Planning Team to introduce the project and the process. You will be able to call into a teleconference using a speaker phone to simplify the discussions. We would like to schedule this teleconference in the next couple weeks if feasible. Please let me know which day and time is convenient for you. We will then provide you the toll-free number which you can pass to each essential participant.

- Please provide us a list of names for your Planning Team to include on the first newsletter and the name of the Planning Team Leader.
- Please also provide a date that we can schedule the project Kick-Off Teleconference to enable us to begin the plan's development.

I look forward to working with you and your Team on this exciting project, and I will follow up with a phone call to confirm that this email was received.

Thank you and kind regards,

Evan

**Evan Wasserman | Environmental Planner, MCP | URS Corporation, Alaska**

700 G Street, Suite 500 | Anchorage, AK 99501

Office: 907.562.3366 | Direct: 907.375.9020

## Wasserman, Evan

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**From:** Wasserman, Evan  
**Sent:** Friday, November 21, 2014 11:27 AM  
**To:** 'Negtemiut\_tribe@live.com'  
**Cc:** Simmons, Scott  
**Subject:** Nightmute Hazard Mitigation Plan  
**Attachments:** Newsletter 1\_Nightmute\_20Nov2014\_EW.pdf

Hello President Tulik,

I am writing to introduce myself, Evan Wasserman, with AECOM/URS, as well as our project manager, Scott Simons. We were contracted by the Division of Homeland Security and Emergency Management (DHS&EM) to develop a Hazard Mitigation Plan for eleven communities. The City of Nightmute is one of the communities selected. I have contacted the City Mayor of Nightmute, Mary Matthias to help identify a team from your community to assist in this effort, and wanted to make sure that the Tribe was also notified. We have previously worked with the neighboring communities of Tooksook Bay, Newtok, Chefnak, Kipnuk, and Scammon Bay during hazard mitigation plan development projects in the past.

Your Hazard Mitigation Plan for the City of Nightmute will identify hazards which routinely impact your community, locate facilities that could be impacted, and list potential projects to reduce impacts before they occur. It is important to note that Nightmute does not have to pay anything for this project. This is an important project for your community, funded by FEMA through the DHS&EM.

Our task is to write the plan while guiding you through the hazard mitigation plan development using a community planning team process. URS will write the plan. The community Planning Team will assist the process by working with AECOM/URS to identify hazards, and provide information on historic damage and facilities. As a team we can come up with projects to reduce risk, and develop mitigation goals. We will provide a list of potential funding sources for projects.

AECOM/URS's role in this project is to ensure that the Plan 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, and it is our experience that successful plans are a result of an involved community.

Our first goal for the community is to encourage you to select a planning team leader and a few team members. Team members should have knowledge of natural hazards that continually cause damages; what facilities are critical for protection from these hazards. We suggest you look for team members from the City, Village elders, the health clinic, school, volunteer fire fighters, law enforcement, and other potential members. We suggest no more than four or five members on this team.

I am attaching a draft newsletter to encourage public involvement. When it is final, you can distribute it to the community. It will ask the community to identify known hazards, and confirm critical infrastructure. When the Planning Team is selected, I will update the draft and return it to you for distribution to your community.

I would like to schedule an introductory meeting with your Planning Team to introduce the project and the process. You will be able to call into a teleconference using a speaker phone to simplify the discussions. We would like to schedule this teleconference in the next couple weeks if feasible. Please let me know which day and time is convenient for you. We will then provide you the toll-free number which you can pass to each essential participant.

- Please provide us a list of names for your Planning Team to include on the first newsletter and the name of the Planning Team Leader.
- Please also provide a date that we can schedule the project Kick-Off Teleconference to enable us to begin the plan's development.

I look forward to working with you and your Team on this exciting project!

Thank you and kind regards,

Evan

**Evan Wasserman | Environmental Planner, MCP | URS Corporation, Alaska**

700 G Street, Suite 500 | Anchorage, AK 99501

Office: 907.562.3366 | Direct: 907.375.9020

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*This newsletter describes the City of Nightmute 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://www.ready.alaska.gov/plans/localhazmitplans.htm>.*

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 prepare Hazard Mitigation Plans (HMP) for fifteen Alaskan Communities. The City of Nightmute was selected for participation in this effort.

URS was contracted to assist the community with preparing a FEMA approvable hazard mitigation plan and subsequent hazard mitigation grant program application during 2012 and 2013.

The Nightmute Hazard Mitigation Plan will identify all natural hazards, such as earthquake, erosion, flood, severe weather, and wildland fire hazards, etc. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts. The public participation and planning process is documented as part of these projects.

## What is Hazard Mitigation?

Across the United States, natural and human-caused disasters have increasingly caused injury, death, property damage, and business and government service interruptions. The toll on individuals, families, and businesses can be very high. The time, money, and emotional effort required to respond to and recover from these disasters takes public resources and attention away from other important programs and problems.

The people and property in the State of Alaska are at risk from a variety of natural hazards that can potentially cause human injury, property damage, or environmental harm.

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 City of Nightmute 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. Applicants typically compete on a statewide basis.

The Pre-Disaster Mitigation (PDM) and the National Insurance Program's Flood Mitigation Assistance (FMA), grant programs are nationally competitive funding programs. These grants use the same application process and eligibility requirements.

## The Planning Process

There are very specific federal requirements that must be met when preparing a hazard mitigation plan. 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:

- ❑ Plan development process
- ❑ Identify hazards specific to the community
- ❑ Identify the population's and structures' risks
- ❑ Define the jurisdiction's mitigation goals
- ❑ List the community's mitigation strategy, selected actions, and implemented projects
- ❑ Provide a copy of the community's HMP Adoption Resolution

FEMA has prepared a Local Planning Review Guide available at:

<http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4859>). It explains how the HMP meets each of the DMA2000 requirements.



FEMA has prepared “Mitigation Planning Guidance” and “How to” guides available at:

<http://www.fema.gov/hazard-mitigation-planning-resources>. The City of Nightmute’s Hazard Mitigation Plan will follow those guidelines.

We are currently in the very beginning stages of preparing the plan. We will be conducting a public meeting to introduce the project and planning team, and to gather comments from our community residents. Specifically we will complete the hazard identification task, and collect data to conduct the risk assessment.

DHS&EM has previously identified natural hazards that occur in the Lower Kuskokwim Regional Educational Attendance Area (REAA) that may also occur specifically in the City of Nightmute.

## We Need Your Help

Please use the following table to identify any hazards you have observed in your area that DHS&EM is not aware of AND any additional natural hazards that may not be on the list.

Nightmute Hazard Worksheet		
Hazard	Lower Kuskokwim REAA*	City of Nightmute
Earthquake	No	
Erosion	Yes (2)	
Flood	Yes (11)	
Ground Failure (Avalanche, Landslide, Permafrost)	No	
Severe Weather	Yes (5)	
Tsunami & Seiche	No	No
Volcanic Ash	No	
Wildland / Tundra Fire	Yes (1)	

## The Planning Team

The planning team is being led by Scott Simmons with assistance from \_\_\_\_\_, \_\_\_\_\_, and the City or Tribal Councils. URS Corporation has been contracted by DHS&EM to provide assistance and guidance to the planning team throughout the planning process.

## Public Participation

Public involvement will continue throughout the project. The goal is to receive comments, identify key issues or concerns, and improve ideas for mitigation. When the Draft Nightmute Hazard Mitigation Plan is complete, the results will be presented to the community before DHS&EM and FEMA approval and community adoption.

\*Hazard Matrix from the 2013 State of Alaska Hazard Mitigation Plan for the Lower Kuskokwim REAA. (Parentheses indicate threat level and number of historical events)

DHS&EM identified critical facilities within the City of Nightmute as part of the Alaska Critical Facilities Inventory, but the list of critical facilities needs to be updated and the estimated value and location (latitude/longitude) determined.

In addition, the number and value of structures, and the number of people living in each structure will need to be documented. Once this information is collected we will determine which critical facilities, residences, and populations are vulnerable to specific hazards in Nightmute. Please add additional facilities if needed.

Nightmute Critical Facilities*	
Facility Type	Facility Name
Airport	02/20
Power Generation Facility	AVEC
Fuel Storage Tanks (>500gal)	Fuel Storage
Fuel Storage Tanks (>500gal)	Fuel Storage
Reservoir/Water Supply	Nightmute HS
Fuel Storage Tanks (>500gal)	Kuskokwim
Community Hall	N/A
Fire Station	N/A
Police Station	N/A
Sewage Lagoon	N/A
Fuel Storage Tanks (>500gal)	Fuel Storage
Airport	Nightmute
Landfill/Incinerator (2)	III Muni Landfill
Hospital/Clinic/ER	Clinic
Community Storage Shed	Sheds
School	SCHOOL
Church	Perpetual Help
Fuel Storage Tanks (>500gal)	Unknown
* Alaska Critical Facilities Inventory	

Please email or fax updated hazard and critical facility information directly to URS or provide it to your community planning & project team leader.

*We encourage you to take an active part in preparing the City of Nightmute’s Hazard Mitigation Plan development effort. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding these important projects. Please contact your community HMP Team Leader or Scott Simmons, URS directly if you have any questions, comments, or requests for more information:*

### City of Nightmute Planning Team Leader

\_\_\_\_\_, (Title)  
P.O. Box \_\_\_\_\_  
\_\_\_\_\_, AK 99\_\_\_\_\_  
Phone: \_\_\_\_\_  
eMail: \_\_\_\_\_

### URS Corporation

Scott Simmons, Hazard Mitigation, Emergency  
Management, and Climate Change Planner  
700 G Street, Suite 500  
Anchorage, Alaska 99501  
261.9706 or 800.909.6787  
[scott\\_simmons@urs.com](mailto:scott_simmons@urs.com)

### Division of Homeland Security & Emergency Management

Scott Nelsen, State Support  
PO Box 5750  
Anchorage, AK 99505-5750  
428.7010 or 800.478.2337  
[scott.nelsen@alaska.gov](mailto:scott.nelsen@alaska.gov)

## Wasserman, Evan

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**From:** Wasserman, Evan  
**Sent:** Wednesday, January 07, 2015 4:30 PM  
**To:** 'nmecityclerk@yahoo.com'  
**Subject:** FW: Nightmute Hazard Mitigation Plan  
**Attachments:** Newsletter 1\_Nightmute\_7Jan2015\_EW.pdf

Hello Noah,

I wanted to follow up on our discussion today regarding the Hazard Mitigation Planning team, and to say thank you for letting me present at the City Council Meeting over the phone.

You have provided me with a list of names for 5 individuals on the Planning Team.

**Please let me know if you received this message and if the spelling of names is correct.**

Also please provide your mailing address and other contact information.

The individuals are:

- Noah Lawrence (City Administrator and Team Lead)
- Clement George
- Timothy Armstrong
- Jay Dall Sr.
- Janet Lawrence


**Attached is the updated Newsletter 1** with the list of team members, general information about the project, a list of hazards that impact your city, and a list of critical facilities in your city.

**Please post this newsletter and distribute to interested people in your community** as you see fit so that we can generate public interest in the Hazard Mitigation Plan.

As discussed, **the next phone call meeting with the planning team will be held on 1/19/2015 at 2:00pm** and will last about a half an hour or more.

**In the meantime, please ask the team to think about the critical facilities in your community so we can update the list, and specific hazard related issues within your city.**

Thank you and I look forward to our next call.

**Evan Wasserman | Environmental Planner, M.S. |**   
700 G Street, Suite 500 | Anchorage, AK 99501  
Office: 907.562.3366 | Direct: 907.375.9020

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**From:** Wasserman, Evan  
**Sent:** Tuesday, November 25, 2014 2:35 PM  
**To:** 'nmecityclerk@yahoo.com'  
**Subject:** Nightmute Hazard Mitigation Plan

**Hello Mayor Kevin Wiseman and City Administrator Noah Lawrence,**

After speaking with Mr. Lawrence today over the phone, it was suggested that fax would be a better form of communication than email.

I am faxing the information for this project as well as a draft newsletter that we are writing for this Hazard Mitigation Project.

The draft newsletter will be used to encourage public involvement. When it is final, you can distribute it to the community. It will ask the community to identify known hazards, and confirm critical infrastructure. When the Planning Team is selected, I will update the draft and return it to you for distribution to your community.

We have scheduled a **teleconference meeting for December 2<sup>nd</sup> at 2:00pm** to speak with you and other interested members of your city council.

- **Please provide us a list of names for your Planning Team to include on the first newsletter and the name of the Planning Team Leader.**
- **Please provide information on specific hazards influencing your community as well as critical facilities in your community.**

**Also let me know if you receive this fax.**

My direct phone number is 907-375-9020 or by email at [evan.wasserman@urs.com](mailto:evan.wasserman@urs.com)

Thanks,

(I am also sending this as an email)

**Evan Wasserman | Environmental Planner, MCP | AECOM + URS**

700 G Street, Suite 500 | Anchorage, AK 99501

Office: 907.562.3366 | Direct: 907.375.9020

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Hello Mayor Kevin Wiseman and City Administrator Noah Lawrence,

I am writing to introduce myself, Evan Wasserman, with AECOM/URS, as well as our project manager, Scott Simons. We were contracted by the Division of Homeland Security and Emergency Management (DHS&EM) to develop a Hazard Mitigation Plan for eleven communities. The City of Nightmute is one of the communities selected. We have previously worked with the neighboring communities of Tooksook Bay, Newtok, Chefornek, Kipnuk, and Scammon Bay during hazard mitigation plan development projects in the past.

Your Hazard Mitigation Plan will identify hazards which routinely impact your community, locate facilities that could be impacted, and list potential projects to reduce impacts before they occur. It is important to note that Nightmute does not have to pay anything for this project. This is an important project for your community, funded by FEMA through the DHS&EM.

Our task is to write the plan while guiding you through the hazard mitigation plan development using a community planning team process. URS will write the plan. The community Planning Team will assist the process by working with AECOM/URS to identify hazards, and provide information on historic damage and facilities. As a team we can come up with projects to reduce risk, and develop mitigation goals. We will provide a list of potential funding sources for projects.

AECOM/URS's role in this project is to ensure that the Plan 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, and it is our experience that successful plans are a result of an involved community.

Our first goal for the community is to encourage you to select a planning team leader and a few team members. Team members should have knowledge of natural hazards that continually cause damages; what facilities are critical for protection from these hazards. We suggest you look for team members from the City, Village elders, the health clinic, school, volunteer fire fighters, law enforcement, and other potential members. We suggest no more than four or five members on this team.

I am attaching a draft newsletter to encourage public involvement. When it is final, you can distribute it to the community. It will ask the community to identify known hazards, and confirm critical infrastructure. When the Planning Team is selected, I will update the draft and return it to you for distribution to your community.

I would like to schedule an introductory meeting with your Planning Team to introduce the project and the process. You will be able to call into a teleconference using a speaker phone to simplify the discussions. We would like to schedule this teleconference in the next couple weeks if feasible. Please let me know which day and time is convenient for you. We will then provide you the toll-free number which you can pass to each essential participant.

**Evan Wasserman | Environmental Planner, MCP | AECOM + URS**  
700 G Street, Suite 500 | Anchorage, AK 99501  
Office: 907.562.3366 | Direct: 907.375.9020

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URS was contracted to assist the community with preparing a FEMA approvable hazard mitigation plan and subsequent hazard mitigation grant program application during 2012 and 2013.

The Nightmute Hazard Mitigation Plan will identify all natural hazards, such as earthquake, erosion, flood, severe weather, and wildland fire hazards, etc. The plan will also identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts. The public participation and planning process is documented as part of these projects.

## What is Hazard Mitigation?

Across the United States, natural and human-caused disasters have increasingly caused injury, death, property damage, and business and government service interruptions. The toll on individuals, families, and businesses can be very high. The time, money, and emotional effort required to respond to and recover from these disasters takes public resources and attention away from other important programs and problems.

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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 City of Nightmute 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. Applicants typically compete on a statewide basis.

The Pre-Disaster Mitigation (PDM) and the National Insurance Program's Flood Mitigation Assistance (FMA), grant programs are nationally competitive funding programs. These grants use the same application process and eligibility requirements.

## The Planning Process

There are very specific federal requirements that must be met when preparing a hazard mitigation plan. 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>.

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FEMA has prepared a Local Planning Review Guide available at:

<http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4859>). It explains how the HMP meets each of the DMA2000 requirements.

FEMA has prepared “Mitigation Planning Guidance” and “How to” guides available at:

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We are currently in the very beginning stages of preparing the plan. We will be conducting a public meeting to introduce the project and planning team, and to gather comments from our community residents. Specifically we will complete the hazard identification task, and collect data to conduct the risk assessment.

DHS&EM has previously identified natural hazards that occur in the Lower Kuskokwim Regional Educational Attendance Area (REAA) that may also occur specifically in the City of Nightmute.

## We Need Your Help

Please use the following table to identify any hazards you have observed in your area that DHS&EM is not aware of AND any additional natural hazards that may not be on the list.

Nightmute Hazard Worksheet		
Hazard	Lower Kuskokwim REAA*	City of Nightmute
Earthquake	No	No
Erosion	Yes (2)	Yes
Flood	Yes (11)	Yes
Ground Failure (Avalanche, Landslide, Permafrost)	No	Yes
Severe Weather	Yes (5)	Yes
Tsunami & Seiche	No	No
Volcanic Ash	No	No
Wildland / Tundra Fire	Yes (1)	No

## The Planning Team

The planning team is being led by Scott Simmons with assistance from Evan Wasserman, Noah Lawrence, Clement George, Timothy Armstrong, Janet Lawrence, and Jay Dall Sr. as well as the Nightmute City Council. AECOM has been contracted by DHS&EM to provide assistance and guidance to the planning team throughout the planning process.

## Public Participation

Public involvement will continue throughout the project. The goal is to receive comments, identify key issues or concerns, and improve ideas for mitigation. When the Draft Nightmute Hazard Mitigation Plan is complete, the results will be presented to the community before DHS&EM and FEMA approval and community adoption.

\*Hazard Matrix from the 2013 State of Alaska Hazard Mitigation Plan for the Lower Kuskokwim REAA. (Parentheses indicate threat level and number of historical events)

DHS&EM identified critical facilities within the City of Nightmute as part of the Alaska Critical Facilities Inventory, but the list of critical facilities needs to be updated and the estimated value and location (latitude/longitude) determined.

In addition, the number and value of structures, and the number of people living in each structure will need to be documented. Once this information is collected we will determine which critical facilities, residences, and populations are vulnerable to specific hazards in Nightmute. Please add additional facilities if needed.

Nightmute Critical Facilities*	
Facility Type	Facility Name
Airport	02/20
Power Generation Facility	AVEC
Fuel Storage Tanks (>500gal)	Fuel Storage
Fuel Storage Tanks (>500gal)	Fuel Storage
Reservoir/Water Supply	Nightmute HS
Fuel Storage Tanks (>500gal)	Kuskokwim
Community Hall	N/A
Fire Station	N/A
Police Station	N/A
Sewage Lagoon	N/A
Fuel Storage Tanks (>500gal)	Fuel Storage
Airport	Nightmute
Landfill/Incinerator (2)	III Muni Landfill
Hospital/Clinic/ER	Clinic
Community Storage Shed	Sheds
School	SCHOOL
Church	Perpetual Help
Fuel Storage Tanks (>500gal)	Unknown
* Alaska Critical Facilities Inventory	

Please email or fax updated hazard and critical facility information directly to AECOM or provide it to your community planning & project team leader.

*We encourage you to take an active part in preparing the City of Nightmute’s Hazard Mitigation Plan development effort. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding these important projects. Please contact your community HMP Team Leader or Scott Simmons, URS directly if you have any questions, comments, or requests for more information:*

**City of Nightmute  
Planning Team Leader**  
Noah Lawrence, (City Administrator)  
P.O. Box \_\_\_\_\_  
Nightmute, AK 99690  
Phone: 907-647-6426  
eMail: [nmecityclerk@yahoo.com](mailto:nmecityclerk@yahoo.com)

**AECOM**  
Evan Wasserman, Hazard Mitigation and  
Environmental Planner  
700 G Street, Suite 500  
Anchorage, Alaska 99501  
261.9706 or 800.909.6787  
[scott\\_simmons@urs.com](mailto:scott_simmons@urs.com)

**Division of Homeland Security &  
Emergency Management**  
Scott Nelsen, State Support  
PO Box 5750  
Anchorage, AK 99505-5750  
428.7010 or 800.478.2337  
[scott.nelsen@alaska.gov](mailto:scott.nelsen@alaska.gov)

Insert Newsletters, Public Notices, Meeting Minutes, etc.

## Wasserman, Evan

---

**From:** Wasserman, Evan  
**Sent:** Friday, March 13, 2015 5:19 PM  
**To:** 'City Clerk Nightmute'  
**Subject:** HMP Meeting Follow-up and Critical Facilities List  
**Attachments:** Nightmute City Council-Planning Team Mtg Notes\_06Mar2015\_EW.pdf; Nightmute-CriticalFacility-HazardsSpreadsheet.pdf; Nightmute-CriticalFacility-HazardsSpreadsheet.xlsx

Good Afternoon Mayor Wiseman,

As a follow up to our meeting last week regarding the Hazard Mitigation Plan for Nightmute, I have attached some notes from the meeting and a list of the critical facilities we discussed. **Please feel free to provide feedback/edits on the meeting notes or critical facilities list. This is just a draft.**

Ideally we would like to be able to get the **GPS coordinates from you for the critical facilities, and photographs.** If this is not possible we can provide general coordinates for the facilities.

**Also please provide any additional examples of hazard events that you would like to have described in the plan.**

Please begin to discuss with the City Council, and the Planning Team for this project any **ideas you may have for hazard mitigation measures/projects we can describe in the plan.**

When is the best time to schedule another meeting?

Does Mid-April work? That way we can go over the Draft Hazard Mitigation Plan

Thanks,

-Evan

**Evan Wasserman**  
Environmental Planner, IE, Planning Group  
D 1-907-375-9020  
[evan.wasserman@aecom.com](mailto:evan.wasserman@aecom.com)

**AECOM**  
700 G Street, Suite 500, Anchorage, AK 99501  
T 1-907-562-3366 F 1-907-562-1297  
[www.aecom.com](http://www.aecom.com)



To	Kevin Wiseman	Date	4/10/15	# of pages	6+ cover sheet
From	EVAN WASSERMAN	Co./Dept.	City of Nightmute	Co.	AECOM
Phone #	(907) 647-6426	Phone #	(907) 375-9020		
Fax #	(907) 647.6427	Fax #	(907) 562-1297		

Subject: Nightmute Hazard Mitigation Plan

Attachments:

- Planning (HMP) Meeting Notes - 06 Mar 2015
- Nightmute Critical Facility - Hazards Spreadsheet

This Fax is to provide HMP planning materials for your review.

Please give me a call and we can schedule a meeting to discuss/go over these attachments.

Thank you,

EVAN WASSERMAN

Environmental Planner

AECOM

phone: (907) - 375-9020

Fax: (907) - 562-1297

## Wasserman, Evan

---

**From:** Wasserman, Evan  
**Sent:** Friday, April 03, 2015 1:44 PM  
**To:** 'City Clerk Nightmute'  
**Subject:** Re: HMP Meeting Follow-up and Critical Facilities List  
**Attachments:** Nightmute City Council-Planning Team Mtg Notes\_06Mar2015\_EW.pdf; Nightmute-CriticalFacility-HazardsSpreadsheet.pdf; Nightmute-CriticalFacility-HazardsSpreadsheet.xlsx

Good Afternoon Mayor Wiseman,

I wanted to check in with you regarding the documents I had sent a few weeks back. I wanted to make sure you received them because I hadn't seen a response from you. Have you and the HMP planning team had a chance to review them?

I can resend if need be.

I would also like to schedule a meeting regarding the review of the critical facilities list I sent. When would be a good time to have a teleconference?

Thank you,

**Evan Wasserman**  
Environmental Planner, IE, Planning Group  
D 1-907-375-9020  
[evan.wasserman@aecom.com](mailto:evan.wasserman@aecom.com)

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---

**From:** Wasserman, Evan  
**Sent:** Friday, March 13, 2015 5:19 PM  
**To:** 'City Clerk Nightmute'  
**Subject:** HMP Meeting Follow-up and Critical Facilities List

Good Afternoon Mayor Wiseman,

As a follow up to our meeting last week regarding the Hazard Mitigation Plan for Nightmute, I have attached some notes from the meeting and a list of the critical facilities we discussed. **Please feel free to provide feedback/edits on the meeting notes or critical facilities list. This is just a draft.**

Ideally we would like to be able to get the **GPS coordinates from you for the critical facilities, and photographs.** If this is not possible we can provide general coordinates for the facilities.

**Also please provide any additional examples of hazard events that you would like to have described in the plan.**

Please begin to discuss with the City Council, and the Planning Team for this project any **ideas you may have for hazard mitigation measures/projects we can describe in the plan.**

When is the best time to schedule another meeting?

Does Mid-April work? That way we can go over the Draft Hazard Mitigation Plan

Thanks,

-Evan

**Evan Wasserman**

Environmental Planner, IE, Planning Group

D 1-907-375-9020

[evan.wasserman@aecom.com](mailto:evan.wasserman@aecom.com)

**AECOM**

700 G Street, Suite 500, Anchorage, AK 99501

T 1-907-562-3366 F 1-907-562-1297

[www.aecom.com](http://www.aecom.com)

**City of Nightmute  
Critical Facility  
Hazard Analysis**

Facility Type	Estimated No. of Households	Facility Name	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather
Government											
Emergency Response	0	Fire Station				\$40,000	8'x8'	X	X	X	X
	2	Police Station				\$75,000	24'20'	X	X	X	X
Education	15	LKSD Nightmute HS & Elem				\$2,500,000	100'x100'	X	X	X	X
Health Care	4	Nightmute Health Clinic				\$1,000,000	75'x100'	X	X	X	X
Community	5	Community Hall				\$600,000	50'x100'	X	X	X	X
	0	Community Storage Shed				\$50,000	20'x30'	X	X	X	X
	2	Church				\$75,000	60'x75'	X	X	X	X
Roads		1/5 mile(.20) long dirt road	Kuuralria Street					X	X	X	X
		1 mile long dirt road	Airport Road					X	X	X	X
		1/3 mile (.33) long dirt road	Changtak Street					X	X	X	X
		1/5 mile (.20) long boardwalk	Boardwalk to Homes					X	X	X	X
		1/12 mile (.08) long dirt road	Amaralria Street					X	X	X	X
		1/12 mile (.08) long dirt road	Kaugia Street					X	X	X	X
Bridge											
Transportation	3	Nightmute Airport				\$1,000,000		X	X	X	X
Utilities	1	AVEC Power Generation Facility				\$200,000	12'X8'	X	X	X	X
	3	Catholic Church Fuel Storage (>500gal) 50'X100'				\$200,000	16'X16'	X	X	X	X
	3	Chinurak, Inc. Fuel Storage (>500gal) 50'X100'				\$200,000	16'X16'	X	X	X	X
	3	Nightmute Power Co. Fuel Storage (>500gal) 50'X100'				\$200,000	16'X16'	X	X	X	X
	3	National Guard Fuel Storage (>500gal) 50'X100'				\$200,000	16'X16'	X	X	X	X
	3	Fuel Storage Tanks (>500gal) 50'X100'				\$200,000	16'X16'	X	X	X	X
	1	LKSD Nightmute HS & Elem Reservoir/Water Supply					24'X20'	X	X	X	X
	1	Sewage Lagoon 250'x100'						X	X	X	X
	0	Landfill/Incinerator 150'x100'						X	X	X	X
Total QOC:	49					Total Damages:	\$6,540,000				

\*DCRA 2012 Pop: 281 or Number of residents based on Census average of 4.75 per household.

\*\* Value of residential structures based on 2010 Census data for 59 residential structures is \$122,900 average cost. City of Nightmute estimates average structure replacement cost at approximately \$300,000

**City of Nightmute  
Critical Facility  
Hazard Analysis**

Facility Type	Estimated No. of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather
<b>*** Value of Critical Facilities (and Occupancy) based on information provided by the City for each structure.</b>					# People In Residential Structures*	# Residential Structures Potentially Impacted	Estimated Damages**				
					45	59	\$15,930,000	X			
							\$0		X		
					45	59	\$15,930,000			X	
					45	59	\$15,930,000				X
<b>EQ Flood Ground Failure Weather</b>					# People in Critical Facilities*	# Critical Facilities Potentially Impacted	Estimated Damages				
					49	23	\$6,540,000	X			
					49	23	\$6,540,000		X		
					49	23	\$6,540,000			X	
					49	23	\$6,540,000				X

**Subject:** Nightmute Hazard Mitigation Planning – Team Meeting Teleconference -- Division of Homeland Security and Emergency Management (DHS&EM) Hazard Mitigation Plan (HMP)

**Community:** Nightmute, Alaska

**Date/Time:** March 6<sup>th</sup>, 2015—2:00pm to 4:00pm

**From:** Evan Wasserman

---

**Attendees:**

Community Members:

- Mayor Kevin Wiseman
- Clement George
- Mark Mark
- Note: This meeting was part of a planned City Council meeting to update the community on the HMP

AECOM:

- Evan Wasserman, Environmental Planner
- 

**Subjects covered included:**

- AECOM was hired to help develop a hazard mitigation plan (HMP) for Nightmute by the Alaska State Division of Homeland Security and Emergency Management. It is AECOM's responsibility to write the plan and take on the bulk of the work to guarantee FEMA compliance, but we need several critical items that only the community can provide:
  - The attendees identified and screened hazards that impact the community and provided brief histories. Attendees also noted the community is developing mitigation project ideas.
  - A mitigation plan ensures community eligibility for FEMA and potentially other federal agency funding, for which they are not currently eligible. The HMP prepares the community to potentially obtain funding to implement projects.
  - AECOM will continue to provide newsletters for public distribution that will outline how to provide input to the planning process and will let the public know where a copy of the plan is available for review, etc.
- Community members confirmed inclusion of earthquake, flooding/scour, severe weather, and ground failure as hazards to be profiled in the HMP. These are not the only concerns, however, and attention should be paid to other hazards.
- Discussion of Nightmute's critical facilities:
  - As part of the critical facility identification process, the planning team members were able to provide input regarding the estimated value of critical facilities, the number of occupants at those facilities, the estimated size of the facilities, and what types of hazards are of impact to the community.
  - Community members identified five facilities as being of critical importance to the community. These included: The school, the hospital/clinic, the power generation facility, the airport, and the community hall. Also stated by community members was that flooding occurs yearly and affects about 25% of the residential buildings in the city; ground failure / permafrost melt affects about 100% of the residential structures in the city; and severe weather/rain/scour affects about 50% of all the residential buildings in the city.
- Potential capital improvement projects and past attempts at mitigation measures were discussed. These included:

- Sand bags or old drums barrels along the west side of the community on both sides of the river to prevent flooding and scour.
  - Elevation of homes that are not currently on pilings.
  - Better foundations for residential and critical facilities to prevent ground failure from permafrost melt.
- Planning team members discussed projects currently being planned for Nightmute's school.
- AECOM and Nightmute will follow up with more communication to continue drafting the HMP.



# Memorandum

**Subject:** Nightmute Hazard Mitigation Planning – Team Meeting Teleconference -- Division of Homeland Security and Emergency Management (DHS&EM) Hazard Mitigation Plan (HMP)

**Community:** Nightmute, Alaska

**Date/Time:** March 6<sup>th</sup>, 2015—2:00pm to 4:00pm

**From:** Evan Wasserman

---

**Attendees:**

Community Members:

- Mayor Kevin Wiseman
- Clement George
- Mark Mark
- Note: This meeting was part of a planned City Council meeting to update the community on the HMP

AECOM:

- Evan Wasserman, Environmental Planner
- 

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# Memorandum

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- Planning team members discussed projects currently being planned for Nightmute's school.
- AECOM and Nightmute will follow up with more communication to continue drafting the HMP.

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# Memorandum

**Subject:** Nightmute Hazard Mitigation Planning –Plan Documentation-- Division of Homeland Security and Emergency Management (DHS&EM) Hazard Mitigation Plan (HMP)

**Community:** Nightmute, Alaska

**Date/Time:** April 24<sup>st</sup>, 2015—4:55pm

**From:** Evan Wasserman

<b>Post-it® Fax Note</b> 7671		Date <u>4/24/15</u>	# of pages <u>4</u>
To <u>Noah Lawrence</u>	From <u>EVAN WASSERMAN</u>		
Co./Dept. <u>City of Nightmute</u>	Co. <u>AECOM</u>		
Phone # <u>907-647-6426</u>	Phone # <u>907-375-9020</u>		
Fax # <u>907-652-6011</u> <u>907-647-6427</u>	Fax # <u>907-362-1297</u>		

Good Afternoon Mr. Lawrence and the HMP Planning Team,

Included below (As well as attached, and faxed) are tables that we plan on including in the Nightmute HMP for the Chapter 7 Capability Assessment. These are examples of what we may include, but we want input from you. Also attached again are the meeting notes from our last teleconference meeting.

As we discussed during our last teleconference meeting on March 6<sup>th</sup>, these tables will be included in the draft plan for your review, however we would first like to gather direct input from you/the Planning Team on these tables and incorporate your comments/edits into the plan before we send out the draft.

Please review and respond to this email based on the instructions provided with each table.

I will call on 4/28 AT 7:00PM for our tentatively scheduled meeting and to go over these items with you directly.

Please determine if the listed Regulatory Tools (ordinances, codes, and plans) currently exist for Nightmute. Mark with either a Yes or No to the highlighted text. The comments are descriptions of the regulatory tools.

**Table 7-1 Nightmute's Regulatory Tools**

Regulatory Tools (ordinances, codes, plans)	Existing Yes/No?	Comments (Year of most recent update; problems administering it, etc.)
Comprehensive Plan	Yes/No?	Explains the City's land use initiatives and natural hazard impacts.
Land Use Plan	Yes/No?	Explains the City's land use goals and initiatives.
Tribal Land Use Plan	Yes/No?	Describes the City's community development goals and initiatives.
Emergency Response Plan	Yes/No?	
Wildland Fire Protection Plan	Yes/No?	
Building code	Yes/No?	The City can exercise this authority.
Zoning ordinances	Yes/No?	The City can exercise this authority.
Subdivision ordinances or regulations	Yes/No?	The City can exercise this authority.
Special purpose ordinances	Yes/No?	The City can exercise this authority.

Please determine if Nightmute currently has the listed Staff/Personnel Resources.  
Mark with either a Yes or No to the highlighted text. The comments are descriptions of the regulatory tools.

**Table 7-2 Nightmute's Technical Specialists 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/No?	The City has staff with this knowledge OR The City hires planners and engineering consultants
Engineer or professional trained in construction practices related to buildings and/or infrastructure	Yes/No?	The City has staff with this knowledge OR The City hires engineering consultants
Planner or engineer with an understanding of natural and/or human-caused hazards	Yes/No?	The City has staff with this knowledge OR The City hires planners and engineering consultants
Floodplain Manager	Yes/No?	The City does not have this capability
Surveyors	Yes/No?	The City has staff with this knowledge OR The City hires consultants when they need a surveyor.
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	Yes/No?	The City has staff with this knowledge Or The City hires consultants when they need a surveyor.
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazard-MH) software	Yes/No?	The City has staff with this knowledge OR The City hires consultants when they need a surveyor.
Scientists familiar with the hazards of the jurisdiction	Yes/No?	The City can work with U.S. Fish & Wildlife Service (USFWS) and Fish & Game (ADF&G), and the Alaska Department of Transportation and Public Facilities
Emergency Manager	Yes/No?	The City Mayor, City Administrator, or Tribal President
Finance (Grant writers)	Yes/No?	City or Tribal Bookkeeper as applicable
Public Information Officer	Yes/No?	The City Mayor, City Administrator, or Tribal President

Please review and select from or add to the above list of example Mitigation Goals.

If these goals are acceptable or if there are additional goals please let me know and we can include in the plan.

**Table 7-4 Mitigation Goals**

No.	Goal Description
<b>Multi-Hazards (MH)</b>	
MH 1	Promote recognition and mitigation of all natural and manmade hazards that affect the City of Nightmute.
MH 2	Promote cross-referencing mitigation goals and actions with other City and Tribal planning mechanisms and projects.
MH 3	Reduce possibility of losses from all natural and manmade hazards that affect the City.
<b>Natural Hazards</b>	
EQ 4	Reduce structural vulnerability to earthquake (ER) 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.



Please review the listed example Action Descriptions for potential Mitigation Actions and determine if these actions would be **CONSIDERED, SELECTED, ONGOING, or COMPLETED**.

Mark with either a C, an S, an O, or Comp for whichever criteria is selected.

**Table 7-5 Potential Mitigation Actions**  
(Ongoing and newly selected items will be carried forward into the MAP implementation)

Supports Goal No.	Hazard	Criteria <i>Considered</i> <i>Selected</i> <i>Ongoing</i> <i>Completed</i>	Action Description
Multi- Hazards (MH)			
MH 1	Promote recognition and mitigation of all natural hazards that affect the City of Nightmute.		Identify and pursue funding opportunities to Implement mitigation actions.
			Update public emergency notification procedures and develop an outreach program for potential hazard impacts or events.
			Build a self-sustaining evacuation center, away from danger of heavy flooding and ice barriers moving inland.
			Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.
			Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
			Acquire emergency warning methods to communicate critical emergency warnings and alerts.
			Investigate benefits of, and potentially join the National Flood Insurance Program to reduce monetary losses to individuals and the community.
MH 2	Cross reference Mitigation goals and actions with other Cities and Tribe.		Develop and incorporate mitigation provisions and recommendations into all community plans and community development processes to maintain protect critical Infrastructure, residences, and population from natural hazard impacts.
			Update or develop, Implement, and maintain jurisdictional debris management plans.
			Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or Infrastructure.
MH 3	Reduce possibility of losses from all natural hazards that affect the City and Tribe.		Acquire (buy-out), demolish, elevate, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.).
			Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.
Natural Hazards			
EQ 4	Reduce vulnerability of structures to earthquake damage.		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.
			Inspect, prioritize, and retrofit any critical facility or public Infrastructure that does not meet current State Adopted Building Codes.
FL 5	Reduce the possibility of damage and losses from flooding and erosion.		Elevate residential, public, or critical facilities at least two feet above the base flood elevation, on gravel pads or pilings.
			Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
			Protect wastewater treatment systems flood protection to prevent erosion damage and sewage lagoons out-wash.
			Develop mitigation Initiatives such as: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide coastal and river bank protection along the River to protect the tank farm, boardwalks, fuel header, and powerlines.
GF 6	Reduce possibility of damage and losses from ground failure.		Complete a ground failure (avalanche, landslide, permafrost etc.) location inventory; identify (and map) threatened critical facilities, residential buildings, Infrastructure, and other essential buildings.
			Promote permafrost sensitive construction practices in permafrost areas.
SW 7	Reduce vulnerability of structures to severe weather damage.		Reinforce buildings and homes against high winds to reduce damage to roofs and shaking.
			Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public Infrastructure from severe winter storms (snow load, ice, and wind).

City of Nightmute  
P.O. Box 90010  
Nightmute, Alaska 99690  
Ph: (907) 647-6426 Fax: (907) 647-6427  
Email [nmecityclerk@yahoo.com](mailto:nmecityclerk@yahoo.com)

# FAX SHEET

To: Even Wasserman

From: Noah Lawrence

Fax: 907 562-1297

Pages: 2 (including this page)

Phone: \_\_\_\_\_

Date: May 6, 15

Re: \_\_\_\_\_

CC: \_\_\_\_\_

☐ Urgent

☒ For Review

☐ Comment

☐ Please Reply

Comments:



# Memorandum

Please review the listed example Action Descriptions for potential mitigation actions and determine if these actions would be CONSIDERED, SELECTED, ONGOING, or COMPLETED.

Mark with either a C, an S, an O, or Comp for whichever criteria is selected.

**Table 7-5 Potential Mitigation Actions**  
(Ongoing and newly selected items will be carried forward into the MAP implementation)

Supports Goal No.	Hazard	Criteria Considered Selected Ongoing Completed	Action Description
Multi- Hazards (MH)			
MH 1	Promote recognition and mitigation of all natural hazards that affect the City of Nighthuts.	S	Identify and pursue funding opportunities to implement mitigation actions.
		C	Update public emergency notification procedures and develop an outreach program for potential hazard impacts or events.
		C	Build a self-sustaining evacuation center, away from danger of heavy flooding and ice barriers moving inland.
		O	Identify critical facilities and vulnerable populations based on identified (and mapped where applicable) high hazard areas.
		S	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
		O	Acquire emergency warning methods to communicate critical emergency warnings and alerts.
		O/a	Investigate benefits of, and potentially join the National Flood Insurance Program to reduce monetary losses to individuals and the community.
MH 2	Cross reference Mitigation goals and actions with other Cities and Tribe.	C	Develop and incorporate mitigation provisions and recommendations into all community plans and community development processes to maintain protect critical infrastructure, residences, and population from natural hazard impacts.
		O	Update or develop, implement, and maintain jurisdictional debris management plans.
		C	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
MH 3	Reduce possibility of losses from all natural hazards that affect the City and Tribe.	O	Acquire (buy-out), demolish, elevate, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.).
		O	Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.
Natural Hazards			
EQ 4	Reduce vulnerability of structures to earthquake damage.	C	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.
		S	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.
FI 5	Reduce the possibility of damage and losses from flooding and erosion.	C	Elevate residential, public, or critical facilities at least two feet above the base flood elevation, on gravel pads or pilings.
		C	Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
		C	Protect wastewater treatment systems flood protection to prevent erosion damage and sewage lagoons out-wash.
		C	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet piling, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide coastal and river bank protection along the River to protect the tank farm, boardwalks, fuel header, and powerlines.
GF 6	Reduce possibility of damage and losses from ground failure.	O	Complete a ground failure (avalanche, landslide, permafrost etc.) location inventory; identify (and map) threatened critical facilities, residential buildings, infrastructure, and other essential buildings.
		O	Promote permafrost sensitive construction practices in permafrost areas.
SW 7	Reduce vulnerability of structures to severe weather damage.	C	Reinforce buildings and homes against high winds to reduce damage to roofs and shaking.
		O	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms (snow load, ice, and wind).



HP LaserJet M1536dnf MFP

# Fax Confirmation

Urs Corp  
9075621297  
May-6-2015 10:42AM

Job	Date	Time	Type	Identification	Duration	Pages	Result
6237	5/ 6/2015	10:40:23AM	Receive	19076476427	2:01	2	OK

19076476427

City of Nightmute

11:24:05 a.m. 05-06-2015

1 / 2

City of Nightmute  
P.O. Box 90010  
Nightmute, Alaska 99690  
Ph: (907) 647-6426 Fax: (907) 647-6427  
Email [nmecityclerk@yahoo.com](mailto:nmecityclerk@yahoo.com)

## FAX SHEET

To: Erin A. Wasserman

From: Noah Lawrence

Fax: <sup>907</sup>562-1297

Pages: 2 (Including this page)

Phone: \_\_\_\_\_

Date: May 6, 15

Re: \_\_\_\_\_

CC: \_\_\_\_\_

☐ Urgent

☒ For Review

☐ Comment

☐ Please Reply

Comments:

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*This newsletter discusses the preparation of the City of Nightmute Hazard Mitigation Plan. It has been prepared to inform interested agencies, stakeholders, and the public about the project and to solicit comments. This newsletter will also be posted on the State of Alaska Division of Homeland Security and Emergency Management Website as the Draft HMP becomes available at: <http://www.ready.alaska.gov/plans/localhazmitplans.htm>.*

## HMP Development

The City of Nightmute was one of 11 communities selected by the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) for a Hazard Mitigation Planning (HMP) development project. The plan identifies natural hazards that affect the community including earthquake, erosion, flood, ground failure, severe weather, and tundra/wildland fire. The HMP also identifies the people and facilities potentially at risk and potential actions to mitigate community hazards. The public participation and planning process is documented as part of the project.

## What is Hazard Mitigation?

Across the United States, natural disasters have increasingly caused injury, death, property damage, and business and government service interruptions. The toll on individuals, families, and businesses can be very high. The time, money, and emotional effort required to respond to and recover from these disasters take public resources and attention away from other important programs and problems.

People and property throughout Alaska are at risk from a variety of hazards that have the potential for causing human injury, property damage, or environmental harm.

The purpose of hazard mitigation is to implement projects that reduce the risk severity of hazards on people and property. Mitigation programs may include short-term and long-term activities to reduce hazard impacts or exposure to hazards. Mitigation could include education, construction or planning projects. Hazard mitigation activity examples include relocating buildings, developing or strengthening building codes, and educating residents and building owners.

## Why Do We Need A Hazard Mitigation Plan?

A community is only eligible to receive grant money for mitigation programs by preparing and adopting a hazard mitigation plan. Communities must have an approved mitigation plan to receive grant funding from the Federal Emergency Management Agency (FEMA) for eligible mitigation projects.

## The Planning Process

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

The DMA2000 requires the plan to document the following topics:

- ❑ Planning process
- ❑ Community Involvement and HMP review
- ❑ Hazard identification
- ❑ Risk assessment
- ❑ Mitigation Goals
- ❑ Mitigation programs, actions, and projects
- ❑ A resolution from the community adopting the plan

FEMA has prepared a Local Planning Review Guide) and (available at: <http://www.fema.gov/library/viewRecord.do?fromSearch=fro msearch&id=4859>). It explains how the HMP meets each of the DMA2000 requirements. FEMA has prepared and “Mitigation Planning Guidance” and “How to Guides” (available at: <http://www.fema.gov/hazard-mitigation-planning-resources>). The City’s Hazard Mitigation Plan will follow those guidelines.

The planning process kicked-off on November 21, 2014 by establishing a local planning committee and holding a public meeting. The planning committee examined the full spectrum of hazards listed in the State Hazard Mitigation Plan and identified four hazards the HMP would address.

After the first public meeting, City staff and AECOM began identifying critical facilities, compiling the hazard profiles, assessing capabilities, and conducting the risk assessment for the identified hazards. Critical facilities are facilities that are critical to the recovery of a community in the event of a disaster. After collection of this information, AECOM helped to determine which critical facilities and estimated populations are vulnerable to the identified hazards in Nightmute.

A mitigation strategy was the next component of the plan to be developed. Understanding the community’s local capabilities and using information gathered from the public

and the local planning committee and the expertise of the consultants and agency staff, a mitigation strategy was developed. The mitigation strategy is based on an evaluation of the hazards, and the assets at risk from those hazards. Mitigation goals and a list of potential actions/projects were developed as the foundation of the mitigation strategy.

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goals are positively stated future situations that are typically long-range, policy-oriented statements representing community-wide visions. Mitigation actions and projects are undertaken in order to achieve your stated objectives. On March 6, 2015, the local planning committee, and city council identified projects and/or actions for each hazard that focus on six categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. A representative sample of the mitigation actions identified as a priority by the planning team are listed below, and explained in more detail in the plan.

The selected projects and/or actions will potentially be implemented over the next five years as funding becomes available. It outlines how the community will monitor

progress on achieving the projects and actions that will help meet the stated goals and objectives, as well as an outline for continued public involvement.

Once the draft plan has been completed, the plan will be available in the City office for public review and comment. Comments should be made via email, fax, or phone to Evan Wasserman or Scott Simmons (listed below) and be received no later than May 31, 2015. The plan will be provided to DHS&EM and FEMA for their preliminary approval and returned to Nightmute's City and Tribal Councils for formal adoption.

## The Planning Committee

The plan was developed with the assistance from the community's planning committee consisting of a cross section from the community. Planning Team members who helped with developing the plan include Team Leader, Mayor Kevin Wiseman / Noah Lawrence, with assistance from Clement George, Timothy Armstrong, Jay Dall Sr., Mark Mark., Janet Lawrence, Evan Wasserman, and AECOM Corporation.

### Sample of the City of Nightmute's Mitigation Actions. Review the draft HMP for a complete list.

Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.	Acquire emergency warning methods to communicate critical emergency warnings and alerts.	Investigate benefits of, and possibly join the National Flood Insurance Program (NFIP) to reduce monetary losses to individuals and the community.
Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms (snow load, ice, and wind).	Identify and map existing ground failure areas with associated damage to assist in new critical facility siting and existing facility relocation siting.	Develop mitigation initiatives such as: Rip-rap (large rocks), sheet pilings, gabion baskets, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide river bank protection along the Toksook River to protect the tank farm, boardwalks, fuel header, powerlines, and residences.
Identify and pursue funding opportunities to implement mitigation actions.	Acquire (buy-out), demolish, elevate, or relocate structures from hazard prone area (erosion, flood, ground failure, etc.).	Update or develop, implement, and maintain jurisdictional debris management plans
Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.	Promote permafrost sensitive construction practices in permafrost areas.

*We encourage you to learn more about the City of Nightmute's Hazard Mitigation Plan. The purpose of this newsletter is to keep you informed and to allow you every opportunity to voice your opinion regarding this important project. If you have any questions, comments, or requests for more information, please contact:*

Evan Wasserman, Environmental Planner  
AECOM  
700 G Street, Suite 500  
Anchorage, Alaska 99501  
907.375.9020  
evan.wasserman@aecom.com , or  
scott.simmons@aecom.com

Scott Nelsen, Emergency Management Specialist  
DHS&EM  
P.O. Box 5750  
Fort Richardson, Alaska 99506  
907.428.7010 or 800.478.2337  
scott.nelsen@alaska.gov

Appendix E  
Benefit—Cost Analysis Fact Sheet



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# Benefit-Cost Analysis Fact Sheet

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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 (FFE).
- 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).

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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 Task Force undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-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 new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns 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			
	Are the goals still applicable?			
	Should new mitigation actions be added to the a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

## Mitigation Action Progress Report

Page 1 of 3

Progress Report Period: \_\_\_\_\_ to \_\_\_\_\_  
(date) (date)

Project Title: \_\_\_\_\_ Project ID# \_\_\_\_\_

Responsible Agency: \_\_\_\_\_

Address: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_

Phone #(s): \_\_\_\_\_ email address: \_\_\_\_\_

List Supporting Agencies and Contacts:

Total Project Cost: \_\_\_\_\_

Anticipated Cost Overrun/Underrun: \_\_\_\_\_

Date of Project Approval: \_\_\_\_\_ Start date of the project: \_\_\_\_\_

Anticipated completion date: \_\_\_\_\_

Description of the Project (include a description of each phase, if applicable, and the time frame for completing each phase): \_\_\_\_\_

[illegible]

Plan Goal (s) Addressed:

Page 2 of 3

Goal:

Indicator of Success:

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Project Status

Project Cost Status

☐ Project on schedule

☐ Cost unchanged

☐ Project completed

☐ Cost overrun\*

☐ Project delayed\*

\*explain: 

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\*explain: 

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☐ Cost underrun\*

☐ Project canceled

\*explain: 

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Summary of progress on project for this report:

A. What was accomplished during this reporting period?

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

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C. How was each problem resolved?

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

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Other Comments:

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