5.19 HAZARDOUS SUBSTANCES

SECTION 5.19 HAZARDOUS SUBSTANCES

5.19.1 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 2013).

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 2013).

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 over 39,065 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation, 2015). These roads cross rivers and streams at many points; hazardous substance spills on roads have the 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.

In addition, hazardous substances can be transported by aircraft or by watercraft. Crashes, spills of materials, and fires on these vessels can pose a hazard.

5.19.2 LOCATION

Hazardous Substances Fixed Site

Many years ago, numerous wastes were dumped on the ground, in rivers, or left out in the open. As a result, thousands of uncontrolled or abandoned contaminated sites were created. These sites included abandoned warehouses, manufacturing facilities, processing plants, and landfills. 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, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP, 2013).

Federal regulations, include the Comprehensive Environmental Response, Compensation and Liability Act (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, 2012).

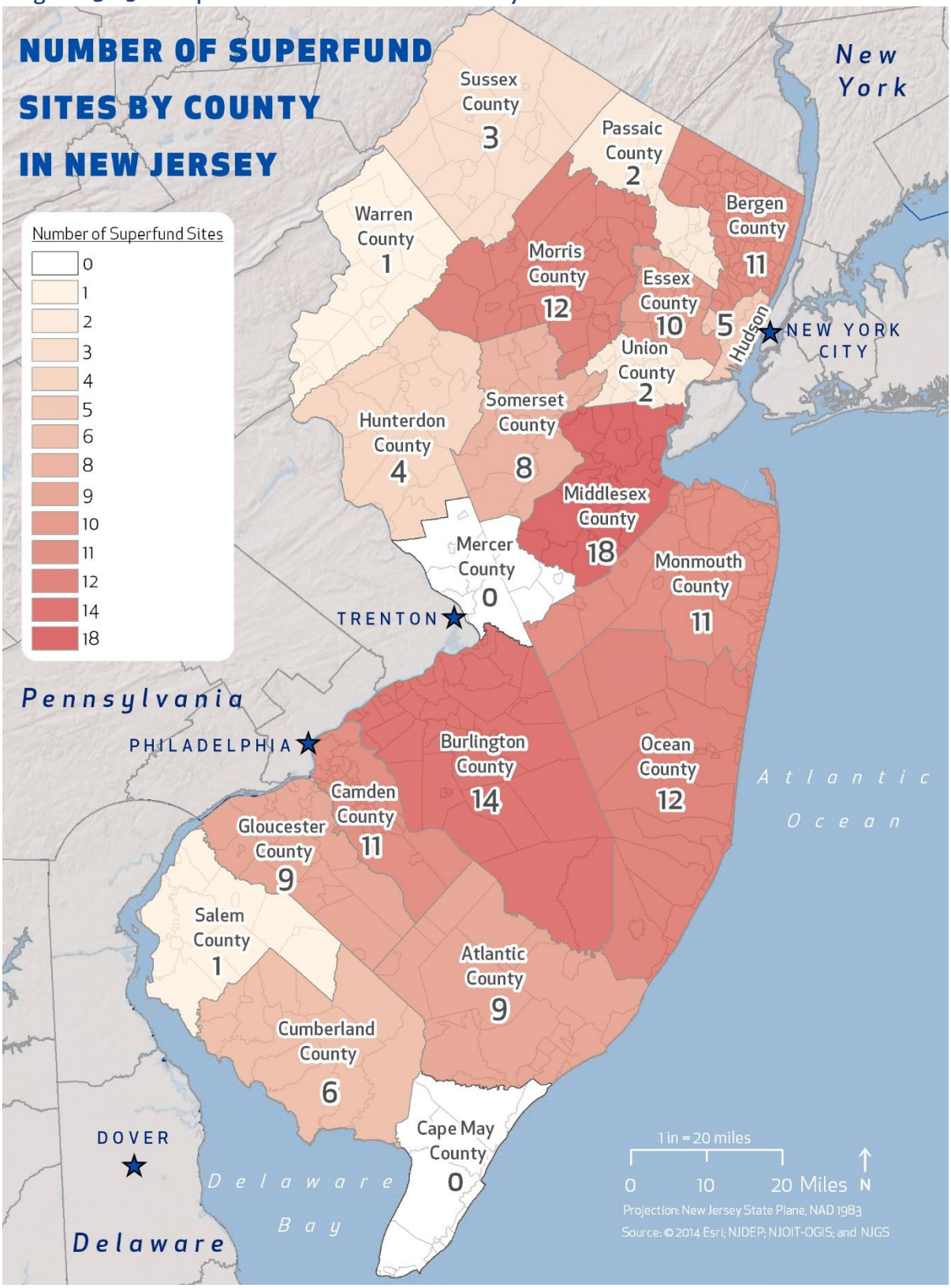
The Community Right to Know (CRTK) program collects, processes, and disseminates the chemical inventory, environmental release and materials accounting data required to be reported under the New Jersey Worker and Community Right to Know Act, N.J.S.A.34:5A and the federal Emergency Planning and Community 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, 2012). Figure 5.19-1 shows the total number of Superfund sites in each county of New Jersey.

New Jersey employers, whose businesses are assigned covered North American Industry Classification System (NAICS) codes listed in the New Jersey Worker and Community Right to Know (CRTK) regulations, are required to submit CRTK surveys listing the environmental hazardous substances (EHSs) present at their facilities in quantities that exceed 500 pounds, unless the EHS is on the federal Emergency Planning and Community Right to Know Act (EPCRA) Section 302 list of extremely hazardous substances with a lower reporting threshold. In addition, Section 312 of EPCRA requires owners and operators of federal facilities and private sector facilities that are subject to the United States Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard to report their inventories of any chemical that requires a Materials Safety Data Sheet (MSDS) and is present on site in quantities that exceed 10,000 pounds, unless the chemical is an Extremely Hazardous Substance with a lower reporting threshold (NJDEP, 2011).

Owners and operators of manufacturing, and select non-manufacturing companies, having the equivalent of 10 or more full-time employees, and manufacturing, importing, processing or otherwise using toxic chemicals listed on the EPCRA Section 313 (TRI) list in quantities that exceed specified thresholds, are required to annually report their releases of these chemicals for the previous year. In New Jersey 342 companies are required to file federal Toxic Chemical Release Inventory (TRI) forms (EPA TRI Explorer, 2016). TRI Form R requires the listing of environmental releases, on-site waste management and off-site transfers while the simplified Form A Certification Statement requires the listing of the chemical only. These companies are also required to submit to NJDEP the Release and Pollution Prevention Report (RPPR) listing the quantities of environmental release, on-site waste management, waste transfer, and chemical throughput information. Most of these facilities are also subject to Pollution Prevention Planning Requirements and, therefore, required to report pollution prevention progress information on the RPPR (NJDEP, 2011).

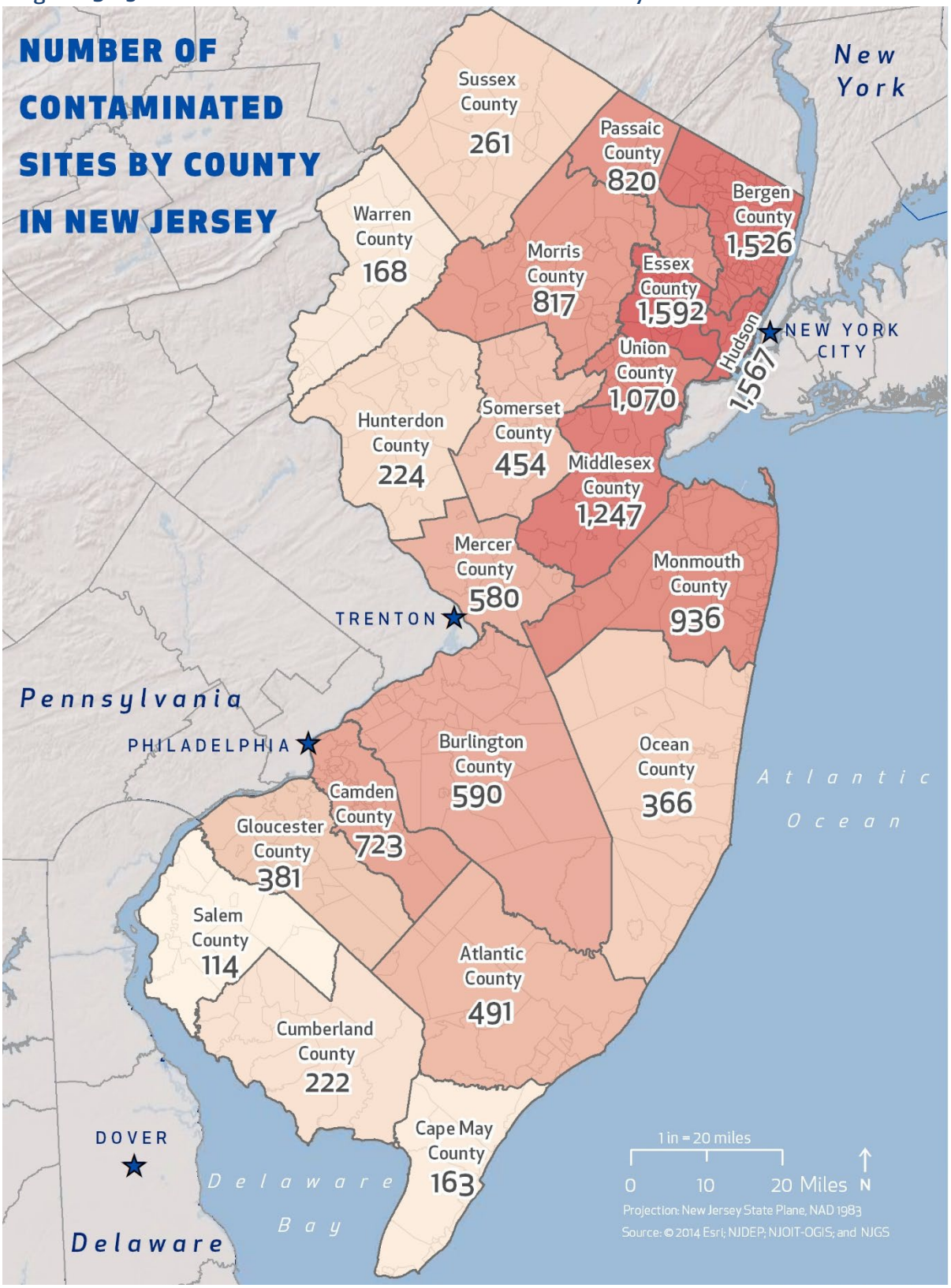
The NJDEP maintains a list of Known Contaminated Sites of New Jersey (KCSNJ). It is an inventory that includes all sites in the State where contamination is known to exist. The remediation for these sites is currently active or pending in the NJDEP's Site Remediation Program (SRP). Currently, there are over 14,000 KCSNJ sites in New Jersey. Figure 5.19-2 shows the total number of KCSNJ for each county.

Figure 5.19-1 Superfund Sites in New Jersey



Source: USEPA, 2017

Figure 5.19-2 Known Contaminated Sites of New Jersey



Source: NJOGIS, 2017

Hazardous Substances In-Transit

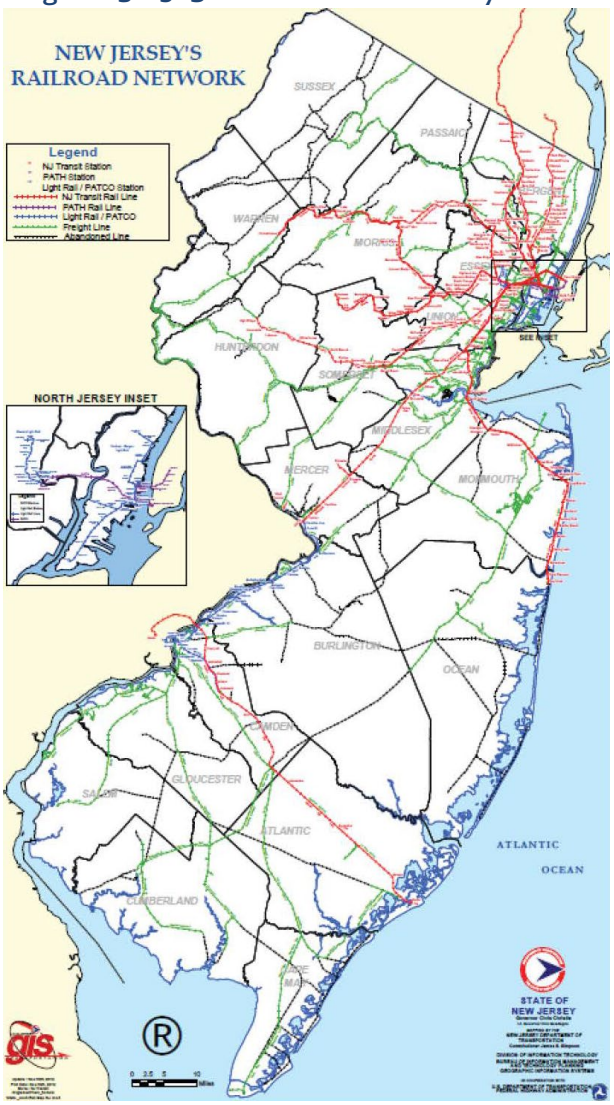
Incidents involving hazardous substances in transit can occur anywhere in the State. New Jersey has several major transportation corridors on which thousands of vehicles transporting hazardous substances travel daily. Major transportation routes include the Garden State Parkway; Atlantic City Expressway; Palisades Interstate Parkway; New Jersey Turnpike; Interstates I-280, I-95, I-295, I-195, I-80, I-78, and I-287; and Routes 1, 33, and 66. Table 5.19-1 outlines the number of miles of roadway per county in the State. To see the major roadways in the state, refer to Figure 4-3 Major Transportation Routes in New Jersey in Section 4 State Profile.

Table 5.19-1 Miles of Public Roads in New Jersey as of 2016

County	Jurisdiction						Total
	NJDOT	Authority	County	Municipal	Park	Federal Agency	
Atlantic	145	57	371	1,395	9	8	1,985
Bergen	106	40	440	2,412	0	0	2,998
Burlington	156	38	501	1,930	219	61	2,905
Camden	102	28	389	1,535	7	0	2,061
Cape May	74	31	201	731	26	0	1,063
Cumberland	89	0	540	679	0	0	1,308
Essex	61	19	213	1,375	10	0	1,678
Gloucester	154	20	400	1,143	0	0	1,717
Hudson	35	21	53	515	2	0	626
Hunterdon	115	1	237	1,078	15	0	1,446
Mercer	119	14	173	1,213	10	1	1,530
Middlesex	139	40	295	2,094	9	1	2,578
Monmouth	205	27	365	2,770	26	131	3,524
Morris	162	0	296	2,107	19	10	2,594
Ocean	141	39	608	2,174	110	37	3,109
Passaic	55	5	235	1,029	10	0	1,334
Salem	86	9	353	430	5	1	884
Somerset	106	0	230	1,398	0	0	1,734
Sussex	111	0	314	907	87	13	1,432
Union	68	20	176	1,160	6	0	1,430
Warren	103	5	256	697	31	44	1,136
Total	2,331	413	6,647	28,772	599	308	39,070

Source: NJDOT, 2016

Figure 5.19-3 Rails in New Jersey

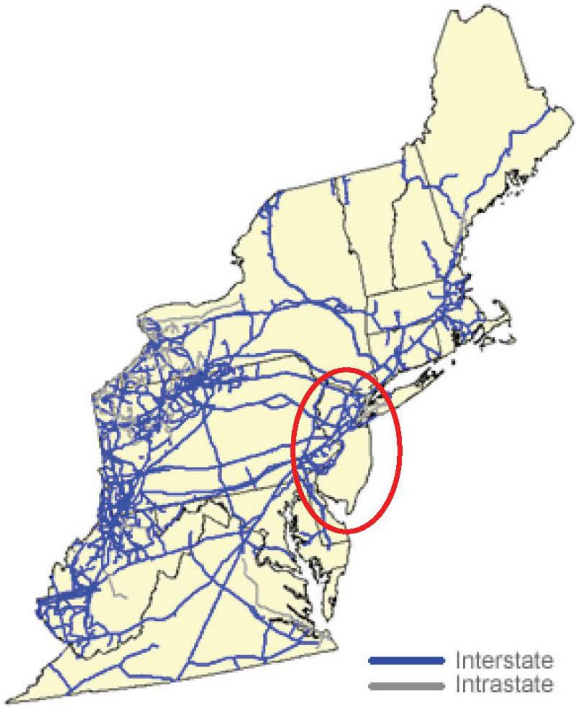


Source: NJDOT 2013

Hazardous substances incidents may also occur along railways across the State. NJDOT has a vital interest in preserving and improving the rail freight part of its transportation network. The State has approximately 1,000 miles of rail freight lines and is served by short-line regional and national railroads.

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. One concern for this hazard are rail cars carrying hazardous substances, such as Bakken Crude which recently is being exported out of NJ terminals by Buckeye Partners. Bakken Crude is one of the most volatile oils and was responsible for killing 42 people in 2013 when the train derailed and exploded in the downtown city of Lac-Mégantic, Quebec, Canada. Therefore, an accident or release could pose a public safety hazard to the community. Figure 5.19-3 shows railways that run throughout New Jersey.

Figure 5.19-4 Interstate Natural Gas Pipelines in the Northeast



Source: US Energy Information Administration 2008

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 5.19-4 shows the extent and locations of pipelines throughout the northeastern United States, with New Jersey highlighted.

Hazardous Substances Offshore

Offshore hazardous substance incidents have the potential to affect New Jersey because of its vast coastline consisting of rivers, bays, and oceans. New Jersey is a vital link in marine transportation in the Northeast. The State has 14 ports, including the Port of New York and New Jersey, which are a critical link for shipping worldwide. The potential for a hazardous substances incident offshore is possible given the volume of shipping traffic around the State.

New Jersey features the Port of New York and New Jersey system, which includes the New Jersey Ports of Port Newark, Elizabeth-Port Authority Marine Terminal, and Port Jersey. More information on the port can be found in Section 4 State Profile. The Port ships a variety of goods, many of which are hazardous.

The cities of Linden and Elizabeth, located on New Jersey's highly industrialized northeast coast, are home to Conoco Phillips' Bayway Refinery (formerly owned by Exxon). The northernmost refinery on the east coast of the United States, Bayway processes 238,000 barrels (10 million gallons) of crude oil per day. The crude oil is brought in by tanker ships from the North Sea, Canada, and West Africa. Once processed, 145,000 barrels of gasoline and 110,000 barrels of distillates per day are transported to east coast customers via

pipeline transport, barges, railcars, and tank trucks. In addition, a petrochemical plant produces lubricants and additives and a polypropylene plant produces over 775 million pounds per year of polypropylene (American Littoral Society, 2013).

Figure 5.19-5 Port of New York and New Jersey

Source: Port Authority of New York and New Jersey, 2013

The Delaware River shoreline is home to six major petroleum refineries that process nearly one million barrels of crude oil per day, as well as other chemicals associated with the refining process, producing 70% of the Northeast's oil and gasoline. Collectively, the Ports of Philadelphia; South Jersey; and Wilmington, Delaware; combined are the largest general cargo port complex in the nation.

In addition to the Port of New York and New Jersey, there are numerous other ports throughout the State. The status of and extent of commercial or private shipping varies greatly across the State. Table 5.19-2 lists the ports of New Jersey.

Table 5.19-2 Ports in New Jersey

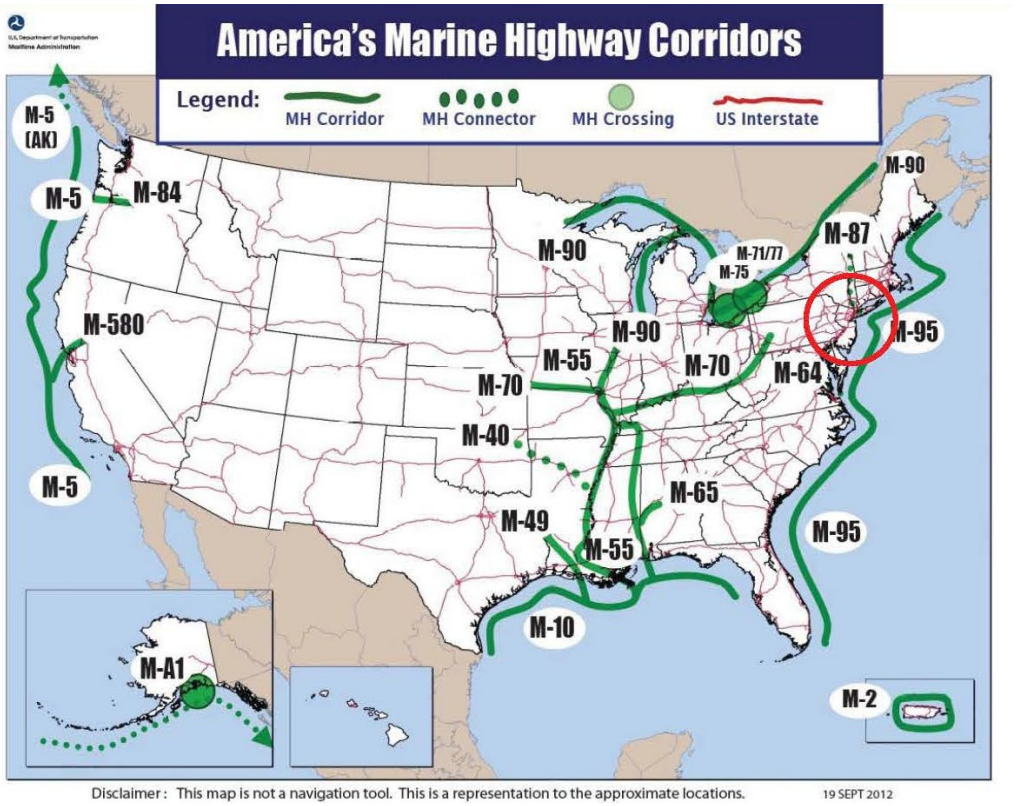
County	Port Name	Owner
Bergen	Port of Hackensack	City of Hackensack
Camden	Port of Camden Port of Pennsauken*	South Jersey Port Corporation Delaware River Port Authority
Cape May	Cape May Harbor Cape May Terminal	City of Cape May Delaware River and Bay Authority
Cumberland	Port Norris Harbor	
Essex	Port Newark*	Port Authority of New York and New Jersey
	Gloucester Marine Terminal	Holt Logistics
Gloucester	Port of Paulsboro	Borough of Paulsboro
Hudson	Port Jersey	Port Authority of New York and New Jersey
Mercer	Port of Trenton	
Middlesex	Port of Perth Amboy	
Salem	Deepwater Point	
Union	Elizabeth-Port Authority Marine Terminal	Port Authority of New York and New Jersey

Source: World Port Source, 2013

* Indicates that container liner service is available.

Aside from ports, New Jersey features several maritime-based transportation routes that also have the potential to cause a hazardous substances incident at sea. America's Marine Highways consist of over 29,000 nautical miles of navigable waterways including rivers, bays, channels, the Great Lakes, and Saint Lawrence Seaway System and coastal routes. The Marine Highway system is a robust and efficient means of moving freight in terms of cost per ton-mile—and yet, it is the most underutilized of our transportation modes. These all-water routes consist of 11 corridors, four connectors, and three crossings that serve as extensions of the surface transportation system.

Figure 5.19-6 America's Marine Highway Corridors



Source: United States Department of Transportation (USDOT)

Port authorities that participate in the project can apply for grants and incentives to build capacity at Ports. The Port of New York and New Jersey would become a key player in this system. Two major routes, the M-95 and M-87 routes would have a direct effect on New Jersey. Figure 5.19-6 illustrates the proposed maritime highway corridors, with New Jersey circled.

5.19.3 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.).

5.19.4 PREVIOUS OCCURRENCES AND LOSSES

This section presents the previous occurrences of hazardous substances incidents in New Jersey. The section is divided by the different forms of hazardous substance release (fixed site, in-transit, and offshore). If applicable, each section begins with a discussion of significant incidents followed by a table outlining other

notable incidences that occurred and affected New Jersey. The previous occurrence section is based on best known and available data, as well as from anecdotal information from the planning team.

Hazardous Substances Fixed Site

The following section outlines past occurrences of hazardous substances incidents occurring at fixed sites. It begins with a discussion of significant past occurrences as well as the total number of pounds of chemicals released from facilities maintained by the EPA.

Motiva Oil Spill – 2012

A tank of diesel fuel failed due to being hit by the storm surge from Superstorm Sandy at a storage facility owned by Motiva Enterprises LLC in Woodbridge Township. Approximately 349,000 gallons of diesel fuel spilled mostly into the Arthur Kill (a narrow waterway that separates New Jersey and Staten Island) and Smith's Creek.

Hazardous substances incidents occurring onsite occur frequently across the State, and are typically small, localized events. EPA maintains records of the amount of chemicals released at facilities each year. Table 5.19-3 presents the total number of pounds of chemicals released from facilities per county between 2012 and 2016.

Table 5.19-3 Pounds of Chemicals Released On-Site 2012-2016

County	2012	2013	2014	2015	2016	2012 to 2016 Total	Annual Average
Atlantic	13,155	2,345	2,552	2,128	1,898	22,079	4,416
Bergen	0,549	79,514	78,493	39,941	46,493	324,990	64,998
Burlington	73,399	194,631	225,804	177,844	183,936	955,613	191,123
Camden	8,431	8,937	5,084	5,766	8,594	36,812	7,362
Cape May	12,339	49,055	24,127	9,637	8,035	203,194	40,639
Cumberland	75,203	102,600	77,430	51,883	51,869	358,986	71,797
Essex	57,546	52,454	84,576	46,378	37,480	278,435	55,687
Gloucester	1,326,539	1,080,838	1,126,695	1,175,193	1,465,310	6,174,575	1,234,915
Hudson	76,353	100,410	160,106	15,278	53,542	505,689	101,138
Hunterdon	280	645	971	920	548	3,364	673
Mercer	12,969	19,539	32,414	9,328	9,233	83,482	16,696
Middlesex	96,836	216,349	193,325	96,309	204,016	1,106,836	221,367
Monmouth	4,002	7,310	9,136	5,055	3,889	29,392	5,878
Morris	46,714	46,679	48,146	54,463	44,368	240,370	48,074
Ocean	15,304	20,525	20,720	2,112	22,611	101,271	20,254
Passaic	21,735	22,773	22,960	6,688	23,417	117,572	23,514
Salem	3,080,210	2,519,392	1,972,360	674,769	603,144	1,849,874	1,769,975
Somerset	26,144	28,987	35,803	34,840	33,374	159,147	31,829
Sussex	15,695	14,676	12,524	11,374	10,578	64,847	12,969
Union	2,712,091	2,725,554	3,171,388	4,070,759	3,058,496	5,738,288	3,147,658
Warren	427,795	382,616	427,926	458,384	216,051	1,912,772	382,554
Total	8,583,289	7,675,830	7,732,540	7,189,050	6,086,880	7,267,590	7,453,518

Source: EPA TRI Explorer, 2017

Hazardous Substances In-Transit

The following section outlines past occurrences of hazardous substances incidents occurring in transit. It begins with a discussion of significant past occurrences as well as hazardous substances releases reported to the EPA.

Arthur Kill Pipeline Leak – 1990

In 1990, a leaking pipeline resulted in a release of 0.5 million gallons of oil into the environment. The leak occurred at an Exxon facility and had a devastating impact on the environment. This incident affected hundreds of birds in the Kill waters and hundreds of marine organisms in the mud and wetlands of the Arthur Kill tributaries, and had indirect impacts on organisms across the region. The incident prompted improvements in leak detection, enforcement, and existing laws (Kane, 1990).

Paulsboro Train Derailment – 2012

On November 30, 2012, a train carrying hazardous substances plunged into the Mantua Creek in Paulsboro Gloucester County. Three cars fell into the creek. One of the tank cars released approximately 23,000 gallons of vinyl chloride into the air as vapor. The incident occurred approximately 1.5 miles from its confluence with the Delaware River, and very close to the Philadelphia International Airport (EPA, 2012).

Figure 5.19-7 Paulsboro Train Derailment

Source: National Transportation Safety Board (NTSB) 2013

Vinyl chloride, a colorless gas industrial chemical with a sweet odor, is known to be highly toxic, flammable, and carcinogenic. It is primarily used in the production of polyvinyl chloride (PVC) plastic. Short-term exposure to high levels of vinyl chloride in the air can cause dizziness, drowsiness, and headaches. Exposure to very high levels can result in death (EPA, 2012).

The incident forced approximately 200 homes in the area to be evacuated until the release was contained (Forand 2013). Figure 5.19-7 shows the rail cars involved in this incident.

In addition to these large incidents, hazardous substances releases occur regularly in smaller quantities. Table 5.19-4 outlines the annual amount of pounds of chemicals released per county reported to EPA from 2012 to 2016.

Table 5.19-4 Pounds of Chemicals Released Off-site 2007-2016

County	2012	2013	2014	2015	2016	2012 to 2016 Total	Annual Average
Atlantic	140,000	40,000	43,000	16,389	12,603	351,992	70,398
Bergen	70,984	8,067	55,912	86,632	50,511	332,107	66,421
Burlington	3,801	2,827	4,455	30,013	131,353	172,449	4,490
Camden	39,047	49,112	37,693	25,201	18,886	169,938	33,988
Cape May	941	834	1,126	519	335	3,755	751
Cumberland	11,688	122,884	122,886	19	2,760	260,238	52,048
Essex	259,003	229,698	166,229	126,214	236,392	1,017,535	203,507
Gloucester	102,466	207,810	239,580	138,420	120,079	808,354	161,671
Hudson	2,729,003	1,177,863	577,484	65,708,938	1,624,432	71,817,720	14,363,544
Hunterdon	74,052	124,525	214,851	342,911	350,832	1,107,170	221,434
Mercer	98	91	82	274	55	600	120
Middlesex	495,640	704,565	1,019,836	1,525,342	1,338,840	5,084,222	1,016,844
Monmouth	5	9	241	0	20,324	20,579	4,116
Morris	6,316	3,637	3,220	2,806	2,378	18,356	3,671
Ocean	24,673	29,079	34,573	38,460	50,712	177,497	35,499
Passaic	4,489	7,539	5,211	4,927	4,599	26,766	5,353
Salem	68,842	26,971	32,841	67,924	82,367	278,946	55,789
Somerset	9,245	13,690	33,741	69	14,212	70,957	14,191
Sussex	NA	NA	NA	NA	NA	NA	NA
Union	183,664	228,415	336,739	165,957	175,787	1,090,561	218,112
Warren	263,809	275,454	278,981	294,653	281,126	1,394,022	278,804
Total	4,487,767	3,413,069	3,208,680	68,575,666	4,518,581	84,203,764	16,840,753

Source: EPA TRI Explorer, 2017

In addition to the EPA reporting, the USDOT maintains data on accidents involving hazardous substances. Table 5.19-5 outlines air, highway, and rail incidents involving hazardous substances in the past 4 years.

Table 5.19-5 Accidents Involving Hazardous Substances 2013 – 2016

County	Type	2013	2014	2015	2016	Total	Grand Total
Atlantic	Air	1	-	1	1	3	9
	Highway	1	3	2	-	6	
	Rail	-	-	-	-	-	
Bergen	Air	2	-	1	-	3	100
	Highway	34	19	27	17	97	
	Rail	-	-	-	-	-	
Burlington	Air	-	-	-	-	-	142
	Highway	50	39	30	22	141	
	Rail	1	-	-	-	1	
Camden	Air	-	1	-	1	2	100
	Highway	33	15	17	24	89	
	Rail	2	5	1	1	9	
Cumberland	Air	-	1	-	1	2	100
	Highway	33	15	17	24	89	
	Rail	2	5	1	1	9	
Cape May	Air	-	-	-	-	-	0
	Highway	-	-	-	-	-	
	Rail	-	-	-	-	-	
Essex	Air	30	17	23	21	91	262
	Highway	34	49	49	37	169	
	Rail	-	1	1	-	2	
Gloucester	Air	-	-	-	-	-	7
	Highway	1	3	1	2	7	
	Rail	-	-	-	-	-	
Hudson	Air	-	1	2	1	4	191
	Highway						

County	Type	2013	2014	2015	2016	Total	Grand Total
		36	38	47	55	176	
	Rail	2	1	5	3	11	
Hunterdon	Air	-	-	-	-	-	1
	Highway	-	-	-	1	1	
	Rail	-	-	-	-	-	
Mercer	Air	1	1	-	-	2	19
	Highway	-	6	6	5	17	
	Rail	-	-	-	-	-	
Middlesex	Air	1	1	-	-	2	19
	Highway	-	6	6	5	17	
	Rail	-	-	-	-	-	
Monmouth	Air	1	1	-	1	3	8
	Highway	-	-	-	5	5	
	Rail	-	-	-	-	-	
Morris	Air	1	-	-	-	1	99
	Highway	25	17	30	26	98	
	Rail	-	-	-	-	-	
Ocean	Air	-	-	-	-	-	7
	Highway	-	-	5	2	7	
	Rail	-	-	-	-	-	
Passaic	Air	-	-	-	-	-	15
	Highway	5	3	4	3	15	
	Rail	-	-	-	-	-	
Salem	Air	-	-	-	-	-	1
	Highway	-	-	1	-	1	
	Rail	-	-	-	-	-	
Somerset	Air	6	1	-	5	12	42

County	Type	2013	2014	2015	2016	Total	Grand Total
	Highway	4	6	4	8	22	
	Rail	4	-	4	-	8	
Sussex	Air	-	-	-	-	-	1
	Highway	-	-	-	-	-	
	Rail	-	-	1	-	1	
Union	Air	1	1	2	2	6	37
	Highway	10	7	5	7	29	
	Rail	-	2	-	-	2	
Warren	Air	-	-	-	-	-	1
	Highway	-	-	-	1	1	
	Rail	-	-	-	-	-	

Source: USDOT 2018

Hazardous Substances Offshore

Several petroleum-based incidents have occurred in and around New Jersey's coastline. Although there is no offshore drilling off the coast of New Jersey, the State's system of ports is vulnerable to hazardous substances incidents because of the cargo shipped throughout the region. The following section discusses past occurrences of hazardous substances incidents in New Jersey.

Motor Tanker (M/T) ATHOS I Oil Spill – 2004

On November 26, 2004, the M/T ATHOS I (Athos) struck a large, submerged anchor while preparing to dock at a refinery in Paulsboro, New Jersey. The anchor punctured the vessel's bottom, resulting in the discharge of nearly 265,000 gallons of crude oil into the Delaware River and nearby tributaries (NOAA, 2006).

The Athos departed Venezuela for the Citgo Asphalt Refinery in Paulsboro, New Jersey on November 20, 2004, carrying approximately 13 million gallons of crude oil. At approximately 9:30 pm on 26 November 2004, tug operators assisting the *Athos* with docking at the refinery notified the United States Coast Guard (USCG) that the tanker was leaking oil. The vessel had struck several submerged objects while maneuvering through Anchorage #9 to its berth. Within minutes, the ship lost power and listed approximately eight degrees to the vessel's port side (NOAA, 2006).

Figure 5.19-8 M/T ATHOS Oil Spill Incident

Source: NOAA 2006

Surveys of the river bottom following the incident found several submerged objects in the area, including an 18,000-pound anchor, large concrete block, and pump casing. The USCG's investigation of the incident determined that the anchor punctured the vessel's number seven center cargo and port ballast tanks (USCG, 2006). The bulkhead between the cargo and ballast tanks was also damaged, allowing product to migrate into the ballast tank and then into the river (USCG, 2005).

Hazardous Substances Incidents in New Jersey

The following table outlines the history of hazardous substances incidents in New Jersey.

Table 5.19-6 Major Hazardous Substances Incidents in New Jersey

Date(s) of Event	Event Type	Counties Impacted	Description
1/1/1990	Hazmat - offshore	Hudson and Union	An Exxon underwater pipeline ruptured and released 567,000 gallons of No. 2 fuel oil into the Arthur Kill. The leak occurred from a 5-foot gash in the 12-inch pipeline that connects the Bayway Refinery at Linden, New Jersey, to the Bayonne Plant in Bayonne, New Jersey. The spill occurred near the New Jersey coast, but tides and winds moved the oil to the three islands in the Kill and the Staten Island coastline.
3/1/1990	Hazmat - offshore	Hudson	Approximately 240,000 gallons of oil spilled from a barge into the Kill van Kull between Bayonne, closing the waterway and blocking ships from Port Newark.
6/8/1990	Hazmat - offshore	Hudson	260,000 gallons of oil spilled from a ruptured tanker docking in Bayonneinto New York Harbor
5/10/1996	Hazmat – offshore	Cape May	The T/V Anitra released 42,000 gallons of oil into Big Stone Anchorage, Delaware Bay. Over 50 miles of beaches were oiled over a 2-week period.
11/26/2004	Hazmat - offshore	Gloucester	The M/T ATHOS I (Athos) struck a large, submerged anchor while preparing to dock at a refinery in Paulsboro, New Jersey. The anchor punctured the vessel's bottom, resulting in the discharge of nearly 265,000 gallons of crude oil into the Delaware River and nearby tributaries.
1/13/2012	Hazmat – fixed site	Gloucester	A malfunctioning fuel pump gasket for a New Jersey Transit facility spilled 26,000 gallons of diesel fuel into Grenloch Lake and surrounding waterways including Big Timber Creek and the Delaware River.
11/30/2012	Hazmat – in transit	Gloucester	A freight train derailment in Paulsboro caused a spill of vinyl chloride. The freight train consisted of two locomotives and 82 cars; seven cars derailed while traveling over a moveable bridge spanning Mantua Creek. Four tanks cars, three containing vinyl chloride and one containing ethanol, were dumped into the Creek. One of the cars released approximately 20,000 gallons of vinyl chloride into the Creek and surrounding area. Over 40 people were treated at the hospital. Estimated equipment damage was multi-millions of dollars.
9/10/2013	Hazmat – in transit	Passaic	A freight Train derailment in Clifton caused a spill of Polychlorinated Biphenyls Solid. The lid of container box MHFU2220 was dislodged and caused the release of about 8000 pounds of material.

Date(s) of Event	Event Type	Counties Impacted	Description
5/19/2014	Hazmat – in transit	Essex	On 5/19/14 driver was loaded with 7500 gallons of lysergic acid diethylamide and end route to delivery destination in Flemington NJ. While in approach to the traffic circle at Mine ST & Route 12 driver tried to avoid a vehicle that entered his path which resulted in the truck and trailer overturning. Clean up crews started pumping the product in the roadway into a small oil truck (1,650 gallons) and into large storage totes and barrels (950 gallons). 3,901 gallons was salvage and pumped from the trailer into a hired tanker and was delivered to original delivery destination.
11/21/2015	Hazmat – in transit	Union	According to the information obtained the following occurred. During offload a loose pipe fitting resulted in the loss of 1 000 gallons of gasoline. The free product released to asphalt lot adjacent roadway and nearby storm/drain. The storm drain leads to a small stream which eventually leads to dismal swamp.

Source: New York Times 1990; Anitra Oil Spill Natural Resource Trustees 2004; RT.com 2012; National Transportation Safety Board (NTSB) 2012; NTSB 2009; USDOT 2018

5.19.4.2 FEMA DISASTER DECLARATIONS

The Federal Emergency Management Agency (FEMA) has not issued any disaster declarations resulting from hazardous substances incidents in New Jersey.

5.19.5 PROBABILITY OF FUTURE OCCURRENCES

Hazardous Substances Fixed Site

Hazardous substances incidents at on-site facilities occur occasionally, typically without significant negative consequence. As indicated in the Previous Occurrence section, on-site chemical releases occur rather frequently. Small spills will occur on site throughout the course of the year. Thus, the probability for future events is high. However, the risk of a major on-site hazardous substances incident in a given year is rather low.

Hazardous Substances In-Transit

As demonstrated by the Past Occurrences section, incidents involving hazardous substances in transit occur rather frequently. The 5-year annual average is approximately 350 incidents per year in all counties. The size and scope of these incidents vary from very small to large amounts of chemicals being spilled. However, as indicated by the Paulsboro train derailment incident, transportation incidents involving hazardous substances can be rather severe. Given the vast road and rail networks throughout the State, and the quantity of hazardous substances transported regularly through the State, the probability for future events in a given year is high.

Hazardous Substances Offshore

Significant hazardous substances occurring offshore are rather rare in New Jersey. As discussed in the Previous Occurrences section, several incidents have occurred over the past couple decades. While these incidents have been rather rare, New Jersey's port systems and waterways are vast and the possibility for an incident does exist. Given the factors noted, past occurrences, and the State's water network, the probability for future incidents in a given year is low.

5.19.5.1 POTENTIAL EFFECTS OF CLIMATE CHANGE

Hazardous substance incidents are non-natural incidents; therefore, there are no direct 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.

5.19.6 IMPACT ANALYSIS

5.19.6.1 SEVERITY AND WARNING TIME

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) and 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 with the closest proximity 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 (e.g. centuries to millennia).

The severity of offshore hazardous substances incidents will vary based on the amount of hazardous substance spilled, the location of the spill, and the prevailing currents. The effects of an accident can have a devastating impact on the environment. An example of the worst-case scenario was the Deepwater Horizon oil spill in 2010, which affected the gulf and the coastline from Texas to Florida and was one of the worst environmental disasters in the United States.

Hazardous Substances Fixed Site

The warning time for an incident occurring at an on-site or fixed facility will vary. Incidents may be sudden without any warning such as an explosion, or may be slowly developing such as a leaking container. Facilities that store extremely hazardous substances are required to notify local officials when an incident occurs. Local emergency responders and emergency management officials would determine the need to evacuate the public or to advise to shelter in place.

Hazardous Substances In-Transit

Similarly to on-site hazardous substances incidents, the amount of warning time for incidents associated with hazardous substances in transit varies based on the nature and scope of the incident. If an explosion did not occur immediately following an accident, there may be time for warning of adjacent neighborhoods and enough time to facilitate appropriate protective actions.

Hazardous Substances Offshore

Offshore hazardous substances incidents will generally have enough warning time and will not be an immediate threat to health and life. In most cases the environmental impacts of hazardous substances incidents will develop slowly as the full extent of the accident may occur over the course of several weeks or months. As was the case with the 2010 Deepwater Horizon incident in the Gulf of Mexico, the immediate impact was limited to the crews stationed on the oil rig, and the greater environmental impact occurred days to weeks into the incident.

5.19.6.2 SECONDARY HAZARDS

Hazardous Substances Fixed Site

The secondary impacts associated with on-site hazardous substances releases include those impacting the health of the community and environment. If spilled, hazardous substances can contaminate wells, kill wildlife, and impact the ecosystem. Hazardous substance incidents also can cause acute and chronic health issues and have an impact on long-term public health. The secondary impacts have the potential to occur regardless of the mode (fixed site, in transit, or offshore) or the source of release.

Hazardous Substances In-Transit

In addition to the secondary impacts noted for the fixed-site hazard, other impacts include damage to the infrastructure such as road beds or bridges may occur.

Hazardous Substances Offshore

Aside from the general impacts noted with the fixed-site hazard, offshore incidents present unique challenges and secondary impacts. The secondary impacts associated with offshore incidents were witnessed in 2010 during the Deepwater Horizon spill occurring in the Gulf of Mexico. The incident had tremendous impacts on the environment, wildlife, and the economy. A significant incident would have a devastating impact on all of these sectors. A significant portion New Jersey's economy is reliant on tourism, as well as near-shore and off- shore fisheries, thus an impact to the shore would be devastating.

5.19.6.3 ENVIRONMENTAL IMPACTS

A hazardous substance release, whether on site, in transit, or offshore, can negatively impact the environment. Depending on the nature and amount of the substance, the release may contaminate the air, water, or soil potentially causing concern for direct human and animal exposure (whether through inhalation, ingestion or dermal exposure), recreational usage, crop irrigation, and fish and wildlife consumption (USEPA, 2011).

5.19.7 VULNERABILITY ASSESSMENT

This section addresses New Jersey's vulnerability, in a qualitative nature, to the hazardous substances hazard. A consequence analysis for this hazard was also conducted and presented in Section 9. Impacts on the public, responders, continuity of operations, and delivery of services; property, facilities, and infrastructure; and the environment, economic condition of the State, and the public confidence in the State's governance is discussed in Section 9 in accordance with Emergency Management Accreditation Program (EMAP) standards. This section addresses assessing vulnerability and estimating potential losses by jurisdiction and to State facilities.

5.19.7.1 ASSESSING VULNERABILITY BY JURISDICTION

As presented in Table 5.1-2 in Section 5.1 Risk Assessment Overview, 13 of the 20 Counties with HMPs included hazardous substances as hazards of concern. The decision to include and profile this hazard in their mitigation plans indicates the presence of risk from this hazard. Of these 13, only Essex County categorized the hazard into high/medium/low ranking and considers this a medium ranked hazard. If hazardous substances were not ranked by a local HMP, the jurisdictions identified their most significant hazards using other methods.

All counties in New Jersey have at least one facility that stores hazardous substances, according to USEPA SARA Title III facilities data. 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. The general population may be exposed to a

hazardous substances release through inhalation, ingestion or dermal exposure. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

The majority of the New Jersey population is vulnerable to the effects of hazardous substances incidents. Populations located along major transportation routes (such as I-95 and I-295) and rail transportation (NJ Transit/Amtrak) are more vulnerable because of the quantities of chemicals transported on these major thoroughfares. Further, populations residing along New Jersey's coast are vulnerable to offshore hazardous substances incidents.

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.

5.19.7.2 ESTIMATING POTENTIAL LOSSES BY JURISDICTION

If a significant hazardous substances incident occurred, not only would life, safety and the built environment be at risk, but the economy of New Jersey would be affected as well. A significant incident in an urban area could 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 of hazardous substances incidents on-site and the State's vulnerability to such an incident is difficult to determine, given the uncertain nature of the size and scope of incidents.

If an incident occurred that would require one of the State's major highways to close, the impact on the economy could be significant. Given the scope and importance of New Jersey's transportation routes to the greater northeastern United States, the vulnerability of New Jersey's economy is significant.

New Jersey's economy is particularly vulnerable to hazardous substances incidents that may occur offshore. Such an event would impact shipping and access to New Jersey's ports as well as the tourism industry, which relies on summer beach network as a significant portion of the State's economy.

A significant portion of the New Jersey economy relies on the State's waterways and shoreline, thus the economy is vulnerable to the impacts of hazardous substances occurring offshore. Tourism associated with the Jersey Shore is critical to the overall economy. If an incident occurred similar to the 2010 Deepwater Horizon spill in the Gulf of Mexico, the impact on the economy would be disastrous. Additionally, if a hazardous substances incident forced the closure of shipping lanes or one of New Jersey's ports, the State would lose millions of dollars in revenue. New Jersey's commercial fishing industry would suffer tremendous losses from a major spill or other hazardous substances incident. Given the importance of New Jersey's waterways to the State's economy, it is clear that the State is vulnerable to hazardous substances incidents occurring offshore.

5.19.7.3 ASSESSING VULNERABILITY TO STATE FACILITIES

Because of the number of facilities storing hazardous substances throughout the State, all State and critical facilities are exposed to hazardous substances incidents.

5.19.7.4 ESTIMATING POTENTIAL LOSSES TO STATE FACILITIES

Potential losses to State facilities and critical facilities caused by a hazardous substances incident are difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs.