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City of Homer
Local Hazard Mitigation Plan

CITY OF HOMER
2022 LOCAL HAZARD MITIGATION PLAN

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ADGGS	Alaska Division of Geological and Geophysical Surveys
ADNR	Alaska Department of Natural Resources
ADOT&PF	Alaska Department of Transportation and Public Facilities
BRIC	Building Resilient Infrastructure and Communities
CFR	Code of Federal Regulations
DMA 2000	Disaster Mitigation Act of 2000
ENSTAR	ENSTAR Natural Gas Company
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
g	gravity
GIS	Geographic Information System
HCC	Homer City Code
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
LHMP	Local Hazard Mitigation Plan
LIDAR	light detection and ranging
NFIP	National Flood Insurance Program
PGA	peak ground acceleration
SFHA	Special Flood Hazard Area
SNAP	Scenarios Network for Alaska + Arctic Planning
STAPLEE	social, technical, administrative, political, legal, environmental, and economic
U.S.	United States
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1.0 INTRODUCTION

1.1 CITY OF HOMER OVERVIEW

The City of Homer is a first-class city in the Kenai Peninsula Borough (Figure 1). The city is on the northern shore of Kachemak Bay, on the southwestern edge of the Kenai Peninsula. The Homer Spit is a distinguishing feature of the city, which extends 4.5 miles from the shoreline into the bay. Homer is 227 road miles south of Anchorage, at the southern terminus of the Sterling Highway. Homer comprises 24.2 square miles, with 13.9 square miles of land and 10.3 square miles of water.

Homer was incorporated in 1964. The city is governed by a city council composed of a mayor and council members. According to the 2020 United States (U.S). Census, the population of Homer is 5,522, up from 5,003 in 2010.

1.2 HAZARD MITIGATION PLANNING

As defined in Title 44 of the Code of Federal Regulations (CFR), Subpart M, Section 206.401, hazard mitigation is "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." As such, hazard mitigation is any work to minimize the impacts of any type of hazard event before it occurs. Hazard mitigation aims to reduce losses from future disasters. It is a process that identifies and profiles hazards, analyzes the people and facilities at risk, and develops mitigation actions to reduce or eliminate hazard risk. The implementation of the mitigation actions—which include short- and long-term strategies that may involve planning, policy changes, programs, projects, and other activities—is the end result of this process.

Over the past two decades, local hazard mitigation planning has been driven by a federal law, known as the Disaster Mitigation Act of 2000 (DMA 2000). On October 30, 2000, Congress passed the DMA 2000 (Public Law 106-390), which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Title 42 of the United States Code Section 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. This new section also provided the legal basis for the Federal Emergency Management Agency's (FEMA's) mitigation plan requirements for the Hazard Mitigation Assistance (HMA) grant programs.

1.3 2022 LOCAL HAZARD MITIGATION PLAN SYNOPSIS

To meet the requirements of the DMA 2000, the City of Homer is updating its 2010 plan, which was included as an annex to the 2014 Kenai Peninsula Borough All-Hazard Mitigation Plan. In 2018, the City unofficially prepared an updated plan. Although the 2018 City of Homer All-Hazard Mitigation Plan was not fully enacted by FEMA, the 2018 plan serves as a reference document for this plan.

The goal of this planning process is to assess risks posed by hazards and to develop prioritized action plans to reduce risks in Homer. The 2022 Local Hazard Mitigation Plan (LHMP) is organized to follow FEMA's Local Mitigation Plan Review Tool (Appendix B), which demonstrates how hazard mitigation plans meet the DMA 2000 regulations. As such, specific planning elements of this review tool are in their appropriate plan sections.

The LHMP structure has been updated to include the following sections:

- **Section 1 Introduction**, which introduces the City of Homer and provides information on hazard mitigation planning.

- **Section 2 Planning Process**, which provides an overview of the planning process, starting with a timeline. It identifies planning team members and describes their involvement with the planning process. This section also details stakeholder outreach, public involvement, and continued public involvement. It provides an overview of the existing plans and reports, details how those documents were incorporated into the 2022 LHMP, and provides a plan update method and schedule. Supporting planning process documentation is provided in Appendix C.
- **Section 3 Hazard Identification**, which provides a description of each of the nine hazards addressed in this plan. Hazard figures are provided in Appendix A.
- **Section 4 Risk Assessment**, which provides hazard impact tables or descriptions for land area, population centers, and critical facilities. An overall summary of vulnerability for each hazard is also provided.
- **Section 5 Mitigation Strategy**, which provides a description of the City of Homer's mitigation goals, potential mitigation actions and projects, and prioritization process. A capability assessment, prioritized action plan, and the process to integrate the 2022 LHMP into other planning mechanisms is also addressed.
- **Section 6 Plan Review**, which provides an overview of development changes that have occurred since the 2010 plan, the progress in local mitigation efforts, and changes in priorities for mitigation actions.
- **Section 7 Plan Adoption**, which provides information about the formal adoption.
- **Section 8 Appendices**, which provides Appendix A (Figures), Appendix B (FEMA Documentation), and Appendix C (Planning Process).

2.0 PLANNING PROCESS

This section addresses Element A of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element A: Planning Process
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))

2.1 OVERVIEW OF THE 2022 LHMP PLANNING PROCESS

The development of the 2022 LHMP was collaborative effort between the City of Homer, AECOM Technical Services, Inc., and a planning team. The planning process officially started in November 2021 and ended in [month, year]. A timeline of the major planning tasks and milestones by month, including the times the planning team met, is provided in Table 2-1. A list of the planning team members and how they contributed to the development of the plan is provided in Table 2-2.

Table 2-1: LHMP Timeline

Date	Tasks	People Involved
November, 2021	LHMP planning team meeting 1 (project overview) Initial information collected: hazards to be profiled, critical facility information	LHMP project manager, consultant, planning team
December, 2021	Initial public outreach, via Facebook and newsletter	LHMP project manager
December 2021 and January 2022	Hazard profiles drafted	LHMP project manager, consultant
January, 2022	Initial stakeholder outreach, via email	LHMP project manager
January, 2022	Critical facilities map reviewed and approved	LHMP project manager, consultant
January, 2022	Hazard figures created, hazard impact assessments drafted Draft mitigation actions developed	Consultant
February, 2022	Planning team meeting 2 (draft mitigation actions reviewed)	LHMP project manager, consultant, planning team

Table 2-1: LHMP Timeline

Date	Tasks	People Involved
February, 2022	Prioritization action plan developed Integration of LHMP into other planning documents determined	LHMP project manager, consultant, planning team
February and March, 2022	Internal Draft LHMP	LHMP project manager, consultant, planning team
March, 2022	Public Draft LHMP Follow-up public outreach and stakeholder involvement	LHMP project manager, consultant, public
[March/April, 2022]	Final Draft LHMP	LHMP project manager, consultant, Alaska Division of Homeland Security and Emergency Management, FEMA Region X
[month, year]	Adoption of Final LHMP	LHMP project manager, City of Homer

Table 2-2: Planning Team

Name	Department/Agency and Title	Contribution
Rick Abboud, AICP	City Planner, City of Homer, LHMP project manager	Served as the LHMP project manager. Led planning team meetings; reviewed and commented on hazard figures, risk assessment tables, mitigation strategies, and the Internal Draft LHMP.
Robert Dumouchel	City Manager, City of Homer	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Jenny Carroll	Special Projects & Communications Coordinator, City of Homer	Reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Janna Davis	Safety Coordinator, Homer Electric Association, Inc.	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Shelly Erickson	City Council Member, City of Homer	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Janette Keiser	Public Works Director, City of Homer	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Mark Kirko	Fire Chief, City of Homer	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.
Scott Mullen	Support Services Director, South Peninsula Hospital	Participated in planning team meetings and/or reviewed planning team documents; reviewed and commented on hazard figures, mitigation strategies, and the Internal Draft LHMP.

2.2 OPPORTUNITIES FOR STAKEHOLDERS

On January 5, 2022, the LHMP project manager reached out to stakeholders via email (Appendix C) about the 2022 LHMP and invited them to participate in the planning process. Stakeholders included the Alaska Department of Homeland Security and Emergency Management, Kachemak City, Alaska Department of Natural Resources (ADNR) Divisions of Forestry and Parks and Recreation, Kenai Peninsula Borough, Friends of Kachemak Bay State Park, University of Alaska Anchorage Kachemak Bay National Estuarine Research Reserve, Kachemak Heritage Land Trust, Cook Inlet Regional, Inc., Homer Airport, Kenai Peninsula School District, Alaska Department of Transportation and Public Facilities (ADOT&PF), and ENSTAR Natural Gas Company (ENSTAR). The Kachemak Bay National Estuarine Research Reserve offered assistance and resources about LHMP planning. The ADNR responded that they had concerns about potential tsunami threat from a glacier-caused landslide across Kachemak Bay. The ADNR is also a landowner along the Homer Spit, which is experiencing damage from erosion. The planning team spoke to them about their concerns and agreed to keep the ADNR informed of the LHMP process. The ADOT&PF also expressed concern about erosion along the Homer Spit and noted that they would like to participate in the planning process. In addition, ENSTAR expressed interest in participating in planning meetings.

The LHMP project manager reached out to the stakeholders again via email on [date], inviting them to review and provide comments about the Public Draft LHMP (Appendix C). [Summary of stakeholder comments].

2.3 PUBLIC INVOLVEMENT

On December 4, 2021, the City of Homer used their monthly newsletter to announce to their public that they were beginning the LHMP update process and provided contact information for interested persons. No comments were received from the public. Also, on [date], the City of Homer used their monthly newsletter to announce the Public Draft LHMP and comment period. Copies of Homer's newsletters are provided in Appendix C.

2.4 REVIEW AND INCORPORATION OF EXISTING PLANS AND REPORTS

A list of the major relevant plans and reports reviewed and incorporated into the 2022 LHMP is provided in Table 2-3.

Table 2-3: Existing Plans and Reports

Plans and Reports	Information to be Incorporated into the 2022 LHMP
Alaska State Hazard Mitigation Plan (2018)	Information on statewide trends and the nature for all hazards are incorporated into the hazard profile and risk assessment sections.
Kenai Peninsula Borough All-Hazard Mitigation Plan (2014)	Information on borough-wide trends and the nature for all hazards are incorporated into the hazard profile and risk assessment sections.
City of Homer All-Hazard Mitigation Plan Update (unofficial) (2018)	Information on community trends and the nature for all hazards are incorporated into the hazard profile and risk assessment sections.
City of Homer and Kachemak City Community Wildfire Protection Plan (Kenai Peninsula Borough 2006)	This plan is in the process of being updated by the borough, but information is incorporated on wildfire history and recommendations brought into the mitigation strategy.

Table 2-3: Existing Plans and Reports

Plans and Reports	Information to be Incorporated into the 2022 LHMP
Homer Comprehensive Plan (City of Homer 2018)	Reviewed to ensure consistency.
Kenai Peninsula Borough Comprehensive Plan (2005)	Reviewed to ensure consistency.
City of Homer Emergency Operations Plan (2013)	Reviewed to ensure consistency.
2005 Homer Area Transportation Plan (City of Homer 2005)	Reviewed to ensure consistency.
Alaska Baseline Erosion Assessment: Study Findings and Technical Report (U.S. Army Corps of Engineers [USACE] 2009)	Background erosion information is incorporated into the hazard identification.
Kenai Peninsula Borough Risk Report: Kenai Peninsula Borough and the Incorporated Cities of Homer, Kachemak, Kenai, Seldovia, Seward, and Soldotna (FEMA 2017)	Background flood and earthquake information is incorporated into the hazard identification.
Coastal Change Analysis (Kachemak Bay Research Reserve 2016)	Historical information on coastal erosion is incorporated into the hazard profiles.
Landslide Hazard Evaluations for Multi-Hazard Risk Mapping in Homer, Alaska (Alaska Division of Geological and Geophysical Surveys [ADGGS] 2020 unpublished)	Information on current and historical landslide hazards in Homer are incorporated into the risk analysis and hazard profiles.
Updated tsunami inundation maps for Homer and Seldovia (ADGGS, 2018)	Tsunami hazard information into the hazard profile section and figure provided in Appendix A.
City of Homer Public Works Campus Tsunami Hazard Report: Risks, Mitigation Strategies, and Recommendations (Public Works Campus Task Force 2021)	Incorporated mitigation recommendations into the mitigation strategy.
Flood Risk Report: Lower Kenai Peninsula (City of Homer 2013)	Incorporated mitigation recommendations into the mitigation strategy.
Coastal Erosion Assessment of Sterling Highway Termini on Homer Spit (Memo from HDR to ADOT&PF 2019)	Information on coastal erosion is incorporated into the hazard profiles.

2.5 CONTINUED PUBLIC PARTICIPATION

A copy of the 2022 LHMP will remain available at the City of Homer Planning and Land Management website and the State of Alaska Division of Community and Regional Affairs online community planning library. The LHMP project manager will use Homer's monthly newsletter to notify the public of, and seek input on, any changes or updates to the 2022 LHMP, including prioritized action plan and the 2027 LHMP kickoff. The public can reach out to the Homer Planning Department with comments or questions at Planning@ci.homer.ak.us.

2.6 PLAN UPDATE METHOD AND SCHEDULE

The 2022 LHMP will be monitored and evaluated by a subset of the planning team, specifically the LHMP project manager. Should the LHMP project manager no longer be involved with the LHMP, the project manager and/or the Homer Planning Department will select a new LHMP project manager to oversee the annual reviews and plan update.

The LHMP project manager will get input from specific planning team members as needed. They will complete the Annual Review Tracker every January and after any major disaster to ensure that the 2022 LHMP is relevant and effective in achieving the plan's goals. Annual review will be tracked in a table in this document (Table 2-4). FEMA-funded mitigation projects will continue to be tracked and reviewed using FEMA Mitigation Progress Report forms; progress summaries will be included in the Annual Review Tracker (Table 2-4) at the beginning of each year.

Four years after the 2022 LHMP's adoption:

- The LHMP project manager will complete the Annual Review Tracker.
- The LHMP project manager will reconvene the planning team and update membership, if necessary.
- The planning team will review Table 2-4, which provides annual summaries of the disasters that have occurred; new permanent information that becomes available; implementation measures; and public outreach and response to determine the hazards to be included in the next LHMP.
- The LHMP project manager will develop a new work plan.
- The LHMP project manager—with support from the planning team—will begin the plan update process, which is expected to take up to 6 months.

Table 2-4: Annual Review Tracker

Year	Disasters that Occurred	Mitigation Actions Implemented	New Relevant Studies/Reports to Include in 2027 LHMP	Public Outreach Conducted	Changes Made to 2022 LHMP
2023					
2024					
2025					
2026					

3.0 HAZARD IDENTIFICATION AND RISK ASSESSMENT

This section addresses Element B of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element B: Hazard Identification and Risk Assessment
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement § 201.6(c)(2)(ii))
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement § 201.6(c)(2)(i))

Hazard identification consists of describing the nature of the hazard, location, disaster history, extent/severity, and probability of future events. Hazard identification profiles have been developed for each of the nine hazards addressed in Section 3.1 through Section 3.9: climate change, earthquake, erosion, flood, landslide, severe weather, tsunami, volcano, wildfire. The hazards profiled for this LHMP are provided in alphabetical order; this order does not signify level of risk or hazard classification.

3.1 CLIMATE CHANGE

Table 3-1: Climate Change

Profile	Description
Nature	Climate is defined as the average statistics of weather, which includes temperature, precipitation, and seasonal patterns in a particular region. Climate change refers to the long-term and irrevocable shift in these weather-related patterns. The Fourth National Climate Assessment Report (2018) states that Earth's climate is now changing at a faster rate than at any time in the history of modern civilization, primarily due to human activities. The disruption in the climate is already impacting the way people live, the food they grow, their health, the wildlife, the availability of water, and much more. The impacts of global climate change are being felt today in the form of sea level rise and storm surge in coastal areas; increased riverine flooding and stormwater inundation; more frequent and prolonged higher temperatures (leading to heat events, wildfires, and permafrost thaw); and more severe and frequent extreme weather events. Changing climate conditions are more pronounced in the polar regions. Alaska is often identified as being on the frontline of climate change because it is warming faster than any other state and faces multiple issues associated with a changing climate. These climate change impacts include: • Retreat of sea ice, which will disrupt marine ecosystems and other animals (such as polar bears and walruses), impact local communities where sea ice is important for subsistence or tourism, and contribute to increased storm surge, coastal flooding, and erosion. • Increase of ocean temperature impacting marine ecosystems and Alaska's fisheries. • Flooding and erosion of coastal and river areas related to changes in sea ice and increase in storm intensity. • Increase in ocean acidification, which will impact marine organisms and thereby disrupting the marine food web. • Increase in the size and frequency of wildfires and droughts. • Thawing permafrost, melting glaciers, and associated effects on the state's infrastructure and hydrology. • Increase of health threats, such as injuries, smoke inhalation, damage to vital infrastructure, decrease of food and water security, and new infectious diseases. • Introduction of harmful or invasive species, with changing weather patterns and warming creating a change in the migration patterns. The City of Homer is vulnerable to an increase in ocean temperature; flooding and erosion of coastal areas; increase in ocean acidification; increase in the size and frequency of wildfires; increase of health threats, and introduction of invasive species.
Location	The entire area of the City of Homer is susceptible to climate change. Potential seal level rise, along with increased intensity of storm surge and coastal erosion, is threatening the Homer Spit.
History	According to the 2018 National Climate Assessment, the rate at which Alaska's temperature has been warming is twice as fast as the global average since the middle of the twentieth century. Statewide annual average temperatures from 1925 to the late 1970s were variable with no clear pattern of change. However, over the past 45 years (late 1970s to present), statewide annual average temperatures began to increase with an average rate of 0.7 degrees Fahrenheit (ºF) per decade. The temperature increase was especially strong in the Arctic due to the polar amplification of global warming. In Homer, the Alaska Climate Research Center has observed a change of annual average temperature from 34.9ºF in 1950 to 38.9ºF in 2020 (11% increase). During that period, the Alaska Climate Research Center also observed an increase of annual precipitation from 15.47 inches to 23.68 inches (29% increase). While historical precipitation and temperature changes in Alaska have been well documented over the past several decades, historical information on sea level rise is less known due to lack of tide gauges with extended records. Researchers believe that prior to 1990, sea level rise on a global

Table 3-1: Climate Change

Profile	Description
	scale was only 0.04 inches per year; however, for the 1993 to 2012 reporting period, sea level rise has been 0.12 inches per year.
Extent / Severity	The University of Alaska Fairbanks Scenarios Network for Alaska + Arctic Planning (SNAP) models climate data for mid-range global emissions. SNAP temperature models show that Homer will experience a temperature increase of 5.3ºF by the end of the century. Likewise, precipitation models show that for the same reporting period Homer will see an average rainfall increase of 2.8 inches (Table 3-2). Sea level rise is not modeled for the City of Homer, but any rise in sea level or storm surge intensity would threaten all land and water on the Homer Spit.
Recurrence Probability	Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods of time ranging from decades to millions of years. It may be a change in average weather conditions or in the distribution of weather around the average conditions (i.e., more or fewer extreme weather events). According to the National Aeronautics and Space Administration, "the current warming trend is of particular significance because most of it is extremely likely (i.e., greater than 95% probability) to be the result of human activity since the mid-twentieth century and proceeding at a rate that is unprecedented over decades to millennia." The National Aeronautics and Space Administration also states that "scientists have high confidence that global temperatures will continue to rise for decades to come, largely due to greenhouse gases produced by human activities.

Table 3-2: Mean Annual Temperature and Precipitation Predictions

	2010-2019	2050-2059	2090-2099
Mean Annual Temperature	39.7°F	42.8°F	45.0°F
Mean Annual Precipitation	28.7 inches	29.6 inches	31.5 inches

3.2 EARTHQUAKE

Table 3-3: Earthquake

Profile	Description
Nature	An earthquake is a sudden motion or trembling caused by a release of strain accumulated in or along the edge of 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 can cause massive damage and extensive casualties in a few seconds. Common effects of earthquakes are ground motion and shaking; surface fault ruptures; and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can amplify ground motions. In addition to ground motion, several secondary hazards can occur from earthquakes, such as the following: • Surface Faulting: Surface faulting is the differential movement of two sides of a fault at Earth's surface. Displacement along faults—in terms of both 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, tunnels, and dams. • Liquefaction: 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 (i.e., horizontal movements that are typically 10 to 15 feet, but can be up to 100 feet), flow failures (i.e., massive flows of soil that are typically hundreds of feet, but can be up to 12 miles), and loss of bearing strength (i.e., soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property. • Landslides/Debris Flows: 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 completely 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 two most common measures of earthquake intensity used in the United States are the Modified Mercalli Intensity scale, which measures felt intensity; and peak ground acceleration (PGA), which measures instrumental intensity by quantifying how hard the earth shakes in a given location. Magnitude is measured by the amplitude of the earthquake waves recorded on a seismograph using a logarithmic scale.
Location	Homer is in a region of high seismicity. It is above a boundary between segments of the earthquake-generating Alaska-Aleutian subduction zone—the Kodiak Island segment to the southwest and the Prince William Sound segment to the northeast. While the 1964 Great Alaska Earthquake ruptured both segments, findings from around the region suggest that the two segments may rupture independently. The nearest studied fault line to Homer is the Falls Creek-Ninilchik anticline, which is a quaternary fault (i.e., one event per 1,600,000 years) approximately 30 miles away. Several other fault lines lie around Homer and on the Kenai Peninsula but are not studied and no details are known.

Table 3-3: Earthquake

Profile	Description
History	As stated in the 2018 State of Alaska HMP, Alaska is one of the most seismically active regions in the world and is at risk of societal and economic losses due to damaging earthquakes. On average, Alaska has one "great" (magnitude of 8 or higher) earthquake every 13 years, one magnitude 7 to 8 earthquake every year, and six magnitude 6 to 7 earthquakes every year. In addition, earthquakes that occur on tectonic plate boundary faults near the coast can generate tsunamis that impact coastal communities, including Homer. The effects of the March 27, 1964 Great Alaska Earthquake (which had a magnitude of 9.2) in the Homer area were thoroughly documented after the event. Observations included general damage caused by tectonic subsidence; and earth flows, landslides, fissures, seiches, submarine landslides, and beach changes caused by strong ground shaking during the event. Most of the damage to the community occurred on Homer Spit as a result of 2 to 3 feet of tectonic subsidence. Since 2000, there have been 27 earthquakes with a magnitude of 5.0 or greater that occurred within 150 miles of the City of Homer. Two of those earthquakes had a magnitude of 7.0 or greater.
Extent / Severity	The strength of an earthquake's ground movement can be measured by PGA. PGA measures the rate in change of motion relative to the established rate of acceleration due to gravity (g = 980 centimeters per second). PGA is used to predict the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (e.g., 10%, 5%, or 2%) of being exceeded in 50 years. The ground motion values are used for reference in construction design for earthquake resistance and can also be used to assess the relative hazard between sites when making economic and safety decisions. The current U.S. Geological Survey (USGS) seismicity model for Alaska was developed in 2007. The PGA values in Homer for a 5% probability of exceedance in 50 years are shown in Figure 2. Based on this model, there are 8,912.52 acres (100%) in the perceived "Severe" shaking zone, with moderate to heavy potential for damage. An earthquake risk assessment was conducted by FEMA in 2017. Two scenarios were analyzed: the first used the January 2016 M7.1 Old Iliamna earthquake event and estimated a loss of improved parcels of $3,303,266 (0.27%); the second simulated the M9.2 Great Alaska Earthquake and estimated a property loss of $56,997,792 (4.60%). The estimated value of structure loss is provided in Table 4-6.
Recurrence Probability	As shown in Figure 2, the seismic PGA for Homer has a 5% probability of severe shaking in Homer in the next 50 years. Based on these data, there is a 5% chance of an earthquake occurring in Homer that will exceed 49.18 PGA in 50 years.

3.3 EROSION

Table 3-4: Erosion

Profile	Description
Nature	Erosion is the wearing and transportation of land. Erosion is typically gradual land loss through wind or water scour. In developed regions, erosion undermines buildings and infrastructure. Erosion can be experienced from coastal, riverine, or wind sources. Erosion forces are embodied in waves, currents, and winds; surface and ground water flow; and freeze-thaw cycles may also play a role. Not all of these forces may be present at any particular location. In the U.S., Alaska is unique because of how permafrost thaw interacts with flooding and erosion to exacerbate the impacts of these hazards. Frozen ground can disintegrate under the compounding influences of permafrost thaw, flooding, and erosion in an escalating feedback loop that can result in damage that is much greater than would be expected from the individual processes alone. Coastal erosion is a common term used to describe the retreat of the shoreline along the ocean. It describes the attrition of land resulting in loss of beach, shoreline, or dune material from natural activity or human influences. Erosion rarely causes death or injury; however, it causes property destruction, prohibits development, and impacts community infrastructure. Erosion can occur rapidly as the result of floods, storms, or other events; or slowly as the result of long-term environmental changes such as melting permafrost. Erosion is a natural process, but its effects can be easily exacerbated by human activity. Coastal erosion can occur from rapid short-term daily, seasonal, or annual natural events such as waves, storm surge, wind, coastal storms, and flooding; or from human activities including boat wakes and dredging. The most dramatic erosion often occurs during storms, particularly because the highest energy waves are generated under storm conditions. Coastal erosion occurs over the area from roughly the top of the shore into the nearshore region to about 30-foot water depth. It is measured as the rate of change in the position or horizontal displacement of a shoreline over a period of time. Bluff recession is the most visible aspect of coastal erosion because of the dramatic change it causes to the landscape. As a result, this aspect of coastal erosion usually receives the most attention. Solifluction, the slow movement of water-saturated soils down a slope during freeze-thaw cycles is another contributor to coastal erosion and can cause slumping. Coastal erosion may also be due to multi-year impacts and long-term climatic change such as sea-level rise, lack of sediment supply, subsidence, or long-term human factors (e.g., aquifer depletion or the construction of shore protection structures and dams). Attempts to control erosion using shoreline protective measures such as groins, jetties, seawalls, or revetments can lead to increased erosion.
Location	The City of Homer experiences coastal erosion annually from winter storms and high storm surge, occurring along the entire coastline. Solifluction also contributes to coastal erosion, particularly on coastal discharge slopes. Particular areas of concern are the Homer Spit, the bluffs along sections of the Sterling Highway, and along the residential areas on Kachemak Drive and Ocean Drive Loop.
History	In 2019, ADOT&PF contracted HDR to conduct a site visit to the Homer Spit to observe the condition of the road along the spit. They noted that it is apparent that the spit is undergoing a long period of erosion, evidenced by the piling structures located on the spit, which are exposed an estimated ten feet more than the previous three years. Beach areas near the road terminus once used for camping and other recreation are now gone. Changes in storm patterns the past few years with milder summers and fewer strong southeasterly events may be affecting the sediment movement along the spit allowing greater erosion and less seasonal accretion. In 1992, the USACE constructed 1,000 feet of revetment, and extended it an additional 3,700 feet in 1998. It is suspected that placement of the rock sections by the USACE affected the supply of sediment, which impacted the overall littoral drift on the Spit. This caused beach lowering adjacent to the

Table 3-4: Erosion

Profile	Description
	rock revetment and further south along the spit. The USACE rock revetment appears exposed almost in its entirety, where in the past a greater portion of rock was buried. In 2005, the Kachemak Bay Research Reserve completed a study of erosion rates in Homer. The study provided an estimate of coastal bluff erosion rates based on a series of aerial surveys from 1951 to 2003. The study concluded that the average erosion rate along Homer's shoreline is approximately 0.3 to 1.2 meters per year. The researchers found that before, during, and right after the 1964 earthquake, erosion rates were faster than they had been since 1975 but slowed after that time. There is evidence that the rates have increased again in recent years.
Extent / Severity	As noted above, studies have shown that Homer's coastal bluffs have retreated on average 0.3 to 1.2 meters per year over the last 70 years. The Homer Spit is eroding approximately 10 feet every 3 years in some places, as noted above.
Recurrence Probability	Erosion will continue each year in Homer on the Homer Spit and the bluffs.

3.4 FLOOD

Table 3-5: Flood

Profile	Description
Nature	A flood occurs when the existing channel of a stream, river, canyon, or other watercourse cannot contain excess runoff from rainfall or snowmelt, resulting in overflow onto adjacent lands. In coastal areas, flooding may occur when high winds or tides result in a surge of seawater into areas that are above the normal high tide line. Secondary hazards from floods can include: • Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features • Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and debris carried by floodwaters (debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects) • Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands • Release of sewage and hazardous or toxic materials when wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed
Location	As shown in Figure 3, the areas most prone to flooding in the City of Homer are along nearly the entire shoreline, the low-lying areas surrounding and including Beluga Lake, and the entire Homer Spit. The flood map does not include risk from tsunami or sea level rise.
History	The City of Homer experiences flooding from rainfall runoff (late summer and early fall), snowmelt (spring and early summer), groundwater floods, and flash floods. Floods can also occur in fall and winter when temperatures vacillate between freezing and thawing. Precipitation in the form of rain on frozen ground has little to no drainage and causes flooding. Homer has experienced floods on several occasions in the last 20 years. Major events occurred in 2002, 2007, and 2013, resulting in numerous bridges being washed out on the Kenai Peninsula and isolating Homer for several weeks while temporary repairs were made. Two of these events were declared disasters and resulted in disruptions to the economy by preventing the flow of goods and materials except by barge or airplane.
Extent / Severity	The magnitude of flooding that is used as the standard for floodplain management in the United States is a flood with a probability of occurrence of 1% in any given year. This flood is also known as the 100-year flood (i.e., base flood). The 100-year flood (1%) and the 500-year flood (0.2%) are considered Special Flood Hazard Areas (SFHAs) and identified on FEMA's Flood Insurance Rate Maps (FIRMs). The City of Homer FIRM (Figure 2) identifies 708.52 acres (7.95%) with a 1% annual chance of flooding. These areas are along the shoreline, around Beluga Lake, and encompass the Homer Spit. There are 113.46 acres (1.27%) with a 0.2% annual chance of flooding, which are on the Homer Spit.
Recurrence Probability	Floods can occur at any time in Homer but are most common in the spring and summer with heavy snowmelt and rainfall runoff, and in the fall and winter during freeze/thaw cycles. Based on previous occurrences of flood events in Homer, severe flooding is most likely to occur every 2 to 7 years.

3.5 LANDSLIDE

Table 3-6: Landslide

Profile	Description
Nature	Landslide is a general term for the dislodging and fall of a mass of soil or rocks along a sloped surface, or for the dislodged mass itself. The term is used for varying phenomena including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. Landslides may result from a wide range of combinations of natural rock, soil, or artificial fill. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also occur because of indiscriminate development of sloping ground or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions. Landslides often occur together with other hazards, which can exacerbate conditions as described below: • Shaking due to earthquakes can trigger events ranging from rock falls and topples to massive slides • Intense or prolonged precipitation that causes flooding can also saturate slopes and cause failures leading to landslides • Wildfires can remove vegetation from hillsides, significantly increasing runoff and debris flow potential • Landslides into a reservoir can indirectly compromise dam safety; a landslide can even affect the dam itself • Saturation by water is also a primary cause of landslides. Saturation can occur in the form of intense or prolonged rainfall, snowmelt, changes in groundwater levels, and surface water level changes along coastlines, earth dams, and banks of lakes. Another type of landslide occurs in areas cut by perennial streams; as floodwaters erode channel banks, rivers have undercut clay-rich sedimentary rocks along their southern bank, thereby destabilizing the ground and causing the ground above it to slide.
Location	In North America, there is an association between landslides and hilly terrain (particularly with slopes ranging from about 20 to 40 degrees). Areas on the mountainous terrain in the city which includes slopes greater than 20 degrees, are shown in Figure 4. The highest concentration of these slopes is along the bluffs running between Skyline Drive East End Road and on the west end of the city, just south of the Sterling Highway (Bluff Point). The Bluff Point landslide is well documented and shown in Figure 5.
History	The ADGGS has identified over 1,000 slope failure scars using aerial photographs and light detection and ranging (LIDAR) data from the Homer and Kachemak areas. Notable landslide failures in Homer include: • At least one severe landslide occurred in Homer above Kachemak following the Great Alaskan Earthquake. • In 2013, heavy rains caused a 16-foot mudslide down Bear Creek Drive (3 miles east on East End Road). Uphill, when heavy rains saturated the narrow Bear Creek Canyon, it "let go," which sent trees and debris down Bear Creek, jamming a culvert on the uphill side of East End Road. A disaster declaration was made for several rain-soaked areas in the Kenai Peninsula Borough. • In 2015, a landslide occurred along a stretch of Kachemak Drive near the Homer Airport. The slide resulted in the closure of Kachemak Drive approximately 0.5-mile from Homer Spit Road to the top of the hill by the old airport. The slide took out a 100-foot section of the east bound lane of Kachemak Drive, pushing clumps of spruce and alder trees into Mud Bay.

Table 3-6: Landslide

Profile	Description
Extent / Severity	No official landslide dataset exists for the City of Homer. However, in North America, there is an association between landslides and hilly terrain (particularly with slopes ranging from about 20 to 40 degrees). As such, the mountainous terrain in Homer that includes slopes greater than 20 degrees is at greatest risk of slide. Approximately 17% (1,504 acres) of Homer is in this hazard area.
Recurrence Probability	Shallow landslides can occur at any time but are more likely to happen when the ground is nearly saturated. However, deep-seated landslides are generally triggered by deep infiltration of rainfall (which can take weeks or months to occur) and therefore typically follow major storm events. It is assumed that the probability of a future landslide event will be highly tied to winter storm/rain events. Based on historical occurrences, severe winter storm conditions are likely in the City of Homer every 2 to 7 years.

3.6 SEVERE WEATHER

Table 3-7: Severe Weather

Profile	Description
Nature	Severe weather occurs throughout Alaska with extremes includes thunderstorms; lightning; hail; heavy and drifting snow; freezing rain/ice storm; extreme cold; and high winds. Severe weather events can include the following: • A winter storm is an event in which the main types of precipitation are snow, sleet, or freezing rain and be accompanied by high winds, cold temperatures, and storm surge. A winter storm can range from a moderate snow over a few hours, to blizzard conditions with blinding wind-driven snow that lasts several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. In more temperate continental climates such as Homer, these storms are not necessarily restricted to the winter season and may also occur in the late autumn and early spring. • Heavy snow and rain occur frequently in coastal areas and snowfall can accumulate 4 inches or more in 12 hours or less. • Freezing rain and ice storms occur when rain or drizzle freezes on surfaces and can cause damage to powerlines, pipelines, and other infrastructure. • Extreme cold varies according to normal regional climate. Alaska's extreme cold usually involves temperatures between -20 and -50ºF. Excessive cold may accompany winter storms, occur after storms, or can occur without storm activity. • High winds in Alaska can equal hurricane force but are under a different classification because they are not cyclonic nor possess other hurricane characteristics. Strong winds occasionally occur over the interior due to strong pressure differences, especially where influenced by mountainous terrain; however, the windiest places in Alaska are generally along the coastlines.
Location	The entire Homer area is vulnerable to the effects of severe weather.
History	Notable severe weather events from 2000 through 2021 include: • In the spring of 2003, strong winds across the Kenai Peninsula resulted in widespread power outages, downed trees, and structural damage and fanned the flames of a 150-acre wildfire in Anchor Point. • In November 2011, a series of major windstorms caused widespread power outages threatening life and property. Power was disrupted to 17,300 homes and businesses. Public infrastructure, commercial property, and personal property damages were reported throughout the borough. • In February 2014, a strong low in the southwest Gulf of Alaska produced strong wind in in the Kachemak Bay Area. The strong wind caused widespread damage from Kenai to the Homer area. Heavy snow fell in the Kachemak Bay area, combined with high wind and blizzard conditions. • In December 2019, a southerly jet stream brought several low-pressure systems to Southcentral Alaska. These were accompanied by above freezing temperatures, abundant rainfall, and high winds as the fronts passed through. A primary impact of this event was the flooding of the Anchor Point River. In addition, North Fork Road was impassable, and the Sterling Highway was flooded in several locations between mile 161 and 163, there was flooding across East End Road at Bear Creek Drive, and a mudslide on East End Road at Kachemak Bay Drive. • In January 2020, a low-pressure system developed south of the Aleutian Islands and then moved north along the Alaska Peninsula and up Cook Inlet. A strong high-pressure system that followed brought a large amount of cold air, which created high winds through the Cook Inlet area. Homer reported 8 hours of blizzard conditions and near-whiteout conditions.

Table 3-7: Severe Weather

Profile	Description
Extent / Severity	Winter storms in the Homer area can produce snow of up to 3 feet per storm, high wind speeds of up to 60 miles per hour and with cold temperatures.
Recurrence Probability	Based on historical occurrences, the City of Homer can expect to experience severe weather conditions approximately 5 to 6 days each year.

3.7 TSUNAMI

Table 3-8: Tsunami

Profile	Description
Nature	A tsunami is a series of traveling ocean waves of extremely long length, generated by disturbances associated primarily with earthquakes occurring below or near the ocean floor. Subduction zone earthquakes at plate boundaries often cause tsunamis. However, tsunamis can also be generated by submarine landslides, sub-marine volcanic eruptions, the collapse of volcanic edifices, and—in very rare instances—large meteorite impacts in the ocean. In the deep ocean, a tsunami may have a length from wave crest to wave crest of 100 miles or more, but a wave height of only a few feet or less. Therefore, the wave period can be up to several hours and wavelengths can exceed several hundred miles. Tsunamis are unlike typical wind-generated swells on the ocean, which might have a period of about 10 seconds and a wavelength of up to 300 feet. Tsunamis not only affect beaches that are open to the ocean, but also bay mouths, tidal flats, and the shores of large coastal rivers. Tsunami waves can also diffract around land masses. Because tsunamis are not symmetrical, the waves may be much stronger in one direction than another, depending on the nature of the source and the surrounding geography. However, tsunamis propagate outward from their source; therefore, coasts in the shadow of affected land masses are safer. Secondary hazards can occur from tsunamis, such as: • Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features. • Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters; debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects. • Release of sewage and hazardous or toxic materials when wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed. • Flood waters can pose health risks such as contaminated water and food supplies. • Loss of shelter leaves people vulnerable to insect exposure, heat, and other environmental hazards. The majority of deaths associated with tsunamis are related to drownings; however, traumatic injuries are also a primary concern. Injuries such as broken limbs and head injuries are often caused by the physical impact of people being washed into debris such as houses, trees, and other stationary items. As the water recedes, the strong suction of debris being pulled into largely populated areas can cause further injuries and undermine buildings and services.
Location	The tsunami inundation zone for Homer is shown in Figure 6 and Figure 7. Nearly the entire Homer Spit could be inundated, as well as the low-lying areas around Beluga Lake and to the coast, excluding the airport.
History	The 1964 Great Alaska Earthquake triggered several tsunamis, one major tectonic tsunami and approximately 20 local submarine and subaerial landslide tsunamis. The major tsunami hit between 20 and 45 minutes after the earthquake. The locally generated tsunamis struck between 2 and 5 minutes after their generation and caused most of the deaths and damage in Homer.

Table 3-8: Tsunami

Profile	Description
Extent / Severity	The Alaska Earthquake Center and University of Alaska Fairbanks model for tsunami waves and inundation shows a maximum composite tsunami inundation for Homer. Based on this model, there are 1,735 acres (19%) of Homer's land area at risk to tsunami inundation. This inundation level includes eight (24%) critical assets. A series of simulated tectonic scenarios were conducted in a report by the ADGGS. The first scenario (a repeat of the 1964 Great Alaska Earthquake) would not result in any inundation in Homer except for the section of Lake Street that separates the tidal flats from Beluga Lake. Some low-lying parts of Homer Spit would be flooded, but the Homer Spit Road would not be inundated. In the next scenario (a magnitude 9.2 earthquake on the Kenai Peninsula), Lake Street (which separates the tidal flats from Beluga Lake), the areas between the tidal flats, the Sterling Highway, and nearly the entire Homer Spit would be inundated. The third scenario (maximum slip distributed between 9.3 and 21.7 miles deep) would result in the most severe inundation. The entire low-lying area of Homer from the tidal flats to the Kachemak Bay shore as well as some residential areas south of Beluga Land and along the Sterling Highway would be inundated. The Homer Spit would be completely inundated under this scenario. The final scenario (rupture of the Cascadia subduction zone) would not result in any inundation except for the tidal flats area and some low-lying areas of the Homer Spit. The City of Homer created a task force to evaluate risks and provide recommendations for mitigation to the public works campus.
Recurrence Probability	The likelihood of a tsunami is hard to predict; however, previous events have shown that it is plausible that an earthquake-generated tsunami could impact the Homer community in the next 10 years.

3.8 VOLCANO

Table 3-9: Volcano

Profile	Description
Nature	A volcano is a vent or opening in the earth's crust from which molten lava (magma), pyroclastic materials, and volcanic gases are expelled onto the surface. The vent may be visible as a small bowl-shaped depression at the summit of a cone or shield-shaped mountain. Through a series of cracks in and beneath the volcano, the vent connects to one or more linked storage areas of molten or partially molten rock. There are four general volcano types: • Lava domes are formed when lava erupts and accumulates near the vent. • Cinder cones are shaped and formed by cinders, ash, and other fragmented material accumulations that originate from an eruption. • Shield volcanoes are broad gently sloping volcanic cones with a flat dome shape that usually encompass several tens or hundreds of square miles, built from overlapping and inter-fingering basaltic lava flows. • Composite or stratovolcanoes are typically steep-sided large dimensional symmetrical cones built from alternating lava, volcanic ash, cinder, and block layers; most composite volcanoes have a crater at the summit containing a central vent or a clustered group of vents. There are three types of volcanic eruptions, described below. Some volcanoes may exhibit only one type of eruption during an event, while others may display an entire sequence of all three types in one event. • Magmatic eruptions are the most well observed eruptions. Magmatic eruptions produce juvenile clasts (composed fragments) during explosive decompression from gas releases. Magnetic eruption subtypes include Hawaiian, Strombolian, Vulcanian, Peléan, and Plinian. • Phreatomagmatic eruptions are volcanic eruptions resulting from the interaction between magma and water. Grain deposits from phreatomagmatic explosion involving high water to magma ratios are extremely fine-grained and distinctly poorly sorted, while deposits resulting from low water to magma ratios are commonly coarse and relatively well sorted. Phreatomagmatic eruption subtypes include: Surtseyan, Submarine, and Subglacial. • Phreatic eruptions are steam-blast eruptions. These eruptions occur when cold groundwater or surface water comes into contact with hot rock or magma. Phreatic eruptions blast out steam, water, ash, volcanic bombs, and volcanic blocks, but no new magma. Other hazards potentially caused by a volcanic eruption include: • Volcanic ashfall • Lava flows • Lahars (debris flows) • Volcanic gas • Pyroclastic surges or flows • Volcanic landslides
Location	As shown in Figure 8, most of the community of Homer (95% of land area) is at risk for moderate tephra ashfall hazard with 0.25 to 1 inch accumulation, and the far western end of Homer (5% of land area) is at risk for high (heavy) tephra ashfall with 1 to 4 inches of accumulation.

Table 3-9: Volcano

Profile	Description
History	The Alaska Volcano Observatory is monitoring 3 volcanos within 100 miles of Homer: • Augustine (70 miles southwest) was last active in 2006 when it had explosive eruptions that produced ash plumes that deposited small amounts of ash in Homer. • Iliamna (60 miles northwest) was last active in 1953 when it emitted a large cloud of smoke. • Redoubt (80 miles northwest) was last active in 2009 when it erupted over several months with multiple ash-producing explosions, culminating in an eruption in which the ash cloud reached 50,000 feet and moved swiftly to the southeast, depositing up to 2 millimeters of ashfall in Homer. Eruptions also occurred in 1968 and 1990.
Extent / Severity	As noted above, all of the Homer area is susceptible to moderate to heavy tephra ashfall. According to the Alaska Volcano Observatory, ash accumulation of 0.25 to 1 inch is likely from moderate tephra ashfall while ash accumulations of 1-4 inches is likely from heavy tephra ashfalls.
Recurrence Probability	Given the proximity of three active volcanos and history of past events, it is probable that the City of Homer will have an ashfall event in the next 50 years.

3.9 WILDFIRE

Table 3-10: Wildfire

Profile	Description
Nature	A wildfire—sometimes referred to as a wildland fire—is a fire in an area of combustible vegetation occurring in rural areas. Wildfires can be caused by human activities (e.g., unattended burns, campfires, or off-road vehicles without spark-arresting mufflers); or by natural events (e.g., lightning, drought, or infestation). Wildfires can be classified as forest, urban, tundra, interface or intermix fires, and prescribed burns. The following three factors contribute significantly to wildfire behavior and can be used to identify wildfire hazard areas: • Topography describes slope increases, which influences wildfire spread rate increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildfire behavior. However, ridge tops may mark the end of wildfire spread because fire spreads more slowly or may even be unable to spread downhill. • Fuel is the type and condition of vegetation that plays a significant role in wildfire spread occurrence. Certain plant types are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available as fire fuel (referred to as the "fuel load"). The living-to-dead plant matter ratio is also important. Certain climate changes may increase wildfire risk significantly during prolonged drought periods as both living and dead plant matter moisture content decreases. Insect infestations can kill trees and create high fuel loads. Both the horizontal and vertical fuel load continuity is also an important factor. • Weather is the most variable factor affecting wildfire behavior. Temperature, humidity, wind, and lightning can affect ignition opportunities and fire spread rate. Extreme weather (e.g., high temperatures and low humidity) can lead to extreme wildfire activity. Climate change increases fire to vegetation ignition susceptibility due to longer dry seasons. By contrast, cooling and higher humidity often signal reduced wildfire occurrence and easier containment. Indirect wildfire effects 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 exacerbate river and stream siltation thereby increasing flood potential, harming aquatic life, and degrading water quality. Vegetation-stripped lands are more susceptible to increased debris flow hazards.
Location	As shown in Figure 9, most of the Homer area has moderate or high wildland fuel risk, with some areas of very high risk. The Homer Spit, tidal flats, and low-lying areas around Beluga Lake are at moderate risk; the areas of very high risk are primarily along the bluffs. The northern and eastern borders of Homer are in the wildland-urban interface. These areas, which are primarily residential, are at higher risk from fires on the Kenai Peninsula. The areas around the Bridge Creek Reservoir are at a higher risk because of substantial spruce bark beetle killed trees. The City has implemented aggressive management in this area to reduce risk.

Table 3-10: Wildfire

Profile	Description
History	Th Alaska Interagency Coordination Center tracks wildfires throughout the state. Every year there are wildfires across the Kenai Peninsula. Homer, like other areas of the Kenai Peninsula, has been dramatically affected by the spruce bark beetle infestation. The vast majority of wildland fires on the Kenai Peninsula are the result of human activities with open burning being the most prevalent. Although lightning-caused fires do occur, they are infrequent, especially on the south Kenai Peninsula. The 2005 Tracy Avenue Fire and the 2009 East End Road Fire were especially threatening to property and had potential loss of life. In May of 2014, a human-caused fire started along the Funny River Road in the central Kenai Peninsula. Over its course, this fire grew to almost 200,000 acres of black spruce, mixed hardwoods, and spruce and bark beetle killed spruce, and grass. Although outside Homer city limits, these recent fires demonstrate the potential for rapid fire spread given the weather conditions, topography, and the availability of local and state wildfire fighting crews.
Extent / Severity	Much of Homer is vulnerable to wildfires. As shown on Figure 9, 65% of the land area in Homer is in a high/very high/extreme fuel risk area. Wildfires can destroy habitat, impact watersheds; burn down homes, buildings, and critical facilities; cause loss of life to humans and animals; and restrict access to recreational areas. Wildfires can cause fire-related injuries; and local and regional transport of smoke, ash, and fine particles, which increase respiratory and cardiovascular risks. People without means for evacuation are also vulnerable to wildfires.
Recurrence Probability	Recorded wildland fires within 10 years and 50 miles of Homer have an average recurrence rate of approximately 2.5 to 3 years. It is anticipated that this probability will continue into the future or increase in frequency as climate change and spruce bark beetles create more fuel for potential fires.

4.0 RISK ASSESSMENT

This section addresses Element B of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element B: Hazard Identification and Risk Assessment
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

4.1 HAZARD IMPACT

A hazard impact assessment predicts the current or expected impact of a hazard on a community or 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.

For this 2022 LHMP, a conservative exposure-level analysis was conducted to assess the risks associated with the identified hazards. Due to a combination of a lack of adequate information and methodology, a semi-quantitative hazard impact assessment has only been prepared for the following hazards: climate change, earthquake, flood, landslide, tsunami, volcano, and wildfire. A qualitative analysis was prepared for the following hazards: erosion and severe weather.

Hazard impact assessments were prepared for the City of Homer's land area, population center, and critical facilities (Table 4-1). A land area of 13.93 square miles was determined using available Geographic Information System (GIS) data. The population center (i.e., a region that describes a center point of Homer's population) was determined to comprise 9.23 square miles. The critical facilities (Figure 10) include a list of facilities that provide services and functions essential to Homer, especially during and after a disaster. Common types of critical facilities include fire stations; police stations; hospitals; schools; water and wastewater systems; and utilities. Critical facilities may also include places that can be used for sheltering or staging purposes, such as community centers, schools and libraries. Critical facilities may also include large public gathering spots and places of worship. For the 2022 LHMP, 33 critical facilities (public and privately owned) were collected in Homer. Critical facility names and coordinates were then geocoded to a location and the resulting geographic features were used for hazard impact assessment. Facility-specific information was given to the City of Homer and will be kept on file.

The overall results of the hazard assessments are provided below. This analysis is a simplified assessment of the potential effects of the hazards on land area (Table 4-2), population center (Table 4-3), and critical facilities (Table 4-4) at risk, without consideration of the probability or level of damage. In addition, elevation data were not available; therefore, additional analysis will need to be conducted to develop a more accurate understanding of hazard vulnerabilities.

Table 4-1: Total Land Area, Population Center and Critical Facilities

Category	Number
Land Area	8,912.52 acres
Population Center	5,899.74 acres
Critical Facilities	33

Table 4-2: Total Acres of Land in a Hazard Area

Hazard Area	Acres	Percent of Total Acres
Climate Change	8,912.52	100
Earthquake		
Weak/Light	0	0
Moderate/Strong	0	0
Very Strong/Severe/Violent	8,912.52	100
Erosion	No mapping data are available for erosion. Based on existing reports and the community planning team, approximately 10% of total land area is susceptible erosion.	
Flood		
1% Annual Chance	708.52	7.95
0.2% Annual Chance	113.46	1.27
Landslide	1,503.91	16.87
Severe Weather	8,912.52	100
Tsunami	1,735.33	19.47
Volcano		
Low	0	0
Low-Moderate/Moderate	8,490.64	95.27
High	421.89	4.73
Wildfire		
Moderate	2,939.61	32.98
High/Very High	5,820.79	65.31
Extreme	15.30	0.17

Table 4-3: Total Number of Acres of Population Center in a Hazard Area

Hazard Area	Acres	Percent of Total Acres
Climate Change	5,899.74	100
Earthquake		
Weak/Light	0	0
Moderate/Strong	0	0
Very Strong/Severe/Violent	5,899.74	100
Erosion	No mapping data are available for erosion. Based on existing reports and the community planning team, approximately 5% of the total population center is susceptible erosion.	

Table 4-3: Total Number of Acres of Population Center in a Hazard Area

Hazard Area	Acres	Percent of Total Acres
Flood		
1% Annual Chance	21.80	3.7
0.2% Annual Chance	0	0
Landslide	1,030.41	17.47
Severe Weather	5,899.74	100
Tsunami	5,657.83	95.90
Volcano		
Low	0	0
Low-Moderate/Moderate	5,878.24	99.64
High	21.50	0.36
Wildfire		
Moderate	1,384.28	23.46
High/Very High	4,503.32	76.33
Extreme	9.46	0.16

Table 4-4: Total Number of Critical Facilities in a Hazard Area

Hazard Area	Number	Percent of Total Facilities
Climate Change	33	100
Sea Level Rise	5	15
Earthquake		
Weak/Light	0	0
Moderate/Strong	0	0
Very Strong/Severe/Violent	33	100
Erosion	7	24
Flood		
1% Annual Chance	3	10
0.2% Annual Chance	1	3
Landslide	1 This facility is not in an area of greater than 20% slope, but is in the path of a potential landslide.	3
Severe Weather	33	100
Tsunami	8	24

Table 4-4: Total Number of Critical Facilities in a Hazard Area

Hazard Area	Number	Percent of Total Facilities
Volcano		
Low	0	0
Low-Moderate/Moderate	31	94
High	2	6
Wildfire		
Moderate	22	67
High/Very High	9	27
Extreme	0	0

4.2 OVERALL SUMMARY OF VULNERABILITY

A list of the key issues, or overall summary of vulnerability, for each hazard profiled in the 2022 LHMP is provided in Table 4-5.

Table 4-5: Overall Summary of Vulnerability

Hazard	Vulnerability
Climate Change	All of Homer is vulnerable to climate change. Over the next century, weather patterns that are considered extreme today are expected to become normal. The City of Homer's overall vulnerabilities to climate change include sea level rise, coastal erosion, increased average annual maximum temperature, increased average annual precipitation, severe moisture deficit/drought, and wildfires. • Sea level rise: 15% of the critical facilities and infrastructure in the city are in the low-lying areas on the Homer Spit and will be at risk of inundation. Flooding due to sea level rise will cause destructive erosion; flooding; and soil contamination with salt; loss of habit for fish, birds, and plants; disruption and/or delay of transportation; and damages to homes and businesses on a more regular basis. • Temperature and precipitation: SNAP temperature models show that all of Homer will experience a temperature increase of 5.3ºF by the end of the century, while precipitation models show that for the same reporting period, Homer will see an average rainfall increase of 2.8 inches. In the summer, an increase in temperature will cause an increase in fire risk. • Mega storms that are linked to climate change can cause severe flooding. Along the coast, deadly and destructive storm surges may push farther inland than they once did, which means more frequent nuisance flooding.
Earthquake	All of the City of Homer is vulnerable to ground shaking from an earthquake and the entire city is in severe perceived ground shaking hazard areas. Nearly 100% of Homer's residents live and 100% of critical facilities and infrastructure are in the severe shaking potential areas. The estimated value of structure loss is provided in Table 4-6. Those that live in severe shaking potential areas can expect earthquake events to produce moderate to heavy damage. According to the USGS, this could mean slight damage in specially designed structures, considerable damage in ordinary substantial

Table 4-5: Overall Summary of Vulnerability

Hazard	Vulnerability
	buildings with partial building collapse, and considerate damage in poorly built or badly designed structures. Those that live in violent shaking potential areas can expect earthquake events to produce the potential for heavy damage. According to the USGS, this could mean that well designed framed structures could be thrown out of plumb and substantial buildings could experience partial building collapse.
Erosion	Coastal erosion along the Homer Spit is a major concern for the City and for property owners. Only approximately 10% of the land area is susceptible to erosion, and those areas are primarily on the Homer Spit. The land base is narrow and significant mitigation will be required to stop or slow the coastal erosion occurring there. If no action is taken, all structures along the spit will be susceptible to damage, including 7 critical facilities, many local businesses, and state and federal land. Coastal erosion is also occurring on the Homer bluffs through storm wave action and solifluction. A 4,830-foot revetment was constructed on the coast near the base of the Homer Spit in 1998, and a seawall was constructed in 2002 in an attempt to protect residential structures from continuing coastal erosion. The seawall requires continuous maintenance because it is frequently impacted by storm surge. In addition, protective measures such as seawalls or revetments can lead to increased erosion when shoreline structures eliminate the natural wave run-up and sand deposition and increase reflected wave action. The increased wave action can scour in front of and behind structures and prevent the settlement of suspended sediment. The primary impact from erosion is the loss of developable land and anything on it. The impact to infrastructure is expensive, ongoing, and includes the Sterling Highway Kachemak Drive, Ocean Loop Drive, and Homer Spit Road.
Flood	The City of Homer is most vulnerable to flooding caused by snowmelt and heavy rainfall. Approximately 9.2% of Homer's land mass (1.28 square miles) and 4 critical facilities (the City of Homer Port and Harbor Office, the Homer Harbor, the Petro Marine Tank Farm, and Pioneer Dock) are in the SFHA, which is concentrated on the Homer Spit, along the shoreline, and low-lying areas around Beluga Lake. Floods can block roadways and cause erosion, mudflows, debris flows, and water damage to structures and result in land loss, injury, and even death. People that are most vulnerable to flooding are generally those that live in the SFHA. There are 26 structures insured by the National Flood Insurance Program (NFIP) and none of those properties are considered Repetitive Loss properties (i.e., any insurable building for which two or more claims of more than $1,000 were paid by the NFIP in any rolling 10-year period, since 1978).
Landslide	No official landslide dataset exists for the City of Homer. However, in North America, there is an association between landslides and hilly terrain (particularly with slopes ranging from about 20 to 40 degrees). As such, the mountainous terrain in Homer that includes slopes greater than 20 degrees is at greatest risk of slide. Approximately 17% (1,504 acres) of Homer is in this hazard area, including 1 critical facility, the Southern Peninsula Hospital. In particular, the ADGGS found that the area covered by the Bluff Point landslide deposit and the area immediately adjacent to the headscarp have an elevated risk of deep-seated landslide hazard. Similarly, the deep-seated landslide at the end of China Poot Road also represents a significant landslide hazard. Development in and on the landslide deposit, as well as development in the mouths of catchments on either side of the China Poot Road landslide should be considered high-risk areas. Debris flow from landslides along the bluffs, particularly below Woodard Canyon,

Table 4-5: Overall Summary of Vulnerability

Hazard	Vulnerability
	has the potential to impact facilities and residential buildings, including the South Peninsula Hospital. Landslides can cause damage to and impact critical infrastructure, including water, sewer, and roadways. They may also cause injury or death to those trapped; break utility lines; block/damage roadways; damage foundations, chimneys, or surrounding land; and lead to flash flooding and further landslides.
Severe Weather	All of the City of Homer is vulnerable to severe weather. The Homer area is most vulnerable to high winds during the winter season. Winds may sweep up loose snow and produce blinding blizzards and dangerous wind chills. A major storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. A storm may knock down trees and powerlines, cause roofs to collapse, and lead to dangerous driving conditions causing drivers to be stranded. Homer has an extensive history of storm damage, especially in the coastal areas along the Homer Spit and adjacent properties. Along the Homer Spit, high winds and coastal storm surge can damage other installments that mitigate erosion, such as revetments and gabion baskets. The Seward Highway between Anchorage and Homer is periodically closed every year due to an avalanche event or for avalanche control, which can further isolate the community.
Tsunami	The Alaska Earthquake Center and University of Alaska Fairbanks model for tsunami waves and inundation shows a maximum composite tsunami inundation for Homer. Based on this model, there are 1,735 acres (19%) of Homer's land area at risk to tsunami inundation. This inundation level includes eight (24%) critical assets. The most at-risk locations in Homer are the Homer Spit, coastal areas, and low-lying areas around (and including) Beluga Lake. Tsunami run-up will likely cause flooding and infrastructure along the Homer Spit could be damaged.
Volcano	Ashfall becomes a public health hazard when humans inhale fine ash. Ash will also interfere with the operation of mechanical equipment including aircraft. In Alaska, this is a major problem because many of the primary flight paths are near historically active volcanoes. Because ash can conduct electricity, accumulation may also interfere with the distribution of electricity from the shorting transformers and other electrical components. Based on modeling, most of the City of Homer is in a moderate ashfall hazard area. Even a small ashfall event could cause significant damage to the built environment (e.g., clogged filters and damaged parts of vehicles and machinery, clogged filters of air-ventilation systems, roof collapse, cellular and radio communication interruption) and the natural environment (e.g., habitat damage, water pollution, weather pattern shifts). In addition, an ashfall event could cause respiratory problems, eye problems, and skin irritation for humans.
Wildfire	Much of Homer is vulnerable to wildfires. As shown on Figure 9, 65% of the land area of Homer is in a high/very high/extreme fuel risk area. During the summer, the entire community is vulnerable to wildland fire because most structures are constructed of wood and other flammable materials. Standing timber and other natural fuels interface with the community. History has demonstrated that fire bands can be carried by local winds up to 0.5 mile, jumping human-made fire lines and spreading fire across large areas. Most areas of Homer

Table 4-5: Overall Summary of Vulnerability

Hazard	Vulnerability
	are immediately adjacent to wildland areas and could be threatened by uncontrolled fire. Without mitigation or preparation efforts, the impacts of a wildland interface fire in Homer could grow into an emergency or disaster. In addition to impacting people, wildland fires may severely impact livestock and pets. Such situations may require emergency life support, 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, which increases flood and landslide potential, harms aquatic life, and degrades water quality.

Table 4-6: Value of Facilities Most Affected by Earthquake

Category	Total Value (Building and Contents)	Estimated Loss from M9.2 Earthquake	M9.2 Earthquake loss Ratio
Boat Dock	$16,366,000	$1,525,582	20.10%
City Office	$239,000	$12,850	5.38%
Airport	$15,416,800	$905,695	5.87%
School	$55,914,600	$3,163,500	11.41%
Emergency Shelter	$4,140,400	$229,649	10.95%
State Office	$2,271,800	$2,038,298	5.74%
Police Station	$2,064,500[1]	$112,256	5.44%
Fire Station	$2,064,500	$112,256	5.44%

Notes:
[1]The information in this table is as reported *in Kenai Peninsula Borough Risk Report: Kenai Peninsula Borough and the Incorporated Cities of Homer, Kachemak, Kenai, Seldovia, Seward, and Soldotna, 2017*. This facility has since been bonded for $5,000,000

4.3 NATIONAL FLOOD INSURANCE PROGRAM INSURED STRUCTURES

The NFIP, managed by FEMA, provides flood insurance to property owners, and businesses. There are 26 NFIP-insured structures in the City of Homer. Of these, none are considered Repetitive Loss properties.

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5.0 MITIGATION STRATEGY

This section addresses Element C of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element C: Mitigation Strategy
C1. Does the Plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement § 201.6(c)(3))
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement § 201.6(c)(3)(i))
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))

5.1 AUTHORITIES, POLICIES, PROGRAMS, AND RESOURCES

The City of Homer's existing authorities, policies, programs, and resources available for hazard mitigation are provided in Table 5-1 (human and technical resources), Table 5-2 (financial resources), and Table 5-3 (planning and policy resources). The ways in which the City of Homer is looking to expand and improve on its hazard mitigation authorities, policies, programs, and resources are provided in Table 5-4.

Table 5-1: Human and Technical Resources for Hazard Mitigation

Staff/Personnel	Department/Agency	Principal Activities Related to Hazard Mitigation
Planner(s) and technical staff with knowledge of land development, land management practices, human-caused hazards, and natural hazards	City of Homer Planning Department	Anticipates and acts on the need for new plans, policies, and code changes. Applies the approved plans, policies, code provisions, and other regulations to proposed land uses.
Fire Chief	City of Homer Volunteer Fire Department	Provides fire protection services in the City of Homer.
Head of Public Works	City of Homer Public Works Department	Maintains the city's roads, drainage, water distribution, wastewater collection, buildings and facilities, and motor vehicles. Works with developers in conjunction with the planning department on proposed subdivisions, land use variances, right-of-way vacations, zoning changes, and building site plans.
Police Chief	City of Homer Police Department	Provides law enforcement services in the City of Homer.
Harbormaster	City of Homer City Department of Port and Harbor	Manages and maintains port and harbor facilities.
Emergency Manager	City of Homer City Manager's Office	Maintains and updates Homer's Emergency Operations Plan. In addition, coordinates local response and relief activities in the Emergency Operations Center; works closely with local, state, and federal partners to support planning and training and to provide information and coordinate assistance.
Engineers, construction project managers, and supporting technical staff	City of Homer Public Works Department	Provides direct or contract civil, structural, and mechanical engineering services, including contract, project, and construction management.
Engineer(s), project manager(s), technical staff, equipment operators, and maintenance and construction staff	City of Homer Public Works Department	Maintains and operates of a wide range of local equipment and facilities and assists members of the public. This includes providing sufficient clean fresh water, reliable sewer services, street maintenance, storm drainage systems, street cleaning, streetlights, and traffic signals.
Floodplain Administrator	City of Homer Planning Department	Enforces its floodplain requirements through the Flood Development Permit program.
Procurement Services Manager	City of Homer Finance Department	Provides a full range of municipal financial services and administers several licensing measures.

Table 5-1: Human and Technical Resources for Hazard Mitigation

Staff/Personnel	Department/Agency	Principal Activities Related to Hazard Mitigation
Public Information Officer	City of Homer City Manager's Office	Coordinates and facilitates a public information program regarding activities of Homer and its various departments; actively promotes the services and successes of operating departments and the benefits to residents; proactively establishes and maintains productive relationships between Homer and any media; and performs related duties as required.

Table 5-2: Financial Resources for Hazard Mitigation

Type	Source	Purpose	Amount
General Fund	City of Homer Finance Department	Program operations and specific projects.	Variable
Enterprise Funds	City of Homer City Department of Port and Harbor	An enterprise fund is a self-supporting government fund that sells goods and services to the public for a fee. An enterprise fund uses the same accounting framework followed by entities in the private sector. Homer uses an enterprise fund for the port and harbor facilities.	Variable
General Obligation Bonds	City of Homer Police Department	General obligation bonds are appropriately used for the construction and/or acquisition of improvements to real property broadly available to residents and visitors. Such facilities include—but are not limited to—libraries, hospitals, parks, public safety facilities, and cultural and educational facilities. The city uses a general obligation bond for the police station.	Variable
Renewable Energy Fund	Alaska Energy Authority	Provides funding for the development of qualifying and competitively selected renewable energy projects in Alaska. The program is designed to produce cost-effective renewable energy for both heat and power For Fiscal Year 2019, $11 million has been allocated by the governor to fund the Renewable Energy Fund. This program runs through 2023.	Project-specific
HMA: Hazard Mitigation Grant Program (HMGP)	FEMA	Supports pre- and post-disaster mitigation plans and projects. Available to communities in Alaska after a presidentially declared disaster has occurred in Alaska.	Project-specific
HMA: Building Resilient Infrastructure and Communities (BRIC)	FEMA	Focuses on reducing the nation's risk by funding public infrastructure projects that increase a community's resilience before a disaster affects an area.	Project-specific

Table 5-2: Financial Resources for Hazard Mitigation

Type	Source	Purpose	Amount
HMA: Flood Mitigation Assistance	FEMA	Funds projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the NFIP.	Project-specific
Homeland Security Preparedness Technical Assistance Program	FEMA/Department of Homeland Security	Build and sustain preparedness technical assistance activities in support of the four homeland security mission areas (i.e., prevention, protection, response, recovery) and homeland security program management.	Project-specific
Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards. Available to fire departments and nonaffiliated emergency medical services providers.	Project-specific
Community Action for a Renewed Environment	U.S. Environmental Protection Agency	Through financial and technical assistance, this program offers an innovative way for a community to organize and take action to reduce toxic pollution (e.g., stormwater) in its local environment. Through this program, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize exposure to them.	Project-specific
Community Block Grant Program Entitlement Communities Grants	U.S. Department of Housing and Urban Development (HUD)	Acquisition of real property; relocation and demolition; rehabilitation of residential and nonresidential structures; construction of public facilities and improvements, such as water and sewer facilities, streets, neighborhood centers; and the conversion of school buildings for eligible purposes.	Project-specific
Community-Based Restoration Program	National Oceanic and Atmospheric Administration	Provides funding and technical assistance to communities for restoration projects that ensure fish have access to high-quality habitat. The goal of these projects is to recover and sustain fisheries.	Project-specific
National Coastal Resilience Fund	National Fish and Wildlife Foundation	Provides assistance to restore, increase and strengthen natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife. It invests in projects that restore or expand natural features such as coastal marshes and wetlands, oyster and coral reefs, forests, coastal rivers and floodplains, and barrier islands that minimize the impacts of storms and other naturally occurring events on communities.	Project-specific

Table 5-3: Planning and Policy Resources for Hazard Mitigation

Name	Description	Hazards Addressed	Emergency Management
Homer City Ordinances Title 21.44 Slopes	The City of Homer has adopted local ordinances to define Steep Slope and to require engineering approval for any development of steep slopes in Homer (Homer City Code [HCC] 21.44.050).	Landslide	Mitigation
Homer City Ordinances, Title 12 Building and Construction, Title 13 Standard Construction Practices, and Title 22 Subdivisions	Hazard-resistant building codes are a cost-effective way to safeguard communities against natural disasters.	Climate Change, Earthquake, Erosion, Flood, Landslide, Severe Weather, Wildfire	Mitigation
City of Homer Emergency Operations Plan	The plan describes the City of Homer's organizational structures, roles, and responsibilities; protocols for providing emergency response and short-term recovery; the purpose, situation, and assumptions; concept of operations, organization, assignment of responsibilities, and plan development and maintenance; authorities; and references.	Coastal Storm Surge/Erosion, Earthquake, Wildland Fire, Flood, Landslide, Tsunami, Volcano, Severe Weather	Response, Recovery
City of Homer Capital Improvement Plan 2019-2024	Identifies capital projects and equipment purchases, provides a planning schedule and identifies options for financing the plan. The plan/program is usually short-range, approximately 6 years.	Landslide, Coastal Storm Surge/Erosion, Flood	Mitigation, Preparedness
Homer Comprehensive Plan	Describes hazard areas and lists goals and policies to reduce the potential risk of death, injuries, and economic damage resulting from natural and human-caused hazards.	Erosion, Flood Landslide	Mitigation, Preparedness, Response
Public Outreach	The City of Homer uses a Facebook page and an email distribution list to provide outreach to the community on relevant events, activities, and planning processes happening in the city.	All	All Phases
NFIP	Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.	Flood	Mitigation

Table 5-4: Ability to Expand Resources

Capability	Type/Description	Expansion
Human and Technical	Mitigation Specialist	Appoint or assign someone with Homer's government to oversee hazard mitigation grant opportunities, including notifying Homer's departments/agencies of upcoming grant cycles, and spearheading Notice of Intent applications, grant applications, and grant management requirements.
Financial	HMA funding	Apply for BRIC and HMGP funding as it becomes available. The focus should be on projects that mitigate critical infrastructure, provide protection for disadvantaged areas, and address climate change.
Planning and Policy	Climate Action Plan	Integrate climate sustainability plans into Homer's Comprehensive Plan (including measures to reduce greenhouse emissions) through a series of local transportation, land use, building energy, water, waste, and green infrastructure programs and policies.
Planning and Policy	Zoning and Permitting Code Updates	Develop City Code that reflects current and future work on city-wide drainage and wetlands to mitigate erosion.

5.2 NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

The NFIP aims to reduce the impact of flooding on residential and nonresidential buildings by providing insurance to property owners and encouraging communities to adopt and enforce floodplain management regulations. Participation in the NFIP is based on an agreement between local communities and the federal government.

The City of Homer joined the NFIP on May 19, 1981, the same day the city was mapped to a FIRM. The current FIRM date for Homer is October 20, 2016. As a participant of the NFIP, the Homer City Planning Department enforces a floodplain management ordinance and participates in FEMA's Community Assisted Visits, which occur on a 3- to 5-year cycle. FEMA's last Community Assisted Visit to Homer occurred in 2011.

5.3 MITIGATION GOALS

Mitigation goals are defined as general guidelines that explain what an agency wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range policy-oriented statements representing a community-wide vision. FEMA's 2022 Building Resilient Infrastructure and Communities priorities are the basis for the three goals (Table 5-5) for the 2022 LHMP.

Table 5-5: Mitigation Goals

Goal #	Description
1	Enhance climate protection and adaptation efforts
2	Create a healthy and safe community
3	Protect critical facilities and infrastructure against hazards

5.4 RECOMMENDED MITIGATION ACTIONS

Mitigation actions help achieve the goals of the LHMP. The recommended mitigation actions provided in Table 5-6 include: education and awareness; structure and infrastructure projects; preparedness and response; and local plans and regulations. This list addresses every hazard profiled in this plan and is based on the plan's risk assessment as well as lessons learned from recent disasters. It was developed using FEMA success stories and best management practices; FEMA job aids; local and regional plans and reports; and input from planning team members.

Table 5-6: Recommended Mitigation Actions

No.	Project Name	Hazard Mitigated	Project Description	Type of Development
1	Critical Facility Auxiliary Power (Phase I)	All	Determine which critical facilities require auxiliary power in order to remain functional during de-energization or public safety power shutoff and/or general loss of power and install auxiliary power systems. Auxiliary power systems may include back-up generators, local Solar Photovoltaic plus storage, and microgrids.	Existing
2	Generators (Phase II)	All	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short-term power disruption. (e.g., first responder, medical facilities, schools, correctional facilities, and water and sewage treatment plants)	New and existing
3	Emergency Radio Communication System Upgrade	All	Continue the city's systematic upgrade of its Emergency Radio Communication System.	Existing
4	Upslope Tidal Marshes	Climate Change	Create tidal marshes with resilience to climate change by providing space for the tidal marshes to spread vertically upslope when sea level rises.	New and existing
5	Downslope Tidal Marshes	Climate Change	Create tidal marshes with resilience to climate change by providing space for tidal marshes to spread vertically downslope to aid upland drainage to the sea	New and existing
6	Seismic Retrofits	Earthquake	Seismically retrofit existing critical facilities to make them more resistant to damage from earthquakes.	Existing
7	Earthquake-Resistant Pipes Replacement	Earthquake, Landslide	Replace aging critical pipes in areas of extreme or violent shaking hazard and landslide hazard areas to improve seismic reliability and safeguard critical water distribution lines against the potential destructive impacts of large-scale earthquakes and accompanying landslides.	Existing
8	Storm Drainage Improvements	Flood	Continue to make capacity/structural improvements to storm drains, channels, and pump stations, as well as green infrastructure systems (such as marshes) to enable them to perform to their capacity in handling water flows.	Existing

Table 5-6: Recommended Mitigation Actions

No.	Project Name	Hazard Mitigated	Project Description	Type of Development
9	Bank and Shoreline Protection	Flood, Erosion	Develop mitigation initiatives such as: revetments, articulated matting, concrete, asphalt, vegetation, or other armoring or protective materials to provide small scale site-specific shoreline bank protection.	New and existing
10	Shoreline Protection on the Homer Spit	Flood, Erosion	Develop plan to implement mitigation recommendations cited in Coastal Erosion Assessment of Sterling Highway Termini on Homer Spit such as: large-scale gravel placement as beach re-nourishment and site-specific shoreline bank protection (revetments) along the Homer Spit.	New and existing
11	Groundwater Protection	Flood, Erosion	Develop mitigation initiatives to provide site-specific protection for near-surface groundwater.	New and existing
12	Property Buyout on the Homer Spit	Flood, Erosion	Buyout property in areas that are prone to flooding or at risk from erosion, particularly on the Homer Spit, as an alternative to "defend in place" mitigation actions.	Existing
13	Property Buyout of Wetlands	Flood, Erosion	Buyout property in areas that have high green infrastructure value, such as wetlands and riparian areas, to provide natural mitigation against flooding and erosion.	Existing
14	Flood Protection Ordinance/Overlay Zone	Flood	Adopt a comprehensive flood protection ordinance/overlay zone for areas that are in the SFHA or subject to flooding. Properties in this overlay are often subject to additional standards concerning development/land uses, building elevation, stream buffers, outdoor storage, building materials, and permitting procedures.	New and existing
15	Sterling Highway Drainage Improvements	Erosion, Flood, Landslide	Continue implementing elements of the Green Infrastructure Stormwater Management Plan for drainage improvements at Sterling Highway Milepost 172 and other erosion-prone areas such as Kachemak Drive, Main Street South and East End Road.	Existing
16	Hillside Protection	Landslide	Stabilize landslide-prone areas through stability improvement measures, including interceptor drains, in situ soil piles, drained earth buttresses, and subdrains.	New and existing
17	Landslide Zone	Landslide	Regulate development through zoning and permitting in landslide-prone areas.	New

Table 5-6: Recommended Mitigation Actions

No.	Project Name	Hazard Mitigated	Project Description	Type of Development
18	Tree Clearing	Severe weather	Develop and implement tree clearing programs for the city and residents to keep trees from threatening lives, property, and public infrastructure from severe weather events.	New and existing
19	Powerline Disconnects	Severe weather	Increase power line wire size and incorporate quick disconnects (breakaway devices) to reduce ice load and windstorm powerline failure during severe wind or winter ice storm events.	New and existing
20	Underground Powerlines	Severe weather	Continue to require new development to implement underground powerlines and relocate aboveground power lines to below ground where possible.	New and existing
21	StormReady Program	Severe weather	Complete certification for the StormReady program. The program encourages communities to take a proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.	New and existing
22	TsunamiReady Program	Tsunami	Maintain certification for the TsunamiReady program. The main goal of the program is to improve public safety before, during, and after tsunami emergencies. It aims to do this by establishing guidelines for a standard level of capability to mitigate, prepare for and respond to tsunamis, and work with communities to help them meet the guidelines and ultimately become recognized as "TsunamiReady" by the National Weather Service.	New and existing
23	Public Works Campus Task Force Recommendations	Tsunami	Implement the recommendations provided by the Public Works Campus Task Force to mitigate impacts of tsunami damage, including developing a long-term plan to move the Public Works Campus.	Existing
24	Tsunami Vertical Evacuation Structure	Tsunami	Construct a tsunami vertical evacuation tower on the Homer Spit to provide temporary refuge above tsunami waves.	New
25	Tsunami Preparedness, Warning, and Evacuation System	Tsunami	Develop a tools and materials to educate the public about tsunami preparedness and methods to make evacuation procedures clear and efficient in the event of a tsunami.	New and existing

Table 5-6: Recommended Mitigation Actions

No.	Project Name	Hazard Mitigated	Project Description	Type of Development
26	Tsunami Warning System	Tsunami	Conduct assessment of tsunami warning system and implement recommendations to add technological performance and redundancy to the siren system.	New and existing
27	Air Filtration Identification	Volcano	Identify vulnerabilities in critical facilities—particularly air filtration and water systems—to deal with ashfall events.	Existing
28	Air Quality Clean Building	Volcano, Wildfire	Identify a building or room to be a designated "clean building" or "clean room" for use during periods of poor air quality created from wildfires, volcanic ash, or other poor air quality event. Acquire air filters and masks for distribution.	Existing
29	Property Buyout near Bridge Creek Reservoir	Wildfire	Buyout property in areas that are prone wildfire, particularly on the near the Bridge Creek Reservoir to protect the drinking watershed.	Existing
30	Wildland-Urban Interface Ordinance/Overlay Zone	Wildfire	Adopt a Wildland-Urban Interface ordinance/overlay zone. Properties in this overlay area are often subject to additional standards concerning structure density and location, building materials and construction, vegetation management, emergency vehicle access, water supply, and fire protection.	New and existing
31	Critical Facility Fireproofing	Wildfire	Consider ways to protect radio sites from wildfire, including rebuilding using fire-resistant materials.	Existing
32	Wildfire Risk Coordination	Wildfire	Continue coordinating with and providing support to the Kenai Peninsula Borough and the Alaska Department of Natural Resources during their wildfire assessments and plan implementations.	New and existing
33	Homer Volunteer Fire Department Fleet Replacement	Wildfire	Improve the Homer Volunteer Fire Department Wildland-Urban-Interface response capabilities by replacing out-of-compliance and substandard Brush-1 initial fire attack vehicle.	New
34	Water Supply	Wildfire	Water sources for both residential protections and firefighting capacity should be developed. This includes increased pumping capability at treatment plant, and two additional 10,000-gallon tanks buried along Skyline Drive.	New and existing
34	Water Lines and Hydrants	Wildfire	Provide additional water lines and fire hydrants to the residential neighborhoods along Skyline Drive.	New and existing

5.5 PRIORITIZED ACTION PLAN

A prioritized action plan is an itemized list of recommended mitigation actions that a community/agency hopes to put into practice to reduce its risks and vulnerabilities.

For the 2022 LHMP, the planning team created a two-tier prioritization process based on the following:

- High priority mitigation actions are those that address hazards of immediate concern and are also cost-effective (positive cost-benefit ratio) and may have an identified funding source.
- Medium priority mitigation actions are those that address hazards that are not of immediate concern and/or those that are of immediate concern but are not cost effective or do not have an identified funding source.

The City of Homer determined the hazards and threats of immediate concern based on the 2022 LHMP's hazard profiles, risk assessment, and capability assessment as follows: climate change, earthquake, erosion, flood, landslide, severe weather, tsunami, and wildfire.

The results of the prioritization process are provided in Table 5-7. For each mitigation action listed, potential funding sources, responsible departments or agencies, and implementation timelines have been identified.

Table 5-7: Prioritized Action Plan

No.	Project Name	Priority	Potential Funding Source	Responsibility	Timing
1	Critical Facility Auxiliary Power (Phase I)	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
2	Generators (Phase II)	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
3	Emergency Radio Communication System Upgrade	High	City of Homer	City of Homer Public Works Department	0 to 5 years
7	Earthquake-resistant pipes replacement	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
8	Storm Drainage Improvements	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
10	Shoreline Protection on the Homer Spit	High	FEMA BRIC/HMGP	City of Homer Planning Department	0 to 5 years
11	Groundwater Protection	High	City of Homer	City of Homer Planning Department	0 to 5 years
12	Property Buyout on the Homer Spit	Medium	HUD Community Block Grant Program	City of Homer City Manager's Office	0 to 5 years
15	Sterling Highway Drainage Improvements	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
16	Hillside Protection	High	FEMA BRIC/HMGP	City of Homer Planning Department	0 to 5 years
17	Landslide Zone	High	City of Homer	City of Homer Planning Department	0 to 5 years
18	Tree Clearing	Medium	City of Homer, FEMA BRIC/HMGP	City of Homer City Management's Office	0 to 5 years
20	Underground Power Lines	High	City of Homer	City of Homer Public Works Department	0 to 5 years
21	StormReady Program	Medium	City of Homer	City of Homer Planning Department	0 to 5 years
22	TsunamiReady Program	High	City of Homer	City of Homer Planning Department	0 to 5 years

Table 5-7: Prioritized Action Plan

No.	Project Name	Priority	Potential Funding Source	Responsibility	Timing
23	Public Works Campus Task Force Recommendations	High	City of Homer, FEMA BRIC/HMGP	City of Homer City Manager's Office	0 to 5 years
24	Tsunami Vertical Evacuation Structure	Medium	City of Homer, FEMA BRIC	City of Homer City Manager's Office	2 to 5 years
25	Tsunami Preparedness, Warning, and Evacuation System	High	City of Homer	City of Homer City Manager's Office	0 to 5 years
26	Tsunami Warning System	High	Kenai Peninsula Borough/Division of Homeland Security	Kenai Peninsula Borough in coordination with City of Homer	0 to 5 years
28	Property Buyout near Bridge Creek Reservoir	High	City of Homer, HUD Community Block Grant Program	City of Homer City Manager's Office	0 to 5 years
30	Wildland-Urban Interface Ordinance/Overlay Zone	High	City of Homer	City of Homer Planning Department	0 to 5 years
31	Critical Facility Fireproofing	High	FEMA BRIC/HMGP	City of Homer Public Works Department	0 to 5 years
33	Homer Volunteer Fire Department Fleet Replacement	High	City of Homer, Assistance to Firefighters Grants Program	City of Homer Volunteer Fire Department	0 to 5 years

5.6 PLAN INTEGRATION

Information about how the 2022 LHMP will be integrated into Homer's relevant plans and programs moving forward is provided in Table 5-8.

Table 5-8: Integration of the 2022 LHMP

LHMP Section	Existing Plan/Policy/Program	Process/Timeframe
Section 3—Hazard Identification	Homer Comprehensive Plan	Update of the Homer Comprehensive Plan to address hazards in the LHMP that are not currently included in it. Consider creating a hazard profiles section in the Comprehensive Plan. The land use planning process can help identify investments in nature-based solutions to natural hazards, including preserving parks and greenways.
Section 3—Hazard Identification	2005 Homer Area Transportation Plan	Update the Homer Area Transportation Plan to address hazards in the LHMP that are not currently included in it. Include planning for the management of floodplains and erosion.
Section 4—Risk Assessment	City of Homer Emergency Operations Plan	Incorporate risk assessment findings into the City of Homer Emergency Operations Plan to help identify and ensure critical resources to maintain operations internally and externally.
Section 5—Mitigation Strategy	City of Homer Capital Improvement Plan 2019-2024	Incorporate the mitigation actions provided in Table 5-7 into the City of Homer Capital Improvement Plan by further studying and evaluating the underlying problems or if studies exist that outline potential solutions. Begin the design stage to develop a plan for each identified project, the actions to be taken, engineering and construction required, schedule, and estimated costs.

6.0 PLAN REVIEW, EVALUATION, AND IMPLEMENTATION

This section addresses Element D of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element D: Plan Review, Evaluation and Implementation
D1. Was the plan revised to reflect changes in development? (Requirement § 201.6(d)(3))
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement § 201.6(d)(3))
D3. Was the plan revised to reflect changes in priorities? (Requirement § 201.6(d)(3))

6.1 CHANGES IN DEVELOPMENT

The 2022 LHMP was updated to reflect the following changes that affect development:

- Five additional critical facilities were added from the previous 2010 LHMP. Two are large docks on the Homer Spit. The ADOT&PF facility and two electrical substations were added. Linear features, such as roads, sewer lines, and telephone lines were excluded from this plan. In addition, the Port and Harbor office has been relocated since the 2010 LHMP.
- New residential development has occurred at a steady rate since the 2010 LHMP. New residential neighborhoods along West Hill Road and East Hill Road could be in areas of higher risk for landslides or wildfires. The City of Homer has actively curtailed development around the reservoir where there is substantial risk of wildfire.

6.2 PROGRESS IN LOCAL MITIGATION EFFORTS

The City of Homer reviewed its 2010 LHMP's mitigation strategy and documented progress made toward each local mitigation effort, provided in Table 6-1. Mitigation actions that had not been implemented were considered for the 2022 LHMP (Table 5-6).

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
A.1.1.1	Distribute, display, and educate about hazards, flood insurance, and the benefits of various protective measures in public outreach programs. Outreach maybe information in a newsletter, on utility bills, in newspapers, public workshops, kiosk at the fire/police hall, and the library.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
A.1.1.2	Provide the public library with documents about hazards, flood insurance, and the benefits of various protective measures.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
A.1.1.3	Provide information about hazards on the City's website and include links to relevant pages that have local conditions, protective measures, permit requirements and maps.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
B.1.1.1	Continue to participate in the National Weather Service/West Coast and Alaska Tsunami Warning Center TsunamiReady Program.	Ongoing, mitigation action included in the 2022 LHMP.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
B.1.1.2	Maintain regular tsunami warning siren drills so that citizens can learn to recognize and expect.	Ongoing, mitigation action modified and included in the 2022 LHMP.
B.2.1.1	Continue to monitor the tsunami evacuation signs on the Homer Spit to Kachemak Drive, East to the junction with East End Road. This route directs people away from the Beluga Slough crossing, which is in the projected tsunami inundation zone.	Ongoing, mitigation action modified and included in the 2022 LHMP.
B.3.1.1	Reduce susceptibility to damage and disruption by incorporating the Tsunami Hazard and FIRMs into the City's planning and zoning process.	Ongoing, mitigation action modified and included in the 2022 LHMP.
B.3.1.2	New development in tsunami hazard areas to meet the same standards required in the coastal high hazard areas.	Ongoing, mitigation action modified and included in the 2022 LHMP.
B.3.1.2	Require the anchoring of fuel tanks, manufactured home, accessory structures, and recreational vehicles to be anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas..
C.1.1.1	Encourage homeowners and property owners to remove dead or diseased trees to create "defensible space."	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.1.1.2	Encourage home and business owners to complete a Fire Wise assessment of their home and/or business.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.1.1.3	Educate homeowners on wildfire resistive construction techniques and strategies to limit their exposure to wildfire.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.1.1.4	Provide interested residents with Fire Wise informational packets and brochures.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.2.1.1	Issue burn permits to Homer residents who wish to dispose of organic materials. Direct nonresidents to the Division of Forestry Website to obtain an open burning permit during the statutory fire season.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
C.3.1.1	Encourage use of composting, chipping, or grinding as an alternative to burning of woody debris.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
C.4.1.1	Maintain open lines of communication between the Division of Forestry, National Weather Service, and the Homer Volunteer Fire Department to determine when fire conditions warrant suspension of burn permits or open burning in general.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.4.1.2	When conditions warrant suspension of burn permits or open burning in Homer, disseminate that information in the form of press-releases to the local radio and print media.	Ongoing, mitigation action modified and included in the 2022 LHMP.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
C.4.1.3	When open burning is prohibited or burn permits are suspended, ensure that the Homer Police Department Dispatch center is notified so that they can advise people who call in to activate their individual permit that a temporary suspension has been placed on open burning.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.4.1.4	Complete a daily assessment of fire danger during closures or suspensions by 10:00 a.m. each day to determine the need to continue the closure or resend the closure.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.5.1.1	Develop list of known shelters (from Emergency Plan), safe zones, and critical infrastructure.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.5.1.2	Review wildfire fuel load and develop mapping of area in need of fuels management activities.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.5.1.3	Develop and implement fuel reduction plan.	Ongoing, mitigation action modified and included in the 2022 LHMP.
C.5.2.1	Attend local planning meetings when conducted.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
C.5.2.2	Review drafts of the Community Wildfire Protection Plan when available and provide feedback to the Alaska Division of Forestry as appropriate.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
D.1.1.1	Identify buildings and facilities that must be able to remain operable during and following a hazard event.	Ongoing, mitigation action included in the 2022 LHMP.
D.1.1.2	Contract a structural engineering firm to assess the identified buildings and facilities to determine their structural integrity and strategy to improve their earthquake resistance.	Ongoing, mitigation action modified and included in the 2022 LHMP.
D.1.2.1	Identify priorities and budget to retrofit existing infrastructure to existing earthquake resistive construction standards.	Ongoing, mitigation action included in the 2022 LHMP.
D.1.2.2	Develop a Request for Proposals to submit for design and construction of the retrofitting requirements.	Ongoing, mitigation action included in the 2022 LHMP.
D.2.1.1	Reference the International Residential Code (current edition) for seismic and wind load requirements.	Ongoing, mitigation action modified and included in the 2022 LHMP.
D.3.1.1	Compile list of available nonstructural mitigation resources available to the public.	Ongoing, mitigation action included in the 2022 LHMP.
E.1.1.1	Annually review the requirements of the NFIP to conform to enrollment objectives and criteria.	Ongoing, mitigation action included in the 2022 LHMP.
E.2.1.1	Encourage FEMA to restudy and remap the city with an emphasis on the Homer Spit, Beluga Slough, and Beluga Lake.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
E.2.2.1	Acquire funds to develop a watershed and drainage management plan that identifies important natural water storage, low features critical to flood function, and predicts future flood hazards.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.3.2.1	Develop overlay map of existing infrastructure (drainages, culvert size, storm drains).	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.3.2.2	Identify high risk city structures.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.3.2.3	Establish an annual inspection of all stormwater management (public and private) and order maintenance as needed.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.3.2.4	Require maintenance logs on private and public stormwater plans.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
E.4.1.1	Require developers/landowners to provide documentation of compliance with existing Flood Damage Prevention requirements if the project is in a flood hazard area as defined by City Code.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
E.4.2.1	Acquire land in high hazard area to restore or retain flood functions.	Ongoing, mitigation action included in the 2022 LHMP.
E.4.2.2	Identify less hazard prone areas for development. Suitability study and map 2008.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.3	Create and maintain buffers and building setbacks from wetlands, creeks, shorelines and drainages.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.4	In the flood hazard areas and along the bluff, consider “relocatable structures” on skids or pilings versus permanent foundation structures.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.5.	Require the anchoring of fuel tanks, manufactured homes, and accessory structures to resist flotation, collapse, and lateral movement due to the effects of wind and water loads.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.6	Preserve open space and/or relocate structures out of high-risk areas.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.7	Provide a means to regulate clearing, filling, grading, dredging, and other development that may impact flood, drainage, and erosion damage.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.8	Minimize adverse impacts of alterations of ground and surface waters and natural flow patterns.	Ongoing, mitigation action modified and included in the 2022 LHMP.
E.4.2.9	Maintain requirements for stormwater control and mitigation through the enforcement of HCC 21.74 Development Activity Plan and HCC 21.75 Stormwater Plan.	Ongoing, mitigation action modified and included in the 2022 LHMP.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
E.4.2.10	Integrate hazard identification, ecosystem protection, protection of community infrastructure and shoreline management into zoning and subdivision ordinances.	Ongoing, mitigation action modified and included in the 2022 LHMP.
F.1.1.1	Do not operate nonessential equipment.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.2	Protect office equipment such as copiers, fax machines, and personal computers.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.3	Allow employees to get home before ashfall occurs.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.4	Limit outdoor activity.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.15	Close doors, windows, and vents.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.6	Do not run exhaust-circulating fans.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.7	Check and change (when needed) oil, oil filter, and air filters.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.8	Wear respirator and eye protection during ash cleanup.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.9	Establish a communication system to alert employees.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
F.1.1.10	Establish an email alert or a call-in voice recording.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
G.1.1.1	Install security systems where hazard materials are stored and/or transferred.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.2.1	Install security measure at the city water treatment plant.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.2.2	Secure all remote pump facilities.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.3.1	Create redundant/backup capability for landline telephone system.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.3.2	Develop off-site backup information technology system.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.3.3	Prepare for utility disruption.	Ongoing, mitigation action modified and included in the 2022 LHMP.
G.1.3.4	Secure vital records and other important document.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.4.1	Encourage local businesses to have adequate cash on hand for emergencies.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.4.2	Encourage local businesses to establish a regular off-site computer back-up system.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
G.1.4.3	Encourage local businesses to participate in the State's Continuity of Business program through the Department of Homeland Security and Emergency Management.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
H.1.1.1:	Safely store biological, chemical, and hazardous materials.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.

Table 6-1: Progress in Local Mitigation Efforts

Action #	Action	Status
H.1.1.2:	Continue to require Fire Marshal certification for all commercial buildings.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
H.1.1.3:	Monitor, in cooperation with the Department of Health, Public Health Center, spikes in illnesses that may indicate the spread of a natural or human-made pathogen among the population.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.
H.1.1.3:	Continue participation and leadership in the Community Based Emergency Planning Committee established by Public Health.	Ongoing, mitigation action no longer considered as part of the 2022 LHMP due to focus on new and emerging mitigation actions and ideas.

Notes:
Regarding Action Numbers, A=public education actions; B=tsunami actions; C=wildfire actions; D=earthquake actions; E=flood actions; F=ash actions; G=technological hazard actions; H= biological, chemical and hazardous materials actions.

In addition, supporting local plans, studies, and programs were reviewed to determine progress in local mitigation efforts. Relevant ongoing actions are provided in Table 5-6.

6.3 CHANGES IN PRIORITIES

The 2010 LHMP's mitigation strategy was prioritized using the STAPLEE (social, technical, administrative, political, legal, environmental, and economic), which FEMA recommended (FEMA 386-9) as a prioritization method in the early to mid-2000s. While the STAPLEE has been replaced in the 2022 LHMP by a more streamlined prioritization process, the priorities (listed below) have not changed:

- To build a culture and practice of disaster resilience by addressing hazards of immediate concern, a mitigation project must have social support.
- To be implemented in a timely manner, a mitigation project must be economically feasible and have an identified funding source.

7.0 PLAN ADOPTION

This section addresses Element E of the Local Mitigation Plan Regulation Checklist.

Regulation Checklist – 44 CFR 201.6 Local Mitigation Plans
Element E: Plan Adoption
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5)) E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))

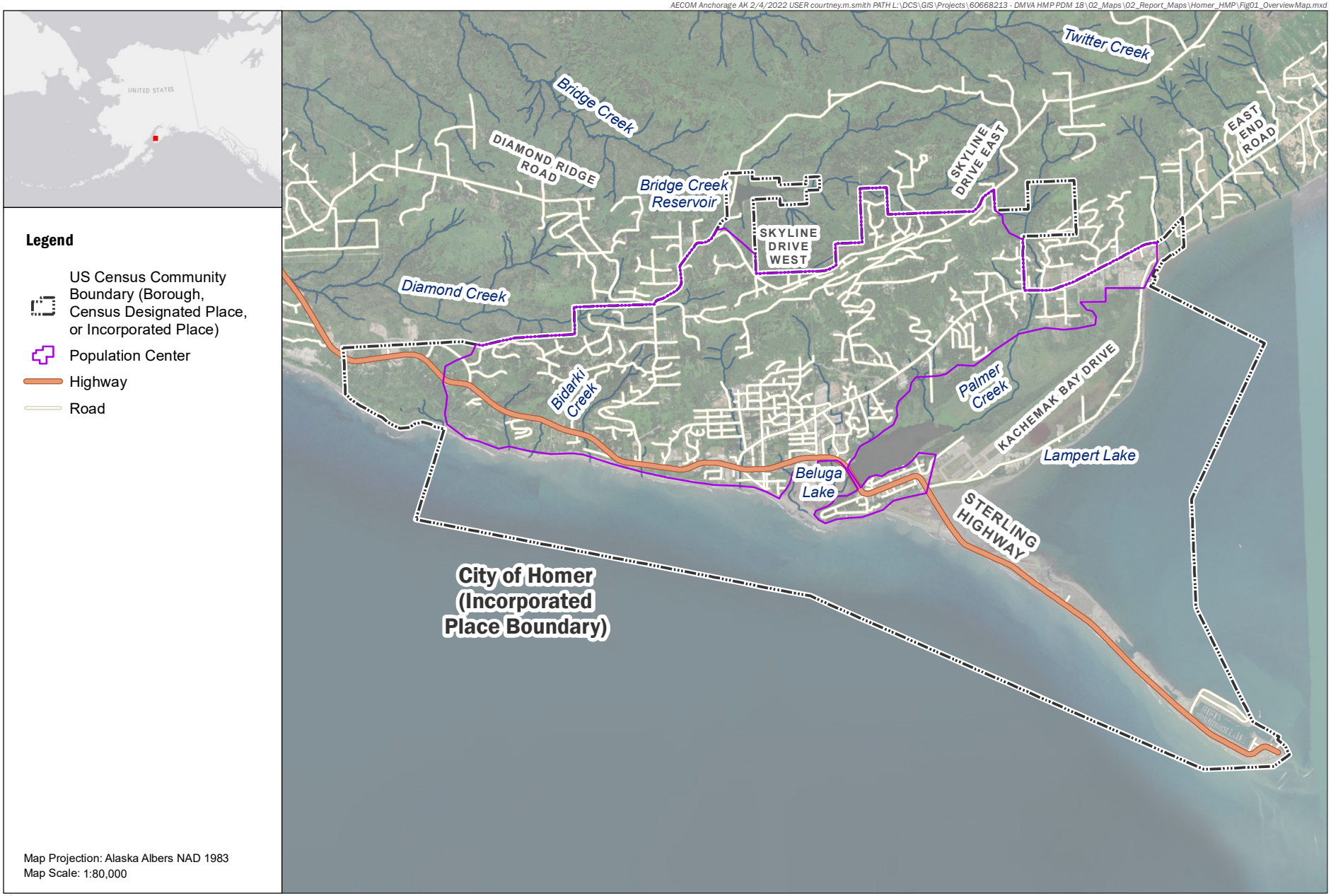
7.1 FORMAL ADOPTION

The 2022 LHMP was formally adopted on [date] by the Homer City Council. A copy of the adoption resolution in on file with the community and the Alaska Division of Homeland Security and Emergency Management.

8.0 APPENDICES

APPENDIX A—FIGURES

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig01_OverviewMap.mxd



US Census TigerLine (2021)
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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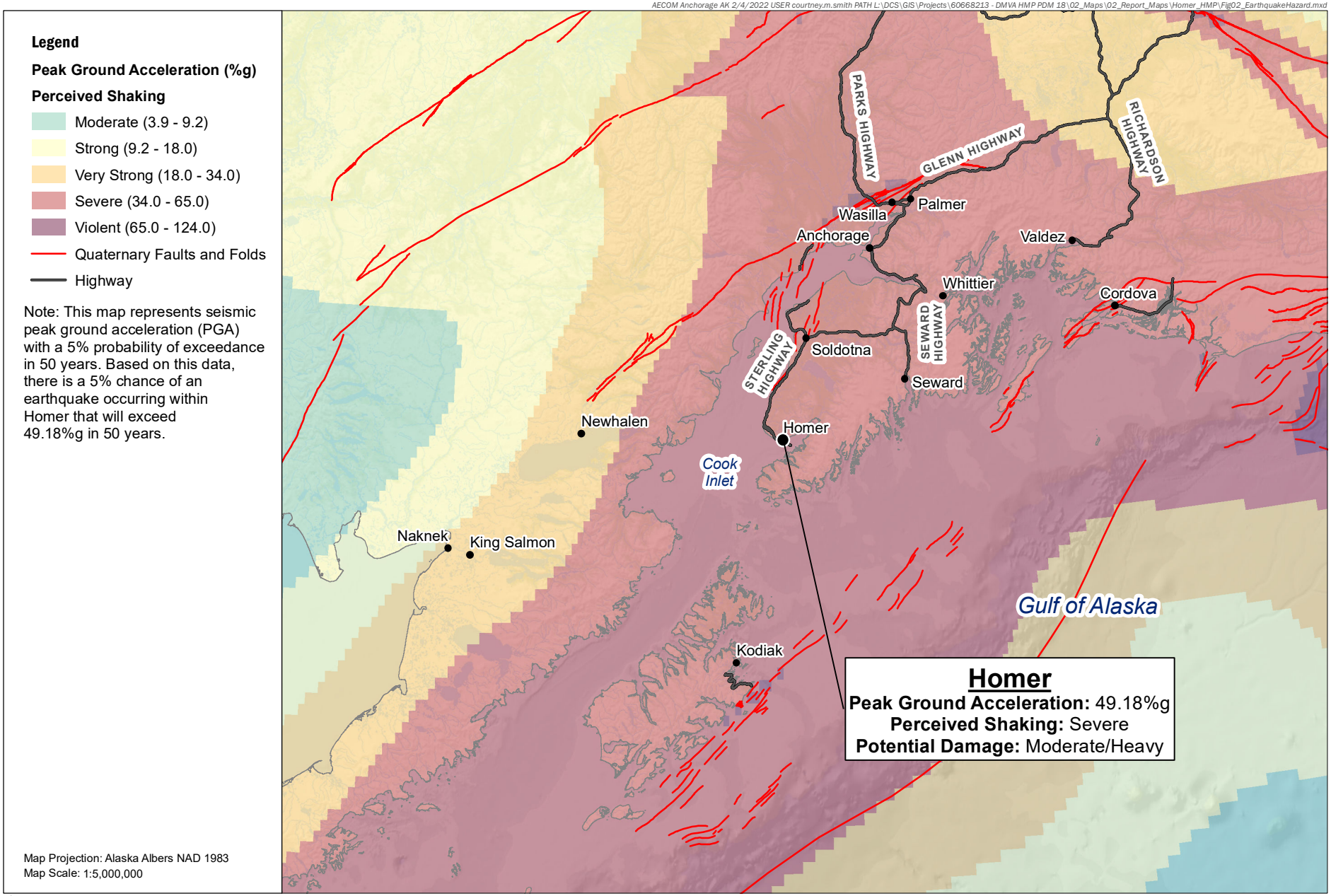
Local Hazard Mitigation Plan

OVERVIEW MAP

Figure 1

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig02_EarthquakeHazard.mxd



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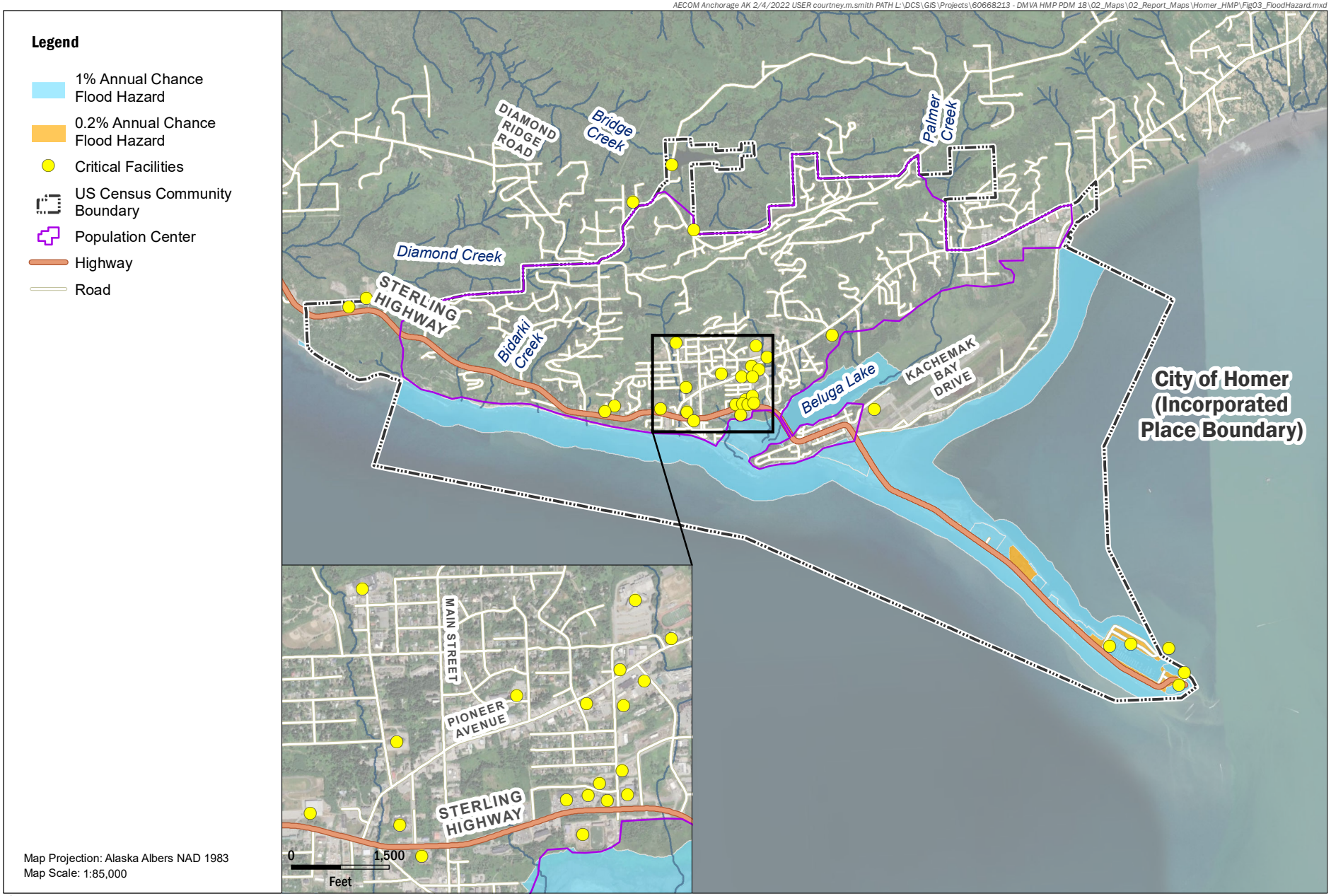
EARTHQUAKE HAZARD AREAS

Figure 2

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig03_FloodHazard.mxd



FEMA (2021); US Census TigerLine (2021)
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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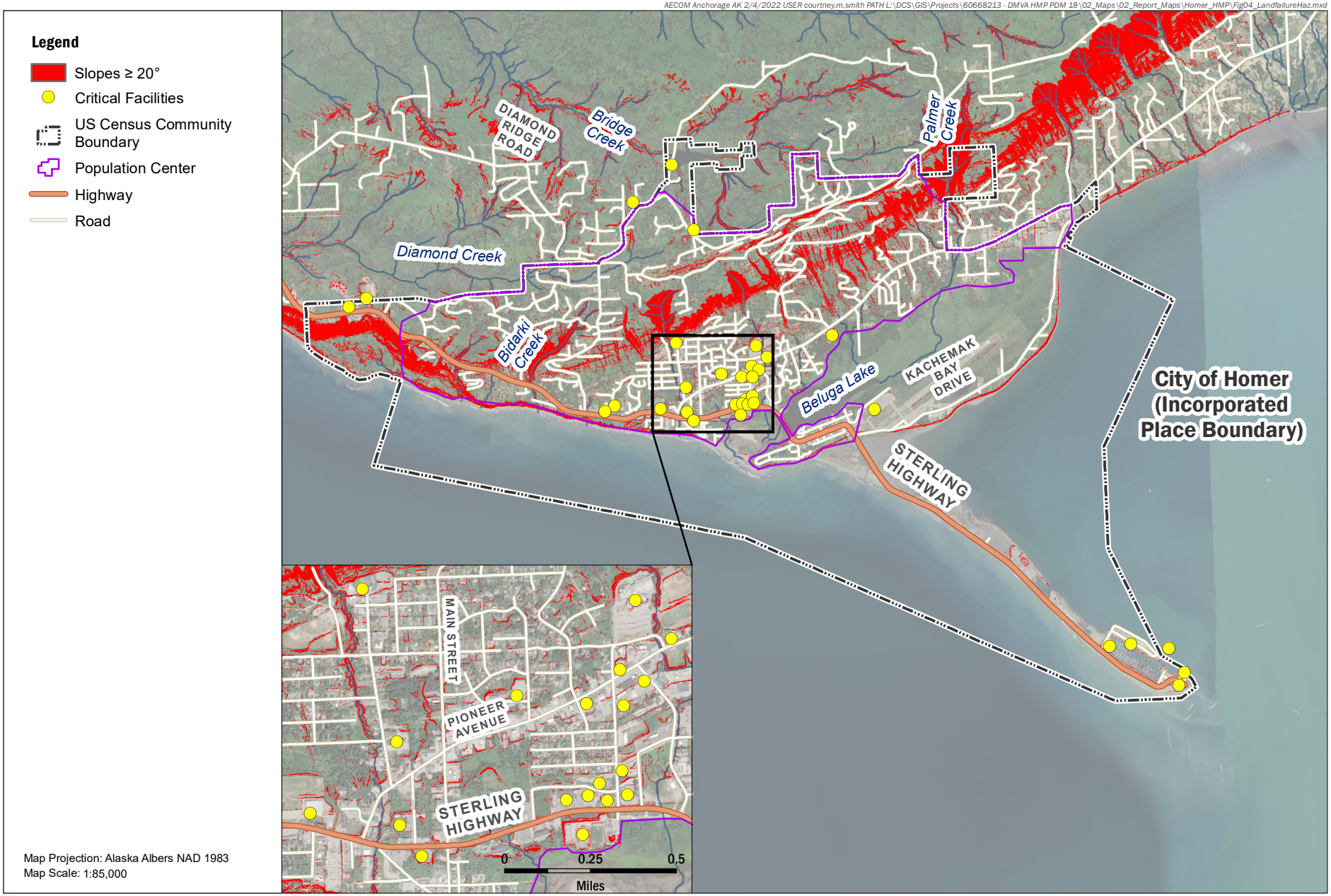
FLOOD HAZARD AREAS

Figure 3

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig04_LandfailureHaz.mxd



US Census TigerLine (2021)
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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LAND FAILURE HAZARD AREAS

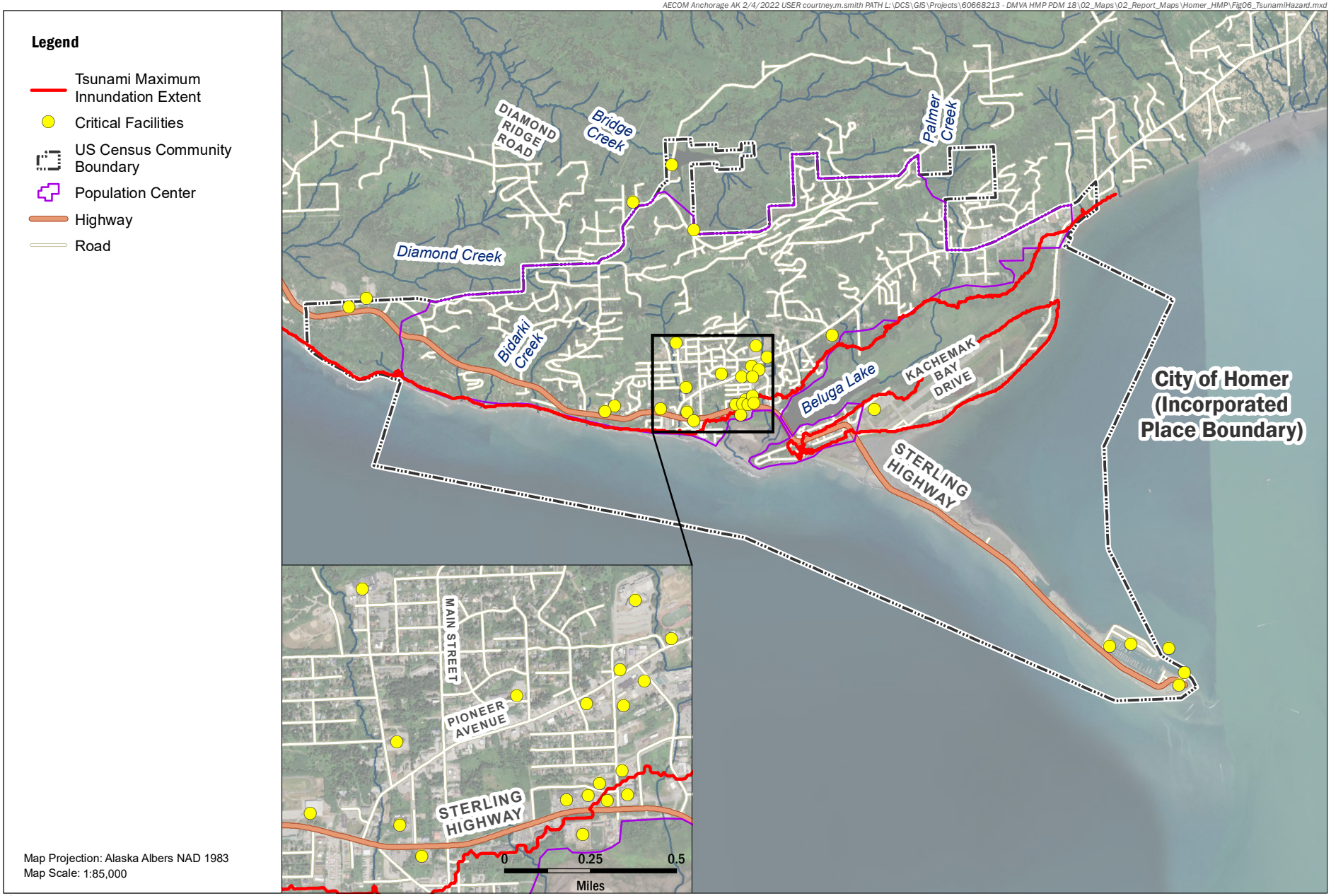
Figure 4

Deep-seated landslide susceptibility near the Bluff Point Landslide. Note that the landslide body (southwest of the yellow headscarp line) is also a landslide deposit and is highly susceptible to repeated failure.

BLUFF POINT LANDSLIDE AREA

Figure 5

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig06_TsunamiHazard.mxd



DGGS (2019); US Census TigerLine (2021)
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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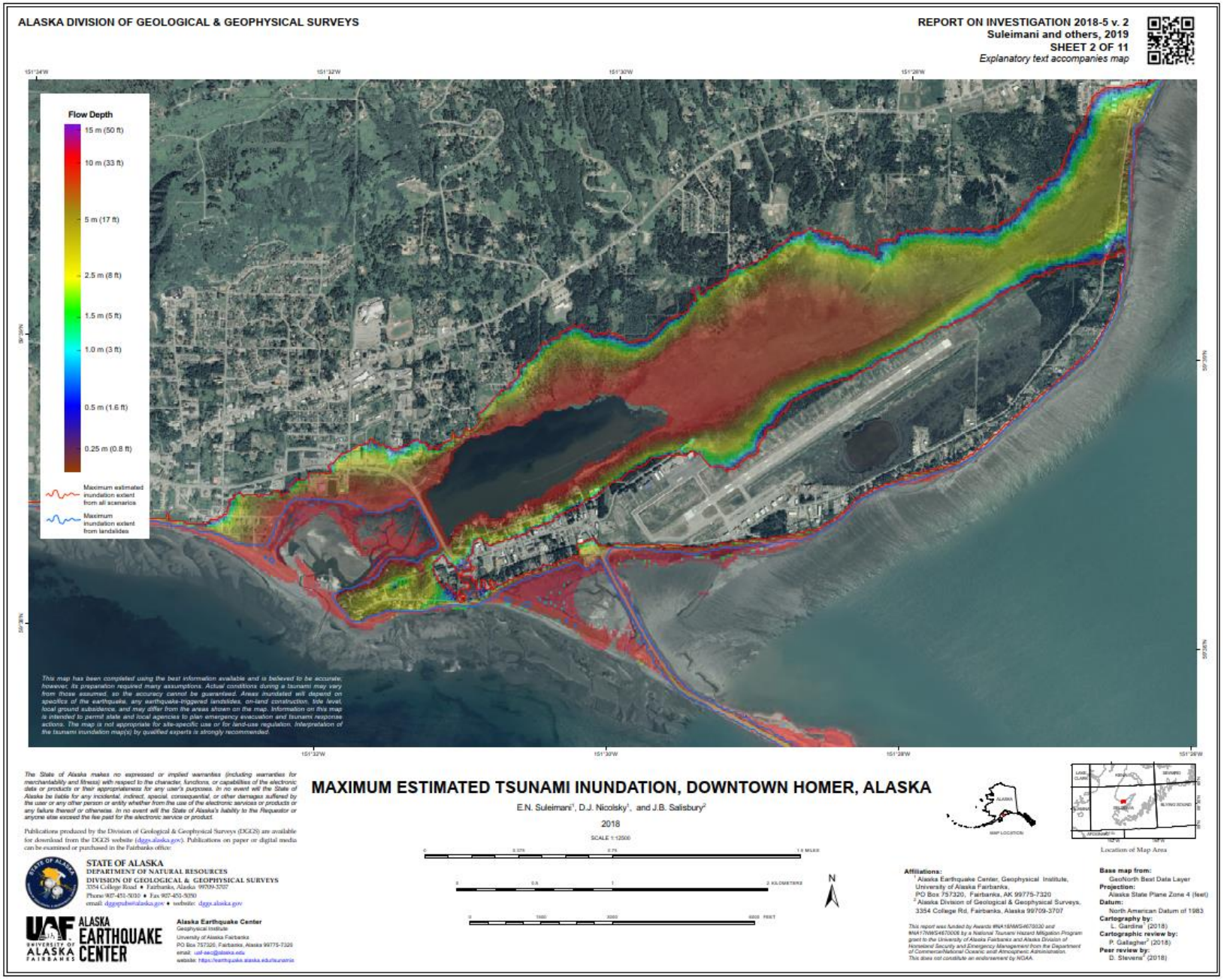
Local Hazard Mitigation Plan

TSUNAMI HAZARD AREAS

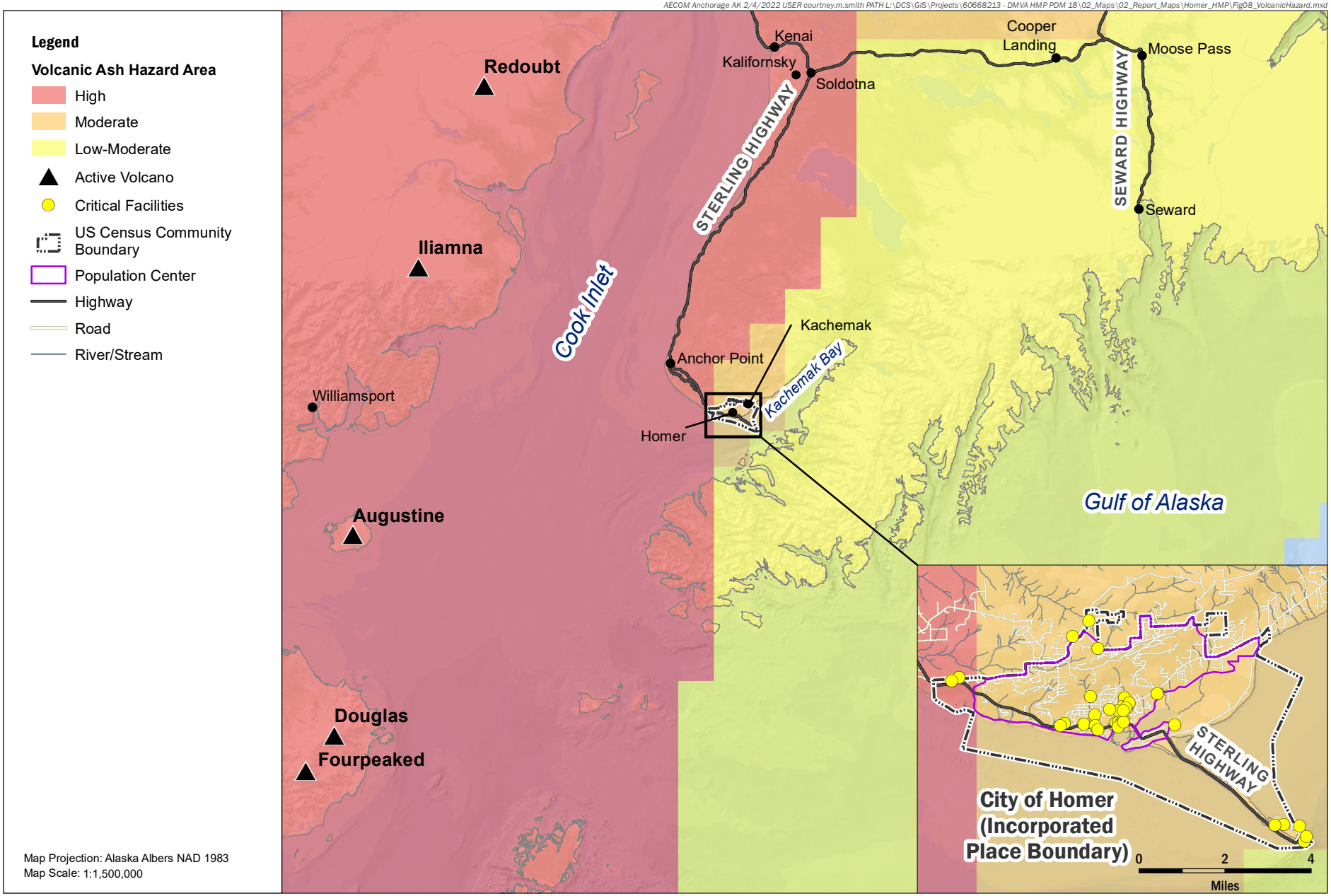
Figure 6



MAXIMUM ESTIMATED TSUNAMI INUNDATION, DOWNTOWN HOMER

Figure 7

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig08_VolcanicHazard.mxd



American Geological Institute (2003); State of Alaska (2018); US Census TigerLine (2021)
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

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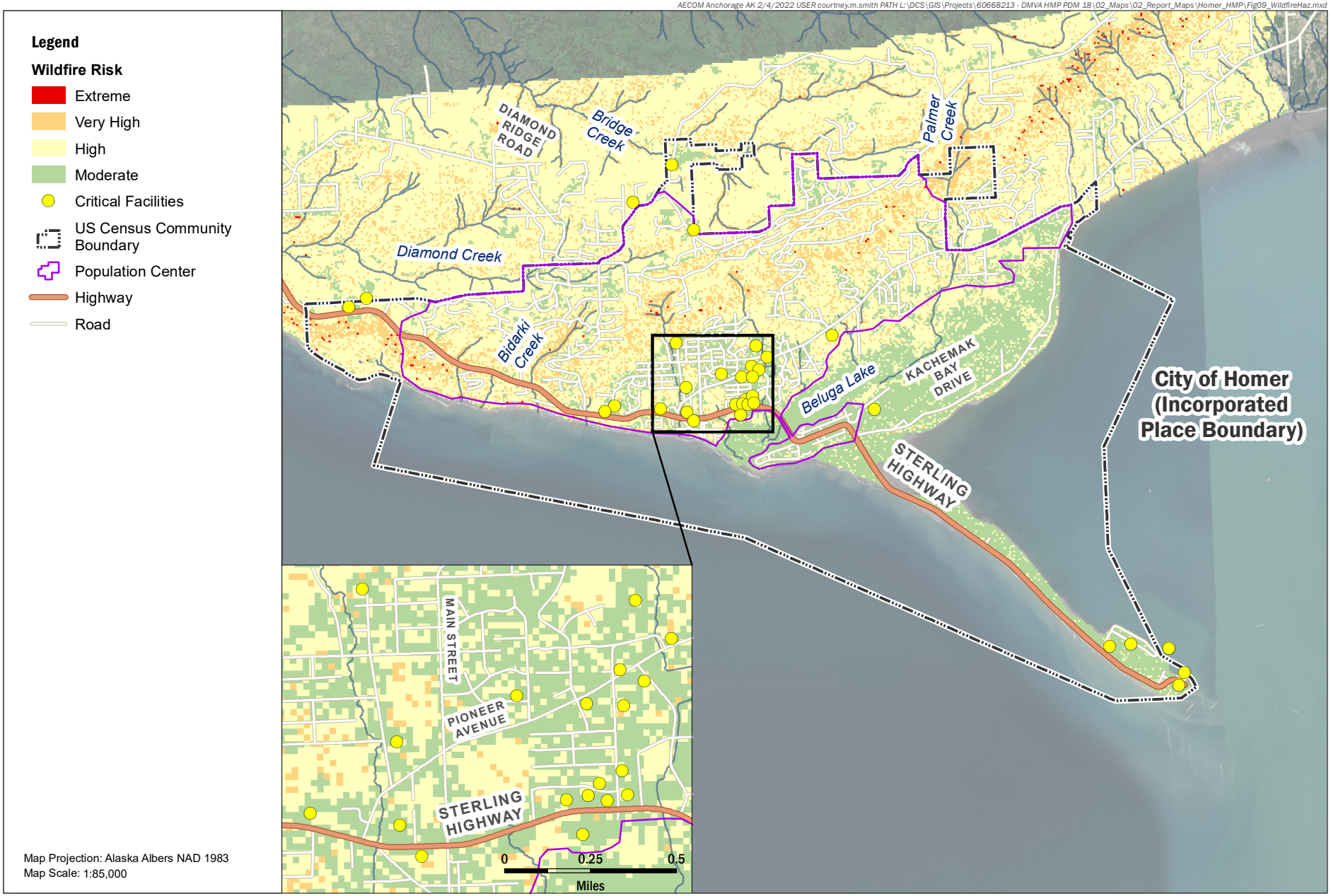
Local Hazard Mitigation Plan

VOLCANIC ASH HAZARD AREAS

Figure 8

AECOM Anchorage AK 2/4/2022 USER courtney.m.smith PATH L:\DCS\GIS\Projects\60668213 - DMVA HMP PDM 18\02_Maps\02_Report_Maps\Homer_HMP\Fig09_WildfireHaz.mxd



US Census TigerLine (2021)
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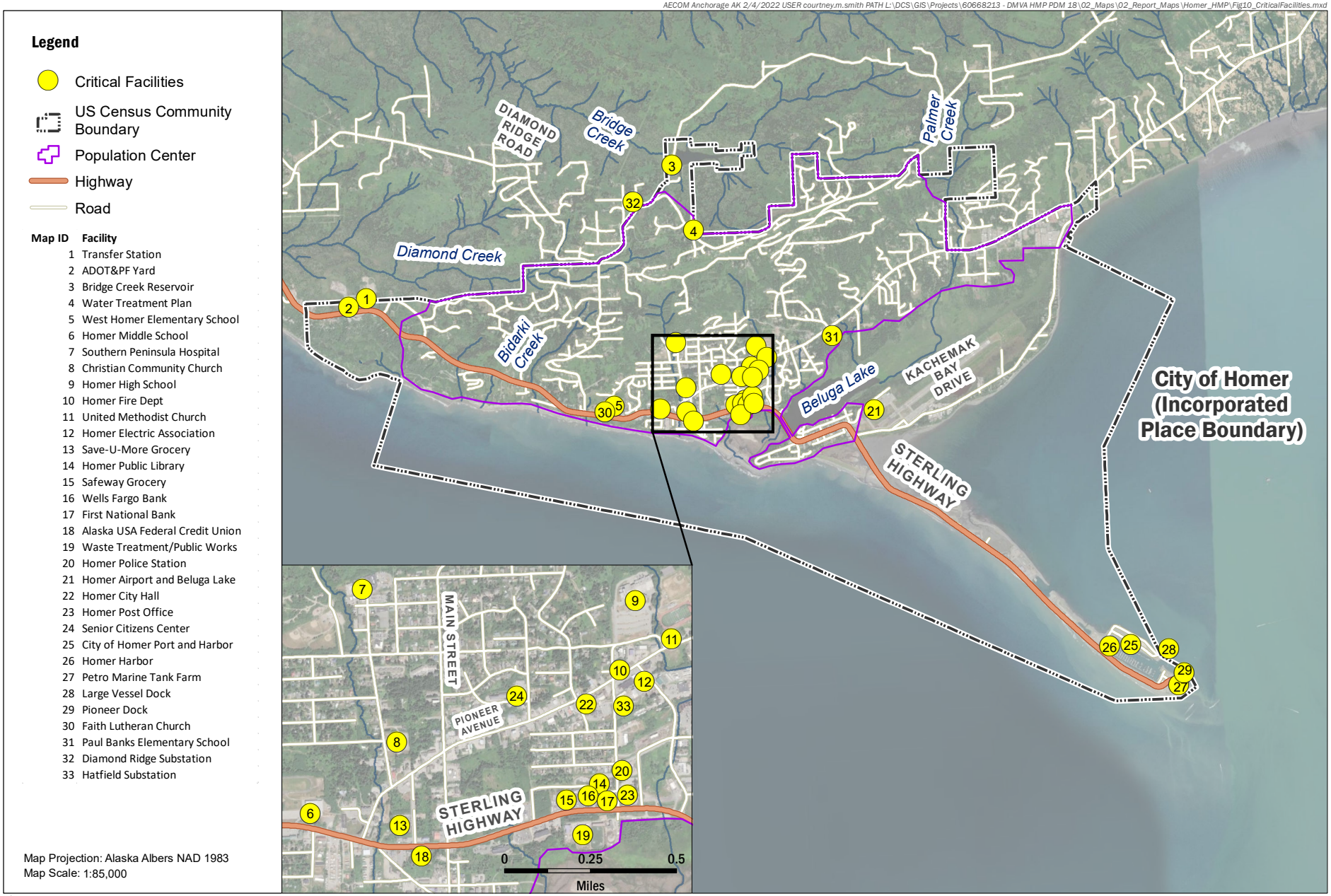
Local Hazard Mitigation Plan

WILDFIRE HAZARD AREAS

Figure 9



US Census TigerLine (2021)
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City of Homer 2022
Local Hazard Mitigation Plan

CRITICAL FACILITIES

Figure 10

APPENDIX B—FEMA DOCUMENTATION

[This appendix will contain the FEMA LHMP Review Tool]

APPENDIX C—PLANNING PROCESS

[This appendix will contain the stakeholder email and a copy of the newsletter to the public.]