

## MAJOR FIRE ACTIVITY<sup>65</sup>

### SUMMARY

**The Hazard:** Major fire activity are generally associated with urban settings, even in rural communities, urban fires are fires in cities and towns with the potential to rapidly spread to adjoining structures. These fires damage and destroy homes, schools, commercial buildings, and vehicles.

**Impacts and Effects:** Any or all of the following: loss of life, loss of property, extensive damage to business and homes, overtaxed emergency response system, overtaxed healthcare provider system; long term, costly clean up of damage.

**Previous Occurrences:** The most famous recent urban fire is the Aldrich Fire in which the oldest continuously operating grocery store in the state was destroyed in the city of Port Townsend in August of 2003.

**Probability of Future Events:** Moderate – Although Jefferson County and the City of Port Townsend have had major structure fires, conditions were not conducive to spread the fire to other buildings. County fire departments and the City of Port Townsend Fire Department have used rapid response, excellent training, and have exercised mutual aid agreements to prevent large fires from developing into a conflagration.

### Definition

Urban fires are fires in cities and towns with the potential to rapidly spread to adjoining structures. These fires damage and destroy homes, schools, commercial buildings, and vehicles.

### Hazard Assessment and Vulnerability Assessment

Port Townsend is a Victorian Seaport with its business district listed in the Registry of National Historic Sites. For decades, nobody had the money to tear down or replace the structures that people were abandoning during a local depression in the late 1800s, until it became fashionable to preserve and restore them. Thus many homes and buildings in this small city are over 100-years old, while many “newer” homes are easily over 50-years old.

Many homes and business structures were constructed prior to the time that construction and fire safety codes were in place and actively enforced. Many older residences are equipped with original wiring, making electrical systems a potential source of ignition. In older neighborhoods, houses are often very close together, lack sprinkler systems, and are conducive to rapidly spreading fire. A significant number of old industrial/business facilities have not been retrofitted with new electrical infrastructure or fire extinguishing sprinklers.

Regular fire inspection programs of residences is non-existent, however recent hiring of fire prevention specialists and fire code inspectors will go far in addressing this situation before it

becomes a problem. Water systems in older residential areas are aging. Some systems may fail to meet demands for fire protection water availability. Land use planning and system upgrades must be addressed in these areas. Residential area roads are often narrow and prevent the response of adequate fire apparatus.

In areas where newer industrial and business buildings are located, these structures are reasonably secure from destruction in the case of a spreading urban fire. New industrial buildings are generally constructed of fire resistant materials, protected with automatic sprinkler systems, and have reasonable spacing between the structures. Although a major fire could occur in such facilities, it would not spread as quickly between neighboring structures. The Uniform Fire Code has required sprinklers in certain industrial and business buildings since 1985. As older buildings have been remodeled and reconfigured to accommodate shops and downtown hotels, they were required to meet more stringent fire codes as well.

Although Jefferson County and the City of Port Townsend have had major structure fires, conditions are no longer conducive to spreading the fire to other buildings. County fire departments, which have absorbed the City of Port Townsend Fire Department, have used rapid response, excellent training, and have exercised mutual aid agreements to prevent large fires from developing into a conflagration.

More stringent enforcement of fire codes has helped ensure reliability of the facilities' defenses. As the county has grown, fire districts have become better equipped and have more paid full-time firefighters on the staff. Fire stations are still located great distances apart; however, much improvement has been experienced over the past decade.

## **CONCLUSION**

Multiple structure fires are an ever-present danger in all parts of the county. Jefferson County needs to continue public education on fire safety, fire alarms, and fire response. The County must continue its efforts in ensuring fire codes are appropriate and enforced.

## MAJOR LAW ENFORCEMENT ACTIVITY<sup>66</sup>

### SUMMARY

**The Hazard:** Any incident that disrupts a community to the degree that police intervention is required to maintain public safety is a major law enforcement activity. In small jurisdictions such as Jefferson County or the City of Port Townsend, this could be a hostage incident, bank robbery, bomb incident, civil disturbance or civil disorder, or a major natural disaster requiring significant control of an area.<sup>67</sup> Many of the other hazards addressed in this Plan include a major law enforcement component in reacting to the event.

### Impacts and Effects:

- Loss of life
- Loss of property
- Closure of businesses
- Looting
- Arson
- Long term divisiveness in the community
- Adverse impacts on tourism and economic development
- Increased demands on law enforcement and emergency response resources
- Increased demands on mental health

**Previous Occurrences:** There are bomb scares at city and county schools two to three times a year, but none have been real so far. There are regular public displays of anti-war protest groups such as the “Raging Grannies”, but again, everything is normally orderly and friendly. In 2009, there was a double-homicide with arson to hide the crime.

**Probability of Future Events:** High – The increase of illegal methamphetamine production and distribution in rural areas such as Jefferson County serve to increase the probability of future incidents necessitating major law enforcement activity.

### Definition

Any incident that disrupts a community to the degree that police intervention is required to maintain public safety is a major police activity, civil disturbance or civil disorder. Demonstrations, riots, strikes, public nuisances, domestic disputes, terrorism, and/or criminal activities can all fall into this category. The hazard could surface in any community, and can be sparked by disagreements ranging from simple family disturbances to political, racial, belief, social and economic differences

### History of Major Police Activity in Jefferson County

Jefferson County has not experienced the violence associated with riots occurring in nearby Seattle in the 1990s. In Seattle, a small-scale riot occurred after the 1992 Rodney King verdict. After the jury’s decision was announced small groups of people roamed downtown Seattle streets smashing windows, lighting dumpster fires and overturning cars. In 1999, during the World Trade Organization Ministerial Conference, riots resulting in injury and death of participants and bystanders occurred. The City of Seattle declared an emergency and the Governor signed a

proclamation of emergency allowing commitment of state resources to support affected local jurisdictions.

In 1998, the Washington State EOC was activated in response to the Makah Indian Nation proposed whale-hunting activities at Neah Bay. At the request of the Clallam County Sheriff, the State of Washington provided resources from the National Guard, Washington State Patrol, Department of Fish and Wildlife, Department of Natural Resources and Emergency Management Division to control disturbances between protestors and residents.

County High Schools including Port Townsend, Chimacum, and Quilcene have all had bomb scares and have had instances of students bringing weapons to school. Following the Columbine High School experience in Colorado, such incidents have been approached with intense seriousness. Although nothing approaching the level of Columbine has occurred, school officials are aware and cognizant of the possibilities.

In 2009, a double-homicide with arson to cover up the crime in the Quilcene area became the focal point of major police and fire activity. The alleged perpetrator was caught within 24-hours, but the continued drain of law enforcement resources to process the crime scene and build a case will have budgetary impact on county operations.

### **Hazard Assessment and Vulnerability Assessment**

Civil disturbances are divisive, often complex in their origin, and are possible in nearly every community in the nation. As the population continues to grow, so will the concentrations of ethnic groups, varied perspectives, and disparate economic status. Jefferson County has experienced a growth rate that has outpaced the rest of the State of Washington. Diverse philosophies exist in county residents. As the economy fluctuates due to economic realities of declining fishing and forest industries, emotions tend to run high. Tourism, a major source of revenue for county businesses could be affected by an increasing potential or the actual developments of civil disturbances.

The difficult economy combined with the smuggling of designer drugs through Canada and the increase in meth labs in rural areas increase the probability of criminal activity that requires a major law enforcement response. The Jefferson County Sheriff's Office has twenty deputies, and the City of Port Townsend has sixteen commissioned officers to cover an 1800 square mile county twenty-four-seven. During holidays or festivals, when man-power is ramped up to deal with a special influx of people, there is a limited additional surge capacity. In the event of an active shooter scenario, individual units of the Washington State Patrol may provide additional support, but specialized units such as a Swat Team or Armored vehicle take two-hours to be authorized, mount-up, and arrive in Port Townsend from their normal staging areas.

### **CONCLUSION**

The potential for major police enforcement activity exists in Jefferson County. Main participants might not be residents of the county. County law enforcement resources are aware and have practiced response scenarios if such disturbances occur. Even with a quick response, state and federal law enforcement support will not arrive to help for many hours.

## MARINE OIL SPILL<sup>68</sup>

### SUMMARY

**The Hazard:** The release of toxic materials, oil and other petroleum discharges in particular, into the marine environment in sufficient quantities to put some portion of the public or the environment in immediate danger from exposure, contact, inhalation or ingestion.<sup>69</sup>

#### **Impacts and Effects:**

- Illness and injuries
- Loss of marine flora and fauna, particularly endangered species
- First responders, population and workers at risk until abatement is effective
- Permanent loss of fishing, clam beds, and oyster beds from chemical spills
- Loss of recreation sites and tourism
- Potential contamination of water supplies
- Business closures
- Long term loss of property use
- Potential lawsuits tying up property and funding for years

**Previous Occurrences:** Small occurrences happen every year. Most are below the reporting levels.

**Probability of Future Events:** Moderate – The Admiralty Inlet is one of the most heavily used shipping lanes in the country.

#### **Definition**

FEMA defines hazardous materials in a broad sense to include:

- Explosive, flammable, combustible, corrosive, oxidizing, toxic, infectious, or radioactive materials
- that, when involved in an accident and released in sufficient quantities,
- put some portion of the general public in immediate danger from exposure, contact, inhalation, or ingestion.

The use, storage, transportation and disposal of hazardous petroleum material and wastes, places the public and the environment at significant risk. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the materials to escape its container, enter the environment, and create a potential hazard. The nature and extent of this risk is difficult to determine as the process involved in hazardous materials and toxic waste management are dynamic. Many federal laws and regulations exist to manage the manufacture, utilization, and disposal of hazardous materials.

#### **History of Major Spills in Washington and Jefferson County**

Data reported to Jefferson County about occurrences happening to hazardous materials average between 25 and 30 per year. Most are small. Spills under 10 gallons are not reportable.

Clean up is the responsibility of the spiller; however the spiller or waste-dumper may not be known. Occurrences have ranged from marine oil spills during bunkering operations to spilled fuel or oil on the road from accidents or overturned containers.

2003 – Point Wells – 4,800 barrels during transfer from shore tanks to a barge. Significant damage to sensitive estuary.

2004 – Legislature passes a bill calling for a “zero-spill” strategy.

2004 – In October an unknown vessel spills 1,000 gallons in Dalco Pass, fouling 21 miles of shoreline.

<b>Spills Report Summary</b>					
Year	1995	1996	1997	1998	1999
Diesel Fuel	297	792	548	622	603
Gasoline	193	322	258	322	320
Crude Oil	3	6	6	7	4
Hydraulic Oil	72	164	161	63	188
Lube Oil	43	75	63	97	68
Radioactive Materials	0	1	5	8	7
Bombs and Explosives	3	3	5	3	0
Drug Labs	61	137	173	336	789
Other Chemicals	49	101	87	89	428
Unknown Material	149	363	376	443	331
Miscellaneous Substances	336	877	864	754	1250
<b>TOTAL</b>	<b>1206</b>	<b>2841</b>	<b>2546</b>	<b>2829</b>	<b>3988</b>

Throughout the State of Washington, nearly 4,000 confirmed hazardous materials spills are reported each year. Illustrative data on the kinds, types and frequencies of statewide spills is shown below:

Data on spills is received from many sources. The State Emergency Management Department advises the county on all reports received. These reports may come from other state agencies, private citizens or federal agencies

## **Hazard Assessment and Vulnerability Assessment**

Areas at risk for hazardous materials transportation incidents lie along highways, pipelines, rivers, and seaport areas. These risks are compounded by natural hazards (e.g. earthquakes, floods, and severe storms). Each incident’s impact and resulting response depends on a multitude of interrelated variables that range from the quantity and specific characteristic of the material to the conditions of the release and area/population centers involved.

## **Oil Spill Readiness in Washington and Jefferson County**

As assessment of Washington’s capacity to respond to a large-scale oil spill (48,000 – 50,000 barrels) was prepared by the Washington Oil Spill Advisory Council in February 2009.<sup>70</sup>

Local responders were asked to identify the recovery systems they would use for a 50,000 barrel instantaneous release spill and a 48,000 barrel continuous release spill of 1000 barrels an hour for 48 hours. Key findings are:

- On-Water Capacity of the state is between 9,500 and 19,500 barrels of a 50,000 barrel instantaneous release during the first 48 hours.
- On-Water Recovery is greatly affected by environmental conditions and the availability of non-dedicated resources, such as equipment and personnel.
- Non-mechanical responses such as dispersant could treat between 1,400 and 8,000 barrels of a 50,000 barrel release using available resources. It could also interfere with on-water recovery by making the dispersing oil harder to collect.
- Burning could treat as much as 4,800 gallons of a 50,000 gallon spill.
- A 50,000 gallon spill could require thousands of trained shoreline cleanup personnel if conditions were “high-consequence”. Hundreds could be needed in a smaller spill under more favorable conditions. There are a maximum of 684 shoreline response personnel available in all of Washington.
- It is estimated that a major oil spill could oil up to 6,000 birds. Washington currently has the capacity to rehabilitate 100 birds, a few pinnipeds such as harbor seals, and up to 25 sea otters.

In short, we are woefully unprepared to deal with a major oil spill on our own. To that end, the best defense is a strong offense, so the Oil Spill Advisory Council advocated for a permanent response tug-boat to be permanently stationed at Neah Bay to assist vessels that are in trouble. A temporary tug-boat was stationed there in 2004.

In 2007, the Port of Port Townsend received funding for an Oil Spill Response Trailer, which is now stationed at the Boat Haven boatyard in Port Townsend. The trailer contains absorbent material and booms for control and recovery of marine oil spills. Local fire and Port of Port Townsend security personnel are trained to use the equipment.

The county Local Emergency Planning Committee (LEPC) was established under the provisions of the State and Federal law (The Community Emergency Planning and Community Right-to-Know Act--EPCRA). The purpose of the LEPC is to coordinate the development of emergency plans and procedures for dealing with a hazardous materials incident. The committee’s charter is to conduct hazard identification, vulnerability analysis, and risk management activities. Additionally, they are chartered to develop and maintain emergency response plans appropriate to hazardous materials based on the volumes and types of substances found in, or transported through their jurisdictions.<sup>71</sup>

The Pacific Oil Spill Prevention Education Team, POSPET, evolved from the simple premise that small oil spills can add up to cause significant environmental and economic harm, and are a regional problem that can be remedied more effectively through collaborative projects drawing from existing talent and resources. For over a decade, POSPET has served as a forum for exchanging information and outreach ideas about prevention of oil spills and other boater best management practices while providing boat and marina operators with a consistent and accurate pollution prevention messages. POSPET members include representatives from state and federal agencies, industry associations, and nonprofit groups from Alaska, British Columbia, Washington, Oregon, California, and nationwide.<sup>72</sup>

## **CONCLUSION**

For major marine oil and hazardous material spills, the Northwest Area Contingency Plan (ACP) will be used for all responses. It combines the resources of the local, State, and Federal governments. Two Geographic Response Plans (GRPs) cover the shorelines of Jefferson County,

specifically the Washington Outer Coast and Hood Canal/Admiralty Inlet. They include resource priorities, protection and clean-up strategies, and local logistical information.

Legislative creation of the Oil Spill Advisory Council in 2004 led to advocacy for a permanent tug boat to be stationed at Neah Bay to assist vessels in trouble, particularly those laden with petroleum cargos. As of 2008, it was estimated that a contracted tug boat at Neah Bay had prevented 34 major incidents.<sup>73</sup> In 2009, congress approved funding for a permanent tug boat at Neah Bay. Also in 2009, the governor of Washington proposed eliminating the Oil Spill Advisory Council as part of an effort to balance the state budget.

Due to inadequate oil spill response capabilities throughout the state, the Jefferson County coastline and Port Townsend Bay remain vulnerable to large scale oil spills



# MARITIME EMERGENCY<sup>74</sup>

## (Ferry Accident; Ship Collision)

### SUMMARY

**The Hazard:** In addition to the Puget Sound itself, the region contains many smaller bodies of water. These areas are vulnerable to shipping and boating accidents, as well as those involving ferries. Ferry accidents could result in a mass casualty incident that may be difficult to address, though the United States Coast Guard has the primary responsibility for safety and rescue on the open waterways. Major emergencies associated with freight vessels though, are more likely to result from collisions with other vessels or mechanical failures during severe weather.<sup>75</sup>

### Impacts and Effects:

- Possible loss of life
- Possible injuries to vessel occupants and to first responders
- Possible mass casualty incident
- Loss of vessel and/or cargo
- Loss of property of vessel passengers
- Threat to endangered species of both aquatic and airborne species from chemical or fuel spills resulting from the accident
- Possible contamination of commercial fishing grounds or shellfish farms
- Possible significant economic damage in limited sectors of the Jefferson County economy

**Previous Occurrences:** In 2005, an escort tug veered in front of a single-hull oil tanker loaded with two million gallons of light fuel oil. The tug boat was rolled over multiple times by the collision, but no one was seriously hurt and no fuel was spilled.<sup>76</sup> In 2008, the Director of Washington’s State Ferry System pulled the two ferries on the Port Townsend – Keystone run out of service on an emergency basis because the 80-year old vessels were considered to be too risky to run.

**Probability of Future Events:** Moderate – Puget Sound and the Admiralty Inlet are some of the highest trafficked sea lanes in the United States. The Port Townsend Bay has traffic from the ferry system, submarines, navy and coast guard warships, commercial fishing vessels, occasional cruise ships, and many pleasure craft. At times, the rough seas can threaten the ferries or small vessels.

### Definition

A maritime accident, for the purposes of the HIVA, would be one in which a vessel of significant size had an accident causing the loss of life and property to the extent that it required the activation of elements of the Jefferson County Department of Emergency Management to help respond. “Marine disasters can be roughly divided into the following four groups: collisions, weather-related events, fires, and infectious diseases. At sea communities are very small and resources are minimal compared to shore-side catastrophes so not much is required to turn a shipboard emergency into a disaster”.<sup>77</sup>

Jefferson County is bordered by the Pacific Ocean, Puget Sound, and the Admiralty Inlet as well as having smaller bodies of water such as Discovery Bay, Port Townsend Bay, and the Hood Canal.

These areas are vulnerable to shipping and boating accidents, as well as those involving ferries. Ferry accidents could result in a mass casualty incident that may be difficult to address, though the United States Coast Guard has the primary responsibility for safety and rescue on the open waterways. Major emergencies associated with freight vessels though, are more likely to result from collisions with other vessels or mechanical failures during severe weather.

### **History of Maritime Accidents in Jefferson County**

Jefferson County was once a major west coast seaport, and as such, has a rich history of maritime accidents. During the period from 1853 through 2002, there have been at least 27 major maritime accidents in the area from Protection Island through the Admiralty Inlet and down to Port Ludlow.<sup>78</sup> This included the steamship *Clallam*, which broke down in a storm, resulting in the deaths of 56 people who were in lifeboats that were launched into a rip tide.

Many Washington maritime incidents occur along the Pacific Coast too. In adjacent Clallam County, for example, there have been at least 33 significant maritime accidents around Tatoosh Island off Cape Flaherty.



Figure 1: Unknown vessel aground near Tatoosh Island.

### **Hazard Assessment and Vulnerability Assessment**

Jefferson County waters and adjacent international sea lanes are traversed by freighters, oil tankers, cruise ships, submarines, warships, pleasure craft, and the occasional whale. Rough water in Port Townsend Bay often causes the cancelation of ferry runs. Figure 2 below illustrates why.



Figure 2: A Washington State Ferry experiences rough water in the Puget Sound.

The Puget Sound area is one of the busiest seaways in the nation with some many unique features:<sup>79</sup>

- It is 3500 square miles; larger than San Diego, Los Angeles, San Francisco, Boston, Miami, and New York combined.
- It has an international border with Canada.
- Over 5,000 deep draft ships transit each year.
- It contains the home ports for the Alaskan Fishing Fleet.
- It contains the Washington State Ferry System, largest in the nation with 500+ transits daily and over 20,000 passengers daily.
- 15 Billion Gallons of Oil are moved annually.
- 3<sup>rd</sup> Largest US Navy Strategic Port in the U.S.
- Recreational Boat Population of 1.3 million.

Given the volume of traffic and the mix of vessels, it is a wonder that there aren't more maritime accidents than there have been.

The Seattle Gateway Sector as control over Puget Sound vessel traffic in much the same way that air traffic controllers control the skies. The Northwest Maritime Center in Port Townsend is adding an "Alternate Gateway Emergency Operations Center" to its new building in Port Townsend to provide backup control if the primary center in Seattle goes down.

A rescue tug boat has been stationed at Neah Bay to provide assistance to vessels in trouble at the entrance to Puget Sound and its vicinity.

Several Jefferson County law enforcement and fire agencies have a limited water rescue and fire-boat capability. These programs are hampered by funding issues, so the equipment is old and their capabilities limited by size. Since the agency boats are not manned full-time, response times are contingent upon whether trained crews happen to be on duty with their respective agency at the time of a water related emergency.

## **CONCLUSION**

Although the waters around Jefferson County can be difficult, safety standards, the positioning of a safety tug boat at Neah Bay, and aggressive response by the USCG have kept the loss of life and vessels down. Nevertheless, the large volume of commercial and recreational vessels in the Puget Sound suggests that it is inevitable more maritime accidents will occur.

Local law and fire agencies train to respond to maritime emergencies, but have limited ability to deal with large maritime disasters.

# MILITARY ORDNANCE INCIDENT<sup>80</sup>

## SUMMARY

**The Hazard:** The largest munitions depot on the west coast, Naval Magazine Indian Island (NAVMAG II), is located within the boundary of Jefferson County. Tens of thousands of tons of high explosives in the form of missiles, torpedoes, warheads, etc. are shipped in and out of the depot every year by ship and by truck. There is a possibility of an accident or incident detonating high explosives near a populated area.

### Impacts and Effects:

- Loss of life and injuries as a direct result of an explosion
- Fatalities and injuries as an indirect result of an explosion, e.g. from flying glass
- Destruction of property in the explosion radius
- Economic impact due to destruction of businesses within the blast radius
- Psychological trauma to survivors and residents
- Depending on the type of event, there may be hazardous residues that contaminate the area for long periods
- Economic impacts due to the loss of property values because of the perceived threat of living near NAVMAG Indian Island
- First responders, population and workers at risk until abatement is effective
- Explosions resulting in destruction and fires
- Permanent loss of fishing, clam beds, and oyster beds from chemical spills
- Loss of recreation sites and tourism
- Potential contamination of water supplies
- Business closures

**Previous Occurrences:** In 2008, a fully loaded semi-truck carrying 155mm munitions out of the base lost its brakes on a hill leading to the main gate of the navy base.

**Probability of Future Events:** Low – NAVMAG Indian Island has a superb track record for safety. The 2008 incident caused the revision of protocols to prevent a recurrence.

### Definition<sup>81</sup>

FEMA defines hazardous materials in a broad sense to include:

- Explosive, flammable, combustible, corrosive, oxidizing, toxic, infectious, or radioactive materials
- that, when involved in an accident and released in sufficient quantities,
- put some portion of the general public in immediate danger from exposure, contact, inhalation, or ingestion.

The production, use, storage, transportation and disposal of hazardous material substances and wastes, places the public and the environment at significant risk. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the materials to escape its container, enter the environment, and create a potential hazard. The nature and extent of this risk

is difficult to determine as the process involved in hazardous materials and toxic waste management are dynamic. Many federal laws and regulations exist to manage the manufacture, utilization, and disposal of hazardous materials.

An ordnance incident is the deliberate or accidental detonation of military ordnance, warheads, missiles, torpedoes, fuels, or any military related device or substance intended for the purpose of delivering high explosives or causing destructive explosions.

The largest munitions depot on the west coast, Naval Magazine Indian Island, is located within the boundary of Jefferson County. Tens of thousands of tons of high explosives in the form of missiles, torpedoes, warheads, etc. are shipped in and out of the depot every year by ship and by truck. There is a possibility of an accident or incident detonating high explosives near a populated area.

### **History of Military Ordnance Incidents in Jefferson County**

There have been no accidental detonations of military ordnance in Jefferson County.

**February 15, 2008<sup>2</sup>** – A shipping truck exiting NAVMAG Indian Island crashed into security bollards raised by the guards when the vehicle lost its brakes. The crash on February 15, 2008 happened just after 7 p.m. when a shipping truck transporting ordnance to the base crashed into one of the hydraulic security walls just inside the main gate.

Navy investigators determined that the 2003 Volvo truck and trailer, carrying 360 rounds of 155mm M107 projectiles, experienced a brake malfunction as it entered the base, causing it to crash into the movable wall used as a security measure.

According to an accident report from the Navy, no ordnance was damaged in the crash and no individuals were injured.

After the incident a safety perimeter of 1,700 feet was set up, stopping traffic on state Highway 116 for more than an hour. The area remained closed until a Navy explosive ordnance disposal team arrived to inspect the truck and ordnance.

The team later determined it was safe to reopen the road.

The ordnance was offloaded and a tow truck was called to dislodge the truck from the barrier.

### **Hazard Assessment and Vulnerability Assessment**

Indian Island has its own security and fire department to handle incidents within the base. Vulnerabilities of the base to severe windstorms, and the potential of hazardous material accidents that could impact the communities around the bay necessitate inter-governmental cooperation at all levels. Depending on its nature, a catastrophic explosion could scatter radiologic debris over a wide area.

Additionally, the trans-shipment of hundreds of thousands of tons of munitions, including those with spent Uranium projectiles, through the area periodically creates opportunities for protest groups. Loaded munitions ships leaving the base sometimes sail within a few hundred yards of downtown Port Townsend because of tidal conditions.

During the Persian Gulf operations known as “Desert Storm” and during Operation Iraqi Freedom, several thousand tons of explosive passed through eastern Jefferson County between

the Hood Canal Bridge and Naval Magazine Indian Island. The type of cargo that is loaded/offloaded at NAVMAG Indian Island is primarily ammunition (e.g., bombs, bullets and missiles). Contract trucks and trailers made several trips each day moving materials between Indian Island and Naval installations in Kitsap County. U.S. Pacific Fleet ordnance material flows from producers and procurement sites through Naval Magazine Indian Island to the Pacific Fleet.

Areas at risk for ordnance materials transportation incidents lie along highways, pipelines, rivers, and seaport areas. These risks are compounded by natural hazards (e.g. earthquakes, floods, and severe storms). Each incident's impact and resulting response depends on a multitude of interrelated variables that range from the quantity and specific characteristic of the material to the conditions of the release and area/population centers involved.

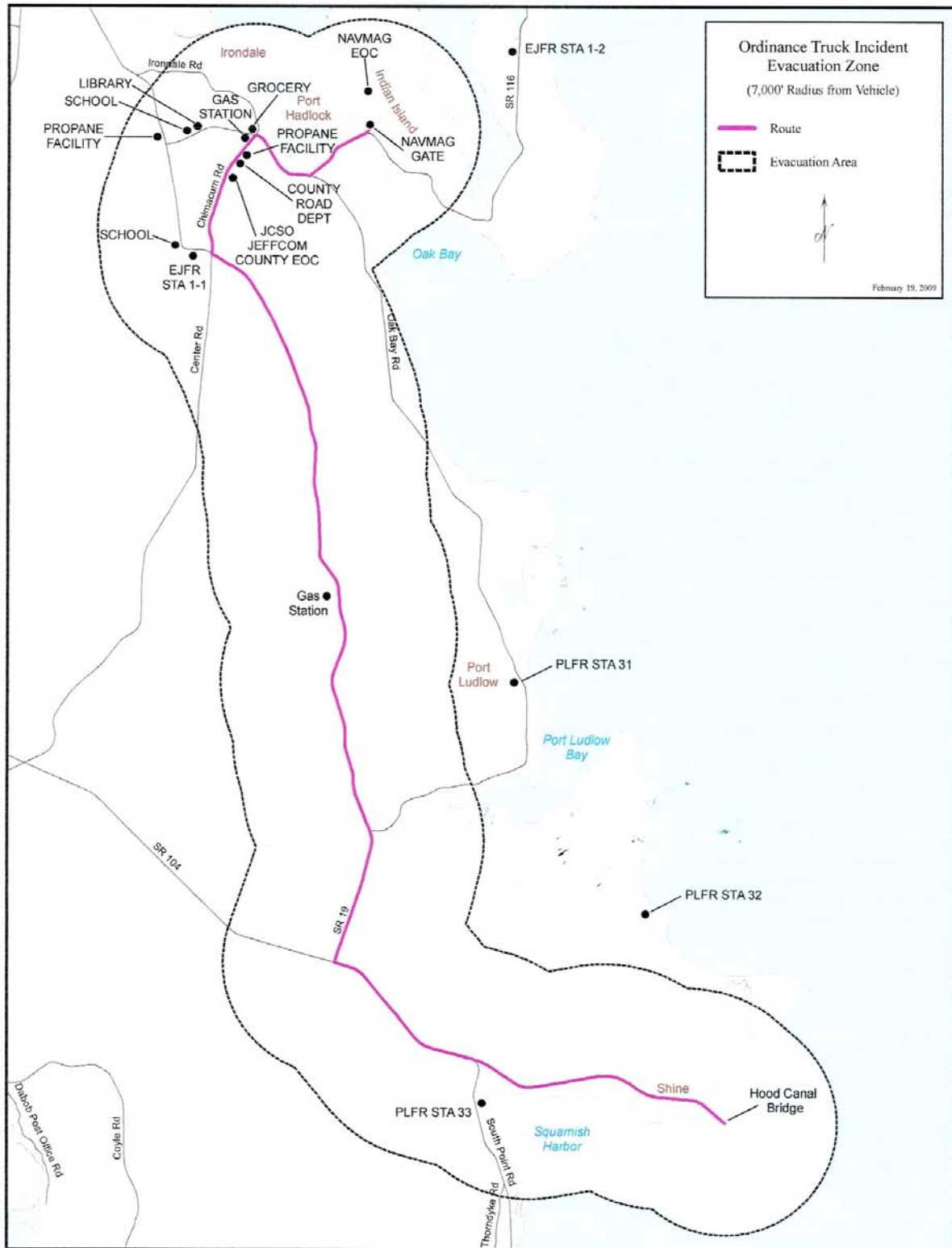
Figure 1 shows the route that trucks take from the Hood Canal Bridge to NAVMAG Indian Island. According to the National Counterterrorism Center (NCTC), a semi-truck fully loaded with high explosives needs an evacuation radius of 7000 feet.<sup>3</sup> Depending on where an ordnance truck had an accident, the evacuation radius could include the County EOC, 9-1-1 facilities, sheriff's office and jail complex, two propane storage facilities, gasoline stations, two schools and a library. It is also possible to have an accident in which the evacuation radius would include both the NAVMAG EOC and the County EOC, thus necessitating transferring EOC operations to the Alternate EOC at the City of Port Townsend nine miles away.

## **CONCLUSION**

Jefferson County has convened its leaders to examine and more thoroughly understand existing emergency response processes, communication plans and methodologies. Citizens, both public and private, must be prepared with evacuation or shelter-in-place plans for all hazards including ordnance incidents. Agencies should have critical incident plans outlining roles for school administrators, law enforcement, fire departments, and medical care providers. Agencies should coordinate their plans with each other to ensure that redundancies are addressed and to further the understanding and opportunities for cooperation by all potentially affected agencies.

A number of critical agencies are vulnerable to being affected by an ordnance truck accident and should have procedures and exercises predicated on having to move operations to the Alternate EOC.

Figure 1. Ordinance Semi-Truck Accident Safe Evacuation Radius





# POWER OUTAGE<sup>82</sup>

## SUMMARY

**The Hazard:** Extended loss of power due to man-made, natural, or a combination of circumstances.

### Impacts and Effects:

- Imperilment of life due to the inability to provide life-support services, e.g. an oxygen concentrator at home
- Imperilment of life due to the inability to produce heat or cooling during adverse weather periods
- Loss of communications
- Disruption of critical services
- Endangerment of property due to catastrophic failure of systems dependent on power
- Extreme hardship for elderly and special needs population
- Loss of refrigeration and losses from spoilage
- Loss of water resulting from inability to run electric pumps
- Potential failure of waste removal systems
- Disrupted fuel supplies
- Loss of business and revenue
- Banking systems are disabled
- Shortage of food supplies as stores close
- Communication systems disrupted as battery backups are depleted
- Higher costs for electricity
- Higher costs for petroleum products
- Alarm systems disabled, potential for criminal acts increased
- Law enforcement and emergency response teams challenged with increased traffic accidents with non-working traffic lights
- Limited patient care as emergency generators become overtaxed

**Previous Occurrences:** The last significant occurrence in Jefferson County was on December 31, 2008, when severe winds broke a Bonneville Power Feeder line cutting off power to 2/3 of the Jefferson County population. Power was restored within hours through a work-around with a neighboring county, but the line itself was not fully repaired for many days. After the Columbus Day storm in 1962, there were areas in Washington that were without power for two to three weeks.

**Probability of Future Events:** High – Severe winter storms combined with above-ground power lines in forested areas makes power outages a regular recurring event. Whether any given outage becomes an extended outage is a function of the severity of the problem, its physical location, and the environmental conditions during the event.

**Definition:**

A power outage is an interruption of normal sources of electrical power. Short-term power outages (up to a few hours) are common and have minor adverse effect, since most businesses and health facilities are prepared to deal with them. Extended power outages, however, can disrupt personal and business activities as well as medical and rescue services, leading to business losses and medical emergencies. Extended loss of power can lead to civil disorder, as in the New York City blackout of 1977. Only very rarely do power outages escalate to disaster proportions, however, they often accompany other types of disasters, such as hurricanes and floods, which hampers relief efforts.<sup>83</sup>

Although there are no statutory definitions of an extended power outage, the Washington Administrative Code (WAC) 246-293-660 sets the minimum standards for water system reliability by defining a power outage as a minimum of 30 minutes.<sup>84</sup> It indirectly sets the outage standard for power utilities as averaging less than four hours per outage, with three outages or less per year over a three year period. Not more than one outage per three year period can exceed eight hours. From this we can infer that an extended power outage is anything over eight hours long.

Other jurisdictions define an extended power outage as one which puts “the comfort and safety” of its citizens at risk. “Comfort and Safety” means an ambient temperature that minimizes residents’ susceptibility to loss of body heat and risk of hypothermia or susceptibility to respiratory ailments and colds.

**History of Power Outage in Jefferson County**

Each year there are multiple power outages within Jefferson County due to a variety of causes: Storms, animals shorting out transformers, vehicle vs. power pole accidents, etc. Most are small localized events, but some have become extended outages that create problems for residents and businesses.

The last significant occurrence in Jefferson County was on December 31, 2008, when severe winds broke a Bonneville Power Feeder line cutting off power to 2/3 of the Jefferson County population. Power was restored within hours through a work-around with a neighboring county, but the line itself was not fully repaired for many days.

In 2007, Port Ludlow was without power for three days after winter storms damaged transmission facilities.

During the summer of 1996, problems with line loading caused major regional power outages along the west coast. Storms have also caused power outages ranging from hours to 3-4 days in areas of Jefferson County. Electrical power shortages also occurred during 1973-74 and in 1977- due to drought conditions.

After the Columbus Day storm in 1962, there were areas in Washington that were without power for two to three weeks.

**Hazard Assessment and Vulnerability Assessment**

Puget Sound has a history of major power outages, typically caused by large storm events. Power outages have lasted as long as 9 – 10 days in some areas of the county. During storms accompanied by cold winter temperatures, power outages have been problematic and dangerous for special needs populations and the elderly.

Loss of a major distribution system due to damage or an act of terrorism on the grid could cause power outages for several hours to several days. Loss of refrigeration and water sources that require electrical pumps could present major health issues. Loss of electricity to power gas stations could affect the fuel supply. With power outages, retail food outlets would be closed, alarm systems could be disconnected, and eventually emergency communication systems and cell phones would be affected after the battery life of backup systems was expended. Back-up generators would be at risk for breakdown following extensive utilization.

Long-term power outages due to drought or failure at a hydroelectric generation station could present problems. The power distribution systems that currently exist are designed to help prevent major power outages for long periods of time. Washington State is connected to a regional transmission grid that has major connections with other grids out-of-region, including British Columbia, Montana, California, and other southwest states.

In general, if Washington is short of electricity due to drought and low water levels in reservoirs powering hydroelectric generating plants, electricity can be purchased elsewhere. The result is higher cost electricity, rather than inadequate supply. Utility companies build on an “N-1 capacity”. This means the utility is prepared for one of each kind of line to go down without a disruption in service. If two of the same type of lines goes down, some may lose power. In the 1996 event, Portland was forced to take everything off line to avoid melting of transmission lines from the overload of power. Even with the grid system, however, voluntary curtailment and conservation must be practiced. The Washington State Curtailment Plan for Electric Energy (WAC 194-22) describes a 5 stage plan for power curtailment with each level representing a more severe shortage that require sterner steps.

Most of the out-of-region power is thermal; it is not affected by drought. In fact, a shortage of electricity over the long term is not a major concern in Western Washington since a substantial amount of electricity is transmitted from Canada to California via Washington and Oregon, therefore providing easy access to external power supplies. Hot weather and increased use often associated with droughts can be a concern for electric utilities, however. Increased loads cause electric lines to heat up; when lines get too hot, they sag. Sagging lines into trees and other vegetation is a major concern and therefore loads must be monitored to control sagging.

Jefferson County is vulnerable to localized, short-term energy emergencies brought about by accidents, terrorism or storms. Most of these energy emergencies can be handled by the utility companies. The effects of energy shortages could include inconvenience to consumers, reduced heating and lighting capability, reduced production in all sectors, potential failure of transportation, water and waste, communication, information, and banking systems. Secondary hazards associated with these events could include traffic accidents as traffic lights are out, limited patient care at the hospital due to power capabilities of backup generators, injuries due to downed power lines, and closure of retail operations including food stores, gas stations, restaurants, and other stores. Energy emergencies can seriously hamper emergency response capabilities and should be planned for.

The most immediate impact of extended power outages is the potential for loss of life due to medical devices at home failing, or temperatures reaching hot or cold extremes because of the loss of heating/cooling capabilities resulting in vulnerable people being placed at risk. As time progresses without the restoration of power, families began to incur economic damage from the loss of food stores in their refrigerators and freezers, or from having to travel to and pay for commercial shelter such as a hotel.

Retail establishments experience loss of business due to their operations not being able to function during the outage. Those businesses with back-up power incur extraordinary costs in producing their own power until the extended outage is over.

Particularly long outages can impact water supply and create other issues as emergency power capabilities break down from extended use, thus requiring extraordinary efforts to maintain normalcy.

All of the above effects result in economic and revenue losses for county residents, and the state.

## **CONCLUSION**

Because of its location, Jefferson County is at risk for severe wind and winter storms that are capable of causing extended power outages. Not all critical facilities have back-up power, while others have diesel or gasoline back-up generators that can eventually run out of fuel. If the event causing the power outage has also damaged arterial highways, fuel resupply may not be available, thus causing secondary power outages two to three days after the initial outage as back-up generators fail.

Several fire stations have back-up generators that run off of 1000-gallon propane tanks, and can last for weeks during winter weather. Power outages caused by a wide-scale event such as an earthquake would severely hamper relief efforts and exacerbate the enormity of the event.

Puget Sound Energy, the power provider for East Jefferson County, is attempting to mitigate the potential for extended power outages by constructing additional power distribution substations, creating more of a presence in Jefferson County to work with consumers, and establishing closer relations with the Jefferson County Department of Emergency Management to improve communications during power outage events.

## **TERRORISM (CBRNE)<sup>85</sup>**

### **SUMMARY**

**The Hazard:** Terrorism comprises a political effort to oppose the status quo by inducing fear in the civilian population through the widespread and publicized use of violence, including murder, injury, and destruction.<sup>86</sup>

#### **Impacts and Effects:**

- Loss of life
- Loss of property
- Damage and potential destruction of government buildings
- Disruption of ferries, bridges, and seaports
- Destruction of historical sites
- Damage to law, fire, emergency medical services and responder facilities
- Disruption of financial institutions and banking
- Contamination of food and water supplies
- Death or illness from bioterrorism, chemical attacks, or nuclear detonation
- Overtaxed emergency response system
- Overtaxed healthcare provider system
- Long term clean up of environmental damage
- Disruption of telecommunication systems and transportation systems from cyber terrorism
- Mass influx of refugees from highly populated areas
- Instillation of fear and paranoia throughout the population

**Previous Occurrences:** Although no overt act of terrorism has been detected in Jefferson County, the Sheriff's Department has received reports of people observing operations at the Naval Magazine Indian Island. In one incident of such suspicious behavior in 2007, a citizen was able to obtain a license plate number that was subsequently traced to a stolen vehicle. The suspect was not apprehended.

**Probability of Future Events:** Medium – Even though Port Townsend and Jefferson County seem like low priority targets, the FBI has reported threats against ferry systems, and it is known that NAVMAG Indian Island has periodically been under observation by persons not wanting to be identified.

#### **DEFINITION:**

Terrorism comprises a political effort to oppose the status quo by inducing fear in the civilian population through the widespread and publicized use of violence, including murder, injury, and destruction. The FBI defines terrorism as “the unlawful use of force or violence against persons or property to intimidate or coerce a government; the civilian population; or any segment of it, in furtherance of political or social objectives”.

## **HISTORY OF TERRORISM IN JEFFERSON COUNTY**

Jefferson County residents, businesses, schools and government have received numerous threatening phone calls over the years regarding bomb threats. Although many reports of pending explosions are received, most are malicious mischief. A few mailboxes have been blown up, and a few cases of arson have occurred. Arson commissions have been for personal gain, some for revenge, and some for a “thrill”. These occurrences have not met the definition of terrorism especially when compared to events such as those that occurred in New York City and Washington DC on September 11, 2001.

Although no overt act of terrorism has been detected in Jefferson County, the Sheriff’s Department has received reports of suspicious persons observing operations at the Naval Magazine Indian Island. In one such incident in 2007, a citizen was able to obtain a license plate number that was subsequently traced to a stolen vehicle. The suspect was not apprehended.

## **HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT**

On September 11, 2001, the entire nation was initiated into the world of international terrorism. Acts resulting in tremendous violence introduced the country to groups such as Al Qaeda. The nation watched with horror from their living rooms the frantic searches and recovery operations at the World Trade Center, the Pentagon, and in an obscure field in Pennsylvania. Fear, disbelief, and immediate counter-terrorism reactions were instituted. These acts accomplished exactly what terrorism is designed to do.

Terrorists hope to instill fear and panic in civilian populations by convincing them that their governments cannot:

- Protect its own population
- Protect the symbols of its authority
- Protect society’s institutions
- Protect society’s infrastructure
- Protect its own officials
- End the threat of more terrorism, and as a result,
- Cannot maintain normal, peaceful conditions in society.

*(Excerpt from “Targets of Terrorists” by Dr. Nicholas Berry)*

Washington State is vulnerable to terrorist activity. Terrorism can be state sponsored or the outgrowth of a frustrated, extremist fringe of polarized and/or minority groups. Extremists have a different concept of morality than mainstream society, thereby making predictions on what and where they will perform other acts of violence very unpredictable. Terrorist groups include extremists in:

- Ethnic, separatists, and political refugees
- Left wing radical organizations
- Right wing racists, anti-authority survivalist groups
- Extremist issue-oriented groups such as religious, animal rights, environmental, etc.

Jefferson County has no immunity to potential terrorist activity. Terrorist groups at play today are constantly emerging. Aside from the notorious Al Qaeda groups, there are other potential “copy groups” who would not hesitate to utilize chemical and biological materials. Terrorists perform acts of violence or spread anthrax through the mail system, or release bio-toxins into the food supply want notoriety, want to spread the maximum amount of fear through the population, and want to create an event that will receive national/international attention. As home to important military installations and our close proximity to Seattle’s economic, financial, and population centers, Jefferson County’s vulnerability to the effects of terrorism is substantial.

Communities that are most vulnerable to terrorist incidents have visible and vulnerable targets. These kinds of targets that are found in Jefferson County include:

- Government office buildings, courthouses, schools, hospitals
- Dams, water supplies, power distribution systems
- Military installations
- Ferries, bridges, seaports
- Theaters, parks, concert halls
- Financial institutions and banks
- Sites of historical and symbolic significance
- Scientific research facilities, academic institutions, museums
- Industrial plants; business offices
- Law, fire, emergency medical services and responder facilities
- Special events, parades, religious services, festivals, celebrations

The term “Weapons of Mass Destruction” (WMD) describes weapons that can be classified into the following categories: Chemical, Biological, Radiological, Nuclear and Explosive. These categories are often referred to as the acronym CBRNE. Biological and chemical agents pose threats because of their accessible nature and the rapid manner in which they could be spread. Most agents can be easily introduced into the environment through aerosol generators, explosive devices, breaking containers, or other forms of covert dissemination. Dispersed as an aerosol, chemical agents have their greatest potential for inflicting mass casualties. Biological agents can be disseminated by the use of aerosols, contaminated food or water supplies, direct skin contact, or injection. The consequences of biological attacks will first be recognized in the hospital emergency rooms and by other health care resources, and will present communities with an unprecedented requirement to provide mass protective treatment, mass patient care, mass fatality management, and environmental health clean-up procedures and plans. Radiological and nuclear weapons would inflict explosions, thermal radiation, and radiation exposure injuries, sickness or death.

Cyberterrorism is a relatively new phenomenon that can be used to potentially disrupt society and exploit our continuing reliance on computers and telecommunication. Cyberterrorism threatens the electronic infrastructure supporting the social, health, and economic well being of all citizens. Interlinked computer networks regulate the flow of power, water, financial services, medical care, telecommunication networks, and transportation systems.

If one were able to accurately predict, it would be more likely that a site in Seattle or Tacoma or a nearby military installation would be the direct target rather than one located in the County. The consequences are that Jefferson County could appear (or it could be announced to the Seattle-Metro area) that this area could be a haven for people fleeing from a terrorist situation. County resources would be quickly overloaded, food supplies would quickly be depleted, lodging would be scarce, and management of people (both local and “refugees”) could be extremely difficult. County leaders have addressed such scenarios and are becoming cognizant of potential problems and the implications of such an event.

In the same vein, Jefferson County’s relative quiet lifestyle offers several areas of seclusion from which covert activities could be planned. The rise of militia groups in other parts of Washington, Oregon, Montana, and Idaho underscores this aspect of the County’s demographics. Groups could see the County as a place to organize and wait until circumstances are right in other areas of the country. Alert citizens and law enforcement alike have the responsibility to be aware of citizens’ activities and to be mindful of the realities of the world today.

**CONCLUSION**

Terrorism is a deliberate strategy. Terrorism is discriminate since it has a definite purpose, but indiscriminate in that the terrorist has neither sympathy nor hate for the randomly selected victim. Although the focus of terrorists is a political authority, their targets and victims tend to involve innocent civilians. Civilians are easier to attack and often produce more dramatic consequences.

Changes in the National Homeland Security Advisory System levels are provided as soon as they are available via an Emergency Management phone line accessible by anyone with a telephone. Jefferson County has convened its leaders to examine and more thoroughly understand existing emergency response processes, communication plans and methodologies. Citizens, both public and private, must be continually aware of suspicious activities. Agencies should have critical incident plans outlining roles for school administrators, law enforcement, fire departments, and medical care providers. Agencies should coordinate their plans with each other to ensure that redundancies are addressed and to further the understanding and opportunities for cooperation by all potentially affected agencies.



## **WATER SHORTAGE / SEWER FAILURE<sup>87</sup> (EXTENDED)**

### **SUMMARY**

**The Hazard:** Water can be in short supply or become contaminated due to either intentional actions or to unintentional consequences of improper handling, system breakdowns, or through the introduction of bacteria from various means.<sup>88</sup>

#### **Impacts and Effects:**

- Health problems ranging from mild discomfort to extremely ill and/or death
- Health care providers overwhelmed by patients
- Hospital bed shortages
- Emergency Medical Systems challenged by increased calls
- Loss of tourism resulting in loss of business revenue
- Long term emergency management crisis if water supply is contaminated
- Adverse impact on agriculture, especially dry land farms and grazing lands
- Increased danger of fires
- Serious impacts to recreation areas
- Imposition of water conservation measures
- Curtailment of industries using large quantities of water causing unemployment
- Shortages of water for firefighting
- Increased prices for local produce

**Previous Occurrences:** There have been no major historical incidents of water shortages or contamination in Jefferson County other than short term disruptions due to minor system breakages or occasional “food poisoning” episodes at restaurants or social gatherings.

**Probability of Future Events:** Moderate – Climatic changes may be impacting the frequency and duration of drought conditions on the Olympic Peninsula.

#### **Definition:**

Water can be in short supply or become contaminated due to either intentional actions or to unintentional consequences of improper handling, system breakdowns, or through the introduction of bacteria from various means. Shortages in this context are extended, but are through non-climatic events, thus droughts are not addressed here, but have their own section.

#### **History of Water Shortage/Sewer Failure in Jefferson County**

There have been no major historical incidents of extended water shortages or water contamination in Jefferson County other than occasional breaks in water lines or the occasional “food poisoning” episodes at restaurants or social gatherings. Wells and water supplies have had short-term periods of contamination following maintenance work on their systems or by accidental contamination of wells due to poor drainage systems or other similar events. In each case, the cause of contamination was referred to the proper authorities or was solved by private owners of the water wells involved.

Several local lakes have had periodic contaminations by blooms of a toxic blue-green algae. This has killed or injured small pets, and has resulted in periods in which the lakes have been quarantined. While inconvenient, these lakes are not major contributors to the economy or the drinking water supply, so the occurrences are of concern only to the degree that they threaten county residents and their animals.

Port Townsend has a single 36” diameter pipeline from the City reservoir to the city itself, twenty-eight miles away. This has occasionally been broken by landslides in vulnerable areas. These are quickly repaired, and water outages have never been more than a day. The city has a 5-million gallon reservoir that can supply the city for two to three days during a water line disruption.<sup>89</sup>

On December 14, 2009, an 80-year old 12” main broke at 11:00 a.m. The break was repaired by 7:00 p.m., but restaurants were ordered by the Public Health Department to close until the water was tested twice with satisfactory results. The test concluded at 4:00 p.m. on the next day.

### **Hazard Assessment and Vulnerability Assessment**

At this time in the history of our country, people are primarily dependent on others to provide water, although a significant number of rural households in Jefferson County have their own wells. County and city water supply systems are large and provide the majority of the county with drinking water. While this system encourages efficiency of supply, it is vulnerable to interruption and can also spread disease rapidly.

Over the past decade, the vulnerability of the Jefferson County communities’ water supplies has been increasing. Primary reasons for the increased risk include:

- Increased development in rural areas has put stress on available water sources
- Possible climatic changes that reduce the winter snow packs responsible for recharging ground water systems
- Aging water delivery infrastructure that is easily disrupted
- Parasites, bacteria, and other organisms have become more resistant to pesticides
- It can take up to a week for people to show signs of exposure. This makes it difficult to track the source because people tend to forget what and where they ingested. Additionally, more people can contract the illness during the incubation period.
- New parasites and bacteria are being identified all the time.
- Speculation based on intelligence gathered in the war on counter-terrorism suggests that contaminating the nation’s regional water supplies would create a disaster for hundreds of thousands of people

The primary effects of a contaminated food or water supply are illnesses and sometimes even death. If the contamination leads to an epidemic, it could severely tax the health care system in regards to diagnosis, treatment and prevention. A community dependent on tourism, such as Port Townsend, would be affected by loss of productivity.

The issue of the balance between development and water rights has reached the state level. The Washington Department of Ecology is preparing water usage rules for East Jefferson County’s Quilcene River-Snow Creek watershed and the Chimacum Valley in which new private wells would be limited to 500 gallons of water per day for indoor use only or be fined. This is extremely unpopular and controversial. Chimacum Valley is the primary location for commercial agriculture in East Jefferson County. Kate Dean, Washington State University Landworks

Collaborative Outreach leader at Port Hadlock Extension, was quoted as saying, “The impacts for new farmers are really huge. Obviously, nothing can be grown on 500 gallons per day.”<sup>3</sup>

During a region-wide event such as a major earthquake, Jefferson County water supplies are extremely vulnerable. For example:

- The City of Port Townsend, which has about 1/3 of the county’s population, depends on a single 36” diameter pipeline to carry its water supply that is known to cross areas that are subject to landslides. Originally built in 1926, with upgrades in 1956, it has known vulnerabilities that are being addressed within funding limitations. The estimated cost to replace the entire line is approximately \$30 million.
- Jefferson Healthcare, the only hospital in Jefferson County, has an MOU with the Jefferson County Public Utility District No. 1 (PUD) to bring a 4000 gallon tanker truck of water to support the hospital operations during a water shortage emergency. The PUD tanker is not regularly used, and there was concern voiced by PUD staff that the breaks on the tanker trailer may not be functional. Additionally, the PUD also provides water to small communities such as Quilcene, and would have an obligation to be in multiple places with one piece of equipment – assuming that the roads were in such a condition as to allow it.
- There are at least three small independent water districts in which neighborhoods in rural areas have banded together to provide water to about a dozen households each. These are isolated and do not have significant back-up power for their pumps.

## **Conclusion**

Education of the population’s water resources must be ongoing and dynamic. Safe drinking water requires two critical steps: protection and treatment. Pollution prevention needs to be integrated with safe drinking water programs. All Group “A” public water systems in Washington State (greater than 15 connections) are required to collect samples for coliform bacteria analysis per WAC 246-290.

Security procedures of water reservoirs must be examined to insure that intentionally introduced contamination is addressed. For instance, the intentional exposure to botulism can easily be done through aerosol droplets falling into the water systems. Health Department and health care providers must be increasingly aware of potential diseases that can be transmitted to the population as a form of terrorism.

Proactive maintenance and upgrade of vulnerable assets must be addressed in both the city and county, particularly in the context of a region-wide disaster event.