City of Golovin
Hazard Mitigation Plan

Prepared by
The City of Golovin
Hazard Mitigation Planning Team
December 2015

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FEMA

December 21, 2015

Honorable Kathy Fagerstrom
Mayor, City of Golovin
P.O. Box 62059
Golovin, Alaska 99762

Dear Mayor Fagerstrom:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***City of Golovin Hazard Mitigation Plan*** as a local plan as outlined in 44 CFR Part 201. With approval of this plan, the City of Golovin is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through December 20, 2020.

The plan's approval provides eligibility to apply for hazard mitigation projects through your state. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted. For example, a specific mitigation activity or project identified in the plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved for FEMA funding under any of the aforementioned programs.

Over the next five years, we encourage your community to follow the plan's schedule for monitoring and updating the plan, and develop further mitigation actions. The plan must be reviewed, revised as appropriate, and resubmitted for approval within five years in order to continue project grant eligibility.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Scott Nelson, Emergency Management Specialist with Alaska Division of Homeland Security and Emergency Management, at (907) 428-7010, who coordinates and administers these efforts for local entities.

Sincerely,

Dana Bisco
for

Mark Carey, Director
Mitigation Division

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

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Acronyms/Abbreviations

°F	Degrees Fahrenheit
ACCIMP	Alaska Climate Change Impact Mitigation Program
ACWF	Alaska Clean Water Fund
ADWF	Alaska Drinking Water Fund
AEA	Alaska Energy Authority
AEEE	Alternative Energy And Energy Efficiency
AFG	Assistance To Firefighters Grant
AICC	Alaska Interagency Coordination Center
AK	Alaska
ANA	Administration For Native Americans
ARC	American Red Cross
AVEC	Alaska Village Electric Cooperative
B/C	Benefit/Cost or Benefit vs. Cost
BIA	Bureau Of Indian Affairs
CCP	Citizen Corps Program
CDBG	Community Development Block Grant
CFR	Code Of Federal Regulations
CFP	Community Forestry Program
City	City Of Golovin
CWSRF	Clean Water State Revolving Fund
DCCED	Department Of Commerce, Community, And Economic Development
DCRA	Division Of Community And Regional Affairs
DEC	Department Of Environmental Conservation
Denali	Denali Commission
DHS	Department Of Homeland Security
DHS&EM	Division Of Homeland Security And Emergency Management
DHSS	Department Of Health And Social Services
DGGS	Division Of Geological And Geophysical Survey
DMA 2000	Disaster Mitigation Act Of 2000
DMVA	Department Of Military And Veterans Affairs
DNR	Department Of Natural Resources
DOE	Department Of Energy
DOF	Division Of Forestry
DOI	Division Of Insurance
DOL	Department Of Labor
DOT/PF	Department Of Transportation And Public Facilities
DSS	Division Of Senior Services
EOC	Emergency Operations Center
EMPG	Emergency Management Performance Grant
EPA	Environmental Protection Agency
EQ	Earthquake
ER	Erosion

Acronyms/Abbreviations

EWP	Emergency Watershed Protection Program
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FL	Flood
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention And Safety
ft	Feet
FY	Fiscal Year
g	Gravity
GF	Ground Failure
GIS	Geospatial Information System
Hazus	Hazard United States – Multi-Hazard Software
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HSGP	Homeland Security Grant Program
HUD	Housing And Urban Development
IBHS	Institute For Business And Home Safety
ICDBG	Indian Community Development Block Grant
IHBG	Indian Housing Block Grant
IHLGP	Indian Home Loan Guarantee Program
INAP	Indian And Native American Programs
IRS	Internal Revenue Service
Kts	Knots
M	Magnitude
MAP	Mitigation Action Plan
MGL	Municipal Grants and Loans
MMI	Modified Mercalli Intensity
mph	Miles Per Hour
NAHASDA	Native American Housing Assistance And Self Determination Act
NFIP	National Flood Insurance Program
NIMS	National Incident Management System
NOAA	National Oceanic And Atmospheric Administration
NRF	National Response Framework
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
pCi/L	pico Curies per liter
PNP	Private Non-Profits
RCASP	Remote Community Alert Systems
RD	Rural Development
RL	Repetitive Loss

Acronyms/Abbreviations

RurALCAP	Rural Alaska Community Action Program Incorporated
SAFER	Staffing For Adequate Fire And Emergency Response
SBA	U.S. Small Business Administration
SHMP	Alaska State Hazard Mitigation Plan
SHSP	State Homeland Security Program
SOA	State Of Alaska
Sq.	Square
Stafford Act	Robert T. Stafford Disaster Relief And Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, And Environmental
TF	Technical Feasibility
US or U.S.	United States
USACE	United States Army Corps Of Engineers
USC	United States Code
USDA	United States Department Of Agriculture
USGS	United States Geological Survey
VFA-RFA	Volunteer Fire Assistance And Rural Fire Assistance Grant
VSW	Village Safe Water
WARN	Warning, Alert, And Response Network
WHIP	Wildlife Habitat Incentives Program

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 2002a), 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are described in detail in Section 2 and are identified in their appropriate sections throughout this HMP.

In October 2007 and July 2008, FEMA combined and expanded flood mitigation planning requirements with local 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.

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

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

(FEMA 2015b)

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

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

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

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

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

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

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

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

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

The City of Golovin 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 has been identified as a high priority action as a result of this hazard mitigation planning update process, and the City of Golovin is investigating application to the NFIP program.

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

As the State Hazard Mitigation plan states:

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

- *Up to 100-percent Federal cost share for severe repetitive loss properties.*
- *Up to 90-percent Federal cost share for repetitive loss properties.*
- *Up to 75-percent Federal cost share for NFIP insured properties.*

> *The FMA program is available only to communities participating in the NFIP. In the State of Alaska, the Department of Commerce, Community, and Economic Development (DCCED) manages this program" (SHMP 2013).*

HMP Layout Description

The HMP consists of the following sections and appendices:

Section 1 Introduction

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 of the City of Golovin (City), 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 the 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 plans to implement to assure continued public participation; and their methods and schedule for keeping the plan current.

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

Section 4 Jurisdictional 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 Assessment

Identifies the City'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. 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 City of Golovin's adoption resolution.

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 of Golovin and the Chinik Eskimo Community's location, geography, history, and demographic information.

2.1 LOCATION, GEOGRAPHY, AND HISTORY

The City of Golovin is a second class city in the unorganized borough. Golovin is located on a point of land between Golovnin Bay and Golovnin Lagoon on the Seward Peninsula (Figure 3-1). It is 70 miles east of Nome in the Cape Nome Recording District. The City of Golovin encompasses 3.7 square miles of land and no water.

Figure 2-1 Golovin's Mapped Location

The climate in and around Golovin is heavily influenced by the ocean in the summer when the sea is ice-free. Average summer temperatures range from 40 to 60 degrees Fahrenheit. Average winter temperatures range from -2 to 19 degrees Fahrenheit. Recorded extremes are -40 to 80 degrees Fahrenheit. Annual precipitation averages 19 inches, and annual snowfall is 40 inches. Golovnin Bay is ice-free from mid-May through November.

Originally, Yup'ik Eskimos settled the village of Chinik at the present day Golovin townsite and what was historically known as Ikfiituq and Atnaq. The people of Golovin have cultural influences from the Kauweramiut, Unaligmiut, and Ibaohiufmuit Eskimos. It is also believed that Athabaskans had a great influence through warfare and individual captures. (DCCED 2015)

2.2 DEMOGRAPHICS

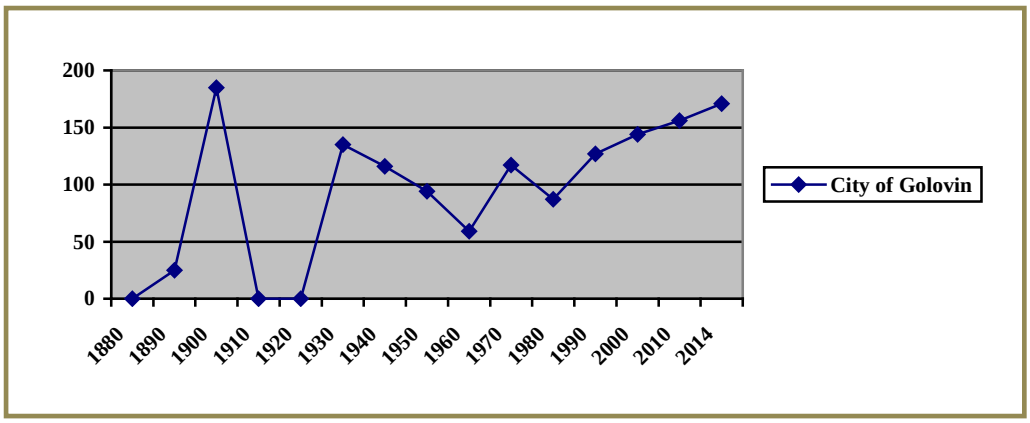

Figure 2-2 Golovin's Historic Population

The 2010 census recorded 156 residents, of which the median age was 25 indicating a relatively young population. The population is expected to remain steady because over half of the population is between 9 and 35 years of age. The City population is principally a Inupiat Eskimo community. The male and female composition is approximately 53 percent (%) and 47 % respectively. The 2010 census revealed that there are 64 households with the average household

having approximately four individuals. The most recent 2014 Department of Labor (DOL) estimated population is 156. Figure 2-2 illustrates the City's historic population.

2.3 ECONOMY

Golovin has a mostly subsistence economy, including activities such as reindeer herding, fish processing, and commercial fishing. Commercial fishing and reindeer herding supplement the subsistence harvests with potential cash income. 21 residents hold commercial fishing permits. Main sources of meat include fish, beluga whale, seal, moose and reindeer.

The economy of Golovin is similar to other rural Alaska communities and can be described as a mixed cash-subsistence economy. The economy relies on subsistence, government jobs, seasonal construction jobs, and commercial fishing. Government jobs are provided through the City, federal agencies, federally funded tribal entities, and the school. Construction jobs are associated with new housing, new facilities, and utility improvements. Fourteen Golovin residents hold commercial salmon permits.

According to the 2010 census, the median household income in Golovin was $37, 705. Approximately 27.4 % were reported to be living below the poverty level. The potential work force (those aged 16 years or older) in Golovin was estimated to be 81, of which 41 were actively employed. In 2010 the unemployment rate was 33.9 percent; however, this rate included part-time and seasonal jobs, and practical unemployment or underemployment is likely to be significantly higher.

Recent construction projects for the High School, Clinic, Bulk Tank Farm and Generator facility brought local employment, but have reached completion, thereby reducing the amount of cash and employment opportunities.

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The June 6, 2004 Department of Community, Commerce, and Economic Development's (DCCED) Community Profile Map depicting Golovin's critical facilities and infrastructure as well as periodic flood impact areas (Figure 2-4).

Figure 2-3 Golovin's DGGS Modified Community Profile Map (DGGS 2012)

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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
Local Planning Process §201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: Element §201.6(b)(1): An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; §201.6(b)(2): An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and nonprofit interests to be involved in the planning process; and §201.6(b)(3): Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information. §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. §201.6(c)(4)(i): The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. §201.6(c)(4)(iii): The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
1. REGULATION CHECKLIST
ELEMENT A. Planning Process
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1)) A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1)) A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3)) A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii)) A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle?) (Requirement §201.6(c)(4)(i))
Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?
Source: FEMA, March 2015.

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, 2015 with a introductory HMP update project email followed by an introductory phone call. The City determined that a December 16, 2014

teleconference with interested City participants would greatly accelerate the project. The teleconference provided a platform to explain how their community was selected by the Division of Homeland Security and Emergency Management's (DHS&EM) 2013 Pre-Disaster Mitigation (PDM) Grant award. AECOM staff described the legacy 2008 HMP's update requirement to enable the City to remain eligible for various mitigation program grants and the overall HMP development process.

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

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 erosion, 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

In summary, the following five-step process took place from December 2014 through June 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 Golovin 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 mayor Kathy Fagerstrom (Planning Team Leader), with City Clerk Virginia Olana, Kathy Punguk, Agnes Moses, Dora Davis, Norma Lewis, Marlene Capaotak. Additional team members may include Chinik Eskimo community member Toby Anungazuk, Jr., Carol Oliver, Donna Katchatag as availability permits.

Table 3-1 identifies the complete hazard mitigation Planning Team.

3-1 Hazard Mitigation Planning Team

Name	Title	Organization	Key Input
Kathy Fagerstrom	Mayor	City of Golovin	Planning Team Lead, HMP review
Virginia Olana	City Clerk	City of Golovin	Planning Team Member, data input and HMP review
Kathy Punguk	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Agnes Moses	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Dora Davis	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Norma Lewis	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Marlene Capaotak	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Carol Oliver	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Donna Katchatag	Council Member	City of Golovin	Planning Team Member, data input and HMP review
Toby Anungazuk, Jr.	Council Member	Chinik Eskimo Community Member	Planning Team Member, data input and HMP review
Scott Simmons	Emergency Management, Hazard Mitigation, and Resiliency Planner	AECOM, Alaska	Contractor, responsible for HMP update 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, 2013. The following agencies were invited to participate and review the HMP:

- University of Alaska Fairbanks, Geophysical Institute, Alaska Earthquake Information Center (UAF/GI/AEIC)
- Alaska Native Tribal Health Consortium-Community Development (ANTHC)

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

Legacy HMP Lifecycle Planning Team Meeting Recommendations

44 CFR requires communities to schedule HMP Planning Team meetings and teleconferences to review, discuss, and determine mitigation implementation accomplishments, track data relevance for future HMP update inclusion and document recommendations for future HMP updates. Meeting minutes are included in Appendix C, Community Outreach.

Table 3-2 lists relevant meeting information for inclusion with the 2015 HMP update to include newly identified hazards that have impacted the area during the 208 HMP's 5-year lifecycle.

Table 3-2 Planning Team Meeting Summaries or Recommendations

Meeting Date	Meeting Attendees	Summary / Recommendations
None	N/A	The City of Golovin did not hold annual HMP review meetings.

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

Table 3-3 Public Involvement Mechanisms

Mechanism	Description
Newsletter #1 Distribution (November 21 2014)	In November 21, 2014, the City posted the newsletter at the City Office, post office, and community bulletin boards to encourage communitywide participation in the upcoming planning activity. The newsletter encouraged the whole community to provide hazard and critical facility information to fulfill their community's needs.
Agency Involvement eMail (November, 2014)	On November 24, 2014 invited jurisdictional agencies to participate in mitigation planning effort and to review applicable newsletters located on the DHS&EM Local/Tribal All Hazard Mitigation Plan Development website at: http://ready.alaska.gov/plans/localhazmitplans.htm
Newsletter #2 Distribution (June, 2015)	In June, 2015, the City posted the newsletter at City Office, post office, store, and community bulletin boards to encourage communitywide participation.

Initial contact was made with Mayor Kathy Fagerstrom on November 21, 2014; she quickly saw the importance of this HMP update project and pleased the City was included within DHS&EM's PDM grant and the prospects of completing the hazard mitigation plan. She selected City Clerk Virginia Olanna to lead the Planning Team and began directing HMP data acquisition efforts.

The newsletter was placed on the DHS&EM website and posted throughout the community (City office, post office, public bulletin boards, etc.) announcing the Kick-off meeting activities.

During the teleconference, URS led the attending public through a hazard identification and screening exercise to assure their current concerns are addressed. The attendees identified six potential hazards: earthquake, flood (erosive scour, ice override, etc.), ground failure (permafrost, sink holes, etc.), severe weather, wildland fire, and radon (a byproduct of uranium decay that commonly affects populations). A few of the legacy 2008 HMP's hazards have been combined within broader categories to better reflect their impacts and relationships.

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 late winter and early spring 2015, which identified 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 Golovin.

A Planning Team meeting was held on May 27, 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 June 30, 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 June, 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 2008 HMP REVIEW

AECOM described the specific HMP information needs during the HMP update project's teleconference to form the foundation for updating the HMP to fulfill current 2015 requirements.

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

Table 3-4 delineates Planning Team identified HMP components that necessitated information update. The Team determined how community changes, construction and infrastructure conditions, climate change impacts, and population increases or decreases have influenced hazard risks and/or facility vulnerabilities.

The current HMP Update process included inviting new and existing stakeholders to review the existing HMP to determine what was accomplished versus what was intended to accomplish. Pertinent section data are identified within Table 3-3, which provided the foundation for completing the 2015 HMP Update.

Table 3-4 HMP Review and Update Needs Determination

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

Table 3-4 HMP Review and Update Needs Determination

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

3

3.5 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 were reviewed and used as references for hazard profiling and to demonstrate community capacity to manage their risks (Table 3-5).

Table 3-5 Documents Reviewed

Existing plans, studies, reports, ordinances, etc.	Contents Summary (How will this information improve mitigation planning?)
Division of Geological and Geophysical Survey (DGGS) LIDAR Data for the Community of Golovin, Alaska	Used to define their flood and coastal storm scour damages
Master Plan for Water and Sewer Facilities, June 1999, City of Golovin, by Montgomery Watson for Alaska Native Tribal Health Consortium (ANTHC)	Provided hazard, soils composition, and current conditions data

Table 3-5 Documents Reviewed

Existing plans, studies, reports, ordinances, etc.	Contents Summary (How will this information improve mitigation planning?)
US Army Corps of Engineers, Erosion Information Paper, - Eek, Alaska, November 10, 2007	Defined the community's erosion impacts
US Army Corps of Engineers (USACE), Alaska Baseline Erosion Assessment, 2009	Defined the area's erosion impacts
USACE, Floodplain Manager's Reports, Community Specific 2011	Defined the area's historical flood impacts
State of Alaska, Department of Commerce, Community and Economic Development (DCCED) Community Profile	Provided historical and demographic information
State of Alaska Hazard Mitigation Plan (SHMP), 2010	Defined statewide hazards and their potential locational impacts

3.6 PLAN MAINTENANCE

This section describes a formal plan maintenance process to ensure that the HMP remains an active and applicable document. It includes an explanation of how the 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

3.6.1 Implementing HMP Precepts

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

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

Once the HMP is community adopted and receives FEMA's final approval, Each Planning Team Member ensures that the HMP, in particular each Mitigation Action Project, is incorporated into existing planning mechanisms whenever possible. Each member of the Planning Team has undertaking the following activities.

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

3.6.2 Continued Public Involvement

DMA 2000 and its implementing regulation for continued public involvement:

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

The 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.

3.6.3 Monitoring, Reviewing, Evaluating, and Updating the HMP

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

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

This section provides an explanation of how Golovin'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 within Section 3.6.3:

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

3.6.3.1 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.

3.6.3.2 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.

The City of Golovin stated they will annually review the HMP and determine project status. However, community activities prevented them from fulfilling this initiative. Table

The City will strive to fulfill 2015 HMP life-cycle annual reviews, as well as work with each project agency or authority lead responsible for administering identified mitigation project to submit a Progress Report (Appendix F) to the Planning Team. These reports will include the current status of their mitigation project; defining 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.

3.6.3.3 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

3.6.3.4 Updating the HMP

The City of Golovin 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 still desires to implement
- Prepare a "new" MAP matrix to identify and direct the HMP's planned life-cycle activities.

- 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

3.6.3.5 Formal State and FEMA HMP Review

Completed HMPs do not automatically qualify the City or Tribe for mitigation grant program eligibility until they have been reviewed and adopted by the City and Tribal councils and received State and FEMA final approval.

Upon completion, the City (or its contractor) and Tribe will submit the updated HMP to the 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.

The City of Golovin and the Chinik Eskimo Community are represented in this HMP and meet the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000, and 44 CFR §201.6(c)(5) and§201.7 respectively.

The Chinik Eskimo Community has participated with this HMP's development and it intends to follow and implement applicable tribal activities to qualify the Village Tribal Council for tribal grant opportunities. The Chinik Eskimo Community's Traditional Council supports 44 CFR 201 and assures compliance with all applicable Federal statutes and regulations.

The City of Golovin and the Chinik Eskimo Community's Councils, with assistance from the State Hazard Mitigation Officer (SHMO), and the State Hazard Mitigation Advisory Committee (SHMAC), are responsible for monitoring, evaluating, and updating their portion of the Golovin Hazard Mitigation Plan in accordance with 44 CFR §201.6 and §201.7 respectively. Their respective councils will monitor the plan to evaluate progress and update the plan every five years, or within 90 days of a Presidential Declared Disaster (as required), to reflect changes in State or Federal law. The Hazard Mitigation Plan Annual Progress Report and Hazard Mitigation Plan Annual Evaluation Forms are plan review tools.

The City and Tribal councils, with assistance from the SHMO and FEMA, determines when significant changes warrant an update prior to the scheduled date.

Once the plan has fulfilled all FEMA criteria, the City and Tribal community will pass an HMP Adoption Resolution and forward it to the State and FEMA for final approval. FEMA's final approval assures the City is eligible for applying for appropriate mitigation grant program funding.

Section Four is included to fulfill the City of Golovin's and the Chinik Eskimo Community's HMP adoption requirements.

4.1 ADOPTION BY LOCAL GOVERNING BODIES AND SUPPORTING DOCUMENTATION

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

DMA 2000 Requirements
Local Plan Adoption §201.6(c)(5): [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.

The City of Golovin's City Council and the Chinik Eskimo Community's Tribal Council are represented in this HMP; they meet the requirements of Section 409 of the Stafford Act, Section 322 of DMA 2000, and 44 CFR §201.6(c)(5) and §201.7 respectively.

The Golovin City Council adopted the HMP on October 20, 2015.

The Chinik Eskimo Community's Tribal Council adopted the HMP on _____.

The City submitted the final draft HMP to FEMA for formal approval; scanned copies of their formal adoption resolutions are included in Appendix C.

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Section Five identifies and profiles the hazards that could affect the City of Golovin and the Chinik Eskimo Community.

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
Identifying Hazards §201.6(c)(2)(i): 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. §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
1. REGULATION CHECKLIST
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT
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

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

For the first step of the hazard analysis, on December 16, 2014 the Planning Team reviewed their legacy HMPs identified hazards to determine how best to modify them based on past events or impacts. 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 six

hazards pose a great threat to the City: earthquake, flood, ground failure, radon, severe weather, and wildland/tundra fire; some of which are influenced by increasing changing climate conditions such as late ice formation, early thaw conditions, increased, lack, or inconsistent rain.

Upon further investigating naturally occurring uranium; this HMP update will continue to profile "radon" as potentially affecting Golovin's population.

Table 5-1 Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	Explanation
Natural Hazards		
Earthquake	Yes	The City of Golovin is located about 75 southeast of the Kigluak-Beddeleben Faults.
Flood (Riverine and/or coastal related floods and resultant erosion)	Yes	Flooding events occur regularly. Shoreline scour continually occur from wind and waves and surface runoff. Additionally, there is historic evidence that ice override (Ivu) has impacted the City of Golovin.
Ground Failure (Avalanche, Landslide/Debris Flow, Permafrost, Subsidence)	Yes	Localized areas in Golovin may be subject to landslides (slope failure), continuous permafrost and experience melting and sinkholes.
Radon	Yes	A uranium mine is within approximately 50 miles of Golovin; the City of Nome has had problems with radon gas in buildings. Naturally occurring uranium decays into radon.
Severe Weather (Cold, Drought, Rain, Snow, Wind, etc.)	Yes	Severe weather impacts the community with climate change/global warming and changing El Niño/La Niña Southern Oscillation (ENSO) patterns generating increasingly severe weather events such as winter storms, heavy or freezing rain, thunderstorms and with subsequent secondary hazards such as riverine or coastal storm surge floods, landslides, snow, and wind etc. 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.
Tsunami (Seiche)	No	This hazard does not exist for this location.
Volcano	No	This hazard does not exist for this location.
Wildland (Tundra) Fire	Yes	The City of Golovin and the surrounding area become very dry in summer months and human caused incidents (i.e., improper extinguishment of cigarettes) may ignite the dry vegetation.

5.3 HAZARD PROFILES

DMA 2000 and its implementing regulations for hazard profiles:

DMA 2000 Requirements
Profiling Hazards Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
1. REGULATION CHECKLIST
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT
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 Golovin'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 Table 5-2 identified criteria from Section 5.3's narrative descriptions.

Table 5-2 Hazard Magnitude/Severity Criteria

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

Similar to estimating magnitude and severity, Probability is determined based on historic events, using Table 5-3 identified criteria, to provide future event recurrence likelihood.

Table 5-3 Hazard Recurrence Probability Criteria

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

The hazards profiled for the City Golovin 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 2006).

Magnitude (M) is the measure of the earthquake strength. It is related to the amount of seismic energy released at the earthquake's hypocenter, the actual location of the energy released inside the earth. It is based on the amplitude of the earthquake waves recorded on instruments, known as the Richter magnitude test scales, which have a common calibration (see Table 5-1).

UPSeis
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Modified Mercalli Intensity Scale

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

Figure 5-1 Modified Mercalli Intensity (MMI 2015)

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, UAF Geophysical Institute's archives. Research included

searching the US Geological Survey (USGS) earthquake database for events spanning from 1973 to present; none of which exceeded M5.0 located within 100 miles of the City.

Therefore the Planning Team determined that based on available recorded data, the City 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 5-5 which lists 50 of the 141 historical earthquakes that exceeded M3.5. The largest ones (highlighted) included three at M4.7 and one at M4.8; none of which caused exceeded M5.0 or had damaging impacts.

Table 5-4 Golovin's Historical Earthquakes

Date	Time	Latitude	Longitude	Depth	Magnitude	Location
03/08/15	10:08:14 PM	64.0663	-165.2734	25.4	3.7	48km S of Nome, Alaska
03/08/15	8:23:48 PM	64.06	-165.2649	19.3	4.3	66km SSW of Nome, Alaska
11/17/10	2:36:50 PM	65.031	-165.569	2.6	3.5	northern Alaska
11/09/10	1:33:43 AM	64.663	-161.79	14.3	3.7	northern Alaska
11/30/08	2:31:36 PM	65.421	-162.007	7.7	3.7	northern Alaska
12/19/07	5:03:05 PM	63.745	-160.887	23.5	3.6	Central Alaska
07/06/06	11:26:58 PM	65.287	-160.734	5.1	4.5	northern Alaska
01/14/06	12:47:07 PM	64.745	-164.657	4.5	3.6	northern Alaska
09/07/05	2:05:49 AM	65.381	-162.194	30	3.6	northern Alaska
09/07/05	2:01:06 AM	65.423	-162.211	30	4.7	northern Alaska
09/06/05	7:16:58 AM	65.439	-162.173	3.9	4.8	northern Alaska
07/28/05	6:58:31 PM	64.582	-163.576	18.7	3.7	northern Alaska
07/21/05	11:48:21 AM	64.614	-163.471	30	3.9	northern Alaska
07/12/05	5:48:05 AM	64.572	-163.472	15.2	3.8	northern Alaska
05/06/05	4:07:08 PM	65.774	-163.53	10	3.6	northern Alaska
11/18/04	11:14:22 PM	63.462	-162.582	5.2	3.7	northern Alaska
12/29/02	9:59:44 PM	65.381	-162.157	10	3.9	northern Alaska
12/22/02	7:03:04 AM	65.392	-162.124	10	3.9	northern Alaska
08/13/02	8:39:05 PM	63.962	-164.455	0	3.5	northern Alaska
08/13/02	6:47:30 PM	64.002	-164.42	6.7	3.7	northern Alaska
04/30/01	12:36:03 PM	64.51	-163.834	8	4.4	northern Alaska
04/03/01	12:48:53 AM	65.589	-162.979	30	3.6	northern Alaska
06/18/00	3:37:14 PM	65.317	-164.083	10	4.7	northern Alaska
04/30/00	8:00:08 AM	64.341	-162.685	10	3.5	northern Alaska
11/05/98	10:12:41 AM	63.885	-165.684	10	3.7	Bering Strait
07/21/98	10:59:43 AM	64.881	-162.32	10	4	northern Alaska
12/15/97	2:22:33 PM	64.555	-162.672	25.1	4.5	northern Alaska
07/14/97	9:55:57 PM	64.961	-164.722	10	4.4	northern Alaska
08/27/96	1:33:04 AM	65.204	-165.444	10	4.4	northern Alaska
05/25/96	1:23:41 PM	64.561	-163.714	20	3.6	northern Alaska
05/25/96	7:08:27 AM	64.513	-162.846	10	3.8	northern Alaska
05/18/95	6:04:21 PM	64.746	-162.311	25	3.8	northern Alaska
04/21/94	1:02:46 AM	64.813	-164.821	10	4.2	northern Alaska
09/24/93	5:03:37 PM	64.197	-164.414	0	3.9	northern Alaska
07/31/93	9:09:39 PM	64.423	-162.447	10	4	northern Alaska

Table 5-4 Golovin's Historical Earthquakes

Date	Time	Latitude	Longitude	Depth	Magnitude	Location
09/28/92	7:34:23 PM	63.959	-162.04	0.8	3.6	northern Alaska
09/14/92	8:31:07 AM	64.671	-165.795	0	3.7	northern Alaska
09/14/92	5:25:15 AM	64.468	-165.936	0	3.7	northern Alaska
08/30/92	1:51:13 PM	64.822	-165.665	18.3	4.7	northern Alaska
04/08/92	1:01:50 AM	64.969	-162.935	10	3.5	northern Alaska
11/17/89	10:46:52 PM	65.087	-164.713	5	3.5	northern Alaska
04/01/89	9:25:44 AM	63.561	-164.27	33	4.1	northern Alaska
07/27/88	11:45:30 PM	64.301	-161.391	10	4.3	northern Alaska
10/05/83	9:55:31 AM	64.7	-160.558	33	3.9	Central Alaska
03/03/83	6:26:05 PM	65.145	-165.626	33	3.9	northern Alaska
08/15/82	3:47:27 PM	65.015	-162.068	33	4.4	northern Alaska
10/24/79	10:19:36 PM	65.238	-164.736	33	4.4	northern Alaska
03/22/78	3:45:20 PM	64.879	-160.482	33	4.7	Central Alaska
09/01/77	9:38:48 PM	64.64	-160.111	33	3.7	Central Alaska
04/11/73	5:12:18 AM	64.608	-160.052	15	4.2	Central Alaska
03/08/15	10:08:14 PM	64.0663	-165.2734	25.4	3.7	48km S of Nome, Alaska

(USGS 2015)

North America's strongest recorded earthquake occurred on March 27, 1964 in Prince William Sound measuring M9.2 and was felt by many residents throughout Alaska. Golovin felt the earthquake but did not experience severe ground motion from this historic event. Planning Team members further stated that residents experienced moderate ground shaking from the November 3, 2002 M7.9 Denali EQ.

5.3.1.3 Location, Extent, Impact, and Recurrence Probability

Location

The entire geographic area of Alaska is prone to earthquake effects. The Kigluaik and Bendeleben faults, which are about 75 miles northwest of the community, are active or potentially active (Haeussler and Plafker 2003). As such USGS data shows that Golovin experienced 19 earthquakes over M2.0 since 1973 with an average magnitude of approximately M3.3 (rounded from 3.289474). Figure 5-2 shows the locations of active and potentially active faults in Alaska.

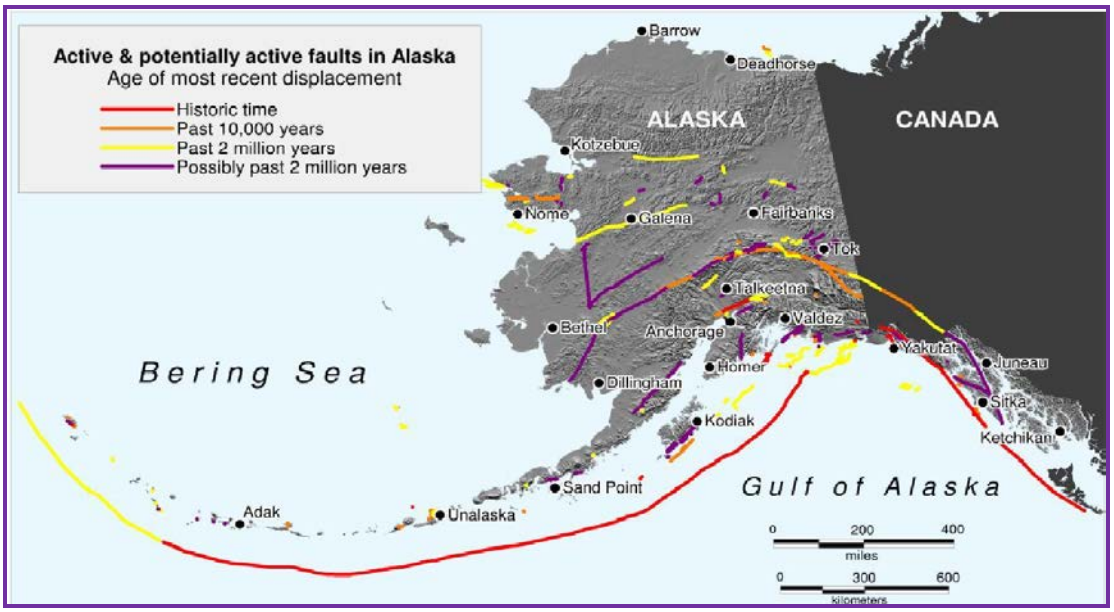

Figure 5-2 Active and Potentially Active Faults in Alaska (DGGS 2009)

5

Extent

The Kigluaik and Bendeleben are normal near vertical faults that produce intra-plate earthquakes, which occur within a tectonic plate sometimes at great distance from the plate boundaries. These types of earthquakes can have magnitudes of 7.0 and greater. Shallow earthquakes in the Fairbanks area are an example of intra-plate earthquakes.

Earthquakes felt in the Golovin area have not exceeded 5.0 M in the past 42 years, and damage has never been reported due to an earthquake event.

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 minor injuries, the potential for critical facilities to be shutdown for less than 24 hours, less than 10 percent of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

The City is located in close proximity from the following earthquake faults as depicted in Figure 5-3:

- Bendeleben Fault
- Crater Creek Fault
- Kigluaik Fault
- Norton Sound Fault
- Kaltag Fault
- Numerous unnamed faults

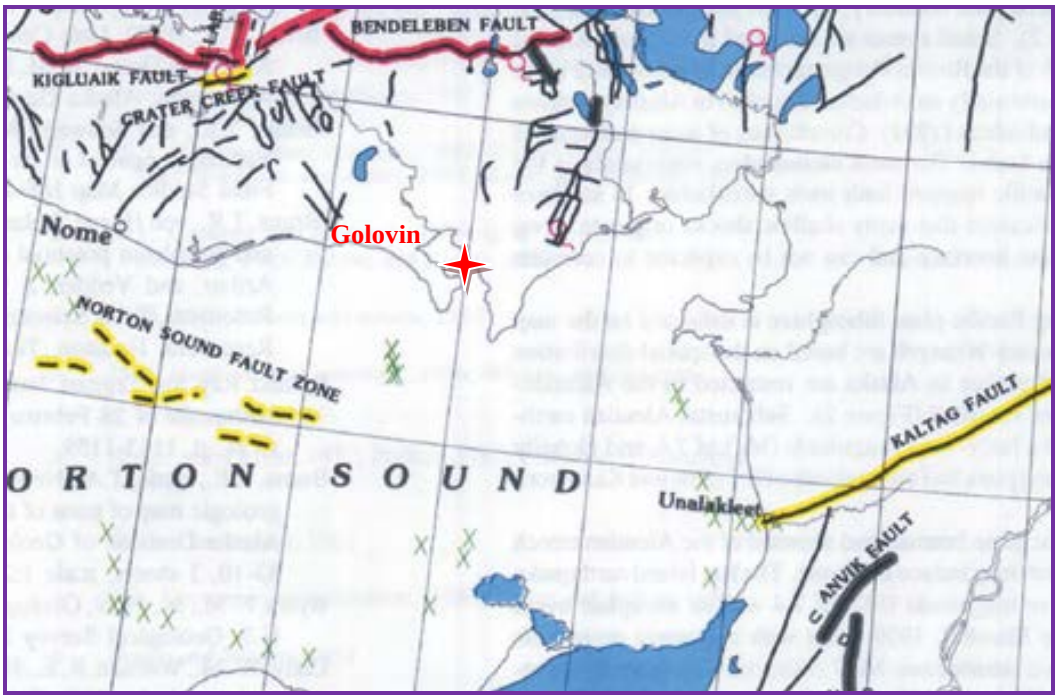

Figure 5-3 Neotectonic Map of Alaska (DGGS 1994)

5

Impact

Golovin is located in an area that is less active than others in the state, although the effects of earthquakes centered elsewhere are expected to be felt in Golovin. 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

The City of Golovin has no official record of significant earthquake activity resulting in damage or injuries. While it is not possible to predict when an earthquake will occur, Figure 5-3 was generated using the U.S. Geologic Survey (USGS) Earthquake Mapping model and indicates approximately an 8 percent probability of a 5.0 M or greater earthquake occurring within 10 years and 50 kilometers (i.e. approximately 31 miles) of Golovin.

This 2009 Shake Map (Figure 5-4) incorporates current seismicity in its development and is the most current map available for this area. Peter Haeussler, USGS, Alaska Region states, it is a viable representation to support probability inquiries.

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

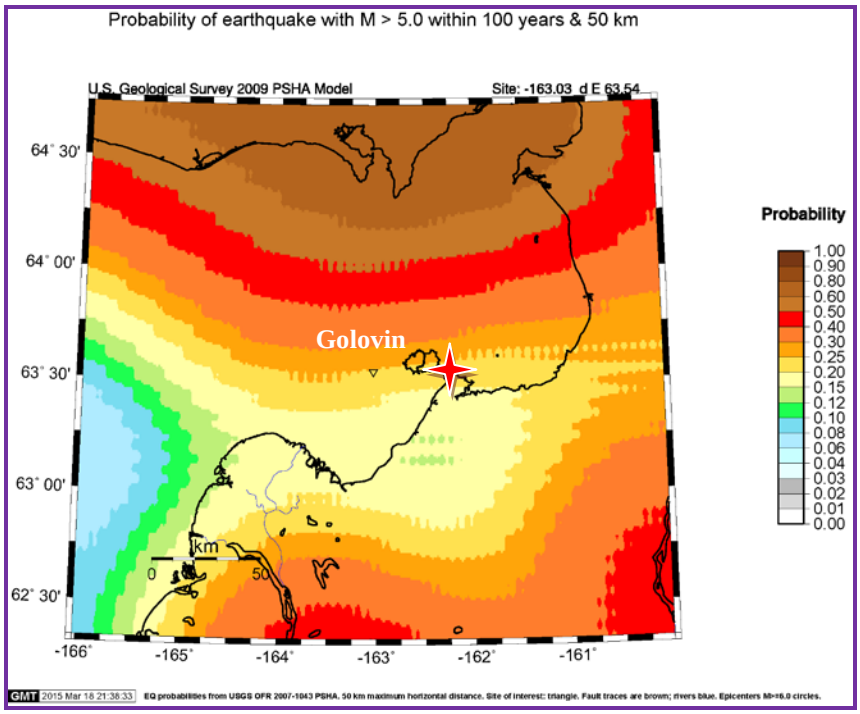

Figure 5-4 Golovin's Earthquake Probability (USGS 2015)

As indicated in Figure 5-4, 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 and indicates a M5.0 or greater earthquake occurring within 100 years and 100 miles of the City is "Possible" within the next five years (1/5=20 percent) chance of occurring; due to an event history that is greater than 10 percent but less than 20percent 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.

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.

Ice jams commonly develop in areas where the channel slope decreases, becomes shallower, or where constrictions occur such as at bridges, at river bends, headwaters, and reservoirs. Ice jams frequently impede water along big rivers during spring break-up.

Water levels increase upstream behind the ice jam. The result is flooding creating a lake-like effect covering a large area. Little damage typically occurs from the water current upstream of the ice jam, but significant damage can result from flooding. However, the downstream effect is very different. The dammed water rapid drains as soon as the ice jam is breached. Downstream water levels rise substantially and water currents increase after the ice jam is breached. This causes significant high water flow scour and land loss. Rising water also causes the ice to float while increased water velocities move the ice further downstream. Large-solid ice blocks are often destructive to natural and material property along the river embankments. Ice jams cause flood events during spring break-up, snowmelt can contribute to the flood. Notable large floods in recent years on the Kenai, Susitna, Kuskokwim, and Yukon rivers were all caused by ice jams and snow melt run-off.

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

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

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

Ice Override (also known as an Ivu) is a phenomenon that occurs when motion of the sheet ice is initiated by wind stress acting on the surface of ice that is not confined. Onshore wind, coupled with conditions such as a smooth gradual sloping beach and high tides can cause ice sheets to

slide up or "override" the beach and move inland as much as several hundreds of feet. Ice override typically occurs in fall and early winter (though events have been reported at other times) and is usually associated with coastal storms and storm surge but may also happen in calm weather.

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

Coastal Scour (used interchangeably with erosion) rarely causes death or injury. However, erosion causes property destruction, prohibits development, and impacts community infrastructure. Erosion is typically gradual land loss through wind or water scour. However, erosion 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. Erosion is a natural process, but its effects can be easily exacerbated by human activity.

Coastal and riverine erosion threaten the Dillingham area's infrastructure, built environment, and utilities adjacent embankments and shorelines.

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

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

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

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

Riverine Scour results from the force of flowing water and ice formations in and adjacent to river channels. This scouring affects the river the channel, river bed and banks and can alter or preclude any channel navigation or riverbank development. In less stable braided channel

reaches, scour, and material deposition are constant issues. In more stable meandering channels, scour episodes may only occasionally occur from human activities including boat wakes and dredging.

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

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

Event Recurrence Intervals

Many flood damages are predictable based on rainfall and seasonal thaw patterns. Most of the annual precipitation is received from April through October with August being the wettest. This rainfall leads to flooding in early/late summer and/or fall. Spring snowmelt increases runoff, which can cause excessive surface flooding. It also breaks riverine winter ice cover, exacerbating localized ice-jam flood or coastal ice override damage impacts.

5.3.2.2 History

The community has experienced major erosion events in 1992, 2003, 2004, and 2005. In 1992, a section of coast 7,800 feet long by 15 to 20 feet inland was eroded in a single event during a storm (Chinik Eskimo Community). Events in 2003, 2004, and 2005 saw erosion of the same magnitude. The 2004 and 2005 events occurred during major storm events addressed in the Severe Weather section (5.3.6). During these events, Golovin experienced coastal erosion as a result of melting permafrost, removal of beach sand, and ivu events accompanying the storms.

Attempts to mitigate erosion have been made, including sand barrels and pit run gravel constructed by the Golovin Flood Control Working Group. These efforts are reported to have been effective, but as of September 17, 2007, the road has been subjected to three high water events and is now exhibiting partial erosion of the slope. Damage has also occurred to downtown roads, the fish plant, the old Golovin landfill, and downtown house pads. The house pads and the roads cost approximately $5,000 each to repair.

A severe fall storm in September 2005 caused the tides to run 7 to 9 feet higher than normal levels. This storm produced severe flooding with seawater flooding the lower village streets and structures, including the school, tank farm, and many of the buildings along Amuktoolik and Punguk Streets (see photos 1, 2, and 3). Roads were covered in 3 feet of water, fuel tanks were floating and the lower village was completely inundated with flood water. State and federal disaster declarations were made.

Photo 1. City of Golovin, lower village and Tank Farm

Photo 2. Main Road through Golovin

Photo 3. Post Office

A similar, but less severe flood occurred during the Bering Sea Storm of October 2004. Both of

Photo 4. City of Golovin, lower village

Photo 5. Main Road through Golovin

Photo 6. Generator

All photos taken during the October 2004 flood event.

these storms were declared disasters on the state and federal levels.

According to the U.S. Army Corps of Engineers (COE), the "flood of record" was recorded at 98.9 feet in October 1992. During this flood, a High Water Elevation (HWE) sign was placed on a utility pole on the southwest corner of the intersection on Amuktoolik Street and Punguk Street. The HWE sign is 3.5 feet above ground in front of a new church building site and across the street from the City Fuel Tank Farm.

COE records also indicate that a storm in 1945 washed away a building where the high school is currently located. The worst flood occurred in October 1913 according to COE records. Village elder, Maude Moses recalled that residents had to caulk the walls of the Dexter Building to keep water from getting inside. It is locally reported that a miner was missing after a large wave hit him. He was one of several people who were evacuating the low lands by following a rope strung from the Dexter Building to higher ground.

The USACE Floodplain Manager's October 2011 report commented that the City's flood elevations and threat as:

> *"Comments: The high water elevation sign that was placed at the elevation of the 1992 flood on the utility pole on the southwest corner of the intersection on Amuktoolik Street and Punguk Street was not replaced when the pole was moved.*
>
> *Floodwaters damaged the power plant, school, and GCI building in 2005. The road to the city drinking water tank was elevated in 2006, and protected the main infrastructure during the 2009 event.*

DNR/DGGS research for compiling data for "Coastal Flooding in Golovin, Alaska, followingthe November 2011 Bering Sea Storm" describes the storms progress as

> *"On November 8, 2011, an extra-tropical cyclone with a low pressure of 945 millibars developed over the Bering Sea and moved northeast across the western coast of Alaska. This severe low-pressure system brought high winds and a large storm surge to the entire Norton Sound region. This storm caused extensive flooding in the lower portion of Golovin on the afternoon of November 9, 2011.*
>
> *This map summarizes the extent of the November 9, 2011, flooding and was created from DGGS measurements of flood indicators in combination with elevations on the 2004*

Alaska Department of Commerce, Community & Economic Development (DCCED) community map and photographs taken by local residents during the storm.

The following facility impact photo (Figure 5-5) correlate to their numbered location defined within the study.

Figure 5-5 Golovin Flood Inundation (DGGS 2012-2)

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

"162. Nome Highway Disaster. *On October 5, 1992, a major Bering Sea Storm with gale-force winds impacted the Norton Sound Coast of the Seward Peninsula in Western Alaska, producing an unusually high storm surge tide and very large waves, particularly in the Nome area. The high tidal waves severely damaged two federal-aide highways, isolating the mining community of Council and endangering the traveling public in the Nome area. DOT/PF will request emergency relief funds from Federal Highway Administration.*

04-206 03 Fall Sea Storm (AK-04-209) Declared January 29, 2004 by Governor Murkowski. *A series of sea storms with high winds and tidal surge during the period of November 1 to November 24, 2003 caused damages in the communities of Unalakleet, Diomede, and Port Heiden. Damage was also reported by the Department of Transportation. The City of Unalakleet and Port Heiden declared local emergencies and Diomede requested assistance in a letter to the Division of Homeland Security and Emergency Management. The Department of Transportation reported damages in Nome on the Nome-Counsel Road (MP 22 and 23.8) and at the Unalakleet airport. The City of Unalakleet had a large quantity of debris deposited throughout the road system. Damages to a gabion protection wall, roads and exposure of a water line were also experienced. Port Heiden experienced tidal erosion that exposed two grave sites, a power line and endangered a road. The US Air Force, under the coordination of the Division of Homeland Security and Emergency Management, addressed the issue of the two grave sites. Disaster Assistance for Emergency Protective Measures and Permanent Work category C for the City of Port Heiden, the Department of Transportation and*

Unalakleet, category F for Port Heiden and debris removal for Unalakleet were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested. No Hazard Mitigation was applicable. The total for this disaster is approximately $654K. This is for Public Assistance for 4 potential applicants with 5 PW's.

04-211 2004 Bering Strait Sea Storm declared October 28, 2004 by Governor Murkowski then FEMA declared (DR-1571) on November 15, 2004. Amended declaration to extend incident to October 24, 2004. *Between October 18 and 20, 2004, a severe winter storm with strong winds and extreme tidal surges occurred along the Western Alaska coastline, which resulted in severe damage and threat to life and property, specifically in the Bering Strait Regional Educational Attendance Area (REAA), including Elim, Nome, Koyuk, Shaktoolik, Unalakleet, and other communities; in the Northwest Artic Borough, including Kivalina, Kotzebue, and other communities; and in the City of Mekoryuk; with potentially unidentified damages in adjacent areas, and additional storm surges likely from continuing weather patterns in this area Alaska. Conditions that exist in the coastal communities of the Northwest Artic Borough as a result of this disaster: severe damage to roadways, power distribution systems, and drain fields. Conditions that exist in the coastal communities of the Bering Strait REAA as a result of this disaster: severe damage to gabions (used to protect shoreline), major damage to coastal highways and roads, damage to water and septic systems, damage to a bridge, damage to power distribution systems, damage to fuel storage tanks, fuel spills, and property damage. Conditions that exist in the City of Mekoryuk as a result of this disaster: major damage to sea wall and damage to roadways. On November 16, 2004, the declaration was amended to reflect a more accurate timeframe of the disaster. The City of St. George appealed the denial of funding decision for the breakwater. The appeal was granted, which increased the original estimate for total funding of this disaster by more than $3 million. The dates of the severe storm were changed to October 18 through October 24, 2004. Individual assistance totaled $1 million for 271 applicants. Public Assistance total $13 million for 60 potential applicants with 125 PW's. Hazard Mitigation totaled $800K. The total for this disaster is $17 million.*

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: sever 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.

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

13-S-244 2013 November Storm Disaster declared by Governor Parnell on November 16, 2013. *On November 5, 2013 the National Weather Service (NWS) issued the first of several coastal flood and winter storm warnings ranging from the central Aleutians to and including the western coastline of Alaska from Bristol Bay to the North Slope. In their published message the NWS warned of very strong low pressure system south of Shemya, moving to the central* ***Bering and Chukchi Sea's*** *bringing a combination of gale, high surf, high wind, freezing spray, coastal flooding and sea surge warnings and watches. The west coast was impacted with hurricane force winds* ***exceeding 85 mph****, high tidal ranges, and strong sea surges. The resultant impact culminated to, damage to public facilities including roads, seawalls, bridges, airports, and public buildings; damage to electrical distribution systems and drinking water systems; damages to private residences and the losses of personal and real property; and coastal flooding and power outages which necessitated evacuation and sheltering operations. Overall, the series of storms created a threat to life and property in 23 cities and villages in the* ***Bering Strait Regional Educational Attendance Area (REAA),*** *Lower Yukon REAA, and Lower Kuskokwim REAA, and the Fairbanks North Star Borough"*

(DHS&EM 2013).

The US Army Corp of Engineers Alaska Baseline Erosion Study's associated Erosion Information Paper – Golovin, Alaska, November 8, 2007 provides detailed high water flow scour information:

"Description of Erosion Problem

Golovin reports both coastal and riverine erosion. Coastal erosion is caused by severe Bering Sea fall and winter storm surges, wind and waves, and high tides through Norton Sound that impact Golovnin Bay and Lagoon. Melting permafrost, removal of beach sand, and ivu events (ice overriding the land) are factors contributing to the severity of the coastal erosion" (USACE 2007).

Alaska Division of Geological and Geophysical Survey recently completed the Color-Indexed Elevation Maps for Flood-Vulnerable Coastal Communities in Western Alaska by Timothy Tschetter, Nicole Kinsman, and Aimee Fish. The project overview states:

> *"This map series is a joint effort by the Alaska Division of Geological & Geophysical Surveys (DGGS) and the National Weather Service (NWS) to merge best-available datasets into a tool that can streamline communication about forecasted water levels, local elevations, and potentially impacted infrastructure during storm events that may cause coastal flooding (fig. 1). These maps are not designed to function as flood inundation maps, but to serve as a temporary tool to communicate about elevations in at-risk coastal communities until true inundation mapping can be completed. Pilot work to test the usefulness of this map format is presented for five communities: Kivalina, Shishmaref, Golovin, Shaktoolik, and Unalakleet…*
>
> *During the 2011 and 2013 fall storm seasons, Alaska NWS staff struggled to convey relevant coastal storm impacts to communities along the west coast of Alaska. Forecast water levels were expressed in units above local tide or above Mean Lower Low Water (MLLW); this did not effectively convey the threat to local decision makers. Staff with the State of Alaska Emergency Operations Center challenged the NWS to use language that community members could understand, suggesting forecasters describe potential impacts to critical infrastructure as a more effective approach…*
>
> ***What are the differences between a Flood Inundation Map and a Color-Indexed Elevation Map?***
> *The color-indexed elevation maps in this series are not a substitute for flood inundation maps; the colored areas on these maps do not directly correspond to flood warning zones, but to pure elevations. When a storm surge impacts a community, local currents, wind, and waves will lead to different peak water levels in different areas. For example:*
> - *A low area in the middle of town may not flood if it is surrounded by higher elevation*
> - *Elevated ocean water levels may prevent drainage from a nearby river, leading to overflow flooding along the riverbanks*
> - *Large waves may break and run high up on one portion of a beach, while farther down the same beach a protective sandbar causes the waves to break offshore*
>
> *Unlike color-indexed elevation maps, flood inundation maps will account for these variables in local conditions by incorporating advanced models of where water will flow in a range of scenarios. Flood zones are established based on the likelihood that an event will occur in any given year (a 2-year flood zone has a 50/50 chance of flooding each year, like flipping a coin). The creation of flood inundation maps is a lengthy process that requires a detailed record of local conditions—data not yet available in many of Alaska's small communities."*

The following data was identified as "Best available data" for their project which resulted from intense and challenging collaboration between the partner agencies.

GOLOVIN			
Community and Area Maps (3)	*Annotated aerial imagery*	*DCRA, 2014*	*2004*
Digital Elevation Model	*Interpolated lidar point-cloud*	*DGGS (in production)*	*2013*
Tidal/Geodetic Datum Conversion	*Estimated offset*	*DGGS (unpublished)*	*2013*

(DGGS 2014b)

The WRCC and DHS&EM provided limited flood impact data for the Golovin area Table 5-6.

Table 5-5 Historic Flood Events and impacts

Location	Date	Event Type	Magnitude
13-S-244, 2013 November Storm Disaster	11/5/2013	High Winds, and Storm Surge	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.
Southern Seward Peninsula Coast (Zone) 12-336, 2011 West Coast Storm	11/8/2011	Coastal Flood	Coastal Flood: Zone 211: At **Golovin**, the coastal flooding began approximately 0300AKST on the 9th and continued until 1400AKST on the 10th. It is estimated that the water levels peaked at 7.4 feet above the normal mean low water levels at 1900AKST on the 9th. In Golovin, many of the downtown areas were flooded and the phone company facility was submerged. Water flooded many home in the downtown area. Ice driven by the storm surge moved into a campsite 6 miles northeast of Golovin on the lagoon side of the village and destroyed 4 cabins and damaged fish racks.
Srn Seward Peninsula Coast (Zone)	9/22/2005	Storm Surge/Tide	Elevated sea levels which added to a pre-existing elevated level (about 2 feet) from a weaker storm a day earlier. The total storm surge was around 9 feet as recorded at Nome... On top of the surge there were wind waves of 10 to 15 feet over Norton Sound... Zone 211: **Golovin** AWOS wind gusts as high as 57 knots (66 mph); Nome ASOS had gusts to 57 mph.
Ern Norton Sound Nulato Hills (Zone)	10/19/2004	Storm Surge/Tide	Storm Surge, High Tide, Wind: ($4.7M Damages) An ex-typhoon east of Japan generated significant and damaging storm surge with high winds: Zone 211: Golovin highest gust 52 knots (60 mph). Additionally Nome reported peak gust 51 knots (59 mph), and Unalakleet AWOS (zone 212) peak gust 45 knots (52 mph), Surge height was 10.45 ft at Nome, the November 1974 storm produced a 10 ft rise in ocean level). Heavy Snow Golovin: Damages to the washateria, the drain field, new power plant and new clinic (all were in the process of new construction). The high ocean water lifted up several three old and unused fuel tanks along with two Connex trailers and floated them away. The school's septic system was rendered unusable - cost to repair $2.3K Zone 212: St. Michaels: several families were temporarily evacuated. Seven short access roads to the beach were damaged, mainly to boat launches. Power poles and lines damaged. Utilidor damaged.
City Of Golovin	Storm of 1992	Storm Surge	This storm produced the “flood of record” in the City of Golovin.

Table 5-5 Historic Flood Events and impacts

Location	Date	Event Type	Magnitude
City Of Golovin	October 1946	Storm Surge	This was a strong coastal storm that produced a high storm surge and damaged many structures throughout the region.
City Of Golovin	Storm of 1945	Storm Surge	This storm washed away at least one building in the City of Golovin and caused severe damage to structures throughout the region.
City Of Golovin	October 1913	Storm Surge	This storm produced the worst flood event the City of Golovin has ever experienced. Throughout the region, winds were recorded as high as 60 miles per hour, storm surges as high as 20 feet, and waves reaching 40 feet. Many people in the region were left homeless.

(NWS 2013, DHS&EM 2014)

The Army Corp of Engineers Floodplain Manager's 2011 report's comments state:

> ***Comments:*** *The high water elevation sign that was placed at the elevation of the 1992 flood on the utility pole on the southwest corner of the intersection on Amuktoolik Street and Punguk Street was not replaced when the pole was moved.*
>
> *Floodwaters damaged the power plant, school, and GCI building in 2005. The road to the city drinking water tank was elevated in 2006, and protected the main infrastructure*

5.3.2.3 Location, Extent, Impact, and Recurrence Probability

Location

The Planning Team indicated that Golovin has a periodic recurrent flooding in the lower village area due to low terrain and close proximity to ocean storm surge.

COE records indicate The worst flood occurred in October 1913. Village elder, Maude Moses recalled that residents had to caulk the walls of the Dexter Building to keep water from getting inside. It is locally reported that a miner was missing after a large wave hit him. He was one of several people who were evacuating the low lands by following a rope strung from the Dexter Building to higher ground

Additionally, a storm in 1945 washed away a building where the high school is currently located.

The June 6, 2004 Department of Natural Resources, Division of Geological and Geophysical Survey's (DGGS) 2012 enhanced DCCED Community Profile Map depicting critical facilities and infrastructure as well as periodic flood extent (Figure 5-6).

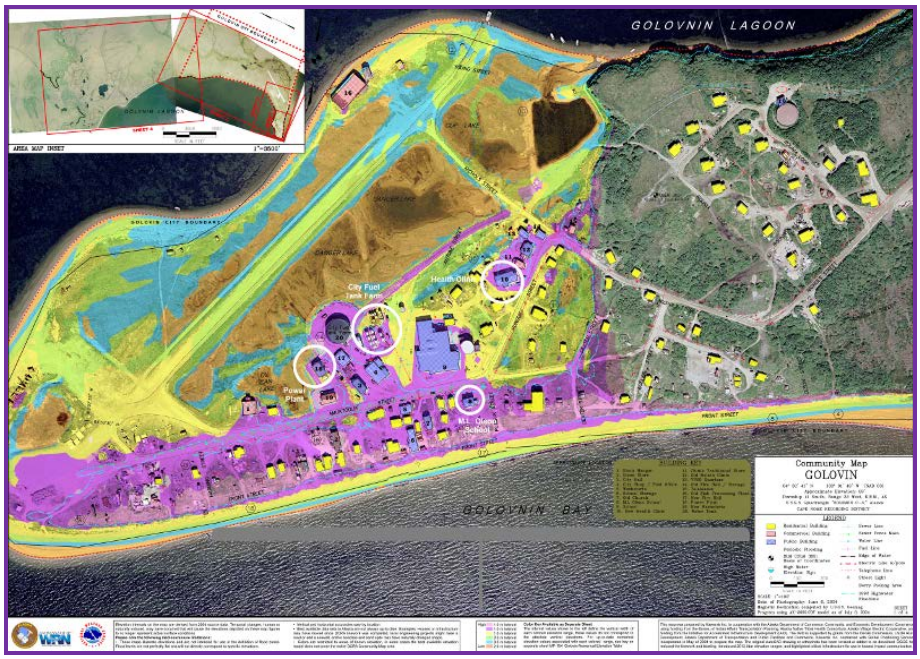

Figure 5-6 Golovin's DGGS Modified Community Profile Map (DGGS 2012)

5

Erosion in Golovin usually removes small areas at a time. For example, sections of riverbank or shoreline 3 feet high by 5 feet long are reported to be affected by erosion. Significant events can cause infrastructure and homes to fall into the sea or the river. Erosion sites have also been noted to be less than 100 feet from important structures and critical facilities, including houses, sheds, water and sewage utilities, fuel tanks, food storage, commercial facilities, roads, power generators, as well as schools, clinics, and other public buildings. Figure 5-7 displays a red dotted "erosion impact" line.

Figure 5-7 Golovin's Erosion Locations (USACE 2007)

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
- Community location related to identified-historical flood elevation

The City experiences severe storm surge and riverine flooding high water flow flood, ivu, and melting permafrost related erosion 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 Golovin are considered “Limited” with injuries that do not result in permanent disability, the potential for critical facilities to be shut-down for more than 1 week, and more than 10 percent of property or critical infrastructure being 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 USACE Erosion Information Paper describes the community's historical impacts as:

> *"The estimated effects of four major erosion events were reported in the community erosion survey:*
>
> *(a) October 1992 an average loss of 15-20 feet inland along 7,800 linear feet of shoreline,*
>
> *(b) September 2003 an average loss of 5 feet inland along 7,800 linear feet of shoreline,*
>
> *(c) October 2004 an average loss of 5 feet inland along 7,800 feet of shoreline, and*
>
> *(d) September 2005 a loss of 5-10 feet inland along 7,800 linear feet of shoreline. The community survey respondent estimated an annual loss of 2-4 feet along 7,800 linear feet of the shoreline.*
>
> *The height of the eroding shoreline bank is reported by the community to be about 3 feet above the normal high tide line, and is eroding on both sides of downtown of the Golovnin Lagoon and Golovnin Bay.*
>
> *Riverine erosion is associated mostly with Chinik Creek.*
>
> *Over the past 20 years the Chinik Creek channel has moved east (aerial photos show a steady rate of easterly movement), reducing the natural sandbar which was part of the breakwater for storm surges. Community areas at lower elevations, including the old runway, are periodically flooded. In a 1984 report, the Alaska Department of Transportation and Public Facilities stated that the gravel mining that takes place at the mouth of Chinik Creek may increase erosion rates in Golovin. A 1994 reconnaissance study by the Corps reported that conditions had not changed…*
>
> *The shore along the south side of the sand point is eroding toward the first row of buildings. Based on the survey, damages from erosion include:*
>
> *[D]owntown roads (repair costs of $5,000+), an abandoned fish plant, the old Golovin dump, and several downtown house pads (repair cost per pad of $5,000+).*
>
> *Outbuildings, sheds, water tanks and lines, fuel tanks, drying racks and smoke houses, a retail store, a road, a boat launch, utility poles, power generators, sewer lines and sewage lagoon, old airport facilities, the old landfill, and beach access trails from dump road are at less than 100 feet from the eroding shoreline and at risk for erosion damage.*

The community is concerned that several structures on the south beach will soon be at risk from ongoing erosion including the old school building, the teacher's quarters, the old church, and many residences. In the 1960's, the barrels filled with sand were placed as a storm surge barrier along the Golovnin Bay shoreline have since rotted away and a pit run gravel road/berm was constructed along Antone Street for $145,155 to help reduce community flooding impacts. No repair and maintenance costs were provided. According to the community survey, the road/berm project has been through 3 high water events and erosion has damaged the road slope. No further measures have been taken to protect from wave erosion. A 200-foot portion of the road/berm project on the north side of the GCI site has not been completed.

The survey respondent defined the erosion as "gradual - taking place by almost imperceptible (so slight, gradual, subtle, as not easily perceived) steps or degrees; developing little by little, nor sharply or suddenly," except during severe Bering Sea Storms where substantial erosion events can occur in a short time during a storm event.

Based on past events and the criteria identified in Table 5-3, the magnitude and severity of erosion impacts in the City of Golovin are considered "Limited" with injuries that do not result in permanent disability, the potential for critical facilities to be shutdown for more than 1 week, and more than 10 percent of property or critical infrastructure being severely damaged.

Recurrence Probability

Based on previous occurrences, USACE Floodplain Manager's report, and criteria in Table 5-3, it is "Likely" that erosion will occur in the next 3 years (event has up to 1 in 3 years chance of occurring) as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.3.3 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 32ºF has existed for two or more years. (DHS&EM 2010).

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 Golovin.

5.3.3.2 History

Uneven settling throughout the years within the City has damaged buildings and roads constructed in permafrost areas.

Landslide has been identified as a hazard to the Bering Strait REAA. However, there is no history of landslides impacting the Bering Strait or the City of Golovin. Furthermore, the surrounding area is not steeply sloped. However, residents of the City of Golovin have identified rock cliffs that are vulnerable to a landslide. The probability of a future collapse is considered high by residents. (Golovin 2008)

5.3.3.3 Location, Extent, Impact, and Recurrence Probability

Location

In general, the probability of slope failure increases with an increase in slope inclination. However, depending on various factors such as soil type, and water content, a slope having a relatively low inclination could be at greater risk of failure than another slope having a relatively high inclination. Other factors that influence susceptibility include: rock type; water content; vegetative cover and type; slope aspect; permeability and rate of infiltration; proximity to seismic sources; and magnitude of seismic events. In addition, unconsolidated deposits of alluvial and glacial outwash materials are subject to accelerated stream bank erosion and

landslides. The possibility of failure also increases in sloped areas in which human have disturbed the soil and vegetation such as from cutback projects and timber reduction areas.

In the City of Golovin, high rock cliffs (Figure 5-8) near the small boat harbor and floating dock are an area of concern for rockslides. Residents of the City have noticed cracks in the rocks that have widened over time.

Figure 5-8 Golovin Harbor Cliffs (Golovin 2008)

The cliffs are approximately 75' high and overlook the lagoon. (T. Anungazuk Jr., personal communication)

The *Permafrost Characteristics Map of Alaska* (Figure 5-9) developed for the National Snow and Ice Data Center/World Data Center for Glaciology shows that Golovin has discontinuous permafrost. This is supported by soil investigations during the City's/Village's 2001 Sanitation Master Plan development process where permafrost was sporadically encountered throughout the community. (DHS&EM 2013)

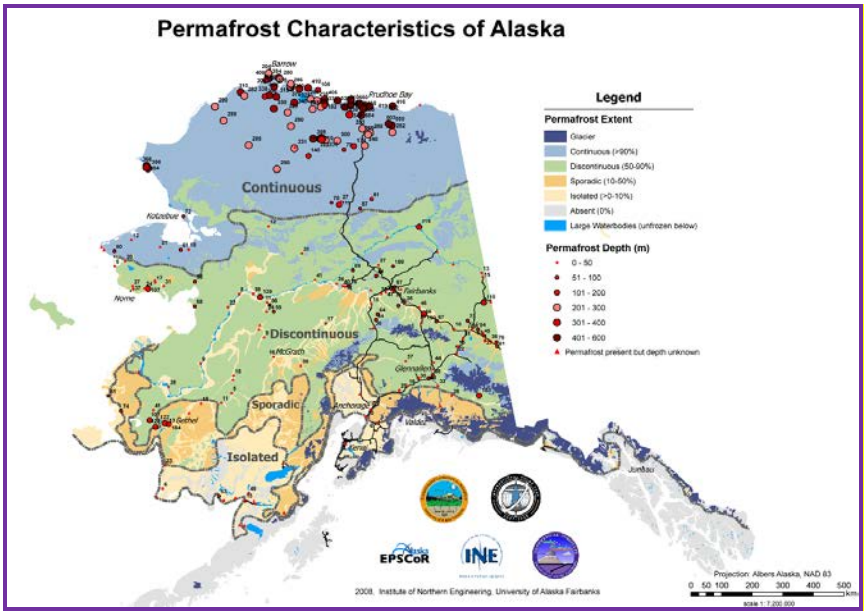

Figure 5-9 Permafrost Characteristics Map of Alaska (Jorgenson et al 2008)

Extent

The geographic extent of landslide events is essentially the same as slide location, while the effects depend on what infrastructure is in the way of a slide, as well as the magnitude and force of the slide itself. The extent of effects could be as limited as one building or property, to region-wide effects, as in the case of a major transportation disruption, slide-induced dam failure, or utility outage.

Ground failure events such as permafrost degradation events and the criteria identified in Table 5-3, the extent of permafrost degradation impacts in the City of Golovin are considered negligible

Ground failure 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 various degradation events and the criteria identified in Table 5-2, the extent of ground failure impacts in the City are considered "Limited". Impacts would not occur quickly but over time with warning signs. Therefore this hazard would not likely to cause injuries or death, neither would it shutdown critical facilities and services. However, 10 percent of property is could be severely damaged.

Impact

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

A rockfall near Golovnin Lagoon could create a potentially damaging wave. This event type occuring during high tide could impact the Chinik Bunkhouse, the old Fish Plant, or the floating dock while emplaced in the Lagoon. The dock's susceptibility would be from late June through late August. (Golovin 2008)

Future Recurrence Probability

Landslides are not common in the area, however, the observed structural instability of the cliffs, slope failure, and melting permafrost subsidence to structures, roads, harbor areas, and the airport indicates a distinct recurrence history. The Planning Team stated 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 (event has up to 1 in 3 years chance of occurring) as the history of events is greater than 20 percent but less than 33 percent likely per year.

5.3.4 Radon

5.3.4.1 Nature

Radon is a naturally occurring carcinogenic and radioactive gas. It is one of the byproducts of uranium. Uranium can be found in soil, water, and rocks such as granite, shale, phosphate, and pitchblende. Uranium decays to produce many byproducts, the most familiar of which include radium, radon, and lead. Radon gas can be found throughout the world, and natural uranium and radium deposits are the most common source of airborne radon.

Radon is invisible to all human senses. The only way to detect radon presence is to test the air in the space you suspect its presence. Radon is measured by the level of radioactivity present, expressed as pico Curies per liter of air (pCi/L). National averages of radon in homes are approximately 1.3 pCi/L, with outside averages measuring approximately 0.4 pCi/L. The U.S. Environmental Protection Agency has established a threshold for indoor radon levels at 4 pCi/L or greater as the presumed level it is economical to reduce radon gas. To be clear, there is no safe exposure level for radon gas.

The University of Alaska-Fairbanks Cooperative Extension reports that four factors must be present for a building to allow radon to enter the indoor space. If one of the four factors is absent, radon gas is generally not a problem. These include:

1. Uranium content in bedrock or base soil must be present in sufficient levels to produce radon through natural decay.
2. Soil permeability must be at a level that permits rapid gas movement so radon can be transported from its origin to inside a building within 6 days (i.e., approximately two half-lives).
3. A building must have soil contact and entry points including holes, cracks, and intentional perforation to permit the transfer of radon gas into the structure (particularly a basement or crawlspace).
4. A building must have lower pressure than what is present in the soil (which permits gas to flow into the building).

Radon gases enter buildings through sump pumps, floor drains, pores in hollow-block walls, mortar joints, and cracks in foundations, walls, and floors. Water sources can also contain radon, particularly well water. Public and private surface water sources do not typically have radon gas present.

5.3.4.2 History

Individual instances of radon have not been documented within the City of Golovin. However, radon has been detected in buildings in Nome, Alaska, which is 70 miles east of Golovin.

5.3.4.3 Location, Extent, Impact, and Recurrence Probability

Location

Detailed mapping for uranium deposits or radon incidences does not exist, however USGS has produced data showing the uranium/thorium ratio over Alaska. The Boulder Creek Mine Project, within a 50 mile radius of Golovin, is the largest uranium deposit in Alaska. There are seven known uranium occurrences within 40 miles of Golovin which is located on the Chinik Eskimo Community's historic site.

EPA and USGS have established three zones (Figure 5-10) that identify areas nationwide that have the potential for elevated indoor radon levels. The zones were determined by combining indoor radon measurements, local geology, and population densities. The radon potential zones identify the likelihood of radon measurements within specific ranges when tests are completed. The City of Golovin, in the Nome Census District, is located in Zone 3, which is an area predicted to have an average radon level of less than 2 pCi/L. (EPA 2015)

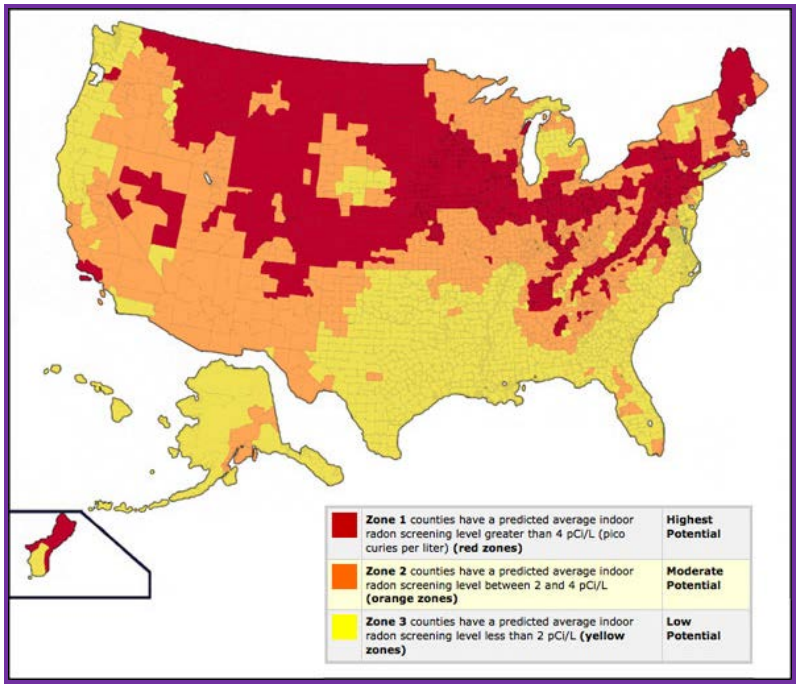

Figure 5-10 National Radon Zone Map (Radon 2015)

Extent

When radon is present in buildings, it is generally found with higher concentrations in basements, crawlspaces, and ground floor levels, as these rooms have closest contact with the source (i.e., soil). Radon can also be released through air via faucets if radon is present in well water. Some studies indicate indoor radon gas levels in Alaska can vary depending on the time of the year. Ventilation and air leakage rates seem to be directly related to radon transport. As most buildings are sealed during winter months and have differing leakage levels, the indoor pressure varies and can affect the radon gas transfer from underlying soils. In addition, atmospheric pressure, temperature changes, and opening doors and windows impact radon transport. These findings indicate a strong need to take multiple readings throughout the year to determine average annual exposure.

Based on historic building radon occurrences and applying the criteria in Table 5-3, the radon impact extent is "Negligible" with injuries treatable with first aid and minor quality of life lost, shutdown of critical facilities and services for 24 hours or less, and less than 10 percent of property being severely damaged.

Impact

Radon does not cause structural damage; however, structural imperfections can allow radon to enter a building and pose serious chronic health risks and even death to inhabitants. It is the second leading cause of lung cancer in the U.S. There have been no impacts from radon exposure in the City of Golovin.

Recurrence Probability

Although, Golovin is located in Radon Level Zone 3, it is important to note that radon levels exceeding 2 pCi/L could be found in isolated areas and the only way to determine exact levels is to test the air within individual buildings.

Based on the lack of historically reported radon incidence within the community and applying the criteria in Table 5-2, it is unlikely that radon exposure will occur in buildings or water. Lack of individually drilled wells contributes to the unlikely probability of radon presence in community water sources. Currently, the primary water source the residents of Golovin use is Chinik Creek, a surface water supply point. Radon exposure is possible in the next 10 years, but it is unlikely.

5.3.5 Severe Weather

5.3.5.1 Nature

Severe weather occur throughout Alaska with extremes experienced by the City of Golovin 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 Golovin**.**

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

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

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

Extreme Cold is the definition of extreme cold varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme". In Alaska, extreme cold usually involves temperatures between -20 to -85°F. Excessive cold may accompany winter storms, be left in their wake, or can occur without storm activity. Extreme cold accompanied by wind exacerbates exposure injuries such as frostbite and hypothermia.

High Winds occur in Alaska when there are winter low-pressure systems in the North Pacific Ocean and the Gulf of Alaska. Alaska's high wind can equal hurricane force but fall under a different classification because they are not cyclonic nor possess other hurricane characteristics. In Alaska, high winds (winds in excess of 65 mph) occur rather frequently over the coastal areas along the Norton Sound. High winds are a severe threat to Golovin.

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 5-11 displays Alaska's annual rainfall map based on Parameter-elevation Regressions on Independent Slopes Model (PRISM) that combines climate data from 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.

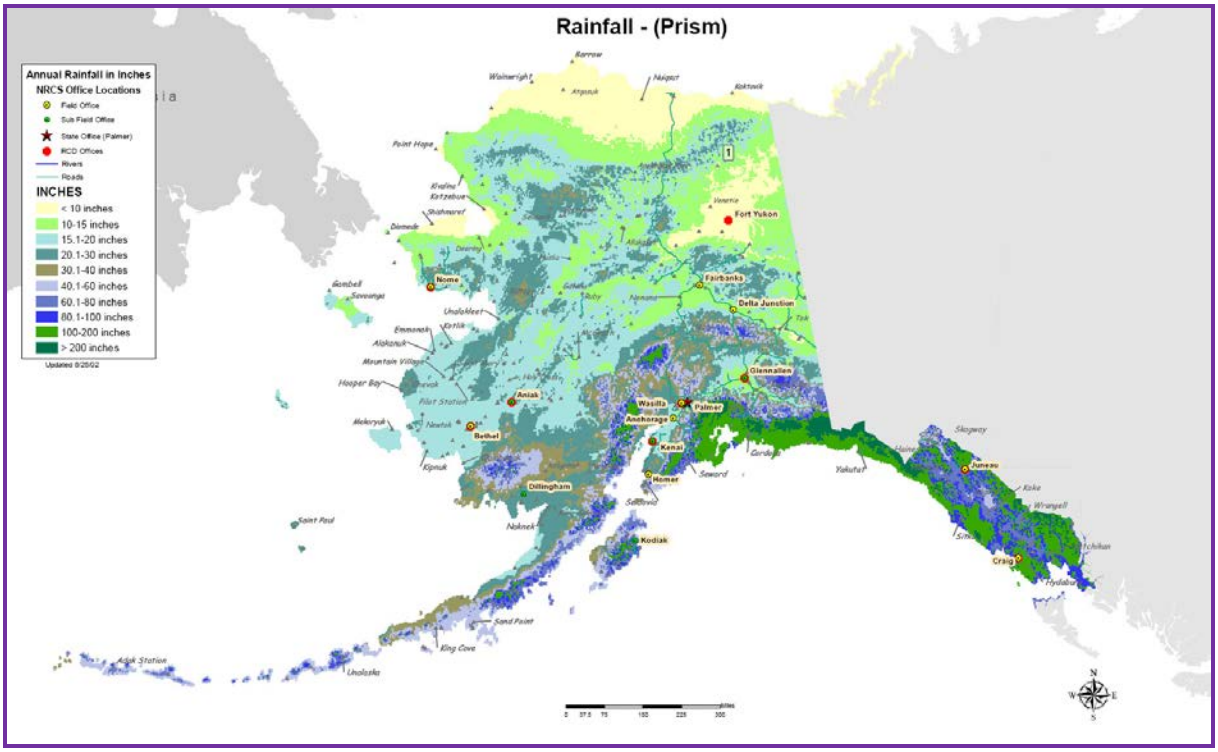

Figure 5-11 Statewide Rainfall Map (NRCS - PRISM 2014)

5.3.5.2 History

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

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

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

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

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

18.3.3.4. Impacts on people's lives

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

Table 5-8 delineates the Weather Service Office's (WSO) weather data. Actual community temperatures and depths may vary due to their relative proximity to the WSO.

Table 5-6 Moses Point, Alaska

(Only Available Record Monthly for Climate Summary spanning 03/01/1943 to 07/31/1967)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	8.8	8	14.7	26.2	43.5	57.6	61.2	57.9	49	31.7	19.2	6	32
Average Min. Temperature (F)	-5.4	-6.5	-2.4	10.1	29.1	42.4	47.1	46	36.8	20.5	7	-7.2	18.1
Average Total Precipitation (in.)	1.15	0.92	1.07	0.91	0.59	0.73	1.85	4.2	3.07	1.21	1.51	1.04	18.26

Table 5-6 Moses Point, Alaska

(Only Available Record Monthly for Climate Summary spanning 03/01/1943 to 07/31/1967)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Total SnowFall (in.)	10.1	9.2	10.3	7.4	0.8	0	0	0	0.3	4.8	13.1	9.8	65.8
Average Snow Depth (in.)	23	26	31	30	12	0	0	0	0	1	6	14	12

(WRCC 2015)

DHS&EM's Disaster Cost Index records the following severe weather disaster events which may have affected the area due to their close proximity to listed communities:

"6. West Coast Storm, November 23, 1979. *A major sea storm on the west coast of Alaska caused extensive damage in 14 villages in the area. The Governor proclaimed a Disaster Emergency effective from Sheldon Point to Togiak. At the request of the Governor, the SBA authorized disaster loans to affected individuals and businesses, and the State provided grants to individuals and families as well as some public assistance related to a fuel spill at Togiak.*

23. Unalakleet, March 5, 1984. *Extreme cold for a period of 6-7 weeks caused a drastic reduction in the city water supply and eventual freezing of a major loop on the city water system. Public assistance has granted to repair/replace portions of the water system.*

25. Elim, March 9, 1984. *A reduction in water from the village source resulted in freezing and rupture in portions of the water and sewer system. Public assistance was granted to replace frozen portions of the water system and to assist in repairing service lines.*

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.*

122. Nome, September 10, 1990. *An unseasonable sea storm caused the sinking & destruction of a transfer barge owned by the city. As a result the city was unable to receive essential goods that are customarily transported by sea. In addition the debris presents a hazard jeopardizing the structural integrity of the Nome causeway.*

162. Nome Highway Disaster. *On October 5, 1992, a major Bering Sea Storm with gale-force winds impacted the Norton Sound Coast of the Seward Peninsula in Western Alaska, producing an unusually high storm surge tide and very large waves, particularly in the Nome area. The high tidal waves severely damaged two federal-aide highways, isolating the mining community of Council and endangering the traveling public in the Nome area. DOT/PF will request emergency relief funds from Federal Highway Administration.*

04-207 03 Fall Sea Storm (AK-04-209) Declared January 29, 2004 by Governor Murkowski. *A series of sea storms with high winds and tidal surge during the period of*

November 1 to November 24, 2003 caused damages in the communities of Unalakleet, Diomede, and Port Heiden. Damage was also reported by the Department of Transportation. The City of Unalakleet and Port Heiden declared local emergencies and Diomede requested assistance in a letter to the Division of Homeland Security and Emergency Management. The Department of Transportation reported damages in Nome on the Nome-Counsel Road (MP 22 and 23.8) and at the Unalakleet airport. The City of Unalakleet had a large quantity of debris deposited throughout the road system. Damages to a gabion protection wall, roads and exposure of a water line were also experienced. Port Heiden experienced tidal erosion that exposed two grave sites, a power line and endangered a road. The US Air Force, under the coordination of the Division of Homeland Security and Emergency Management, addressed the issue of the two grave sites. Disaster Assistance for Emergency Protective Measures and Permanent Work category C for the City of Port Heiden, the Department of Transportation and Unalakleet, category F for Port Heiden and debris removal for Unalakleet were approved under the State Public Assistance Program. No Federal Disaster Assistance was requested. No Hazard Mitigation was applicable. The total for this disaster is approximately $654K. This is for Public Assistance for 4 potential applicants with 5 PW's.

04-208 2004 Bering Strait Sea Storm declared October 28, 2004 by Governor Murkowski then FEMA declared (DR-1571) on November 15, 2004. Amended declaration to extend incident to October 24, 2004. *Between October 18 and 20, 2004, a severe winter storm with strong winds and extreme tidal surges occurred along the Western Alaska coastline, which resulted in severe damage and threat to life and property, specifically in the Bering Strait Regional Educational Attendance Area (REAA), including Elim, Nome, Koyuk, Shaktoolik, Unalakleet, and other communities; in the Northwest Artic Borough, including Kivalina, Kotzebue, and other communities; and in the City of Mekoryuk; with potentially unidentified damages in adjacent areas, and additional storm surges likely from continuing weather patterns in this area Alaska. Conditions that exist in the coastal communities of the Northwest Artic Borough as a result of this disaster: severe damage to roadways, power distribution systems, and drain fields. Conditions that exist in the coastal communities of the Bering Strait REAA as a result of this disaster: severe damage to gabions (used to protect shoreline), major damage to coastal highways and roads, damage to water and septic systems, damage to a bridge, damage to power distribution systems, damage to fuel storage tanks, fuel spills, and property damage. Conditions that exist in the City of Mekoryuk as a result of this disaster: major damage to sea wall and damage to roadways. On November 16, 2004, the declaration was amended to reflect a more accurate timeframe of the disaster. The City of St. George appealed the denial of funding decision for the breakwater. The appeal was granted, which increased the original estimate for total funding of this disaster by more than $3 million. The dates of the severe storm were changed to October 18 through October 24, 2004. Individual assistance totaled $1 million for 271 applicants. Public Assistance total $13 million for 60 potential applicants with 125 PW's. Hazard Mitigation totaled $800K. The total for this disaster is $17 million.*

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: sever 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.*

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

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

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

The Golovin area is continually impacted by severe weather. Figures 5-12 and 5-13 depict the City's historic and future predicted precipitation and temperatures. Note the projected decreasing precipitation potentially due to climate change estimates. Decreased rain and snow could dramatically increase wildland fire potential as well as adversely impact wildlife habitat.

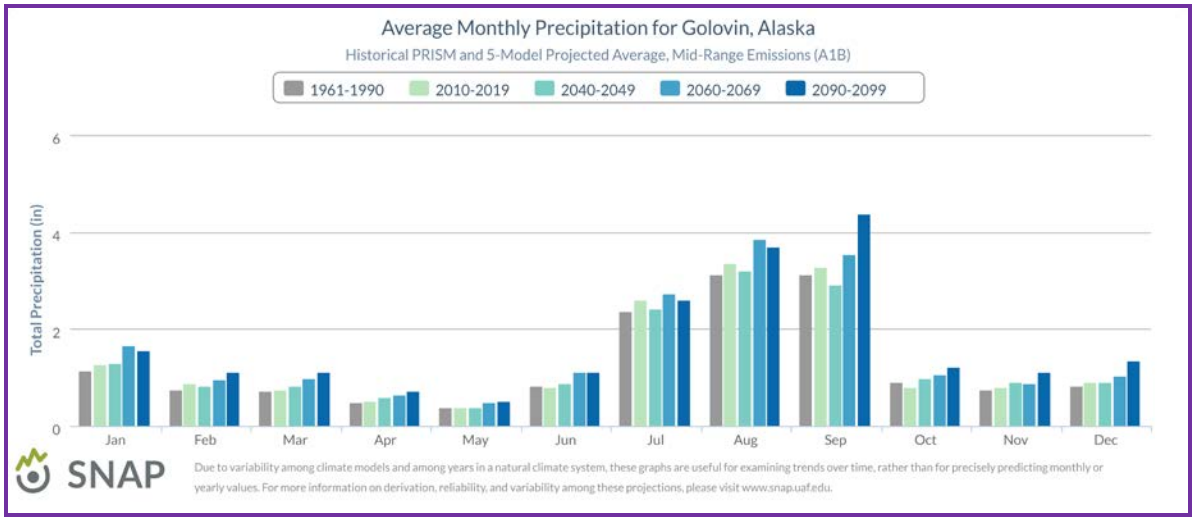

Figure 5-12 Golovin's Historic and Predicted Precipitation (SNAP 2015).

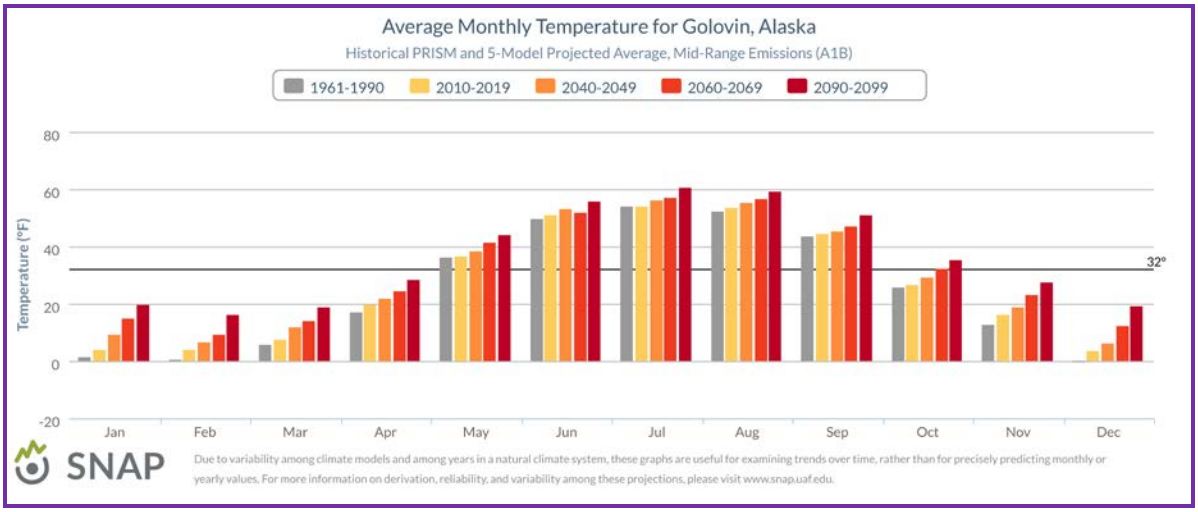

Figure 5-13 Golovin's Historic and Predicted Temperatures (SNAP 2015)

Table 5-9 lists a representative sample of Golovin's major storm events the National Weather Service (NWS) identified for the their Weather Zone. Each weather event may not have specifically impacted the Golovin area.

These storm events are listed due to their close proximity to listed communities or by location within the identified zone.

Table 5-7 Severe Weather Events

Location	Date	Event Type	Magnitude
Golovin	January 2008	winter storm	A severe winter storm with winds nearing approximately 60 miles per hour tore the roof off a utility building in the City. Schools and City offices were closed.
Golovin	September 2005	Coastal Storm Surge	This storm was a declared federal and state disaster. The storm lasted two days and high tides in the area reached 10.3 feet with winds at 56 miles per hour. The City of Golovin experienced severe flooding and erosion. Preliminary estimates of damage in the region reached $3.2 million
Golovin	October 19, 2004	Coastal Storm Surge	This storm was a declared federal and state disaster. Winds in the region were recorded at 59 miles per hour with a high tide of 10.5 feet. The City of Golovin experienced severe flooding and erosion. The total estimated cost of this disaster was $12,460,469
Bering Sea Storm	October 8, 2002	High Wind	Winds in the region were recorded as high as 45 miles per hour and some areas experienced a high tide of 14 feet.
Golovin	1992	Flood	This storm produced the "flood of record" in the City of Golovin
Bering Sea Storm	1974	Coastal Storm Surge	In November 1974, three storms simultaneously pounded the region. Storm surges were recorded at levels reaching 12 feet mean lower low water. Regionally, there was damage to critical facilities and infrastructure and homes were destroyed. Contaminated water was also an issue.

(NWS 2013, WRCC 2013)

5.3.5.3 Location, Extent, Impact, and Recurrence Probability

Location

The entire area, which includes the Golovin area, experiences periodic severe weather impacts with high winds, extreme cold, and storm surge damages. The most common to the area are high winds and severe winter storms. Table 5-11 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 90 mph; and extreme low temperatures that reach -85ºF.

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 land's topography influence a severe weather event's impact within a community. Hurricane force winds, rain, snow, and storm surge can be expected to impact the entire Golovin area.

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 three years (event has up to 1 in 3 years chance of occurring) as the history of events is greater than 20 percent but less than or equal to 33 percent likely per year.

5.3.6 Wildland Fire

5.3.6.1 Nature

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

areas with ample vegetation. In addition to wildland fires, wildfires can be classified as tundra fires, urban fires, interface or intermix fires, and prescribed burns.

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

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

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

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

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

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

5.3.6.2 History

The Alaska Interagency Coordination Center (AICC) identified 111 tundra/wildland fires (Figure 5-14) that occurred within 50 miles of the City. Table 5-9 lists 39 of those fires that exceeded 100 acres with the largest one burning 224,000 acres in 1954, the second burning 100,000 acres in 1971 and the more recent large event burned approximately 175,000 in 1977.

Table 5-8 Wildfire Locations Since 1939 within 50 Miles of Golovin

Fire Name	Fire Year	Estimated Acres	Latitude	Longitude	Cause
Koyuk River 2	2014	161	64.9946667	-160.977	Lightning, Tundra
Shaktoolik River	2013	11,699.5	64.1213333	-160.298	Lightning, Spruce
Egavik Creek	2010	129.2	64.0369415	-160.889	Lightning
Eagle Creek	2010	195	64.6783371	-162.948	Lightning, Spruce
Oregon Creek	2004	7,750	65.12583	-163.345	Lightning, Tundra
East Fork Koyuk	2004	3,309.1	65.27805	-160.548	Lightning, Spruce
Cliff Creek	2004	6,352.2	64.92361	-163.038	Lightning, Spruce
Peace River	1997	3,200	65.2166672	-161.45	Lightning
Koyuk River	1997	800	64.9833298	-160.833	Cooking Fire
Kka Ne 7	1993	400	64.9333344	-160.95	Lightning
Hay Sw 15	1992	50	65.0666656	-161.6	Lightning
032061	1990	200	65.1333313	-164.8	Lightning
Gmt Sw 30	1990	380	65.1166687	-162.117	Lightning
032060	1990	317	65.1833344	-161.967	Lightning
732053	1987	1,500	64.9666672	-160.9	Lightning
414057	1984	1,000	64.9499969	-162.683	Lightning
Gmt Ssw 16	1977	70,000	65.1999969	-161.533	Lightning
Gmt S 12	1977	175,000	65.25	-161.25	Lightning
Dry Canyon	1977	46,000	65.0500031	-162.633	Lightning
Salmon	1975	300	65.1333313	-161.617	Miscellaneous
Cable	1972	14,000	64.6999969	-160.75	Lightning
Akulik River	1972	13,000	64.9166641	-160.75	Lightning
Peace	1972	1,500	64.8666687	-160.667	Lightning
Tag River	1972	2,500	64.2666702	-160.883	Lightning
Little Bear	1972	8,680	64.9666672	-160.5	Lightning
Cairn 4	1971	100,000	65.0500031	-164.833	Lightning
West Fork	1971	2,560	65.0833359	-164.417	Lightning
Niukluk River	1971	9,600	65.0333328	-164.25	Lightning
Alameda	1970	2,000	65.0999985	-161.067	Lightning
Christmas Mtn	1960	2,350	64.5333328	-160.5	Recreation
Granite Mtn	1960	37,800	65.2333298	-161.2	Recreation
Koyuk E-18	1958	200	64.6999969	-160.667	Lightning
Shaktolik	1957	15,700	64.4166641	-160.933	Lightning
Koyuk #2	1956	300	64.9166641	-161.167	Recreation
Koyuk #1	1956	12,000	65.25	-161.5	Lightning
Imuruk Basin	1954	224,000	65	-165	Lightning
Moses Point	1947	2,560	64.6999969	-162.017	Undefined
Shatolick	1943	100	64.4833298	-161.15	Lightning
Norton Bay	1941	10,000	64.6999969	-160.633	Unknown

(AICC 2014)

Figure 5-14 Golovin's Historical Wildfire Locations (AICC 2014)

5.3.6.3 Location, Extent, Impact, and Recurrence Probability

Location

Under certain conditions wildland fires may occur near the City when weather, fuel availability, topography, and ignition sources combine. Since fuels data is not readily available, for the purposes of this plan, all areas outside City limits are considered to be vulnerable to tundra/wildland fire impacts. Since 1938, only four wildland fire events have occurred within 50 miles of the City (Figure 5-10).

Extent

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

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

Golovin's historical fires have burned approximately 788,000 acres. It is difficult to determine the average number of acres burned as the fires were vastly different for each of the identified wildland fire events identified in Table 5-9 (AICC 2015). An average based on such diverse data would easily be overstated.

Based on the past wildland fire events occurring within 50 miles of Golovin and the criteria identified in Table 5-3, the magnitude and severity of impacts in the Golovin area are considered "Negligible" with minor injuries, there is potential for critical facilities to be shut down for less than 24 hours, less than 10 percent of property or critical infrastructure being severely damaged, and little to no permanent damage to transportation or infrastructure or the economy.

Impact

Impacts of a wildland fire that interfaces with Golovin's population center could grow into an emergency or disaster if not properly controlled. A small fire can threaten lives and resources and destroy property. In addition to impacting people, wildland fires may severely impact livestock and pets. Such events may require emergency watering and feeding, evacuation, and alternative shelter.

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

Fire is recognized as a critical feature of the natural history of many ecosystems. It is essential to maintain the biodiversity and long-term ecological health of the land. The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the fire management planning process and the full range of fire management activities is exercised in Alaska, to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social consequences on firefighters, public safety and welfare; natural and cultural resources threatened; and the other values to be protected dictate the appropriate management response to the fire. In Alaska, and within 50 miles of the Golovin, the natural fire regime is characterized by a return interval of approximately 150 due to their tundra vegetation, gently rolling topography.

Recurrence Probability

An important issue related to the wildland or tundra fire probability is the interface fire is increased development along the community's perimeter, accumulation of hazardous wildfire fuels, and the uncertainty of weather patterns that may accompany climate change. These three combined elements are reason for concern and heightened mitigation management of each community's wildland interface areas, natural areas, and open spaces. Climate change and flammable vegetation species are prolific throughout Alaska's forests and tundra locations. Fire frequency may increase in the future as a result.

Based on the history of wildland fires in the Golovin area applying the criteria identified in Table 5-3, it is "Likely" a wildland fire event will occur in the next 3 years. The event has up to 1 in 3 years chance of occurring and the history of events is greater than 20 percent but less than or equal to 20 percent likely each 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

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

DMA 2000 Recommendations
Assessing Risk and Vulnerability, and Analyzing Development Trends §201.6(c)(2)(ii): 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. *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: §201.6(c)(2)(ii)(A): The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; §201.6(c)(2)(ii)(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. §201.6(c)(2)(ii)(C): 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. §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.
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 Golovin and the Chinik Eskimo Community's infrastructures' hazard vulnerability synopsis.

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	30	50	50	75
Ground Failure	100	100	100	100
Weather	100	100	100	100
Wildland Fire	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 City of Golovin's 2009-2013 Water and Sewer Utilities Business Plan describers their land use capability as:

> ***"5.0 Environmental Scan***
>
> ***5.8 Designated Land Status and Management Issues***
>
> *There are no National Wildlife Refuges near Golovin, according to the U.S Fish and Wildlife Service. There are no designated Wild and Scenic Rivers near Golovin, according to the U.S. National Park Service. Golovin is included in the Bering Strait*

Coastal Resource Service Area. Development in Golovin may be subject to the Bering Strait Coastal Management Plan developed in 1989. State land includes the airport. No Native Allotments exist within the city limits. There are some local right of way and easements issues to consider before developing certain projects.

5.9 Land Use Potential

Within Golovin there are some possible land areas for future development projects if care is taken not to build on existing gravesites or wetlands. There is one site which should not be used due to contamination issues, the old dumb site at the mouth of the Chinik Creek. A Brownsfield assessment recommended in 2007 that the site be moved due the threat of erosion.

6.0 Opportunities and Barriers to Development

6.1 Development Opportunities, Trends, and Strengths*-What are our development opportunities, current trends in Golovin, or strengths and assets that will help us as we plan and complete projects in our community?...*

- ***Environmental*** *– subsistence hunting and fishing areas are more accessible than in other communities, open water, good geographic location, access to the ocean, rocks, trees, etc., clean town site, relatively clean dumpsite, no known old contaminated military sites nearby, wide variety of game available in each season, wind, solar, and thermal as potential alternative energy sources, variety of wild plants like greens and berries, mineral development potential for precious metals, gold, clay, and gravel, deep water site possible for deep water port and small boat harbor development, natural sheltered harbor, potential for residential and local crab fishery, pass though point for the Iditarod and other races, local and regional snowmachine races like the Nome-Golovin Race, bird watching, location with unique geography and history, and historical site development potential at Dexter Road House.*

- *Infrastructure – new clinic, new school, internet available, more stable power, locally run utilities (electric, water and sewer), new church, old church building renovated, and a local store.*

6-2 Development Barriers*, Hazards, And Areas Of Concern-What Are Development Barriers, Hazards, Or Areas Of Concern That We Need To Consider As We Begin Development Projects?...*

- ***Environmental*** *– climate changes (later freeze and earlier thaws, storms), need to be careful about beavers damaging the water source, intercept fisheries are hurting the fish populations, poor fish management, no local input in wildlife and fish management, need more local input on fish studies, need a voice on federal subsistence board, climate change patterns,*

Golovin is ignored when flooding and erosion issues are addressed in the region despite our presentations of

documentation, Golovin needs to be more aggressive and obtain state and federal assistance for funding of flooding and erosion issues, our old landfill lies in a flood zone and needs to be moved, Golovin needs to select a relocation site, and complete an emergency plan.

- ***Infrastructure*** *– need a better water source, need a recreational facility, need more local office space, need for more local housing, external agencies are not listening to*

local people about issues like the Post Office/zip code need, slow mail service, expectation of outside agencies for us to rubber stamp the plans they make for the community without any input, last minute notices about funding opportunities for projects or the need for resolutions to process grants written by outside agencies, outside agencies not coming to Golovin to participate or obtain input, need a pressurized water line from the water tank to each home, lack of jobsite oversight on projects to assure jobs are done on time and within budget, very little local control over funding passed through other agencies, and housing materials in storage need to be made into houses before the materials are lost or damaged" (GEDP 2009).

6.3 CURRENT ASSET 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.

6.3.1.1 Population and Building Stock

Population data for the City were obtained from the 2010 U.S. Census, DCRA, and the Department of Labor (DOL). The US Census reports the City's total population for 2010 as 156 and 2014 DOL data reported an estimated population of 171 (Table 6-2).

Table 6-2 Estimated Population and Building Inventory

Population		Residential Buildings	
2010 Census	DOL 2014 Data	Total Building Count	Total Value of Buildings[1]
156	171	59	US Census $5,428,000 City: $14,750,000

1 Sources: U.S. Census 2010 population data and listed housing value at $92,000.
The Project Team determined that the average structural replacement value of all single-family residential buildings is $250,000.

Estimated replacement values for those structures, as shown in Table 6-2, were obtained from the 2010 U.S. Census, and 2014 DOL certified estimate.

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 $250,000. A total of 59 single-family residential buildings were considered in this analysis.

6.3.1.2 Existing Infrastructure

The City of Golovin and the Chinik Eskimo Community has benefited from numerous funding opportunities to assist them with upgrading their infrastructure.

Table 6-3 list 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.

Table 6-3 Golovin's Completed Capital Improvement Project List

Award Year	Project Description/Comments	Project Status	Award Amount	End Date
2010	Purchase Bulk Fuel	Closed	$4,808	6/30/2010
2009	Loader Acquisition	Closed	$333,953	8/19/2009
2006	Community Facilities and Equipment	Closed	$44,156	12/31/2007
2006	City Facilities Repair and Maintenance	Closed	$25,000	6/30/2010
2004	Temporary Fiscal Relief Grant	Closed	$40,000	Undefined
2003	Community Facilities & Equipment	Closed	$25,882	4/30/2005
2003	State Revenue Sharing	Closed	$28,763	3/31/2004
2003	Safe Communities	Closed	$2,887	3/31/2004
2003	Payment in Lieu of Taxes	Closed	$8,664	6/30/2003
2002	Safe Communities	Closed	$2,835	3/31/2003
2002	Payment in Lieu of Taxes	Closed	$8,028	6/30/2002
2002	Shared Fisheries Business Tax	Closed	$145	6/30/2002
2002	State Revenue Sharing	Closed	$28,647	3/31/2003
2002	CP&I/Multi-Purpose Improvements & Purchase	Closed	$35,264	7/31/2004
2001	Small Boat Harbor	Closed	Undefined	6/29/2005
2001	Community Facilities & Equipment (not front sec)	Closed	$10,183	8/7/2004
2000	Washeteria Upgrade	Closed	$20,000	5/15/2007
1999	Repair and Upgrade JD340C -Widetrack	Closed	$25,000	2/20/2006
1998	Ripper Cat With Cabin	Closed	$25,000	6/29/2005
1997	City Hall Upgrade	Closed	$25,000	6/30/2001
1996	Water and Sewer Project	Closed	$14,817	6/30/2000
1995	Clinic Upgrade	Closed	$25,000	6/30/1999
1994	Facility Improvements and Equipment	Closed	$30,000	Undefined
1994	Community Facilities/Equipment/Road Repair	Closed	$25,000	6/30/1998
1992	Road Improvements/Security Fencing/Equipment Facility	Closed	$75,000	Undefined
1990	Redike Tank Farm, Upgrade and Extend Road, Dump Rehabilitation and City Buildings Upgrade.	Closed	$34,500	Undefined
1986	Clinic	Closed	$175,000	Undefined
1985	Equipment	Closed	$15,000	Undefined

Table 6-3 Golovin's Completed Capital Improvement Project List

Award Year	Project Description/Comments	Project Status	Award Amount	End Date
1985	Water and Sewer Project	Closed	$90,000	Undefined
1985	Equipment Garage/Power Utility Building	Closed	$234,000	Undefined
1985	Water/Sewer/Waste Heat Project	Closed	$625,000	Undefined
1984	Electrical Generation System	Closed	$70,000	Undefined
1984	Heavy Equipment	Closed	$221,000	Undefined
1983	Community Building	Closed	$100,000	Undefined
1983	Heavy Equipment	Closed	$87,000	Undefined
1993	Community Facility Expansion/Equipment	Closed	$75,000	Undefined
1982	Health Clinic Upgrade	Closed	$50,000	Undefined
1982	Youth Recreation Center	Closed	$15,000	Undefined
1982	Shelter Cabin	Closed	$15,000	Undefined
1982	Electrification	Closed	$225,200	Undefined

(DCRA 2013)

6.3.1.3 Golovin's 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 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra/Wildland Fire
Government	2	City Office & Post Office	Amuktoolik Street	64.54312	-163.03417	$350,000	W1	X		X	X	X
	3	Tribal Office	Nichols Street	Undefined	Undefined	$250,000	W1	X		X	X	X
Emergency Response	1	Village Public Safety Office (VPSO)	Amuktoolik Street	64.54491	-163.03038	$250,000	W1	X	X		X	X
	0	Fire Dept (Volunteer Only)										
	0	Emergency Operations Center & Shelter (Clinic)	Punguk Street	64.54474	-163.03065	$0	W1	X	X		X	X
Education	67	Martin L. Olson School	Amuktoolik Street	64.54346	-163.03262	$17,500,000	W1	X		X	X	X
	0	Old School	Amuktoolik Street	64.54264	-163.0327	$750,000	W1	X		X	X	X
Medical	3	Golovin Clinic (New)	Punguk Street	64.54474	-163.03065	$750,000	W1	X	X	X	X	X
Community	0	New Church	Amuktoolik Street	64.5431	-163.03149	$275,000	W1	X		X	X	X
	0	Old Church	Front Street	Undefined	Undefined	$125,000						
	3	Chinik Traditional Store	Punguk Street	64.54458	-163.03074	$300,000	W1	X		X	X	X
	3	Olson Store	Front Street	64.54251	-163.03455	$300,000	W1	X		X	X	X
	1	Pro Elite Store	Egelak Street	64.54334	-163.02781	$300,000	W1	X		X	X	X
	12	Community Hall	Undefined	64.54312	-163.03417	$1,000,000	W1	X		X	X	X
	1	Snowmachine Shop	Undefined	64.54339	-163.03377	$75,000	W1	X		X	X	X
	1	VPSO Quarters	Nichols Street	64.5449	-163.03079	$85,000	W1	X	X	X	X	X
	6	Teachers Quarters	Undefined	64.54491	-163.03038	$250,000	W1	X		X	X	X
	0	Old Fire Hall (Storage)	Nichols Street	Undefined	Undefined	$150,000	W1	X	X	X	X	X
	0	Old Fish Processing Plant	Old Airport	Undefined	Undefined	$1,200,000	W1	X	X	X	X	X
	0	Cemetery	Undefined	64.54787	-163.01126	$20,000	Undefined	X		X	X	X

Table 6-4 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra/Wildland Fire
Roads	0	Total community road miles:	12 Miles									
		Airport Road	N/A	Undefined	Undefined	$7,800,000	HRD 1	X		X	X	X
		Amuktoolik Street						X	X	X	X	X
		Antone Street						X	X	X	X	X
		Aukon Street						X		X	X	X
		Dexter Street						X		X	X	X
		Egelak Street						X		X	X	X
		Front Street						X	X	X	X	X
		Harding Street						X		X	X	X
		Nichols Street						X		X	X	X
		Punguk Street						X	X	X	X	X
		Rounia Loop						X		X	X	X
Bridge		None										
Transportation	0	New Gravel Airstrip	Nichols Street	64.54787	-163.01126	$7,000,000	AFO	X		X	X	X
	0	Old Gravel Airstrip	Undefined	64.54343	-163.03529	$5,000,000	AFO	X		X	X	X
	0	Olson Hangar	Amuktoolik Street	Undefined	Undefined	$750,000	S1L	X	X	X	X	X
	0	Airport maintenance shop	Airport Road	64.54948	-163.01234	$500,000	W1	X		X	X	X
	2	City Maintenance Shop	Amuktoolik Street	64.54328	-163.03382	$500,000	W1	X		X	X	X
Utilities	2	Power Generation Facility	Amuktoolik Street	64.54312	-163.03417	$750,000	EPPS	X	X	X	X	X
	0	High School Generator	Amuktoolik Street	64.54367	-163.0328	$50,000	EPPS	X		X	X	X
	0	Elementary School Generator	Amuktoolik Street	64.54283	-163.03289	$50,000	EPPS	X		X	X	X
	0	City Fuel Tank Farm	Antone Street	64.54361	-163.03396	$350,000	OTF	X		X	X	X
	0	Old Tank Farm	Front Street	Undefined	Undefined	$150,000	OTF	X		X	X	X
	0	Fuel tank farm	Antone Street	64.54347	-163.03172	$350,000	OTF	X		X	X	X

Table 6-4 Critical Facilities and Infrastructure

Facilities	Number of Occupants	Facilities	Address	Latitude	Longitude	Estimated Value	Building Type	Earthquake	Flood	Ground Failure	Severe Weather	Tundra/Wildland Fire
	1	Water Treatment Plant	Rounia Loop	64.54695	-163.02566	$500,000	PWTP	X		X	X	X
	0	New Washeteria	Rounia Loop	64.54294	-163.03297	$150,000	PWTP	X		X	X	X
	0	Water tank 2	Amuktoolik Street	64.54367	-163.03171	$85,000	PWTS	X		X	X	X
	0	Water tank 3	Rounia Loop	64.54291	-163.03326	$85,000	PWTS	X		X	X	X
	0	City of Golovin Water Tank	Rounia Loop	64.54681	-163.02548	$85,000	PWTS	X		X	X	X
	0	Landfill	Landfill Road	64.54787	-163.01126	$55,000	N/A	X		X	X	X
	0	New Septic	Undefined	64.54787	-163.01126	$85,000	WWTS	X	X	X	X	X
	0	Satellite (VPSO Quarters)	Nichols Street	64.5449	-163.03079	$25,000	CBO	X		X	X	X
	0	TeleAlaska	Nichols Street	64.545	-163.02961	$25,000	CBO	X	X	X	X	X
Total Occ	108				**Total Estimated Value**	$48,275,000						

(Golovin 2015, DHS&EM 2014)

6.4 REPETITIVE LOSS PROPERTIES

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

DMA 2000 Requirements
Addressing Risk and Vulnerability to NFIP Insured Structures §201.6(c)(2)(ii): 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. *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: §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of] the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; §201.6(c)(2)(ii)(B): The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; §201.6(c)(2)(ii)(C): 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. §201.6(c)(3)(ii): The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
1. REGULATION CHECKLIST
ELEMENT B. NFIP Insured Structures
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.

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6.4.1.1 NFIP Participation

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

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 Golovin. The following discussion contains data obtained from the Project Team and their subsequent analysis. Therefore the results of the City based exposure analysis for loss estimations in the City are summarized in Tables 6-5 and 6-6.

Table 6-5 Golovin's Critical Facility Potential Hazard Exposure Analysis

		Government and Emergency Response		Educational		Medical		Community	
Hazard Type	Methodology	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)	* # Bldgs / # Occ	Value ($)
Earthquake	Descriptive	5/6	850,000	2/67	18,250,000	1/3	750,000	12/27	4,080,000
Flood	Descriptive	0/0	0	0/0	0	1/3	750,000	3/1	1,435,000
Ground Failure	Descriptive	5/6	850,000	2/67	18,250,000	1/3	750,000	12/27	4,080,000
Severe Weather	Descriptive	5/6	850,000	2/67	18,250,000	1/3	750,000	12/27	4,080,000
Wildland Fire	Descriptive	5/6	850,000	2/67	18,250,000	1/3	750,000	12/27	4,080,000

Table 6-6 Golovin's Critical Facility Potential Hazard Exposure Analysis (Continued)

		Highway		Bridges		Transportation Facilities		Utilities	
Hazard Type	Methodology	Miles	Value ($)	No.	Value ($)	# Bldgs / # Occ	Value ($)	# Bldgs / # Occ	Value ($)
Earthquake	Descriptive	12	7,800,000	0/0	0	5/2	13,750,000	18/3	2,795,000
Flood	Descriptive	1.5	975,000	0/0	0	1/	750,000	3/2	860,000
Ground Failure	Descriptive	12	7,800,000	0/0	0	5/2	13,750,000	18/3	2,795,000
Severe Weather	Descriptive	12	7,800,000	0/0	0	5/2	13,750,000	18/3	2,795,000
Wildland Fire	Descriptive	12	7,800,000	0/0	0	5/2	13,750,000	18/3	2,795,000

6.7.1 Exposure Analysis – Hazard Narrative Summaries

Earthquake

The City and surrounding area can expect to experience moderate 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 at risk of experiencing moderate earthquake impacts as a result of its close proximity to known earthquake faults.

The USGS Shake Map indicates that Golovin has a moderate probability (see Section 5.3.1.3) for experiencing significant ground movement that may result in infrastructure damage and personal injury.

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

- 171 people in 64 residences (approximate value $16,000,000)
- Six people in five government and emergency response facilities (approximate value $850,000)
- 67 people in two educational facilities (approximate value $18,250,000)
- Three people in one medical facility (approximate value $750,000)
- 27 people in 12 community facilities (approximate value $4,080,000)
- 12 road system miles (approximate value $7,800,000)
- Two people in five transportation facilities (approximate value $13,750,000)
- Three people in 15 utility facilities (approximate value $2,795,000)

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

Flood

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 neither does the USACE Floodplain Manager provide flood information or a 100 year floodplain map for the community. Damages could potentially include:

- 18 people in six residences (approximate value $1,500,000)
- Three people in one medical facility (approximate value $750,000)
- One person in three community facilities (approximate value $1,435,000)
- 1.5 road system miles (approximate value $975,000)
- One person in one transportation facilities (approximate value $750,000)
- Two people in three utility facilities (approximate value $860,000)

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.

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

- 171 people in 64 residences (approximate value $16,000,000)
- Six people in five government and emergency response facilities (approximate value $850,000)
- 67 people in two educational facilities (approximate value $18,250,000)
- Three people in one medical facility (approximate value $750,000)
- 27 people in 12 community facilities (approximate value $4,080,000)
- 12 road system miles (approximate value $7,800,000)
- Two people in five transportation facilities (approximate value $13,750,000)
- Three people in 15 utility facilities (approximate value $2,795,000)

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.

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

- 171 people in 64 residences (approximate value $16,000,000)
- Six people in five government and emergency response facilities (approximate value $850,000)
- 67 people in two educational facilities (approximate value $18,250,000)
- Three people in one medical facility (approximate value $750,000)
- 27 people in 12 community facilities (approximate value $4,080,000)
- 12 road system miles (approximate value $7,800,000)
- Two people in five transportation facilities (approximate value $13,750,000)
- Three people in 15 utility facilities (approximate value $2,795,000)

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

Wildland Fire

Impacts associated with a wildland fire event include the potential for loss of life and property. It can also impact livestock and pets and destroy forest resources and contaminate water supplies. Buildings closer to the outer edge of town, those with a lot of vegetation surrounding the structure, and those constructed with wood are some of the buildings that are more vulnerable to the impacts of wildland fire. Section 5.3.5.3 provides additional detail regarding wildland/tundra fire impacts

According to the Alaska Fire Service, there are no wildland fire areas within Golovin's City limit boundaries. However, 111 wildland fires have occurred within a 50-mile radius of the City (see

Section 5.3.7.3). It is "Possible" that a wildland fire could interface with the population center of the City. This area includes approximately:

- 171 people in 64 residences (approximate value $16,000,000)
- Six people in five government and emergency response facilities (approximate value $850,000)
- 67 people in two educational facilities (approximate value $18,250,000)
- Three people in one medical facility (approximate value $750,000)
- 27 people in 12 community facilities (approximate value $4,080,000)
- 12 road system miles (approximate value $7,800,000)
- Two people in five transportation facilities (approximate value $13,750,000)
- Three people in 15 utility facilities (approximate value $2,795,000)

6.8 FUTURE DEVELOPMENT

The City of Golovin has numerous environmental challenges. Their 2009-2013 Water and Sewer Utilities Business Plan provides a few concerns for their land use capacity. Their rural location and coastal location combined with changing climatic impacts exacerbates natural hazard impact damages:

> ***"5.0 Environmental Scan***
>
> *29B**5.9 Land Use Potential***
>
> *Within Golovin there are some possible land areas for future development projects if care is taken not to build on existing gravesites or wetlands. There is one site which should not be used due to contamination issues, the old dumb site at the mouth of the Chinik Creek. A Brownsfield assessment recommended in 2007 that the site be moved due the threat of erosion" (GEDP 2009).*

The City's EDP defined "Identified project needs and benefits", and a few "Potential constraints to project development" deemed vital to each of their proposed project's prioritization process:

> ***"Identified project needs and Benefits items:***
>
> - *Golovin also needs to prepare now for construction of new buildings in the future which will need access to sewer and water. Inability to provide sewer and water service to new sites could hold up other construction projects and hurt the community.*
> - *Moving the power plant to higher ground will assure the community will have reliable power and eliminate potential problems in the future. Reliable power is necessary to daily life and will improve the well-being and safety of residents.*
> - *The current sits are nearly depleted and there is a need for an accessible site with good rock. Having a new gravel source in Golovin will allow for future progress and new development projects.*
> - *The community lacks a breakwater barrier to protect Golovin from the destructive waves when storms hit from the west and south… In order to mitigate these [historic*

impact] concerns; an adequate breakwater and other erosion control measures are needed.

Potential Constraints to Project Development

- *Funding sources for new water source development and water and sewer projects are competitive and limited. Most of the sewer and water funding goes to other communities where the needs are greater. Some funding sources may be reluctant to award grants to fund extensions to older homes or homes that are located in difficult places.*
- *Funding and land issues are the major constraints to the project. High shipping costs and a short construction season are also an issue.*
- *The need for preliminary mineral surveys, land issues, short construction seasons, heavy equipment needs, high freight costs, and project funding are the major constraints to the project.*
- *Golovin feels they have a smaller population and more aggressive communities receive funding before they do because it is hard to convince outside agencies of the severity of the problem" (GEDP 2009).*

The GECP also listed narrative descriptions for future mitigation actions or improvements:

- *"Waste Management – … install sewer and water, relocate old landfill to end Chinik Creek pollution...*
- *Electric Power and Bulk Fuel – Develop alternative energy (wind, solar, thermal), and relocate power plant out of the flood zone.*
- *Transportation – resurface airport runway to solve the mud problem with rain and thaw,… dust control on roads around town, fix pot holes…*
- *Housing – Elder houses, adequate homes for young families who are growing, need more new home construction, home lot improvement, install ventilation fans to keep mold and moisture out of homes, reduce water collection around homes with gravel fill, improved foundations, improved insulation…*
- *Environment – erosion control of beach and hills due to changes in tides and thawing ground…*
- *Sewer and Water – water and sewer planning for ongoing maintenance due to shifting ground, fix and open new washeteria, fix the plumbing in the clinic, improved road to water source, build a well or change water source to Kichavik or other permanent and viable source with a road to camp, and finish water and sewer hookup to all residents and businesses" (GEDP 2009).*

The city of Golovin is not a NFIP participant; therefore Table 6-7 demonstrates that Golovin has no future development funded that would determine future NFIP programmatic impacts.

Table 6-7 Planned and Funded Projects

Award Year	Project Description/Comments	Project Status	Award Amount	End Date
2013	Heavy Equipment	Active	$394,500	6/30/2017

(DCRA 2012)

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Section Seven delineates the Village's 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
Identification and Analysis of Mitigation Actions §201.6(c)(3): [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. §201.6(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs. §201.6(c)(3)(iv): [For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. Requirement §201.6(c)(4): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.
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)*
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?

DMA 2000 Requirements
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 GOLOVIN'S CAPABILITY ASSESSMENT

DMA 2000 and its implementing regulations for technical and fiscal resources available to the community for HMP project implantation and management.

DMA 2000 Requirements
Incorporation into Existing Planning Mechanisms §201.6(c)(3): [The plan shall include the following:] A *mitigation strategy* that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.
1. REGULATION CHECKLIST
ELEMENT C. Incorporate into Other Planning Mechanisms
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.

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Tables 7-1, 7-2, and 7-3 delineate the City/Village'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 Golovin's Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Existing Yes/No	Comments
Comprehensive Plan	No	
Land Use Plan	No	
Tribal Land Use Plan	No	
Economic Development Plan	Yes	Defines the City future needs and concerns (land use, transportation, infrastructure upgrades, and health and safety projects and initiatives.
Emergency Response Plan	No	
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 Golovin's Technical Specialists

Staff/Personnel Resources	Yes / No	Department/Agency and Position
Planner or engineer with knowledge of land development and land management practices	No	The City hires 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 hires consultants when they need a surveyor.
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	Yes	The City has staff with this knowledge.
Personnel skilled in Geospatial Information System (GIS) and/or Hazards Us-Multi Hazard (Hazus-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 and other subject matter experts for as needed.
Emergency Manager	Yes	The City Mayor, City Administrator, or Tribal President.
Finance (Grant writers)	Yes	City or Tribal Bookkeeper as applicable.
Public Information Officer	Yes	The City Mayor, City Administrator, or Tribal President.

Table 7-3 Golovin's Financial Resources

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)	City and Tribe may exercise this option
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

Table 7-3 Golovin's Financial Resources

Financial Resource	Accessible or Eligible to Use for Mitigation Activities
Incur debt through private activity bonds	City may 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. City & Tribe
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. City & Tribe
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. ***Golovin does not qualify for this funding source because they do not participate in the NFIP.***
United State Fire Administration (USFA) Grants	These grants assist state, regional, national or local organizations in addressing fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters. City & Tribe
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts. City only

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

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7.3 DEVELOPING MITIGATION GOALS

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

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

The 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, eight 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 **outreach** activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the City of Golovin (City) and the Chinik Eskimo Tribe (Tribe or Tribal).
MH 2	**Cross-reference** or coordinate mitigation goals and actions with other City and Tribal planning mechanisms and projects.
MH 3	Develop **construction** activities that reduce possibility of losses from all natural and manmade hazards that affect the City and Tribe.
Natural Hazards	
EQ 4	Reduce structural vulnerability to earthquake (EQ) damage.
FL 5	Reduce flood and erosion (FL) damage and loss possibility.
GF 6	Reduce ground failure (GF) damage and loss possibility.
RA 7	Reduce population vulnerability from radon (RA) impacts.
SW 8	Reduce structural vulnerability to severe weather (SW) damage.
WF 9	Reduce structural vulnerability to tundra/wildland fire (WF) damage.

7.4 IDENTIFYING MITIGATION ACTIONS

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

DMA 2000 Requirements
Identification and Analysis of Mitigation Actions §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
1. REGULATION CHECKLIST
ELEMENT C. Mitigation Actions
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?
Source: FEMA, March 2015.

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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.

After developing mitigation goals, the Planning Team reviewed their legacy HMP's existing projects as well as a comprehensive list of new potential mitigation actions that may further benefit the community.

Table 7-5 lists the legacy HMP's Mitigation Action Plan's (MAP) listed actions or projects current status as well as their determination whether to carrying them forward into then new MAP (Table 7-8). They defined current project's status as: completed, deleted, deferred, re-

defined, or Ongoing. They also listed new or considered actions identified from a comprehensive list for each hazard type.

On May 27, 2015, the Planning Team brought 23 legacy HMP projects and selected four new natural hazard, mitigation actions for potential Mitigation Action Plan (MAP) implementation during the five-year life cycle of this HMP. 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.

Table 7-5 Mitigation Goals and Potential Actions

(Blue text items are the current HMP Identified Mitigation Action Items and their respective status determinations)

Goals		Status		Actions
No.	**Description**	**New** *Considered, Selected* **Brought Forward** *Complete, Deferred, Deleted, or Ongoing*	**Explain Status**	**Description**
Multi-Hazards (MH)				
MH 1	*Provide **outreach** activities to educate and promote recognizing and mitigating all natural and manmade hazards that affect the City of Golovin (City) and the Chinik Eskimo Tribe (Tribe).*	*Deferred - Ongoing*	*Due to funding deficiency - Simplified wording*	*1A: Hold an annual or biennial "hazard meeting" to provide information to residents about recognizing and mitigating all natural hazards that affect the City of Golovin.*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as outreach category tasks*	*2A, 8A: Install a Community Siren System to alert the community of a natural hazard occurrence to enhance warning and response activities to increase warning time for the community.*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as outreach category tasks*	*1A, 10D: Develop, acquire, and/or purchase hazard brochures to educate community concerning HMP identified hazard's impacts, monitoring, and mitigation (earthquake, flood, radon, ground failure, winter storms, wildland fire)*
		Select	New	Identify and pursue funding opportunities to implement mitigation actions.
MH 2	***Cross-reference** or coordinate mitigation goals and actions with other City and Tribal planning mechanisms and projects.*	Select	New	The City will strive to manage their existing plans by coordinating and incorporating mitigation provisions with all community plan processes such as comprehensive, economic development, capital improvement, and land use, transportation plans etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
		Select	New	Integrate the Mitigation Plan's hazard vulnerability assessment findings for enhanced emergency planning.
		Deferred - Ongoing	*N/A*	*2B: Finalize City's Emergency Operations Plan*
		Deferred - Ongoing	*Due to funding deficiency -*	*3A, 6A, 7B, 9A, 11A: Support hazard mapping efforts of the City overlain with all critical facilities, infrastructure, and residential and non-residential buildings to facilitate*

Table 7-5 Mitigation Goals and Potential Actions

(Blue text items are the current HMP Identified Mitigation Action Items and their respective status determinations)

Goals		Status		Actions
No.	**Description**	**New** *Considered, Selected* **Brought Forward** *Complete, Deferred, Deleted, or Ongoing*	**Explain Status**	**Description**
			Combines similar Multi-Hazard as coordinated planning category tasks	*locational siting. (High water flow flooding & scour, ground failure (landslide, rockslide, permafrost, wildfire)*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as coordinated planning category tasks*	*4A, 10B: Adopt and implement Uniform International and State Building Codes to meet natural hazard requirements (earthquake, ground failure, radon, wind)*
		Deferred - Ongoing	*N/A*	*5A: Adopt and enforce floodplain management ordinances*
		Deferred - Ongoing	*N/A*	*5B: Join the NFIP, which regulates development in floodplains and provides federally backed insurance to individuals who live in communities that have joined the program.*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as coordinated planning category tasks*	*5A, 6A, 7B, 9A, 11B: Adopt an ordinance that prohibits new structures within historic hazard areas (flood, ice run-up, permafrost, landslide, zone.*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as coordinated planning category tasks*	*7A, 11B: Adopt an ordinance promoting permafrost sensitive construction practices and siting in permafrost areas.*
		Deferred - Ongoing	*Due to funding deficiency - Split legacy 8B project to create two for better grouping and combining*	*8B: Develop ordinance to require using hazard appropriate materials and construction practices for new and remodeled structures. (earthquake, high water flow, permafrost, weather, wildland fire)*
MH 3	*Develop **construction activities** that reduce possibility of losses from all natural and manmade hazards that affect the City and Tribe.*	*Deferred - Ongoing*	*Due to funding deficiency*	*2A: Install a Community Siren System*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as*	*2C, 3E, 3F: Relocate or elevate assets (roads, utilities, structures, etc.) that are at risk from natural hazard impacts. (high water flow, scour, utilities, old landfill, radon, wildfire, emergency evacuation.*

Table 7-5 Mitigation Goals and Potential Actions

(Blue text items are the current HMP Identified Mitigation Action Items and their respective status determinations)

Goals		Status		Actions
No.	**Description**	**New** *Considered, Selected* **Brought Forward** *Complete, Deferred, Deleted, or Ongoing*	**Explain Status**	**Description**
			construction project category tasks	
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as construction project category tasks*	*3B & 5C: Identify specific facility mitigation measures and prioritize properties for high-water flow damage control measure implementation (earthquake, high water-flow, scour, ground failure, weather)*
		Deferred - Ongoing	*Due to funding deficiency - Combines similar Multi-Hazard as construction project category tasks*	*4B, 8B, 9A: Encourage use of natural hazard resistant construction materials and practices for new and remodeled structures to resist impacts (Earthquake, flood, permafrost,)*
		Deferred - Ongoing	*Due to funding deficiency - Reworded*	*8C: Develop better trail system marking/identification between communities to prevent residents from becoming lost when traveling between communities during a severe weather events.*
EQ4	*Reduce vulnerability, damage, or loss of structures from earthquake (EQ) damage*	*Deferred - Ongoing*	*Due to funding deficiency*	*4C: Develop building inspection program to assure that all future development meets seismic resistant design requirements; supported by construction inspections conducted by City staff or contract engineer.*
FL 5	*Reduce flood and scour (FL) damage and loss possibility.*	*Deferred - Ongoing*	*Due to funding deficiency*	*3D: Install high water flow scour control measures such as gabion baskets, riprap, sheet-piling, and/or geotextile fabric where needed, taking into consideration potential ice override event effects.*
		Deferred - Ongoing	*Due to funding deficiency*	*3C: Install, realign, or relocate culverts where needed.*
GF 6	*Reduce vulnerability, damage, or loss of structures from ground failure (GF) events.*	*Deferred - Ongoing*	*Due to funding deficiency*	*7A: Support localized mapping effort to identify existing permafrost and other potential ground failure locations*
RA 7	*Reduce vulnerability, or injury from Radon (RA).*	*Deferred - Ongoing*	*Due to funding deficiency*	*7A: Support localized mapping effort to identify existing permafrost and other potential ground failure locations*
		Deferred - Ongoing	*Due to funding deficiency*	*7A: Support localized mapping effort to identify existing permafrost and other potential ground failure locations*
SW 8	*Reduce vulnerability, damage, or loss of structures from severe weather (SW) damage.*	Select	New	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).
WF 9	*Reduce vulnerability,*	*Deferred -*	*Due to funding*	*9A: Promote FireWise building design, siting, and materials*

Table 7-5 Mitigation Goals and Potential Actions

(Blue text items are the current HMP Identified Mitigation Action Items and their respective status determinations)

Goals		Status		Actions
No.	Description	**New** *Considered, Selected* **Brought Forward** *Complete, Deferred, Deleted, or Ongoing*	Explain Status	Description
	damage, or loss of structures from wildland or tundra fires (WF).	*Ongoing*	*deficiency - Low priority*	*for construction.*

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
Implementation of Mitigation Actions §201.6(c)(3)(iii): [The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
1. REGULATION CHECKLIST
ELEMENT C. MITIGATION STRATEGY
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.

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The Planning Team evaluated and prioritized each of the mitigation actions on May 27, 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, flood, ground failure, severe weather, and tundra/wildland fire).

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

On May 27, 2015, the hazard mitigation Planning Team prioritized 27 hazard mitigation actions (23 legacy HMP and four newly identified) that were selected to carry forward into the 2015 updated 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

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)

City of Golovin (City Mayor's Office)

Golovin Tribal Council (Tribal Council Office)

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

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

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

US Department of Agriculture (USDA) /
USDA, Farm Service Agency
Emergency Conservation Program (ECF)
Rural Development (RD)

USDA, Natural Resources Conservation Service (NRCS)
Conservation Technical Assistance Program (DCT)
Conservation Innovation Grants (CIG)
Environmental Quality Incentives Program (EQIP)
Emergency Watershed Protection Program (EWP)
Watershed Planning (WSP)

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

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

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

Alaska Department of Military and Veterans Affairs (DMVA), Division of Homeland Security and Emergency Management (DHSEM)
Mitigation Section (for PDM & HMGP projects and plan development)
Preparedness Section (for community planning)
State Emergency Operations Center (SEOC for emergency response)

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

Alaska Department of Transportation
State road repair funding

Alaska Energy Authority (AEA)
AEA/Bulk Fuel (ABF)

AEA/Alternative Energy and Energy Efficiency (AEEE)

Alaska Department of Environmental Conservation (DEC)/
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 Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 1.0	Identify and pursue funding opportunities to implement mitigation actions.	High	City of Golovin Mayor Chinik Eskimo Tribal Council (The Native Council is included as a viable responsible entity in order to obtain Administration for Native Americans (ANA) funding, the Tribe would need to be the applicant for those projects)	City, Tribe, (See Table 7-7 and Appendix A)	Ongoing	B/C: City and Village life requires this as an ongoing activity; it is essential for rural communities as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 1.2	*Hold an annual or biennial "hazard meeting" to provide information to residents about recognizing and mitigating all natural hazards that affect the City of Golovin.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, FEMA HMA, AFG, FP&S, SAFER, ANA, EEFSP, Lindbergh, Rasmuson, Denali Commission*	*Ongoing 1-4 years*	*B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *TF: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.*
MH 1.3	*Install a Community Siren System to alert the community of a natural hazard occurrence to enhance warning and response activities to increase warning time for the community.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, FG, FP&S, SAFER*	*Ongoing 2-4 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*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 1.4	*Develop, acquire, and/or purchase hazard brochures to educate community concerning HMP identified hazard's impacts, monitoring, and mitigation (earthquake, flood, radon, ground failure, winter storms, wildland fire)*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Federal Emergency Management Agency (FEMA) HMA programs, AFG, FP&S, and SAFER*	*Ongoing 1-4 years*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to, and recover from disasters.* *TF: This low cost activity can be combined with recurring community meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.*
MH 2.1	The City will strive to manage their existing plans by coordinating and incorporating mitigation provisions with all community plan processes such as comprehensive, economic development, capital improvement, and land use, transportation plans etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Medium	City Mayor or Tribal Council as applicable	City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)	1-3 years	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and residents. TF: This is feasible to accomplish as cost can be associated with plan reviews and updates. The action relies on staff and review committee availability and willingness to serve their community.

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 2.2	Integrate the Mitigation Plan's hazard vulnerability assessment findings for enhanced emergency planning.	Medium	City Mayor or Tribal Council as applicable	City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)	1-3 years	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This is technically feasible because it requires application of knowledge of the hazard mitigation plan and other planning efforts. Feasibility is reliant on technical skills already possessed by employees holding positions that would implement this action.
MH 2.3	*Finalize City's Emergency Operations Plan*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, DCCED/CDBG*	*Ongoing 1-3 years*	*B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents.* *TF: This is feasible to accomplish as no cost is associated with the action and only relies on member availability and willingness to serve their community.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 2.4	*Support hazard mapping efforts of the City overlain with all critical facilities, infrastructure, and residential and non-residential buildings to facilitate locational siting. (High water flow flooding & scour, ground failure (landslide, rockslide, permafrost, wildfire)*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, NRCS, USACE*	*Ongoing 2-4 years*	*B/C: Identifying threatened infrastructure proximity to natural hazards is vital to their sustainability. There are currently few mapped hazard areas. This is a vital first step. This knowledge will help the community focus on activities to protect their vital infrastructure.* *TF: The project is technically feasible as the community has considerable knowledge about their resources and historical impact areas.*
MH 2.5	*Adopt and implement Uniform International and State Building Codes to meet natural hazard requirements (earthquake, ground failure, radon, wind)*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe, DCRA, Denali Commission*	*Ongoing 3-5 years*	*B/C: Building code development, implementation and enforcement can effectively reduce future losses to hazardous events. Building codes can actually assist bush communities through making maximum use of materials and shipping costs the first time.* *TF: This project is technically feasible as the community need only demonstrate cost savings by demonstrating losses from history utility impacts and down time.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

- *Blue Italicized Initiatives were brought forward from existing HMP or other identified plans*
- *See Table 7-9 Potential Funding Agency list and Appendix A for agency programmatic details*

Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 2.6	*Adopt and enforce floodplain management ordinances*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*Ongoing 3-5 years*	*B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents.* *TF: This is feasible to accomplish as no cost is associated with the action and only relies on member availability and willingness to serve their community.*
MH 2.7	*Join the NFIP, which regulates development in floodplains and provides federally backed insurance to individuals who live in communities that have joined the program.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe*	*Ongoing* 3-5 years	*B/C: This low-cost program will help reduce damage and losses due to earthquake events and to prevent urban fires.* *T/F: This is technically feasible because it requires application of knowledge of the emergency management, hazard mitigation planning, and other planning efforts. Feasibility is reliant on technical skills already possessed by employees holding positions that would implement this action.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 2.8	*Adopt an ordinance that prohibits new structures within historic hazard areas (flood, ice run-up, permafrost, landslide, zone.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*Ongoing 3-53 years*	*B/C: Land Use plans are an essential community development and land management tool. Focused and coordinated planning enables effective damage abatement and ensures proper attention is assigned to reducing losses, damage, and injuries. And Strengthens materials management.* *TF: This action is feasible with limited fund expenditures.*
MH 2.9	*Adopt an ordinance promoting permafrost sensitive construction practices and siting in permafrost areas.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*Ongoing 3-5 years*	*B/C: Land Use plans are an essential community development and land management tool. Focused and coordinated planning enables effective damage abatement and ensures proper attention is assigned to reducing losses, damage, and injuries. And Strengthens materials management.* *TF: This action is feasible with limited fund expenditures.*

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MH 2.10	*Develop ordinance to require using hazard appropriate materials and construction practices for new and remodeled structures. (earthquake, high water flow, permafrost, weather, wildland fire)*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*Ongoing 1-3 years*	*B/C: Land Use plans are an essential community development and land management tool. Focused and coordinated planning enables effective damage abatement and ensures proper attention is assigned to reducing losses, damage, and injuries. And Strengthens materials management.* *TF: This action is feasible with limited fund expenditures.*
MH 3.1	*Install a Community Siren System*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, FG, FP&S, SAFER*	*Ongoing* 3-5 years	*B/C: Sustained emergency response planning, notification, 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*
MH 3.2	*Relocate or elevate assets (roads, utilities, structures, etc.) that are at risk from natural hazard impacts. (high water flow, scour, utilities, old landfill, radon, wildfire, emergency evacuation.*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe, HMA, Natural Resources Conservation Service (NRCS), ANA, USACE, US Department of Agriculture (USDA), Lindbergh Grants Program*	*Ongoing 1-3 years*	*B/C: This project would remove threatened structures from hazard areas, 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.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 3.3	*Identify facility specific mitigation measures and prioritize properties for high-water flow damage control measure implementation (earthquake, high water-flow, scour, ground failure, weather)*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe, HMA, NRCS, USACE, USDA/EWP, USDA/ECP, DCRA/ ACCIMP*	*Ongoing 1-3 years*	*B/C: Flood hazard mitigation is among FEMA's highest national priorities. FEMA desires communities focus on repetitive flood loss properties. This activity will ensure the City and Tribal Councils focus on priority flood locations and projects.* *TF: Low to no cost makes this outreach activity very feasible.*
MH 3.4	*Encourage use of natural hazard resistant construction materials and practices for new and remodeled structures to resist impacts (Earthquake, flood, permafrost,)*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe, HMA, ANA, NRCS, USACE*	*Ongoing 2-5 years*	*B/C: Improving slope stability will greatly reduce potential infrastructure and residential losses. Project costs would outweigh replacement costs of lost facilities.* *Vegetative or other readily available materials may improve revitalization and facilitate community focused repairs with similar materials.* *TF: Technically feasible as the community has the skill to implement this action using native materials and equipment.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
MH 3.5	*Develop better trail system marking/identification between communities to prevent residents from becoming lost when traveling between communities during a severe weather events.*	*Low*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*Ongoing 1-3 years*	*B/C: This project will ensure the community looks closely at their hazard areas to ensure they can safely travel to communities during severe weather events.* *TF: This is technically feasible using existing city and tribal resources.*
EQ 4.1	*Develop building inspection program to assure that all future development meets seismic resistant design requirements; supported by construction inspections conducted by City staff or contract engineer.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Natural Resources Conservation Service (NRCS), ANA, USACE, US Department of Agriculture (USDA), Lindbergh Grants Program*	*2-5 years*	*B/C: Coordinated planning ensures effective damage abatement and ensures staff assign proper attention to reduce losses and damage to structures and City residents.* *TF: This action is feasible with limited fund expenditures.*
FL 5.1	*Install high water flow scour control measures such as gabion baskets, riprap, sheet-piling, and/or geotextile fabric where needed, taking into consideration potential ice override event effects.*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe, HMA, ANA, NRCS, USACE*	*Ongoing 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.*

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
FL 5.2	*Install, realign, or relocate culverts where needed.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, HMA, ANA, Denali Commission, NRCS, USACE, USDA/EWP, USDA/ECP, DCRA/ ACCIMP*	*Ongoing 2-4 years*	*B/C: Improving water flow capability 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 6.1	*Support localized mapping effort to identify existing permafrost and other potential ground failure locations*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, NRCS, USACE*	*Ongoing 2-4 years*	*B/C: Identifying threatened infrastructure proximity to natural hazards is vital to their sustainability. There are currently few mapped hazard areas. This is a vital first step. This knowledge will help the community focus on activities to protect their vital infrastructure.* *TF: The project is technically feasible as the community has considerable knowledge about their resources and historical impact areas.*

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
RA 7.1	*Require testing of new structures within 6 months of occupancy.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, Denali Commission, Division of Community and Regional Affairs (DCRA)*	*1-3 years*	*B/C: Coordinated planning and testing enables effective injury damage abatement and focuses attention to assign actions to reduce impacts to City residents.* *TF: This type activity is technically feasible within the community typically using existing labor and specialized equipment and testing kits.*
RA 7.2	*Provide short-term home radon testing kits for all residences and critical facilities.*	*High*	*City Mayor or Tribal Council as applicable*	*City, Tribe,*	*Ongoing* *1-3 years*	*B/C: P Properly trained and knowledgeable residents will reduce radon impacts; critical to community health and safety.* *Focused HAZMAT knowledge, and monitoring guides residents with determining exposure to reduce exposure or injury.* *TF: This type activity is technically feasible within the community; typically using existing labor and specialized equipment and testing kits.*

Table 7-8 City of Golovin and the 's Mitigation Action Plan (MAP)

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Goal / Action ID	Description	Priority (High, Medium, Low)	Responsible Department	Potential Funding Source(s)	Timeframe (1-3 Years 2-4 Years 3-5 Years)	Benefit-Costs (BC) / Technical Feasibility (T/F)
SW 8.1	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).	Low	City Mayor or Tribal Council as applicable	City, Tribe, DCCED/CDBG, Denali Commission	3-5 years	B/C: Scheduling maintenance and implementing mitigation activities will potentially reduce severe winter storm damages caused by heavy snow loads, wind, and freezing rain. TF: This type activity is technically feasible within the community typically using existing labor, equipment, and materials. Specialized methods are not new to rural communities as they are used to importing required contractors.
WF 9.1	*Promote FireWise building design, siting, and materials for construction.*	*Medium*	*City Mayor or Tribal Council as applicable*	*City, Tribe, AFG, FP&S*	*Ongoing 1-3 Years*	*B/C: Sustained mitigation outreach programs have minimal cost and will help build and support community capacity enabling the public to appropriately prepare for, respond to, and recover from disasters.* *TF: This project is technically feasible using existing City and Tribal staff.*

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

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

- Review the 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.

Section 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

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/nehrp.shtm, and
    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).

- 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). Provides diverse funding opportunities; providing a wide benefit range. Their grants and loans website provides a brief programmatic overview with links to specific programs and services. (http://www.rd.usda.gov/programs-services)
  - Farm Service Agency: Emergency Conservation Program, Non-Insured Assistance, Emergency Forest Restoration Program, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service. (http://www.fsa.usda.gov/FSA/stateoffapp?mystate=ak&area=home&subject=landing&topic=landing)

- Natural Resources Conservation Service (NRCS) has several funding sources to fulfill mitigation needs. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/)
  - The Emergency Watershed Protection Program (EWP). This funding source is designed is to undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/)
  - Watershed Surveys and Planning. NRCS watershed activities in Alaska are voluntary efforts requested through conservation districts and units of government and/or tribes. The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries. (http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wsp/)

- Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program (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 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)

- 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)
  - Indian Housing Block Grant (IHBG)/ Native American Housing Assistance and Self Determination Act (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
    - 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)

- Department of Housing and Urban Development (HUD) provides a variety of disaster resources. They also partner with Federal and state agencies to help implement disaster recovery assistance. Under the *National Response Framework* the FEMA and the Small

Business Administration (SBA) offer initial recovery assistance. (http://www.hud.gov/info/disasterresources_dev.cfm)

- HUD, Office of Homes and Communities, Section 108 Loan Guarantee Programs. This program provides loan guarantees as security for Federal loans for acquisition, rehabilitation, relocation, clearance, site preparation, special economic development activities, and construction of certain public facilities and housing. (http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm)
- HUD, Office of Homes and Communities, Section 184 Indian Home Loan Guarantee Programs (IHLGP). The Section 184 Indian Home Loan Guarantee Program is a home mortgage specifically designed for American Indian and Alaska Native families, Alaska Villages, Tribes, or Tribally Designated Housing Entities. Section 184 loans can be used, both on and off native lands, for new construction, rehabilitation, purchase of an existing home, or refinance.
- Because of the unique status of Indian lands being held in Trust, Native American homeownership has historically been an underserved market. Working with an expanding network of private sector and tribal partners, the Section 184 Program endeavors to increase access to capital for Native Americans and provide private funding opportunities for tribal housing agencies with the Section 184 Program. (http://www.hud.gov/offices/pih/ih/homeownership/184/)
- 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)
  - 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).
- 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 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.

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

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

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

Their geologists and support staff are leaders in researching Alaska's geology and implementing technological tools to most efficiently collect, interpret, publish, archive, and disseminate information to the public. Information is available at: (http://www.dggs.dnr.state.ak.us/index.php?menu_link=publications&link=publications_search#)

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

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)

  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 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/Resourses4states+Nonprofits.htm)

- Denali Commission. Introduced by Congress in 1998, the Denali Commission is an independent federal agency designed to provide critical utilities, infrastructure, and economic support throughout Alaska. With the creation of the Denali Commission, Congress acknowledged the need for increased inter-agency cooperation and focus on Alaska's remote communities. Since its first meeting in April 1999, the Commission is credited with providing numerous cost-shared infrastructure projects across the State that exemplifies effective and efficient partnership between federal and state agencies, and the private sector. (http://www.denali.gov/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)

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Appendix B

FEMA Hazard Mitigation Plan (HMP) Review Tool

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APPENDIX A:
LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: City of Golovin	**Title of Plan:** City of Golovin Hazard Mitigation Plan	**Date of Plan:** July 2015
Local Point of Contact: Mayor Kathy Fagerstrom	**Address:** City of Golovin P.O. Box 62059 City of Golovin, AK 99762	
Title: City Clerk		
Agency: City of Golovin		
Phone Number: 907.779 3211 or 779.3681	**E-Mail:** Golovin_ak@hotmail.com	

State Reviewer: **Scott Nelsen**	**Title: Mitigation Planner**	**Date: 7/31/2015**

FEMA Reviewer:	**Title:**	**Date:**
David Freeborn	**Mitigation Champion (FEMA Contractor)**	**8/31/15**
Kristen Meyers	**FEMA Mitigation Planner**	**9/16/15; 10/24/15**
Date Received in FEMA Region X	7/31/2015	
Plan Not Approved		
Plan Approvable Pending Adoption	10/24/15	
Plan Approved	12/21/2015	

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 3.1, Page 3-1 Section 3.2, Page 3-3 Table 3-1, Page 3-3	√	
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))	Section 3.3, Page 3-3 Table 3-3, Page 3-4	√	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 3.3, Page 3-3 to 3-5Table 3-2, Page 3-4	√	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 3.5, Page 3-7 Table 3-5	√	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 3.5.2, Page 3-8 Section 3.6.2, Page 3-9	√	
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))	Section 3.6, Page 3-8 Section 3.6.3,Page 3-9	√	
ELEMENT A: REQUIRED REVISIONS			

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 5.2, Page 5-1 Table 5-1, Page 5-2 ***Earthquake*** Section 5.3.1, Page 5-5 Location: Page 5-8 to 5-9 Extent: Page 5-9 to 5-10 ***Flood*** Section 5.3.2, Page 5-11 to 5-13 Location: Page to 5-21 to 5-22 Extent: Page 5-23 ***Ground Failure***, Section 5.3.3, Page 5-25 to 5-27 Location: Page 5-27 to 5-28 Extent: Page 5-29 ***Radon*** Section 5.3.4, Page 5-33 Location: Page 5-31 Extent: Page 5-31 ***Severe Weather*** Section 5.3.5, Page 5-32 to 5-34 Location: Page 5-40 Extent: Page 5-40 ***Wildland Fire*** Section 5.3.6, Page 5-41 to 5-42 Location: Page 5-44 Extent: Page 5-44 to Page 5-45	√	

B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	***Earthquake***, Section 5.3.1.2 History: Page 5-6 to 5-8 Section 5.3.1.3 Probability: Page 5-10 to 5-11 ***Flood*** Section 5.3.2.2, History: Page 5-14 to 21 Section 5.3.2.3 Probability: Page 5-25 ***Ground Failure***, Section 5.3.3.2 History: Page 5-27 Section 5.3.3.3 Probability: Page 5-29 ***Radon*** Section 5.3.4.2 History: Page 5-30 Section 5.3.4.3 Probability: Page 5-32 ***Severe Weather*** Section 5.3.5.2 History: Page 5-34 to 40 Section 5.3.5.3 Probability: Page 5-41 ***Wildland Fire***, Section 5.3.6.2 History: Page 5-42 to 5-44 Section 5.3.6.3 Probability: Page 5-45	√	

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))	***Earthquake***, Section 5.3.1.3 Impact: Page 5-10 ***Flood*** Section 5.3.2.3 Intent: Page 5-23 to 5-25 ***Ground Failure***, Section 5.3.3.3 Impact: Page 5-29 ***Radon*** Section 5.3.4.3 Impact, Page 5-32 ***Severe Weather*** Section 5.3.5.3 Impact, Page 5-41 ***Wildland Fire***, Section 5.3.6.3 Impact, Page 5-45 **Vulnerability Analysis Overview** Chapter 6, Page 6-1 through Page 6-17	√	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	*Section 1.2.1 Page 1-4 Section 6.4 Page 6-16*	√	
ELEMENT B: REQUIRED REVISIONS			

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? (Requirement §201.6(c)(3))	Section 7.1, Page 7-2 Tables 7-1, 7-2, 7-3, Pages 7-2 through Page 7-4	√	
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))	Section 1.2.1 Page 1-3 Section 6.4.1.1, Page 6-16 Section 7.4, Page 7-6	√	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 7.3 Page 7-5 to 7-6 Table 7-5: Page 7-6 to 7-9	√	
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? (Requirement §201.6(c)(3)(ii))	Section 7-4, Page 7-5 Table 7-5, Page 7-5 through Page 7-9, Table 7-10	√	
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))	Section 7-5 Process, Page 7-9 Table 7-6, Page 7-10 to 7-11 Section 7.6 Mitigation Action Plan Tables 7-7 and 7-8 Page 7-11 to Page 7-23	√	
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? (Requirement §201.6(c)(4)(ii))	Section 7.6, Table 7-8: Section 7.7 Page 7-24	√	
ELEMENT C: REVISIONS:			

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 3.4 Table 3-4, Page 3-6 Section 6.8 Page 6-17	√	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 7 Mitigation Strategy Section 7.3 Goals refined Section 7.4 Previous action status reviewed Section 7.6 new MAP contains ongoing and new action for implementation	√	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 7.6 defines current MAP priorities	√	
ELEMENT D: REQUIRED REVISIONS			
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))	Section 4.1, Page 4-1	√	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	N/A		
ELEMENT E: REQUIRED REVISIONS Plan to be adopted following FEMA review			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT
A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

ELEMENT A. PLANNING PROCESS

Plan Strengths

- The plan includes a strong list of stakeholders invited to participate in the planning process and comment on the plan.

Opportunities for Improvement

- Consider listing the names of all members of City Council and the Tribal Council that participated in the planning process.
- Having a description of which of the added stakeholders actually participated from the list, and how they participated, would strengthen the plan.
- Similarly, consider including a description of how the public was involved instead of simply when the opportunity was given. Did any members of the public provide comments or feedback? If so, how were they incorporated?
- Consider using more active public participation efforts in the plan update.
- Consider including the Annual Review Questionnaires as an appendix to the HMP in the next five-year update.

ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Plan Strengths

- Table 5-1 provides a nice and brief snapshot of why hazards were selected for inclusion in the HMP.
- Scales for magnitude/severity and likelihood are well-defined and described.
- The 5.3.X.1: Nature sections very clearly delineate the range of types of hazards included in each categorization.
- Plan does a good job of incorporating climate change information and its projected impacts on hazards, where appropriate.

Opportunities for Improvement

- Elaboration on Table 5-1 as to why certain hazards were not included would strengthen the plan.
- In general, the discussion of the location of hazard events could be stronger. In lieu of quantitative data, future plan updates should include a qualitative description of where hazard events have occurred or are expected to occur in the future. Where a hazard impacts the entire community equally, the plan should state so in the hazard profiles themselves, not just in the Vulnerability Assessment section of the plan (as it currently does in the Severe Weather profile).
- Many maps were small and difficult to read. Golovin's location was not noted on all maps. Consider larger maps with the jurisdiction marked on each one for future plan updates. On the wildfire map, there was no indication on the legend what the color-coding of events meant.
- "Severe Weather" as a single hazard encompasses a great deal of different kinds of hazard events

that strike at very different times of the year, geographies, scales, and ranges of magnitude. Consider separating this hazard out in future plan updates.

- Almost all of the hazards are expected to impact 100% of the planning area when they occur. Consider incorporating some kind of ranking or rating for hazards to identify which are more pressing concerns to mitigate.

ELEMENT C. MITIGATION STRATEGY

Plan Strengths

- Plan provides a detailed list of potential funders for hazard mitigation activities, and the associated Appendix provides good baseline descriptions of funding sources that can be used as a starting point for identifying funds.

Opportunities for Improvement

- The discussion of the integration could be stronger. For example, include the update schedule for the Economic Development Plan and other mechanisms so it is clear when integration will occur in the future. Where are the current planning mechanisms aligned? Where are there gaps that integrating planning mechanisms would fill?

B. Resources for Implementing Your Approved Plan

The **Local Mitigation Plan Review Guide and Tool** resource is available through FEMA's Library and should be referred to for the next plan update.
http://www.fema.gov/library/viewRecord.do?id=4859

The **Local Mitigation Planning Handbook** is available. While the requirements under §201.6 have not changed, the *Handbook* provides guidance to local governments on developing or updating hazard mitigation plans to meet the requirements is available through the FEMA Library website. http://www.fema.gov/library/viewRecord.do?id=7209

The **Mitigation Ideas: A Resource for Reducing Risk from Natural Hazards** resource presents ideas for how to mitigate the impacts of different natural hazards, from drought and sea level rise, to severe winter weather and wildfire. The document also includes ideas for actions that communities can take to reduce risk to multiple hazards, such as incorporating a hazard risk assessment into the local development review process. http://www.fema.gov/library/viewRecord.do?id=6938

The **Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials** resource provides practical guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns. It includes recommended steps and tools to assist with local integration efforts, along with ideas for overcoming possible impediments, and presents a series of case studies to demonstrate successful integration in practice.
http://www.fema.gov/library/viewRecord.do?id=7130

The FEMA Region X Risk Mapping, Analysis, and Planning program (RiskMAP) releases a monthly newsletter that includes information about upcoming events and training opportunities, as well as hazard and risk related news from around the Region. Past newsletters can be viewed at http://www.starr-team.com/starr/RegionalWorkspaces/RegionX/Pages/default.aspx. If you would like to receive future, email rxnewsletter@starr-team.com.

The mitigation strategy includes projects that are eligible for FEMA's grant programs. Contact the State Hazard Mitigation Officer, Ann Gravier, at ann.gravier@alaska.gov for application information.

Appendix C

City and Village HMP Adoption Resolution

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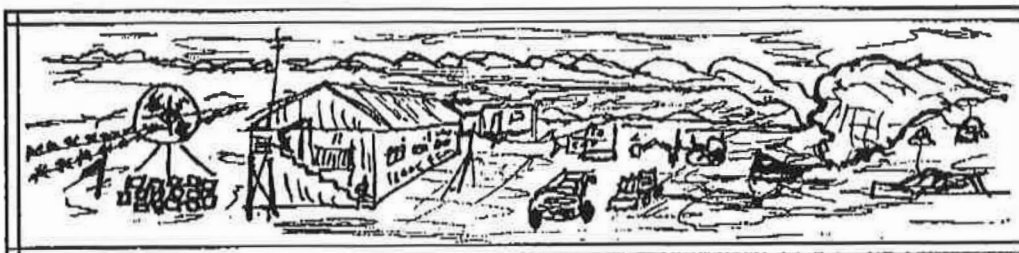

City of Golovin
P.O. Box 62059
Golovin, Alaska
99762
Ph: (907) 779-3211
or 779-3681

RESOLUTION #16-03

City of Golovin, State of Alaska, Hazard Mitigation Plan

WHEREAS the City of Golovin is vulnerable to damages from natural hazard events which pose a threat to public health and safety and could result in property loss and economic hardship;
WHEREAS a hazard mitigation Plan (HMP) was developed through the work of City of Golovin's planning Team, and interested parties within the planning area;
WHEREAS the Plan recommends hazard mitigation actions that will protect the people and property affected by natural hazards that face the City, that will reduce future public, private, community, and personal costs of disaster response and recovery; and that will reinforce City of Golovin's leadership in emergency preparedness efforts;
WHEREAS the DISASTER Mitigation ACT of 2000 (P.L. 106-390) (DMA 2000) and associated Federal regulations published under 44 CFR Part 201.6 require the City Council to formally adopt a Hazard Mitigation Plan subject to the approval of the Federal Emergency Management Agency to be eligible for federal hazard mitigation projects and activities funds;
WHEREAS the City held public meetings to receive Plan comment as required by DMA 2000;
NOW THEREFORE BE IT RESOLVED by the City Council that:

1. The Plan is hereby adopted as an official plan of the City.
2. The City's officials identified in the Planning Process (Section 3) and the Mitigation Action Plan (Section 7) are hereby directed to implement the recommended actions assigned to them. These officials will report quarterly on their activities, accomplishments, and progress to the City Council.
3. The City's Hazard Mitigation Planning Team will provide annual progress reports on the status of the implemented Mitigation Action Plan's projects to the Planning Team Leader. The Planning Team shall submit this report to the City Council annually by the Plan's adoption anniversary date.
4. The Planning Team will complete periodic updates of the Plan as indicated in the Plan Maintenance Section (Section 3), but no less frequently than every five years.
5. NOW THEREFORE, BE IT RESOLVED by City Council that the City of Golovin adopts the Hazard Mitigation Plan, dated October 20th, 2015 as this jurisdiction's Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 20th day of October, 2015 by the City Council.

Katherine Fagerstrom, Mayor

ATTEST: Virginia L. Olanna
Virginia L. Olanna, City Clerk

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Appendix D

Public Outreach Activities

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

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

New HMP Development

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

HMP Update Required

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

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

The Lake and Peninsula Borough, MJHMP

Organized Cities

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

Unorganized Communities

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

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

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

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

Kind Regards
-Scott-

R. Scott Simmons, CFM, CPM
AECOM + URS
700 G Street, Suite 500 | Anchorage, AK 99501
Ph: 907.261.9706 | 800.909.6787 | Personal Mobile: 841.1832 | Fax: 907.562.1297
eMail Address: 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.

From:	Simmons, Scott
To:	"Golovin_ak@hotmail.com"
Subject:	City of Golovin Hazard Mitigation Plan Update project
Date:	Friday, November 21, 2014 2:05:00 PM
Attachments:	image002.png GolovinDraftNewsletter11-14.pdf

Hello Mayor,

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

I have attached three planning guidance documents for your review. You will note that I highlighted various items for specific emphasis as they pertain to changes for either tribal or organized city (local) government HMP requirements.

AECOM+URS was contracted by the Division of Homeland Security and Emergency Management (DHS&EM) to develop a Hazard Mitigation Plan Update for 21 communities. The City of Golovin is one of 10 jurisdictions' selected to assist with updating their HMP.

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

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

AECOM+URS's role in this project is to ensure that the Updated HMP meets state and federal requirements -- part of this requirement is to describe the process in which the community was involved. We are at the beginning stages of this project. Your proactive initiative to have us meet with your Planning Commission is an awesome start.

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

Describe how the HMP has changed:

- New Planning Team membership and processes
- HMP update participation and plan reviewers,
- Identify new hazards not formerly addressed,
- Help us explain your hazard impacts since 2009,

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

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

AECOM+URS will provide two (2) newsletters. The first newsletter will introduce the project and explain the planning process, encourage public involvement; ask the community to identify known hazards, and to confirm their critical infrastructure as identified by DHS&EM's statewide small community Critical Facility Database. The second will introduce the updated draft HMP and encourage the community to review and provide comments to make the plan better or more usable to mitigate your hazards. I have attached the draft Newsletter for your review. Please write me back with the names of the team leader and current Team Membership 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 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 Commission to include on the first newsletter and the name of the Planning Team Leader(s) as appropriate.

I will forward a few other items such as a draft agenda and documents designed to address the various HMP update criteria.

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

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

CITY OF GOLOVIN HAZARD MITIGATION PLAN NEWSLETTER

Newsletter #1 **Insert Month/Year**

This newsletter describes the City of Golovin's Hazard Mitigation Planning project development processes to all interested agencies, stakeholders, and the public and to solicit comments. It can also be viewed on the State of Alaska Division of Homeland Security and Emergency Management Website at *http://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 Golovin was selected for participation in this effort.

AECOM was contracted to assist the community with preparing a FEMA approvable hazard mitigation plan and subsequent hazard mitigation grant program application during 2014 and 2015.

The Golovin Hazard Mitigation Plan will be updated to identify new natural hazard impacts from earthquake, flood, ground failure, radon, 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 HMP to receive a project grant from FEMA's pre- and post- disaster grants identified in their Hazard Mitigation Assistance programs and other agency's mitigation grant programs. The City of Golovin 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 FEMA compliant HMP. These requirements are commonly referred to as the Disaster Mitigation Act of 2000, or DMA2000 criteria. Information about the criteria and other applicable laws and regulations may be found at: http://www.fema.gov/mitigation-planning-laws-regulations-guidance.

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

- Plan development process
- Identify hazard changes specific to the community
- Identify the population's and structures' risks
- Define the jurisdiction's mitigation goals
- Determine the status of the community's mitigation strategy's selected and implemented projects
- Provide a copy of the community's HMP Adoption Resolution

FEMA has prepared a Local Planning Review Guide) and (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 and "Mitigation Planning Guidance) and "How to Guides" (available at: http://www.fema.gov/hazard-mitigation-planning-resources. The City's HMP update 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.

Golovin's legacy HMP has previously identified natural hazards that may have created more serious impacts to Golovin's residents.

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.

Bering Strait Hazard Worksheet		
Hazard	Bering Strait REAA*	City of Golovin
Earthquake	Yes	Yes
Flood	Yes (2L)	Yes
Ground Failure (Avalanche, Landslide, Permafrost)	Yes	Yes
Severe Weather	Yes (19L)	Yes
Tsunami & Seiche	No	No
Volcanic Ash	No	No
Wildland / Tundra Fire	Yes (3L)	Yes
Radon	No	Yes
*Hazard Matrix from the 2010 State of Alaska Hazard Mitigation Plan for the Bering Strait REAA. (Parentheses indicate threat level and number of historical events)		

DHS&EM identified critical facilities within the City of Golovin 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 Golovin. Please add additional facilities if needed.

Golovin's Critical Facilities*	
City Hall /Post Office	New Gravel Airstrip
City Hall /Post Office	Old Gravel Airstrip
VPSO Quarters	Airport maintenance shop
Golovin Fire Dept	City Shop
Emergency Operations Center & Shelter (Clinic)	Power Generation Facility
Martin L. Olson School	High School Generator
Elementary School	Elementary School Generator
Primary School	City Fuel Tank Farm
Golovin Clinic	Fuel tank farm
Church 1	Water Treatment Plant
Emergency Shelter (Clinic)	Washeteria
Chinik Store	Water tank 2
Olson Store	Water tank 3
Pro Elite Store	City of Golovin Water Tank
Community Hall	Landfill
Snowmachine Shop	Sewage Lagoon
Teachers Quarters	VPSO Quarters
Cemetery	Mukluk Telephone
* 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.

The Planning Team

The planning team is being led by Mayor Kathy Fagerstrom with assistance from Virginia Olana, Kathy Punguk, Agnes Moses, Dora Davis, Norma Lewis, and Marlene Capaotak. 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 Golovin Draft Hazard Mitigation Plan is complete, the results will be presented to the community before DHS&EM and FEMA approval and community adoption.

We encourage you to take an active part in preparing the City of Golovin'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 Golovin
Planning Team Leader
Virginia Olan, City Clerk
P.O. Box 62059
Golovin, AK 99762
Phone: 779.3211
eMail: Golovin_ak@hotmail.com

AECOM
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@aecom.com

Division of Homeland Security & Emergency Management
Scott Nelsen, State Support
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scott.nelsen@alaska.gov

Memorandum

700 G Street, Suite 500
Anchorage, AK 99501
Toll Free: 800.909.6787
Phone: 907.261.9709
Fax: 907.562.1297

SUBJECT: Division of Homeland Security and Emergency Management (DHS&EM) Hazard Mitigation Plan (HMP) – City of Golovin Kick-Off Team Meeting and HMP Work Session

Community: City of Golovin, Alaska, 907.779.3211

Date/Time: December 16, 2014

From: R. Scott Simmons

Attendees:

- DHS&EM: Scott Nelsen, Hazard Mitigation Plan Development
- URS: Scott Simmons, Meeting Lead

Community Members:

- Virginia Olana, Team Leader
- Kathy Punguk
- Agnes Moses
- Dora Davis
- Norma Lewis
- Marlene Capaotak

Future Participants

- Toby Anungazuk, Jr.
- Carol Oliver
- Donna Katchatag

- **Subjects covered included:**
  - URS was contracted to update the City's 2008 hazard mitigation plan by reviewing and annotating what has changed during the HMP's life cycle.
  - It is URS' responsibility to write the plan and take on the bulk of the work to guarantee FEMA compliance.
  - The URS and DHS&EM encouraged the team to take-on HMP data gathering – to spread the work among the team members reducing the workload on the Team Leader, and to have periodic meetings to check progress and to discuss continued needs.
  - Teams are far more successful than any individual as one idea can lead to several – increasing the success of the Team.
  - It is essential the Community Planning Team reviews the existing HMP to guide us through the update process. URS provided a draft worksheet to depict typical review areas identified by FEMA's HMP Review Tool. URs will review the plan and annotate where appropriate all required update requirements.
  - The following subjects were covered during the teleconference/work session:
    - The attendees readily agreed to provide up-to-date information for editing the existing plan
    - Virginia introduced her Planning Team and provided a brief overview of their hazard threats emphasizing that severe weather and devastating storm surge erosion are their greatest threats.
    - Attendees agreed to consolidate a few hazards for simplicity as well as remove a few that pose no substantial threat.

    Consolidate
      - Multi-Hazard (MH) 1: Group all outreach or educational initiatives
      - MH 2: Group all plan coordinating initiatives
      - MH 3: Group projects that reduce impacts from multiple hazard threats (such as a project that alleviates weather impacts resulting in flooding and erosion)

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- Flood: Storm surge, ice run-up, and scour (erosion)
- Ground Failure: permafrost, landslide, ground water erosion

Remove or no longer profile:

- Volcano: considered a very minor threat to Golovin that can be eliminated from the HMP
- Radon: is considered a very minor threat and can be removed from the HMP

New Hazards

- No new hazards identified

- The Planning Team discussed the need to review and refine their Critical Facilities Inventory for accuracy, facilities' physical locations (street addresses and GPS coordinates as available), estimated values, and estimated number of occupants to enable URS to complete an updated risk assessment and vulnerability analysis.
- The Capability Assessment Data Sheet lists community resources for implementing and administering projects

- The importance of public involvement during development and draft HMP review is a FEMA focus and essential for HMP compliance. There will be several opportunities for the public to participate, review progress, and the access the draft HMP prior to state and FEMA reviews.
- There will be two newsletters defining the HMP update initiative as well as its progress.

CITY OF GOLOVIN HAZARD MITIGATION PLAN (HMP)

June 2015 **Newsletter 2**

This newsletter discusses the preparation of the City of Golovin Hazard Mitigation Plan. It has been prepared to inform interested agencies, stakeholders, and the public about the project and to solicit comments. This newsletter 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*.

HMP Development

The City of Golovin was one of 21 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=fromsearch&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 December 2, 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 five hazards the HMP would address.

After the first public meeting, City and Tribal 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 Golovin.

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. In May, 2015, your HMP planning committee 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. A maintenance plan was also been developed for the hazard mitigation plan. 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.

The draft plan is available in the City office for public review and comment. Comments should be made via email, fax, or phone to Scott Simmons (listed below) and be received no later than July 14, 2015. The plan will be provided to DHS&EM and FEMA for their preliminary approval and returned to Golovin'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 Kathy Fagerstrom, with assistance from City Clerk Virginia Olana, the City and Tribal Councils, and AECOM.

Sample of the City of Golovin's Mitigation Actions. Review the draft HMP for a complete list.		
New: Identify and pursue funding opportunities to implement mitigation actions.	New: Integrate the Mitigation Plan's hazard vulnerability assessment findings for enhanced emergency planning.	New: 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).
New: The City will strive to manage their existing plans by coordinating and incorporating mitigation provisions with all community plan processes such as comprehensive, economic development, capital improvement, and land use, transportation plans etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.		*NOTE: The following projects or activities were brought forward from the legacy 2008 HMP:*
1A: Hold an annual or biennial "hazard meeting" to provide information to residents about recognizing and mitigating all natural hazards that affect the City of Golovin.	*3A, 6A, 7B, 9A, 11A: Support hazard mapping efforts of the City overlain with all critical facilities, infrastructure, and residential and non-residential buildings to facilitate locational siting. (High water flow flooding & scour, ground failure (landslide, rockslide, permafrost, wildfire)*	*2C, 3E, 3F: Relocate or elevate assets (roads, utilities, structures, etc.) that are at risk from natural hazard impacts. (high water flow, scour, utilities, old landfill, radon, wildfire, emergency evacuation.*
2A, 8A: Install a Community Siren System to alert the community of a natural hazard occurrence to enhance warning and response activities to increase warning time for the community.	*5B: Join the NFIP, which regulates development in floodplains and provides federally backed insurance to individuals who live in communities that have joined the program.*	*3D: Install high water flow scour control measures such as gabion baskets, riprap, sheet-piling, and/or geotextile fabric where needed, taking into consideration potential ice override event effects.*
1A, 10D: Develop, acquire, and/or purchase hazard brochures to educate community concerning HMP identified hazard's impacts, monitoring, and mitigation (earthquake, flood, radon, ground failure, winter storms, wildland fire)	*5A, 6A, 7B, 9A, 11B: Adopt an ordinance that prohibits new structures within historic hazard areas (flood, ice run-up, permafrost, landslide, zone.*	*4B, 8B, 9A: Encourage use of natural hazard resistant construction materials and practices for new and remodeled structures to resist impacts (Earthquake, flood, permafrost,)*

We encourage you to learn more about the City of Golovin'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:

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Appendix E

Benefit–Cost Analysis Fact Sheet

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Benefit-Cost Analysis Fact Sheet

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

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

All Benefit-Costs must be:

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

General Data Requirements:

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

Damage and Benefit Data

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

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

Building Data

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

Use Correct Occupancy Data

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

Questions to Be Answered

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

Common Shortcomings

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.
- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.
- Use of incorrect Project Useful Life (not every mitigation measure = 100 years).

Appendix F

Plan Maintenance Documents

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Annual Review Questionnaire

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

MITIGATION ACTION PROGRESS REPORT

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

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

Responsible Agency: _____

Address: _____

City: _____

Contact Person: **Title:**

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

_____ _____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

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

Anticipated completion date: _____

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

_____

_____

Milestones	Complete	Projected Completion Date

MITIGATION ACTION PROGRESS REPORT

Plan Goal(s) Addressed: _____

Goal: _____

Success Indicators: _____

Project Status

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

*** explain:** _____

- ☐ **Project canceled**

Project Cost Status

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

**** explain:** _____

Cost underrun***

***** explain:** _____

Summary of progress on project for this report:

A What was accomplished during this reporting period? _____

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

C. How was each problem resolved? _____

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

Other Comments: _____