

CHAPTER 1. CITY OF KENMORE UPDATE ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

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1.2 JURISDICTION PROFILE

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—August 31, 1998
- **Current Population**—21,370 as of April 1, 2014
- **Population Growth**—Since 2008, the City of Kenmore has grown by 1,170 people—an increase of almost 6%. It is anticipated that by 2035, the City will have a population of 28,473.
- **Location and Description**— Kenmore is located in the northern portion of King County commonly known as the “Northshore” area, between the cities of Bothell and Lake Forest Park. The City extends along the northeastern shoreline of Lake Washington and is bisected from east to west by the Sammamish River, which connects Lake Sammamish to Lake Washington. Swamp Creek and its extensive wetlands divide the northern portion of the city. Kenmore is about 6 square miles in size and is primarily developed with single-family neighborhoods. Most commercial development stretches along SR-522 which crosses the City from east to west.

Brief History— Native Americans who lived in the Sammamish River Valley Area were known as the Simump Tribe. White settlers, who arrived in the 1860s, called them the Squaks, a corruption of the word “Squowh.” The forest-covered hills of Kenmore were acquired by investors in Washington timber lands, including Philo Remington (inventor of Remington guns). Remington later sold most of his property in the Kenmore area to Watson C. Squire (his son-in-law). Squire was the last territorial governor of Washington state and one of the state’s first United States Senators. Squire platted his land in 1892.

Kenmore was named by John McMasters. He and his wife, Annie, were originally from the small town of Kenmore, Canada - 40 miles south of Ottawa. They arrived in Puget Sound in 1889 and leased land at Kenmore from Squire and named the area after his old home town. McMasters operated McMasters’ Shingle Mill from 1900 to 1920. At first Kenmore was only the mill, its cookhouse, manager’s house, bunkhouse and a few worker shacks. The mill was just at the edge of Lake Washington, where logs were floated to the area to be made into shingles for roofs and the sides of houses.

In 1913-1914, the brick road between Lake Forest Park and Bothell was opened and restaurants sprang up in the Kenmore portion of the road. The first school was built in 1914. In about 1918 a bridge across the Sammamish River was constructed.

After the end of logging and in the days after the first World War, the Puget Mill Company (Pope & Talbot) offered small tracts of land for residential use in Kenmore. Kenmore's immediate proximity to Seattle—just two miles (3 km) north of modern Seattle city limits—made it an early target of post-war housing development. The first plats in the new Uplake neighborhood were sold in 1954. Homes were built north of the highway and between the main intersection and Swamp Creek. Development of the southern part of the city started about the same time.

During the second half of the 20th Century, the population of Kenmore grew quickly. On August, 31, 1998, the City incorporated.

- **Climate**—Kenmore’s climate is typical of the Seattle area, with temperatures varying from an average high of 75 degrees in August to an average low of 36 degrees in January.
- **Governing Body Format**—The seven member City Council is the legislative branch of the city government and serves as the policymaking body. The Council selects one of its members as Mayor and one of its members as Deputy Mayor, both to two-year terms. The Council appoints a City Manager to provide management direction of all City departments and activities in accordance with City Council policies and direction. The Kenmore City Council assumes responsibility for the adoption of this plan; the City Manager will oversee its implementation.
- **Development Trends**—In the 10 years between 2000 and 2010, 1,081 new housing units were built in Kenmore. It is anticipated that an additional 3,667 units will be built over the 25 years between 2010 and the 2035 planning horizon. This averages to an additional 147 new units annually. Jobs actually were lost in the City during the decade between 2000 and 2010, reflecting impacts of the Great Recession. Over the 25 years between 2010 and 2035, it is anticipated that an additional 3,079 jobs will come to Kenmore--an average of 123 new jobs per year. Regional policy documents designate Kenmore as a “Larger City”--expected to become an important subregional job, service, cultural, and housing center over time, with strong links to the regional transportation system. Creating a Downtown “central place” is an important community focus, as are advancing the public’s access to and connection to the waterfront and protecting existing single-family neighborhoods. Zoning changes to allow clean light manufacturing throughout much of the commercial area outside of the Downtown core may support the growth of primary jobs in the City.

1.3 PUBLIC INVOLVEMENT STRATEGY

Early in development of this Hazard Mitigation Plan, the City conducted a public survey about hazard mitigation issues. The survey was announced by a story in the Bothell-Kenmore Reporter, on the city’s website, and through social media. Fifty people responded to the survey. Most (70%) were Kenmore residents. An additional 25% were Kenmore residents who also work in the City. Two percent of the surveyed work in Kenmore but were not residents. Survey questions included: what hazards are you most concerned about affecting Kenmore; how prepared does your household feel post- disaster; what actions can the city take to mitigate these hazards; and following a disaster, from whom would you expect to receive help?

Respondents were least concerned about avalanches and dam failures.¹ They were slightly concerned by seiches (lake waves) and volcanic eruptions. The most concerning hazards were earthquakes, floods, severe weather, and landslides.

Ninety-two percent of respondents were prepared in some way to deal with a natural disaster. Of that 92%, 60% felt somewhat prepared, 16% felt adequately prepared, 12% felt well prepared and 4% felt very well prepared. Only 8% of respondents felt not prepared at all. In the first day following a disaster, over 70% of respondents stated that they expect help from family and neighbors in the affected area. Only 16% believed that local government would assist them in recovery.

Respondents supported the retrofitting of power infrastructure—in conjunction with Northshore Utility District and Puget Sound Energy-- as the highest mitigation priority. This was followed by retrofitting of City-owned infrastructure, including roads and bridges. More than 50% of respondents believed that partnering with Northshore Fire Department, the Northshore School District, and hospital districts to retrofit fire stations, schools and hospitals was a priority mitigation measure. Nearly 50% focused on education about risk and natural hazards that affect Kenmore as a means to reduce damage and disruption following a disaster.

Updating city laws and regulations for hazard areas such as floodplains and steep slopes was viewed as a medium priority. Acquisition of properties in high hazard areas or in areas that are repeatedly damaged was viewed as a low priority.

When asked how information about what to do and how to help should be distributed, 36% of respondents preferred local broadcast media such as TV and radio. A close 34% prefer city government email and alerts for information. Other less popular modes of information include the city government website, community information bulletin boards, and social media networks like Facebook and Twitter.

1.4 CAPABILITY ASSESSMENT

The assessment of the jurisdiction's legal and regulatory capabilities is presented in Table 1-1. The assessment of the jurisdiction's fiscal capabilities is presented in Table 1-2. The assessment of the jurisdiction's administrative and technical capabilities is presented in Table 1-3. Information on the community's National Flood Insurance Program (NFIP) compliance is presented in Table 1-4. Classifications under various community mitigation programs are presented in Table 1-5.

¹ A weir is located on the Sammamish River.

**TABLE 1-1.
LEGAL AND REGULATORY CAPABILITY**

	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code	Yes	No	No	Yes	KMC Title 15, updated 2013
Zonings	Yes	No	No	Yes	KMC Title 18, updated 2014
Subdivisions	Yes	No	Yes	Yes	KMC Title 17, updated 2011
Stormwater Management	Yes	No	Yes	Yes	KMC Title 13, updated 2010
Post Disaster Recovery	Yes	No	No	Yes	Comprehensive Emergency Management Plan (CEMP), updated 2013
Real Estate Disclosure	No	No	Yes	Yes	
Growth Management	Yes	No	Yes	Yes	Comprehensive Plan, updates ongoing
Site Plan Review	Yes	No	No	No	KMC Chapter 18.105, updated 2011
Public Health and Safety	Yes	No	Yes	Yes	KMC Title 8, 1998 and 2003
Environmental Protection	Yes	No	Yes	Yes	KMC Titles 16 and 18, updated 2012
Planning Documents					
General or Comprehensive Plan	Yes	No	Yes	Yes	Comprehensive Plan, updates ongoing
	<i>Is the plan equipped to provide linkage to this mitigation plan?</i>				<u>No</u>
Floodplain or Basin Plan	Yes	No	No	No	Swamp Creek Basin Study, 2014
Stormwater Plan	Yes	No	Yes	Yes	Comprehensive Plan, 2014
Capital Improvement Plan	Yes	No	Yes	Yes	Updated 2014
	<i>What types of capital facilities does the plan address?</i>				Transportation, parks, surface water
	<i>How often is the plan revised/updated?</i>				Annually
Habitat Conservation Plan	Yes	No	Yes	No	Comprehensive Plan, 2006
Economic Development Plan	Yes	No	No	Yes	Comprehensive Plan and Economic Development Strategy, 2009
Shoreline Management Plan	Yes	No	Yes	Yes	Updated 2012
Community Wildfire Protection Plan	No	No	No	No	

Response/Recovery Planning					
Comprehensive Emergency Management Plan	Yes	No	No	Yes	Updated 2013
Threat and Hazard Identification and Risk Assessment	Yes	No	Yes	No	Hazard Mitigation Plan, ongoing
Terrorism Plan	Yes	No	No	No	CEMP, 2013
Post-Disaster Recovery Plan	Yes	No	No	No	CEMP, 2013
Continuity of Operations Plan	Yes	No	No	No	CEMP, 2013
Public Health Plans	Yes	No	Yes	No	CEMP, 2013, and County Health plans

TABLE 1-2. FISCAL CAPABILITY	
Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	Yes – through King County Consortium
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Unknown
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Other	Surface water utility fee; Real Estate Excise Tax

TABLE 1-3. ADMINISTRATIVE AND TECHNICAL CAPABILITY		
Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Development Services/Assistant and Associate Planners Community Development/ Director and Senior Planner Public Works/Director, Senior Engineer and Civil Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Development Services/Director, Building Inspectors Public Works/Director, Senior Engineer, Civil Engineer and Surface Water Program Manager
Planners or engineers with an understanding of natural hazards	Yes	Development Services/Assistant and Associate Planners Community Development/Director and Senior Planner Public Works/Director, Senior Engineer, Civil Engineer, and Surface Water Program Manager
Staff with training in benefit/cost analysis	Yes	Finance and Administration/Director and Accountant
Surveyors	No	

Personnel skilled or trained in GIS applications	Yes	Development Services/Associate Planner Public Works/Surface Water Program Manager and Surface Water Technician
Scientist familiar with natural hazards in local area	Yes	Public Works/Surface Water Program Manager
Emergency manager	Yes	Development Services Director
Grant writers	Yes	Community Development/Director, Senior Planner and Parks Project Manager Public Works/Director, Senior Engineer, Civil Engineer, Surface Water Program Manager City Manager's Office/Management Analyst, Volunteer & Events Coordinator

**TABLE 1-4.
NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE**

What department is responsible for floodplain management in your community?	Development Services
Who is your community’s floodplain administrator? (department/position)	Development Services Director
Do you have any certified floodplain managers on staff in your community?	No
What is the date of adoption of your flood damage prevention ordinance?	1998 (Flood Damage Prevention); 2006 (Critical Areas); 2012 (Shoreline Management)
When was the most recent Community Assistance Visit or Community Assistance Contact?	2012
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	No
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why)	No. FIRM Panel 63 of 1725 is out of date and needs to be updated by FEMA.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Yes. Better floodplain maps are needed.
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	No

**TABLE 1-5.
COMMUNITY CLASSIFICATIONS**

	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule	No		
Public Protection	No		
Storm Ready	No		
Firewise	No		
Tsunami Ready (if applicable)	No		

1.5 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-6 lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: 2
- Number of FEMA-Identified Severe Repetitive Loss Properties: None

- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: None

Type of Event	FEMA Disaster # (if applicable)	Date	Preliminary Damage Assessment
Landslide (62 nd Ave. NE and NE 150 th St.)	N/A	4/2013	\$5,000
Severe Winter Weather	4056	1/2012	\$56,000
Landslide (15209 61 st Ave. NE)	N/A	3/2011	\$100,000
Landslide (61 st Ave. NE and NE 184 th St.)	N/A	12/2010	\$5,000
Landslide (15219 61 st Ave. NE)	N/A	12/2010	\$186,000
Severe Winter Weather	1825	12/12/08-1/5/09	\$50,000
Flooding	1734	12/1/07-12/17/07	\$380,000
Landslide (15021 61 st Ave. NE)	N/A	1996 and 2006	\$250,000
Severe Winter Weather (Hanukkah Eve Windstorm)	1682	12/14/06-12/15/06	Unknown. One fatality in Kenmore (carbon monoxide poisoning)
Earthquake (Nisqually)	1361	2/28/01	Unknown
Landslide (north side of SR-522, west of 61 st Ave. NE)	N/A	Almost annually	Unknown. Series of small slumps and slides.
Sammamish River Flooding	Unknown	1998/1999	Unknown

1.6 HAZARD RISK RANKING

Table 1-7 presents the ranking of the hazards of concern. Initial rankings were prepared by Kenmore’s Senior Planner in conjunction with King County staff. The rankings then were reviewed and adjusted by an interdepartmental team of Kenmore staff members. Ranking factors included probability of a hazard event and potential impacts on people, property and the economy. Ranking scores could range from a high of 54 to a low of 0.

Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes.

Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1	Earthquake	48
2	Severe Weather	39
3	Severe Winter Weather	39
4	Flood	15
5	Landslide	15
6	Wildfire	9
7	Tsunami	6
8	Volcano	6
9	Dam Failure	0
10	Avalanche	0

1.7 METHODOLOGY FOR DEVELOPMENT OF ACTION PLAN MATRIX

To develop the Action Plan, the risk ranking was reviewed along with the list of historical hazard events and actions from the previous plan. Previously uncompleted initiatives were carried forward to this Plan, if feasible, and new initiatives were identified in response to current information and concerns.

1.8 STATUS OF PREVIOUS PLAN INITIATIVES

Table 1-8 summarizes the initiatives that were recommended in the previous version of the hazard mitigation plan and their implementation status at the time this update was prepared.

TABLE 1-8. PREVIOUS ACTION PLAN IMPLEMENTATION STATUS				
Action #	Action Status			Comments
	Completed	Carry Over to Plan Update	Removed; No Longer Feasible	
KM-01-MH-ST	X			Incorporate the full emergency management cycle – including Planning, Response, Recovery and Mitigation – into Kenmore’s planning, policy, and financial processes. CEMP updated in 2013
KM-02-MH-ST		X		Identify equipment necessary for safety and operations. Carried over as new action KM-10
KM-03-MH-ST		X		Continue and enhance hazard education programs. Carried over as new action KM-11
KM-04-MH-ST		X		Enhance public safety strategies for debris avoidance and management for natural hazards events. Carried over as new action KM-18
KM-05-MH-LT	X			Develop mapping capabilities to better identify hazard areas and assess potential damage. Activities are ongoing (Kenmore Public Works)
KM-06-D-ST	X			Work with Northshore Utility District to educate consumers about drought impacts and ways to minimize water waste. Activities are ongoing (Northshore Utility District)
KM-07-E-ST		X		Conduct non-structural retrofit activities. Carried over as new action KM-12
KM-080E-ST		X		Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices. Carried over as new action KM-13
KM-09-E-ST		X		Identify city-owned buildings and infrastructure that require structural retrofiting. Carried over as new action KM-14

KM-10-E-LT	X			<p>Identify funding sources for structural and nonstructural retrofitting of structures that are identified as seismically vulnerable.</p> <p>Completed for infrastructure, 2014, Kenmore Public Works.</p>
KM-11-F-ST	X			<p>Incorporate Flood Reduction Management Plan and Surface Water Management Plan recommendations into the City of Kenmore’s Capital Improvement Schedule.</p> <p>2014, Kenmore Public Works</p>
KM-12-F-ST	X			<p>Identify surface water drainage obstructions within the City of Kenmore</p> <p>2014, Kenmore Public Works</p>
KM-13-F-LT	X			<p>Enhance data and mapping for floodplain information within the city, and identify and map flood-prone areas outside of designated floodplains.</p> <p>2012-2014, Kenmore Public Works and Development Services</p>
KM-14-F-LT	X			<p>Develop acquisition and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in the floodplain.</p> <p>Activities are ongoing (Kenmore Public Works)</p>
KM-15-L-ST		X		<p>Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard prone areas.</p> <p>Carried over, with more specificity, as new action KM-9</p>
KM-16-L-ST	X			<p>Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development.</p> <p>2006 and 2011, Kenmore Community Development</p>
KM-17-S-ST	X			<p>Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe storms.</p> <p>Activities are ongoing (Kenmore Public Works)</p>
KM-18-S-ST	X			<p>Increase public awareness of severe storm mitigation activities.</p> <p>Activities are ongoing (City Manager’s Office)</p>
KM-19-S-ST			X	<p>Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during severe storm events.</p> <p>Trees of concern are on private property and not under City control</p>
KM-20-T-ST		X		<p>Develop public information to educate citizens on this type [tsunami/seiche] of hazard.</p> <p>Carried over as new action KM-15</p>

KM-21-V-ST		X		<p>Collaborate to develop ash fall models that are specific to the north King and south Snohomish Counties area.</p> <p>Carried over as new action KM-16</p>
KM-22-V-ST			X	<p>Develop and implement policy for maintaining stock of filters for key vehicles and pieces of equipment.</p> <p>Action not financially feasible considering cost/benefit analysis, given the low risk of a volcanic event with local impact</p>
KM-23-W-LT		X		<p>Increase communication, coordination, and collaboration between wildland-urban interface property owners, city planners, fire prevention crews, and city officials to address risks, existing mitigation measures, and federal assistance programs.</p> <p>Carried over as new action KM-17</p>

HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-9 lists the initiatives that make up the jurisdiction’s hazard mitigation plan. Table 1-10 identifies the priority for each initiative. Table 1-11 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-9. HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-1 — Continue to maintain compliance and good standing under the National Flood Insurance Program. This will be accomplished through the implementation of floodplain management programs that, at a minimum, will meet the minimum requirements of the NFIP, which include the following: <ul style="list-style-type: none"> • Enforcement of the adopted flood damage prevention ordinance, • Participating in floodplain identification and mapping updates, and • Providing public assistance/information on floodplain requirements and impacts 							
New and existing	Urban Flooding	2,4,10,12	Kenmore Development Services	Low	General Fund	Ongoing	No
KM-2 — Consider evaluation of the City’s building code enforcement program under the Building Code Effectiveness Grading Schedule, administered by the WA Survey and Rating Bureau.							
New	All Hazards	5,10	Kenmore Development Services	Low	General Fund	Short-term	No
KM-3 — Integrate the hazard mitigation plan into other plans, ordinances or programs to dictate land uses within the jurisdiction.							
New	All Hazards	2,4,8,10	Kenmore Community Development	Low	General Fund	Short-term	No
KM-4 — Consider participation in incentive based programs such as the CRS, Firewise and StormReady.							
New and existing	Flood, Severe Weather, Wildfire	2,3,4,6,10,13	Kenmore Development Services	Low	General Fund	Long-term	No
KM-5 — Where appropriate, support retrofitting, purchase, or relocation of structures located in hazard-prone areas to protect structures from future damage, with properties with exposure to repetitive losses as a priority.							
Existing	All Hazards	5,9,13	Kenmore Public Works	High	FEMA grants	Long-term	No

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-6 — Continue to support the county-wide initiatives identified in this plan.							
New and existing	All Hazards	4,6,11,12, 13, 14, 15	Kenmore Development Services	Low	General Fund	Ongoing	No
KM-7 — Actively participate in the plan maintenance strategy identified in this plan.							
New and existing	All Hazards	4,6,11,12, 13, 14, 15	Kenmore Community Development	Low	General Fund	Ongoing	No
KM-8 — Strive to capture perishable data (i.e. high water marks, preliminary damage estimates, and damage photos) after significant hazard events to support future updates to the risk assessment of this plan.							
New and existing	All Hazards	1,2,4	Kenmore Public Works and Building Inspectors in Development Services	Medium	General Fund, FEMA Grants	Short-term	No
KM-9 — Investigate and improve mapping of landslide hazard areas. Increase understanding of vulnerability and risk to life and property in hazard prone areas. Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard prone areas, particularly near 84th Ave. NE and 88th Ave. NE between NE 157th Street and NE 169th Street, and in areas of previous landslides.							
New and existing	Landslide	2,4,10, 12,13	Kenmore Development Services	Medium	Partnership with King County	Short-term	Yes
KM-10 — Identify and begin acquisition of City equipment necessary for safety and operations during a natural hazard event.							
New and existing	All Hazards	1,3	Kenmore Public Works	Medium	General Fund, Surface Water Management Fund and Street Fund	Ongoing	Yes
KM-11 — Continue to facilitate and support hazard education programs, such as CERT training or providing educational materials for family disaster preparedness.							
New and existing	All Hazards	3,4,6,7,11, 13,14,15	Kenmore City Manager's Office	Low	General Fund	Ongoing	Yes

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-12 — Conduct non-structural retrofit activities in City facilities, such as strapping down and securing computers and other office equipment and machinery, securing shelves and heavy furniture to walls, ensuring that heavy items are not stored overhead, mounting computer servers on seismic isolation platforms, etc.							
Existing	Earthquake	1,3,5,12	Kenmore Public Works	Medium	General Fund FEMA Grants	Medium-term	Yes
KM-13 — Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and other government offices.							
Existing	Earthquake	1,3,4,5,7,8,9,11,12,13,14,15	Kenmore City Manager's Office	Low	General Fund FEMA Grants	Ongoing	Yes
KM-14 — Identify city-owned buildings and infrastructure that require structural retrofiting.							
Existing	Earthquake	1,3,4,9,12	Kenmore Public Works	Low	General Fund, FEMA Grants	Short-term	Yes
KM-15 — Develop public information to educate citizens on tsunamis/seiches.							
New and existing	Seiche	3,4,6,7,8,11,12,13,14,15	Kenmore Development Services	Low	General Fund	Medium-term	Yes
KM-16 — Encourage King County to develop ash fall models that are specific to the north King and south Snohomish Counties area.							
New and existing	Volcano	2,4,12	Kenmore Development Services	High	FEMA Grants	Long-term	Yes
KM-17 — Increase communication, coordination, and collaboration between wildland-urban interface property owners, city planners, fire prevention crews, and city officials to address risks, existing mitigation measures, and federal assistance programs related to wildfire.							
New and existing	Wildfire	1,2,3,4,6,7,8,10,11,12,13,14,15	Kenmore Development Services	Low	General Fund FEMA Grants	Ongoing	Yes

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-18 — Enhance public safety strategies for debris avoidance and management for natural hazards events. Implementation measures include developing and enhancing right-of-way maintenance programs, educating property owners about tree maintenance near roadways, and developing coordinated management strategies for public safety issues such as clearing debris from public and private property.							
New and existing	All Hazards	1,3,6,7,8, 11,12,13, 14,15	Kenmore Public Works	Low	General Fund	Ongoing	Yes

**TABLE 1-10.
MITIGATION STRATEGY PRIORITY SCHEDULE**

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Priority ^a
KM-1	4	High	Low	Yes	No	Yes	High
KM-2	2	Medium	Low	Yes	No	Yes	High
KM-3	4	Medium	Low	Yes	No	Yes	High
KM-4	6	High	Low	Yes	No	Yes	High
KM-5	3	High	High	Yes	Yes	No	Medium
KM-6	7	Medium	Low	Yes	No	Yes	High
KM-7	7	Medium	Low	Yes	Yes	Yes	High
KM-8	3	Medium	Medium	Yes	Yes	No	Medium
KM-9	5	High	Medium	Yes	No	No	Medium
KM-10	2	High	Medium	Yes	No	No	Medium
KM-11	8	High	Low	Yes	No	Yes	High
KM-12	4	High	Medium	Yes	Yes	No	Medium
KM-13	12	High	Low	Yes	Yes	Yes	High
KM-14	5	Medium	Low	Yes	Yes	Yes	High
KM-15	10	High	Low	Yes	No	No	Medium
KM-16	3	Medium	High	No	No	No	Low
KM-17	13	Medium	Low	Yes	Yes	Yes	High
KM-18	10	High	Low	Yes	No	Yes	High

a. See Chapter 1 for explanation of priorities.

**TABLE 1-11.
ANALYSIS OF MITIGATION INITIATIVES**

Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche	6,7		6,7			
Dam Failure	6,7		6,7			
Drought	6,7,8		4,6,7,8,11			
Earthquake	2,3,6,7,8,9,10,14,18	5,13	3,4,6,7,8,11,13,18	3	6,10,12	
Flood	1,3,6,7,8,9,10,18	1,5	1,3,4,6,7,8,11,18	1,3	6,10	
Landslide	2,3,6,7,8,9,10,18	5	3,4,6,7,8,9,11,18	3	6,10	
Severe Weather	2,6,7,8,9,10,14,18	5	3,4,6,7,8,11,18		6,10,12	
Tsunami/Seiche	3,6,7,8,18	5	3,4,6,7,8,11,15,18		6,10	
Volcano	6,7,8,10,16,18		4,6,7,8,11,16,18		6,10	
Wildfire	2,3,6,7,8,10,17,18	5	3,4,6,7,8,11,17,18		6,10	

a. See Chapter 1 for explanation of mitigation types.

1.9 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Enhanced mapping of landslide hazard areas and floodplains would greatly improve the City’s understanding of vulnerability and risks.

1.10 ANNEX DEVELOPMENT CHRONOLOGY/MILESTONES

Table 1-12 summarizes important milestones in the development of Kenmore’s Annex. Additional documentation of the planning process is available upon request.

TABLE 1-12. ANNEX DEVELOPMENT MILESTONES			
Date	Event	Description	Attendance
10/3/14	Meeting with KCOEM	Overview of RHMP, received “Linkage Package” of instructions and templates.	6
11/13/14	Meeting with KCOEM	In-depth discussion of annex template and linkage procedure.	3
12/12/14	Public Outreach	Press release announcing Kenmore’s participation in King County’s Hazard Mitigation Plan including a link to a public survey.	N/A
12/17/14	Meeting with KCOEM	In-depth discussion of annex template and linkage procedure.	3
02/19/15	Internal Planning Meeting	Discussion of draft annex and information to be provided by City departments.	5
4/27/15	Meeting with City Manager	Review and discussion of draft annex.	2
4/28/15	Draft to KCOEM	Draft annex submitted to KCOEM (and their consultant) for review and comment.	N/A
5/4/15	Public Outreach	Announcement of public comment period and opportunity for citizens to participate.	N/A
X/X/XX	Final to KCOEM	Final draft annex submitted to KCOEM. KCOEM submits plan to WA EMD who forwards to FEMA.	N/A
X/X/XX	Pre-adoption Approval	Received pre-adoption approval from FEMA.	N/A
X/X/XX	Adoption	Kenmore City Council adopts the plan.	N/A
X/X/XX	Plan Approval	Final approval granted by FEMA.	N/A

CITY OF KENMORE

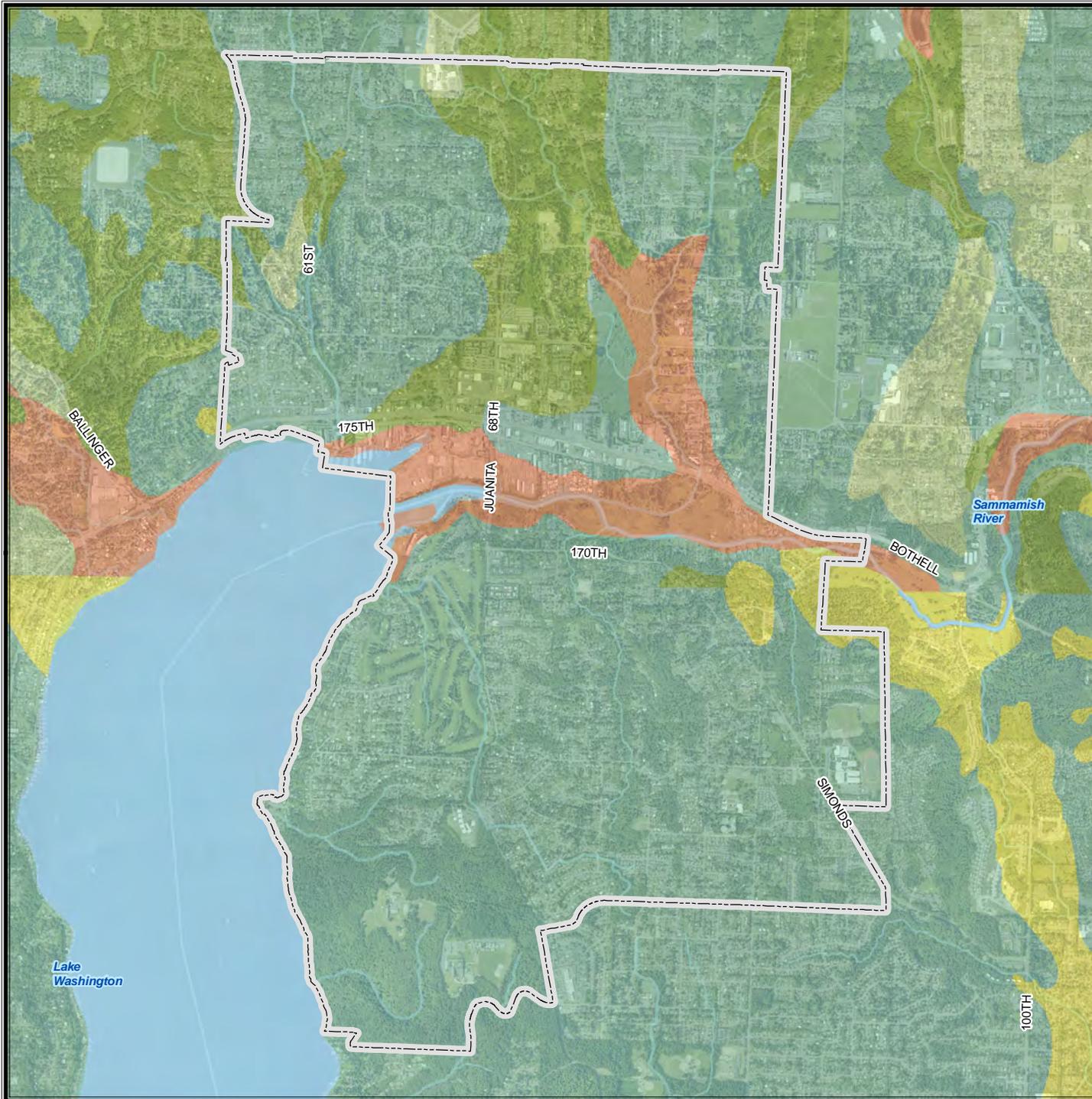
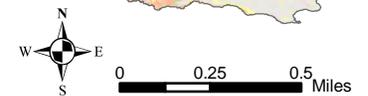
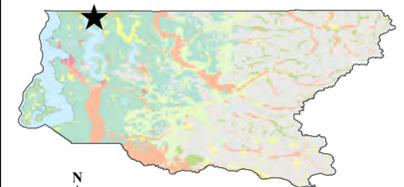
Liquefaction Susceptibility

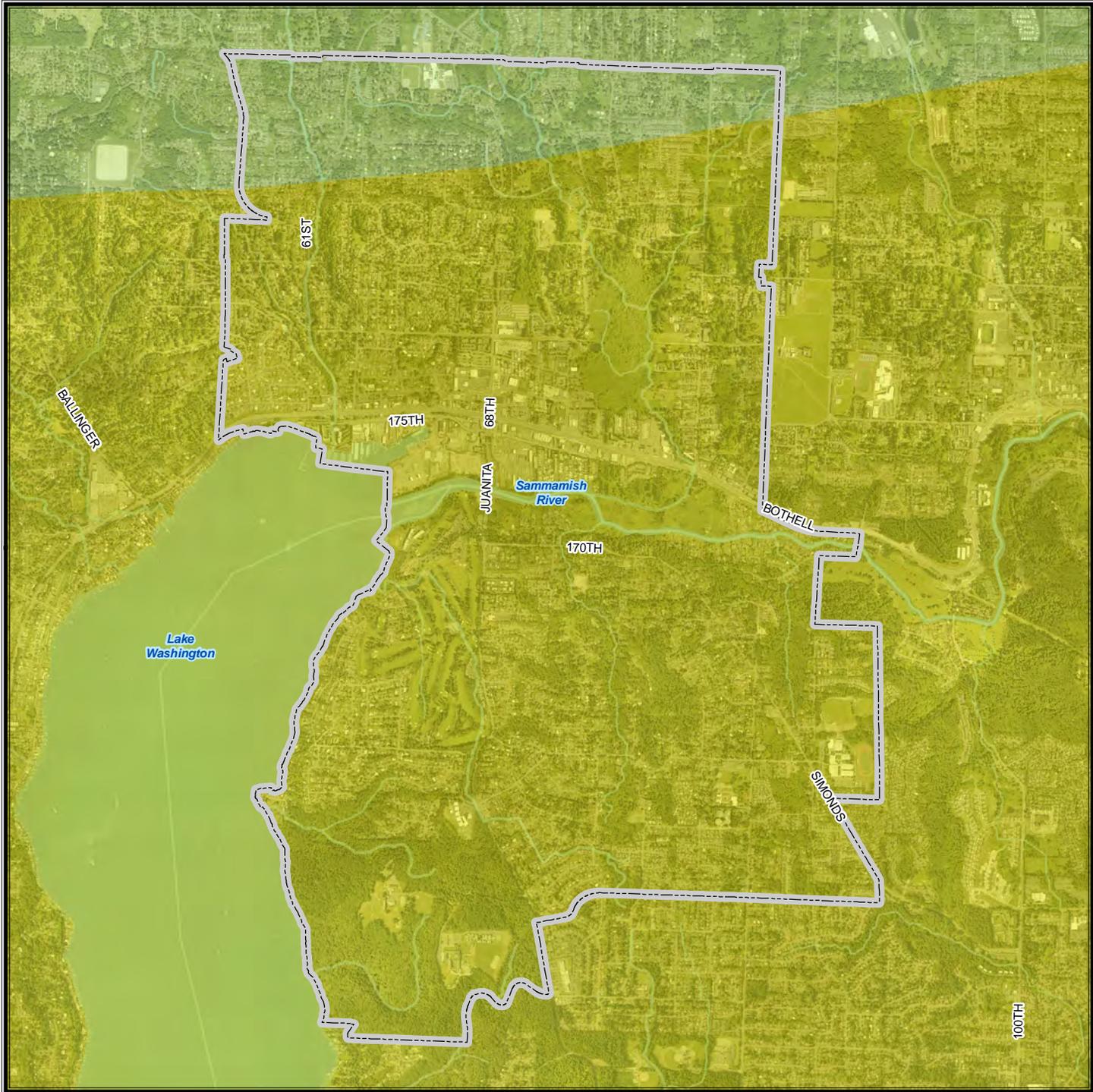


Liquefaction data provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. Data is based solely on surficial geology published at a scale of 1:100,000.

A liquefaction susceptibility map provides an estimate of the likelihood that soil will liquefy as a result of earthquake shaking. This type of map depicts the relative susceptibility in a range that varies from very low to high. Areas underlain by bedrock or peat are mapped separately as these earth materials are not liquefiable, although peat deposits may be subject to permanent ground deformation caused by earthquake shaking.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





CITY OF KENMORE

Seattle M7.2 Scenario Peak Ground Acceleration

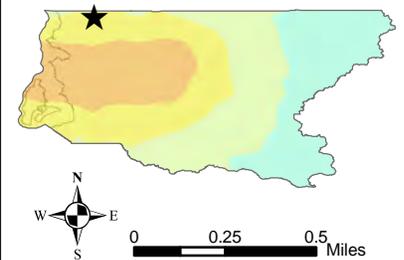
Mercalli Scale, Potential Shaking

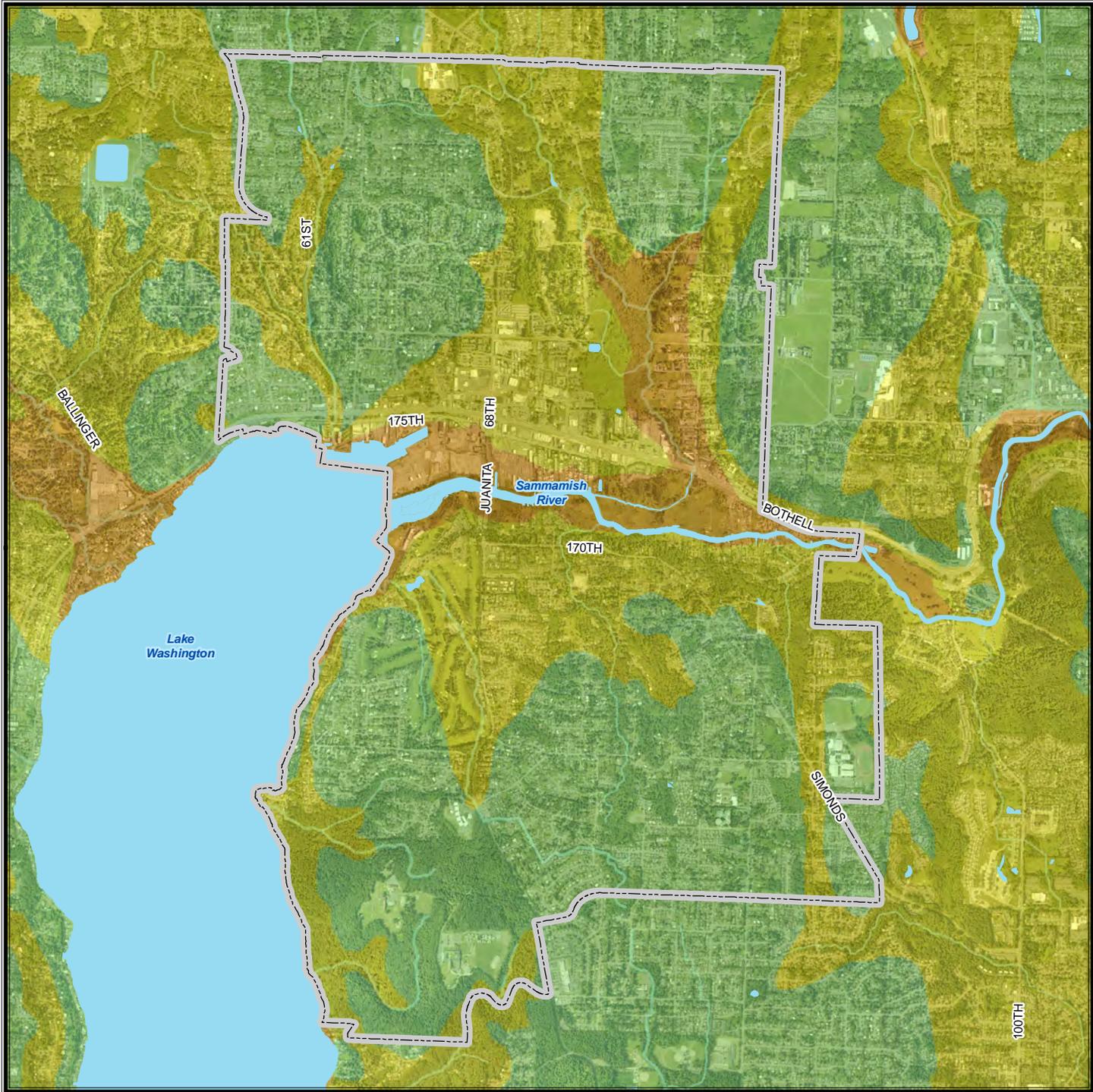
- I (Not Felt)
- II - III (Weak)
- IV (Light)
- V (Moderate)
- VI (Strong)
- VII (Very Strong)
- VIII (Severe)
- IX (Violent)
- X+ (Extreme)

Magnitude: 7.2
Epicenter: N47.52 W122.37

A ShakeMap is designed as a rapid response tool to portray the extent and variation of ground shaking throughout the affected region immediately following significant earthquakes. Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on both estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





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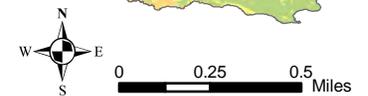
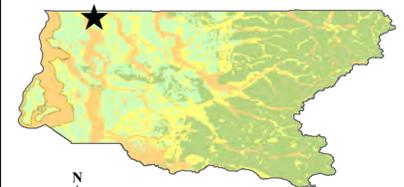
National Earthquake Hazard Reduction Program (NEHRP) Soil Classification

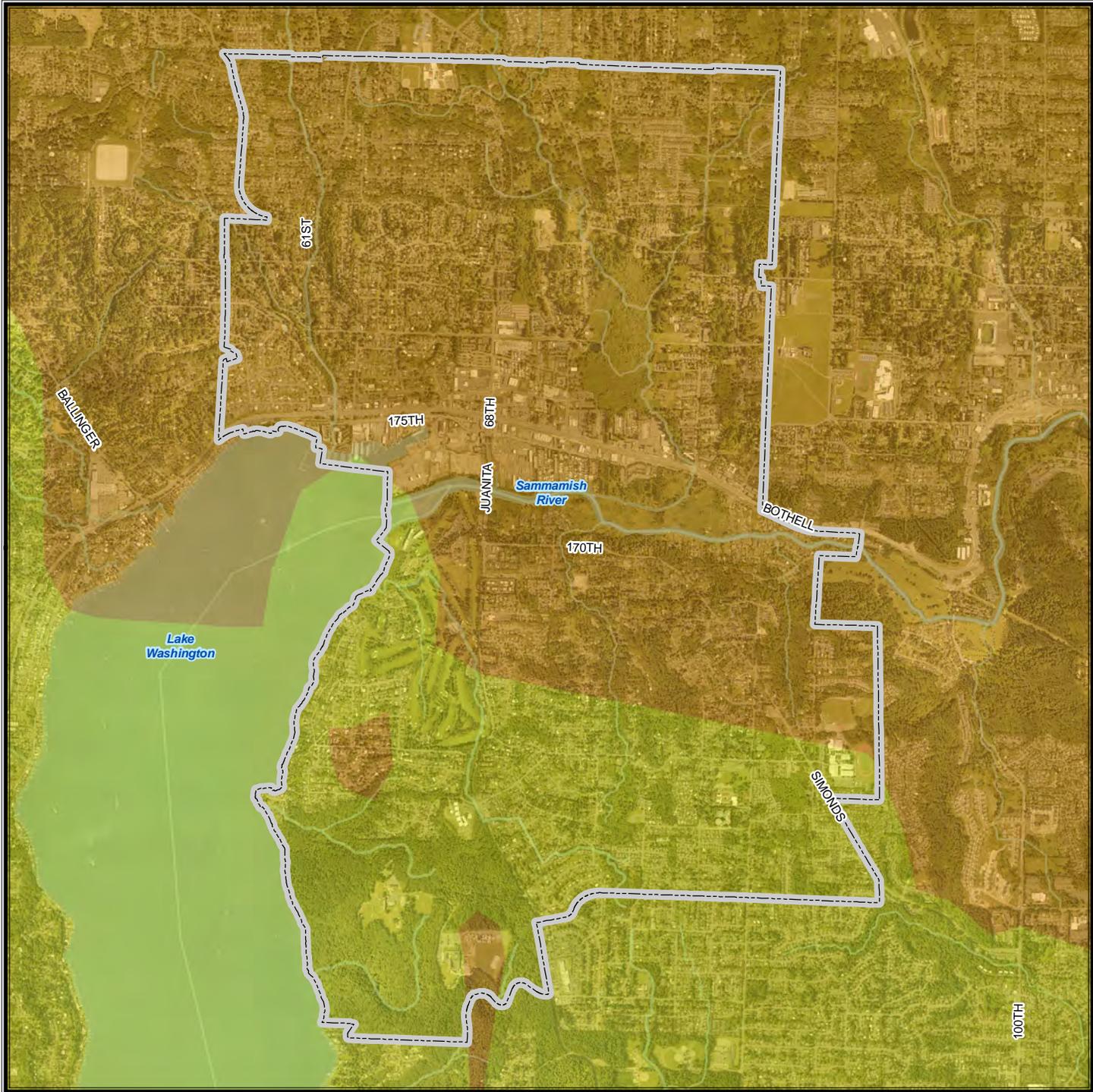
- Site Class B - Rock
- Site Class C - Very Dense Soil, Soft Rock
- Site Class D - Stiff Soil
- Site Class E - Soft Soil

Soil classification data provided by Washington State Department of Natural Resources, Geology and Earth Resources Division.

The dataset identifies site classes for approximately 33,000 polygons derived from the geologic map of Washington. The methodology chosen for developing the site class map required the construction of a database of shear wave velocity measurements. This database was created by compiling shear wave velocity data from published and unpublished sources, and through the collection of a large number of shear wave velocity measurements from seismic refraction surveys conducted for this project. All of these sources of data were then analyzed using the chosen methodologies to produce the statewide site class maps.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





CITY OF KENMORE

South Whidbey M7.4 Scenario Peak Ground Acceleration

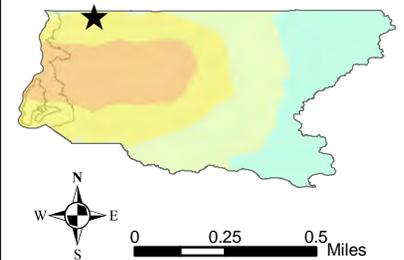
Mercalli Scale, Potential Shaking

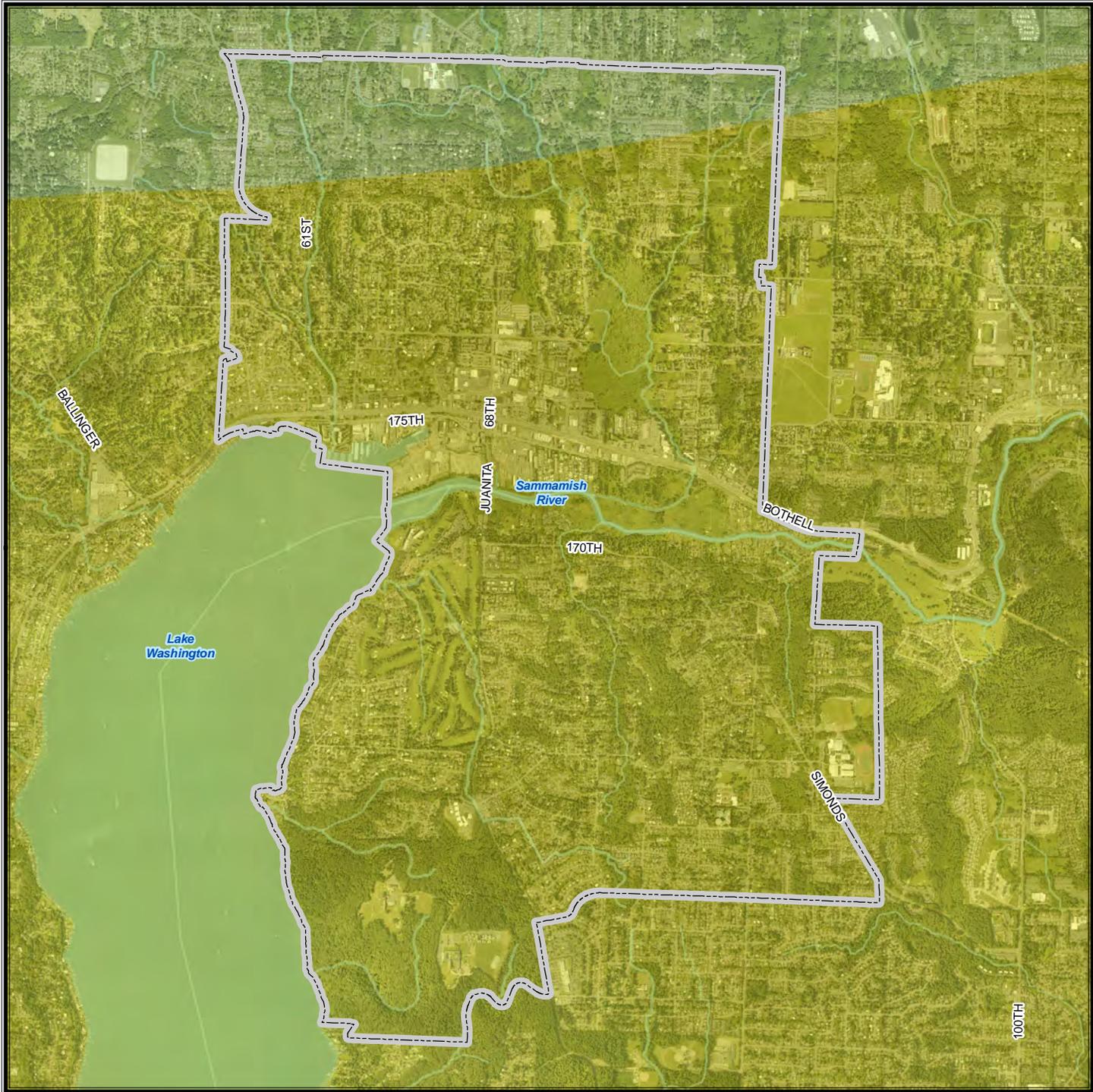
- I (Not Felt)
- II - III (Weak)
- IV (Light)
- V (Moderate)
- VI (Strong)
- VII (Very Strong)
- VIII (Severe)
- IX (Violent)
- X+ (Extreme)

Magnitude: 7.4
Epicenter: N48.05 W122.47

A ShakeMap is designed as a rapid response tool to portray the extent and variation of ground shaking throughout the affected region immediately following significant earthquakes. Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on both estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





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Tacoma M7.1 Scenario Peak Ground Acceleration

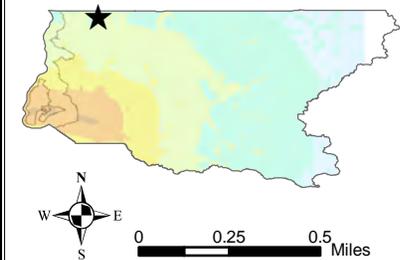
Mercalli Scale, Potential Shaking

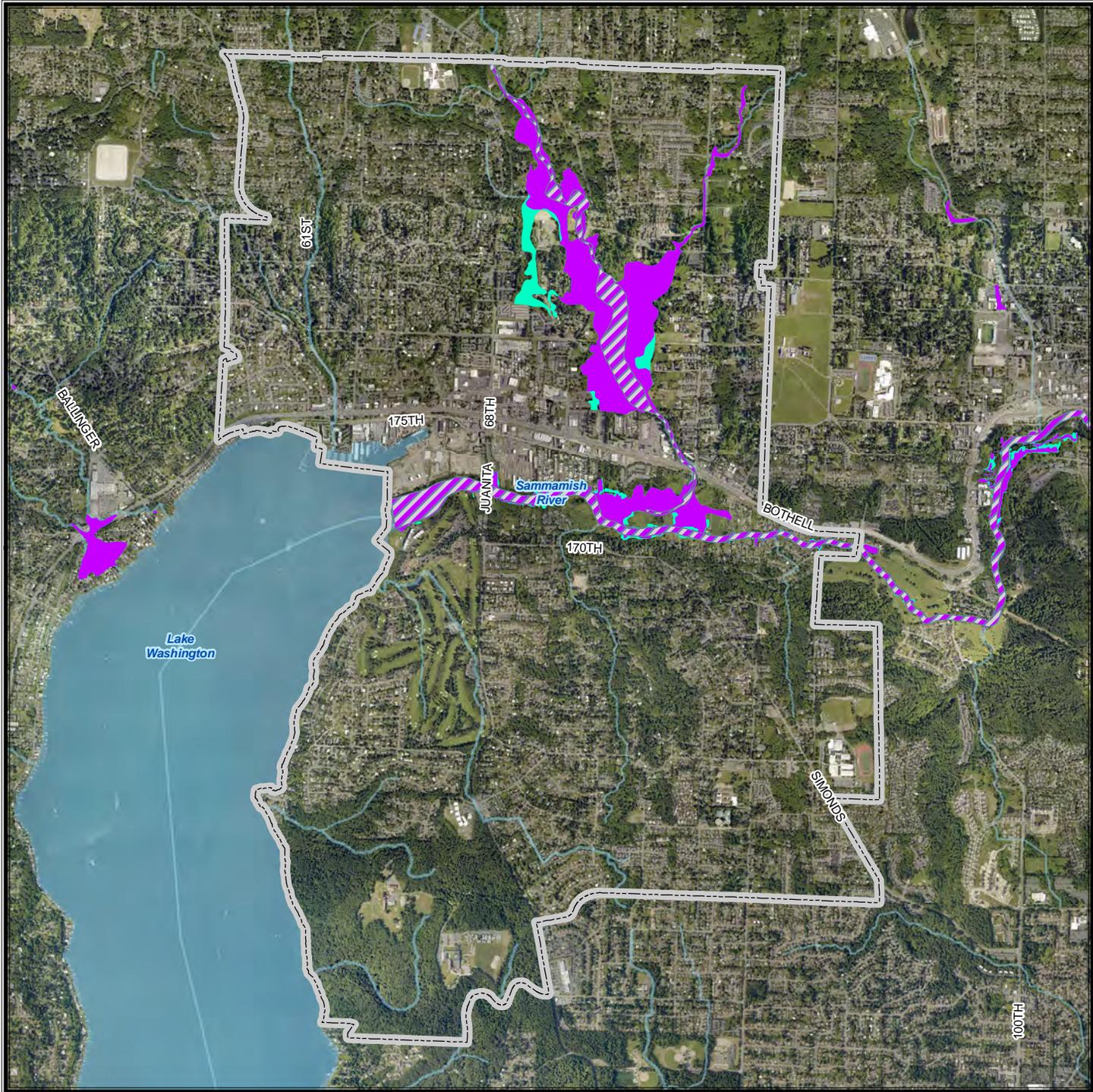
- I (Not Felt)
- II - III (Weak)
- IV (Light)
- V (Moderate)
- VI (Strong)
- VII (Very Strong)
- VIII (Severe)
- IX (Violent)
- X+ (Extreme)

Magnitude: 7.2
Epicenter: N47.52 W122.37

A ShakeMap is designed as a rapid response tool to portray the extent and variation of ground shaking throughout the affected region immediately following significant earthquakes. Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on both estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





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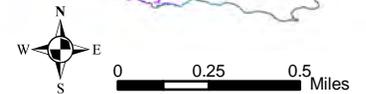
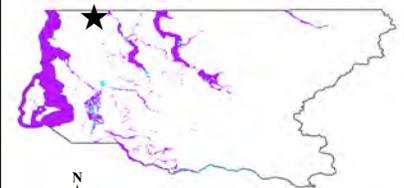
FEMA DFIRM Flood Hazard Areas

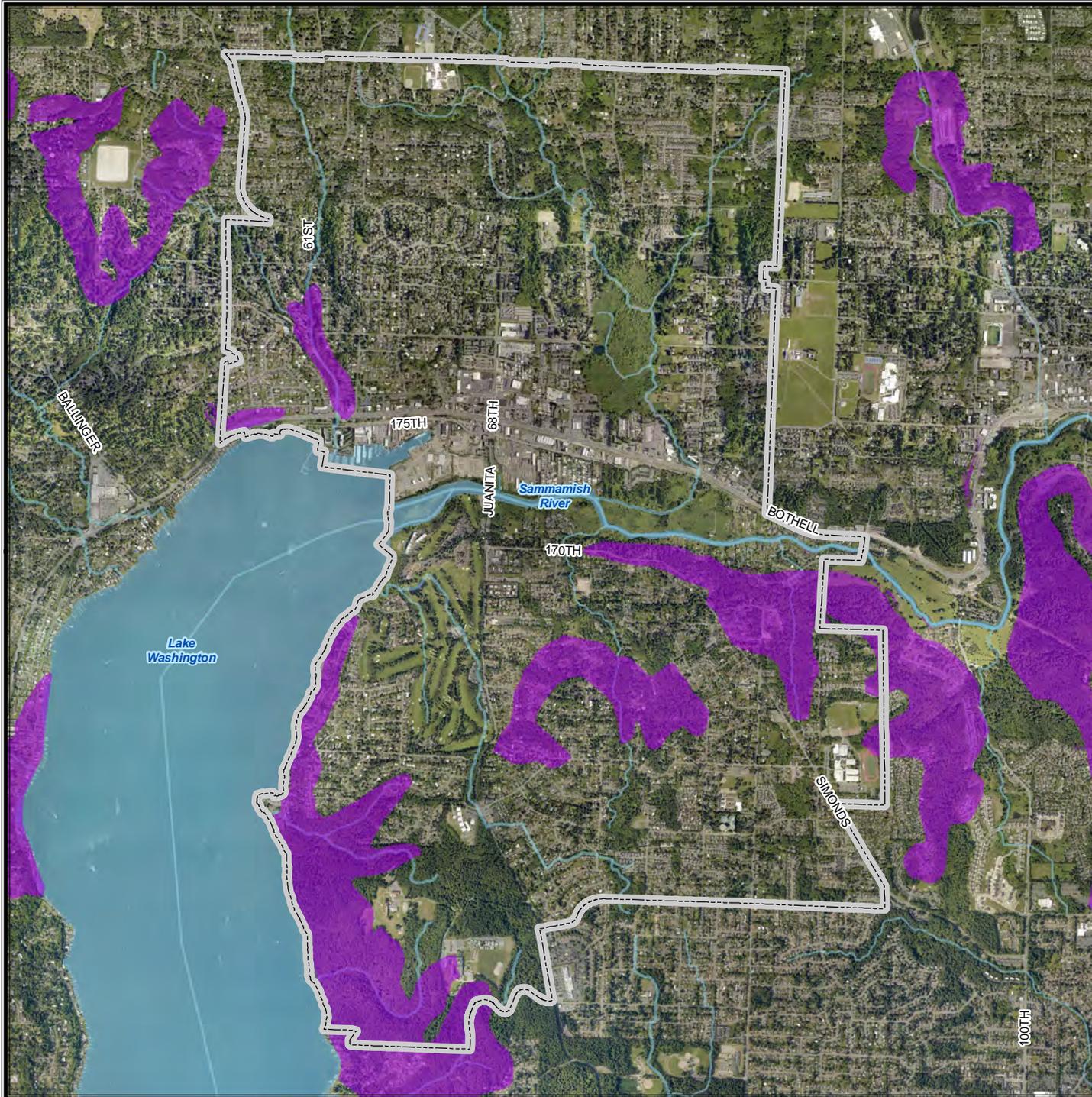
-  Floodway
-  1 Percent Annual Flood Hazard
-  0.2 Percent Annual Flood Hazard

Flood hazard areas as depicted on draft FEMA Digital Flood Insurance Rate Maps (DFIRM).

The 1 percent annual flood hazard is commonly referred to as the 100 year floodplain. The 0.2 percent annual flood hazard is commonly referred to as the 500 year floodplain.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





CITY OF KENMORE

Landslide Hazard Areas

■ All Hazard Areas

The landslide hazard areas shown have been merged from three assessments for use for planning purposes:

WA DNR Landslide Areas data provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. This dataset contains 1:24,000-scale polygons defining the extent of mapped landslides in the state of Washington, compiled chiefly from pre-existing landslide databases created in different divisions of the Washington State Department of Natural Resources to meet a variety of purposes.

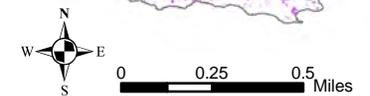
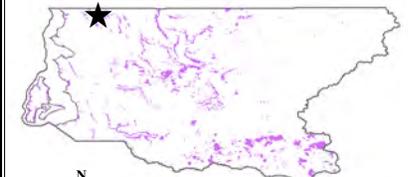
King County Slide Areas - Landslide areas are areas subject to severe landslide risk identified in the Sensitive Areas Ordinance as:

- A. Any area with a combination of:
 1. Slopes greater than 15 %
 2. Impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel)
 3. Springs or groundwater seepage.
- B. Any area that has shown movement during the Holocene epoch (from 10,000 years ago to present), or that is underlain by mass wastage debris of that epoch.
- C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action.
- D. Any area that shows evidence of, or is at risk from, snow avalanches.
- E. Any area located on an alluvial fan, presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported deposits.

Slope/Soils Analysis:

1. Areas of slope greater than 40%. Slope determined using a DEM generated from 2002 LiDAR data. Slope data provided by King County DNRP.
2. Areas of Qf (alluvial fans), Qls (discrete landslides), and Qmw (colluvium and the cumulative debris from small indistinct landslides that accumulate on and at the base of unstable slopes) soils as identified in surface geology data provided by King County DNRP.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology



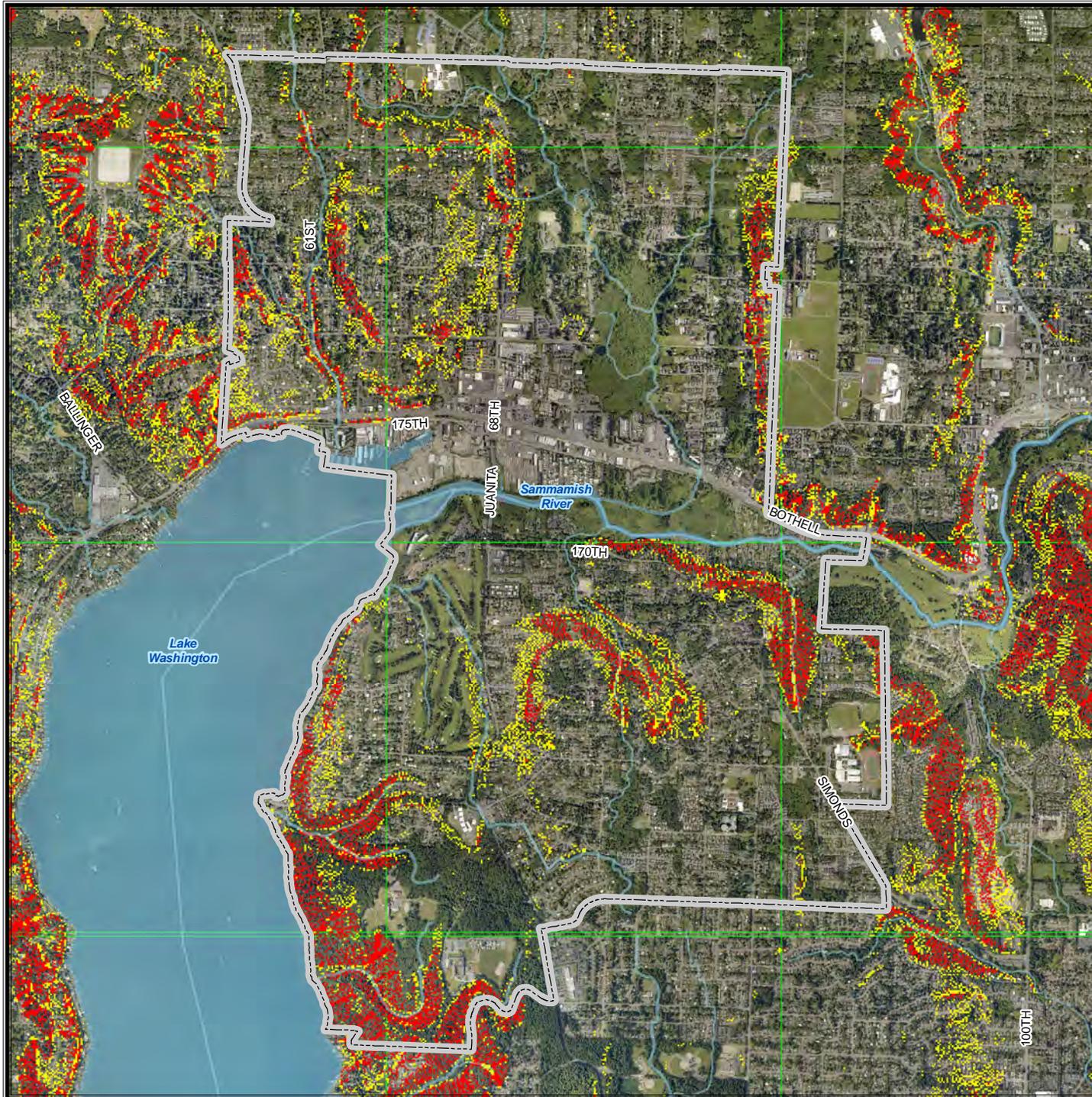
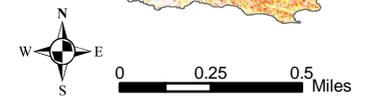
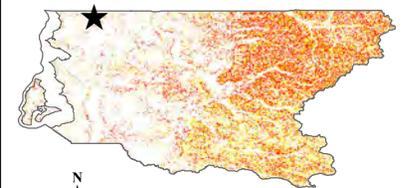
CITY OF KENMORE

Slope Stability

- Low Slope Instability
- Medium Slope Instability
- High Slope Instability

Slope stability data downloaded from the WA State Department of Natural Resources, Forest Practices Division website. This dataset is a predictive layer of shallow-rapid slope stability using one or more calibrated GIS-based models that use DEMs to generate slope and curvature information. The models used are SMORPH and SHALSTAB. Additionally, other information, such as landslide inventories, soils, mass wasting units, geology, and precipitation amounts are used in the calibration of these models to a specific area. These landslide data were collected at a variety of scales, over a large period of years. The horizontal accuracy of the grid coverage is dependent on the resolution of the Digital Elevation Model (DEM) from which it was derived.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





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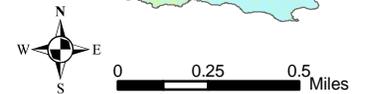
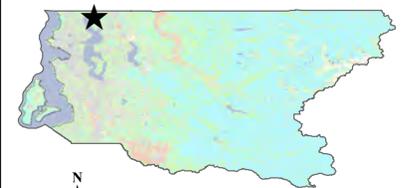
2008 LANDFIRE Fire Behavior Fuel Model

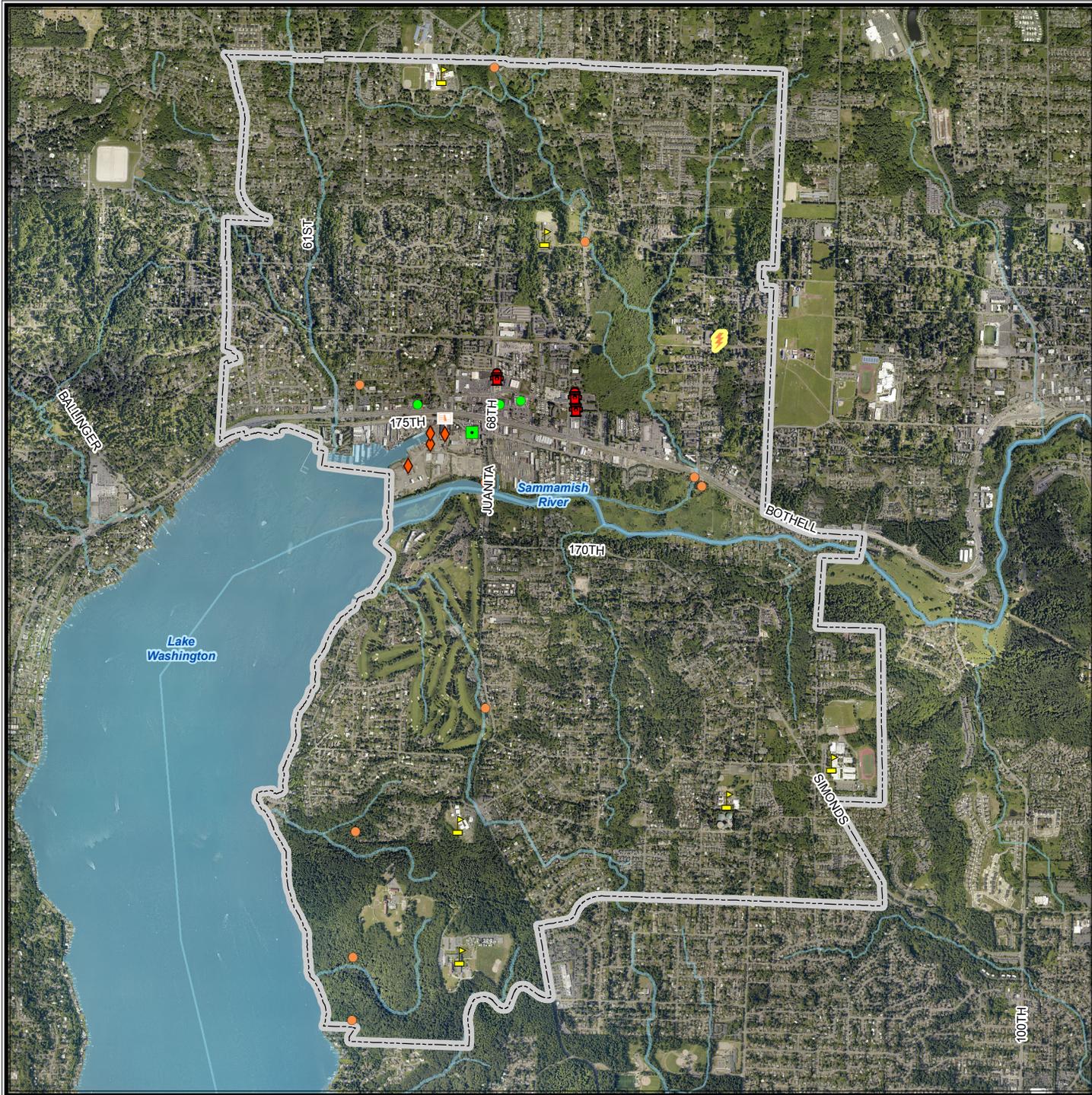
Anderson 13 Fuel Classes

Burnable		Non-Burnable	
FBFM1	FBFM2	Developed	Agriculture
FBFM3	FBFM5	Water	Barren
FBFM6	FBFM8		
FBFM9	FBFM10		
FBFM11			

Fuel Class data (LANDFIRE REFRESH 2008 (lf_1.1.0)) provided by the Wildland Fire Science, Earth Resources Observation and Science Center, U.S. Geological Survey. The LANDFIRE fuel data describe the composition and characteristics of both surface fuel and canopy fuel. Thirteen typical surface fuel arrangements or "collections of fuel properties" (Anderson 1982) were described to serve as input for Rothermel's mathematical surface fire behavior and spread model (Rothermel 1972). These fire behavior fuel models represent distinct distributions of fuel loadings found among surface fuel components (live and dead), size classes and fuel types. The fuel models are described by the most common fire carrying fuel type (grass, brush, timber litter or slash), loading and surface area-to-volume ratio by size class and component, fuelbed depth and moisture of

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology





CITY OF KENMORE

Critical Facilities and Infrastructure

Critical Facilities

- Government Function
- HazMat
- Medical Care
- Protective Function
- Schools
- Other Facility

Critical Infrastructure

- Bridges
- Communications
- Dams
- Water Supply
- Power
- Transportation
- Wastewater

Locations are approximate.

Base Map Data Sources: King County, U.S. Geological Survey, WA Department of Ecology

