

4 Chapter 4 Environment



Figure 4-1: A view of Porphry Mountain north of town

The natural environment is a major determinant of the quality of life of Jamestown. The terrain, climate, and geology of the area can be rugged and challenging. The importance of preserving and respecting the unique mountain environment has been recognized by Jamestown residents. The natural environment is also a prominent reason why many community members choose to live in the mountains. Both taking action to prevent impacts of natural hazards as well as adapting and embracing the environment are important to the future of Jamestown.

The policies in this section are an expression of Jamestown residents' desire to protect the environment and special interest areas, as well as the health, safety, welfare, and property of residents in the town and surrounding area. This desire to ensure the safety of both existing and new development in certain "environmentally sensitive" (hazard) areas was expressed in the *1981 Jamestown Comprehensive Plan* and has been reconfirmed during the numerous planning processes held between 2013 and 2016 as part of the rebuilding efforts following the 2013 Flood. As an important outcome of these processes, the Town published an extensive study on Jamestown's landscape and hazard issues associated with the natural environment in the *2015 Hazard Identification and Risk Assessment and Land Use and Housing Study*. This document helped inform the *2016 Boulder County Hazard Mitigation Plan*. As a result, Jamestown's policies have evolved from this previous set of values and information expressed in the 1981 plan on the local environment.

These environmental policies are also the outcome of an expression of other Jamestown values - the desire for regulations that not only provide some safety measures for new development, but also for regulations that have some flexibility. Residents expressed that the cost of development be borne by the developer and that the cost of public utilities services and the liability of the Town not be increased. This is an important consideration as extension of services in hazardous areas is expensive and difficult.

Beyond recognition of natural hazards, the importance of preserving and respecting the unique mountain environment has been recognized by Jamestown residents. As expressed during the preparation of the *Jamestown Area Long Term Recovery Plan* (2015), community members desire to be good stewards of the region's ecosystem. By encouraging stewardship of the environment throughout the community, Jamestown can enhance the management and protection of natural resources to support outdoor recreational opportunities, to preserve the natural character of the town, and to sustain regional wildlife and healthy environmental systems. The community understands that development patterns and methods can impact the natural environment and thus development needs to occur in a mindful and respectful manner. The community also knows that it can leverage existing agencies and entities to protect resources as well as to take steps to educate the community on ways to create a more harmonious existence with nature.

Natural Hazard Areas of Concern

Slopes and Soils

The terrain in and around Jamestown is mountainous with steep slopes. Slopes range from relatively level ground to over 100% slope (land which changes at least 100 feet in elevation per 100 feet horizontal distance on the ground). Over 70% of Jamestown lies on steep slopes¹ considered to be potentially unstable particularly if disturbed by human activities or by extreme precipitation events. Areas with slopes in excess of about 25% are considered potentially unstable slopes. Most of the mountainous land adjoining the valley floors have slopes in excess of 25%².

Slopes and their soils can produce severe problems for development itself, particularly for structure stability as well as for emergency service access. Engineering technology is available to develop safely on slopes of up to 50%. However, such engineering and mitigation of hazardous conditions can be very costly. Septic system runoff may be difficult to control, erosion tendencies may increase and slope failure is possible. Provision of water services and other utilities is difficult and costly on steep slopes. Extensive grading, cutting, and filling are common in steep hillside development which causes further erosion problems and destruction of the natural beauty of hillsides and viewsheds.

Rockfall

Rockfall in general is not a severe constraint within Jamestown although two areas in the north part of town are subject to rockfall hazards according to the Jamestown Hazard Identification and Risk Assessment. The naturally recurring rockfall on Porphyry Mountain is remote enough

¹ *Jamestown Hazard Identification and Risk Assessment*, 2015.

² *Ibid.*

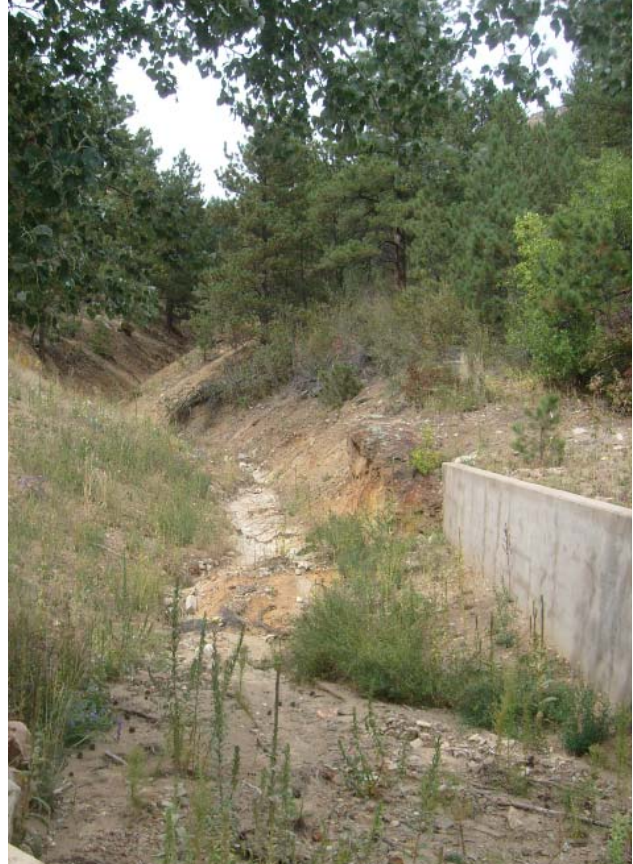


Figure 4-2: Howlett's Gulch

that it does not present a hazard to present or probable future development within town limits. Rockfall near the southeast section of town along County Road 94 presents a mild hazard to motorists especially during the spring freeze-thaw periods. Also, areas of 100% slope (or more) present potential rock fall problems and hazards should be mitigated when development is planned below these areas.

Alluvial Soils

Alluvial soils or alluvial debris fans exist where gulches drain into the stream flowing through the valley floor where Jamestown is located. Water flows quickly through these very permeable soils. This quality of the soil is troublesome for building foundations and controlling septic runoff, especially since they are usually adjacent to streams where contamination and pollution can easily occur. Mitigation of the hazard is possible, although the soils are usually located on floodplains and mitigations for flooding is of overriding concern.

Debris Flow

Debris flows pose one of the most serious geological hazards to the town in the near term. About 13% of the town is within debris flow hazard areas, with about 30 basins being capable of producing debris flows that could affect the town in the future. Six of these basins generated debris flows during the 2013 storm event³.

³ Jamestown Hazard Identification and Risk Assessment, 2015

Flood Hazards

Jamestown has a history of flooding. Six major floods have occurred in Jamestown in the last 130 years, the latest occurring in 2013. Because there are a number of narrow gulches that drain hillsides from both the north and south sides of James Creek, peak flooding in Jamestown usually occurs within a few hours after a single storm event.

A portion of the town is presently built in the floodplain and is therefore in danger. This development also presents danger to structures downstream as floating or swept along debris can increase the volume and force of the flood. Debris in the channel also poses a significant threat to bridges and culverts through blockage, which can result in the diversion of flow toward houses and other structures in the floodplain. In areas where little advance notice of flooding is available, a careful control of types of land use and engineering in the floodplain is needed to maintain public safety.

After the 2013 flood event, the floodway and 100-year floodplain (area inundated in a flood event that has a 1% probability of occurring in any given year) for the James and Little James Creeks were remapped due to the change in conditions caused by the flood and emergency watershed protection projects done to stabilize the creeks. The 1% annual chance flood event is the standard national measurement for flood mitigation actions and the National Flood Insurance Program (NFIP). The new floodplain data is used to update the Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRMs). The floodplain identification is important to property owners since following the flood insurance guidelines is vital for obtaining federal or private lender/bank funds for most private development and town improvements.

Jamestown Flood History		
Year	Cause	Damage
June 1894	heavy rains, heavy spring runoff	most of low-lying areas was washed away; most of the houses on the north side of Main Street were ruined or washed away, as was much of the road
August 1913	heavy rains	damaged or destroyed almost every house and all of the bridges along James Creek
August 1955	brief (30 minute) cloud burst	damaged four bridge and culvert crossings and deposited several inches of mud in local residences
1965	heavy rain	destroyed a number of buildings and roads
May 1969	heavy snow and rain	destroyed a number of buildings, roads, and the town water supply
September 2013	heavy rain	destroyed or damaged 18 houses, several roads, and water infrastructure; landslides also causes significant damage

Figure 4-3: Jamestown Flood History Source: Jamestown Stream Corridor Master Plan Technical Memorandum, 2014

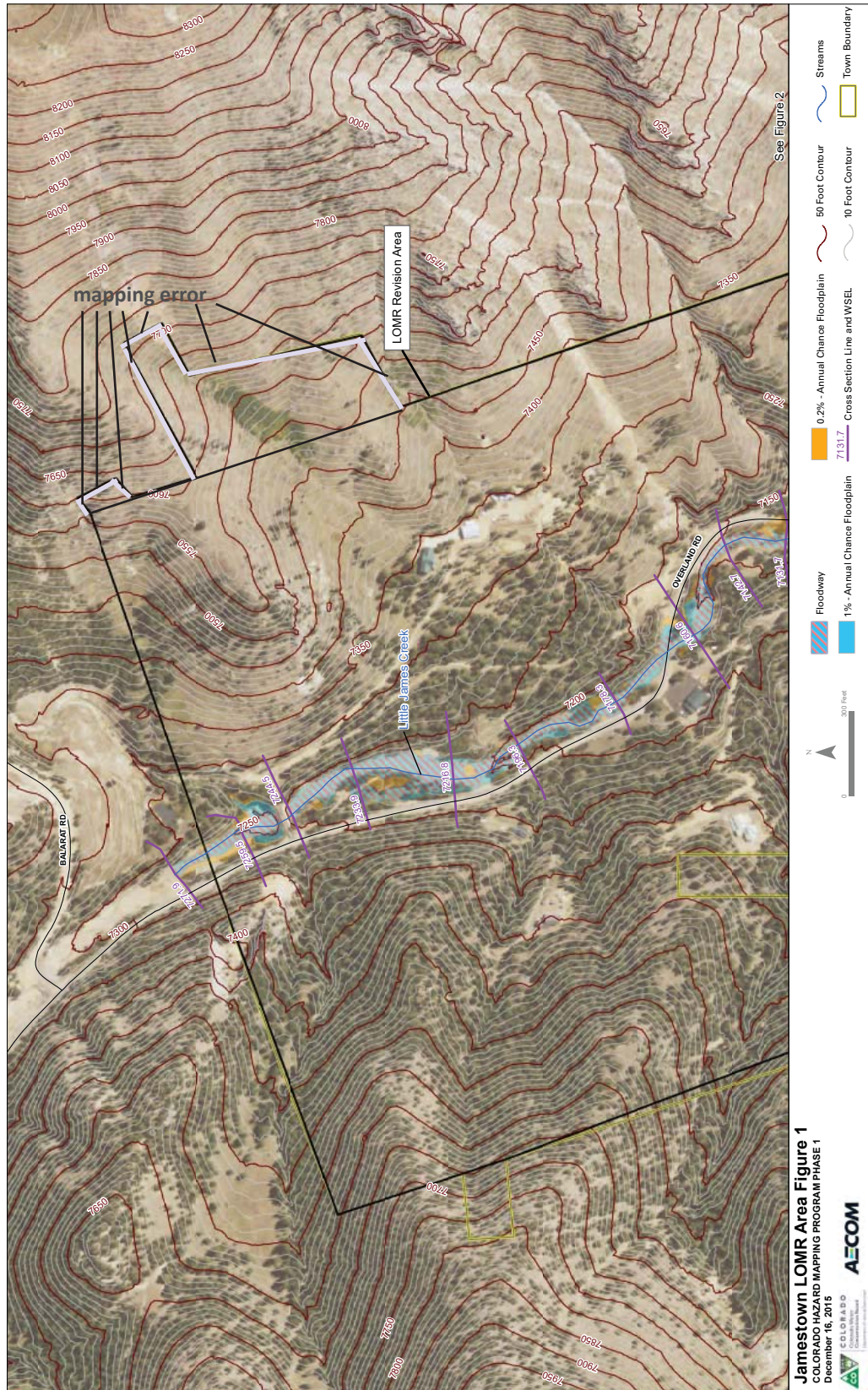


Figure 4-4: Floodplain associated with James and Little James Creeks - north Little James Creek - from AECOM / Colorado Hazard Mapping Program; gray lines indicate mapping error of town boundary

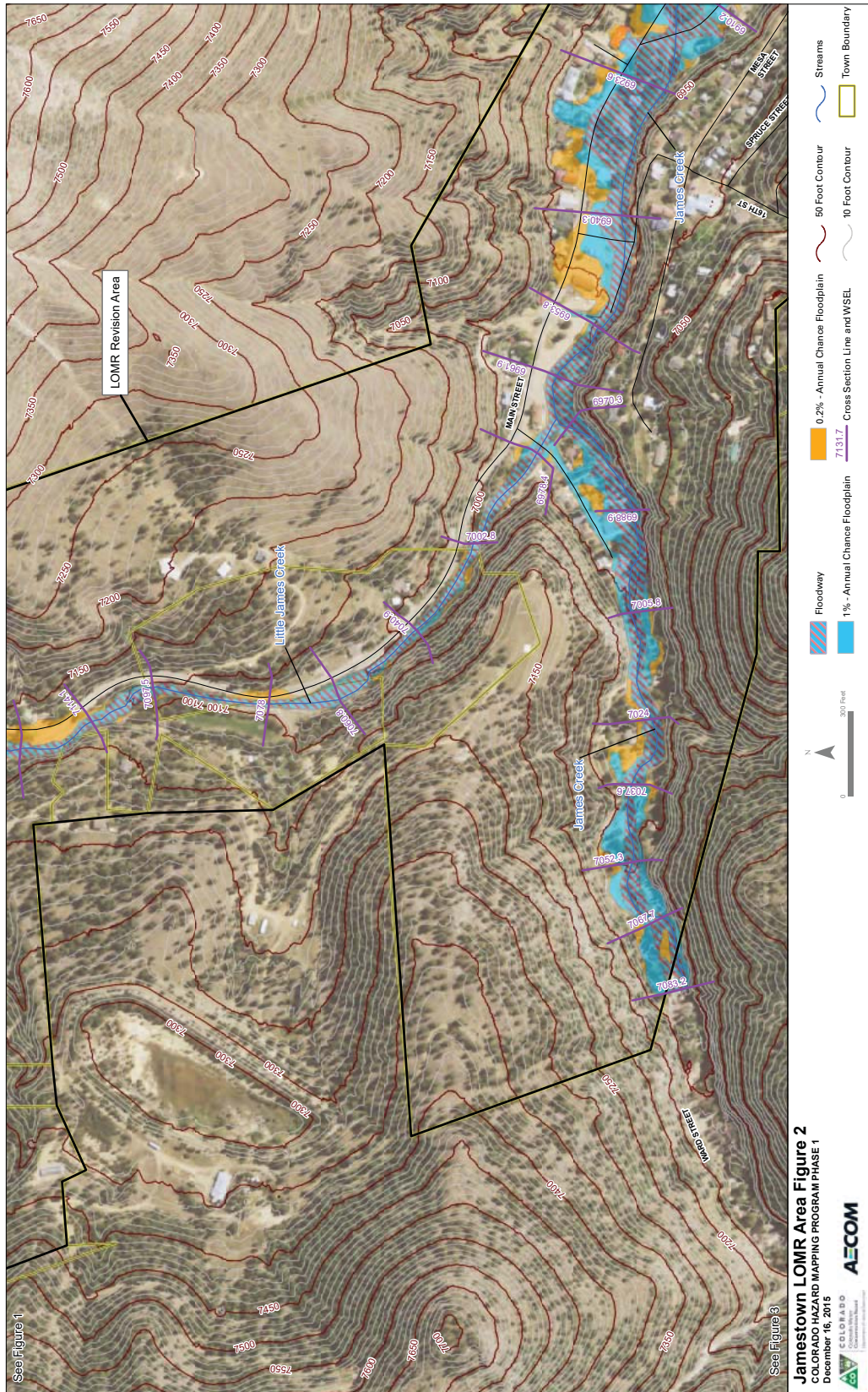


Figure 4-5: Floodplain associated with James and Little James Creeks - - confluence of James Creek and Little James Creek - from AECOM / Colorado Hazard Mapping Program

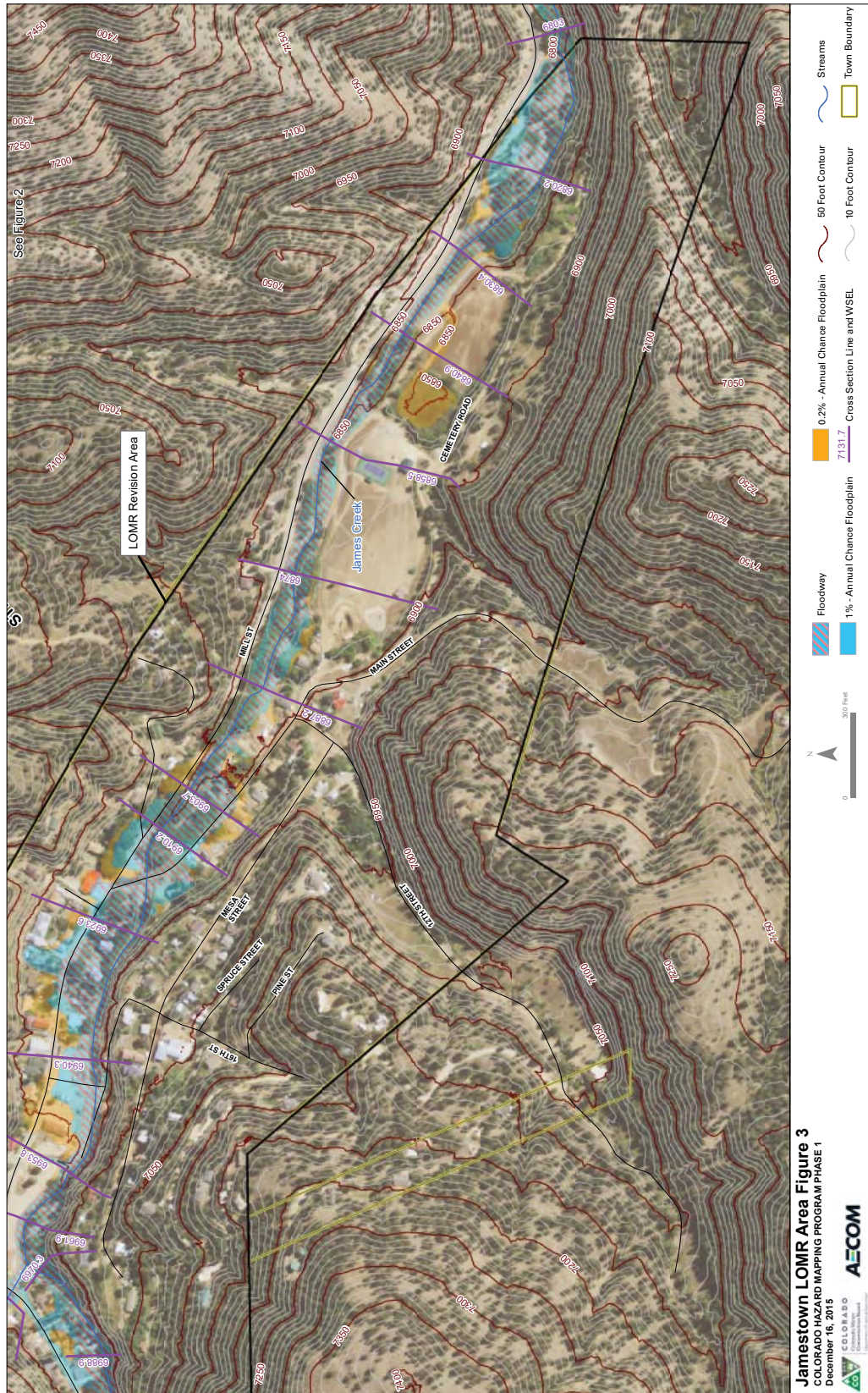


Figure 4-6: Floodplain associated with James and Little James Creeks - lower James Creek - from AECOM / Colorado Hazard Mapping Program

**Boulder County's Approach to Development within the Floodplain
(per the 2015 Boulder Valley Comprehensive Plan)**

The county will protect the public and property from the impacts of flooding in a timely and cost effective manner while balancing community interests with public safety needs. Recognizing that the impact of climate change on the magnitude and frequency of significant flood events is not yet known, the county will continue to monitor the effects of climate change on floodplain delineation and management and amend regulation and management practices as needed for the purpose of protecting life and property.

The county will manage the potential for floods by implementing the following guiding principles: a) Preserve floodplains; b) Be prepared for floods; c) Help people protect themselves from flood hazards; d) Prevent unwise uses and adverse impacts in the floodplain; and e) Seek to accommodate floods, not control them. In addition, the county will prepare for, respond to, and manage flood recovery by implementing multi-hazard mitigation programs and projects, preparing flood response and recovery plans and regulating the siting and protection of critical facilities in floodplains.

The county seeks to manage flood recovery by protecting critical facilities in the 500-year floodplain and implementing multi-hazard mitigation and flood response and recovery plans. The county's approach to flood management also includes: a) efforts to preserve currently undeveloped areas in existing floodplains; b) developing public awareness of flood risks and encouraging the public to proactively implement protective measures that reduce the risk to themselves and their property.

Wildfire Hazards

Jamestown and the vicinity are vulnerable to wildfires during periods of high fire or greater fire danger. Most of Jamestown and vicinity fall into a moderate or high threat wildfire hazard area according to the *Jamestown Hazard Identification and Risk Assessment*. These areas have potential for difficult-to-contain, rapidly spreading crown fires. Density of vegetation, population, and steepness of slopes (winds and access problems) increase the hazards. Flammable woody debris and vegetation support rapid fire spread and high intensity flames that are difficult to control. There are a number of public education and preventive/mitigation measures possible to address this hazard. This hazard has other significant impacts on Jamestown because the cost of homeownership is increased due to fire insurance rates and the cost of public roads/utilities is high for necessary access and water service. The road system, terrain and land ownership patterns pose serious impediments to wildfire suppression and hazard mitigation. Areas that are a source of drinking water are of critical importance and adverse effects from fire are a key concern.

Mines, Mill Tailings, and Radon

Several mines operated within and in close proximity of town limits. Hazards and constraints related to mines and mill tailing include radiation, contamination, and ground stability. Reclaimed tailings from local mills are found at four locations within Jamestown along James and Little James Creeks, the largest being the three-celled tailings pond at and downstream of Elysian Park. Several types of geologic hazards and constraints may

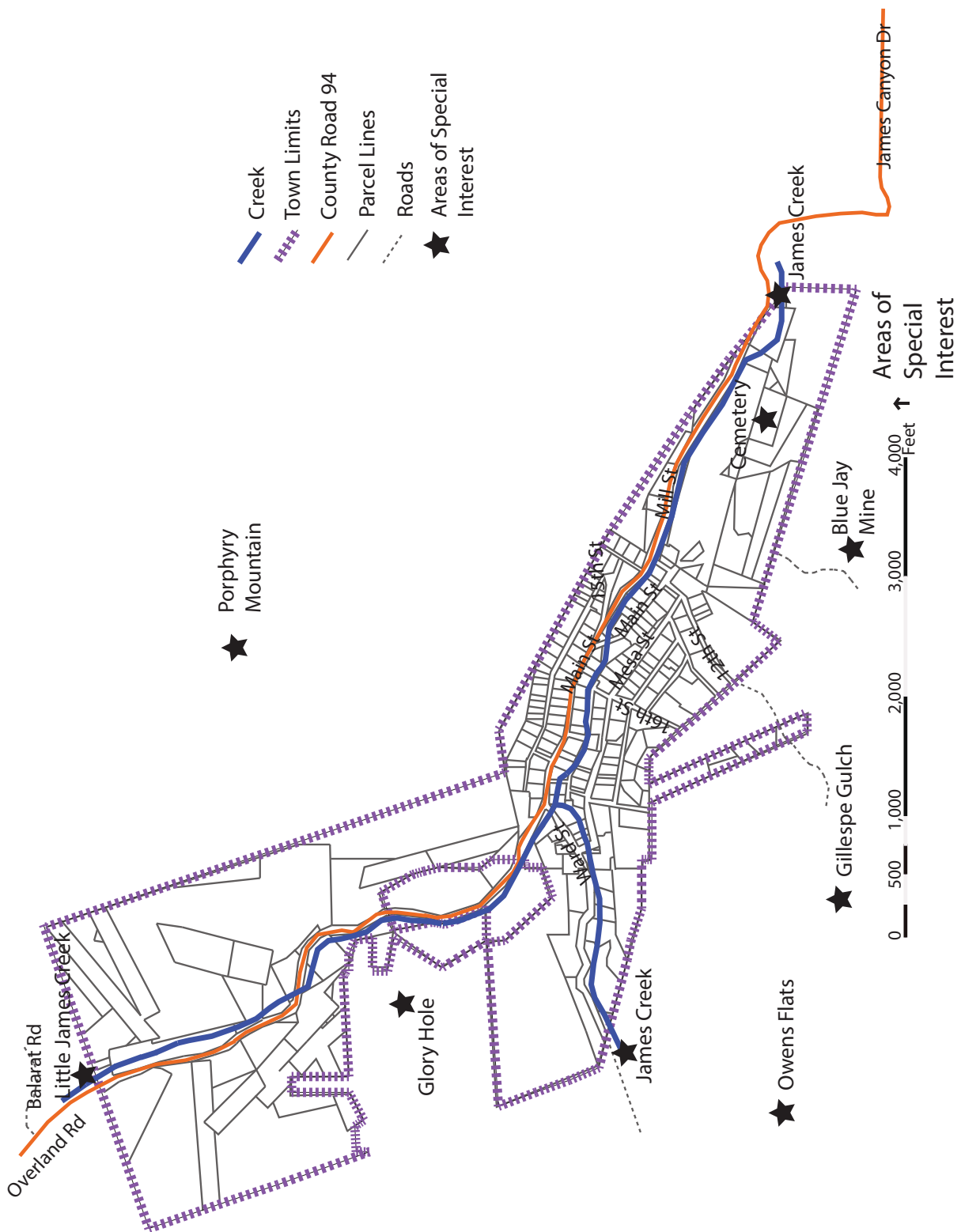


Figure 4-7: Areas of Special Interest - established in 1981

exist in areas with inactive mines, mine waste piles, and mill tailings including open shafts, adits, and subsidence features. Mill tailings also may be unsuitable for foundations unless mitigated. Mill tailings may pose environmental problems, particularly water quality, related to the presence of lead, arsenic, or other harmful elements, and they potentially could cause radiation hazards or be sources of acid drainage⁴.

Radon is a potential problem in many parts of Colorado, including Jamestown. The types of granitic and metamorphic bedrock beneath Jamestown tend to cause a somewhat higher risk of radon than that in some other locations in the state. Presence of uranium minerals in some of the mineralized veins increases the likelihood of radon in those areas⁵.

Areas of Special Interests

In the *1981 Jamestown Comprehensive Plan*, certain areas in the Jamestown vicinity have been identified as important to preserve in their present or natural state. These places are scenic visual resources, and provide the community with an appreciation of its local heritage and a common identity. Some of these areas are outside the legal boundaries of Jamestown, but their importance is not lessened by the lack of jurisdiction. By stating community concern and the importance of these areas, Jamestown hopes to be influential in their preservation for the future. Identified Areas of Special Interest include: the Town-owned cemetery; the Blue Jay Mine, the Glory Hole, the Little and Big James Creeks, and three areas in Roosevelt National Forest including Porphyry Mountain, Owen's Flats, and Gillespie Meadow. Since the 1981 plan, the Town has purchased a conservation easement for the Blue Jay Mine and Boulder County owns the mineral rights under it. In addition, the listed areas of special interest have been identified and adopted as areas of special interest in the *Boulder County Comprehensive Plan*.

⁴ *Jamestown Hazard Identification and Risk Assessment*, 2015.

⁵ *Ibid.*



Figure 4-8: Bear Aware signs around Jamestown

Living With Nature

Jamestown residents benefit from having the resources to educate themselves about living in a mountain community. As conveyed in the *Jamestown Area Long Term Recovery Plan*, the natural environment is a key factor drawing many residents to Jamestown and the preference is to live with nature rather than in conflict with it. There are several areas of attention when it comes to living with nature. Ensuring that the natural systems remain healthy is important to the community. A healthy watershed supports a viable riparian corridor, excellent water quality, and sustainable forest ecosystem. Healthy vegetation helps stabilize creek banks and slope soils, assists in uptake of metals pollution, and creates a beautiful visual backdrop. Respectful, quiet access to the surrounding National Forest allows for recreational opportunities and personal reflection. Although conflicts exist, many Jamestown residents deeply appreciate the wildlife in and around town and want to ensure the safety and health of wildlife, as well as to ensure the health and safety of the community.

There are several programs that can assist the community in learning how to live with nature. Programs such as Bear Aware and Save Our Bears aim to improve bear / human conflicts. Programs such as FireWise and the assistance from groups such as the Wildfire Partners help community members be more knowledgeable about protecting themselves and neighbors against wildfires. Regional groups such as Lefthand Watershed Oversight Group and the James Creek Watershed Initiative can provide guidance on water quality, healthy riparian habitat, and the importance of bank stability. Better collaboration with the U.S. Forest Service may allow for improved access to public lands as well as coordinated hazard mitigation efforts. There are a number of strategies outlined in the *Jamestown Area Long Term Recovery Plan* that aim to educate the community on environmental issues and improve the condition of the natural environment.

Current Regulations and Programs

Development Standards

The Town has several ordinances that apply to development within hazard areas:

Ordinance No. 2, Series 1984 acknowledges that many areas in the Town are within mapped natural hazard areas and new construction proposed in these areas are subject to Special Review. This Special Review requires studies and reports concerning the mitigation of the hazards to ensure development is done safely and avoids impacts to the property as well as to adjacent properties.

Ordinance 2, Series 2003 authorized the payment of Town funds for the acquisition of a conservation easement for the Blue Jay Mine property.

Ordinance 7, Series 2004 sets standards for driveways and includes specifics for turnaround areas for emergency vehicles, erosion control, grade limits, and other safety parameters to ensure safe access to development.

Ordinance 2, Series 2009 presents regulations for subdividing land. The regulations direct development to avoid hazard areas and encourages the enhancement of the environment. The ordinance also sets site design standards such as how hazards are to be avoided or mitigated.

Ordinance 4, Series 2011 is the Town waterworks and watershed ordinance. This ordinance requires review and permitting of certain activities in an attempt to protect the Town's water supply from pollution or from activities that will create hazard to health and water quality.

Ordinance 8, Series 2012, Ordinance 5, Series 2014, and Ordinance 2-1, Series 2016 set standards for development in all Special Flood Hazard Areas. These ordinances apply to development within a 100-year floodplain. The intent is to reduce potential damage to properties in the defined area due to flood events.

Through the **1997 Intergovernmental Agreement** (established through Ordinance 4, Series 1996 and Ordinance 1, Series 2004), building permits for properties in Jamestown are reviewed and issued by Boulder County. The County reviews permits for compliance with the Town's adopted building code, the 2009 International Building Code⁶. The building permit process includes on-site wastewater treatment system review by the Boulder County Health Department. Soils tests are required when submitting for building and septic permits in hazard areas.

Plans and Programs

The following plans and programs exist for the community's benefit.

2011 Source Water Protection Plan – The *Source Water Protection Plan* focuses on addressing issues that affect water quality such as mining activities, septic systems, impacts from transportation on roads, climate change, flood hazards, public lands, wildland fires, mountain pine beetle, reservoir and diversion operation and maintenance, and residential practices. The plan provides several management approaches that can be implemented within the protection area to help reduce the risks of potential contamination to the community's source water. These approaches complement existing regulatory protection measures implemented at the state and federal governmental levels by filling protection gaps that can only be addressed at the local level. The plan recommendations apply to new development in identified areas upstream of the Town's water treatment plant. The Colorado Rural Water Association prepared the plan for the Town through its Source Water Protection Program. The Colorado Department of Public Health and Environment Water Quality Control Division provided assistance.

⁶ Jamestown adopted the 2009 Edition of the 2009 International Building Code and Exhibit A to the Boulder County Commissioners Resolution 2010-138 excluding Administrative Section 113, Chapter 7 and Section R325: Fire Resistant Materials and Construction, Chapter 11 Energy Efficiency, and Administrative Section 117 concerning contractor licensing requirements.

2015 Jamestown Area Long-Term Recovery Plan - The *Jamestown Area Long-Term Recovery Plan* includes a “Living with Nature” chapter. The chapter presents goals and strategies for a healthy watershed, a balance of preservation with recreation, coexisting with wildlife and their natural environment, and environmental education. The plan’s “Safe Community” chapter includes a goal and a number of strategies for disaster mitigation.

2015 Jamestown Hazard Identification and Risk Assessment (HIRA) - The HIRA maps local hazards, conveys risks as a result of the hazard, and provides cautions and mitigation measures to exercise in regard to development.

2015 Boulder County Hazard Mitigation Plan (HMP) – Jamestown participates in the county-wide HMP which is similar to the HIRA but at a county scale and focuses on mitigation rather than identification. The HMP frames mitigation and response plans to protect people and property from hazards that threaten the county. The plan also results in eligibility for certain federal disaster assistance including Federal Emergency Management Agency’s (FEMA) Hazard Mitigation Grant Program and the Pre-Disaster Mitigation program. Boulder County also earned credits for the National Flood Insurance Program’s Community Rating System.

2017 Drainage and Stormwater Management Master Plan - As of 2016, the Town is underway with the development of a master plan to address drainage and stormwater management. The plan is intended to evaluate drainages in and around town to determine appropriate mitigation for debris flows and other threats; assess drainages for issues and alternatives to improve the overall drainage system; and identify stormwater quality measures to address water quality as it enters the area creeks.

James Creek Watershed Initiative (JCWI) and Lefthand Watershed Oversight Group (LWOG) – Jamestown supports and is involved with the James Creek Watershed Initiative (JCWI) and Lefthand Watershed Oversight Group (LWOG). Both are community organizations working to preserve, improve, and protect the James Creek Watershed and the Left Hand Creek Watershed (in which the James Creek Watershed is located) and to improve water quality. JCWI is a local grassroots group while LWOG is a non-profit stakeholder organization formed and operated pursuant to the Colorado Revised Nonprofit Act. The mission of the organization is to assess, protect, and restore the quality of the Left Hand Creek watershed and foster stakeholder collaboration. LWOG’s Board of Directors (BOD) is made up of representatives from the Town of Ward, Town of Jamestown, City of Longmont, Boulder County, St. Vrain and Left Hand Water Conservancy District, Left Hand Ditch, and JCWI. Other voting members are elected to the BOD due to demonstration of interest in issues or particular technical or scientific expertise. The US Forest Service is represented at meetings but has no vote. Both watershed groups monitor water quality along Little James and James Creeks. LWOG also oversees the River Watch program to assess stream health for the watershed. The Lefthand Watershed Oversight Group participated with the creation of the *Left Hand Creek Master Plan* that guides recovery of the creek after the 2013 Flood event.

Floodplain Administrator – the Town has a floodplain administrator who reviews development proposals that occur within the floodplain, advises the developer on how to be in compliance with the floodplain ordinances, and issues Floodplain Development permits (Ordinance 8, Series 2012, Ordinance 5, Series 2014, and Ordinance 2-1, Series 2016).

Boulder County Wildfire Partners - Wildfire Partners is a mitigation program to help all Boulder County mountain and foothills homeowners prepare for wildfire. The team can provide homeowners with important technical and financial assistance. The team also has a unique partnership with insurance companies that may assist property owners with insurance coverage. Prior to 2013, the Town of Jamestown began discussions in regard to participating in the program but efforts were delayed by the need for flood recovery.

Environmental Policies

General

1. The Town will consider potential impacts to natural systems when making decisions on public and private development proposals. Types of use, the level of development, the mitigation of hazards, and damage to the environment should be reviewed prior to use and/or development approval. Building permit review should allow development when safely possible and the burden of regulation and mitigation borne by the developer.

Slope Hazard Areas

2. Jamestown will require certified engineering and administration of development in slope hazard areas to eliminate slope failures, erosion, aesthetic deterioration, and hard-to-control septic runoffs. Review of development within areas exceeding 20% slope should include soil reports, a detailed site plan, a professionally engineered foundation, and an erosion control plan for building and road construction.

Rockfall and Debris Flow Hazard Areas

3. Jamestown discourages development in rockfall and debris flow hazard areas, but will allow development if certified mitigation of hazards by stabilizing slopes and reducing the risk of erosion, rock slides, and/or debris flows are possible. Mitigation should not create a visual impact to the landscape. Evaluation of the hazard should be done prior to issuance of a building permit.

Flood Hazard Areas

4. Jamestown will require conformance with the adopted Floodplain Development Ordinance. These controls should assure compatibility of uses in the floodplain and protect downstream settlements. Flood Insurance Rate Maps (FIRMs) and policies will continue to be adopted when revised over time.

Alluvial Soil Hazard Areas

5. Jamestown will require certified mitigation of hazards and limit on density of development in alluvial soil areas in order to keep ground water clean and at high levels, limit flood danger, and assure safe and solid building foundations in these areas of highly permeable soil.

Wildfire Hazard Areas

6. Jamestown will encourage certified mitigation of fire hazards for development in severe wildfire hazard areas by the Jamestown Volunteer Fire Department in order to reduce the possibility of fires and to increase the ability to fight fires once they have started. Mitigations should include adequate roads and access for fire equipment, fire breaks and other means. Such roads and fire breaks need to be harmonious with other values the town has for the environment. The Town will continue to encourage defensible site designs that minimize the risks to life and property development in these areas.

Areas of Special Interest

7. The Town recognizes that certain natural, aesthetic, and historic features are an integral part of the small town, mountain environment and contribute to the high quality of life in Jamestown. Jamestown should continue to encourage areas of special interest to be preserved in their natural or existing state. For areas outside the town jurisdiction, Jamestown should strongly state its interest and exert pressure whenever these areas are threatened.

Air and Water Quality

8. Jamestown encourages that regional and national standards for air and water quality be strictly enforced to preserve the high quality of life in Jamestown and to protect the environment.

- The Town will support the Boulder County Public Health Department's monitoring of on-site wastewater systems in an effort to avoid negative impacts to the watershed and water quality.
- Jamestown will take measures to ensure implementation of the Source Water Protection Plan and enforcement of the Watershed District Ordinance (Ordinance 4, Series 2011).
- The Town will take a watershed approach to addressing water quality and will continue to support and work with the local watershed groups, Boulder County, and the State of Colorado to ensure local water quality is maintained.

Living with Nature

9. Jamestown will support local efforts to educate the community on how to live harmoniously with the environment, including ways to reduce human / wildlife conflicts, and will support the dissemination of information on the general flora and fauna of the area, water quality issues, and hazard mitigation.

10. Jamestown will work with the United States Forest Service and Boulder County to address forest management issues including forest land access, recreation, trail maintenance, and hazard mitigation.

Proposed Programs and Actions

1. The Town should expand the building permit system to include review of safe building sites as well as identification of adequate hazard mitigation measures. Building permit applications should be approved or disapproved based on consistency with the *Jamestown Comprehensive Plan* and the Town adopted building code.

2. The Town should evaluate, prioritize, and implement appropriate recommendations of the *2015 Hazard Identification and Risk Assessment*, the Land Use and Housing Study, and the *2017 Drainage and Stormwater Management Master Plan* to better protect the Town from potential hazards and to help to safeguard water quality.
3. The Town should continue to work with local fire districts, Boulder County, and other agencies to assist private landowners with creating defensible space and hardening homes by participating in programs such as FireWise Communities and Boulder County Wildfire Partners that encourage and support mitigation.
4. The Town should continue to implement the *Jamestown Area Long-Term Recovery Plan* and its projects to promote environmental education, protection of the watershed, protection wildlife and wildlife corridors, and the reduction of human/wildlife conflicts.
5. Jamestown should continue to host educational programs including those provided by the Environmental Protection Agency, U.S. Forest Service, Boulder County Health, Boulder County Office of Emergency Management, the James Creek Watershed Initiative and the Left Hand Oversight Group. Other educational programs such as Save Our Bears should be supported.
6. The Town should continue to participate in several initiatives that reduce risks to both the Town and residents specifically, including the National Flood Insurance Program (NFIP), and the Community Rating System (CRS).
7. The Town should meet with the Forest Service to address the community goals of re-establishing non-motorized access to and mitigating hazards on Forest Service lands within and adjacent to town limits.

Topic Cross Reference

Because many of the topics in the comprehensive plan are inter-related, particularly to land use, below is a chart that conveys where additional related topics may be found.

<i>Chapter</i>	<i>For more information on:</i>
Circulation	Roads, access and getting around town
Utilities	Town water service and on-site wastewater treatment
Facilities and Services	Town facilities and services, regional services
Land Use	Existing land use and predicted future land use
External Factors	Relationships with Boulder County and the U.S. Forest Service