



Annex H Durham Irrigation District

H.1 Introduction

This Annex details the hazard mitigation planning elements specific to Durham Irrigation District (DID or District), a new participating jurisdiction to the 2014 Butte County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the DID, with a focus on providing additional details on the risk assessment and mitigation strategy for the District.

H.2 Planning Process

As described above, the DID followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Butte County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table H-1. Additional details on plan participation and District representatives are included in Appendix A.

Table H-1 Durham Irrigation District Planning Team

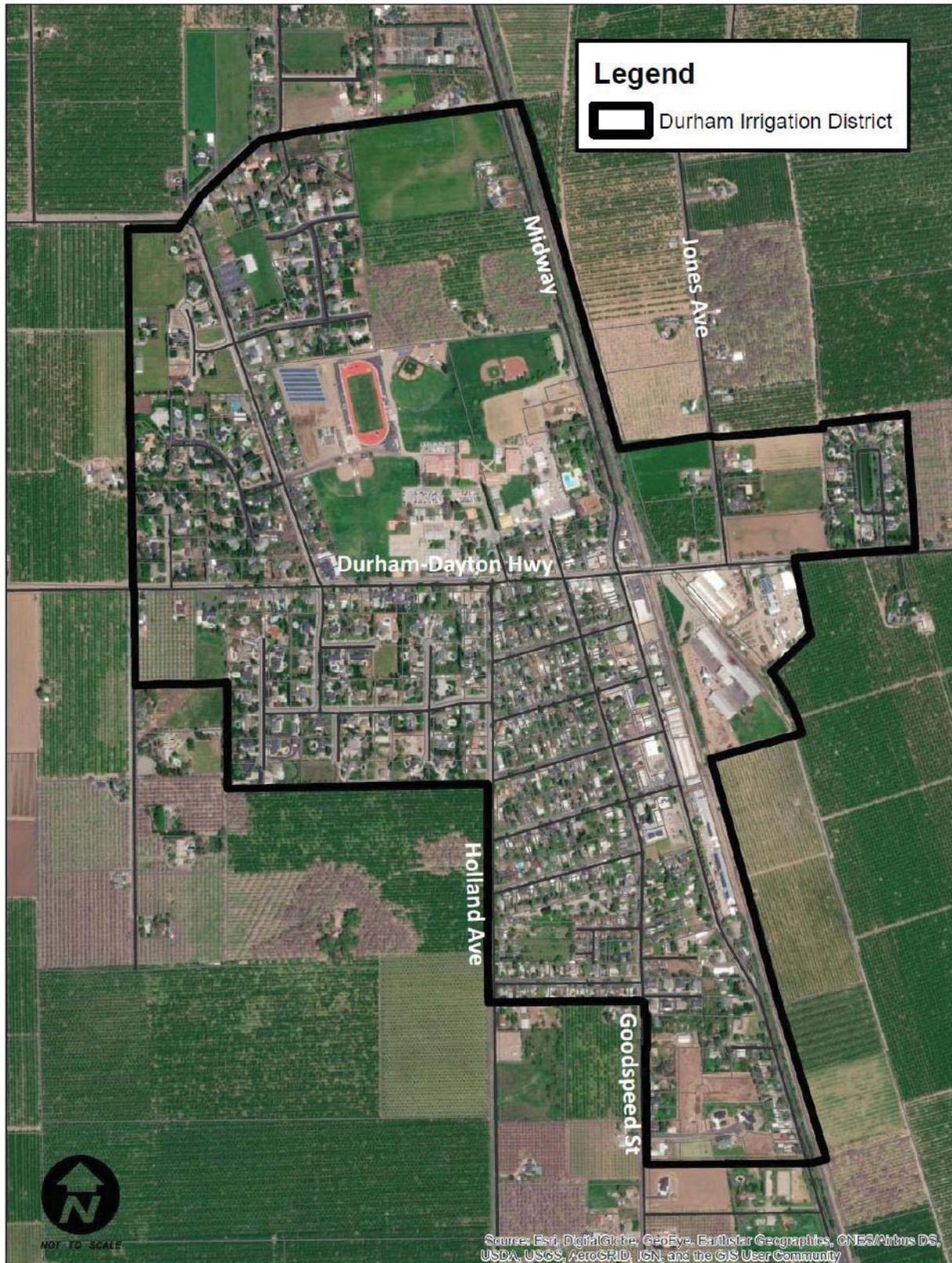
Name	Position/Title	How Participated
Kristin McKillop	Engineering Consultant	Attended meetings, Completed Worksheets, Reviewed Drafts
Kamie Loeser	Contract District Manager	Completed Worksheets, Reviewed Drafts
Mark Adams	Engineering Consultant	Completed Worksheets, Reviewed Drafts

Source: DID

H.3 District Profile

The community profile for the District is detailed in the following sections. Figure H-1 displays a map and the location of the District within Butte County.

Figure H-1 Durham Irrigation District Map



Source: DID

H.3.1. Overview and Background

The Durham Irrigation District provides domestic water services to parcels in the unincorporated community of Durham, which is south of the City of Chico. The District was established in 1948 to serve the unincorporated community of Durham and surrounding area with high quality domestic water service. For over 70 years the District has adapted to ever changing drinking water quality standards in order to provide superior water and excellent service to our valued customers. The District's service area encompasses 506 acres (0.8 square miles) and approximately 555 parcels. The District's current Sphere of Influence (SOI) is coterminous with the District's jurisdictional boundaries. The District has an estimated population of 1,442 with 459 service connections.

The District is an independent special district (not part of any county or city) that provides domestic water service to parcels within its service area.

H.4 Hazard Identification

DID's planning team identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to the District (see Table H-2).

Table H-2 Durham Irrigation District – Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude / Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Occasional	Limited	Low	Medium
Drought & Water shortage	Extensive	Likely	Significant	High	High
Earthquake	Extensive	Occasional	Critical	High	Low
Floods: 100/200/500 year	Limited	Occasional	Limited	Low	Medium
Floods: Localized Stormwater	Limited	Occasional	Limited	Medium	Medium
Hazardous Materials Transportation	Limited	Unlikely	Limited	Medium	Low
Invasive Species: Aquatic	Limited	Occasional	Limited	Low	Low
Invasive Species: Pests/Plants	Limited	Occasional	Limited	Low	Low
Landslide, Mudslide, and Debris Flow	Limited	Unlikely	Limited	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low	High
Severe Weather: Freeze and Winter Storm	Significant	High Likely	Critical	High	Medium
Severe Weather: Heavy Rain and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: Wind and Tornado	Limited	Occasional	Limited	Low	Low
Stream Bank Erosion	Limited	Occasional	Limited	Low	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire	Extensive	Highly Likely	Catastrophic	Medium	High
<p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> <p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Impact: Low: Not likely to increase the probability of this hazard. Medium: Is likely to increase the probability of this hazard. High: Is very likely to increase the probability of this hazard.</p>					

H.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile the DID's hazards and assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

H.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section H.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the District and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

H.5.2. Vulnerability Assessment and Assets at Risk

This section identifies the DID's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the DID's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

Table H-3 lists critical facilities and other District assets identified by the DID planning team as important to protect in the event of a disaster. DID's physical assets, valued at over \$18 million, consist of the buildings and infrastructure to support DID's operations.

Table H-3 Durham Irrigation District Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
5-miles of Distribution Pipe System	2" up to 8" pipe for water delivery	\$6,000,000	Drought, Earthquake, Wildfire, Natural Disaster
3 Well Station Improvements	Pump station upgrades	\$4,000,000	Earthquake, Wildfire, Natural Disaster
Water Storage	Water and Fire Flow Storage	\$8,000,000	Earthquake, Wildfire, Natural Disaster

Source: DID

Due to budgetary constraints, the District operates with little overhead capital. The office does have a computer, fixtures and supplies related to a small office operation. Until recently, the District contracted with a Certified Drinking Water System Distribution Operator who provided his own vehicle and tools used on the job. For this reason, the District does not have or maintain all the necessary equipment or personnel to provide all services required for continual operations, especially those requiring heavy equipment, and therefore many projects must be contracted out to licensed providers. Some examples of contracted work include repairs of existing infrastructure, installation of new meters or valves, and well pump maintenance. The District Operator also oversaw and inspected any work outside of his contractual scope of work performed by contractors for improvements to District infrastructure. The District recently expanded the scope of services that NorthStar Engineering currently provides to the District to include management and operations of District facilities. NorthStar Engineering employees now fill the position of District General Manager and District Water System Operator.

The District has three groundwater wells that supply the water required by District users. Two wells have back up power to maintain full operations during outages. One well lacks back up power, but this does not affect system capability as the other wells have capacity to meet demands.

Portions of the water delivery conveyance system are aging and should be replaced in the near future. However, the District has made and continues to make many improvements to the well pumps and in the timing of deliveries, thus avoiding pressure surges and line breaks. These improvements have extended the life of the existing piping conveyance system, and typical pipeline breaks are now only caused by tree damage. Limited portions of the District's domestic water infrastructure lack shut off valves and service in those areas must be interrupted to make repairs or new service connections.

Natural Resources

DID has a variety of natural resources of value to the District. These natural resources parallels that of the County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

DID has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of the County as a whole. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

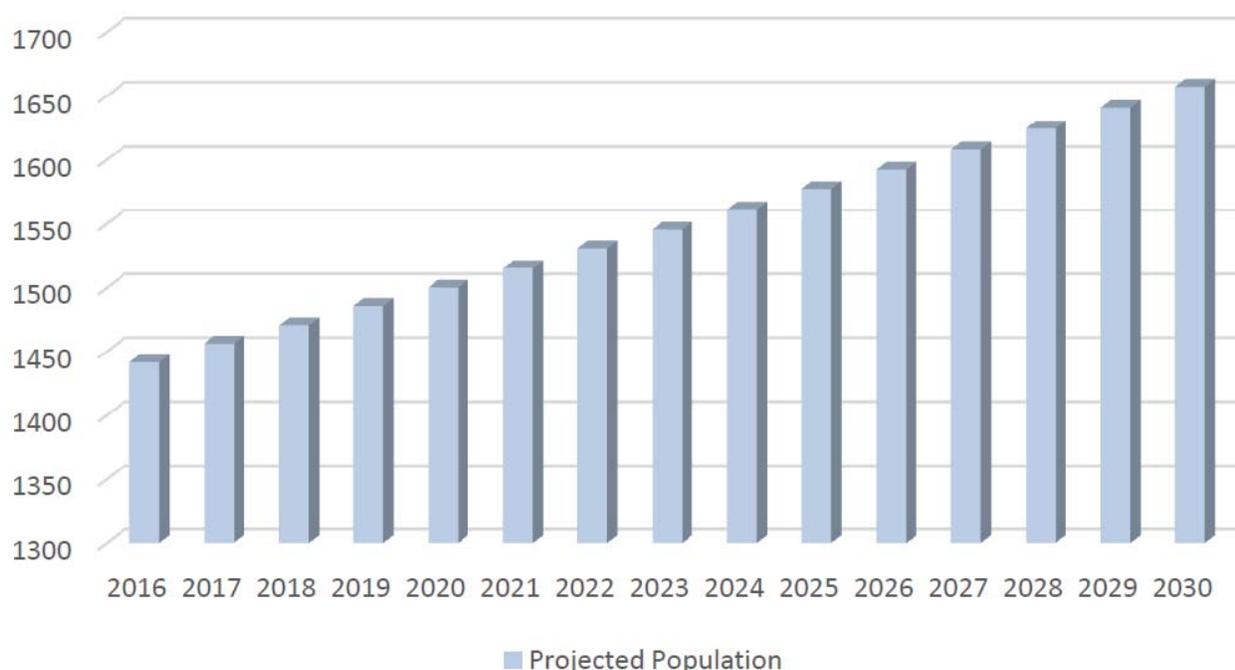
The District's jurisdictional boundaries consist of the unincorporated community of Durham and its surrounding area. There are no clear significant growth areas; the Butte County General Plan zoning ordinance greatly limits the growth in the area. The Durham-Dayton-Nelson Area Plan which is incorporated into the Butte County's General Plan 2030 establishes area-wide land use policies that provide less potential for future development than had been allowed under the former Durham-Dayton-Nelson Area Plan (D2N), which governed the area prior to the adoption of the new Durham Area Plan. Any future growth in the District will be dictated by requests for annexation submitted to, and approved by, LAFCo.

Smaller parcels comprising of approximately 456 acres within the District are used for urban uses within the community core of Durham. Land uses within the District include single-family residential uses, commercial uses, industrial uses, and public uses. There is very little potential for new development within the boundaries of the District. A large portion of the core community of Durham is zoned for medium and medium-high density residential uses. However, the lack of a public sanitary sewer system in the Durham area restricts the creation of smaller parcels or the construction of multiple dwellings on existing developed parcels. The area of the District outside of the community core of Durham is mostly zoned for agricultural uses on parcels with a minimum parcel size of 20 to 40 acres.

Future Development

The District has no control over future development in areas serviced by the District. The population within the DID service area is expected to grow at a rate of approximately 1 percent a year, with most of that growth occurring within the unincorporated community of Durham (seen in Figure H-2). Population growth within the Durham area could be significantly greater than 1 percent annually if a sanitary sewer system is constructed to serve the area. However, there are no known plans for a sanitary sewer system to be constructed in the Durham area.

Figure H-2 Durham Irrigation District – Projected Population Growth 2016 to 2030



Source: May 16, 2019 Draft Municipal Service Review and Sphere of Influence Plan

As population increases, and growth occurs within the District, service demands will increase. Expansion of services is facilitated by increases in revenues due to rate increases and the collection of connection and service fees from new development.

H.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment for those hazards identified above in Table H-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Butte County Planning Area).

An estimate of the vulnerability of the DID to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Drought & Water Shortage

Likelihood of Future Occurrence—Likely

Vulnerability—High

Hazard Profile and Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or wildfires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Location and Extent

As discussed in the Base Plan, drought and water shortage are regional phenomenon. The whole of the County, as well as the whole of the DID, is at risk. Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time, which does not usually affect water shortages. Should a drought last for a long period of time, water shortage becomes a larger issue.

Past Occurrences

Since drought is a regional phenomenon, past occurrences of drought for the DID are the similar to those for the County. Those past occurrences can be found in Section 4.2.8 of the Base Plan.

Vulnerability and Impacts to Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including in the DID is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the DID to drought is District-wide, but impacts may vary and include reduction in water quality and supply and an increase in dry fuels. The increased dry fuels result in an increased fire danger.

The most significant qualitative impacts associated with drought in the Planning Area are those related to water intensive activities such as wildfire protection, municipal usage, commerce, tourism, and recreation. Voluntary conservation measures are typically implemented during extended droughts. Drought conditions can also cause water quality deterioration and soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs.

Assets at Risk

All District assets from Table H-3 would be at risk from drought and water shortage.

Future Development

The District will need to continue to plan for and add infrastructure capacity for population growth.

Earthquake and Liquefaction

Likelihood of Future Occurrence—Occasional

Vulnerability—High

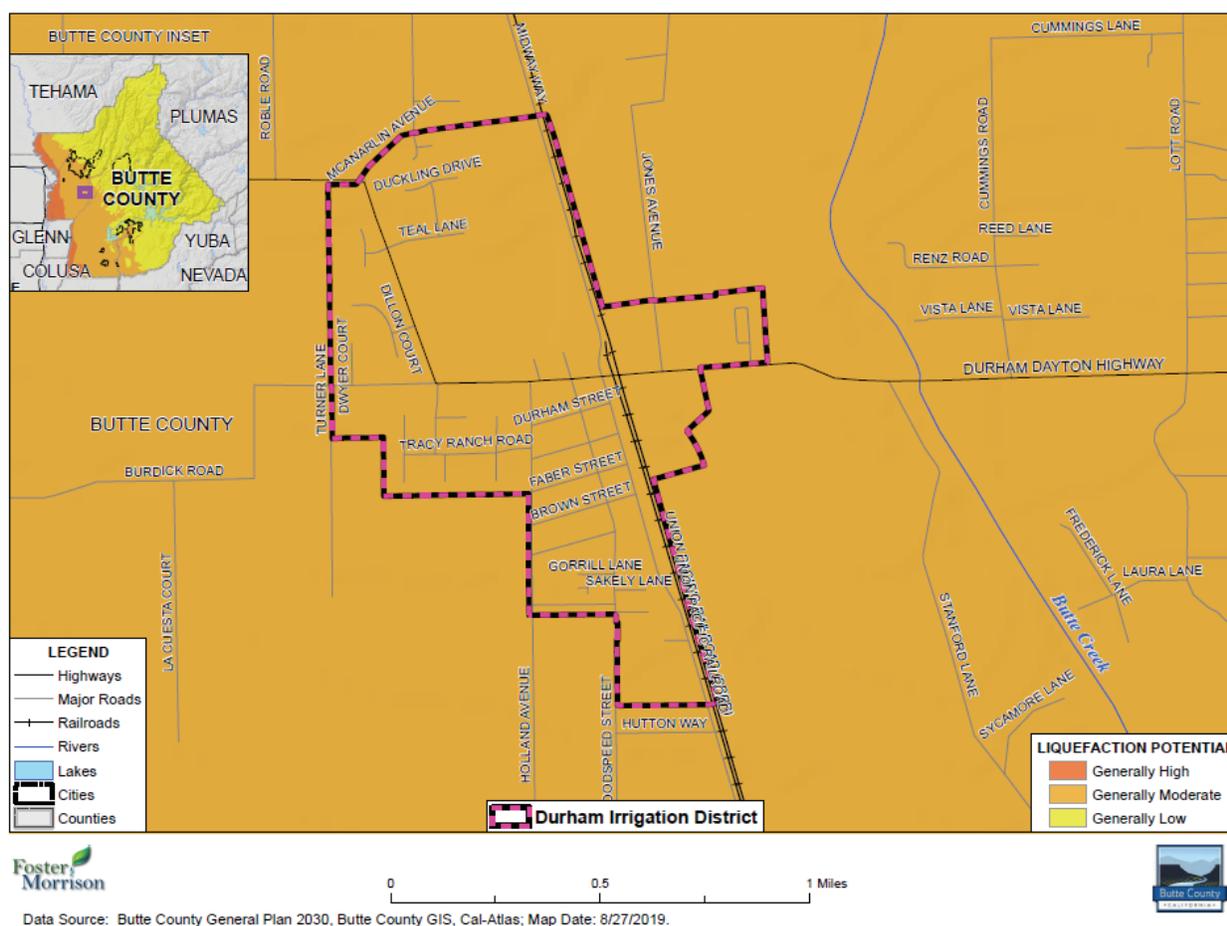
Hazard Profile and Problem Description

The State of California has identified five areas of critical seismic concern including surface ruptures, ground shaking, ground failure, tsunamis, and seiches. Each of these is caused by earthquake activity thereby creating hazards for life and property, which has the potential anywhere in California. The District is not at risk for tsunamis or seiches due to its inland location and the absence of nearby large bodies of water. Due to the proximity of the District to the Cleveland Hills Fault, the District can expect low to medium intensity shocks from time to time. These earthquakes can cause liquefaction within the District. Liquefaction is a process whereby soil is temporarily transformed to a fluid formed during intense and prolonged ground shaking.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. DID and the surrounding area is located in a region of relatively low to moderate risk of earthquake occurrence. The only known active fault in Butte County is the Cleveland Hills fault, the site of the August 1975 5.7 Richter magnitude Oroville earthquake. Additionally, the District is potentially at risk to liquefaction from earthquake shaking. A map of liquefaction potential and District locations is shown on Figure H-3.

Figure H-3 Durham Irrigation District – Liquefaction Areas



The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake’s magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.10 of the Base Plan. Earthquake and liquefaction both have a short onset period, and the duration of shaking and liquefaction is short as well.

Past Occurrences

1975 – Oroville Earthquake. As detailed in the Base Plan, this 5.7 magnitude earthquake resulted in a federal disaster declaration for Butte County.

The DID noted no other past occurrences of earthquakes or liquefaction that affected the District or District operations.

Vulnerability and Impacts to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage.

Ground shaking is the primary earthquake hazard. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems.

Seismic events can have particularly negative effects on older buildings constructed of unreinforced masonry (URM), including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Butte County is within the less hazardous Zone 3. There are not URM or soft story buildings in the District.

Impacts to the DID from an earthquake event include possible injuries, loss of life and damage to District facilities and distribution lines.

Assets at Risk

All District assets from Table H-3 would be at risk from earthquake and liquefaction.

Future Development

Although new development will occur within the District boundaries, given chance of a major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

Floods: Localized Stormwater

Likelihood of Future Occurrence—Occasional
Vulnerability—Medium

Hazard Profile and Problem Description

Localized flooding and other issues caused by severe weather events, primarily heavy rains and severe storms, are an annual occurrence in the District. Normally storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that overwhelm the drainage system. Primary concerns include impacts to infrastructure and roadways that provides a means of ingress and egress throughout the District.

Location and Extent

Durham and the nearby City of Chico are subject to localized flooding. The extent of localized flooding can be measured in volumes, velocity, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

The District noted no specific past occurrences of localized flooding that affected District facilities.

Vulnerability and Impacts to Localized Flood

Localized flooding occurs throughout the District primarily during the winter and spring months during periods of heavy rains. Localized flooding can cause road closures, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year and storm to storm, depending on the quantity of runoff. Heavy rains may produce ponding around storm drains and in low lying areas, but these events are short in duration and do not typically cause property damage. Impacts to the District can include damages to facilities and infrastructure. Localized flooding can also affect transportation routes that District personnel must take to get to District facilities.

Assets at Risk

The District noted no facilities at risk to this hazard.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding.

Hazardous Materials Transportation

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the Environmental Protection Agency (EPA), a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

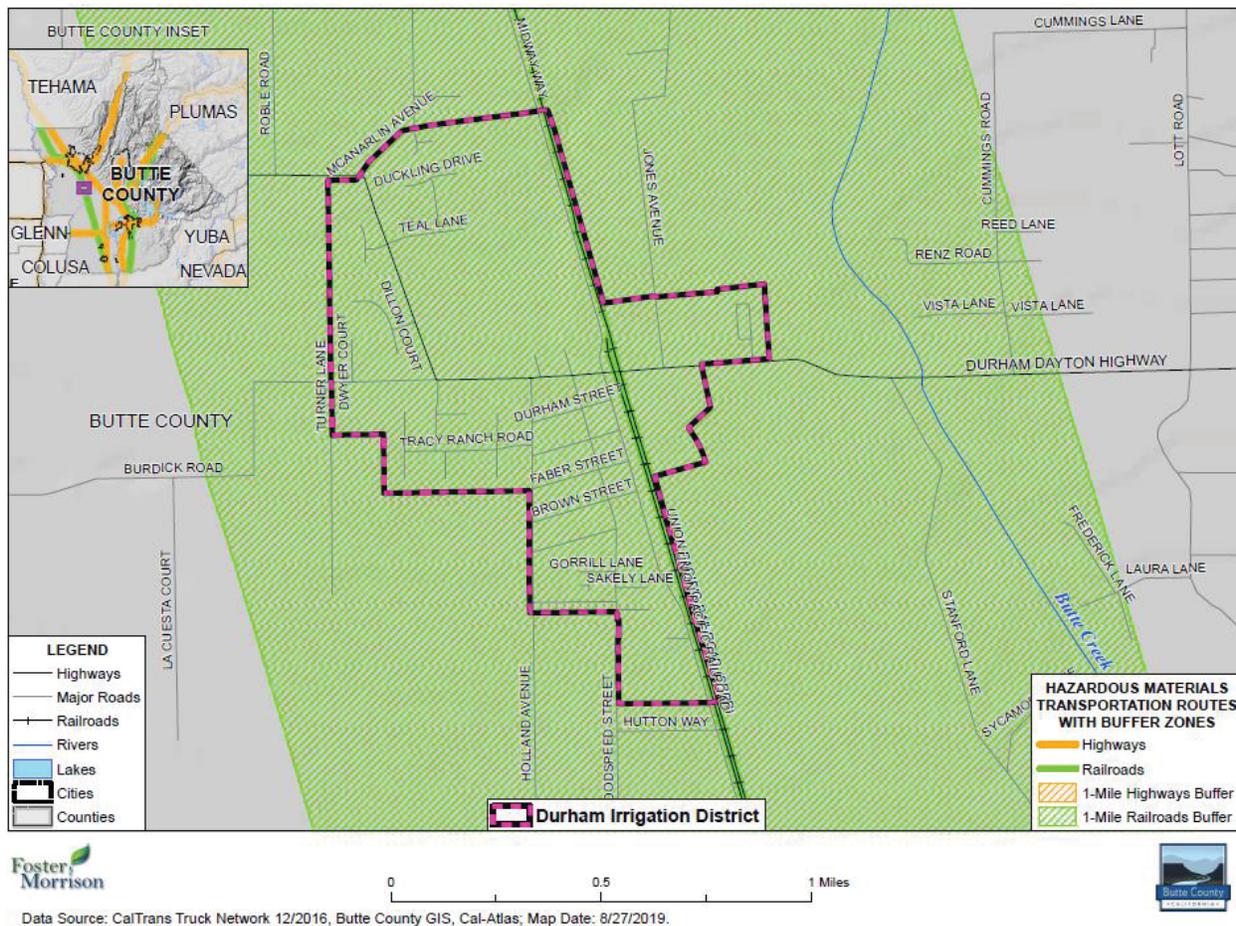
The release of hazardous materials during a transportation related incident is a concern to the Butte County Planning Area and the DID. The significance of environmental or human exposure to a hazardous materials release depends on the type, location, and quantity of the material. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained. A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local site or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual,

such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Location and Extent

In the DID, a hazardous materials transportation event is most likely to occur along Highways 32, 99, and along the Union Pacific railroad tracks. Hazardous materials buffer zones, discussed in Section 4.3.9 of the Base Plan, along with District areas are shown on Figure H-4.

Figure H-4 Durham Irrigation District – Hazardous Materials Buffer Zones



Trucks and rail cars that use these transportation corridors commonly carry a variety of hazardous materials including gasoline, other petroleum products, and other hazardous materials and waste known to cause human health problems. The speed on onset of a hazardous materials spill is short. The duration of the event depends on multiple factors, including the type and amount of material spilled and the properties of the material spilled.

Past Occurrences

The District noted no past events of hazardous materials spills in transportation that affected the District.

Vulnerability and Impact to Hazardous Materials Transportation

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities impacted by a specific event have a tangible dollar value, loss from a human-caused hazard can inflict an even greater toll on a community, both economically and emotionally. The impact to the District and District assets will vary from event to event and depend on the type, location, and nature of the specific hazardous material incident.

Impacts from hazardous materials transportation spills vary by location and severity of any given event and will most likely only affect the immediate area of the District where the spill occurred. Impacts in the District include damage to properties, critical facilities, and infrastructure. Life safety can also be an issue during larger spills. The most significant impact to the District is associated with drinking water quality should the spill reach the District's water supplies.

Assets at Risk

Assets at risk to hazardous materials transport are more related to potential groundwater pollution which is the source of the District's water supply.

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route

Severe Weather: Freeze and Winter Storm

Likelihood of Future Occurrence—Highly Likely

Vulnerability—High

Hazard Profile and Problem Description

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Winter storms in the District, while not typical, can include freezing temperatures, snow, and ice. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Freeze and winter storms are regional issues, meaning the entire District is at risk to freeze and winter storm. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 21.8 days that fall below 32°F in western Butte County, with no days falling below 0°F. Freeze and snow have a slow onset and can be generally be predicted in advance in the County and District. Freeze events can last for hours (in a cold overnight), or

for days at a time. Snowfall is measured in amount of snowfall and snow depths. It is rare for snow to fall, and even rarer that snow accumulates in the District.

Past Occurrences

The District noted no past experiences of freeze or storm that had damaging effects on District facilities.

Vulnerability and Impacts to Freeze and Storm

The District experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations. Occasionally, winter storms with freezing weather, snow and ice can affect the District. Winter storms can include snow and ice, and are occasionally accompanied by high winds, which can cause downed trees and power lines, power outages, broken pipes, accidents, and road closures. District facilities can be affected by loss of electricity. Also of concern to the District are frozen distribution pipes, pumps, and other District infrastructure.

Assets at Risk

All District assets from Table H-3 would be at risk from freeze and winter storm.

Future Development

The District will ensure that all future facilities are built to code and to be hardened against winter storm and freeze.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

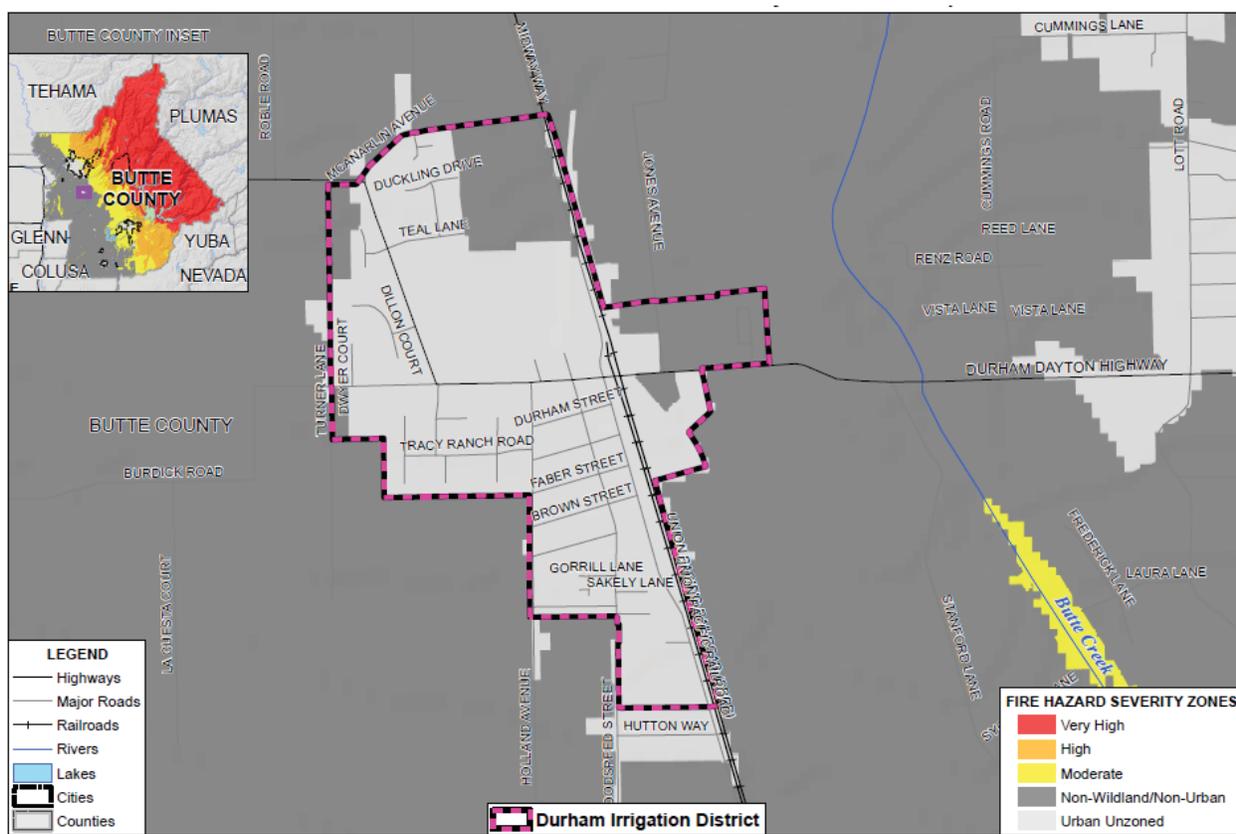
Hazard Profile and Problem Description

Wildland fire is an ongoing concern for the District. Generally, the fire season extends from early spring through late fall of each year, during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire suppression practices have affected the natural cycle of the ecosystem. While the fire season was considered to be predominantly May through October, it has now become a year around concern. Complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District.

Location and Extent

CAL FIRE defines areas of risk within the County and the District in Fire Hazard Severity Zones (FHSZ). The whole of the District lies in the Non-wildland/Non-Urban Fire Hazard Severity Zone. District locations and FHSZ are shown on Figure H-5.

Figure H-5 Durham Irrigation District – FHSZs in District



0 0.5 1 Miles

Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_4, Draft 9/2007 - c4fhszl06_1), Butte County GIS, Cal-Atlas; Map Date: 8/27/2019.



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time or may have durations lasting for a week or more.

Past Occurrences

The District Planning Team noted that the western portion of the community of Durham was evacuated during the 2018 Camp Fire as the fire approached State Route 99.

Vulnerability to Wildfire

Risk and vulnerability to the Butte County Planning Area and the District from wildfire is of significant concern, with some areas of the planning area being at greater risk than others. High fuel loads in the planning area, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to November fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the

WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the Planning Area, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The DID is not immune to numerous types of grass and brush fires and any one of them may accelerate into a large urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of property, structures and rangeland. The natural fuels available in or near the District vary in the rate and intensity of burning. Much of the land surrounding the District is farmland, which lowers the risk to District facilities.

Wildfires can cause short-term and long-term disruption to the County and District, as evidenced by the Camp Fire in Paradise and the resultant increase in the displaced populations in other incorporated and unincorporated areas. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

Complicating the issue, PG&E shutdowns can occur during red flag days, which affects the District. District wells are dependent upon electricity as a power source for operation. Not all the wells have a back-up generator.

Assets at Risk

All District assets from Table H-3 would be at risk from wildfire.

Future Development

Although the District is located outside of the WUI, the area is subject to grassland fires within the region and assets are at risk to fire.

H.6 Capability Assessment

Capabilities are the programs and policies currently in place to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation education, outreach, and partnerships.

H.6.1. Regulatory Mitigation Capabilities

Table H-4 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table H-4 Durham Irrigation District – Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N/A	
Capital Improvements Plan	Yes 2018	The plan does not specifically address hazards or mitigation actions, with the exception of need for the installation of a generator at Well Station #3. The plan could be amended to identify hazards and implement mitigation actions.
Economic Development Plan	No	
Local Emergency Operations Plan	No	
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Management Plan/Program	No	
Engineering Studies for Streams	No	
Community Wildfire Protection Plan	No	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N/A	
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	
Fire department ISO rating:	N/A	
Site plan review requirements	N/A	
Land Use Planning and Ordinances		
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	N/A	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A	
Flood insurance rate maps	N/A	
Elevation Certificates	N/A	

Acquisition of land for open space and public recreation uses	N/A
Erosion or sediment control program	N/A
Other	
How can these capabilities be expanded and improved to reduce risk?	
The Capital Improvement Program could be expanded to address and reduce potential risks to District assets.	

Source: DID

H.6.2. Administrative/Technical Mitigation Capabilities

Table H-5 identifies the District staff/roles responsible for activities related to mitigation and loss prevention in the District.

Table H-5 Durham Irrigation District – Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N/A	
Mitigation Planning Committee	N/A	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Drainages are maintained.
Mutual aid agreements	No	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	No	
Floodplain Administrator	No	
Emergency Manager	No	
Community Planner	No	
Civil Engineer	Yes Contract	The District uses contract engineering services.
GIS Coordinator	No	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	No	
Hazard data and information	Y	Just as part of this LHMP
Grant writing	Yes Contract	The District uses contract grant services.
Hazus analysis	No	
Other		

How can these capabilities be expanded and improved to reduce risk?

Yes, the District could expand these services to identify opportunities to reduce risk.

Source: DID

H.6.3. Fiscal Mitigation Capabilities

Table H-6 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table H-6 Durham Irrigation District – Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	No	The CIP could identify future mitigation actions.
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric services	Yes	The District recently conducted a Prop 218 Rate Increase, however, the increase did not take into consideration improvements necessary to minimize hazards.
Impact fees for new development	Yes	The District could identify fees for new development that would ensure mitigation of hazards associated with no development.
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	No	
Incur debt through private activities	No	
Community Development Block Grant	Yes	
Other federal funding programs	Yes	The District could not use these funds for future mitigation actions.
State funding programs	Yes	The District may be eligible for state funding programs.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District could identify potential outside funding sources to improve facilities to minimize risks.		

Source: DID

H.6.4. Mitigation Education, Outreach, and Partnerships

Table H-7 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table.

Table H-7 Durham Irrigation District – Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No	
Natural disaster or safety related school programs	No	
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District could identify potential programs and organizations that could assist with outreach and partnerships to educate residents of potential hazards, as applicable.		

Source: DID

H.7 Mitigation Strategy

H.7.1. Mitigation Goals and Objectives

Durham Irrigation District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

H.7.2. Mitigation Actions

The planning team for the District identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Drought and Water Shortage
- Earthquake and Liquefaction
- Floods: Localized Stormwater
- Hazardous Materials Transportation
- Severe Weather: Freeze and Winter Storm
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan.

Mitigation Actions

Action 1. Pipe Replacement Program for Water Redundancy and Fire Flows

Hazards Addressed: Water reliability during fire, drought and water shortage.

Goals Addressed: 1, 2, 3, 4, 5, 7, 9

Issue/Background: Pipelines in the original central service area are approximately 50-75 years old. These pipelines range from 1 to 6 inches in diameter and are comprised of steel, asbestos cement, galvanized steel and cast iron. Many of these pipelines have reached their useful life and need to be replaced as age results in increasing numbers of leaks, water loss and service district disruption.

There have been three locations within the existing system that have been identified as having a gap or missing section of water main. Infilling these gaps will provide redundant water supply to all users south of Durham Dayton Highway and will increase the available flow and pressure for the users.

Project Description: The District has prioritized replacement of these lines according to the need and age for many of these pipelines but reserves the right to adjust the priority with Board action in the case of an emergency or failure. At the time of replacement, the District is proposing to increase the size of each line to increase the available flow and pressure for the users.

It is proposed to replace approximately 11,350 lineal feet of pipeline and 256 service connections from the main to the meter.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Plan

Responsible Office/Partners: Durham Irrigation District

Cost Estimate: \$3,500,000

Benefits (Losses Avoided): Meet planned distribution and fire flow capacity needs.

Potential Funding: District fees and grants.

Timeline: 5 years.

Project Priority: High

Action 2. Well Improvements Station #3

Hazards Addressed: Water reliability during power outage from wildfire, earthquake, winter weather, flooding, heavy rain and storm or hazardous material spill.

Goals Addressed: 1, 2, 3, 4, 5, 7, 9

Issue/Background: Water well improvements to ensure water availability during power outage.

Project Description:

- Replace Station #3 building.
- Station #3 pressure tank rehabilitation.
- Install a new 6" sand filter at Station #3.
- Install new generator at Station #3.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Plan

Responsible Office/Partners: Durham Irrigation District

Cost Estimate: \$210,000

Benefits (Losses Avoided): Ensure water supply during power outage.

Potential Funding: District fees and grants.

Timeline: 5 years.

Project Priority: High