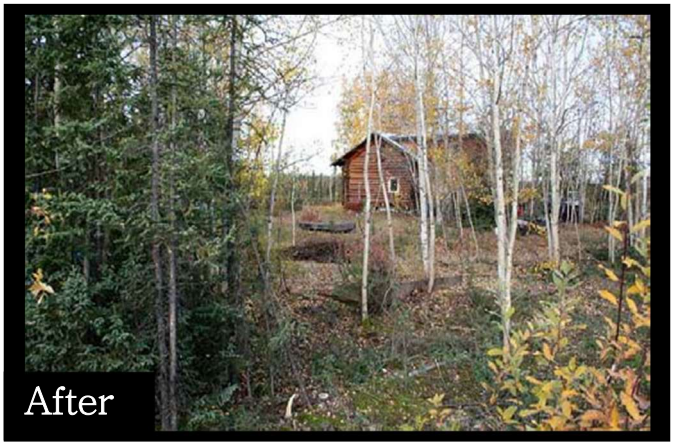
The Native Village of Evansville Hazard Mitigation Plan



Prepared by
The Native Village of Evansville Mitigation Planning Team

December 2017

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Acronyms/Abbreviations

°F	Degrees Fahrenheit
AFG	Assistance to Firefighters Grant
AICC	Alaska Interagency Coordination Center
ANA	Administration for Native Americans
ANTHC	Alaska Native Tribal Health Consortium
APA	American Planning Association
ARC	American Red Cross
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CD	compact disc
CDBG	Community Development Block Grant
CHEMS	Community Health and Emergency Medical Services
CFR	Code of Federal Regulations
DCCED	Department of Commerce, Community, and Economic Development
DCRA	Division of Community and Regional Affairs
DSS	Division of Senior Services
DEC	Department of Environmental Conservation
DGGS	Division of Geological and Geophysical Survey
DHHS/ADF	Department of Health and Human Services, Administration of Children & Families
DHSS	Department of Health and Social Services
DHS	United States Department of Homeland Security
DHS&EM	Division of Homeland Security and Emergency Management
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
EPA	Environmental Protection Agency

FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention and Safety
ft	feet
FY	Fiscal Year
g	gravity as a measure of peak ground acceleration
GIS	Geographic Information System
HAZUS	Hazard US
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUD	Housing and Urban Development
IBHS	Institute for Business and Home Safety
ICDBG	Indian Community Development Block Grant
IHBG	Indian Housing Block Grant
IHS	Indian Health Service
IRHA	Interior Regional Housing Authority
IRS	Internal Revenue Service
M	Magnitude
MM	Modified Mercalli
mph	miles per hour
NAHASDA	Native American Housing Assistance and Self Determination Act
NFIP	National Flood Insurance Program
PDM	Pre-Disaster Mitigation
PGA	peak ground acceleration
SAFER	Staffing for Adequate Fire and Emergency Response
SBA	US Small Business Administration
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, and Environmental
USACE	United States Army Corps of Engineers
USDA/RD	United States Department of Agriculture/Rural Development

US	United States
USC	United States Code
USGS	United States Geological Survey
Village Evansville	Native Village of Evansville or Evansville Native Village or
VOR	VHF Omnidirectional Range
VSW	Village Safe Water

1.0 Introduction

This section 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 HAZARD MITIGATION PLANNING

Hazard mitigation, as defined in Title 44 of the Code of Federal Regulations (CFR), Part 201.2, is "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." Many areas have expanded this definition to also include human-caused hazards. As such, hazard mitigation is any work done to minimize the impacts of any type of hazard event before it occurs. It aims to reduce losses from future disasters. Hazard mitigation is a process in which hazards are identified and profiled, people and facilities at risk are analyzed, and mitigation actions are developed. The implementation of the mitigation actions, which include long-term strategies that may include planning, policy changes, programs, projects, and other activities, is the end result of this process.

1.2 PLANNING REQUIREMENTS

1.2.1 Local Mitigation Plans

In recent years, local hazard mitigation planning has been driven by a 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 8 and are identified in their appropriate sections throughout this HMP.

FEMA's October 31, 2007 and July 2008 changes to 44 CFR Part 201 combined and expanded flood mitigation planning requirements with local hazard mitigation plans (44 CFR §201.7). 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 HMPs now qualify communities for several Federal Hazard Mitigation Assistance (HMA) grant programs.

1.3 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 HMP. Two of the grants are authorized under the

Stafford Act and DMA 2000, while the remaining one is authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act. As of June 19, 2008, the grant programs were segregated. The HMGP is a directly-funded competitive disaster grant program whereas the Unified Mitigation Assistance Programs (Pre-Disaster Mitigation [PDM] and FMA, although competitive) rely on specific grant pre-disaster grant funding sources, sharing several common elements.

> *"The Department of Homeland Security (DHS) FEMA Hazard Mitigation Assistance (HMA) grant programs present a critical opportunity to protect individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds. The HMA programs provide PDM grants annually to States, Territories, Tribes, and Local communities. The statutory origins of the programs differ, but all share the common goal of reducing the loss of life and property due to natural hazards.*
>
> *The PDM program is authorized by the Stafford Act and focuses on mitigation project and planning activities that address multiple natural hazards, although these activities may also address hazards caused by manmade events. The FMA program, Repetitive Flood Claim program, and Severe Repetitive Loss program are authorized by the National Flood Insurance Act, and focus on reducing claims against the NFIP."* (FEMA 2006e)

1.3.1 Hazard Mitigation Assistance (HMA) Unified Programs

The Hazard Mitigation Grant Program (HMGP) provides grants to States, Tribes, and Local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. FEMA may provide a State or Tribe with up to 20 percent of the total aggregate disaster damage costs to fund HMGP project or planning grants. The cost-share for this grant is 75% Federal/25% non-Federal.

The PDM grant program provides funds to State, Tribes, and Local entities, including universities, for hazard mitigation planning and mitigation project implementation prior to a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The total amount of PDM funding available is appropriated by Congress on an annual basis. In Fiscal Year (FY) 2016, PDM program funding totaled approximately $90 million. The cost-share for this grant is 75% Federal/25% non-Federal.

The goal of the FMA grant program is to reduce or eliminate flood insurance claims under the NFIP. Particular emphasis for this program is placed on mitigating repetitive loss properties. The primary source of funding for this program is the National Flood Insurance Fund. Grant funding is available for three types of grants, including Planning, Project, and Technical Assistance. Project grants, which use the majority of the program's total funding, are awarded to States, Tribes, and Local entities to apply mitigation measures to reduce flood losses to properties insured under the NFIP. In FY 2016, FMA funding totaled $199 million. The cost-share for this grant is 75% Federal/25% non-Federal.

1.4 HMP DESCRIPTION

The remainder of this HMP consists of the following sections and appendices:

Prerequisites

Section 2 addresses the prerequisites of plan adoption, which include adoption by the Native Village of Evansville (Village). The adoption resolution is included in Appendix B.

Community Description

Section 3 provides a general history and background of the Village, including historical trends for population and the demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed. A location figure of the area is included.

Planning Process

Section 4 describes the planning process and identifies the Planning Team Members, the meetings held as part of the planning process, and the key stakeholders within the Village and the surrounding area. In addition, this section documents public outreach activities (Appendix C) and the review and incorporation of relevant plans, reports, and other appropriate information.

Hazard Analysis

Section 5 describes the process through which the Planning Team identified, screened, and selected the hazards to be profiled in this update of the HMP. The hazard analysis includes the nature, history, location, extent, impact, and probability of future events for each hazard. In addition, historical and hazard location figures are included.

Vulnerability Analysis

Section 6 identifies potentially vulnerable assets—people, residential and nonresidential buildings, critical facilities, and critical infrastructure—in the Native Village of Evansville. The resulting information identifies the full range of hazards that the Native Village of Evansville could face and potential social impacts, damages, and economic losses.

Mitigation Strategy

Section 7 defines the mitigation strategy which provides a blueprint for reducing the potential losses identified in the vulnerability analysis. The Planning Team developed a list of mitigation goals and potential actions to address the risks facing the Native Village of Evansville.

Mitigation actions include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

Plan Maintenance

Section 8 describes the Planning Team's formal plan maintenance process to ensure that the HMP remains an active and applicable document. The process includes monitoring, evaluating (Appendix E), and updating the HMP; implementation through existing planning mechanisms; and continued public involvement.

References

Section 9 lists the reference materials used to prepare this HMP.

Appendix A

Appendix A provides the FEMA review tool, which documents compliance with FEMA criteria.

Appendix B

Appendix B provides the adoption resolution for the Native Village of Evansville.

Appendix C

Appendix C provides public outreach information, including newsletters, meeting sign-ins, and trip reports.

Appendix D

Appendix D contains the Benefit-Cost Analysis Fact Sheet used to prioritize mitigation actions.

Appendix E

Appendix E provides the plan maintenance documents, such as an annual review sheet and the progress report form as well as a community natural hazard survey.

2.0 Prerequisites

2.1 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: PREREQUISITES

Local Plan Adoption

Requirement §201.7: The local hazard mitigation 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., Village Council, Commissioner, Tribal Council).

Element

- Has the local governing body adopted the new or updated plan?
- Is supporting documentation, such as a resolution, included?

The Native Village of Evansville is the local jurisdiction represented in this HMP and meets the requirements of Section 409 of the Stafford Act and Section 322 of DMA 2000. The Evansville Native Village will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002 and will amend this HMP whenever necessary to reflect changes in Tribal or Federal laws and statutes.

The local governing body of the Native Village of Evansville adopted the HMP by resolution on Insert Date. A scanned copy of the resolution is included in Appendix B.

3.0 Community Description

This section describes the location, geography, and history; demographics; and land use development trends of the Native Village of Evansville.

3.1 LOCATION, GEOGRAPHY, AND HISTORY

Evansville is an unincorporated native village located within an Unorganized Borough. The Village is co-located and virtually surrounds the City of Bettles about 180 air miles and 250 road miles northwest of Fairbanks, adjacent to Bettles. Evansville lies at approximately 66.924910 north latitude and -151.506100 west longitude (Sec. 08, T024N, R018W Fairbanks meridian.). Evansville is located in the Yukon-Koyukuk recording district (Division of Community and Regional Affairs [DCRA] 2017).

The Native Village of Evansville covers approximately 1.6 square miles of land. Extreme temperature changes occur throughout Alaska's interior. The Native Village of Evansville's temperatures range from a winter low of -40 degrees Fahrenheit (ºF) to above 80ºF during the summer. The area receives approximately 14.2" of rain and 83" of snow annually.

The Koyukon Athabascan, Kobuk, Selawik, and Nunamiut Eskimos inhabited the area as nomadic tribes following game and fish food sources to support their subsistence lifestyle.

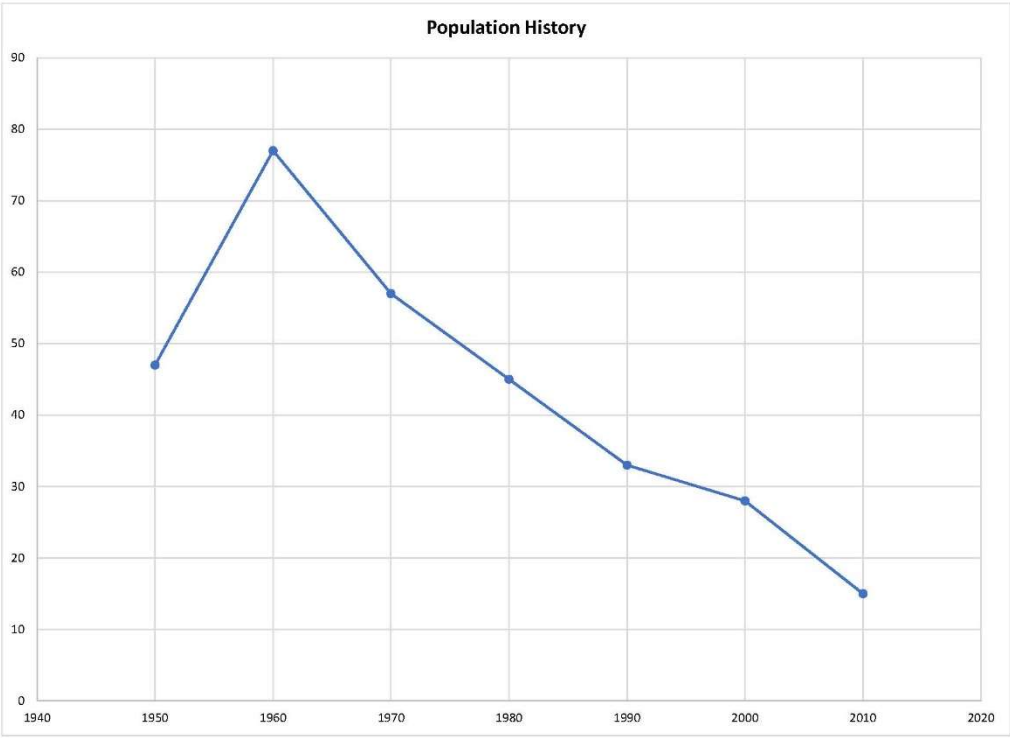
- "Old Bettles" was originally a trading post located six miles from its present location.
- The Koyukuk River barge line and the United States (U.S.) Post Office used the Old Bettles Trading Post for their respective operations.
- Bettles Field was constructed in 1945 by a US Navy contractor. The airfield opened work opportunities along with James Anderson building the Bettles Lodge, contracting Wilfred Evans, Sr. and others to do the construction. A general store was opened by Fred Pitts and a sawmill was opened by Wilfred Evans, Sr.
- A post office was opened in 1950 (located in the Bettles Lodge).
- The school was built in 1956 (no longer open).

- The health clinic opened in 1980.

3.2 DEMOGRAPHICS

The 2010 U.S. census recorded 15 residents, of which the median age was 52 years. Evansville is a blended Athabascans and Inupiat Eskimos village, and 53% of residents recognize themselves as Native. The male and female composition is approximately 60 and 40%, respectively. The 2010 census revealed that there are 12 occupied households with the average household having approximately 2 individuals. The most recent 2016 Department of Labor estimated population is 10. Figure 1 illustrates the historic population of the Evansville Native Village.

Figure 1-Evansville Historical Population



3.3 ECONOMY

The Native Village of Evansville has a unique employment record as they can claim that 100% of the heads of household are employed. Most hold fulltime employment with the Federal Aviation Administration (FAA), National Park Service, City of Bettles or Evansville Tribal government, the general store, and lodging facilities. Summers bring part-time work opportunities from tourism such as hunting, fishing, and recreational guiding and increased staff requirements from the other employers. Trapping, crafts, construction projects, and Bureau of Land Management (BLM) firefighting also supplement income.

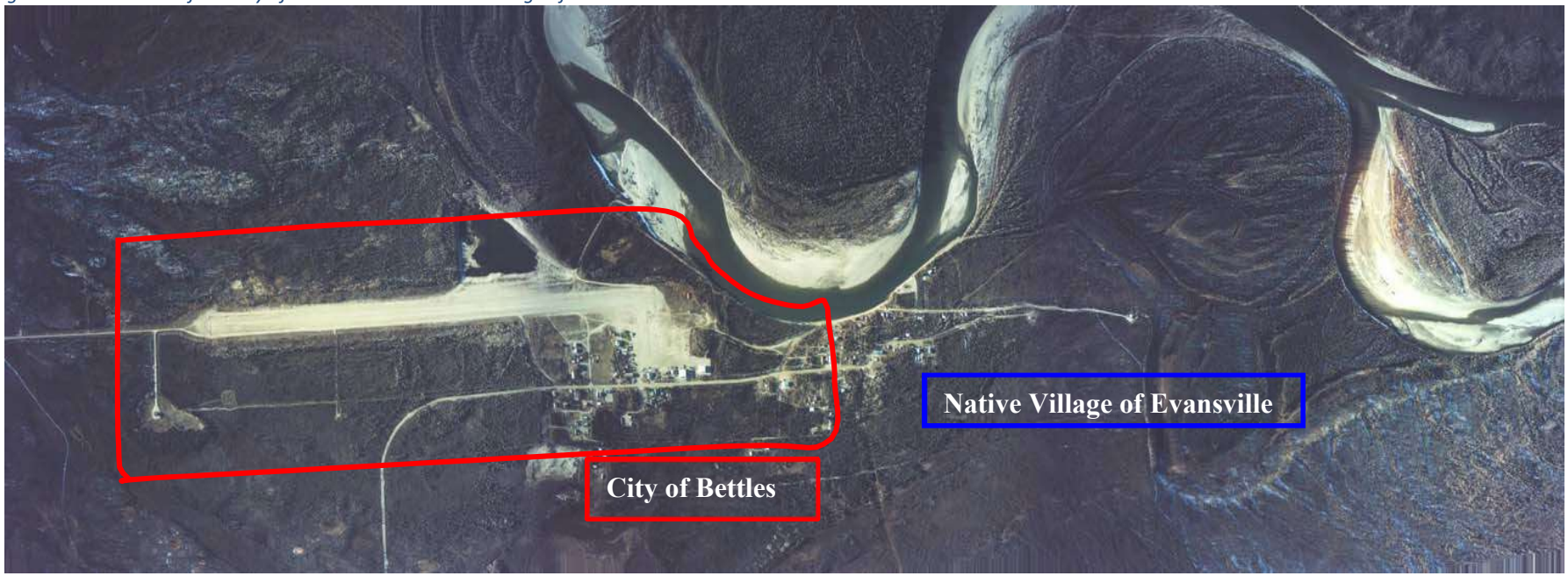
The community has road access during the winter months, allowing the community to supplement their subsistence foods with foods, goods, and materials. Road access greatly reduces food expenses for residents. The native population primarily rely on summer subsistence that consists of harvesting salmon, whitefish, moose, caribou, sheep, bear, small

game, and berries.

According to the 2010-2014 ACS 5-Year Estimate, the median household income in Evansville was $28,914. It was determined that no residents of Evansville live below the poverty level. According to the 2010-2014 ACS 5-Year Estimate, the unemployment rate was 0%.

Figure 2 is an aerial photo of the City of Bettles and the Native Village of Evansville provided by the U.S. Army Corps of Engineers (USACE) from their 2009 Alaska Baseline Erosion Assessment showing the close proximity of these two communities and locations adjacent to the Koyukuk River. The white areas adjacent to the river embankment are soil deposition and historic channel locations. The red line indicates the approximate extent of the City of Bettles. The land surrounding the City belongs mostly to the Native Village of Evansville.

Figure 2-Aerial Photo of the City of Bettles and the Native Village of Evansville



4.0 Planning Process

This section 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. Additional information regarding the Planning Team and public outreach efforts is provided in Appendix C.

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

DMA 2000 Requirements: Planning Process

Local Planning Process

Requirement §201.7: 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

- An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- 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
- Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.7: [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.

Element

- Does the plan provide a narrative description of the process followed to prepare the new or updated plan?
- Does the new or updated plan indicate who was involved in the planning process?
- Does the new or updated plan indicate how the public was involved?
- Does the new or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- 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?

4.1 OVERVIEW OF PLANNING PROCESS

The Village of Evansville developed this HMP Update with assistance from the State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM).

Updates to this plan include:

1. A review of the local hazards facing the Village of Evansville.
2. An examination of the progress towards minimizing or eliminating those hazards from the 2010 HMP.
3. A reevaluation of the community's vulnerability to local hazards.

4 Revised community demographic and economic information.

5 An update on mitigation goals and projects set in 2010.

6 New mitigation goals and projects.

The first step in the planning process began with a Planning Team kickoff meeting on November 14, 2017. During this meeting, the Planning Team made a decision on the hazards that need to be profiled for Evansville in 2017. Mitigation goals and projects from the 2010 plan were updated, and new mitigation goals and projects were determined. A draft of the HMP Update was written and reviewed by the Planning Team and residents. During a joint City of Bettles and Native Village of Evansville community meeting on December 18, 2017, community input was received, and final revisions were made to the plan.

In summary, the following five-step process was utilized in the HMP updating:

1. Organize resources: Members of the Planning Team identified resources, including staff, agencies, and local community members, who could provide technical expertise needed in the development of the HMP update.
2. Assess risks: The Planning Team reviewed the hazards specific to Evansville. The Planning Team updated the associated risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy update.
3. 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.
4. Update the mitigation strategy: After reviewing the risks posed by each hazard, the Planning Team reviewed the existing mitigation goals, objectives, and actions. Subsequently, the Planning Team identified completed objectives and prioritized future projects.
5. Monitor progress: The Planning Team reviewed the implementation process to ensure the success of an ongoing program to minimize hazard impacts to Evansville.

4.2 HAZARD MITIGATION PLANNING TEAM

The Planning Team consisted of First Chief Frank Thompson and Tribal Administrator Naomi Costello. The State of Alaska, Division of Homeland Security and Emergency Management (DHS&EM) provided funding and project oversight. LeMay Engineering & Consulting, Inc., DHS&EM's contractor, provided assistance to the Planning Team. Table 1 identifies the Planning Team.

Table 1-Hazard Mitigation Planning Team

Name	Title	Organization	Phone
Frank Thompson	First Chief	Evansville Tribal Council	692.5005
Naomi Costello	Tribal Administrator	Evansville Tribal Council	692.5005
Jennifer LeMay, PE, PMP	Planner/Consultant	LeMay Engineering & Consulting, Inc.	350.6061
Patrick LeMay, PE	Planner/Consultant	LeMay Engineering & Consulting, Inc.	250.9038
Janina Broek, EIT	Planner/Consultant	LeMay Engineering & Consulting, Inc.	350.6061
Brent Nichols, CFM	State Hazard Mitigation Officer	DHS&EM	428.7085

4.3 PUBLIC INVOLVEMENT AND OPPORTUNITIES FOR INTERESTED PARTIES TO PARTICIPATE

First Chief Frank Thompson issued an invitation to Stakeholders, the public, and surrounding communities via two project newsletters describing the planning update process and announcing the public meetings and availability of the Draft HMP Update for review. The public consists of the 10 residents of Evansville and the 10 residents of nearby Bettles. The Village posted the first project newsletter announcing the November 14, 2017 meeting. Alaska Power and Telephone and the Tanana Chiefs Conference were in attendance in addition to the Evansville Tribal Council. Following this initial meeting, the Planning Team posted the second project newsletter at visible locations in Evansville. This newsletter announced the availability of the Draft HMP Update and encouraged community members to review the plan and provide comments via phone or email to Jennifer LeMay, PE, or by bringing comments to the December 18, 2017 joint City of Bettles and Native Village of Evansville community meeting. No comments or input were received at the December 18 meeting.

The Planning Team held a public meeting on November 14, 2017. During the meeting, Patrick LeMay, PE, led the attending public through a hazard identification update and screening exercise. The attendees confirmed the hazards identified in development of the 2010 HMP: flood, wildland fire, earthquake, permafrost, severe weather, erosion, and landslide as hazards which periodically impact the Village. After discussion, climate change was added to the 2017 HMP Update.

LeMay Engineering & Consulting, Inc. described the specific information needed from the Planning Team and public to update the risk assessment. An updated risk assessment was completed that illustrated the assets that are exposed and vulnerable to specific hazards. Mitigation actions were also reviewed, and new ones were added.

This HMP will also be stored on the State Department of Commerce, Community, and Economic Development Community and Regional Affairs (DCCED/DCRA) plans website for public reference, https://www.commerce.alaska.gov/web/dcra/PlanningLandManagement/CommunityPlansAndInfrastructure.aspx after plan approval and adoption.

Appendix C contains all public involvement documentation.

4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the HMP Update. The following were reviewed and used as references for the jurisdiction information and hazard profiles in the risk assessment of the HMP for the Village of Evansville:

- *The Native Village of Evansville Hazard Mitigation Plan*, March 2010
- *US Army Corps of Engineers, Alaska Baseline Erosion Assessment, Erosion Information Paper – Evansville, Alaska.* December 14, 2009, provided erosion hazard data.
- *State of Alaska, Department of Commerce, Community and Economic Development Community Profile (DCCEDC), provided community resource and demographic information*
  .
- *Alaska Interagency Community Wildfire Protection Plan Guide: Bettles/Evansville*, June 2006

A complete list of references consulted is provided in Section 9.

5.0 Hazard Profiles

This section identifies and profiles the hazards that could affect the Village.

5.1 OVERVIEW OF A HAZARD ANALYSIS

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

Hazard profiling is accomplished by describing hazards in terms of their nature, history, magnitude, frequency, location, extent, and probability. Hazards are identified through historical and anecdotal information, existing plans, studies, and hazard map collection and review for the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

5.2 HAZARD IDENTIFICATION AND SCREENING

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

DMA 2000 Requirements: Risk Assessment: Identifying Hazards

Identifying Hazards

Requirement §201.7: [The risk assessment shall include a] description of the type of all-natural hazards that can affect the jurisdiction.

Element

- Does the new or updated plan include a description of the types of all-natural hazards that affect the jurisdiction?

Source: FEMA, July 2008.

For the first step of the hazard analysis, the Planning Team identified 11 possible hazards that could affect the Evansville Native Village. They then evaluated and screened the comprehensive list of potential hazards based on a range of factors, including prior knowledge or perception of the relative risk presented by each hazard, the ability to mitigate the hazard, and the known or expected availability of information on the hazard (see Table 2). The Planning Team determined that eight hazards pose the greatest threat to the Village: earthquake, erosion, flood, landslide, permafrost, severe weather, wildland fire, and climate change. The remaining hazards excluded through the screening process were considered to pose a lower threat to life and property in the Village due to the low likelihood of occurrence or the low probability that life and property would be significantly affected.

Table 2-Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	Explanation
Avalanche	No	This hazard does not exist for the Village.
Earthquake	Yes	Periodic, unpredictable occurrences.
Erosion	Yes	Damages occur during high water and ice jam scouring events.
Flood	Yes	Snowmelt and ice jam flooding occurs during spring thaw (break-up). Fall flooding events occur from soil saturation. Two homes were impacted during the 1994 flood.
Landslide	Yes	The downriver fallout area (Winter Trail) could potentially block the river. Significant landslides have occurred on the Winter Trail in the burn area. Part of the trail has been relocated. The Winter Trail is used as an ice road in the winter to bring fuel and supplies in the community.
Permafrost	Yes	Permafrost is present throughout Alaska.
Tsunami & Seiche	No	This hazard does not exist for the Village.
Volcano	No	This hazard does not exist for the Village.
Weather	Yes	Annual weather patterns, severe cold, freezing rain, and snow accumulations are predominant threats. The snowfall amount directly determines winter weather damages. Less snow causes frost line to deepen, resulting in frozen water and sewer pipes. More snow provides better ground insulation. Severe cold usually occurs during December-January. High winds typically occur from February-March and August-September. August experiences the most rain. Too much rain causes wild game to move to more distant dry ground away from the Village increasing resident travel to harvest subsistence foods. Heavy rain and spring thaw causes high river water which reduces the Village's residents' capability to harvest King salmon for subsistence needs.
Wildland Fires	Yes	Historic wildfire occurrences during summer dry season (April- October).
Climate Change	Yes	Climate change has the potential to aggravate natural disasters along the coastline and rivers, particularly flooding and erosion. Warmer winter temperatures have allowed for faster growth of aspen trees, which fuel wildland fires. The First Chief stated in 2017 that the last 10 years have had warmer winters, less snowfall, and increased aspen trees.

5.3 HAZARD PROFILE

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

DMA 2000 Requirements: Risk Assessment – Profiling Hazards

Profiling Hazards

Requirement §201.7: [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.

Element

- Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?
- Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
- Does the plan provide information on previous occurrences of each hazard addressed in the new or updated plan?
- Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

Source: FEMA, July 2008.

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

- Nature
- History
- Location
- Extent (to include magnitude and severity)
- Impact (general impacts associated with each hazard are described in the following profiles – detailed impacts to Evansville Native Village residents and critical facilities are further described in Section 6 as part of the overall vulnerability summary for each hazard)
- Probability of future events

Each hazard is assigned a rating based on the following criteria for probability (Table 3) and magnitude/severity (Table 4).

Table 3-Hazard 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%). History of events is greater than 33% likely per year. Event is "Highly Likely" to occur.
3–Likely	Event is probable within the next 3 years. Event has up to 1 in 3 years chance of occurring (1/3=33%). History of events is greater than 20% but less than or equal to 33% likely per year. Event is "Likely" to occur.
2–Possible	Event is probable within the next 5 years. Event has up to 1 in 5 years chance of occurring (1/5=20%). History of events is greater than 10% but less than or equal to 20% likely per year. Event could "Possibly" occur.
1–Unlikely	Event is possible within the next 10 years. Event has up to 1 in 10 years chance of occurring (1/10=10%). History of events is less than or equal to 10% likely per year. Event is "Unlikely" but is possible of occurring.

Probability is determined based on historic events, using the criteria identified above, to provide the likelihood of a future event.

Table 4-Hazard Magnitude/Severity Criteria

Magnitude / Severity	Criteria
4-Catastrophic	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% 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% 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% 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

Similar to estimating probability, magnitude and severity are determined based on historic events using the criteria identified above.

The hazards profiled for the Evansville Native Village are presented in the rest of Section 5.3. The order of presentation does not signify the level of importance or risk.

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 and 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), 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 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, 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 US to measure intensity is the Modified Mercalli (MM) Intensity Scale. As shown in Table 5, the MM Intensity 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) (see Table 5) (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).

Table 5-Magnitude/Intensity/Ground-Shaking Comparisons

Magnitude	Intensity	PGA (% *g*)	Perceived Shaking
0 – 4.3	I	<0.17	Not Felt
	II-III	0.17 – 1.4	Weak
4.3 – 4.8	IV	1.4 – 3.9	Light
	V	3.9 – 9.2	Moderate
4.8 – 6.2	VI	9.2 – 18	Strong
	VII	18 – 34	Very Strong
6.2 – 7.3	VIII	34 – 65	Severe
	IX	65 – 124	Violent
	X	124 +	Extreme
7.3 – 8.9	XI		
	XII		

(MMI 2006)

5.3.1.2 History

The Village has no history of damaging earthquakes. Table 5 lists historical earthquakes from 1971 to 2017 which exceeded M 5.0 located within 100 miles of the Village.

Table 6-Historical Earthquakes for the Native Village of Evansville

Cat	Year	Mo	Day	Orig Time	Lat	Long	Depth (Miles)	Magnitude	Distance (Miles)
PDE	1985	03	09	140804.38	66.24	-150.03	6.8	6.0 MLPMR	62

PDE	1985	03	09	141625.49	66.29	-150.12	6.2	5.4 MLPMR	57
PDE	1985	03	10	133029.53	66.14	-150.15	6.2	5.6 MLPMR	65
PDE	1985	03	16	133310.61	66.18	-150.05	6.2	5.0 MLPMR	65
PDE	1986	06	04	154820.80	65.64	-152.60	6.2	5.7 MLPMR	94
PDE	1986	06	24	204602.76	66.13	-149.64	6.2	5.2 MLPMR	75

United States Geological Survey (USGS) 2017

Since 1977, 1749 earthquakes have been recorded within a 100-mile radius of the Village. The average magnitude of these earthquakes is M 1.8. The largest recorded earthquake within 100 miles of the Evansville Native Village measured M 6.0 on March 9, 1985, and caused no damage to critical facilities, residences, non-residential buildings, or infrastructure. Since 1957, there have only been four earthquakes greater than M 2.5 within 50 kilometers of Evansville; the largest of these only measured M 3.1. The Village determined they need not be concerned with earthquake impacts with magnitudes below M 5.0 based on this information. As of November 11, 2017, there has not been an earthquake in the Evansville, Alaska Region greater than 5.0 M since 1986.

North America's strongest recorded earthquake occurred on March 27, 1964 in Prince William Sound, measuring M 9.2 and was felt by many residents throughout Alaska. The Evansville Native Village residents felt ground motion resulting from this historic event; however, no local damage occurred.

5.3.1.3 Location, Extent, Impact, and Probability of Future Events

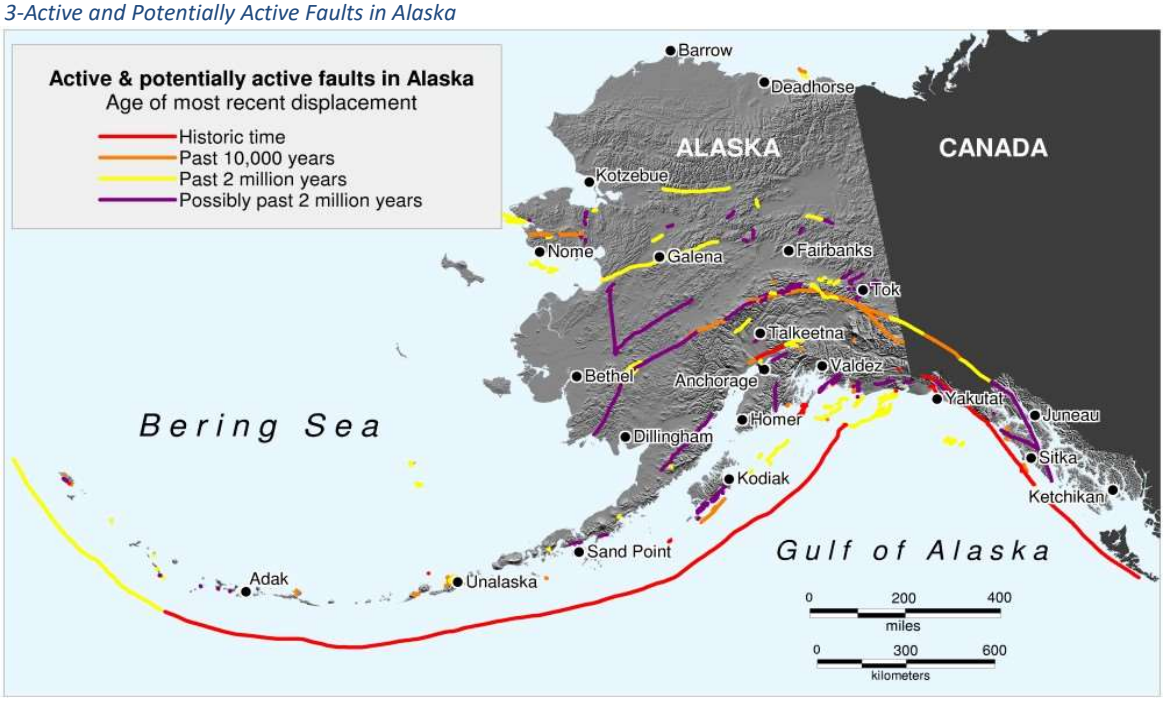
Location

The entire geographic area of Alaska, including the Native Village of Evansville, is prone to the effects of an earthquake. The Kaltag Fault follows the Yukon River and is relatively centered on the Koyukuk/Yukon River confluence. The Kobuk Fault Zone comprises a fault system of smaller faults; located north of Alatna Village running east to west along the border of the Brooks Range (GSA 1998).

Of the 1,749 recorded earthquakes since 1977, six exceeded M 6.0. The largest recorded event occurred on March 9, 1985, and measured M 6.0 at a depth of 6.8 miles. The epicenter was located approximately 62 miles from the Native Village of Evansville (USGS 2009).

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

Figure 3-Active and Potentially Active Faults in Alaska



Extent

The Kaltag and Kobuk fault zones produce intraplate 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 intraplate earthquakes (GSA 1998).

Earthquakes felt in the Native Village of Evansville area have not exceeded M6.0 in the past 40 years, and damage has never been reported due to an earthquake event.

Based on historic earthquake events and the criteria identified in Table 5-3, the magnitude and severity of earthquake impacts in the Evansville Native Village are considered negligible with minor injuries, the 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

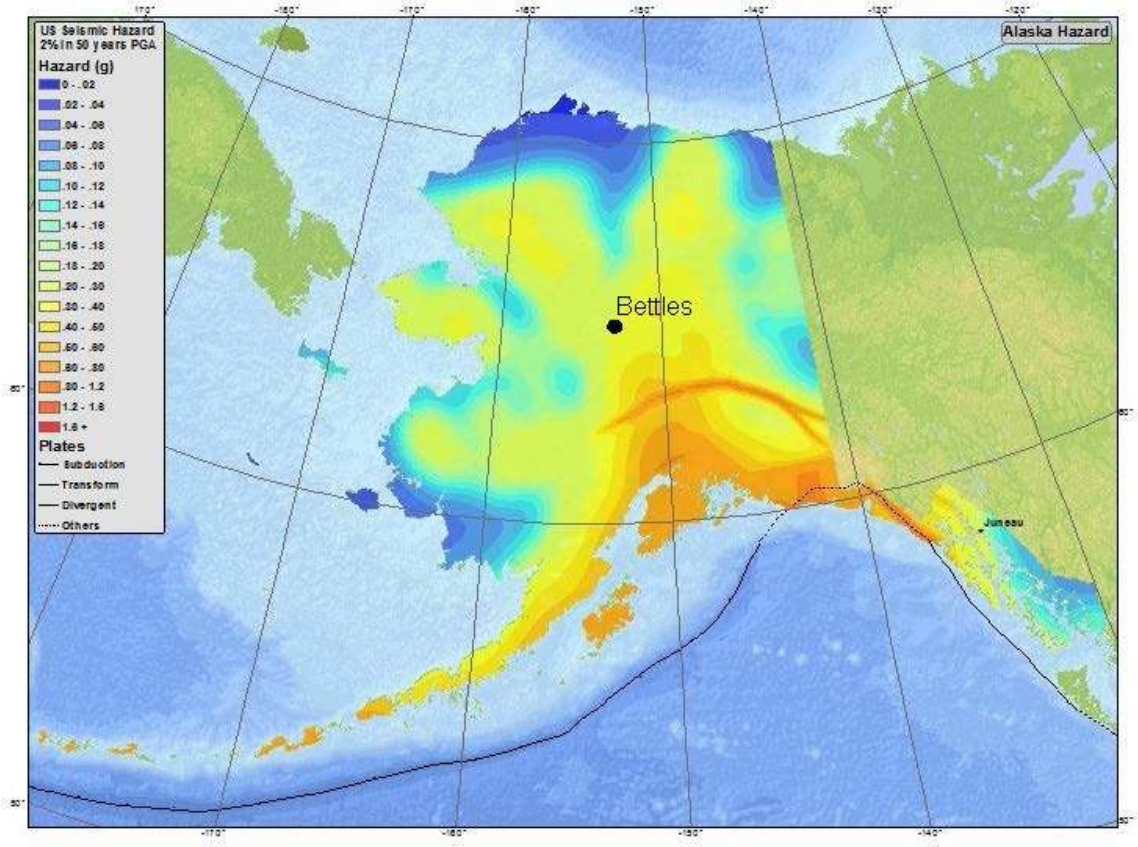
Evansville Native Village is located in an area that is less active than others in the State, although the effects of earthquakes centered elsewhere are expected to be felt in Evansville Native Village. Impacts to the community such as significant ground movement that may result in infrastructure damage 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.

Probability of Future Events

Evansville Native Village 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 4 was generated using the U.S. Geological Survey (USGS) Earthquake Mapping model and indicates Evansville has a two percent probability of ground acceleration between 0.30g and 0.40g in 50 years. Long-term climate change could be responsible for moving the Earth's tectonic plates, thus increasing earthquake activity.

Figure 4-Evansville Earthquake Probability (USGS 2017)



5.3.2 Erosion

5.3.3.1 Nature

Erosion rarely causes death or injury. However, erosion causes the destruction of property, development, and infrastructure. Erosion is the wearing away, transportation, and movement of land. It is usually gradual but can occur rapidly as the result of floods, storms, and other events;
or, slowly as the result of long-term environmental changes. Erosion is a natural process, but its effects can be exacerbated by human activity.

Riverine erosion is a problem in developed areas where disappearing land threatens development and infrastructure. Riverine erosion results from the force of flowing water and ice formations in and adjacent to river channels. This erosion affects the bed and banks of the channel and can alter or preclude any channel navigation or riverbank development. In less stable braided channel reaches, erosion and deposition of material are a constant issue. In more stable meandering channels, episodes of erosion may only occur occasionally.

5.3.3.2 History

The Village Planning Team stated, "Acute erosion and flash flooding damaged public infrastructures, fuel tank farms, private property, dikes and bridge abutment revetments." However, the USACE Baseline Erosion Assessment, Evansville Erosion Information Paper declared that Evansville has no defined historical data. Naomi Costello, Tribal Administrator stated that "erosion rates vary during storm events. One event could take 40 ft and the next event could have minimal loss." She further stated the community experiences an average embankment loss of approximately ten feet per year.

In 2000, the Bureau of Indian Affairs (BIA) funded a $500,000 erosion repair project to repair the Village's erosion-damaged embankment. Additionally, in 2006, the Village participated in a USDA Natural Resources Conservation Program funding $351,000 for a voluntary acquisition/ demolition program with the Village providing a 10% match for total cost of the program with reclamation as a natural area. This requirement prevents others from building in the erosion hazard area.

5.3.3.3 Location, Extent, Impact, and Probability of Future Events

Location

Riverine erosion hazards are known to affect the Native Village of Evansville. The Village states that their Koyukuk river embankment is quite high, approximately 15-20 feet above the normal water height yet "natural river flow, heavy rains, flooding, ice jams, spring break-up, and melting permafrost contribute to erosion." (USACE 2009b).

Riverine erosion impact has slowly persisted over the years but does not directly impact the Village's infrastructure. Factors that influence erosion includes flooding, spring break-up, and melting permafrost. The riverbanks adjacent to the Village are essential to the lives of the residents.

Figure 5 is a cropped portion of an aerial photo provided by USACE from their 2009 Alaska Baseline Erosion Assessment of the Native Village of Evansville showing its location adjacent to the Koyukuk River. The white areas adjacent to the river embankment are soil deposition and historical river channel locations.

The white material adjacent to the river is where the river channel used to be located. It also contains material deposition from prior flood and erosion events. This photo shows how much embankment has been lost from erosion over time.

Extent

A variety of natural and human-induced factors influence the erosion process within the community. River orientation and proximity to up and downstream river bends can influence erosion rates. Embankment composition also influences erosion rates, as sand and silt will erode easily, whereas boulders or large rocks are more erosion resistant. Other factors that may influence riverine erosion include:

- Geomorphology

- Amount of encroachment in the high hazard zone
- Proximity to erosion inducing structures
- Nature of the topography
- Density of development
- Structure types along the embankment
- Embankment elevation

Figure 5-Aerial Photo of the Native Village of Evansville

The Village Planning Team stated that erosion land loss averages about one foot per year over the past 20-30 years. Erosion in Evansville Native Village usually removes small areas at a time. Significant events can cause infrastructure and homes to fall into the river. Erosion sites have also been noted to be within 50 feet from important structures and critical facilities, including houses, sheds, fuel tanks, food storage, roads, and power generators. The clinics, and other public buildings, are within 500 feet of the river bank.

The USACE *Alaska Baseline Erosion Assessment* for the Native Village of Evansville gave a "Monitor Conditions" classification to the Village's erosion threat. *"The community ... has reported significant impact related to erosion but the impacts are not likely to affect the viability of the community. The erosion issue may warrant Federal, State, or other intervention. The USACE categorized Evansville as "A Monitor Conditions Community" a community that should be watched to determine their entire erosion threat. Taking action in a Monitor Conditions Community to prevent a problem from becoming worse would be*

prudent." (USACE 2009a)

Based on past events, the 2009 *USACE Alaska Erosion Assessment*, and the criteria identified in Table 3, the magnitude and severity of erosion impacts in the Evansville Native Village are considered limited with injuries that do not result in permanent disability, the potential for critical facilities to be shut down for more than one week, and more than 10% of property or critical infrastructure being severely damaged.

Impact

Impacts from erosion include loss of land and any development on that land. Erosion can cause increased sedimentation of river deltas and hinder channel navigation—affecting marine transport. Other impacts include reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (fuel headers and electric and water/wastewater utilities), and economic impacts associated with costs trying to prevent or control erosion sites.

Damage from coastal erosion is not usually something that happens immediately; rather it happens slowly over time. Significant events however, can cause infrastructure, critical facilities, residences, and other buildings to succumb to the sea or otherwise be destroyed.

> *"River bank erosion is threatening five homes estimated to be less than 50 feet from the bank. Other structures and facilities estimated to be less than 100 feet from the eroding bank include the power plant, three fuel tanks, outbuildings/sheds, and smoke houses. The fuel tanks are 185 feet from east of the current eroding cut bank located behind the power plant's generator. The clinic and the Evansville Tribal Council Office are estimated to be just over 500 feet from the river bank. The erosion survey reports that some utility poles have been relocated to avoid loss."* (USACE 2009b)

Three homes that were threatened by erosion have been relocated. There is currently one home within 10 feet from the edge or the river and at critical risk of erosion impact.

Probability of Future Events

Based on previous erosion land loss rates of one foot per year, it is reasonable to predict the rate to continue at this unaccelerated rate where the next 50 years could result in an additional 50-foot loss. This would result in the five homes within 50 feet of the river being potentially lost and the other infrastructure within 100 feet would then be threatened unless relocated. Effects of long-term change in weather patterns could negatively affect erosion as temperatures increase and precipitation increases as storms move toward the poles.

Therefore, based on previous and potential occurrences and applying the criteria identified in Table 4, it is likely that erosion will occur in the next three years (event has up to one in three year's 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 Flood

5.3.4.1 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.

Four primary types of flooding occur in the Evansville Native Village including: rainfall-runoff floods; snowmelt floods; ice jam floods; and ice overflow (aufeis) flooding.

Rainfall-runoff Flood

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 Flood

Snowmelt floods typically occur in spring or early summer. The depths of the snow pack and spring weather patterns influence the magnitude of flooding.

Ice Jam Flood

Ice jam floods occur after an ice jam develops; thus, this type of flood can occur any time of the year that a river has ice on it. Ice jams restrict water flow on a river or stream and form during the following three situations:

- fall freeze-up
- spring break-up (i.e., when the existing ice cover is broken into pieces that block flowing water at bridges or other constrictions)
- midwinter (i.e., when stream channels freeze, forming anchor ice)

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

Water levels increase upstream behind the location of the ice jam. The result is flooding of an area by 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. As soon as the ice jam is breached, there is usually rapid draining of the dammed water. Downstream water levels rise substantially after the ice jam is breached, and strong water currents are created, which can cause erosion and other significant damages. Additionally, the rising water causes the ice to float while increased velocities of water move the ice further downstream. The motion of large solid ice blocks is often destructive to natural and material property in the vicinities. When 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 snowmelt.

Ice Overflow (Aufeis) Flood

Aufeis is glaciation or icing of streams and rivers, affecting road surfaces and infrastructure. Aufeis forms during the winter when emerging ground water freezes. Stream glacial flooding occurs when ice forms from the bottom up not from the top down forcing water out of the stream channel. If aufeis occurs on a roadway, it makes travel difficult. For example, the Steese Highway frequently has an aufeis problem in the winter months. In the mid-1980s, several homes in Fox suffered from an aufeis event occurring at the wellhead. The homes flooded about six feet deep, and, then, froze.

Timing of events

Many floods are predictable based on rainfall patterns. Most of the annual precipitation is received from September through February with October being the wettest. This rainfall leads to flooding in late summer and fall. Spring snowmelt increases runoff, which can cause flooding. It also breaks the winter ice cover, which causes localized ice-jam floods.

5.3.4.2 History

"Highest water recorded was in 1971 at an elevation of 87.0 feet, which is still within bank. Datum reference is the NOAA Profile River Gage. Bank full is at 90; flood stage is at 99 [feet]." (USACE 2009)

Table 7 lists flooding events for the National Weather Services' Bettles Weather Zone (also included Evansville). Additionally, Evansville residents also mentioned a high-water event that occurred in 2017 where the river water level was only 1.5 feet from the flood stage of the 1994 event.

Table 7-Evansville Historical Flood Events

Zone(s)	Location(s)	Date(s)	Event	Description
AK004	Alatna , Allakaket, Bettles, Evansville, Hughes	8-9-May-91	Flood	Minor Flooding
AK004	Alatna, Allakaket, Bettles, Hughes	Federal Emergency Management Agency (FEMA) declared (DR-1039) on September 12, 1994	Flood	Major river flooding on the Koyukuk, Kobuk, and Noatak Rivers. The total estimated flood damages of the flooded villages on the rivers was $74,000,000. Governor declared Federal disaster emergencies, unprecedented losses of personal and public properties.

AK004	Alatna, Allakaket, Bettles, Evansville, Hughes, Huslia	State 98-188 Endicott Mountain Flood 26-31-May-98, 01-Jun-98	Flood	Rain and rapid snowmelt flooding on the Koyukuk River and the Chandalar River. High water swept away one floatplane dock at Bettles, and 30 ft of bank and road connecting Bettles to Evansville (a mile or so away). Rain amounts for the event ranged from .75 to 1.8". This event continued into June on the Koyukuk River only. Total disaster damages: $688,000

Note: No flooding occurred from 1999 to 2017.
(NOAA, 2017)

5.3.4.3 Location, Extent, Impact, and Probability of Future Events

Location

The Native Village of Evansville is located adjacent to the City of Bettles. The USACE floodplain management website indicates there are no known major flood events that have affected either location, however, researching the State's 2016 disaster records shows that the Bettles floatplane dock was replaced and the river dredged to replace the dock damaged from the May/June 1998 flood event. The river required dredging to remove sediment deposition from the 1998 flood event which reduced depth requirements for floatplane access to this vital economic resource (DHS&EM 2013).

"According to a 2006 report, the US Department of Agriculture, Natural Resources Conservation Service (NRCS) received funding through the Emergency Watershed Protection program to provide emergency measures at Evansville, including the purchase of floodplain easements that may be used to remove/buyout [flood threatened] … property[s] …." The USDA funded project funded a voluntary acquisition / demolition project to remove structures from the erosion area and to return the land to its natural state (USACE 2009b). Three homes were bought out under this program.

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
- Village or city location related to the typical flood elevation

Most of the Village's structures are above the level of this periodic flooding. However, the high-water line for the 1971 flood occurred at an elevation of 87.0 ft. The high-water flow remained within the bank as full bank height is 90 ft with flood stage measured at 99 ft.

Based on past flood events and the criteria identified in Table 3, the extent of flood impacts in the Native Village of Evansville 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% of property is 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
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features
- 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, increasing loads on these features or causing overtopping or backwater damages)
- Sewage and hazardous or toxic materials release as wastewater treatment plants or sewage lagoons are inundated, storage tanks are damaged, and pipelines are severed

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.

The Native Village of Evansville and the City of Bettles are equally impacted by flood debris deposition and stream bank erosion (erosion is discussed in detail in Section 5.3.2) due to their co-location along the banks of the Koyukuk River.

Probability of Future Events

Based on USACE (2009) data the criteria identified in Table 4, it is possible a flood event will occur in the next 10 years (event has up to 1 in 10 year's chance of occurring) as the history of events is less than or equal to 10% likely per year. Effects of long-term change in weather patterns could negatively affect erosion as temperatures increase and precipitation increases as storms move toward the poles.

5.3.4 Landslide

5.3.5.1 Nature

Landslide is a general term for the 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, rockfalls, 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, landslides often occur with other natural hazards, thereby exacerbating conditions, as described below:

- Shaking due to earthquakes can trigger events ranging from rockfalls and topples to massive slides.
- Intense or prolonged precipitation that causes flooding can also saturate slopes and cause failures leading to landslides.
- Landslides into a reservoir can indirectly compromise dam safety, and a landslide can even affect the dam itself.
- Wildfires can remove vegetation from hillsides, significantly increasing runoff and landslide potential.

Development and other human activities can also provoke landslides. Increased runoff, excavation of hillsides, shocks and vibrations from construction, non-engineered fill, 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 landslide potential.

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

and lahars.

- **Lateral Spreads:** This 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:** Falls are the free-fall movement of rocks and boulders detached from steep slopes or cliffs.
- **Topples:** Topples are rocks and boulders that rotate forward and may become falls.
- **Complex:** Any combination of landslide

types. Indicators of a possible landslide 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.

In Alaska, seasonally frozen ground and permafrost are often agents of ground failure. Permafrost impacts are explained in more detail in Section 5.3.5. 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 32º Fahrenheit has existed for two or more years. Permafrost can form a stable foundation if kept frozen but when thawed, the soil weakens and can fail. Approximately 85% of Alaska is underlain by continuous or discontinuous permafrost (DHS&EM 2013).

5.3.5.2 History

The landslide hazard threat to the Yukon Koyukuk Census Area is presently unknown as there have been no historical landslides impacting the Census Area or the Evansville Native Village. However, the Village Planning Team stated that landslides occurred downriver in 2004 but did not create a river blockage. However, a more substantial landslide could potentially create more severe damages from river blockage. Complications for this type event are unpredictable.

The history of permafrost and possible future ramifications are discussed further in Chapter 5.3.5.

5.3.5.3 Location, Extent, Impact, and Probability of Future Events

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 humans have disturbed the soil and vegetation such as from cutback projects and timber reduction areas. The Native Village of Evansville is concerned about how a downriver landslide would impact their Village as floodwater could potentially back-up behind a landslide-induced river blockage.

Extent

The geographic extent of landslide events is essentially the same as slide location, while the effects depend on what infrastructure will be impacted by 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 community-wide effects.

There is no record of past landslide events directly impacting the Native Village of Evansville; however, the Planning Team has determined the landslide extent follows the criteria identified in Table 3. The magnitude and severity of landslide impacts in the Village are considered negligible where injuries and/or illnesses are treatable with first aid, minor quality of life lost, shutdown of critical facilities and services to be shut down for 24 hours or less, and less than 10% of property being severely damaged.

Impact

A downriver landslide could potentially impact the entire Village if sufficient material completely blocked the Koyukuk River during a typical spring thaw or rain induced high water event. The resulting flood could be devastating to the Village when the backed up water seeks the low lands that skirt behind the Village's 15-20 foot high protective river embankment.

Probability of Future Events

The Planning Team has determined that the landslide threat follows the criteria identified in Table 4. It is possible that a landslide will occur downriver from the community within the next 10 years (event has up to 1 in 10 year's chance of occurring) as the history of events is less than or equal to 10% likely per year. Effects of long-term change in weather patterns

could negatively affect erosion as temperatures increase and precipitation increases as storms move toward the poles.

5.3.5 Permafrost

5.3.6.1 Nature

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".

Permafrost melting (or degradation) occurs naturally as a result of climate change, although this is usually a very gradual process. Thermokarst is the process by which characteristic land forms result from the melting of ice-rich permafrost. As a result of thermokarst, subsidence often creates depressions that fill with melt water, producing water bodies referred to as thermokarst lakes or thaw lakes.

Human-induced ground warming can often degrade permafrost much faster than natural degradation caused by a warming climate. Permafrost degradation can be caused by constructing warm structures on the ground surface allowing heat transfer to the underlying ground. Under this scenario, improperly designed and constructed structures can settle as the ground subsides, resulting in loss of the structure or expensive repairs. Permafrost is also degraded by damaging the insulating vegetative ground cover, allowing the summer thaw to extend deeper into the soil causing subsidence of ice-rich permafrost, often leading to creation of thermokarst water bodies. Evidence of this type of degradation can be seen where thermokarst water bodies are abundant in the ruts of an old trail used by heavy equipment (cat trails) or where roads or railroads constructed by clearing and grubbing have settled unevenly.

5.3.6.2 History

No comprehensive permafrost damage record is available from which to obtain specific damage data. However, the Planning Team has stated that uneven settling throughout the years within the Native Village of Evansville has damaged buildings and roads constructed in permafrost areas.

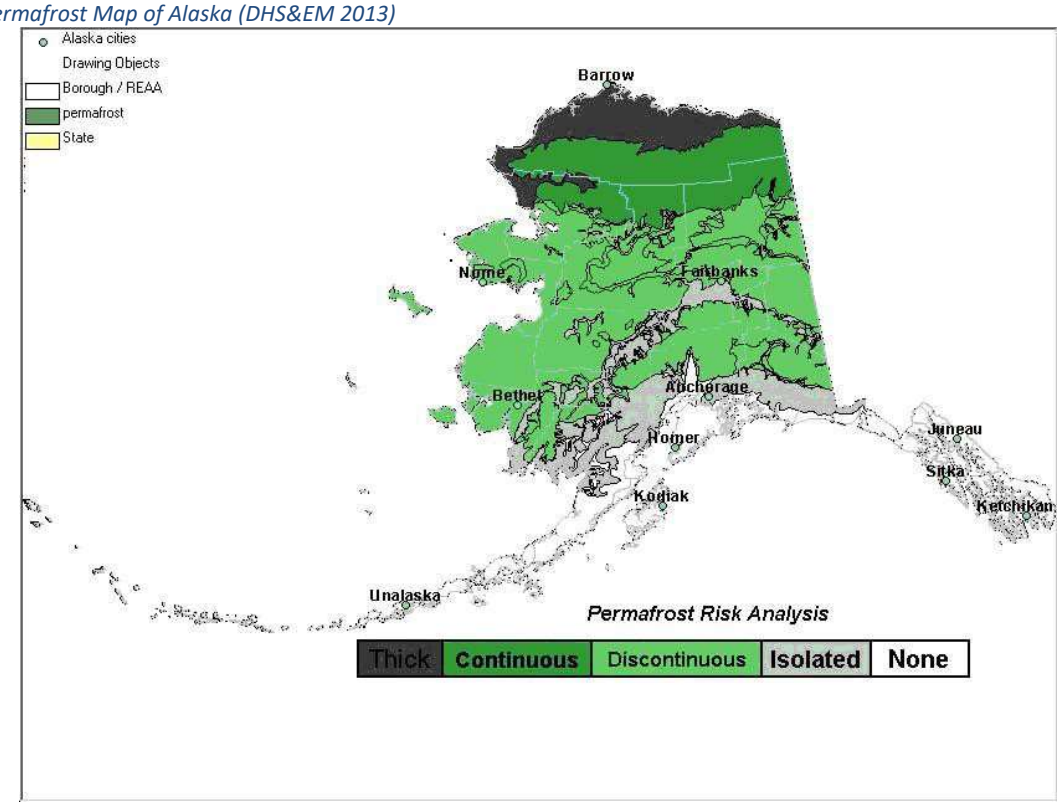
The hillside downriver from the Village had a rarely occurring landslide event when underlying permafrost melted and caused the hillside to slough off into the Koyukuk River in 2004. Landslides also occur occasionally along Evansville's winter trail. The winter trail is used as an ice road and is a means to bring fuel and supplies to the communities. A section of the winter trail was relocated around the landslide area.

5.3.6.3 Location, Extent, Impact, and Probability of Future Events

Location

According to Permafrost Map of Alaska (Figure 6), the entire Evansville Native Village is underlain by discontinuous permafrost. The Planning Team stated that permafrost is prevalent along Cemetery Road, in the area surrounding the landfill and beneath the hill adjacent to the VHF omnidirectional range (VOR) Lake.

Figure 6-Permafrost Map of Alaska (DHS&EM 2013)



Extent

The damage magnitude could range from minor (with 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 affected.

Based on past permafrost degradation events and the criteria identified in Table 3, the extent of permafrost degradation impacts in the Evansville Native Village are considered negligible where injuries are treatable with first aid, minor quality of life is lost, shutdown of critical facilities and services occurs for 24 hours or less, and less than 10 percent of property is severely damaged.

Impact

Impacts associated with degrading permafrost include surface subsidence and damage to infrastructure, structures, and/or roads. Permafrost does not pose a sudden and catastrophic hazard but improperly designed and constructed structures can settle as the ground subsides,

resulting in expensive repairs or loss of the structure. Permafrost restricts use of the ground surface, and affects the location and design of roads, buildings, communities, pipelines, airfields, and bridges. To avoid costly damage to these facilities, careful planning and design in the location and construction of facilities is warranted.

Probability of Future Events

A comprehensive list of historical permafrost damage data is non-existent for the Native Village of Evansville. However, the Planning Team stated that permafrost damage occurs annually to those structures located near the wetlands and along the roads to the VOR Lake. The team also expressed that permafrost deposits completely surround the landfill and are prevalent under the hillside adjacent to the VOR Lake. The Planning Team stated that the probability for permafrost occurring follows the criteria in Table 4, the probability of future damage resulting from permafrost is possible in the next five years as the history of events is greater than 10% but less than or equal to 33% likely per year. Effects of long-term change in weather patterns could negatively affect permafrost as temperatures rise.

5.3.6 Weather (Severe)

5.3.7.1 Nature

Severe weather in Evansville includes heavy and drifting snow, freezing rain/ice storm, extreme cold, and high winds.

Heavy and Drifting Snow

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. Drafting 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/Ice Storm

Freezing rain and ice storms occur when rain or drizzle freezes on surfaces, accumulating 12 inches in less than 24 hours.

Extreme Cold

The definition of extreme cold varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered “extreme”. In Alaska, extreme cold usually involves temperatures between -20 to -50°F. Excessive cold may accompany winter storms or can occur without storm activity.

High Winds

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 characteristics of hurricanes. In Alaska, high winds (winds in excess of 60 mph) occur rather frequently over the interior due to strong pressure differences, especially where influenced by mountainous terrain.

5.3.7.2 History

Alaska's interior regions experience drastic temperature difference throughout the year. Summer temperatures can reach close to 100ºF while winter can reach -85ºF as it did during the 1989 Omega Glock Cold Spell disaster event. Table 8 lists the National Weather Service's major storm events for the Village's Weather Zone. Each weather event may not have specifically impacted the Village but they were listed due to the Village's close proximity to listed communities or by location within the identified zone.

Table 8-Severe Weather Events

Zone(s)	Location(s)	Date(s)	Event	Description
AK004	Bettles	10-Nov-85	Heavy Snow	8" (1-day)
AK004 AK008	Various	24-25-Feb-89	Winter Storm	Wind and heavy snow in many areas, affected all villages.
AK004	Alatna, Allakaket	15-16-May-89	Ice Jam Flood	Airport runway flooded
AK004	Bettles	1-2Mar-90	Heavy Snow	9-10" (1-day)
AK004	Bettles	1-5-Mar-91	Heavy Snow	13" (2-day)
AK004	Alatna , Allakaket, Hughes	8-9-May-91	Flood	Minor Flooding
AK004	Alatna, Allakaket, Bettles, Hughes	FEMA declared (DR-1039) on September 12, 1994	Flood	Major river flooding on the Koyukuk, Kobuk, and Noatak Rivers. The total estimated flood damages of the flooded villages on the rivers was $74,000,000. Governor declared Federal disaster emergencies, unprecedented losses of personal and public properties.
AK004	Bettles, Evansville	16-18-Feb-96	Heavy snow	Snow storm totals: Zone 4: Bettles 7 in.
AK004		24-26-Feb-96	High Wind	Strong winds in the passes of the Alaska and Brooks Ranges.
AK004 & AK008	Bettles, Evansville	26-29-Feb-96	Heavy snow	Snowfall totals for Bettles 11"
AK004	Alatna , Allakaket, Bettles, Evansville	17-19-Dec-96	Winter storm	Heavy snow over parts of Zone 3 and eastern Zone 4. Bettles 3" + 6".
AK004	Alatna, Allakaket, Bettles, Evansville, Hughes, Huslia	State 98-188 Endicott Mountain Flood 26-31-May-98, 01-Jun-98	Flood	Rain and rapid snowmelt flooding on the Koyukuk River. High water swept away one floatplane dock at Bettles, and 30 ft of bank and road connecting Bettles to Evansville (a mile or so away). Rain amounts for the event ranged from .75 to 1.8". This event continued into June on the Koyukuk River only. Total disaster damages: $688,000
AK004 & AK008	Alatna, Allakaket, Bettles, Evansville	22-24-Jan-99	Heavy Snow	Blizzard conditions, precipitation, and strong winds Bettles 15", 3pm 22nd to 3am 24th
AK004 & AK008	Alatna, Allakaket, Bettles, Evansville, Galena, Hughes, Huslia, Kaltag, Ruby, Grayling	29-31-Jan-99	Extreme Cold	Cold air mass in the -50s to -60s one or more times.

Zone(s)	Location(s)	Date(s)	Event	Description
AK004 & AK008	Alatna, Allakaket, Bettles, Evansville, Galena, Hughes, Huslia, Kaltag, Ruby, Grayling	01-12-Feb-99	Extreme Cold	Continuation of January event. Cold air mass in the - 50s to -60s one or more times. The lowest recorded temperatures and dates are: Galena -64, 2nd; Kaltag - 65, 7th; Ruby, -58, 6th; Grayling -58, 1st, 2nd, & 4th.
AK004	Alatna, Allakaket, Bettles, Evansville, Galena, Hughes, Huslia, Nulato Kaltag	1-3-Feb-00	Winter Storm	Winter weather, strong south winds, blizzard conditions and high winds. Heavy snow occurred at: Galena 8.3", 2nd; Kaltag 8", 2nd. Blizzard conditions occurred at Huslia.
AK004 & AK008	Bettles, Nulato, Galena, Kaltag	9-11-Nov-00	Winter Storm	Winter Weather, strong south winds, blizzard conditions, and freezing rain.
AK219	Upper Koyukuk Valley	5-Jan-02	High Wind	Wind gusts to 43 knots (50 mph). Damages: $35,000
AK216 & AK219	Bettles, Galena	1-3-Mar-03	Heavy Snow	Heavy snow fell near Bettles (Zone 219) with 11” of new snow. Galena (Zone 216) measured 8” with near white out conditions
AK219	Bettles	8-Nov-03	Heavy Snow	Snow. Bettles reported 6.5” of snow.
AK219	Bettles	22-Dec-03	Heavy Snow	Snow. Bettles reported 9.0” by 9pm on the 22nd.
AK219	Bettles	2-Feb-04	Heavy Snow	Snow. Bettles reported 8.0”, with the snow beginning at 1153 pm on the 1st.
AK216-AK219	Galena, Bettles	2-5-Jan-05	Heavy Snow	Arctic cold front with snow. Heavy Snow at Galena 8" in the 24 hours beginning at 1800 AST on the 1st. Bettles Airport 10.4" in 24 hours beginning 0000 AST on the 3rd.
AK219	Bettles	4-6-Dec-08	Winter Storm	Snowfall at Bettles with a total of 6.7” of snow from the 4th through 1400 AKST on the 6th.

Zone(s)	Location(s)	Date(s)	Event	Description
AK216 & AK219	Galena, Bettles	1-12-Jan-09	Extreme Cold/ Wind Chill	Cold snap did not produce any record low temperatures. It was the most prolonged cold snap across interior Alaska since 1999. Zone 216: Galena: - 51ºF on the 2nd. Zone 219: Bettles: -51ºF on the 4th.
AK215, AK216 & AK219	Alatna, Allakaket, Anvik, Bettles, Evansville, Galena, Hughes, Huslia, Kaltag, Nulato, Ruby	13-16-Jan-09	Winter Storm	Near to above freezing temperatures, freezing rain, and snow. Galena snow changed to freezing rain Zone 219: 9.7" of snow was observed at Bettles.
AK219	Bettles, Evansville	12-14-Jan-13	Winter Storm	Heavy snow was reported at Bettles, where a storm total of 14 inches was reported by the FAA contract weather observer.
AK219	Bettles, Evansville	6-7-Dec-13	Ice Storm	The weather observer at Bettles reported 0.27 inch of freezing fain.
AK219	Bettles, Evansville	24-26-Feb-17	Heavy Snow	A series of low pressure systems brought an abundant amount of moisture to the western Interior of Alaska with accumulations of 1 to 2 feet reported. Strong winds and local blizzard conditions on the summits. ||Zone 219: 17 inches of snow reported at Bettles.

(NOAA National Weather Service 2017)

5.3.7.3 Location, Extent, Impact, and Probability of Future Events

Location

The National Weather Service has continued to modify their system for assigning weather zones to facilitate and more accurately confine weather patterns to relevant geographic areas. Consequently, this data in Table 8 reflects different zone numbering patterns and should be used to depict weather events that have historically impacted the area; some of which may not have impacted the Native Village of Evansville as severely as other areas within the same zone. Figures 9 and 10 provide further weather data for Evansville using the Airport in adjacent Bettles.

Table 9-Bettles Precipitation Summary (WRCC 2017)

BETTLES AP, ALASKA

Period of Record General Climate Summary - Precipitation

Station:(500761) BETTLES FAA AIRPORT														
From Year=1951 To Year=2012														
	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	0.78	3.42	1973	0.00	1961	0.98	21/1962	8	3	0	0	11.5	55.8	1973
February	0.79	3.21	2003	0.00	1979	0.99	28/1996	8	2	0	0	11.7	41.7	2011
March	0.62	3.60	1963	0.00	1960	0.87	05/1963	7	2	0	0	9.4	35.2	1991
April	0.59	3.08	2002	0.01	1969	0.98	06/1982	6	2	0	0	6.8	34.7	1984
May	0.70	3.01	1998	0.04	1959	1.02	26/1995	7	2	0	0	1.0	12.0	1952
June	1.41	3.59	1965	0.00	1959	1.93	17/1958	10	4	1	0	0.0	0.0	1951
July	2.05	5.42	1963	0.33	1962	1.63	15/2007	12	6	1	0	0.0	0.0	1951
August	2.50	9.16	1994	0.41	1958	2.96	17/1994	14	7	1	0	0.0	2.6	1969
September	1.83	4.80	2002	0.13	1984	1.31	29/1954	11	6	1	0	2.0	19.2	1996
October	1.13	3.82	1972	0.12	1974	1.14	06/1963	11	4	0	0	11.8	28.3	1972
November	0.92	3.85	1967	0.02	1995	1.35	09/1992	10	3	0	0	13.9	41.6	1967
December	0.91	3.41	2011	0.12	1995	1.11	04/2011	10	3	0	0	15.5	45.5	2011
Annual	14.23	24.46	1965	6.88	1969	2.96	19940817	115	44	5	0	83.7	147.5	1993
Winter	2.48	6.78	1993	0.77	1961	1.11	20111204	26	8	1	0	38.8	88.0	1993
Spring	1.91	5.17	1963	0.24	1969	1.02	19950526	20	6	0	0	17.1	54.3	1965
Summer	5.95	12.49	1963	1.69	1962	2.96	19940817	36	17	2	0	0.0	2.6	1969
Fall	3.87	7.91	1993	0.36	1984	1.35	19921109	33	12	1	0	27.8	59.3	1979

Table updated on Oct 31, 2012

Table 10-Bettles Temperature Summary (WRCC 2017)

BETTLES AP, ALASKA

Period of Record General Climate Summary - Temperature

Station:(500761) BETTLES FAA AIRPORT															
From Year=1951 To Year=2012															
	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	-4.6	-20.5	-12.5	48	01/1980	-70	04/1975	16.0	1981	-35.6	2012	0.0	30.3	30.9	25.5
February	2.0	-16.7	-7.4	40	21/1977	-64	09/1999	6.3	1989	-29.3	1990	0.0	27.8	28.2	22.7
March	14.6	-9.3	2.6	49	22/1998	-56	14/1964	17.7	1965	-14.2	1959	0.0	28.4	30.9	22.4
April	32.9	10.4	21.6	66	29/2010	-37	07/1986	33.7	1995	10.2	1986	0.0	13.6	28.7	7.9
May	53.5	33.6	43.6	86	31/1983	-10	03/1952	51.0	1990	32.9	1952	0.0	0.7	13.4	0.2
June	68.3	47.0	57.6	92	16/1969	27	01/1960	63.5	2004	51.8	1955	0.1	0.0	0.3	0.0
July	69.3	48.9	59.1	93	06/1986	29	14/1959	64.0	2007	51.5	1959	0.1	0.0	0.1	0.0
August	62.5	43.4	52.9	88	06/1994	22	30/1968	60.9	1977	45.2	1969	0.0	0.0	2.2	0.0
September	48.9	32.4	40.6	79	05/1957	0	23/1992	47.2	2006	29.3	1992	0.0	0.9	14.2	0.0
October	25.7	12.6	19.2	57	02/2003	-35	31/1992	29.4	2003	7.0	2008	0.0	22.4	29.8	6.5
November	6.0	-8.1	-1.1	45	13/1976	-57	25/1974	17.0	1979	-16.7	1955	0.0	29.1	29.9	20.2
December	-1.3	-16.5	-8.9	38	09/1960	-59	25/1957	10.1	1969	-29.1	1964	0.0	30.8	31.0	25.1
Annual	31.5	13.1	22.3	93	19860706	-70	19750104	26.7	1981	16.0	1956	0.3	183.9	239.6	130.5
Winter	-1.3	-17.9	-9.6	48	19800101	-70	19750104	2.9	2001	-21.4	1971	0.0	88.9	90.1	73.3
Spring	33.7	11.6	22.6	86	19830531	-56	19640314	30.4	1990	12.4	1964	0.0	42.6	73.0	30.5
Summer	66.7	46.4	56.6	93	19860706	22	19680830	61.1	2004	53.4	1963	0.3	0.0	2.7	0.0
Fall	26.8	12.3	19.6	79	19570905	-57	19741125	29.1	1979	10.7	1956	0.0	52.4	73.8	26.7

Table updated on Oct 31, 2012

Extent

The entire Evansville Native Village area is equally vulnerable to the effects of severe weather. Blizzard conditions and heavy snow depths for the area can reach 18 inches per storm event; wind speed can exceed 49.5 mph; and extreme low temperatures have reached -72 ºF.

Based on past severe weather events and the criteria identified in Table 3, the extent of severe weather in the Evansville Native Village is 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% of property is severely damaged.

Impact

The intensity, location, and the land's topography influence the impact of severe weather

conditions on a community.

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.

Probability of Future Events

Based on previous occurrences and the criteria identified in Table 4, it is likely a severe storm event will occur in the next three years (event has up to one in three year's chance of occurring) as the history of events is greater than 20% but less than or equal to 33% likely per year. Effects of long-term change in weather patterns could negatively affect severe weather as temperatures increase and precipitation increases as storms move toward the poles.

5.3.7 Wildland Fire

5.3.8.1 Nature

A wildland fire is a type of wildfire that spreads through consumption of vegetation. 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 arson 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 urban fires, interface or intermix fires, and prescribed fires.

The following three factors contribute significantly to wildland fire behavior and can be used to

identify wildland fire hazard areas.

- **Topography:** As slope increases, 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, ridgetops may mark the end of wildland fire spread, since fire spreads more slowly or may even be unable to spread downhill.

- **Fuel:** 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. The risk of fire is increased 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:** 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. 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.

5.3.8.2 History

Wildland fires have not been documented within the boundaries of the Native Village of Evansville; however, wildland fires have occurred within 1/8 mile of the Village. The most recent event occurred in 2004 when a fire started one mile from the Village coming to within 1/8 mile. The southwesterly wind blew the fire eastward barely missing the Village. The Planning Team stated that wildland fire is the most threatening hazard for the Native Village of Evansville.

According to the Division of Forestry's Alaska Interagency Coordination Center (AICC), over 240 wildland fires occurred within 50 miles of Bettles/the Village of Evansville. Table 11

lists seven wildfires that have occurred within six miles of Bettles over the last 78 years (from 1939 to 2017), and Figure 7 provides a pictorial perspective.

Table 11-Native Village of Evansville Wildfires Locations (Since 1939 within 6 miles of Evansville)

Fire Name	Fire Year	Estimated Acres	Latitude	Longitude	Specific Cause
Betttles Field Fire	1946	253,952	66.91666	-151.5167	Lightning
Bettles Village	1951	3	66.88333	-151.5	Incendiary
031055	1990	0.2	66.91666	-151.5167	AIRCRAFT
131557	1991	0.1	66.91666	-151.5	OTHER
BTT E 0.9	1991	1	66.91666	-151.5	FIREWORKS
331436	1993	0.1	66.91666	-151.5	BURNING DUMP
Evansville	2004	135,627	66.91167	-151.5	Undetermined

(Alaska Interagency Coordination Center [AICC] 2017)

5.3.8.3 Location, Extent, Impact, and Probability of Future Events

Location

The City is not generally susceptible to wildland fires within the City limits. However, some parts of the City contain dense black spruce which increases vulnerability. Under certain conditions wildland fires may occur in any area with fuel surrounding the Evansville Native Village. Since fuel data is not readily available, for the purposes of this HMP Update, all areas outside Village limits are considered to be vulnerable to wildland fire impacts. Since 1939, seven wildland fire events have occurred within six miles of the Evansville Native Village.

Extent

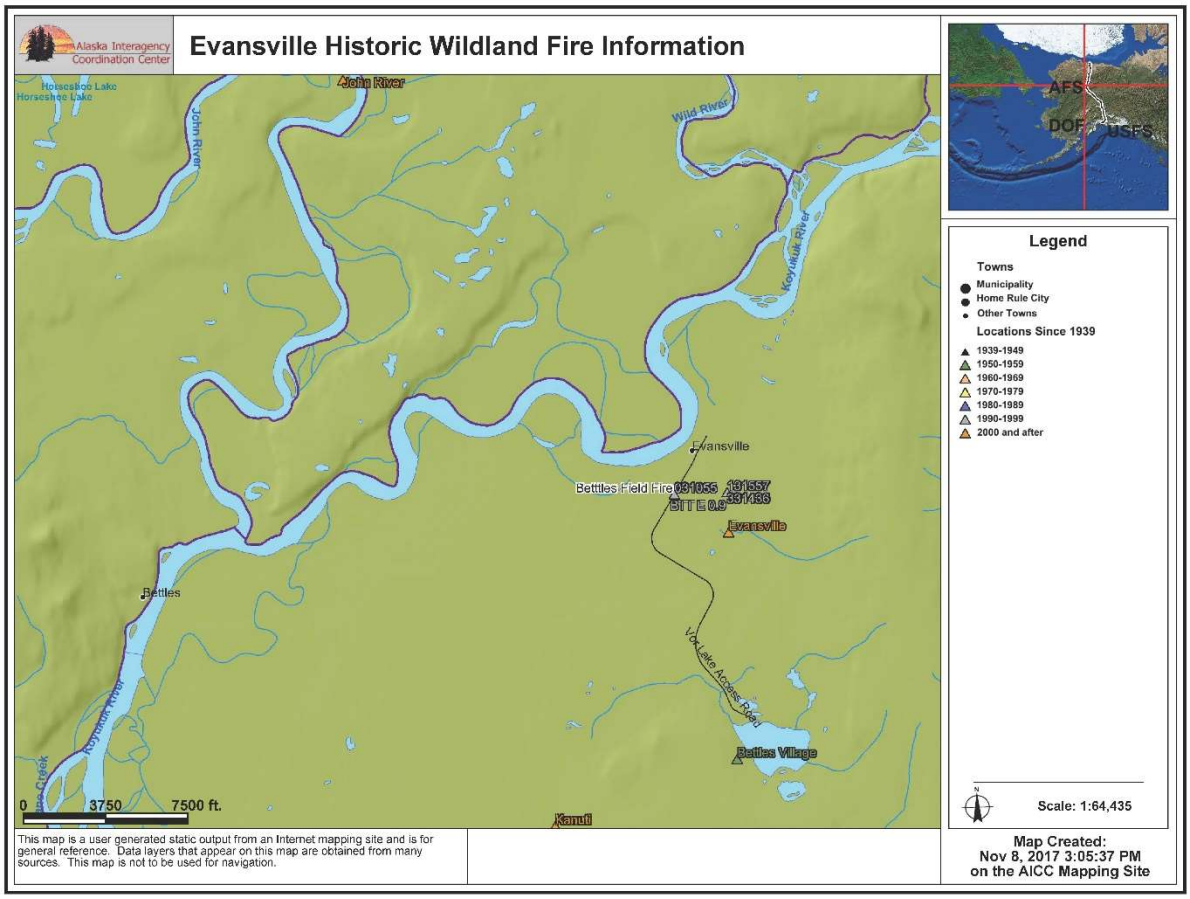
Generally, fire vulnerability dramatically increases in the late summer and early fall as vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type, 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.

During the past 78 years, an average of 55,655 acres burned during the seven wildland fire events from Table 11. In recent decades, Alaska's Division of Forestry has been able to more efficiently manage wildland fires using a four-tiered suppression methodology based on

infrastructure criticality and has more modern resources available as they respond to wildland fires which potentially threaten populated areas (DOF 2009).

Figure 7-Evansille Wildfire History (AICC 2017)



Based on past wildland fire events and the criteria identified in Table 3, the magnitude and severity of impacts in the Evansville Native Village are considered negligible with minor injuries, the potential for critical facilities to be shut down for less than 24 hours, less than 10% 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 the population center of Evansville Native Village could grow into an emergency or disaster if not properly controlled. A small fire can threaten lives and resources and destroy property. In addition to impacting people, wildland fires may severely impact livestock and pets. Such events may require emergency food and water, 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.

Probability of Future Events

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 firefighter and public safety and welfare, and natural and cultural resources threatened.

Based on the history of wildland fires within the 50-mile radius of the Village of Evansville area and applying the criteria identified in Table 4, it is likely a wildland fire event will occur in the next 3 years. The event has up to 1 in 3 year's chance of occurring, and the history of events is greater than 20% but less than or equal to 33% likely each year. Effects of long-term change in weather patterns could negatively affect wildland fires as spruce bark beetles increase, killing trees, and increasing the amount of potential fuel.

5.3.8 Climate Change

5.3.9.1 Description

For this HMP, climate change refers to the long term variation in atmospheric composition and weather patterns on a global scale. Global climate change may occur gradually due to small variations or rapidly due to large catastrophic forces. Greenhouse gasses, especially carbon dioxide and methane are commonly regarded as the most significant factors influencing the Earth's current climate.

Significant atmospheric variations may also be influenced by more than one event, for instance, an asteroid impact and a major eruption over a longer time period. For scientists studying climate change, both hazards imply different time periods. Therefore, the time period estimates for previous climate change events tend to vary and cannot be accurately applied to current predictive climate change models, which now must account for human activity. This is significant because hazard mitigation planning relies greatly upon the historical record.

5.3.9.2 Location

Climate change is a global event. Therefore, the community of Evansville is vulnerable to climate change.

5.3.9.3 Extent

Through studies of the historical record, climate change affects water acidity, atmospheric composition, precipitation, weather patterns, and temperatures.

5.3.9.4 Local Impact

Wildland fires and permafrost are both important issues in the Evansville community, and have the potential to be exacerbated by climate change.

In 2017, residents commented that in recent years they have experienced warmer winter temperatures, which has led to drier conditions and a longer growth season of aspen and spruce trees, which are fuel for wildland fires in the region. According to Inside Climate News, "Increased wildfire activity will change the shape and extent of boreal forests, and affect wildlife habitat and Alaska's indigenous residents. And while climate change is the prime culprit, the fires will also intensify global warming. Burning organic soils will send even more CO_2 into the atmosphere, according to Higuera and other scientists who study ecosystem changes in the region. 'That four-fold increase by 2100, that's just huge. It's indescribable what that would mean to the landscape and the carbon cycle,' said Michelle Mack, a professor of ecosystem ecology at Northern Arizona University, who was not involved in the study." (ICN, 2016)

Additionally, according to the National Oceanic and Atmospheric Administration, "the overall average temperature across Alaska increased by 3°F Fahrenheit in the past 60 years, and winter temperatures have gone up by 6 degrees°F in that same span." Rising temperatures could mean rapid melting of permafrost. This increases the possibility that roads, building, and other structures on thawed areas will collapse. As permafrost thaws, it can release carbon dioxide and methane gases, which could accelerate global warming.

5.3.9.5 Probability

Given the Earth's history of climate change and the current observed changes in the atmosphere, it is "credible" a disaster event attributed to climate change will occur in the next ten years as the probability is less than or equal to 10 percent likely per year.

6.0 Vulnerability Analysis

This section provides an overview of the vulnerability analysis and describes the five specific steps: asset inventory, methodology, data limitations, exposure analysis for current assets, and areas of future development.

6.1 OVERVIEW OF A VULNERABILITY ANALYSIS

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.

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.

DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Overview

Assessing Vulnerability: Overview

Requirement §201.7: [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards. This description **shall** include an overall summary of each hazard and its impact on the community.

Element

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does the new or updated plan address the impact of each hazard on the jurisdiction?

- Identification of the types and numbers of repetitive properties in the identified hazard areas.

DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Addressing Repetitive Loss Properties

Assessing Vulnerability: Addressing Repetitive Loss Properties

Requirement §201.7: [The risk assessment] **must** also address NFIP Insured structures that have been repetitively damaged.

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss 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.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures

Assessing Vulnerability: Identifying Structures

Requirement §201.7: 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 area.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

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

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan describe the methodology used to prepare the estimate?

6.2 VULNERABILITY ANALYSIS: SPECIFIC STEPS

6.2.1 Asset Inventory

Asset inventory is the first step of a vulnerability analysis. Assets that may be affected by hazard events include population (for community-wide hazards), residential buildings (where data is available), and critical facilities and infrastructure. The assets and associated values throughout the Evansville Native Village are identified and discussed in detail in the following sections.

6.2.1.1 Population and Building Stock

Population data for the Evansville Native Village were obtained from the 2010 U.S. Census. The Evansville Native Village's total population for 2010 was 15, and 2016 Department of Labor data reported a population of 10 (Table 12).

Table 12-Estimated Population and Building Inventory

Population		Residential Buildings	
2010 Census	2016 Department of Labor Estimate	Total Building Count	Total Value of Buildings[1]
15	15	25	$6,250,000

Sources: Evansville Native Village, US Census 2010, and DCCED/DCRA 2016 Certified Population Data.
[1] Average structural value of all single-family residential buildings is $250,000 per structure by the Village.

Estimated numbers of residential buildings and replacement values for those structures, as

shown in Table 12, were obtained from the Evansville Native Village, the 2010 U.S. Census, and DOL. A total of 25 single-family residential buildings were considered in this analysis.

6.2.1.2 Repetitive Loss Properties

The Evansville Native Village does not participate in the NFIP.

6.2.1.3 Existing Critical Facilities and Infrastructure

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 Evansville Native Village and fulfilling important public safety, emergency response, and disaster recovery functions. The critical facilities profiled in this HMP Update include the following:

- Government facility (Village of Evansville's Tribal Administrative Office)
- Medical clinic
- Community gathering place (Tribal Hall)
- Utilities, such as electric generation, communications, and landfills

The total number of critical facilities is listed in Table 13.

Table 13-Critical Facilities

Occupancy Type	Facility Name	Location/Address	Structure value or Per Mile Replacement Cost	Total Miles, Gallons (Gal), or Occupants (Occ)
Government Facility	Tribal Office	101 Hickel Hwy		5 Occ
	Landfill Maintenance Building	103 Hickel Hwy	$192,906	1 Occ
	US Post Office – Evansville	Main Street	$150,000	1 Occ
Transportation Facilities	Airport - Bettles Field	Airport Road	$8,000,000	0 Occ
	V.O.R. Lake Waterlane Seaplane Base	V.O.R Lake	$5,294,857	0 Occ
Emergency Response Facility	Bettles Fire Department	Main Street, Bettles	$250,000	7 Occ
	Gates of the Arctic National Park Service Building	Main Street	$5,000,000	5 Occ
Educational Facility	None			
Care Facility	Frank Tobuk, Sr. Health Clinic Evansville	101 Hickel Hwy	$327,578	2 Occ
Community Facility	Multi-Purpose Building/Community Center/Senior Center/Washeteria	101 Hickel Hwy	$500,000	7 Occ
	Cemetery - Evansville Tribal Council	Tobuk Lane		
	Store - Bettles Lodge	Aircraft Ramp Parking Area	$1,500,000	5 Occ
	Store - Brooks Range Aviation	Aircraft Ramp Parking Area	$200,000	7 Occ
	Spirit Lights Lodge	Main Street	$1,500,000	2 Occ
Roads	Roads Bureau of Indian Affairs (BIA)	N/A	$4,000,000	4 Miles
	Roads Bureau of Land Management (BLM) Hickle Hwy (2447)	N/A	$10,000,000	28.5 Miles
	Roads (Community)	N/A	2,500,000	4 Miles
	Landfill Road	Willow Road	$3,150,000	0 Occ
Bridges (local, State, & Federal)	None			
Utilities	Tanks	Area		10,000 Gal
	Alaska Power & Telephone, Fuel Storage Tanks	Main Street	$100,000	0 Occ 85,000 Gal
	Brooks Range Aviation, Fuel Storage Tanks	Aircraft Ramp Parking Area	$125,000	0 Occ 6,100 Gal
	Evansville The Village Tribal Council Fuel Storage Tanks, Gasoline	101 Hickel Hwy	$50,000	0 Occ 5,000 Gal
	Evansville The Village Tribal Council Fuel Storage Tanks, Diesel	101 Hickel Hwy	$50,000	0 Occ 10,000 Gal
	Landfill with sludge pit & Incinerator – Class 3 Permit: SWYKC001199520103MA	Willow Spur Rd	$740,000	0 Occ 3 Acres 2 Cell

(Evansville 2017)

6.2.1.4 Future Critical Facilities and Infrastructure

Currently, there are two plans for future development in the Native Village of Evansville. A new $1.2 million medical clinic has been proposed. In addition, there are plans to expand the landfill, which services both Evansville and Bettles.

6.2.2 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.

Critical facilities were identified by the Planning Team and were compared to locations where hazards are likely to occur. If any portion of the critical facility fell within a hazard area, it was counted as being exposed and vulnerable to the particular hazard.

Replacement structure and contents values were developed for physical assets. These values were obtained from the State of Alaska Critical Facilities Database or provided by the Evansville Native Village. For each physical asset located within a hazard area, exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced). Finally, the aggregate exposure, in terms of replacement value or insurance coverage, for each category of structure or facility was calculated. 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.

6.2.3 Data Limitations

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. 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).

6.2.4 Exposure Analysis

The results of the exposure analysis for loss estimations in the Evansville Native Village are summarized in Table 14 and in the following discussion.

Table 14-Native Village of Evansville Potential Hazard Exposure Analysis

			Residential Structures		Critical Facilities		Total	
Hazard	Methodology	Population[(a)]	Number	Structure Value[(b)]	Number	Structure Value[(b)]	Structures	Value [(b)]
Earthquake*	Simplified exposure-level analysis	15	25	$6,250,000	15	$21,385,484	40	$27,635,484
Erosion	Simplified exposure-level analysis	2	1	$500,000	5	$827,578	6	$1,327,578
Flood	Division of Community and Regional Affairs (DCRA) community flood mapping	0	0	$0	0	$0	0	$0
Landslide	Descriptive	2	1	$250,000	0	$0	1	$250,000
Permafrost*	Simplified exposure-level analysis	15	25	$6,250,000	15	$21,385,484	40	$27,635,484
Weather (Severe)*	Simplified exposure-level analysis	15	25	$6,250,000	15	$21,385,484	40	$27,635,484
Wildland Fire*	Simplified exposure-level analysis	15	25	$6,250,000	15	$21,385,484	40	$27,635,484
Climate Change *	Simplified exposure-level analysis	15	25	$6,250,000	15	$21,385,484	40	$27,635,484

* All people, critical facilities, and residential structures are equally vulnerable to this hazard.
N/A = not available
(a) total population was based on DCCED/DCRA 2016 population data - population estimates were provided by the Planning Team for Erosion, Flood, Landslide hazard areas.
(b) estimates based on Evansville Planning Team input.

Earthquake

Based on earthquake probability model maps produced by the USGS, the entire Evansville Native Village area is at risk of experiencing the impacts from an earthquake. However, the probability is low (see Section 5.3.1). Impacts to the community such as significant ground movement that may result in infrastructure damage are not expected. The entire existing and future Evansville Native Village population, residences, and critical facilities are exposed to the effects of an earthquake. This includes 15 people, 25 residences, and 15 critical facilities.

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. Although all structures are exposed to earthquakes, buildings within Evansville Native Village constructed with wood have slightly less vulnerability to the effects of earthquakes than those with masonry.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same low impact level as the Evansville Native Village is not located in an area with a high probability of strong shaking (i.e., >M4.8).

Erosion

The Planning Team stated that only the embankment along the Koyukuk River is potentially impacted by erosion. There are approximately four people in two residential buildings located in an area exposed and historically prone to erosion. There are five critical facilities located in areas exposed and historically prone to erosion. These include: the Multi-Purpose Building (where the Tribal Office is located), Landfill Maintenance Office, City of Bettles Airport, and the Alaska Power & Telephone Building and fuel tanks.

Impacts from erosion include loss of land and any development on that land. Erosion can cause increased sedimentation of harbors and river deltas and hinder channel navigation, reduction in water quality due to high sediment loads, loss of native aquatic habitats, damage to public utilities (docks, harbors, electric and water/wastewater utilities), and economic impacts associated with costs trying to prevent or control erosion sites. In the Evansville Native Village, only the location of a building can lessen its vulnerability to erosion.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level until the Village institutes land use controls prohibiting new construction in erosion prone areas. Impacts could also be lessened if affected properties could be relocated.

Flood

According to Planning Team, there are no residential buildings and no critical facilities in areas exposed and historically prone to flooding.

Impacts associated with flooding in the Evansville Native Village include water damage to structures and contents, roadbed erosion and damage, stranded boats in sandbars, areas of standing water in roadways, and damage or displacement of 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 to pass through an open area under the main floor of a building) are more vulnerable to the impacts of flooding.

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

Landslide

The Planning Team stated that one residential structure and two people of the population are located in the landslide hazard area. However, they did identify three critical facilities potentially at risk to rarely occurring melting permafrost generated landslides: the landfill access road, the landfill, and the hillside adjacent to the VOR lake. The soils could slough from a permafrost melt event similar to the one that occurred in 2004 impacting these critical facilities.

The Native Village of Evansville manages land use for those lands under their control limiting development in areas with high landslide risk. Subsequently landslides may only impact these three infrastructures where injuries and public and private financial losses in indirect and direct ways would occur.

Permafrost

According to mapping completed by the USGS, the entire Evansville Native Village is underlain by discontinuous permafrost, thus exposed to the potential impacts from this hazard. This includes 15 people, 25 residences, and 15 critical facilities.

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

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. To lessen future impacts the Village could institute land use initiatives prohibiting new construction in permafrost zones and encouraging building code compliance to accommodate the effects of permafrost on structures and infrastructure.

Weather, Severe

Using information provided by the Evansville Native Village and the National Weather Service, the entire existing and future Evansville Native Village population, residences, and critical facilities are equally exposed to the effects of a severe weather event. This includes 15 people, 25 residences, and 15 critical facilities.

Impacts associated with severe weather events include roofs collapsing, trees and power lines falling, damage to light aircrafts and sinking of small boats, injuries and deaths resulting from snow machine or vehicle accidents, and overexertion while shoveling 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, disruption in utilities, frozen pipes, and carbon monoxide poisoning. Section 5.3.6 provides additional detail regarding the impacts of severe weather. 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 impacts of severe weather.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. To lessen future impacts the Village could institute and enforce building codes to accommodate the effects of severe weather on structures.

Wildland Fire

According to the Division of Forestry, there have been no wildland fires within the Native Village of Evansville boundaries. However, more than 240 wildland fires have occurred since 1939 within a 50-mile radius of the Village. There is potential for wildland fire to interface with the Village's population center. Thus, for the purposes of this exposure and vulnerability assessment, it is assumed that all structures within the Village are equally exposed to the impacts of a wildland fire event. This includes 15 people, 25 residences, and 15 critical facilities.

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.

Impacts to future populations, residences, critical facilities, and infrastructure are anticipated at the same impact level. Community education, building materials, and prepared response personnel are some things that could lessen future impacts.

DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Analyzing Development Trends

Assessing Vulnerability: Analyzing Development Trends

Requirement §201.7: [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.

Element

- Does the new or updated plan describe land uses and development trends?

6.3 LAND USE AND DEVELOPMENT TRENDS

Land use in the Evansville Native Village is predominately residential with few areas of commercial services and community (or institutional) facilities. The majority of commercial enterprises are located in the City of Bettles approximately one mile away. The Village does not anticipate much future development as suitable developable vacant land is in short supply within the boundaries of the Native Village of Evansville.

The Evansville Native Village has no formal zoning or other land use controls as they are a tribal government. There are few areas of commercial land use within the Village.

Development Trends

Development in Evansville Native Village will likely remain relatively flat following its slowly declining population levels since 1960. Within the past decade, funding was provided for updates to homes in Evansville. Currently, 80% of the homes have a septic system and are on well water. Vulnerability to potential hazards has remained the same since the 2011 HMP as suitable developable vacant land is in short supply.

The following projects are in various stages from planning to construction. The earlier dated projects may be complete as this was the most recent data available from the DCCED Community Profile for the Native Village of Evansville.

7.0 Mitigation Strategy

This section outlines the four-step process for preparing a mitigation strategy including: developing mitigation goals, identifying mitigation actions, evaluating mitigation actions, and implementing mitigation action plans. Within this section, the Planning Team developed the mitigation goals and potential mitigation actions for the Evansville Native Village.

7.1 DEVELOPING MITIGATION GOALS

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

DMA 2000 Requirements: Mitigation Strategy – Local Hazard Mitigation Goals

Local Hazard Mitigation Goals

Requirement §201.7: [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Element

Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

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, nine goals were developed to reduce or avoid long-term vulnerabilities to the identified hazards in 2009 (Table 15). These goals were re-prioritized in 2017 to reflect that wildland fires, landslide, erosion, and permafrost are the highest priority in that order.

Table 15-Mitigation Goals

No.	Goal Description
1	Reduce possibility of damage and losses from wildland fires. Update in 2017: This is the highest priority for Evansville.
2	Reduce possibility of damage and losses from landslide. Update in 2017: This is still a priority for Evansville.
3	Reduce possibility of damage and losses from erosion. Update in 2017: This is still a priority for Evansville.
4	Reduce possibility of damage and losses from permafrost. Update in 2017: This is still a priority for Evansville.
5	Promote recognition and mitigation of all natural hazards that affect the Native Village of Evansville.
6	Cross reference mitigation goals and actions with other Native Village of Evansville planning mechanisms and
7	Reduce possibility of losses from all natural hazards that affect the Native Village of Evansville.
8	Reduce vulnerability of structures to earthquake damage.
9	Reduce the possibility of damage and losses from flooding. Update in 2017: This is still a priority for Evansville.
10	Reduce vulnerability of structures to severe winter storm damage.

7.2 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: Mitigation Strategy - Identification and Analysis of Mitigation Actions

Identification and Analysis of Mitigation Actions

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

Element

- Does the new or updated plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?

After mitigation goals and actions were developed, the planning team assessed the potential mitigation actions to carry forward in the mitigation strategy. Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Mitigation actions are usually grouped into four broad categories: prevention, property protection, public education and awareness, and structural projects. On August 28, 2009, the Planning Team selected 63 mitigation actions for potential 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. These potential projects are listed in Table 16 below.

DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Identification and Analysis of Mitigation Actions: NFIP Compliance

Requirement §201.7: [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Element

- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Table 16-Mitigation Goals and Potential Actions (Bold ID items were selected for implementation by the Planning Team)

Goals		Actions	
No.	**Description**	**ID**	**Description**
1	Promote recognizing and mitigating all natural hazards that affect the Native Village of Evansville	**A**	Hold an annual or biennial "hazard meeting" to provide information to residents about recognizing and mitigating all natural hazards that affect the Native Village of Evansville. Presented in the form of a brochure or written media so that residents can take information with them after the meeting.
		B Ongoing	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all natural hazards.
		C	Join the National Flood Insurance Program (NFIP) to reduce monetary losses to individuals and the community.
		D	Identify and list repetitively flooded structures and infrastructures, analyze the threat to these facilities, and prioritize mitigation actions to protect the threatened population.
2	Reduce possibility of losses from all natural hazards that affect the Native Village of Evansville.	**A**	Identify and pursue funding opportunities to implement mitigation actions through internal and external agencies such as (Alaska Native Tribal Health Consortium (ANTHC), Department of Commerce, Community, and Economic Development (DCCED), Alaska Department of Transportation (AKDOT), and US Housing and Urban Development (HUD) etc.).
		B	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. first responder and medical facilities, schools, correctional facilities, and water and sewage treatment plants, etc.)
		C	Acquire (buy-out), demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas. Update in 2017: three homes that had been close to the erosion prone area of the river have been moved; there is still one home within 10 feet of the river.
		D	Identify and list repetitively flooded structures and infrastructures, analyze the threat to these facilities, and prioritize mitigation actions to protect the threatened population.
		E	Raise frontage road bed to mitigation recurring road surface damages.
		F	Increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load and wind storm power line failure during severe wind or winter ice storm events.
		G	Harden utility facilities located along river embankments to mitigate potential flood, debris, and erosion damages.
		H	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption (i.e. first responder and medical facilities, schools, correctional facilities, and water and sewage treatment plants, etc.)
		I	Develop vegetation projects to restore clear cut and riverine erosion damage and to increase landslide susceptible slope stability
		J	Perform hydrologic and hydraulic engineering, and drainage studies and analyses. Use information obtained for feasibility determination and project design. This information should be a key component, directly related to a proposed project.
		K	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.

Goals		Actions	
No.	Description	ID	Description
3	Cross reference Mitigation goals and actions with other Village planning mechanisms and projects	**A**	Establish a formal role for the jurisdictional Hazard Mitigation Planning Committees to develop a sustainable process to implement, monitor, and evaluate community wide mitigation actions.
		B	The Village will aggressively manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, and transportation plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding sources.
		C	Integrate the Mitigation Plan findings for enhanced emergency response planning.
		D	Develop and incorporate building ordinances commensurate with building codes to reflect survivability from flood, fire, wind, seismic, and other hazards to ensure occupant safety.
		E	Develop and incorporate mitigation provisions and recommendations into zoning ordinances and community development processes to maintain the floodway and protect critical infrastructure and private residences from other hazard areas.
		F	Review ordinances and develop outreach programs to assure propane tanks are properly anchored and hazardous materials are properly stored and protected from known natural hazards such as flood or seismic events.
4	Reduce vulnerability of structures to earthquake damage.	**A**	Disseminate Federal Emergency Management Agency (FEMA) pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits.
		B	Develop outreach program to educate residents concerning benefits of increased seismic resistance and modern building code compliance during rehabilitation or major repairs for residences or businesses, and to ensure new buildings comply with hazard resistant construction practices.
		C	Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current State Adopted Building Codes.
		D	Evaluate critical public facility seismic performance for fire stations, public works buildings, potable water systems, wastewater systems, electric power systems, and bridges within the jurisdiction.
5	Reduce possibility of damage and losses from erosion.	**A**	Maintain and update erosion hazard locations, identify critical facilities potentially impacted and develop mitigation initiatives such as bank stabilization or facility relocation to prevent or reduce the threat. Update in 2017: Fuel tanks near river erosion area were relocated; continue to monitor potential effect of erosion on clinic and power plant generator.
		B	Relocate buildings that are at risk of being affected by erosion. Update in 2017: Three homes have been moved; there is still one home (within 10 feet of erosion area) that needs to be relocated.
		C	Apply for grants/funds to implement riverbank protection methods.
		D	Develop and provide information to all residents on riverbank erosion and methods to present it in an easily distributed format.
		E	Install riprap, or pilings to harden or "armor' stream banks where severe erosion occurs.
		F	Harden culvert entrance bottoms with rock to reduce erosion or scour.
		G	Install embankment protection such as vegetation, riprap, gabion baskets, sheet piling, and walls to reduce or eliminate erosion.
		H	Raise frontage road bed to mitigation recurring road surface erosion damages.

Goals		Actions	
No.	Description	ID	Description
6	Reduce the possibility of damage and losses from flooding.	A	Develop and maintain Geographic Information System (GIS) mapped critical facility inventory for all structures located within 100-year and 500-year floodplains.
		B	Develop and maintain GIS mapped inventory, and develop prioritized list of residential and commercial buildings within 100-year and 500-year floodplains.
		C	Develop and maintain GIS mapped inventory of repetitive loss (RL) properties to include the types and numbers of properties.
		D	Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100-year floodplain using survey elevation data.
		E	Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding and significant damages or road closures.
		F	Develop an outreach program to educate public concerning NFIP participation benefits, floodplain development, land use regulation, new building siting, and NFIP flood insurance availability to facilitate continued compliance with the NFIP. Update in 2017: Evansville is not to participate in NFIP. This action will be removed in the next plan update.
		G	Develop, implement, and enforce floodplain management ordinances.
		H	Develop outreach program to educate residents concerning flood proofed well and sewer/septic installation for new and existing buildings.
		I	Acquire (buy-out), relocate, elevate, or otherwise flood-proof identified critical facilities and private properties.
		J	Raise frontage road bed to mitigation recurring road surface flood damages.
7	Reduce possibility of damage and losses from landslide.	A	Complete a landslide location inventory; identify threatened critical facilities and other buildings and infrastructure.
		B	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
		C	Develop process to limit future development in high landslide potential areas (permitting, geotechnical review, soil stabilization techniques, etc).
		D	Develop a vegetation management plan addressing slope-stabilizing root strength while facilitating precipitation containment.
		E	Relocate AP&T generator building.
8	Reduce possibility of damage and losses from permafrost.	**A**	Identify and map existing permafrost areas to assist in critical facility relocation siting.
		B	Promote permafrost sensitive construction practices for new building siting in permafrost areas.

Goals		Actions	
No.	Description	ID	Description
9	Reduce vulnerability of structures to severe weather damage.	**A Ongoing**	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.
		B	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting special needs populations.
		C Ongoing	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events. Update in 2017: Trees have been thinned out in many areas of the Village; this is an ongoing action.
		D Ongoing	Develop personal use and educational outreach training for a "safe tree harvesting" program. Implement along utility and road corridors, preventing potential winter storm damage.
		E	Implement and enforce the most current State adopted building codes for new construction to ensure structures can withstand winter storm hazards such as high winds, rain, water, and snow.
10	Reduce possibility of damage and losses from wildland fires.	**A**	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
		B Ongoing	Develop Community Wildland Fire Protection Plans.
		C Ongoing	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping for new and existing buildings.
		D Ongoing	Promote FireWise building siting, design, and construction materials for new structures.
		E Ongoing	Provide wildland fire information in an easily distributed format for all residents.
		F	Develop, adopt, and enforce burn ordinances that require burn permits, restrict campfires, and controls outdoor burning.
		G	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high risk areas.
		H	Identify, develop, implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.

7.3 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

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

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Implementation of Mitigation Actions

Requirement: §201.7: [The mitigation strategy section shall include] an action plan describing how the actions will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

Element

- Does the new or updated mitigation strategy include how the actions are prioritized?
- Does the new or updated mitigation strategy address how the actions will be implemented and administered?
- Does the new or updated prioritization process include an emphasis on the use of a cost-benefit review to maximize benefits?
- Does the updated plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?

The Planning Team evaluated and prioritized each of the mitigation actions 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 Native Village of Evansville. To complete this task, the Planning Team first prioritized the hazards that were regarded as the most significant within the community (erosion, flood, and severe weather). The Planning Team reviewed the simplified Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) evaluation criteria (shown in Table 17) and the Benefit-Cost Analysis Fact Sheet (Appendix D) 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 relative benefits and costs, and where available, the technical feasibility. A detailed cost-benefit analysis is anticipated as part of the application process for those projects the Village chooses to implement.

Table 17-STAPLEE 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 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 October 22, 2009, the Planning Team prioritized each mitigation action selected to be carried forward into the Mitigation Action Plan. To determine the priority of the mitigation action, the Planning Team considered each hazard's history, extent, and probability. 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 in the Mitigation Action Plan was completed to provide the Village with an approach to implement the plan. Table 18 summarizes the mitigation action priorities, and these priorities remained the same as 2011.

7.4 IMPLEMENTING A MITIGATION ACTION PLAN

Table 18 shows the Evansville Native Village Mitigation Action Plan Matrix that shows how the mitigation actions were prioritized, how the overall benefit/costs were taken into consideration, and how each mitigation action will be implemented and administered by the Planning Team.

Table 18 Native Village of Evansville Mitigation Action Plan Matrix

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
1A	Hold an annual or biennial "hazard meeting" to provide information to residents about recognizing and mitigating all natural hazards that affect the Native Village of Evansville. Update in 2017: This was not implemented due to lack of resources.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, FEMA HMA, HMGP, AFG, FP&S, SAFER, ANA, EFSP	1-4 Years	B/C: Sustained 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 Tribal Council staff
1B	Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all natural hazards. Update in 2017: This action was not implemented due to lack of resources.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) Program grants, FEMA Hazard Mitigation Grant Program (HMGP) grant, FEMA Assistance to Firefighters Grant (AFG) Program's Fire Prevention and Safety Grant (FP&S) Program, and Staffing for Adequate Fire and Emergency Response (SAFER) Program, Administration for Native Americans (ANA)	Ongoing	B/C: Sustained 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 Tribal Council staff
2A	Identify and pursue funding opportunities to implement mitigation actions. Update in 2017: This action was not implemented due to lack of resources.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council	Ongoing	B/C: Identifying potential funding sources is minimal in cost and essential for the Village due to limited available funding levels. This activity is essential to reducing damage and losses from any hazard event. TF: Tribal Council staff are technically capable of researching available funding sources. However, engineering assistance from outside the community may be required for construction projects.

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
2C, 6I	Acquire (buy-out), demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas. Update in 2017: Three homes that had been close to the erosion prone area of the river have been moved; there is still one home within 10 feet of the river.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Council, HMA, HMGP, AFG, FP&S, SAFER, ANA, EFSP	1 Year	B/C: Acquisition or relocation projects are the most cost-effective methods to remove structures from damage and the population from hazard damage. Relocation costs are minor compared to building replacement due to the community's rural location where materials shipping is exceedingly expensive. TF: The Village has the technical capability to manage and conduct this project.
2E, 5H, 6J	Raise frontage road bed to mitigation recurring road surface damages. Update 2017: Not complete due to lack of funding.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER, ANA, EFSP	3-5 Years	B/C: Raising the road bed to reduce erosion and flood damages removes the roadbed from the hazard area. TF: The Village has the technical capability to manage and conduct this project.
5A	Maintain and update erosion hazard locations, identify critical facilities potentially impacted and develop mitigation initiatives such as bank stabilization or facility relocation to prevent or reduce the threat. Update in 2017: Fuel tanks near river erosion area were relocated; continue to monitor potential effect of erosion on clinic and power plant generator.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER, ANA, EFSP	Ongoing	B/C: Identifying threatened infrastructure proximity to natural hazards is vital to their sustainability. There are no currently 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 staff and resources they have used to relocate and elevate buildings.

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
7B	Relocate AP&T generator building. Update in 2017: Not complete due to lack of funding.	High	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, ANA. AP&T	3-5 Years	B/C: Relocation projects are the most cost effective methods to remove structures from damage and the population from hazard damage. Critical facility relocation costs are minor compared to facility replacement due to the community's rural location where materials shipping is exceedingly expensive. TF: The Village has the technical capability to manage and conduct this project.
3A	Establish a formal role for the jurisdictional Hazard Mitigation Planning Committees to develop a sustainable process to implement, monitor, and evaluate community wide mitigation actions. Update in 2017: This action was not mitigated due to lack of funding.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council	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 Village residents. TF: This action is feasible with limited fund expenditures.
3B	The Village will aggressively manage their existing plans to ensure they incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, and transportation plans, etc. to demonstrate multi- benefit considerations and facilitate using multiple funding sources. Update in 2017: This action was not mitigated due to lack of funding.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council	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 Village residents. TF: This action is feasible with limited fund expenditures.

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
8A	Identify and map existing permafrost areas to assist in critical facility relocation siting. Update in 2017: This action was not mitigated due to lack of funding.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, ANA, HMA, HMGP	4 Years	B/C: Identifying permafrost locations is a minimal cost which would decrease damage to facilities if they were sited appropriately. Project must be associated with a relocation or construction project. TF: The community currently has identified permafrost locations but they have not created a map defining the area and they dig test holes to determine permafrost depth prior to construction.
9A	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms. This action was not mitigated due to	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER, ANA	2-4 Years	B/C: A sustained maintenance program is minimal in cost and will help reduce or eliminate future weather-related damages. TF: This project is technically feasible through available community member skill sets.
9C Ongoing	Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events. Update in 2017: Trees have been thinned out in many areas of the Village.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville, HMA, HMGP, AFG, FP&S, SAFER, ANA	Completed	B/C: Sustained maintenance program is minimal in cost and will help reduce or eliminate future weather-related damages. TF: This project is technically feasible through available community member skill sets.
10B Ongoing	Develop Community Wildland Fire Protection Plans. Update in 2017: A CWPP was prepared. This action can be deleted during the next plan update.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, AFG, FP&S, SAFER, ANA	Completed	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and Village residents. TF: This action is feasible with limited fund expenditures.

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
10C Ongoing	Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping for new and existing buildings. Update in 2017: This action was not implemented due to lack of resources.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, AFG, FP&S	1-3 Years	B/C: Sustained 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 Tribal Council staff.
10D Ongoing	Promote FireWise building siting, design, and construction materials for new structures. Update in 2017: This action was not implemented due to lack of	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, AFG, FP&S	1-3 Years	B/C: Sustained 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 Tribal Council staff.
10E Ongoing	Provide wildland fire information in an easily distributed format for all residents. Update in 2017: This action was not implemented due to lack of resources.	Medium	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER	1-3 Years	B/C: Sustained 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 Tribal Council staff.
4A	Disseminate FEMA pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits. Update in 2017: This action was not implemented due to lack of resources.	Low	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER, ANA, EFSP	2-4 Years	B/C: Sustained 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 Tribal Council staff.

Action ID	Description	Prioritization	Responsible Department	Potential Funding	Time frame	Benefit/Costs (B/C) /Technical Feasibility (TF)
9D Ongoing	Develop personal use and educational outreach training for a "safe tree harvesting" program. Implement along utility and road corridors, preventing potential winter storm damage. Update in 2017: This action was not implemented due to lack of resources.	Low	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville, HMA, HMGP, AFG, FP&S, SAFER, ANA	2-4 Years	B/C: Sustained 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 Tribal Council staff.
10A	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures. Update in 2017: This action was not implemented due to lack of resources.	Low	First Chief Frank Thompson Native Village of Evansville Tribal Council	Native Village of Evansville Tribal Council, HMA, HMGP, AFG, FP&S, SAFER, ANA	2-4 Years	B/C: Sustained 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 Tribal Council staff.

8.0 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 Native Village of Evansville 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:

- Monitoring, evaluating, and updating the HMP
- Implementation through existing planning mechanisms
- Continued public involvement

8.1 MONITORING, EVALUATING, AND UPDATING THE LHMP

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

DMA 2000 Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

Monitoring, Evaluating and Updating the Plan

Requirement §201.7: [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.

Element

- Does the new or updated plan describe the method and schedule for monitoring the plan, including the responsible department?
- Does the new or updated plan describe the method and schedule for evaluating the plan, including how, when and by whom (i.e., the responsible department?
- Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

The HMP was prepared as a collaborative effort among the Planning Team Members. There were no other ongoing tribal planning efforts in 2017 to integrate the Update of this HMP with. To maintain momentum and build upon previous hazard mitigation planning efforts and successes, the Evansville Native Village will use the Planning Team to monitor, evaluate, and update the HMP. Each authority identified in Table 18 will be responsible for implementing the Mitigation Action Plan. The First Chief and Tribal Administrator, the Hazard Mitigation Planning Team co- Leaders (or designees), will serve as the primary points-of-contact and will coordinate local efforts to monitor, evaluate, and revise the HMP. The Evansville Native Village will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002 and will amend this HMP whenever necessary to reflect changes in Tribal or Federal laws and statutes.

The Planning Team will review the HMP on an annual basis and monitor the progress in implementing the HMP, particularly the Mitigation Action Plan. Each July, Evansville holds its annual corporation meeting. During this meeting the Planning Team will distribute informational fliers and surveys relevant to Evansville Mitigation Action Plan. As shown in Appendix E, the Annual Review Worksheet will provide the basis for possible changes in

the HMP Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes to or increases in resource allocations, and engaging additional support for the HMP implementation. The Planning Team Leaders 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:

- Participation of authorities and others in the HMP implementation
- Notable changes in the risk of natural or human-caused hazards
- Impacts of land development activities and related programs on hazard mitigation
- Progress made with the Mitigation Action Plan (identify problems and suggest improvements as necessary)
- The adequacy of local resources for implementation of the HMP

A system of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, each authority administering a mitigation project will submit a Progress Report to the Planning Team. As shown in Appendix E, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieved the appropriate goals identified in the plan. As projects are completed, project grants will be closed out in accordance with their applicable funding source instructions.

In addition to the annual review, the Planning Team will update the HMP every five years. To ensure that this update occurs, in the third year following adoption of the HMP, the Planning Team will undertake the following activities:

- Request grant assistance for DHS&EM to update the mitigation plan (this can take up to one year to obtain and one year to update the plan)
- Thoroughly analyze and update the risk of natural and human-made hazards
- Provide a new annual review (as noted above), plus a review of the three previous annual reviews
- Provide a detailed review and revision of the mitigation strategy
- Prepare a new Mitigation Action Plan for the Evansville Native Village
- Prepare a new draft HMP
- Submit an updated HMP to the DH&EM and FEMA for approval
- Submit the FEMA approved plan for adoption by the Evansville Native Village

8.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in

the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

Incorporation into Existing Planning Mechanisms

Requirement §201.7: [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.

Element

- Does the new or updated plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?
- Does the updated plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?

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.

- 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.

8.3 EVANSVILLE NATIVE VILLAGE CAPABILITY ASSESSMENT

The Evansville Native Village capability assessment reviews the technical and fiscal resources available to the community. This section outlines the resources available to the Evansville Native Village for mitigation and mitigation related funding and training.

Table 19 Evansville Native Village Regulatory Tools

Regulatory Tools (ordinances, codes, plans)	Existing?	Comments (Year of most recent update; problems administering it, etc.)
Building code	No	The Tribal Council does not possess this authority.
Zoning ordinances	No	The Tribal Council does not possess this authority.
Subdivision ordinances or regulations	No	The Tribal Council does not possess this authority.
Special purpose ordinances	No	The Tribal Council does not possess this authority.
Tribal Constitution	Yes	Establishes tribal authority.
Comprehensive Plan	No	

Community Plan	Yes	In Progress, discusses community goals, land development, and land use.
Sanitation Plan	Yes	Discusses sanitation facility options, soil composition, and future expansion possibilities.
Clinic Business Plan	Yes	Discusses health care in the community and potential business impacts.
Transportation Plan	Yes	Lists BIA roads, location, design, and future expansion
Community Wildfire Protection Plan	Yes	Identifies actions to protect the community.
Emergency Response Plan	No	
Land Use Plan	Yes	The Tribal Corporation has a land use resolution which guides members with building location to prevent flood and erosion damages and losses.
Erosion Study	Yes	2009 USACE Erosion Information Paper
Flood Study	No	

Federal Resources

The Federal government requires local governments to have a hazard mitigation plan 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).
    - 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.

- Mitigation Resources for Success compact disc (CD). FEMA 372, September 2001. This CD contains a wealth of information about mitigation and is useful for state and local government planners and other stakeholders in the mitigation process. It provides mitigation case studies, success stories, information about Federal mitigation programs, suggestions for mitigation measures to homes and businesses, appropriate relevant mitigation publications, and contact information.
- A Guide to Federal Aid in Disasters. FEMA 262, April 1995. When disasters exceed the capabilities of state and local governments, the President's disaster assistance programs (administered by FEMA) is the primary source of Federal assistance. This handbook discusses the procedures and process for obtaining this assistance, and provides a brief overview of each program.
- 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, 2009.
  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)

- Department of Agriculture (USDA). Assistance provided includes: Emergency Conservation Program, Non-Insured Assistance, Emergency Watershed Protection, Rural Housing Service, Rural Utilities Service, and Rural Business and Cooperative Service.
- Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Weatherization Assistance Program. This program minimizes the adverse effects of high energy costs on low-income, elderly, and handicapped citizens through client education activities and weatherization services such as an all-around safety check of major energy systems, including heating system modifications and insulation checks.
- Department of Health and Human Services, Administration of Children & Families (DHHS/ADF), 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/)

- Department of Housing and Urban Development (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.
- Department of Housing and Urban Development, Community Development Block Grants (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.
- 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.
- 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), Tax Relief. Provides extensions to current year's tax return, allows deductions for disaster losses, and allows amendment of previous tax returns to reflect loss back to three years.
- U.S. Army Corps of Engineers. The USACE Alaska District's Civil Works Branch studies potential water resource projects in Alaska. These studies analyze and solve water resource issues of concern to the local communities. These issues may involve navigational improvements, flood control or ecosystem restoration. The agency also tracks flood hazard data for over 300 Alaskan communities on floodplains or the sea coast. These data help local communities assess the risk of floods to their communities and prepare for potential future floods. The USACE is a member and co-chair of the Alaska Climate Change Sub-Cabinet.
- US Small Business Administration (SBA). May provide low-interest disaster loans to individuals and businesses that have suffered a loss due to a disaster. Requests for SBA loan assistance should be submitted to DHS&EM.

State Resources

- DHS&EM 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 the elevation, relocation, or acquisition of hazard-prone properties. DHS&EM also provides mitigation funding resources for mitigation planning on their Web site at http://www.ak-prepared.com/plans/mitigation/mitigati.htm.

- Division of Senior Services (DSS): Provides special outreach services for seniors, including food, shelter and clothing.
- Division of Insurance (DOI): Provides assistance in obtaining copies of policies and provides information regarding filing claims.
- Department of Military and Veterans Affairs (DMVA): Provides damage appraisals and settlements for VA-insured homes, and assists with filing of survivor benefits.
- The Community Health and Emergency Medical Services (CHEMS) is a section within Division of Public Health within the Department of Health and Social Services (DHSS). DHSS is charged with promoting and protecting the public health and one of CHEMS' responsibilities is developing, implementing, and maintaining a statewide comprehensive emergency medical services system. The department's statutory mandate (Alaska Statute 18.08.010) requires it to:
    - Coordinate public and private agencies engaged in the planning and delivery of emergency medical services, including trauma care, to plan an emergency medical services system
    - Assist public and private agencies to deliver emergency medical services, including trauma care, through the award of grants in aid
    - Conduct, encourage, and approve programs of education and training designed to upgrade the knowledge and skills of health personnel involved in emergency medical services, including trauma care
    - Establish and maintain a process under which hospitals and clinics can represent themselves to be trauma centers because they voluntarily meet criteria adopted by the department which are based on an applicable national evaluation system
- DCRA within the DCCED. DCRA administers the CDBG, FMA, 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 department also administers programs for State "distressed" and "targeted" communities.
- 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.

- Department of Transportation and Public Facilities (DOT/PF). 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.

  In addition, 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 safe, efficient, economical, and effective operation of the State's highways, harbors, and airports. DOT/PF uses it's Planning, Design, and Engineering, Maintenance and Operations, and Intelligent Transportation Systems resources to identify the hazard, 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 the temporary replacement bridges and materials necessary to make the multi-model transportation system operational following a natural disaster.

- Department of Natural Resources (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 for the use and development of Alaska's mineral, land, and water resources, and collaboration on earthquake mitigation.

  - DNR’s Division of Geological and Geophysical Survey (DGGS). DGGS collects and distributes information about the State's geologic resources and hazards. 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 that information to the public

  - DNR’s DOF. 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.

  - DOF also manages various wildland fire programs, activities, and grant programs such as the FireWise Program, the Community Forestry Program and the Volunteer Fire Assistance and Rural Fire Assistance Grant programs. Information can be found at http://forestry.alaska.gov/fire/current.htm.

Other Funding Sources and 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.
- 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.

Local Resources

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

Table 20 Evansville Native Village Staff Resources

Staff/Personnel Resources	Y/N	Department/Agency and Position
Planner or engineer with knowledge of land development and land management practices	Yes	Evansville, Inc.
Engineer or professional trained in construction practices related to buildings and/or infrastructure	Yes	Evansville, Inc.
Planner or engineer with an understanding of natural and/or human-caused hazards	Yes	Evansville, Inc.
Floodplain Manager	No	Jimmie C. Smith, State Floodplain Manager
Surveyors	No	Village may hire surveying consulting services
Staff with education or expertise to assess the jurisdiction's vulnerability to hazards	No	Fire Chief, Eric Fox of Bettles

Personnel skilled in Geological Information System (GIS) and/or Hazard Multi-Hazard (HAZUS-MH)	No	Planned for Future Environmental Coordinator position
Scientists familiar with the hazards of the jurisdiction	No	US Fish and Wildlife Service (USFWS) local office; Alaska Department of Fish and Game (ADF&G) local office
Emergency Manager	Yes	Fire Chief, Eric Fox of Bettles
Grant writers	Yes	Tribal Administrator, Naomi Costello
Public Information Officer	Yes	Tribal Administrator, Naomi Costello

Table 21 Evansville Native Village Financial Resources

Financial Resources	Accessible or Eligible to Use *(Yes/No/DK-Don't Know)*
Tribal General Funds	Yes, insufficient funds available to enable extensive mitigation action implementation.
Community Development Block Grants (CDBG)	Yes
Capital Improvement Projects Funding	Yes, insufficient funds available to enable extensive mitigation action implementation.
US Department of Agriculture (USDA) Housing and Urban Development (HUD) Home Grants	Yes
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric service	No
Impact fees for homebuyers or developers for new developments/homes	No
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

8.4 CONTINUED PUBLIC INVOLVEMENT

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

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement
Continued Public Involvement
Requirement §201.7: [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.
Element
■ Does the new or updated plan explain how continued public participation will be obtained?

The Evansville Native Village is dedicated to involving the public directly in the continual reshaping and updating of the HMP. A paper copy of the HMP and any proposed changes will available at the Village Tribal Office. An address and phone number to which people can direct their comments or concerns will also be available at Village Tribal Office.

Each May, Evansville holds a city clean-up day involving most of its residents. During this time, the Planning Team will distribute surveys relevant to the Evansville Mitigation Action Plan (see Appendix E). Completed surveys will be retained and kept until the next five-year update.

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Appendix A: Public Involvement

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November 14, 2017

Brent Nichols, CFM
State of Alaska
DMVA DHS&EM
P.O. Box 5750
Joint Base Elmendorf-Richardson, Alaska 99505-5750

Mr. Nichols:

This letter serves as the Evansville Village's Letter of Commitment to support DMVA DHS&EM and LeMay Engineering & Consulting, Inc. in their Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) planning grant to update the 2010 hazard mitigation plan for Evansville. The end goal of this grant is a State- and FEMA- approved hazard mitigation plan that the Evansville Village will adopt.

Sincerely,

Frank Thompson
First Chief

Hazard Mitigation Plan Update for Evansville, Alaska

Newsletter #1: November 8, 2017

The State of Alaska, Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management (DHS&EM) was awarded a Pre-Disaster Mitigation Program grant from the Federal Emergency Management Agency (FEMA) to update the 2010 hazard mitigation plan (HMP) for Evansville. This plan will assist the Tribe as a valuable resource tool in making decisions. Additionally, communities must have a State- and FEMA-approved and community-adopted HMP plan to receive FEMA pre- and post- disaster grants.

LeMay Engineering & Consulting, Inc. was contracted to assist Evansville with preparing a 2017 HMP update. The HMP will identify all applicable natural hazards. The plan will identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Join the planning team and offer your advice: Any interested community member may join the planning team. To join, call or send Jennifer LeMay an email at jlemay@lemayengineering.com. The purpose of this newsletter is to introduce this project and encourage public involvement during this process. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas.

Attend the November 14, 2017, Community Introductory Meeting at 1 pm: The agenda will be a summary of the hazard mitigation plan process by Patrick LeMay. You're invited to provide input to the plan. Specifically, we'll be discussing which of the following hazards are realistic for Evansville: earthquake, tsunami, flood/erosion, ground failure/avalanche, severe weather, wildland fire, and climate change? Also, what facilities are critical to your community?

For more information, contact:
Frank Thompson, First Chief (907) 692-5005
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner, (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager, (907) 428-7085

jlemay@lemayengineering.com

From: jlemay@lemayengineering.com
Sent: Monday, November 6, 2017 10:42 AM
To: 'evansvillealaska@gmail.com'
Cc: 'Nichols, Brent A (MVA)'; 'Dembroski, Rick W (MVA)'; 'patrick.lemay@lemayengineering.com'; 'Janina@lemayengineering.com'
Subject: Update of Evansville Hazard Mitigation Plan
Attachments: Tribal_Mitigation_Planning_Fact_Sheet_(4.19.16)_FINAL.pdf

Tracking:

Recipient	Read
'evansvillealaska@gmail.com'	
'Nichols, Brent A (MVA)'	
'Dembroski, Rick W (MVA)'	
'patrick.lemay@lemayengineering.com'	
'Janina@lemayengineering.com'	
Janina@lemayengineering.com	Read: 11/6/2017 11:46 AM

Good morning, Frank:

The State of Alaska Department of Military & Veterans Affairs, Division of Homeland Security & Emergency Management (DMVA DHS&EM) has secured a FEMA grant to assist the Tribe in updating its Hazard Mitigation Plan. The DVMA DHS&EM has contracted with LeMay Engineering & Consulting, Inc. to assist in updating the plan. This Plan will be updated at no cost to the Tribe. Brent Nichols is the Project Manager for the State of Alaska (I've copied him above). I am the Project Manager and Planner on this contract for my company, and Janina Broek and Patrick LeMay will also be assisting me (I've copied them on this email).

Hazard mitigation is the process of profiling hazards, analyzing risk, and developing preventative actions. When the preventative actions are implemented, risks are reduced or eliminated. The plan is a living document that creates a framework for governments to reduce the negative impacts from future disasters on lives, property, and the economy. Please see the attached fact sheet for a summary of the process used to develop a Hazard Mitigation Plan. Adoption of the plan by FEMA and the Tribe qualifies the Tribe for FEMA hazard mitigation grants and projects such as, home elevations & relocations, culverts, levee revetments, etc., if funding is available and there is a demonstrated need meeting grant requirements. The plan needs updating every five years pending available funds.

May I assume you will be the Planning Team Lead for this updating effort? If so, I'd like to propose that we speak in the next few days via phone. I can answer any questions that you may have and outline a general approach for us to get started on the plan. You can provide guidance on how the Tribe envisions the process according to your protocol. It would be helpful to me if you could consider a few things before we talk.

1. Janina and I would like to begin updating the plan based on our past experience and using State of Alaska information from their 2013 All-Hazards Mitigation Plan and the State of Alaska Department of Commerce, Community, and Economic Development, Community and Regional Affairs website as well as other agency websites. Have any additional plans been prepared for your community since the plan was updated that may be useful for us to review in updating the plan?

2. Does the Tribe have an existing Local Planning Emergency Committee that could be activated to serve as the Hazard Mitigation Planning Committee? If not, please identify community members that you would like to serve on the Hazard Mitigation Planning Committee? These could be the same as in your existing plan or different. Would it be possible to

convene this committee or commission in November for an introductory meeting? If possible, we'd like to have a second meeting in December to present the plan to the public and ask for comment. Our objective is FEMA approval and Tribe adoption in early April. I'd like to lock in a day and time for the first meeting and the second meeting, as soon as possible.

I look forward to speaking with you. Please give me a call when you have time in the next few days.

Thank you.

Jennifer LeMay, PE, PMP
Vice President
(907) 350-6061

LeMay Engineering
& Consulting, Inc.

Evansville Hazard Mitigation Plan Introductory Meeting

November 14, 2017

1 pm at Tribal Office

Name	Organization	Contact Information (phone or email)
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc.	907.250.9038
Frank D Thompson	Evansville Tribal Council	907-692-5005
Naomi Costello	Evansville Tribal Council	907-692-5005
Alan Manns	Alaska Power + Tele	907-692-5212
Susan Sakari	Tanana Chiefs Conf. Health Aide	907-692-5432

LeMay Engineering & Consulting, Inc.

Patrick M. LeMay, P.E.
President
4272 Chelsea Way
Anchorage, AK 99504
(907) 250-9038
patrick.lemay@lemayengineering.com

November 14, 2017

Brent A. Nichols, EMSII, CFM
Emergency Management Specialist (EMS) II & Certified Floodplain Manager (CFM)
Department of Military and Veterans Affairs (DMVA)
Division of Homeland Security and Emergency Management (DHS&EM)
P.O. Box 5750
JBER, AK 99505-5750

Subject: **Hazard Mitigation Planning Process Trip Report**
Native Village of Evansville, Alaska

On November 14, 2017, Patrick M. LeMay, PE of LeMay Engineering & Consulting, Inc. traveled to Evansville, Alaska. The purpose of this trip was to conduct an introductory meeting, gather hazard data, review with community leaders the applicable hazards for the area, review potential mitigation strategies, and update the critical facilities within the community.

First Chief Frank Thompson provided a commitment letter verifying that the Native Village of Evansville will participate in the update and evaluation the 2017 draft hazard mitigation plan and present it to the Tribal Council for adoption. A public review meeting is scheduled within Evansville for Monday night, December 18, 2017, for public comment on the Draft Hazard Mitigation Plan. The Tribal Council will make the Draft Plan available for review prior to the public meeting.

Both Frank Thompson, First Chief, and Naomi Costello, Tribal Administrator, agreed to be part of the hazard mitigation planning process. Both Mr. Thompson and Ms. Costello were part of the 2010 LMP process. In 2010, there were two additional LMP members who have since moved away from the community. Two interested community members joined the introductory meeting today as part of the public process. The two additional meeting attendees were: Alaska Power & Telephone Plant Operator, Alan Manns, and Tanana Chiefs Conference Community Health Aide, Susan Sakar. Mr. Thompson and Ms. Costello are the only employees of the Native Village of Evansville Tribal council representing 100% of the paid staff on the LMP Team. Of the 16-full time residents, four residents were on shift work at the time of the meeting, with four residents sleeping from their night shift work. Three community members are elders ranging in age from 80 to 93 and were not willing to leave their warm homes to attend the meeting, and the 16th community member is 5 years old.

If you have any questions, please do not hesitate to call me at (907) 250-9038.

11/14/17
Patrick M. LeMay, P.E./Date

Hazard Mitigation Planning Process

Updates to existing plans

Plans must be updated every five years and approved by DHS&EM and FEMA and then adopted by the community by resolution for the community to remain eligible for FEMA grant funding

This is a public process. Everyone who wants to be involved will be given the opportunity to be involved in this process. Send Jennifer LeMay, PE, PMP an email if you'd like more information at jlemay@lemayengineering.com or call her at (907) 350-6061.

We welcome public input and will have a public comment hearing at a public meeting for you to provide input on the plan.

Which hazards are applicable for your community?

- Flood
- Erosion
- Wildland Fire
- Tsunami/Seiche
- Earthquake
- Volcano
- Avalanche
- Ground Failure/Landslide
- Permafrost Degradation
- Severe Weather
- Climate Change

We're interested in information related to:

- hazard identification,
- profiles,
- previous occurrences,
- probability of occurrences, and
- typical recurrence intervals

for each potential hazard.

Plan Process

- Today's introductory meeting
- Gathering of data
- Draft Plan available for public comment (December is our goal month)
- Public hearing for Draft Plan (public comment period)
- State/FEMA review and pre-approval
- Newsletter announcing Final Plan (the public may still comment)
- City and/or Tribal adoption
- Final Approval from State/FEMA (prior to April 23, 2018).

After Plan is completed, approved, and adopted, your community will be eligible to apply for mitigation project funds from DHS&EM and FEMA for five years until the plan requires another update.

Contacts:
Patrick LeMay, PE, LeMay Engineering & Consulting, Inc. Planner (907) 250-9038
Jennifer LeMay, PE, PMP LeMay Engineering & Consulting, Inc. Planner (907) 350-6061
Brent Nichols, CFM, State of Alaska DHS&EM Hazard Mitigation Officer (907) 428-7085

Hazard Mitigation Plan Update for Evansville, Alaska

Newsletter #1: December 15, 2017

LeMay Engineering & Consulting, Inc. was contracted to assist Evansville with preparing a 2017 HMP update. The HMP will identify all applicable natural hazards. The plan will identify the people and facilities potentially at risk and ways to mitigate damage from future hazard impacts.

Join the planning team and offer your advice: Any interested community member may join the planning team. To join, call or send Jennifer LeMay an email at jlemay@lemayengineering.com. The goal is to receive comments, identify key issues or concerns, and improve mitigation ideas.

Attend the December 18, 2017, Public Hearing of the Draft HMP Update at the Tribal Office at 7 pm: The agenda will be a summary of the Draft Plan Update by Patrick LeMay. You're invited to provide input to the plan. Specifically, we'll be discussing:

2017 Plan Hazards

- Earthquake
- Erosion
- Flood
- Landslide
- Permafrost
- Severe Weather
- Wildland Fires
- Climate Change

What would be your top three hazards from the above list?

Critical Infrastructure

Vulnerability Overview Percentages

Mitigation Projects

For more information, contact:
Frank Thompson, First Chief (907) 692-5005
Patrick LeMay, PE, Planner (907) 250-9038
Jennifer LeMay, PE, PMP, Lead Planner, (907) 350-6061
Brent Nichols, DMVA, DHS&EM Project Manager, (907) 428-7085

Evansville Hazard Mitigation Plan Public Hearing

December 18, 2017

7 PM at Tribal Office

Name	Organization	Contact Information (phone or email)
Naomi Costello	Evansville Tribal Council	evansvillealaska@gmail.com
Patrick M. LeMay, PE	LeMay Engineering & Consulting, Inc	907.250.5038
Shannon M. LeMay	LeMay Engineering + Consulting, Inc	907-854-9278

Appendix B: Area Use Map

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AREA USE MAP
BETTLES/EVANSVILLE

66° 55' 24" N 151° 30' 26" W (NAD 83)
Approximate Elevation: 644.56' at 14(c) ROW AP54
Township 24 North, Ranges 18 & 19 West, F.M., AK
U.S.G.S. Quadrangle "BETTLES D-3 & D-4", Alaska
FAIRBANKS RECORDING DISTRICT

SEE SHEET 1 FOR DETAILED COMMUNITY MAP

0 600 1200 1800
SCALE IN FEET

SCALE: 1"=600'
Date of Photography: July 17, 2009
Magnetic Declination computed by U.S.G.S. Geomag
Program using WMM-2005.COF model as of August 1, 2009

Legend & Notes

ANCSA 17(b) Easements
Kanuti National Wildlife Refuge

MAP NOTES

This map was prepared by the Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs (Commerce) using funding from Federal Emergency Management Agency and US Department of the Interior Bureau of Indian Affairs. Commerce contracted with Global Positioning Services, Inc. in June of 2009 to prepare the map.

T. 24 N. R. 19 W., F.M.
T. 24 N. R. 18 W., F.M.

True North
Magnetic North 20 1/2° E

Sec. 24 IC No. 600 Evansville Inc.
Sec. 24 IC No. 600 Evansville Inc.
Sec. 19 IC No. 600 Evansville Inc.
Sec. 13 IC No. 600 Evansville Inc.
Sec. 12 IC No. 600 Evansville Inc.
Sec. 1 IC No. 600 Evansville Inc.
Sec. 19 IC No. 1166 Evansville Inc.
Sec. 18 IC No. 600 Evansville Inc.
Sec. 19 IC No. 600 Evansville Inc.
Sec. 18 IC No. 1166 Evansville Inc.
Sec. 7 IC No. 600 Evansville Inc.
Sec. 6 IC No. 600 Evansville Inc.
Sec. 30 IC No. 600 Evansville Inc.
Sec. 18 IC No. 600 Evansville Inc.
Sec. 19 IC No. 1164 Evansville Inc.
Sec. 18 IC No. 1164 Evansville Inc.
Sec. 18 IC No. 600 Evansville Inc.
Sec. 17 IC No. 1164 Evansville Inc.
Sec. 29 IC No. 600 Evansville Inc.
Sec. 20 IC No. 600 Evansville Inc.
Sec. 17 IC No. 600 Evansville Inc.
Sec. 8 IC No. 600 Evansville Inc.
Sec. 5 IC No. 600 Evansville Inc.
Sec. 21 IC No. 600 Evansville Inc.
Sec. 16 IC No. 600 Evansville Inc.
Sec. 28 IC No. 600 Evansville Inc.
Sec. 9 IC No. 600 Evansville Inc.
Sec. 4 IC No. 600 Evansville Inc.

USS No. 10830 Lot 1
DO 5/21/1951
ANS 268

USS No. 10830 Lot 2
DO 5/21/1951
ANS 268

USS No. 10830 Lot 3
DO 5/21/1951
ANS 268

USS No. 10830 Lot 4
PLO 2909

USS No. 10830 Lot 5
Quit Claim Deed to Evansville Inc.
Bk. 952, Pg. 59
5/17/96

EVANSVILLE ANCSA 14(c) TRACT C
Plat No. 93-142
Quit Claim Deed to Evansville Inc.
Bk. 952, Pg. 59
5/17/96

EVANSVILLE ANCSA 14(c) TRACT B
Plat No. 93-142
Quit Claim Deed to Evansville Inc.
Bk. 952, Pg. 59
5/17/96

ABANDONED SEPTAGE PIT

APPROXIMATE LOCATION
60' Wide Existing Road Esmt.
EIN 100 C4
30' Existing Underground Power and Control Cables
EIN 101 C4
20' Wide Medium Intensity Approach Light System
EIN 103 C4

Permit, Avigation & Hazard Easement & ROW
SOA DOT & PF
Bk. 583, Pgs. 288-293
12/30/88

BETTLES AIRPORT TRACT II
Plat No. 90-07RS

Permit, Avigation & Hazard Easement & ROW
SOA DOT & PF
Bk. 583, Pgs. 288-293
12/30/88

BETTLES AIRPORT TRACT I
Plat No. 90-07RS
Deed to SOA DOT & PF
Bk. 193, Pgs. 63-65
5/27/66

APPROXIMATE LOCATION
2000' Radius Land Use Restriction Esmt. for VOR Site
EIN 102 C4

APPROXIMATE LOCATION
25' Wide Existing Access Trail Esmt.
EIN 2 C1, C5, D9

Ice Road to Old Bettles

BETTLES CITY BOUNDARY

LEASE PARCEL D

CLOSED LANDFILL

BOAT LANDING

TRACT IV
Plat No. 90-07
Permit, Avigation & Hazard Easement & ROW
SOA DOT & PF
Bk. 604, Pgs. 370-375
12/30/98

KOYUKUK RIVER

EROSION

TRACT D
Plat No. 99-90

BOAT LANDING

APPROXIMATE LOCATION
50' Wide Existing Access Trail Esmt.
EIN 1 C3 C5 D9 L

EVANSVILLE ANCSA 14(c)
Plat No. 93-142

KANUTI NATIONAL WILDLIFE REFUGE BOUNDARY

BETTLES AIRPORT VOR LAKE TRACT VI
Plat No. 2003-83
Corporation Warranty Deed to SOA DOT&PF
Bk. 1174, Pg. 893-901
12/2/99

VOR LAKE ACCESS ROAD
BERRY PICKING ON BOTH SIDES OF ROAD

EVANSVILLE LANDFILL AND ACCESS ROAD
Plat No. 95-110

VOR Lake Access Road (WILLOW ROAD)

Deed to State in Trust, Commerce
Bk. 952, Pgs. 56-58
5/17/96

EVANSVILLE LANDFILL
Plat No. 95-110
Lease to Evansville Tribal Council
Bk. 952, Pg. 60-67
5/17/96

Lease Lots 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

BETTLES AIRPORT VOR LAKE TRACT VII
Plat No. 2003-83

Corporation Warranty Deed to SOA DOT&PF
Bk. 1174, Pg. 893-901
12/2/99

Fire Break
Fire Break
Fire Break

HICKEL HIGHWAY
Plat No. 93-142
Deed to State in Trust, Commerce
Bk. 812, Pgs. 152-155
9/7/93

APPROXIMATE LOCATION
50' Wide Existing Access Trail Esmt.
EIN 4 C3 C5 L

To Cemetery

BETTLES/EVANSVILLE AREA USE MAP SHEET 1 1"=600' (2009 PHOTOGRAPHY)

Appendix C: FEMA Review Tool

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FEMA Region 10 Tribal Mitigation Plan Review Tool

The *Tribal Mitigation Plan Review Tool* records how the tribal mitigation plan meets the regulations in 44 CFR §§ 201.7 and 201.5 (if applicable) and offers FEMA plan reviewers an opportunity to provide feedback to the tribal government.

- **Section 1**: The Regulation Checklist documents FEMA's evaluation of whether the plan has addressed all requirements. If plan requirements are not met, FEMA uses each Required Revisions section to indicate necessary changes.
- **Section 2**: The Strengths and Opportunities for Improvement summary identifies plan's strengths as well as areas for improvement as part of the next plan update.

The FEMA mitigation planner must reference the *Tribal Mitigation Plan Review Guide* when completing the *Tribal Mitigation Plan Review Tool*.

<table>
<tr><td>Tribal Jurisdiction:
Evansville, Alaska (Region 10)</td><td colspan="2">Title of Plan:
The Native Village of Evansville Hazard Mitigation Plan Update</td><td>Date of Plan:
December 29, 2017</td></tr>
<tr><td colspan="2">Tribal Point of Contact:
Frank Thompson</td><td colspan="2" rowspan="3">Address:
P.O. Box 26087
Evansville Field, AK 99726</td></tr>
<tr><td colspan="2">Title:
First Chief</td></tr>
<tr><td colspan="2">Agency:
Native Village of Evansville</td></tr>
<tr><td colspan="2">Phone Number: (907) 692-5005</td><td colspan="2">Email: evansvillealaska@gmail.com</td></tr>
</table>

State Reviewer (if applicable):	**Title:**	**Date:**
Brent Nichols, CFM	State Hazard Mitigation Officer	

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region 10		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

Section 1: REGULATION CHECKLIST

1. Standard Regulation Checklist **Regulation** (44 CFR § 201.7 Tribal 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? [44 CFR § 201.7(c)(1)]	20-23, 97-107		
A2. Does the plan document an opportunity for public comment during the drafting stage and prior to plan approval, including a description of how the tribal government defined "public"? [44 CFR § 201.7(c)(1)(i)]	22, 97-107		
A3. Does the plan document, as appropriate, an opportunity for neighboring communities, tribal 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? [44 CFR § 201.7(c)(1)(ii)]	22, Plan will be uploaded to DHS&EM webpage for review after approval		
A4. Does the plan describe the review and incorporation of existing plans, studies, and reports? [44 CFR § 201.7(c)(1)(iii)]	23, 95-96		
A5. Does the plan include a discussion on how the planning process was integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives? [44 CFR § 201.7(c)(1)(iv)]	76-82, 84-86		
A6. Does the plan include a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within the plan update cycle)? [44 CFR § 201.7(c)(4)(i)]	83-93, 114-123		
A7. Does the plan include a discussion of how the tribal government will continue public participation in the plan maintenance process? [44 CFR § 201.7(c)(4)(iv)]	93, 119-123		
ELEMENT A: REQUIRED REVISIONS			
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 the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	28-56		
B2. Does the plan include information on previous occurrences of hazard events and on the probability of future hazard events for the tribal planning area? [44 CFR § 201.7(c)(2)(i)]	28-56		

1. Standard Regulation Checklist **Regulation** (44 CFR § 201.7 Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
B3. Does the plan include a description of each identified hazard's impact as well as an overall summary of the vulnerability of the tribal planning area? [44 CFR § 201.7(c)(2)(ii)]	31, 35, 39, 42, 44, 50-51, 54, 55, 27-68		
ELEMENT B: REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan include a discussion of the tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of tribal laws and regulations related to hazard mitigation as well as to development in hazard-prone areas? [44 CFR §§ 201.7(c)(3) and 201.7(c)(3)(iv)]	8-10		
C2. Does the plan include a discussion of tribal funding sources for hazard mitigation projects and identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities? [44 CFR §§ 201.7(c)(3)(iv) and 201.7(c)(3)(v)]	86-91		
C3. Does the Mitigation Strategy include goals to reduce or avoid long-term vulnerabilities to the identified hazards? [44 CFR § 201.7(c)(3)(i)]	69		
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure? [44 CFR § 201.7(c)(3)(ii)]	70-82		
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized, implemented, and administered by the tribal government? [44 CFR § 201.7(c)(3)(iii)]	77-82		
C6. Does the plan describe a process by which the tribal government will incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate? [44 CFR § 201.7(c)(4)(iii)]	84-85		
C7. Does the plan describe a system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy, including monitoring implementation of mitigation measures and project closeouts? [44 CFR §§ 201.7(c)(4)(ii) and 201.7(c)(4)(v)]	114-123		
ELEMENT C: REQUIRED REVISIONS			

1. Standard Regulation Checklist **Regulation** (44 CFR § 201.7 Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ELEMENT D. PLAN UPDATES			
D1. Was the plan revised to reflect changes in development? [44 CFR § 201.7(d)(3)]	67-68		
D2. Was the plan revised to reflect progress in tribal mitigation efforts? [44 CFR §§ 201.7(d)(3) and 201.7(c)(4)(iii)]	77-82		
D3. Was the plan revised to reflect changes in priorities? [44 CFR § 201.7(d)(3)]	76-82		
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. ASSURANCES AND PLAN ADOPTION			
E1. Does the plan include assurances that the tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, including 2 CFR Parts 200 and 3002, and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes? [44 CFR § 201.7(c)(6)]	Will be in Adoption Resolution		
E2. Does the plan include documentation that it has been formally adopted by the governing body of the tribal government requesting approval? [44 CFR § 201.7(c)(5)]	12		
ELEMENT E: REQUIRED REVISIONS			

2. Enhanced Regulation Checklist **Regulation** (44 CFR § 201.5 Enhanced Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ENHANCED ELEMENT F. STANDARD PLAN REQUIREMENTS			
F1. Does the enhanced plan include all elements of the standard tribal mitigation plan? [44 CFR §§ 201.3(e)(3), 201.5(b), and 201.7]	Yes		
ENHANCED ELEMENT F: REQUIRED REVISIONS			
ENHANCED ELEMENT G. INTEGRATED PLANNING			
G1. Does the enhanced plan demonstrate integration to the extent practicable with other tribal and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §§ 201.3(e)(3) and 201.5(b)(1)]	76-82		
ENHANCED ELEMENT G: REQUIRED REVISIONS			
ENHANCED ELEMENT H. TRIBAL MITIGATION CAPABILITIES			
H1. Does the tribal government demonstrate commitment to a comprehensive mitigation program? [44 CFR §§ 201.3(e)(3) and 201.5(b)(4)]	76-82		
H2. Does the enhanced plan document capability to implement mitigation actions? [44 CFR §§ 201.3(e)(3), 201.5(b)(2)(i), 201.5(b)(2)(ii), and 201.5(b)(2)(iv)]	76-82		
H3. Is the tribal government using existing mitigation programs to achieve mitigation goals? [44 CFR §§ 201.3(e)(3), 201.5(a) and 201.5(b)(3)]	76-82		
ENHANCED ELEMENT H: REQUIRED REVISIONS			

2. Enhanced Regulation Checklist **Regulation** (44 CFR § 201.5 Enhanced Tribal Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ENHANCED ELEMENT I. HMA GRANTS MANAGEMENT PERFORMANCE			
I1. With regard to HMA, is the tribal government maintaining the capability to meet application timeframes and submitting complete project applications? [44 CFR §§ 201.3(e)(3), 201.5(b)(2)(iii)(A)]	76-82		
I2. With regard to HMA, is the tribal government maintaining the capability to prepare and submit accurate environmental reviews and benefit-cost analyses? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(B)]	76-82		
I3. With regard to HMA, is the tribal government maintaining the capability to submit complete and accurate quarterly progress and financial reports on time? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(C)]	76-82		
I4. With regard to HMA, is the tribal government maintaining the capability to complete HMA projects within established performance periods, including financial reconciliation? [44 CFR §§ 201.3(e)(3) and 201.5(b)(2)(iii)(D)]	76-82		
ENHANCED ELEMENT I: REQUIRED REVISIONS			

Section 2: STRENGTHS AND OPPORTUNITIES FOR IMPROVEMENT

INSTRUCTIONS: The purpose of the ***Strengths and Opportunities for Improvement*** section is for FEMA to provide more comprehensive feedback on the tribal mitigation plan to help the tribal government advance mitigation planning. The intended audience is the tribal staff responsible for the mitigation plan update. FEMA will address the following topics:

1. Plan strengths, including specific sections in the plan that are above and beyond the minimum requirements; and
2. Suggestions for future improvements.

FEMA will provide feedback and include examples of best practices, when possible, as part of the *Tribal Mitigation Plan Review Tool,* or, if necessary, as a separate document. The tribal mitigation plan elements are included below in italics for reference. FEMA is not required to provide feedback for each element.

Required revisions from the **Regulation Checklist** are not documented in the **Strengths and Opportunities for Improvement** section. Results from the **Strengths and Opportunities for Improvement** section are not required for Plan Approval.

Describe the mitigation plan strengths areas for future improvements, including areas that may exceed minimum requirements.

- Planning process
- *Hazard identification and risk assessment*
- *Mitigation strategy (including Mitigation Capabilities)*
- *Plan updates*
- *Adoption and assurances*
- *Enhanced Plan - Integrated planning*
- *Enhanced Plan - Tribal government mitigation capabilities (commitment to a comprehensive mitigation program)*
- *Enhanced Plan - HMA grants management performance*

Appendix D: 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 E: Plan Maintenance Documents

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Annual Review Questionnaire

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

Mitigation Action Progress Report

Progress Report Period: _____ (date) to _____ (date)

Project Title: _____ Project ID# _____

Responsible Agency: _____

Address: _____

City: _____

Contact Person: _____ Title: _____

Phone #(s): _____ email address: _____

List Supporting Agencies and Contacts:

_____

_____

Total Project Cost: _____

Anticipated Cost Overrun/Underrun: _____

Date of Project Approval: _____ Start date of the project: _____

Anticipated completion date: _____

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

_____

_____

_____

Milestones	Complete	Projected Date of Completion

Plan Goal (s) Addressed:

Goal: _____

Indicator of Success: _____

_____

_____

_____

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 be accomplished over the next reporting period?

Other Comments:

Community Local Hazard Mitigation Plan Survey

This survey is an opportunity for you to share your opinions and participate in the mitigation planning process. The information that you provide will help us better understand your concerns for hazards and risks, which could lead to mitigation activities that will help reduce those risks and the impacts of future hazard events.

The hazard mitigation process is not complete without your feedback. All individual responses are strictly confidential and will be used for mitigation planning purposes only.

Please help us by taking a few minutes to complete this survey and return it to:

Tribal Administrator, Evansville

Vulnerability Assessment

The following questions focus on how vulnerable the community or its facilities are to damage from a particular hazard type using the following vulnerability scale:

0= Don't Know 1 =Minimally Vulnerable 2=Moderately Vulnerable 3=Severely Vulnerable

1. How vulnerable to damage are the *structures* in the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
c. Earthquakes?	0 1 2 3
d. Severe weather storms?	0 1 2 3
e. Erosion?	0 1 2 3
f. Ground failure (landslide, permafrost)?	0 1 2 3
g. Climate change?	0 1 2 3
h. Other hazards?	0 1 2 3
Please Specify:	

2. How vulnerable to damage are the *critical facilities* within our community from:

[Critical facilities include airport, community shelter, bulk fuel storage tanks, generators, health clinic, law enforcement office (VPO, VPSO, police department), school, public works, e.g. washeteria/water treatment, reservoir/water supply, satellite dish, communications tower, landfills, sewage lagoons, and stores.]

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Severe weather storms?	0 1 2 3
e. Ground failure (landslide, permafrost)?	0 1 2 3
f. Erosion?	0 1 2 3
g. Climate change?	0 1 2 3
h. Other hazards?	0 1 2 3

Please Specify:

3. How vulnerable to displacement, evacuation or life-safety is the community from:

a. Flooding?	0 1 2 3
b. Wildfire?	0 1 2 3
C. Earthquakes?	0 1 2 3
d. Severe weather storms?	0 1 2 3
e. Ground failure (landslide, permafrost)?	0 1 2 3
f. Erosion?	0 1 2 3
g. Climate change?	0 1 2 3
h. Other hazards?	0 1 2 3

Please Specify:

4. Do you have a record of damages incurred during past flood events? Yes No

If yes, please describe:_____

_____

_____

Preparedness

Preparedness activities are often the first line of defense for protection of your family and the community. In the following list, please check those activities that you have done, plan to do in the near future, have not done, or are unable to do. *Please check one answer for each preparedness activity*.

Have you or someone in your household:	Have Done	Plan to do	Not Done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?	☐	☐	☐	☐
Talked with family members about what to do in case of a disaster or emergency?	☐	☐	☐	☐
Made a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	☐	☐	☐	☐
Prepared a "Disaster Supply Kit" extra food, water, medications, batteries, first aid items, and other emergency supplies)?	☐	☐	☐	☐
In the last year, has anyone in your household been trained in First Aid or CPR?	☐	☐	☐	☐

5. Would you be willing to make your home more resistant to natural disasters? ☐ Yes ☐ No

6. Would you be willing to spend more money on your home to make it more disaster resistant? ☐ Yes ☐ No ☐ Don't know

7. How much <u>are you willing to spend</u> to better protect your home from natural disasters? *(Check only one)*

☐	Less than $100	☐	Desire to relocate for protection
☐	$100-$499	☐	Other, please explain
☐	$500 and above		
☐	Nothing / Don't know		
☐	Whatever it takes		

Mitigation Activities

A component of the Local Hazard Mitigation Plan activities is developing and documenting additional mitigation strategies that will aid the community in protecting life and property from the impacts of future natural disasters.

Mitigation activities are those types of actions you can take to protect your home and property from natural hazard events such as floods, severe weather, and wildfire. Please check the box for the following statements to best describe their importance to you. Your responses will help us determine your community's priorities for planning for these mitigation activities.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	☐	☐	☐	☐	☐
Protecting critical facilities (clinic, school, washeteria, police/fire department, water/sewer, landfill)	☐	☐	☐	☐	☐
Preventing development in hazard areas	☐	☐	☐	☐	☐
Protecting natural environment	☐	☐	☐	☐	☐
Protecting historical and cultural landmarks	☐	☐	☐	☐	☐
Promoting cooperation within the community	☐	☐	☐	☐	☐
Protecting and reducing damage to utilities, roads, or water tank	☐	☐	☐	☐	☐
Strengthening emergency services (clinic workers, police/fire)	☐	☐	☐	☐	☐

8. Do you have other suggestions for possible mitigation actions/strategies?

_____

_____

_____

_____

_____

General Household Information

9. Please indicate your age: _____

and Gender: ☐ Male ☐ Female

10. Please indicate your level of education:

☐	Grade school/no schooling	☐	College degree
☐	Some high school	☐	Postgraduate degree
☐	High school graduate/GED	☐	Other, please specify
☐	Some college/trade school		

11. How long have you lived in Evansville?

☐ Less than 5 years ☐ 5 to 10 years ☐ 11 to 20 years ☐ 21 or more years

12. Do you have internet access? ☐ Yes ☐ No

13. Do you own or rent your home? ☐ Own ☐ Rent

If you have any questions regarding this survey or would like to learn about other ways that you can participate in the development of the Local Hazard Mitigation Plan, please contact the Tribal Administrator.

Thank You for Your Participation!

This survey may be submitted anonymously; however, if you provide us with your name and contact information below we will have the ability to follow up with you to learn more about your ideas or concerns (optional):

Name: _____

Address: _____

_____

Phone: _____