4.3.9 Hazardous Materials Release

The following section provides the hazard profile and vulnerability assessment for the hazardous materials hazard in Passaic County.

2020 HMP Changes

- All subsections have been updated using best available data.
- Previous events between 2014 and 2019 were researched, with a comprehensive list of previous events in Appendix E (Risk Assessment Supplement).

4.3.9.1 Profile

Hazard Description

Hazardous substances are substances that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). Many are commonly used substances which are harmless in their normal uses, but are quite dangerous if released. The Superfund law designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2020).

Superfund’s definition of a hazardous substance includes the following:

- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of CERCLA.
- Any hazardous substance designated under section 311(b)(2)(a) of the Clean Water Act (CWA), or any toxic pollutant listed under section 307(a) of the CWA. There are over 400 substances designated as either hazardous or toxic under the CWA.
- Any hazardous waste having the characteristics identified or listed under section 3001 of the Resource Conservation and Recovery Act.
- Any hazardous air pollutant listed under section 112 of the Clean Air Act, as amended. There are over 200 substances listed as hazardous air pollutants under the Clean Air Act (CAA).
- Any imminently hazardous chemical substance or mixture which the EPA Administrator has "taken action under" section 7 of the Toxic Substances Control Act (USEPA 2020).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as the environment. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

Transportation of hazardous substances on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazard substance release incidents. New Jersey is composed of approximately 39,000 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation [NJDOT] 2019). In Passaic County there are approximately 247 miles of roadway. These roads cross rivers and streams at many points; hazardous substance spills on roads have the potential to pollute watersheds that serve as domestic water supplies for parts of the State. Potential also exists for hazardous substance releases to occur along rail lines as collisions and derailments of train cars can result in large spills.
Pipelines can also transport hazardous liquids and flammable substances such as natural gas and petroleum. Incidents can occur when pipes corrode, when they are damaged during excavation, incorrectly operated, or damaged by other forces. In New Jersey, most of the large pipeline leaks have been caused by marine traffic hitting or the anchors of ships effecting pipelines in the waterways. Additionally, hazardous substances can be transported by aircraft or by watercraft. Crashes, spills of materials, and fires on these vessels can pose a hazard.

The Passaic County Health Department is the lead agency for responding to hazardous materials emergencies by virtue of certification from the Department of Environmental Protection and by County Ordinance. The Health Department works in cooperation with local provider agencies, such as the County Sheriff and local fire departments. For detailed information regarding the duties of the Passaic County HAZMAT, see Section 5 (Capability Assessment).

Location

The following provides information regarding the location of hazardous substance incidents.

Hazardous Substances Fixed Site

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These types of substances are most often released as a result of transportation accidents or a chemical spill at a facility. Many products containing hazardous materials are also used and stored in homes.

In response to concerns regarding health and environmental risks, Congress established the Superfund program in 1980 to clean up these sites. The Superfund program is administered by the USEPA in cooperation with individual states. In New Jersey and Passaic County, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP 2020). There are two superfund sites remaining in Passaic County (NJOEM 2019); in the Borough of Ringwood and Township of Wayne.

In 2009, the Site Remediation Reform Act (SRRA) established the Licensed Site Remediation Professional (LSRP) program. This program has fundamentally changed the process for how sites are remediated in New Jersey, including Passaic County. In 2019, New Jersey Governor signed legislation to further improve the effectiveness of the program. The NJ DEP and Waste Management Program (SRWMP) reported 13,531 contaminated sites, and of these sites, 10,558 were active LSRP cases. From 2009 to 2019, more than 53,000 cases were closed (NJDEP 2020). There are 16 open remediation sites in Passaic County (NJDEP 2020).

The NJDEP maintains a list of Known Contaminated Sites of New Jersey (KCSNJ). It is an inventory that includes all sites in the State where contamination is known to exist. The remediation for these sites is currently active or pending in the NJDEP’s Site Remediation Program (SRP). As of April 12, 2017, there are over 13,000 KCSNJ sites in New Jersey, with 820 of those sites in Passaic County (NJOEM 2019).

Federal regulations include the CERCLA and the Superfund Amendments and Reauthorization Act (SARA) required that a National Priorities List (NPL) of sites throughout the United States be maintained and revised at least annually (NJDEP 2013).

Fixed-site facilities that use, manufacture, or store hazardous substances in New Jersey pose risk and must comply with Title III of the federal SARA. SARA was signed into law on October 17, 1986. It is a federal law that applies nationwide. It must be realized that this law is linked to N.J.S.A. 34:5A, the New Jersey Worker and Community Right to Know Act. SARA requires the governor of each state to establish a State Emergency Response Commission (SERC). New Jersey’s SERC was established by Executive Order on February 13, 1987. SARA also requires that the emergency planning districts be established by the SERC. The Act specified that
these districts can be existing political subdivisions. The function of the emergency planning district is to facilitate preparation and implementation of emergency plans. In New Jersey, all municipalities and counties have been designated emergency planning districts (total of 588). The Local Emergency Planning Committees (LEPC) is the policy body for the emergency planning district (New Jersey Division of Fire Safety 2011).

The State enacted the Toxic Catastrophe Prevention Act (TCPA), N.J.S.A. 13:1K-19 et seq. Currently, implementation of the requirements established under this Act is facilitated by the TCPA Program. Certain industrial facilities using materials considered extraordinarily hazardous must take steps to prevent releases and protect public safety. New Jersey has also mandated that facilities storing large quantities of hazardous substances take preventative measures to reduce the likelihood of a leak or discharge. Established under the New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), these requirements include testing and inspection of storage tanks, training of employees, and emergency response planning. The Discharge Prevention Containment and Countermeasure (DPCC) program facilitates implementation of these requirements. Regulations related to reporting of chemical and petroleum discharges are also administered under this program. The Program is sometimes referred to by the acronym DPCC, which refers to an important preparedness document that major facilities develop under the program (NJDEP 2018).

The Community Right to Know (CRTK) program collects, processes, and disseminates the chemical inventory, environmental release and materials accounting data required to be reported under the New Jersey Worker and Community Right to Know Act, N.J.S.A.34:5A and the federal Emergency Planning and Community Right to Know Act of 1986 (EPCRA). EPCRA is also known as Title III of the SARA. This information is used by the public, emergency planners, and first responders to determine the chemical hazards in the community (NJDEP 2014).

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. This report lists 29 facilities in Passaic County (U.S. EPA 2017).

The Right-to-Know Network

The Right-to-Know Network provides access to databases and resources on the environment. The databases include: Toxic Release Inventory (TRI), National Response Center Spills and Accidents (ERNS), Risk Management Plans (RMP), Hazardous Waste Biennial Reporting System (BRS), and Resource Conservation and Recovery Act Information System - violations and permits (RCRIS).

- Toxic Release Inventory (TRI) Database - TRI is a database of information about releases and transfers of toxic chemicals from facilities in certain industrial sectors, including manufacturing, waste handling, mining, and electricity generation. Facilities must also report the total amount of toxic chemicals in waste that they produce.
- National Response Center (NRC) Spills and Accidents database - the Spills and Accidents database contains data on toxic chemical spills and other accidents reported to the NRC. This database used to be called ERNS, the Emergency Response Notification System, and is still referred to as ERNS in many situations. Incidents reported to NRC range from minor to serious, from an oil-sheen on water to a release of thousands of gallons. NRC reports are extensive, but also known to be incomplete, as many incidents are never reported, and those that are reported generally are not subject to verification.
- Risk Management Plan (RMP) database - Federal law requires industrial facilities that use large amounts of extremely hazardous substances to file a RMP with the U.S. Environmental Protection Agency (EPA). These RMP data are intended to save lives, protect property, and prevent pollution. In particular, some industrial facilities are switching to safer and more secure chemicals that reduce the danger to employees...
Section 4.3.9: Risk Assessment – Hazardous Materials Release

and surrounding communities. EPA does not release to the public some of the most important data in the RMP database; these data can only be obtained by going to a federal reading room.

- Biennial Reporting System (BRS) database – the BRS database contains data on the generation, shipment, and receipt of hazardous waste. BRS contains information from the Hazardous Waste Reports that must be filed every two years under the Resource Conservation and Recovery Act (RCRA), the Federal statute that regulates the generation, treatment, storage, disposal, or recycling of solid and hazardous waste.

- Resource Conservation and Recovery Act Information System (RCRIS) database – this database contains data on hazardous waste handler permits and activities. The RCRIS database, unlike many EPA databases, does not have “reporting years”. It is a continuously updated set of data that includes records from the early years of RCRA through the present.

Hazardous Substances In-Transit

Incidents involving hazardous substances in transit can occur anywhere in the State. Figure 4.3.9-1 shows the major transportation routes and features in the County. Major highways include I-287, I-80 and the Garden State Parkway.

Hazardous substance incidents may also occur along railways in Passaic County. The NJDOT has a vital interest in preserving and improving the rail freight part of its transportation network. Rail shipments allow cost-effective movement of goods with less stress on the State’s highway system. Major commodities shipped by rail entail petrochemicals (including plastic pellets), construction materials, food products, raw materials, and finished goods for manufacturers. Of concern for this hazard are rail cars carrying hazardous substances. An accident or release could pose a public safety hazard to the community.

Hazardous substances can also be transported via pipeline across the State. New Jersey has an extensive network of natural gas and petroleum pipelines. Several of the petroleum pipelines originate in the Gulf Coast region (Colonial Pipeline and Buckeye Pipeline). Figure 4.3.9-2 shows the extent and locations of pipelines throughout the northeastern United States.
Figure 4.3.9-1. Major Transportation Features in Passaic County
Figure 4.3.9-2. Interstate Natural Gas Pipelines in the Northeast

Source: NJDOT, n.d.
Note: The approximate location of Passaic County is indicated by the red circle.
Extent

The extent of a hazardous substance release will depend on whether it is from a fixed or mobile source, the size of impact, the toxicity and properties of the substance, duration of the release, and the environmental conditions (for example, wind and precipitation, terrain, etc.). The severity of a hazardous material release relates to its impact on human safety and welfare and on the threat to the environment. The types of threats to human safety and welfare include: poisoning of water or food sources and/or supply; presence of toxic fumes or explosive conditions; damage to personal property; need for the evacuation of people; and interference with public or commercial transportation. The threats to the environment include: injury or loss of animals or plants or habitats that are economic or ecological importance such as commercial, recreation or subsistence fisheries or livestock, seal haul outs, and marine bird rookeries; impact to recreational areas such as public beaches; and impact to ecological reserves, forests, and archaeological and cultural sites (Passaic County HMP 2010).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous substances can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

With a hazardous substance release, whether accidental or intentional, several potentially exacerbating or mitigating circumstances will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place measures protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alters dispersion of hazardous substances on-compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase the damage to the facility itself and to surrounding buildings

As discussed earlier, the severity of the incident is dependent not only on the circumstances described above, but also with the type of substance released and the distance and related response time for emergency response teams. The areas proximate to the releases are generally at greatest risk; however, depending on the agent, a release can travel great distances or remain present in the environment for a long period of time (i.e. centuries to millennia).

Previous Occurrences and Losses

Between 1954 and 2019, the State of New Jersey was not included in any FEMA declared disasters (DR) or emergencies (EM) related to hazardous substances incidents (FEMA 2020).

The U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) provides an incident report database for information on incidents throughout the U.S. According to this database, between 2013 and 2016, there have been 15 incidents in Passaic County (all highway) (NJOEM 2019). The U.S. EPA maintains records of the amount of chemicals released at facilities each year. Between 2014 and 2018, Passaic County had a total of 123,714.8 pounds of chemicals released on-site and a total of 155,659.22 pounds of chemicals released off-site (EPA 2020).
Probability of Future Occurrences

Predicting future hazardous substance incidents in Passaic County is difficult. They can occur at anytime and anywhere in the County. Incidents can be sudden without any warning or slowly develop. Small spills, both fixed site and in-transit, occur throughout the year and the probability for these events are high.

In Section 4.4, the identified hazards of concern for Passaic County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering and Planning Committees, the probability of occurrence for the release of hazardous substances in the County is considered ‘frequent’. It is estimated that the County will continue to experience direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, water quality and supply concerns, and transportation delays, accidents and inconveniences.

Climate Change Impacts

Hazardous substance incidents are non-natural incidents; therefore, there are no implications for impacts from climate change. Secondary impacts, such as excessive heat on containers may occur, but also can occur during normal fluctuations in temperature.

4.3.9.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable to the identified hazard. The following section discusses Passaic County’s vulnerability, in a qualitative nature, to hazardous substance events.

Impact on Life, Health and Safety

Depending on the type and quantity of chemicals released and the weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When hazardous substances are released in the air, water or on land they may contaminate the environment and pose greater danger to human health. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

Due to the varied location of different hazardous substances and wastes sites in Passaic County, the entire County is considered vulnerable to this hazard. Those particularly vulnerable include populations located along major transportation routes because of the quantities of chemicals transported on these major thoroughfares. Potential losses from hazardous substances incidences include human health and life and property resources. These types of incidents can lead to injury, illnesses, and/or death from both the involved persons and those living in the impacted areas.

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. The 2017 report lists 29 facilities in Passaic County, with a majority located in Clifton (EPA 2017).

Superfund is a program administered by the U.S. EPA to locate, investigate, and cleanup the worst hazardous waste sites throughout the U.S. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicated that Passaic County has 2 Superfund sites (NJOEM 2019). One of the sites is in the Borough of Ringwood and the other site is located in Wayne Township.
Impact on General Building Stock

Potential losses to the general building stock caused by a hazardous substance releases, whether in transit or at fixed sites, is difficult to quantify. The degree of damages depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. The closure of waterways, railroads, airports and highways as a result of a hazardous substance incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and level of service disruptions.

Impact on Critical Facilities

Potential losses to critical facilities caused by a hazardous substance incident is difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. Refer to Section 3 (County Profile) which summarizes the number and type of critical facilities in Passaic County.

Impact on Economy

If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Passaic County may be impacted as well. A significant incident in an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. The exact impact on the economy is difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substance incidents have the potential to lead to major transportation route closures in Passaic County. The closure of waterways, railroads, airports, and highways as a result of these incidents has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the level of services disruptions.

Impact on Environment

Hazardous wastes that are released into the environment can be harmful to species and their habitat (EPA 2020). Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the localized habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like the EPA to ensure that the environment and community is protected from these types of events.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development and Change in Population
Passaic County has been and is projected to continue to grow in population. In addition, as discussed in Sections 3 and 9, areas are targeted for future growth and development. As areas near major transportation routes continue to be developed, this may increase the population exposed to in-transit hazardous material releases.

Climate Change

As temperatures change, excessive heat on containers that contain hazardous materials may alter the material properties. In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the project changes in increased precipitation events; magnitude and frequency

Change of Vulnerability

Overall, the County’s vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to hazardous substance incidents.