I. Purpose

The City of Oakland (City) Severe Weather Annex to the Emergency Operations Plan (EOP) was developed to ensure the protection of lives and property through the coordinated execution of response and recovery activities. This annex outlines roles and responsibilities of primary and supporting departments, warning, response, and recovery efforts from a severe weather incident.

II. Situation and Assumptions

Severe weather covers a wide range of meteorological conditions including: flooding, extreme heat, tornadoes, thunderstorms, lighting, and drought. This section briefly describes the nature and potential causes of each type of severe weather as well as the City's potential vulnerability. ***This section is not intended to be a compendium of all the various types of severe weather but rather a listing of those most likely to occur in the City and have significant consequences***.

Table 1: Severe Weather Hazard Analysis

Hazard	Frequency	Warning Lead Times	Consequences	Population/Area at Risk
Flood	Medium (Between 1 and 25 years)	24 hours to minutes/none	Medium (Localized damage may be severe; citywide impact minimal to moderate. Handled with city resources and some mutual aid.)	Medium
Severe Weather	Medium	Weeks to days	Low (Some citywide impact possible. Usually handled with available City resources.)	Low

Table 1 shows the hazard analysis for the types of severe weather profiled in **Section 2** of the City of Oakland EOP.

A. Flooding

Flooding is the inundation of normally dry land as a result of a rise in the level of surface waters or the rapid accumulation of storm-water runoff; it becomes a hazard when the flow of water has the potential to damage property and threaten human life or health. Flood risks are greatest, and flood hazards most severe, in winter, when water bodies are usually full and soils saturated.

Flooding is primarily a natural process and, therefore, difficult to prevent. However, land-use and development decisions have a significant effect on the frequency and severity of floods; in general, urbanization increases the risk of flooding by increasing stormwater runoff and, to a lesser extent, erosion. Flooding can take many forms – river floods, storm-related flash floods

and coastal floods, for example – and have many causes, including heavy rains, melting snow, inadequate drainage systems, and failed dams and levees.

The City of Oakland's watershed consists of 15 main creeks, over 30 tributaries, Lake Merritt and the Oakland Estuary. The following are excerpts from FEMA's December 21, 2018 Flood Insurance Study (FIS) for Alameda County as the principle flood problems for the City of Oakland:

> *In the City of Oakland, many of the storm drain facilities are natural creeks meandering through residential areas. Natural vegetation growth; man-deposited debris; and encroachment of buildings, bridges, and other structures into the floodway contribute to the flood problems.*
>
> *In general, the drainage systems are adequate to carry low frequency storm runoff. However, with larger storms, general flooding occurs.*
>
> *There is little record of past flooding. Principal flood problems are due to inadequate capacity of the open channel or underground conduit, or debris-plugged culverts and bridges. Generally, shallow flooding results, occurring primarily in the lower residential and industrial areas close to the shoreline.*
>
> *Lake Merritt tidal lagoon was a source of flooding in the past. However, since the construction of the 7th Street Pump Station, the 1-percent annual chance flood is contained.*

B. Extreme Heat

Extreme heat is defined as temperatures that hover 10 ºF or more above the average high temperatures for a region for several days or weeks. Extreme heat events can lead to an increase in heat-related illnesses and deaths, cause drought, and impact water supplies. Such events do not typically impact buildings; however, losses may be associated with the urban heat island effect and overheating of heating, ventilation, and air conditioning systems..

Extreme heat is the primary weather-related cause of death in the United States. In a 10-year record of weather fatalities across the nation (2006 – 2015), excessive heat claimed more lives each year than floods, lightning, tornadoes, and hurricanes. According to the *California Climate Adaptation Strategy*, heat waves have claimed more lives in California than all other declared disaster events combined. Despite this history, not a single heat emergency was proclaimed in California at the state or federal level between 1960 and 2016. Heat waves do not strike victims immediately, but their cumulative effects slowly cause harm to vulnerable populations. Older adults, children, and sick or overweight individuals are at greater risk from extreme heat.

C. Tornadoes and Wind Storms

According to the California Catastrophic Incident Base Plan,[1] the risk of tornadoes and cyclonic storms such as hurricanes is low in California, but periodic windstorms have disrupted power supplies and caused damage to property throughout the state. High winds are defined as those that last longer than 1 hour at greater than 39 miles per hour (mph) or for any length of time at greater than 57 mph. In the Bay Area high winds associated with cyclonic systems and their cold fronts occur in the winter, generally between the months of November through March.

According to the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC), there have been only three recorded tornadoes in Alameda County since 1950. The NCDC has recorded over 22 high wind events in Alameda County since 1994.[2]

A tornado, while rare, can occur anywhere in the City of Oakland and when a wind storm occurs it affects the entire city.

D. Severe Thunderstorms and Lightning

According to the National Weather Service (NWS), a severe thunderstorm by definition is a thunderstorm that produces 3/4 inch hail or larger in diameter and/or winds equal or exceed 58 miles an hour. Severe thunderstorms and lightening events are rare in the Bay Area and usually do not produce any major damage.

E. Drought

Drought is a significant decrease in water supply relative to what is typical in a given location. It is a normal phase in the climate cycle of most regions, originating from a deficiency of precipitation over an extended period of time, usually a season or more. This leads to a water shortage for some activity, group or environmental sector. Drought can be characterized based on various impacts or measurements:

- ☐ Meteorological measurements such as rainfall deficit compared to normal or expected rainfall
- ☐ Agricultural impacts due to reduced rainfall and water supply (e.g., crop loss, herd culling, etc.)
- ☐ Hydrological measurements of stream flows, groundwater, and reservoir levels relative to normal conditions

[1] California Governor's Office of Emergency Services. *California Catastrophic Incident Base Plan: Concept of Operations*. September 23, 2008.

[2] The NOAA NCDC does not provide information on severe weather incidents on a city basis from its website. County information is provided as a frame of reference to show the potential frequency of similar types of severe weather incidents in the City.

- ☐ Direct and indirect socio-economic impacts on society and the economy (e.g., increased unemployment due to failure of an industry because of drought).

2012 to 2017 Drought

California's most recent drought set several records:

- ☐ The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation.
- ☐ 2014 set new climate records for statewide average temperatures and for record-low water allocations in the State Water Project and federal Central Valley Project.
- ☐ 2013 set minimum annual precipitation records for many communities.

On January 17, 2014, the governor declared a state of emergency for drought throughout California. This declaration followed release of a report that stated that California had had the least amount of rainfall in its 163-year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. Drought conditions worsened into 2015. On April 1, 2015, following the lowest snowpack ever recorded, the governor announced actions to save water, increase enforcement to prevent wasteful water use, streamline the state's drought response, and invest in new technologies to make California more drought-resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent on average.

The statewide hydrologic drought from 2012 through 2016 included the driest four-year statewide precipitation on record (2012 – 2015) and the smallest Sierra-Cascades snowpack on record (2015, with 5 percent of average). It was marked by extraordinary heat: 2014, 2015 and 2016 were California's first, second and third warmest year in terms of statewide average temperatures.

On April 7, 2017 the governor ended the drought state of emergency in most of California, following unprecedented water conservation and plentiful winter rain and snow.

On April 21, the governor declared another drought emergency proclamation which was expanded to 41 total counties on May 10, 2021.

F. Monitoring Severe Weather

The NWS office in Monterey, California is responsible for monitoring and alerting state and local agencies of severe weather. In particular, the Meteorological Services Division sets requirements, implements, and manages day-to-day programs of weather prediction and warnings in the Region.

G. Assumptions

Refer to **Section 1.4.2** of the Oakland EOP for overarching emergency management assumptions. In addition, the following assumptions have been used to develop this annex:

- Electric power may be most susceptible to damage and, at the same time, be most essential for recovery from the effects of a severe weather incident.

- The utility company may pro-actively shut-down power based on severe weather conditions to prevent equipment malfunctions from unintentionally igniting a fire.
- Effective communications may be a major concern due to the disruption of telephone service and the loss and/or damage of radio antenna towers and related equipment.
- Both response and recovery operations may be hampered by snow/ice/debris blocked roads, damaged bridges or roads, and downed trees and utility poles.
- Populations with disabilities and others with access and functional needs are especially vulnerable to severe weather conditions and dependent upon electrical power for life support equipment.
- Homeless individuals are especially vulnerable to severe weather conditions. Traditional outreach mechanisms (for example, television and radio) may not be accessible to them.
- Evacuation/closing of low-lying areas, businesses/industries, public parks and local campgrounds may be necessary
- A severe weather incident may result in cascading impacts and produce persistent chemical, biological, or radiological contamination that severely challenge the ability and capacity of governments and communities to achieve a timely recovery.

III. Concept of Operations

All responses to a severe weather event will be conducted in accordance with the concept of operations as outlined in the City of Oakland EOP.

Severe weather emergency response will be carried out using the following phases as guidelines to determine the most appropriate level of response.

A. Activation Level III: Readiness

The City of Oakland conducts ongoing training and exercises to maintain a constant state of readiness. Level I actions include:

- Enhance public education on relevant topics, including understanding of severe weather warning systems, home safety, personal preparedness checklists, evacuation routes, and pre- and post-weather event safety procedures (such as attention to flooded roads, snow/ice conditions, hazards of electrocution, etc.).
- Review, exercise, and reevaluate severe weather emergency plans, policies, and procedures.
- Review resource lists (including private contractors) and availability of road-clearing equipment, four-wheel-drive vehicles, emergency generators, fuel, chainsaws, etc.
- Review shelter availability, in particular electric power generation redundancy.
- Test emergency communications systems and generators per standard requirements. This should be done at a time when the system is used the least (that is, most likely at night) to prevent system overload and complications that can arise while testing systems.
- Ensure emergency supplies (fuel, generators, food, etc.) are in working order and quantities are sufficient to last for at least 48 hours.

- Ensure integration among local entities of knowledge of existing conditions and road closing guidelines, etc.
- Coordinate with the EOC Functional Needs Coordinator (E-FNC) to understand and prioritize functional needs population resources and services that will be needed during and after an incident.

B. Activation Level II: Severe Weather Alert

When the City has received an alert of impending severe weather, Level II actions will be initiated:

- Initial coordination call and periodic or daily calls as needed among the key city departments with weather and power updates.
- Conduct outreach efforts with organizations that represent vulnerable populations, such as homeless and functional needs populations.
- Identify and prepare shelters/warming/cooling centers.
- Coordinate with Alameda County Public Health to contact medical facilities.
- ESF #15 – Public Information provides updates to the public using all mechanisms (i.e., media, City website, social media, and hotlines, including services such as 2-1-1).

C. Activation Level I: Severe Weather Emergency

Level III actions are taken when conditions pose a severe threat or an actual occurrence of severe weather. Level III actions include:

- Convene key response departments to identify any protective or response actions the City should take to alleviate the situation, including the proclamation of a local emergency.
- Implement the City's EOP and supporting relevant Emergency Support Functions (ESFs).
- Implement response actions in accordance with operational priorities.

During a severe weather incident, the following functions will be critical and will be supported by established ESF annexes to the EOP:

Functions	Incident Conditions
Evacuations **ESF #1 – Transportation** **ESF #5 – Management** **ESF #16 – Evacuation**	• The time between alert and notification of a potential severe weather threat can vary significantly. During flooding events, evacuation orders may be needed to protect the public.

Severe Weather

Functions	Incident Conditions
Damage Assessments and Debris Removal **ESF #3 – Public Works and Engineering**	• Damage assessment of critical infrastructure and debris removal of vegetation may be required during or following a severe weather event. For example, in the case of a flood, clearing debris from storm drains will be critical part of mitigating and responding to the incident. On-going damage assessments for critical infrastructure, such as power, water, and gas infrastructure, during extreme heat or cold incidents will be needed to maintain situational awareness of the number of potentially affected individuals that may need shelter.
Mass Care, Housing, and Human Services **ESF #6 – Mass Care and Shelter** **ESF #11 – Food, Agriculture, and Animal Services**	• The City must have the ability to support the provision of temporary shelter, food, emergency first aid, and other essential life support to people and animals during a severe weather event.
Public Health and Medical Support **ESF #8 – Public Health and Medical**	• Severe weather events may result in injuries requiring medical attention and cause medical surge issues.
Search and Rescue **ESF #9 – Search and Rescue**	• Severe weather events such as flooding may cause significant structural damage to buildings and other critical infrastructure. Search and rescue efforts may be needed to rescue individuals who are stranded on streets and buildings. Swift water rescue may be required.
Public Information **ESF #15 – Public Information**	• Preparing the public to respond to a severe weather event is an on-going effort. During the alert stage, providing timely information to the public will reduce the number of individuals affected.

IV. Operational Roles and Responsibilities

The following table describes roles and responsibilities *specific* to severe weather incidents. Primary departments identified to lead each ESF are responsible for coordinating and/or delegating the activities of the ESF. Additional roles and responsibilities to support associated emergency response efforts are described in the specific ESFs. Refer to the specific ESF for more information. Additional ESF may be activated to support the response as necessary.

ESF #1 – TRANSPORTATION
Primary Department: Oakland Department of Transportation
Preparedness (Pre-event)
☐ Identify mass transit capabilities to support evacuation and to bring the public to shelters/warming/cooling centers.
☐ Identify evacuation routes from flood-prone areas.
Response
☐ Determine which routes are available for emergency use if needed.
☐ Maintain and repair damaged traffic control devices.
☐ Establish a transportation plan to support response efforts such as providing transportation assistance to shelters/warming stations/cooling centers.
☐ Coordinate with ESF #13 – Law Enforcement to establish traffic control points.
☐ Coordinate with ESF #8 – Public Health and Medical and the E-FNC on the movement of populations with disabilities and others with access or functional needs from the incident area.
Recovery
☐ Assess and document damage to transportation infrastructure. Provide documentation to the Emergency Operations Center (EOC) Planning and Intelligence Section.
☐ Identify and repair transportation infrastructure.
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

ESF #3 – PUBLIC WORKS
Primary Department: Oakland Public Works Department
Preparedness (Pre-event)
☐ Coordinate with utilities to render safe, harden, or provide redundant critical infrastructure.
☐ Deploy field units to clear debris from storm drains and remove equipment out of potentially affected areas.
☐ Coordinate with utilities to develop guidance to the public on how to reduce power outages/blackouts (e.g., minimize use of non-essential electrical equipment during peak hours).
Response
☐ Coordinate utility issues, including rendering safe, repairing, and restoring.

- ☐ Continue coordination with utilities providing guidance to the public on the reduction of outages/blackouts.
- ☐ Deploy field units to monitor and clear debris and repair infrastructure as appropriate.
- ☐ Document damage assessments and estimates from field personnel.

Recovery

- ☐ Assess and document damage to public infrastructure. Provide documentation to the EOC Planning and Intelligence Section.
- ☐ Identify and repair damaged infrastructure.
- ☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
- ☐ Participate in the After Action Report.

ESF #4 – FIREFIGHTING

Primary Department: Oakland Fire Department

Preparedness (Pre-event)

- ☐ Move and stage resources out of the affected area if necessary (for example, during a flood).
- ☐ Assign staff in affected area to other locations.

Response

- ☐ Support evacuation efforts.
- ☐ Support search and rescue efforts and respond to fire and hazardous material incidents.
- ☐ Consider holding over or calling back staff.

Recovery

- ☐ Release excess personnel and equipment according to demobilization pan.
- ☐ Document and provide damage assessments of City infrastructure to the EOC.
- ☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
- ☐ Participate in the After Action Report.

ESF #5 – MANAGEMENT

Primary Departments: Emergency Management Services Division & City Administrator's Office

Preparedness (Pre-event)

- ☐ Bring together relevant stakeholders to develop detailed standard operating procedures (SOPs) for how to respond to severe weather.

ESF #5 – MANAGEMENT
Response
☐ Receive and assess the severe weather threat.
☐ Coordinate with the Policy Group and the EOC Operations Section to develop protective actions.
☐ Initiate communication/coordination with key state response agencies and local authorities.
☐ Open shelters/warming stations/cooling centers as appropriate.
☐ Activate outdoor warning sirens and other emergency alert and other public notification systems if appropriate.
☐ Coordinate with the E-FNC and ESF #15 – Public Information to reach out to functional needs and other vulnerable populations, such as the homeless.
☐ Monitor number of affected individuals (e.g., deaths, injuries, and damages).
☐ Consider the need for an emergency proclamation and work with the City Administrator and/or City Council to obtain one if necessary.
☐ Provide coordination for disaster recovery activities and agencies.
Recovery
☐ Coordinate the documentation of damage assessments with reporting agencies and develop a combined report.
☐ Provide coordination for recovery activities.
☐ Ensure all response and EOC personnel complete all required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Facilitate post-incident analysis and conduct the After Action Report.
☐ Revise EOP and/or any annexes or procedures as necessary and informed by the incident.

ESF #6 – MASS CARE AND SHELTER
Primary Department: Oakland Parks, Recreation, and Youth Development Department
Preparedness (Pre-event)
☐ Identify shelter/warming station/cooling center locations and resources.
☐ During the alert period, top off fuel tanks, test generators, and order additional supplies.
Response
☐ Coordinate the opening and staffing of shelters/warming stations/cooling centers within the City.
☐ Coordinate with the E-FNC and the shelter functional needs coordinator(s) (S-FNC) to ensure that functional needs populations needs are being met.
☐ Continue to assess the need for shelters and provide ongoing analysis to the EOC.
Recovery

ESF #6 – MASS CARE AND SHELTER
☐ Close shelter locations as sheltering needs are resolved.
☐ Provide information on disaster assistance (housing, disaster grants).
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

ESF #8 – PUBLIC HEALTH AND MEDICAL (Please refer to ESF #8 – Public Health and Medical for detailed responsibilities as well as the Alameda County Health and Medical Agency plans for detailed information)
Primary Departments: Human Services Department & Oakland Fire Department
Preparedness (Pre-event)
☐ Discuss how to modify EMS tactics and protocols to fit various types of severe weather incidents.
☐ During the alert period, top off fuel tanks, test generators, and order additional supplies.
☐ During the warning period, assign and bring on additional staff.
☐ Pre-deploy and stage resources as appropriate.
Response
☐ Establish and maintain operational awareness of Oakland public health and medical services through direct communications links with operational units (Incident Command in the field, hospitals, nursing homes, health care facilities, Department Operations Centers [DOCs], etc.) in the field and/or their appropriate coordinating entities.
☐ Provide primary coordination with Alameda County Health Care Services Agency.
☐ Monitor and provide reports to EOC management on deaths and injuries associated with the severe weather incident.
☐ Coordinate with Alameda County Health Care Services Agency for the implementation of the Operational Area Disaster Medical Health Plan and surge capacity plans, including assessments of immediate medical needs as well as the following activities:
☐ Provide on-scene triage, treatment, and stabilization in coordination with field units.
☐ Activate field treatment sites.
☐ Track patients transported through EMS.
☐ Assign patients to available hospital service in accordance with established protocols.
☐ Support surge implementation throughout the medical system.
☐ Request the National Disaster Medical System (NDMS) support if needed.
☐ Request the Medical Health Mutual Aid System activation through the Oakland EOC if needed.
☐ Request police escort for all ESF #8 – Public Health and Medical personnel performing response actions.

Recovery
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

ESF #9 – SEARCH AND RESCUE
Primary Department: Oakland Fire Department
Preparedness (Pre-event)
☐ Move and stage resources out of flood prone areas.
Response
☐ Advise Incident Command on structural and debris management issues.
☐ Coordinate response activities associated with search and rescue including locating, extricating, and providing medical treatment on site to victims.
☐ Request additional search and rescue resource through the Operational Area EOC if necessary.
Recovery
☐ Release excess personnel and equipment according to demobilization plan.
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

ESF #11 – FOOD, AGRICULTURE, AND ANIMAL SERVICES
Primary Departments: Human Services Department & Oakland Animal Services Department
Preparedness (Pre-event)
☐ Identify vendors that will be able to provide food and animal supplies during a disaster for shelters and affected residents.
Response
☐ Coordinate the delivery of food and water to shelters for people and pets.
☐ Coordinate the safe disposal of animal remains.
☐ Coordinate with ESF #10 – Hazardous Materials and ESF #8 – Public Health and Medical regarding the safety of agricultural food supplies.
Recovery

ESF #11 – FOOD, AGRICULTURE, AND ANIMAL SERVICES
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

ESF #15 – PUBLIC INFORMATION
Primary Department: City Administrator's Office
Preparedness (Pre-event)
☐ Develop messages and standard operating procedures for various types of severe weather events.
☐ Provide information to 2-1-1 and other public information sources as described in established procedures.
☐ During the alert period, develop and release messages to the public on how to prepare for the incident and how the City is responding.
Response
☐ Activate the Emergency Public Information Team (EPIT).
☐ Prepare instructions for the media actions taken by the City of Oakland to respond to the incident and the consequences (for example, the number of affected individuals).
☐ Work with other EOC Section and Unit leaders to develop verified fact sheets regarding the scope of the event.
☐ Monitor broadcast media, and use information to develop follow-up news releases and rumor control.
Recovery
☐ Complete required administrative and financial forms for reimbursement and to meet legal requirements.
☐ Participate in the After Action Report.

V. Polices

The following agreements, procedures, plans, and guidelines apply to the execution of this Annex:

- The Severe Weather Annex will assist in coordination with impacted departments without regard to race, color, national origin, religion, nationality, sex, age, disability, limited English proficiency, economic status, or sexual orientation.
- This annex will not supersede the existing City of Oakland codes, regulations, and compliance standards for emergency response.

VI. References

The following agreements, procedure, plans, and guidelines apply to the execution of the Severe Weather Annex, in addition to references listed in the EOP and ESFs associated with this Annex:

- City of Oakland Base Emergency Operations Plan
- City of Oakland Functional Needs Annex
- City of Oakland Animal Care Annex
- City of Oakland Parks and Recreation Disaster Manual
- Department of Human Services Manual
- City of Oakland 2016 – 2021 Local Hazard Mitigation Plan
- Oakland Municipal Code, Article 15 and (Ord 12815 § 3 (part), 2007: Ord 12186 (part), 1999)
- Article 15 of the California Emergency Services Act (Chapter 7, Division 1, Title 2 of the Government Code)