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Giuseppe (referred to here as Joseph Curiale,

Plaintiff,

v.

A CLEMENTE, INC.; ANTHONY CLEMENTE, INC.;
SOLVAY SPECIALTY POLYMERS, USA, LLC;
SOLVAY SOLEXIS, INC.;
ARKEMA, INC.;
E.I. DU PONT DE NEMOURS & COMPANY;
THE CHEMOURS COMPANY;
THE CHEMOURS COMPANY FC, LLC;
CAMDEN COUNTY ENERGY RECOVERY ASSOCIATES LP;
CAMDEN COUNTY ENERGY RECOVERY CORP.;
FOSTER WHEELER CAMDEN COUNTY INC.;
COVANTA CAMDEN GP, LLC;
THE 3M COMPANY; AND
JOHN DOE ENTITIES #1-20,

Defendants.

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - SALEM COUNTY
DOCKET NO. SLM-L-_____-22

CIVIL ACTION

COMPLAINT AND JURY DEMAND

Plaintiff, Joseph Curiale, by way of complaint against A. Clemente, Inc., Anthony Clemente, Inc., Solvay Specialty Polymers, USA, LLC, Solvay Solexis, Inc., Arkema, Inc., E.I. Du Pont De Nemours & Company, The Chemours Company, The Chemours Company FC, LLC, The 3M Company, Camden County Energy Recovery Associates LP, Camden County Energy Recovery Corp., Foster Wheeler Camden County Inc., Covanta Camden GP, LLC; and John Doe Entities #1-20 (collectively "Defendants") say that:

THE NATURE OF THE ACTION

1. This is a civil action brought by Joseph Curiale ("Joseph" or "Plaintiff"). This case seeks to recover damages for personal injuries suffered by Joseph.

2. Joseph suffers from profound and permanent personal injuries including but not limited to:

a. Leukemia

b. Sinus Tumors

c. Pain and suffering, and emotional distress

d. Loss of the ability to enjoy life's pleasures

3. Those injuries were foreseeably caused by the above Defendants' misconduct, including their intentional discharge, use, and/or disposal of toxic and dangerous chemicals and substances discussed below, which were a substantial factor in causing Plaintiff's injuries.

PARTIES

a. Plaintiff

4. Joseph Curiale is an adult citizen of the State of New Jersey, born on November 19, 1958. Since approximately 2000, he has been domiciled at 134 Holly Drive Woolwich Township, New Jersey. Prior to that, he resided at 172 Perkintown Road in Pedricktown, New Jersey.

5. The exposures of greatest significance with respect to the etiology of Joseph's injuries occurred during the period when he resided at 172 Perkintown Road in Pedricktown, New Jersey in approximately mid 1989-2000, and at 134 Holly Drive Woolwich Township, New Jersey beginning in approximately 2000.

6. As a consequence of Defendants' intentional, knowing, reckless, grossly negligent, and negligent acts and omissions described herein, resulting in the contamination of the environment, water, air, and soil, including but not limited to Plaintiff's water supply, Plaintiff seeks to recover compensatory and punitive damages for the personal injuries suffered by him.

7. The external routes of exposure which caused the injuries for which Defendants are responsible, involved airborne dispersion, groundwater, surface water, contamination of domestic water supplies, soil contamination, and vapor intrusion in and around the Plaintiff's residence and adjacent neighborhoods.

b. Defendants

i. Clemente

8. Defendants A. Clemente, Inc. and Anthony Clemente, Inc. (a/k/a "A. Clemente, Inc." hereafter collectively referred to as "Clemente") is a corporation organized under the laws of the State of New Jersey, and is the owner of block 247, lots 1 and 2, also known as 211 South Pennsville Auburn Road, in the Township of Carneys Point, County of Salem, State of New Jersey (the "Clemente Property").

9. The Clemente Property has been used for the disposal of hazardous waste generated by E.I. Du Pont de Nemours & Company and others, which hazardous waste has migrated on to Plaintiff's property causing exposure to a variety of harmful substances and the profound personal injuries described above suffered by Plaintiff Joseph Curiale.

ii. Solvay

10. Defendant Solvay Specialty Polymers, USA, LLC ("Solvay USA") is a corporation duly organized under the laws of the State of Delaware with its principal place of business located in Houston, Texas.

11. Defendant Solvay Solexis, Inc. ("Solvay Solexis") is the predecessor of Solvay USA and was a corporation duly organized under the laws of the State of Delaware with its principal place of business located in Houston, Texas.

12. Defendants Solvay USA and Solvay Solexis will collectively be referred to hereinafter as "Solvay."

iii. Arkema

13. Defendant Arkema, Inc. ("Arkema") is a Pennsylvania corporation with its principal place of business located at 2000 Market Street, Philadelphia, Pennsylvania 19103.

iv. Du Pont

14. Defendant E.I. du Pont de Nemours & Company ("DuPont") is a corporation duly organized under the laws of the State of Delaware with its principal place of business located at 974 Centre Road, Wilmington, Delaware 19805.

v. Chemours

15. Defendant The Chemours Company ("Chemours Co.") is a corporation duly organized under the laws of the State of Delaware with its principal place of business located at 1007 Market Street, Wilmington, Delaware 19899.

16. Defendant The Chemours Company FC, LLC ("Chemours FC") is a corporation duly organized under the laws of the State of Delaware with its principal place of business located at 1007 Market Street, Wilmington, Delaware 19899.

17. Defendants Chemours Co. and Chemours FC will collectively be referred to hereinafter as "Chemours".

vi. 3M

18. Defendant The 3M Company ("3M") is a corporation duly organized under the laws of the State of Minnesota with its principal place of business at 2501 Hudson Road, Maplewood, Minnesota 55144.

vii. Camden

19. Defendant Camden County Energy Recovery Associates LP is a domestic Limited Liability Partnership whose principal place of business is within the State of New Jersey.

20. Defendant Camden County Energy Recovery Corp. is a New Jersey Corporation with its principal place of business within the State of New Jersey.

viii. Foster Wheeler

21. Defendant Foster Wheeler Camden County Inc. is a New Jersey Corporation with its principal place of business within the State of New Jersey.

ix. Covanta

22. Defendant Covanta Camden GP, LLC is a limited liability corporation with its principal place of business within the State of New Jersey.

23. The following entities will be collectively referred to as "Covanta" or the "Incinerator Defendants" in this Complaint: Camden County Energy Recovery Corp., Foster Wheeler Camden County

Inc. a/k/a AMEC Foster Wheeler Power Systems, Inc.; Camden County Energy Recovery Associates LP; and Covanta Camden GP, LLC.

x. John Doe Entities

24. Defendants John Doe Entities #1-10 are fictitious names of corporations, companies, partnerships, or other business entities or organizations whose identities cannot be ascertained as of the filing of this Complaint, certain of which are successors to, predecessors or alter egos of, or are otherwise related to, the identified defendants in this matter or which are otherwise liable pursuant to the causes of action set forth herein as a result of their intentional, knowing, reckless, discharge, storage, and/or disposal of the toxic and hazardous chemicals described herein into the surrounding air, soil, and water, thereby causing the contamination of the air, soil, surface water, and groundwater in and around Plaintiff's residence and adjacent neighborhoods.

24. Plaintiff Joseph Curiale suffers from profound personal injuries as described above.

25. These injuries were all proximately caused by the above Defendants' misconduct, including their intentional, reckless, and/or negligent discharge, storage, and/or acceptance for disposal of toxic and hazardous chemicals including but not limited to the toxins described in this Complaint.

26. With respect to the polyfluoroalkyl substances ("PFAS"), perfluorooctanoic acid ("PFOA"), perfluorononanoic acid ("PFNA"), and perfluorooctanesulfonic acid ("PFOS") chemicals, the United States Environmental Protection Agency ("EPA") has identified 3M as the dominant global producer of PFOA and related chemicals (PFAS, PFOA, PFNA and PFOS). PFAS, PFOA, PFNA and PFOS are hereafter collectively referred to as PFAS.

27. 3M manufactures at least eighty-five (85%) percent of total worldwide volumes of PFOA and related chemicals.

SOLVAY AND ARKEMA'S WEST DEPTFORD FACILITY

28. Solvay has been the owner and operator of a manufacturing facility located at 10 Leonard Lane, West Deptford, New Jersey 08085 ("the West Deptford facility") from 1990 to present.

29. Before 1990, Arkema owned and operated the West Deptford facility where it manufactured among other PFAS chemicals, polyvinylidene fluoride ("PVDF").

30. Solvay also manufactured PVDF, which is another PFAS compound, at the West Deptford facility.

31. PVDF is a specialty plastic used in conjunction with lithium batteries, medical and defense uses, semi-conductors, or other instances when a higher level of purity is required.

32. On information and belief, Arkema manufactured PVDF and other high- performance materials at the West Deptford facility prior to 1990.

33. Solvay's West Deptford facility was considered to have the second highest capacity in the world for purposes of using Surflon S-11 to make PVDF, which is composed of approximately 74% PFNA.

34. In connection with its operations, Solvay released vast amounts of PFNA into the surrounding air, soil and water contaminating the site, off-site properties including Plaintiff's, and New Jersey's natural resources with the PFNA chemical.

35. At relevant times, Solvay also used sodium perfluorooctanoate ("NaPFO") as a surfactant at the West Deptford Facility, which was supplied to it by 3M.

36. NaPFO degrades into PFOA.

37. As a result of its operations, Solvay released vast amounts of PFOA into the surrounding air, water and soil contaminating the site, off-site properties including Plaintiff's, and New Jersey's natural resources with the PFOA chemicals.

38. Prior to 1990, and at relevant times, as a result of their operations, Arkema released massive amounts of PFOA into the surrounding air, soil and water contaminating the site, off-site properties including Plaintiff's and New Jersey's natural resources with the PFOA.

39. Further, at all relevant times, these defendants used incineration as a method to discharge and dispose of waste from their West Deptford facility.

40. This conduct was performed with greed and in callous disregard of the public health as well as Plaintiff's health and well-being, in order to maximize profit, avoid necessary expense, to promote sales of their products and to reduce or eliminate their obligations to otherwise remediate or prevent the discharge of PFAS and other toxic waste into the environment and Plaintiff's domestic water supplies.

DUPONT AND CHEMOURS' CHAMBER'S WORKS FACILITY

41. From 1891 to 2015, DuPont owned and operated Chambers Works, 67 Canal Road and Route 130, located in Pennsville and Carneys Point Townships, New Jersey.

42. DuPont wrongfully produced, used, and discharged into the environment approximately 1,600 separate chemicals, pollutants, and other potentially hazardous substances from the Chambers Works facility.

43. However, Plaintiff specifically *does not allege* that any discharges from the Chambers Works facility during the Second World War pursuant to the following federal contracts: **a)** W-670-ORD-2210 or W-670-CRD-2210, **b)** W-7412-Eng-2, **c)** W-7412-Eng-6, **d)** W-7412-Eng-3, **e)** W-7412-Eng-22, and **f)** W-7412-Eng-8 proximately caused any harm to Joseph. Accordingly no claims are made respecting the Defendants' conduct in connection with the performance of those contracts.

44. PFOA was used at Chambers Works beginning in the late 1950s to, among other things, manufacture fluoroelastomers, perfluoroelastomers and specialty fluoroelastomers used in a variety of consumer and other products for their chemical non-stick and heat-resistant properties.

45. Telomers were used and manufactured at Chambers Works.

46. PFOA is a by-product of the telomer manufacturing process.

47. At relevant times 3M supplied DuPont with PFOA.

48. DuPont also accepted large quantities of PFAS-containing waste from off-site facilities and discharged this and other toxic waste along with wastewater from its on-site PFAS-related processes through its wastewater treatment plant.

49. As a result of its operations, for decades, DuPont released massive amounts of PFOA as well as other PFAS, including PFNA, and other toxins from Chambers Works into the surrounding air, water and soil,

50. These releases contaminated the Chambers Works site, off-site properties including Plaintiff's, and New Jersey's natural resources.

51. Further, at all relevant times, these defendants used incineration as a method to discharge and dispose of waste from their Chambers Works facility.

52. In 2015, DuPont transferred its Chambers Works facility to Chemours.

53. DuPont continued to operate at the location pursuant to an industrial lease through which DuPont was the tenant and Chemours FC was the landlord.

54. Chemours accepted the transfer of DuPont's Chambers Works facility with the knowledge that the site had been wrongfully contaminated with PFAS and other toxic substances.

55. Chemours accepted the transfer of DuPont's Chambers Works facility with the knowledge that it was discharging PFAS and other toxins into the surrounding air and water contaminating off-site properties including Plaintiff's, and New Jersey's natural resources.

56. Sampling of residential drinking water wells in the surrounding area revealed contamination at least five miles away from the Chambers Works facility with a substantial number of wells exceeding applicable screening criteria for concentrations of PFOA, PFNA, or PFOA and PFOS combined.

57. NJDEP has declared that: "DuPont has not been working in good faith to address the contamination it released into New Jersey's environment. Instead, DuPont knowingly concealed the true nature of the chemicals it discharged, while simultaneously moving forward with a corporate reorganization that moved its 'performance chemicals' business (including its PFAS-related

product lines), the [Chambers Works facility] itself, and the associated liabilities to Chemours [Co.] and Chemours FC and away from DuPont (and tens of billions of dollars of its assets). DuPont has concealed from the Department and the community the extent and nature of the environmental injuries its contaminants caused."

58. NJDEP also declared that "[b]oth DuPont and The 3M Company ("3M") put their profits above the public health, safety, and the environment of New Jersey."

59. Discovery will no doubt identify additional chemicals that were released into the environment to which Plaintiff was exposed.

60. This conduct was performed with greed and in callous disregard of the public health as well as Plaintiff's health and well-being. It was perpetrated in order to maximize profit, avoid necessary expense, to promote sales of Defendants' products and to reduce or eliminate their obligations to otherwise remediate or prevent the discharge of PFAS and incinerator and other chemicals into the environment and Plaintiff's domestic water supplies.

THE INCINERATOR DEFENDANTS' WASTE DISPOSAL FACILITIES

61. At all relevant times, the Incinerator Defendants operated waste incineration facilities in Camden New Jersey and Chester, Pennsylvania, among other locations.

62. At all times relevant to this Complaint, the aforesaid Covanta Defendants' incineration facilities discharged various

toxic substances into the air, including dioxins, PFAS, and furans, which include 2,3,7,8-tetrachlorodibenzoparadioxin ("TCDD"). TCDD is often referred to as the most toxic chemical known to man.

63. As a result of its operations, for decades, Covanta released and discharged massive amounts of toxins into the surrounding air, contaminating the site and off-site properties, including the Plaintiff's property, and contaminating New Jersey's natural resources.

64. The Incinerator Defendants knew that toxins, including those aforementioned, were being discharged into the environment.

65. The discharge and release of these toxins by Covanta caused exposure to a variety of harmful substances and substantially contributed to the profound personal injuries described above sustained by Plaintiff, Joseph Curiale.

66. This conduct was performed with greed and in callous disregard of the public health as well as Plaintiff's health and well-being. It was perpetrated in order to maximize profit, avoid necessary expense, to promote sales of their products and to reduce or eliminate their obligations to otherwise remediate or prevent the discharge of harmful substances and incinerator and other chemicals into the environment, the air breathed by Plaintif, and Plaintiff's domestic water supplies.

THE IDENTITY OF RELEVANT TOXINS (CAUSATION CHEMICALS)

67. All told, there were literally thousands of chemicals used and discharged as waste from the Chamber's Works, the Incinerator Defendants, and West Deptford facilities over the course of their history and continuing until the present.

68. That does not mean that *all* of these chemicals at *all* times proximately caused damage to Plaintiffs. Some were discharged so long ago in the past and/or in such small quantities as to render proximate causation improbable.

69. Others were discharged *after* Plaintiffs had suffered injury, rendering causation temporally impossible, although in some cases, aggravation of previously initiated injury occurs.

70. Nonetheless, even if one considers the numbers of chemicals wrongfully discharged in adequate quantities during relevant exposure time frames, a significant number of chemicals and waste remain many of which plausibly caused Joseph's injuries.

71. At this time, based upon information currently available, Plaintiffs have identified a discrete and pared down list of chemicals, heavy metals, and waste (collectively "causation chemicals") which individually and/or in combination with each other, proximately caused injury to Joseph.

72. These causation chemicals include:

a. **Poly- and Perfluoroalkyl substances ("PFAS")**, [for instance perfluorononanoic acid ("PFNA"),

perfluorooctanoic acid ("PFOA"), and perfluorooctanesulfonic acid ("PFOS"), as well as their replacement compounds, including but not limited to "GenX"].

b. **Dioxins:** persistent toxic heterocyclic hydrocarbons that occur especially as by-products of various industrial processes and waste incineration and that are reproductively toxic, developmentally toxic, damage the immune system, interfere with hormones, and are carcinogenic;

c. **Furan:** a class of carcinogenic organic compounds of the heterocyclic aromatic series characterized by a ring structure composed of one oxygen atom and four carbon atoms. "Agent Orange" is among this family. Dioxins and Furans are among the most toxic substances known to man.

d. **Lead:** a chemical element with the symbol Pb and atomic number 82. It is a heavy metal and denser than most common materials. Exposure to lead may cause *inter alia* anemia, weakness, cancer, and kidney and brain damage. Lead can cross the placental barrier, which means pregnant women exposed to lead also expose their unborn child. Lead can damage a developing baby's nervous system.

e. **Mercury**: a chemical element with the symbol Hg and the atomic number 80. It is a heavy metal commonly known as quicksilver. The EPA has identified health effects of mercury exposure to include harm to the brain, heart, kidneys, lungs, and immune system of people of all ages. High levels of methylmercury in the bloodstream of babies developing in the womb and young children may harm their developing nervous systems, affecting their ability to think and learn.[1]

f. **Arsenic**: a chemical element with the symbol As and an atomic number of 33. Arsenic is a heavy metal. The World Health Organization has characterized Arsenic as carcinogenic and highly toxic to humans. Exposure to arsenic can cause cancer and skin lesions. It has also been associated with cardiovascular disease and diabetes. In utero and early childhood exposure are linked to negative impacts on cognitive development and increased deaths in young adults. Long-term exposure to arsenic from drinking water and food can cause cancer and skin lesions.

[1] *See* epa.gov/mercury/basic-information-about/mercury#health [last updated 12/21/2021].

g. **Polycyclic Aromatic Hydrocarbons [PAHs]** chemical compounds containing only carbon and hydrogen composed of multiple aromatic rings. PAHs are by-products of industrial processes and especially waste incineration.

73. Plaintiff reserves the right to ask the Court for leave to amend this Complaint, if and when discovery discloses a proper basis under Rules 15 or 16 Fed. R. Civ. P. to add additional causation chemicals.

THE TOXICITY OF CAUSATION CHEMICALS – COMMON CONSIDERATIONS

74. These seven toxins, (hereafter "causation chemicals") individually and in mixtures have the capacity to cause *inter alia*:

a. adverse reproductive, neurological, and developmental outcomes including but not limited to birth defects, developmental delays, intellectual disability, autism spectrum disorders, genetic damage, embryonic tumors, infertility, sub-fertility spontaneous abortion, stillbirth, cerebral palsy and effect on infant birth weights;

b. liver, kidney, and immunological disorders and illness;

c. impaired resistance to infectious disease;

d. cardiovascular disease and disorders;

e. metabolic diseases and disorders;

f. increased cholesterol levels;

g. endocrine and thyroid disease and disorders and hormone disruption;

h. asthma, allergies, and respiratory disease;

i. skin disorders;

j. orthopedic injuries;

k. gastrointestinal illness;

l. malignancies, tumors and neoplasms including but not limited to: brain cancer, kidney cancer, ovarian cancer, bladder cancer, testicular cancer, breast cancer, pancreatic cancer, leukemia, and colon cancer; and

m. death

75. Further, these causation chemicals have the capacity to act in additive or synergistic fashion such that mixed exposures enhance or even multiply their ability to inflict, aggravate and accelerate harm(s) of the type described above.

76. The disorders identified above are all subject to latency periods, which are time gaps between the moment of initial exposure and the time when the disorders are either diagnosed or present symptoms.

77. The mechanisms by which these relevant toxins inflict harm include but are not limited to:

a. apoptosis [cell death],

b. oxidative stress,

c. genotoxicity [spontaneous or *de novo* mutation],

d. epigenetic change,

e. diminished cellular nourishment,

f. impaired cell to cell communication,

g. endocrine disruption,

h. impaired or excessive immune responses,

i. intrauterine growth retardation,

j. impaired or delayed organogenesis, and

k. the capacity to cross placental and brain barriers.

78. There are no safe levels of exposures to these toxins. This is especially true with mixed and prolonged exposures. However, even a single exposure is capable of inflicting harm and causing disease.

79. The cause of the disorders identified above need not be unitary. Rather causes may be and frequently are multifactorial with more than one factor serving as a substantial factor in bringing about the ultimate adverse outcome.

80. Accordingly, two individuals identically exposed to the same toxin(s) will not necessarily suffer identical outcomes.

THE CAUSATION CHEMICALS

a. Poly- and Perfluoroalkyl Substances ("PFAS")

81. Poly- and perfluoroalkyl substances ("PFAS") are man-made chemicals.

82. PFAS have been used to make many household products such as Teflon®, Gore-Tex® Stainmaster®, Scotchgard®, and Tyvek®.

83. PFAS compounds are a substantial threat to the environment and human health.

84. PFAS chemicals have been classified as carcinogenic.

85. Studies report that PFAS exposures have the capacity to cause inter alia: testicular cancer, kidney cancer, liver cancer, brain cancer, lymphomas, leukemia, breast cancer, lung cancer, autoimmune disorders, endocrine disorders, developmental and genetic defects to fetuses, developmental defects to breastfed babies, reduced vaccine response, neurological damage, central nervous system damage, cognitive impairment, increased cholesterol, increased liver enzymes, and a host of other disorders including those suffered by Joseph.

86. PFAS compounds are resistant to degradation.

87. PFAS compounds persist indefinitely in the environment.

88. PFAS compounds and their metabolites bioaccumulate in living tissue.

89. People who consume PFAS via drinking water and are otherwise exposed by inhalation, ingestion or absorption,

accumulate increasing concentrations of PFAS and other toxins or their metabolites in their blood.

90. For decades, Defendants and their predecessors in interest have known (or should have known) of the highly toxic characteristics of PFAS.

91. People who consume PFAS via drinking water and are otherwise exposed by inhalation, ingestion or absorption; accumulate increasing concentrations of PFAS and other toxins or their metabolites in their blood.

92. For decades, Defendants and their predecessors in interest have known (or should have known) of the highly toxic characteristics of PFAS.

93. The New Jersey Department of Environmental Protection ("NJDEP") has devoted and is continuing to identify and investigate the presence of PFAS in New Jersey's environment, as well as monitor, treat, clean up, and/or remove PFAS in impacted areas.

94. Chemicals including but not limited to "GenX" have been substituted by Defendants in lieu of their PFAS chemicals.

95. These replacement chemicals are being inaccurately touted as short-chain and having shorter half- lives.

96. These replacement chemicals do not break down in the environment.

97. They have also been detected in drinking water, soil, groundwater, and surface waters.

98. In 2009, EPA issued a preliminary health advisory values for PFOA and PFOS in drinking water of 400 parts per trillion ("ppt") and 200 ppt, respectively.

99. In 2016, EPA lowered its advisories for PFOA and PFOS to 70 ppt collectively total in further recognition of their extreme danger at even the most miniscule doses.

100. In 2018 the United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry ("ATSDR") released draft minimum risk levels of 21 parts per trillion ("ppt") for PFOA and PFNA, and 14 ppt for PFOS.

101. NJDEP has adopted a specific groundwater Quality Standard ("GWQS") of 10 ppt for PFNA and a Maximum Contaminant Level ("MCL") of 13 ppt.

102. NJDEP added PFNA to its List of Hazardous Substances on January 16, 2018.

103. On March 13, 2019, the NJDEP established interim specific groundwater quality criteria for PFOA and PFOS of 10 ppt.

104. NJDEP has proposed adding PFOA and PFOS to the List of Hazardous Substances.

105. NJDEP also issued a Statewide PFAS Directive, Information Request and Notice to Insurers against Defendant Solvay Specialty Polymers USA, LCC, Defendant Solvay Solexis, Inc., Defendant E.I. du Pont de Nemours & Company, Dowdupont, Inc., DuPont Specialty Products USA, LLC, Defendant The Chemours Company

FC, LLC, Defendant The Chemours Company, and Defendant The 3M Company to notify them that the Department believes them to be responsible for the significant contamination of New Jersey's natural resources, including the air and waters of the State, with poly- and perfluoroalkyl substances ("PFAS") which encompass the air and water utilized by plaintiffs. *See* **Exhibit A.**

b. Dioxins and Furans

106. Dioxins and furans create extraordinarily serious health hazards.

107. The EPA announced in 2012 that the limit for human oral consumption of dioxins and furans is 0.7 picograms Toxic Equivalence (TEQ) per kilogram bodyweight per day that works out to 17 billionth of a gram for a 150 lb person per year.

108. Dioxins are highly toxic and cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones. Dioxins accumulate in food chains, concentrating mainly in the fatty tissue of animals.

109. While Dioxins are classified as known human carcinogens, they also cause noncancerous effects like atherosclerosis, hypertension, and diabetes. Long-term exposures to dioxins cause disruption of the nervous, immune, reproductive, and endocrine system. Short-term exposure to high levels impairs the liver function and causes chloracne. The most sensitive population to dioxin exposure are fetuses and infants. A large number of health

effects have been documented in the scientific literature, and they all place dioxins among the most toxic chemicals known to man.

110. Dioxin is formed by burning chlorine-based chemical compounds with hydrocarbons. The major source of dioxin in the environment comes from waste-burning incinerators.

111. Furans are a variety of Dioxin.

112. The New Jersey Department of Health has identified Furan as a carcinogen stating "there may be *no* safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level." It has further stated that "[i]t should be recognized that Furan can be absorbed through your skin, thereby increasing your exposure."

c. Lead

113. The U.S. National Toxicology Program noted in a 2012 monograph that lead "is one of the most extensively studied environmental toxicants, with more than 28,900 publications on health effects and exposure in the peer-reviewed literature."[2]

[2] National Toxicology Program (NTP). Health effects of low-level lead. June 2012. NIH Publication No. 12-5996. Available at: https://ntp.niehs.nih.gov/ntp/ohat/lead/final/monographhealtheffectslowlevellead newissn 508.pdf

114. Children are widely recognized to suffer significant and permanent adverse effects from low doses of lead. Experts agree that:[3]

- Lead poisoning is a completely preventable disease.
- No safe blood lead level threshold for children has been identified.
- Blood lead levels once considered safe for children are now considered to be hazardous.

115. The National Toxicology Program's expert panel reviewed a massive amount of literature on the potential adverse health effects of low levels of lead. Their conclusions about the evidence from studies which used blood lead level as the measure of exposure are excerpted in tables in that study.[4] Children exposed to lead suffered significant harm to their brains, according to the National Toxicology Program panel. The panel judged the evidence sufficient for a causal relationship between childhood lead exposure resulting in blood lead levels of 5-10 µg/dL and lower IQ, attention-related difficulties, behavioral problems and lower academic achievement. This exposure also harmed children's hearing and affected the timing of puberty. The panel also concluded that there was evidence that prenatal lead exposure at low levels affects children's hearing and affected the timing

[3] Op. cit., Tarrago, 2017.
[4] Op. cit, NTP, 2012.

of puberty. The panel also concluded that there was evidence that prenatal lead exposure at low levels affects children's cognitive function, behavior and postnatal growth.

116. Several studies, which have been given high marks for their methodology when evaluated by the National Toxicology panel, explore the practical implications of the harm to brain function from developmental lead exposure. For example, Miranda and colleagues[5] found that higher past blood lead levels among fourth graders was significantly associated with lower test scores. When the authors replicated the study with a state-wide dataset of student test scores they found a steady linear decline in 4th grade test scores at progressively higher blood lead levels—even though most students had fairly low blood lead levels which were 10 µg/dL or lower.[6] Learning and behavioral exceptional were designated as (LBED) students to include behaviorally or mentally learning disabled students. Exceptionally designated other (EDO) students were designated as those who have autism, vision, hearing or speech impairments or other handicaps. Higher blood lead levels were more common among LBED and EDO students.

117. The authors concluded:

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[5] Miranda ML, et al. The relationship between early childhood blood lead levels and performance on end-of-grade tests. Environmental Health Perspectives 2007;115(8):1242-1247.
[6] Miranda ML, et al. Early childhood lead exposure and exceptionality designations for students. International Journal of Child Health and Human Development. 2010;3(1):77-84.

> Our results suggest that even very low levels of early lead exposure increase the likelihood of having a LBED exceptional designation. This represents another example of how lead may be contributing to the achievement gap.
> Source: Miranda et al., 2010.

118. Another example from this literature is the prospective study that followed 488 children who had blood lead tests at 30 months of age and then followed until they were 7-8 years old. Lead exposure was associated with significant reductions in test scores for reading and math, and also more than double the risk for antisocial behavior (OR 2.9, p = 0.040) and hyperactivity (OR 2.82, p = 0.034).

119. Thus, even low-level lead exposure will harm children's health. The endpoints that are affected, especially, learning, cognition, hyperactivity, behavior problems and school performance can significantly impact life achievement, social success and quality of life. Only a small amount of lead exposure is sufficient to push children downhill in terms of these endpoints. The damage can begin in utero if pregnant women are exposed.

120. Adults suffer significant and permanent adverse effects from relatively low doses of lead. Medical research among adults has led to establishment of following facts:[7]

[7] Op. cit., NTP, 2012 and Op. cit., Tarrago, 2017.

- Blood lead levels have been demonstrated to be hazardous.
- Men experience adverse health effects from lead exposure as well as women.
- Adults are harmed by lead exposure at substantially lower doses than are reflected in worker protection regulations of the U.S. Occupational Safety and Health Administration.[8]
- A pregnant woman's recent lead exposures are transmitted to her fetus because the placenta does not provide an effective barrier.
- A pregnant woman's past lead exposures are also a source of prenatal and fetal exposure because lead from her bone stores is mobilized into her bloodstream.[9]
- Pregnant women with elevated blood lead levels may have an increased chance of miscarriage, intrauterine growth restriction and preterm labor.

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[8] NTP's expert panel concluded that that there is sufficient evidence for adverse health effects among adults at blood lead levels of 5-10 mg/dL. However, the U.S. OSHA standard has not been revised in decades, and still does not require medical removal from workplace lead exposure until the blood lead level reaches 40-60 mg/dL. See Op. cit., NTP, 2012 and Op. cit., Tarrago, 2017.

[9] Gomaa A, et al. Maternal bone lead as an independent risk factor for fetal neurotoxicity: a prospective study. Pediatrics 2002;110(1 Pt 1):110-118.

- The elderly are particularly vulnerable to acute and cumulative lead exposure because the neurotoxicity of lead accelerates cognitive decline.[10]

121. The National Toxicology Program expert panel concluded that there is sufficient evidence that blood lead levels of <5 µg/dL among adults decrease the glomerular filtration rate of the kidneys and that having a blood lead level <10 µg/dL increases the risk for hypertension. Hypertension is a significant health problem which requires ongoing medical care and is a well-established powerful risk factor for having a stroke or developing multi-infarct dementia, end stage renal disease, damage to the retina and hypertensive heart disease.

122. The National Toxicology Program panel also thought that the available literature provided support for linking lead exposure to cardiovascular-related mortality and neurologic effects. Cardiovascular-related mortality is clearly an important adverse effect.

123. The Department of Veterans Affairs Normative Aging Study has been following more than 700 Boston-area men for 15 years, periodically assessing cognitive function and correlating it to

[10] Stewart WF and Schwartz BS. Effects of lead on the adult brain: a 15-year exploration American Journal of Industrial Medicine 2007;50(10):729-739.

cumulative lead exposure as determined by K-shell X-ray fluorescence measurements of lead content in the tibia and patella bones. Declines in overall cognitive function, as measured by the Mini Mental Status Exam, were significantly related to cumulative lead exposure.[11] Specifically, an increase in bone lead from the 25th to the 75th percentile was equivalent to loss of more than one year of age-related cognitive decline. The ability to recall a list of words declined faster over time among men with higher lead levels.

124. A similar study was conducted among 1,140 older men and women in Baltimore.[12] Higher tibia lead levels correlated with worse scores for language, processing speed, eye-hand coordination, executive functioning, verbal memory and learning, visual memory and manipulation of visual information to form a design.

125. Substantial amounts of good-quality research supports the conclusion that relatively low levels of environmental lead exposure will harm the health of adults. Hypertension risk is increased and hypertension is strongly linked to cardiovascular and renal mortality. The neurological endpoints which are

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[11] Farooqui Z, et al. Associations of cumulative Pb exposure and longitudinal changes in Mini-Mental Status Exam scores, global cognition and domains of cognition: The VA Normative Aging Study. Environmental Research 2017;152:102-108.
[12] Op. cit., Stewart 2007.

affected, especially cognitive decline in the elderly, can significantly impact activities of daily living, need for a caregiver and quality of life. Cumulative exposure to only a small amount of lead (i.e., non-occupational exposure) is sufficient to push elderly people downhill in terms of cognitive functioning

126. Further, the toxic nature of lead has been known since 2000 B.C. Lead poisoning was known in Roman times due to the use of lead in water pipes and wine and food storage vessels. (Eisinger, 1982, Lessler, M. A., *Lead and Lead Poisoning from Antiquity to Modern Times*, The Ohio State Journal of Science V 88, n 3 (June 1988, 78-84). The effect of lead on the human body and especially on young children has also been well studied and proven. A child's exposure to lead is known to cause neurological and brain injuries, including but not limited to, learning disabilities, behavioral deficits, cognitive deficits, executive function disorders as well as attentional and hyperactivity disorders. (See for example, the CDC Treatise, *Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention, Advisory Committee on Childhood Lead Poisoning of the Centers for Disease Control*, Jan 4, 2012, containing 92 clinical and scientific citations on lead toxicity).

127. In addition, it has been established in the scientific and medical literature that a child's exposure to lead causes a diminution in IQ scores. (e.g. Landrigan et al., 1975; Needleman

et al., 1979; Canfield et al, 2003). The Canfield study published in the New England Journal of Medicine in 2003 showed that children who were not even symptomatic from their exposure to and ingestion of lead had a 7.4 point IQ decrement when lead levels increased from 1 to 10 micrograms (mcg) per deciliter (dL) of blood. As lead levels increased from 10-20 mcg children's IQs fell an additional 4.6 points. (Canfield, R et. al., *Intellectual Impairment in Children with Blood Lead Concentrations below 10 mcg per deciliter*, New England Journal of Medicine 2003, 348: pp. 1517-1526, April, 17, 2003). In young children, blood lead levels as low as 1 to 3 mcg/dL have been associated with neurobehavioral toxicity. (NIH Research Matters, July 14, 2014).

128. Studies have demonstrated that there is no evidence of a threshold below which any lead exposure is non-toxic. (See for example, Lanphear, BP, *Childhood Lead Poisoning Prevention Too Little, Too Late*, Journal of the American Medical Association (JAMA) May 11, 2005-Vol. 293, No. 18 pp. 2274-2275). In June of 2014 Liu et. al., from the University of Pennsylvania reported that lead level increases of as little as 1 mcg/dL were associated with significant observable increases in teacher reported problems. (Liu, J et. al., JAMA Pediatrics, June 30, 2014; NIH Research. Matters, www.nih.gov/news-events/nih-research-matters/low/levels-lead linked). Lanphear reported in 2000 that for every 1 mcg increase in blood lead concentration there was a

1 point decrement in reading scores, a 0.7 point decrement in mean arithmetic scores et al (Lanphear B. *Cognitive Deficits Associated with Blood Lead Concentrations of <10 mcg/dL in US Children and Adolescents*, Pub Health Reports, November 2000, Vol 115, pp521-529). The American Academy of Pediatrics and the CDC have both stated that there is no safe level of lead. (Low Level Lead Exposure Harms Children: A Renewed call for Primary Prevention. Report of the Advisory Committee on Childhood Lead Poisoning Prevention of the CDC, January 4, 2012).

129. Lead exposure is also harmful to adults. Lead toxicity in adults can cause a myriad of health issues and disorders, including but not limited to, neuro-muscular disorders, birth defects, kidney damage and other cognitive, brain and neurological disorders described above. Lead is also carcinogenic and associated with increased risk of tumorigenesis.

130. Lead is measured in the human body in micrograms per deciliter of blood (mcg/dL). Lead does not belong in the human body. As noted above pediatric and scientific experts' consensus opinion is that there is no safe level of lead in the human body, especially in the bodies of young children. The definition of lead poisoning or the level of concern as has historically been defined by the Center for Disease Control ("CDC") has repeatedly been ratcheted downward. Recent research now indicates that lead is associated with neurobehavioral damage at blood lead levels of

5 mcg/dL or even lower. (CDC Treatise, Low Level Lead Exposure Harms Children). The National Institute of Health, through its Environmental Health Unit has determined that lead levels as low as 2 mcg/dL are responsible for 290,000 cases of attention deficit hyperactivity disorder in the US. (NIEH, *Exposure to Environmental Toxicants and ADHD*, Braun, J et al, September 2006).

d. Mercury

131. The World Health Organization ("WHO") [31 March 2017] has determined that:

- "Exposure to Mercury-even in small amounts- may cause serious health problems, and is a threat to the development of the child in utero and early in life exposure to mercury - even small amounts - may cause serious health problems, and is a threat to the development of the child in utero and early in life.
- Mercury may have toxic effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes.
- Mercury is considered by WHO as one of the top ten chemicals or groups of chemicals of major public health concern.

132. A significant example of mercury exposure affecting public health occurred in Minamata, Japan, between 1932 and 1968,

where a factory producing acetic acid discharged waste liquid into Minamata Bay. The discharge included high concentrations of methylmercury. The bay was rich in fish and shellfish, providing the main livelihood for local residents and fishermen from other areas. For many years, no one realized that the fish were contaminated with mercury, and that it was causing a strange disease in the local community and in other districts. At least 50,000 people were affected to some extent and more than 2000 cases of neurological disease caused by lead exposure, now known as Minamata, disease were certified. Minamata disease peaked in the 1950s, with severe cases suffering brain damage, paralysis, incoherent speech and delirium.

133. Elemental and methylmercury are toxic to the central and peripheral nervous systems. The inhalation of mercury vapor can produce harmful effects on the nervous, digestive and immune systems, lungs and kidneys, and may be fatal. The inorganic salts of mercury are corrosive to the skin, eyes and gastrointestinal tract, and may induce kidney toxicity if ingested. [id.]

134. Neurological and behavioral disorders may be observed after inhalation, ingestion or dermal exposure of different mercury compounds. Symptoms include tremors, insomnia, memory loss, neuromuscular effects, headaches and cognitive and motor dysfunction. Mild, subclinical signs of central nervous system toxicity can be seen in workers exposed to an elemental mercury

level in the air of 20 µg/m3 or more for several years. Kidney effects have been reported, ranging from increased protein in the urine to kidney failure. [id.]

135. Burning coal for power and heat is a major source of mercury.

136. The United States Environmental Protection Agency[13] has determined that mercury is a neurotoxin.

137. Possible symptoms of methylmercury exposure include:

- Loss of peripheral vision;
- "Pins and needles" feelings, usually in the hands, feet, and around the mouth;
- Lack of coordination of movements;
- Impairment of speech, hearing, walking; and/or
- Muscle weakness.

138. Children exposed to methylmercury while they are in the womb can have impacts to their cognitive thinking, memory, attention, language, fine motor skills, and visual spatial skills.

139. The United States Government has also determined the toxic effects of mercury depend on its chemical form and the route of exposure. Methylmercury [CH_3Hg] is the most toxic form. It

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[13] [https://www.epa.gov/mercury/health-effects-exposures-mercury]

affects the immune system, alters genetic and enzyme systems, and damages the nervous system, including coordination and the senses of touch, taste, and sight. Methylmercury is particularly damaging to developing embryos, which are five to ten times more sensitive than adults. Exposure to methylmercury is usually by ingestion, and it is absorbed more readily and excreted more slowly than other forms of mercury. [USGS Fact Sheet 146-00 (October 2000)].

e. Polycyclic Aromatic Hydrocarbons ("PAHs")

140. The Agency for Toxic Substances and Disease Registry[14] has determined:

a. Because of combustion of fossil fuels and organic waste, PAHs are ubiquitous in the environment; b) Studies show that certain PAH metabolites interact with DNA and are genotoxic, causing malignancies and heritable genetic damage in humans; c) In humans, heavy occupational exposure to mixtures of PAHs entails a substantial risk of lung, skin, or bladder cancer.

b. PAHs are a class of organic compounds produced by incomplete combustion or high-pressure processes. PAHs form when complex organic substances are exposed to high temperatures or pressures. [id.]

[14] [https://www.atsdr.cdc.gov/csem/pah/docs/pah.pdf]

141. The more common PAHs include:

- benzo(a)anthracene,
- benzo(a)pyrene,
- benzo(e)pyrene,
- benzo(g,h,i)perylene,
- benzo(k)fluoranthene,
- chrysene,
- coronene,
- dibenz(a,h)acridine,
- dibenz(a,h)anthracene, and
- pyrene. [id. Page 9 of 68]

142. Routes of exposure to PAHs include inhalation, ingestion and dermal contact.

143. Exposure also occurs via placental transfer, and in breast milk.

144. Among the regulatory levels relating to PAHs the EPAs maximum contaminate level (MCL) for PAH in drinking water is 0.2 parts per billion.

145. Diolepoxides—PAH intermediate metabolites—are mutagenic and affect normal cell replication when they react with DNA to form adducts (DNA modifications).

146. The carcinogenicity of PAHs is well established. These include lung, skin gastrointestinal and bladder cancer, as well as scrotal cancer.

147. PAHs can also harm the hematopoietic and immune systems and can produce reproductive, neurologic and developmental effects.

f. Arsenic

148. Arsenic exposure can cause lung and skin cancers and may cause other cancers. The association between chronic arsenic exposure and cancer is strongest for skin, lung, and bladder cancer. Liver (angiosarcoma), kidney, and other cancers have limited strength of association [IARC 2004; NRC 2000].

149. The World Health Organization has also determined that long-term exposure to arsenic from drinking-water and food can cause cancer and skin lesions. It has also been associated with cardiovascular disease and diabetes. In utero and early childhood exposure has been linked to negative impacts on cognitive development and increased deaths in young adults.

150. Other adverse health effects that have been associated by the World Health Organization with long term ingestion of inorganic mercury include:

a. Developmental effects;

b. Diabetes;

c. Pulmonary disease;

d. Cardiovascular disease;

e. Adverse pregnancy outcomes;

f. Lung disease;

g. Heart attack;

h. Kidney failure; and

i. Adverse impact upon cognitive development, intelligence and memory.

151. Chronic arsenic exposure has also recently been associated with inducing or accelerating atherosclerosis, and increasing platelet aggregation.

152. The EPA has set a limit of 0.01 ppm for arsenic in drinking water.

153. Arsenic is released into the atmosphere from coal fired power plants and incinerators because coal and waste products contain arsenic.

154. Arsenic like lead and mercury cannot be destroyed in the environment. It can only change form, or become attached to or separated from particles.

155. Arsenic (and lead or mercury) released from power plants or other combustion processes, are usually attached to very small particles.

156. These particles have the propensity to remain airborne for many days and travel long distances.

INCINERATION

157. At all relevant times, Defendants DuPont, Chemours, Solvay, Arkema, and the Incinerator Defendants and Covanta used

incineration as a method to discharge and dispose of waste from their facilities and elsewhere.

158. As a consequence of this method of discharging waste from these facilities, at all relevant times, vast quantities of toxic particulate matter and gases or vapors were discharged from smokestacks into the air.

159. The process of incineration of the many chemical compounds and waste present at these facilities *inter alia* produces vast quantities of the following toxic chemicals: a) Dioxins, b) Furans, c) Polycyclic Aromatic Hydrocarbons ["PAHs"]. In addition, certain heavy metals such as lead, mercury, arsenic, cadmium, chromium are also released in vast quantities (hereafter collectively, chemicals and heavy metals may be referred to as "incinerator waste").

160. This incinerator waste is largely released into the atmosphere as particulate matter which entrained into the atmosphere where the ambient winds carry these tiny particles large distances which included Plaintiff's residences and the surrounding neighborhoods.

161. The vapors and incinerator waste released from the Chambers Works and West Deptford and Covanta facilities when it finally comes to rest will also contaminate the surrounding soil, and also enters the surrounding ground and surface waters.

162. Further, these particles are so small that they are easily inhaled and pass through the alveoli into the blood stream. They also can be absorbed through the skin and enter into the blood stream in that fashion, or be swallowed and enter into the digestive system.

163. Once within the body, this incinerator waste has the capacity to cross through the placenta and also into the brain and central nervous system.

164. Air pollutants released from incinerators as particulate matter cause lung and heart diseases. Heavy metals such as lead, mercury and arsenic, cause neurological diseases. Toxic chemicals, such as PFAS, dioxins, and furans cause cancer and other health problems.

165. Further, Defendants operated these incinerators in a negligent, reckless and otherwise improper fashion which they knew or should have known subjected the communities surrounding their facilities and Plaintiffs to the high likelihood of developing grave and potentially lethal illness.

166. This misconduct included:

a. Improper design of their incineration facilities;

b. Failure to adequately investigate the potential hazards associated with their incineration activities;

c. Failure to achieve adequate combustion temperatures in their facilities, thereby increasing the number and quantity of toxins produced and discharged;

d. Failure to adequately scrub or otherwise filter or diminish the toxins;

e. Failure to adequately monitor toxic emissions;

f. Failure to accurately report these emissions;

g. Failure to warn the surrounding community and others of the hazards associated with their incineration activities;

h. Failure to properly dispose the solid waste (e.g., ash) that remained after the incineration was completed; and

i. Falsely representing that their incineration activities were environmentally safe and posed no health risks when they knew or should have known that this was not the case;

167. This misconduct was motivated by greed and in reckless disregard of the health and safety of Plaintiffs and their neighbors.

Exposure

168. Relevant exposures in this case occurs by direct or indirect exposure by absorption, contact, ingestion, and inhalation.

169. The dose of exposure takes into account *inter alia*:

a. The intensity of exposure (sometimes quantified in parts per million, billion or trillion or by other units of measurement);

b. The duration of exposure (measured in units of time);

c. The chronicity of exposure (e.g., a single event, a work week, continuously);

d. The timing of exposure relative to, for example, either the onset or diagnosis of disease, or the gestational stages of pregnancy, time of lactation, or periods of post-natal development.

170. Exposure must also take into account what occurs from a metabolic perspective once a toxin enters the body. Some toxins are broken down by metabolic processes which produce metabolites which are themselves toxic. Various chemicals often produce the same harmful metabolite thereby enhancing their common toxicity. Further, toxins have the capacity to overwhelm the body's natural defense mechanisms (e.g., the liver or kidney) thereby allowing additional toxins to wreak havoc.

171. Further, some of these toxins, particularly the heavy metals, PFAS, and PAH's have the capacity to remain in the body (and in the environment) for prolonged periods and therefore continue to cause harm. In fact, the body often stores these

toxins in bone or fatty tissue. During pregnancy and at other times, these toxins are leached or released from these sites to cause increased harm.

172. Regulatory standards respecting the causation chemicals do not take into account exposures to multiple toxins or even multiple routes of exposure (e.g., skin and inhalation) to a single toxin.

173. Allegations concerning the presence, discharge and dispersion of PFOS and PFNA have already been discussed and found plausible by the Court in prior Rule 12(b)(6) Fed. R. Civ. P. motion practice.

174. Insofar as the remaining causation chemicals are concerned, first, as set forth above, it is established scientifically, that the process of incineration necessarily produces *inter alia*, dioxins, PAHs, furans, as well as lead, mercury and arsenic and other PFAS compounds.

175. Accordingly, even if there records or monitoring results did not exist to confirm their presence, nonetheless as a matter of well-established physical and chemical and thermodynamic principles their presence may not only be inferred, but are certain.

176. As explained above, these emissions, in vapor but principally in airborne particulate form travel long distances,

indeed many miles farther than the locations where these Plaintiffs were chronically exposed.

177. Even preliminarily and prior to any disclosure respecting these causation chemicals, publicly available sources dating back as far as the 1970s and continuing forward to the present (e.g., EPA RCRA reports, US Army Engineering Reports, 1976 Directory of Chemical Producers, Enforcement Action Excel Reports) have confirmed the presence of the causation chemicals at Defendants' facilities as well as in the surrounding community.

178. These sources *inter alia* document the presence of:

a. PFAS;

b. Lead;

c. Mono- and dichlorobenzenes;

d. Benzene;

e. Arsenic;

f. PCBs

g. Mercury;

h. Naphthalene; and

i. Various PAHs.

179. Illustrative of the presence and dispersion of these causation chemicals is a Comprehensive RCRA Facility Investigation Report - DuPont Chambers Works Complex, Deepwater, NJ, transmitted to the U.S. EPA on October 1, 2014 by DuPont to the EPA. This

lengthy report contains admissions respecting the presence and dispersion of causation chemicals. These include:

a. A determination that sampling at Carney's Point found exceedances of arsenic, lead, five PAHs, and 2,4-DNT [p. 106 Point 9.1];

b. A wide variety of VOC and SVOC exceedances of NJNRDCSRS remained on the site including arsenic lead and mercury [id., p. 107];

c. Groundwater sampling revealed concentrations that exceeded NJGWIIA in the local aquifer including arsenic, lead, mercury, and benzoanthracene (a PAH) [id. p. 108]

d. Groundwater sampling found exceedances for both PFOA and PFOS [id. p.109]

e. Carneys Point Soil Data Status reported exceedances for Manufacturing Areas 1,2, and 5 including benzo(a)pyrene (a PAH), arsenic, lead, 5 PAHs [id., Table 6.1];

f. Soil samples at the Carneys Point dewatering pond revealed exceedances of benzo(k)fluoranthene and dibenzo(a,h)anthracene, both PAHs [id.]

g. Soil samples at incinerators I through IV identified multiple exceedances including Bezo(a)pyrene, Benzo(a)antracene, naphthalene,

Benzo(b)flouroanthene, and a wide variety of Volatile Organic Chemicals and metals which include dioxins and furans. [id., Table 7-1];

h. Table 7-1 identified above contains a lengthy list of other soil samples from the Chambers Works site that include landfills, dump sites, that repeatedly identify all of the causation chemicals;

i. The same is true for Table 7-2 referencing yet additional exceedances from soil sampling.

180. Attached hereto as **Exhibit B** are Tables from this DuPont report to the EPA.

181. Some incinerator Stack Emission data that is publicly available for West Deptford and Chambers Works identify *inter alia* between 2003 and 2022[15] the following relevant substances:

a. Lead compounds (both sites);

b. Dioxin (DuPont);

c. Mercury (both sites);

d. A variety of PAHs (both sites); and

e. Arsenic (Solvay)

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[15] Sources for this data include: EPA Toxics Release Inventories Lead and Lead Compounds 2016-2020 [Chemours]; EPA Toxics Release Inventories Benzoperylene 2016-2017 [Chemours]; DUPONT SPECIALTY PRODUCTS USA LLC-CHAMBERS WORKS FACILITY 2003, 2005, 2006, 2007, 2008; and https://echo.epa.gov/detailed/facility/report?fid=110007970142.

182. Another document dated June 29, 2017 from a Solvay consultant Thomas R. Buggey to the New Jersey DEP-Bureau of Case Management entitled Perfluoroalkyl Compound Investigation Report nonetheless identifies the following:

a. Confirmation of the presence of PFAS as well as PFOA in well water sampling and soil sediment sampling proximate to the plant (p. ix);

b. Laboratory sample findings of PFDA as well as PFOS and PFNA in soil sampling (p.3-3)

c. Admission that Sodium Perfluoroocanoate (NaPFO) described as a long chain PFAS was employed at the facility until about 2002 (p.3-10 and n.4);

d. Chart acknowledging the large volumes of Surflon and NaPFO used at the facility between 1991 and 2010 (p.3-10);

e. Admissions that PFAS concentrations of soil samples "may be the result of air deposition from identified emission sources located near the Polymer building" (p. 5-1).

f. Groundwater findings for PFOA and PFNA (p.5-5);

g. Charts showing soil boring results for PFOA, PFNA and PFUnDA (Fig.2);

h. Aerial photo showing locations around facility where soil samples located PFOA, PFOS, PFNA, PFUnDA (Fig.4, 6).

183. The above illustrations are a small part of the proofs that discovery and further expert investigation will inevitably disclose respecting the presence and dispersion of the causation chemicals in addition to PFOS and PFNA.

184. The presence and dispersion of these causation chemicals is not only plausible but virtually certain. Nor is their toxicity and capacity individually and collectively to cause harm, including those suffered by the instant Plaintiff subject to doubt.

Bases for Punitive Damages

185. At all material times hereto, Defendants knew or should have known that their causation chemicals would contaminate the environment including the air, soil, and groundwater and contaminate the drinking and household water of residents in surrounding communities, including Plaintiff's.

186. At all material times, Defendants knew or should have known that their causation chemicals were hazardous substances and the reckless, and/or wanton and willful discharge of those chemicals into the environment and surrounding communities would reach Plaintiff's property, soil, air, and drinking and household water wells thus exposing them to high and injurious concentrations of the hazardous chemicals.

187. At all material times, Defendants knew or should have known of the health and environmental impacts of their causation chemicals for decades but continued to use them in products and release them into the environment.

188. At all material times hereto, Defendants knew that the causation chemicals were harmful to people and the environment based on its own studies.

189. At all material times hereto, despite actual or constructive knowledge of its chemicals' toxicity to humans and the environment, Defendants proactively sought to conceal that information from the public.

190. At all material times hereto, despite actual or constructive knowledge of its chemicals' toxicity to humans and the environment, Defendants proactively misrepresented the chemicals' hazardous properties, including knowingly and purposefully withholding material information from regulators and governmental agencies.

191. At all material times, even after Defendants acquired actual knowledge that it was causing groundwater, soil, air, and drinking water contamination and thus exposing Plaintiff and nearby residents to its causation chemicals, Defendants continued their operations and continued discharging these toxins into the environment and exposing residents in surrounding communities,

including Plaintiff, in reckless and conscious disregard for the serious health and safety risks associated with such exposure.

192. At all material times, Defendants committed acts and omissions with respect to causation chemicals with actual malice and/or with a wanton and willful disregard of persons who foreseeably might be harmed by those acts or omissions.

193. At all material times, Defendants knowingly, continuously, and with conscious indifference to the rights of residents in surrounding communities, including Plaintiff, to have access to clean air, soil, water, and drinking water, caused, allowed, or permitted the discharge of large quantities of causation chemicals into the environment, air, soil, and groundwater, had no justification for doing so, and made no effective effort to alleviate the problem.

194. This misconduct was motivated by greed and taken in deliberate and knowing disregard of their duties to Plaintiff and all similarly situated individuals.

195. Defendants' acts and omissions as set forth in the preceding paragraphs demonstrate their reckless and conscious disregard of the health, safety, and welfare, of residents in the community, including Plaintiff.

196. As a direct and proximate result of Defendants' conscious and deliberate disregard for the health, safety, and welfare of residents in surrounding communities, including

Plaintiff, Plaintiff suffered and continues to suffer severe and permanent personal injuries and other damages, both economic and noneconomic, as set forth above.

197. The misconduct of Defendants was committed with knowing, conscious, and deliberate disregard for the rights and safety of residents in surrounding communities, including Plaintiff, thereby entitling Plaintiff to punitive damages in an amount appropriate to punish Defendants and deter them from similar conduct in the future.

198. Defendants' actions showed willful misconduct, malice, fraud, wantonness, and/or oppression, and conscious indifference to the consequences.

199. As a consequence, each Defendant is individually and jointly and severally liable to Plaintiff for both compensatory and punitive damages.

CLAIMS

Count I: Negligence

Plaintiff v. All Defendants
(Including John Doe Entities #1-10)

200. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

201. Defendants knew or should have known that the release of causation chemicals into the air, soil, groundwater and drinking

or household water are hazardous to human health and the environment.

202. Defendants further knew or should have known that it was unsafe and/or unreasonably dangerous to discharge the causation chemicals into the environment in proximity to surrounding residential communities, including Plaintiff's residence(s).

203. Defendants DuPont, Chemours, Solvay, Arkema, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 had a duty to take all reasonable measures to ensure that the causation chemicals would be effectively contained and not discharged into the surrounding environment.

204. Defendants DuPont, Chemours, Solvay, Arkema, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 had a duty to operate and manage their facilities and its related wastes in such a way as to not create a nuisance or dangerous condition that could cause injury or damage to human health and the environment.

205. Defendants DuPont, Chemours, Solvay, Arkema, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 further had a duty to ensure that the manufacturing and incineration processes that they chose to employ did not unreasonably endanger the drinking water relied upon by residents in the surrounding community and the air that they breathed, including Plaintiff.

206. Defendants DuPont, Chemours, Solvay, Arkema, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 breached

the above-stated duties by unreasonably disposing of the causation chemicals in a manner which made it foreseeable that they would enter the environment, specifically but not limited to the air and groundwater, exposing nearby residents, including Plaintiff, who relied upon the groundwater for their drinking and household water supply and relied on the surrounding atmosphere for the air that they breathed.

207. Defendant 3M had a duty to warn users of their PFAS and other relevant products, regulatory agencies, and those who might be exposed to those products, of the dangers of releasing PFAS and other relevant toxins into the environment.

208. Defendant 3M breached the above-stated duty by failing to adequately warn and provide sufficient instructions to purchasers such as Defendants DuPont, Chemours, Solvay, Arkema, Covanta and the Incinerator Defendants, and John Doe Entities #1-10, to avoid discharging PFAS and other relevant toxins into the environment where it was likely to enter the environment including the soil, air, and water including groundwater and be inhaled, absorbed and/or ingested by residents including Plaintiff in surrounding communities.

209. Defendant 3M further breached a duty by neglecting to inform itself of the improper manner in which its purchasers, including the other Defendants mishandled highly toxic 3M products.

210. As a direct and proximate result of these acts and omission, Defendants individually and collectively wrongfully caused the environment to be contaminated with PFAS and the other causation chemicals, thereby exposing Plaintiff to these chemicals and substances, and causing injury to Plaintiff as described above.

211. All Defendants contributed to the contamination of the environment with the causation chemicals, and all subsequently contributed to Plaintiff's exposure to these chemicals, thereby causing injury to Plaintiff.

212. The acts and omissions of Defendants were negligent, and as a result, Joseph has suffered and/or will in the future suffer damage in the form of bodily injury, emotional distress, economic loss, medical expenses and was otherwise damaged, for which Defendants are liable.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count II: Gross Negligence and Recklessness

Plaintiff v. All Defendants
(Including John Doe Entities #1-10)

213. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

214. At all relevant times, Defendants, as detailed above, committed acts and omissions with respect to PFAS and other causation chemicals with actual malice and/or with a wanton and willful disregard of persons who foreseeably might be harmed by those acts or omissions and/or with gross negligence.

215. Specifically, Defendants caused, permitted, and allowed the release of PFAS and other causation chemicals into the environment including the air, water, and soil, including the drinking water of Plaintiff, demonstrating an entire want of care and a conscious indifference to the rights, welfare, safety, and health of Plaintiff, such that Defendants' acts constitute gross negligence or reckless, willful or wanton misconduct.

216. Such conduct was motivated by greed in an effort to maximize profit with disregard to their duties and responsibilities to the public and to Plaintiff.

217. All Defendants contributed to the contamination of the environment with PFAS and other causation chemicals, and all subsequently contributed to Plaintiff's exposure to these chemicals, thereby causing injury to them.

218. Defendants' conduct involved deliberate acts or omissions with knowledge of a high degree of probability of harm to the Plaintiff and an attendant reckless indifference to his health, safety, and welfare.

219. Defendants' conduct demonstrated a willful and wanton, malicious and reckless disregard of the rights of Plaintiff so as to constitute gross negligence and recklessness and warrant the imposition of punitive damages.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count III: Private Nuisance

Joseph v. Solvay, Arkema, DuPont, Chemours, Covanta and Incinerator Defendants, and John Doe Entities #1-10

220. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

221. Defendants' acts and omissions with respect to the release of the causation chemicals into the environment resulted in the contamination of the air, soil, and water, including but not limited to Plaintiff's water supply, and have thus unreasonably interfered with Plaintiff's use and enjoyment of his property, invading the home and body of Joseph.

222. Defendants' acts and omissions with respect to the release of PFAS and other causation chemicals made Plaintiff's water supply unfit for consumption and other domestic purposes.

223. Defendants' unreasonable interference with the use and enjoyment of Plaintiff's property constitutes a continuous invasion of his rights.

224. Defendants, Solvay, Arkema, DuPont, Chemours, and Covanta and the Incinerator Defendants all contributed to the contamination of the environment with PFAS and other causation chemicals, and all substantially contributed to a private nuisance on Plaintiff.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count IV: Public Nuisance

Joseph v. Solvay, Arkema, DuPont, Chemours, Covanta and the Incinerator Defendants, and John Doe Entities #1-10

225. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

226. Defendants' conduct detailed above unreasonably interfered with a right common to the general public, including the public's right to be free from environmental contamination in the air it breathes and water it drinks, and in which its members bathe, shower, and swim.

227. Defendants' conduct detailed above unreasonably and significantly interfered with the public health and public safety

by contaminating water, soil, and air with toxic and carcinogenic chemicals.

228. Defendants' conduct was of a continuing nature, and/or produced a long-lasting effect, and Defendants knew and/or had reason to know that it would have a significant effect on the public's rights.

229. Joseph suffered harm of a kind different from that suffered by other members of the public exercising the right common to the general public.

230. Defendants' acts and omissions with respect to the release of causation chemicals in the environment including the air, soil, and water resulted in the contamination of Plaintiff's home and private water supply and the air that he breathed.

231. Defendants' unreasonable interference with the use and enjoyment of Plaintiff's property constitutes a continuous invasion of his rights.

232. Defendants, Solvay, Arkema, DuPont, Chemours, and Covanta and the Incinerator Defendants all contributed to the contamination of the environment with causation chemicals, and all subsequently contributed to the public nuisance imposed on Plaintiff.

233. Defendants' creation of a continuing public and/or private nuisance has damaged Joseph in the form of bodily injury,

emotional distress, and other damages all of a type not common to the general public, for which Defendants are liable.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count V: Past and Continuing Trespass

Joseph v. Solvay, Arkema, DuPont, Chemours, Covanta and the Incinerator Defendants, and John Doe Entities #1-10

234. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

235. As related above, Joseph, is the owner(s) and/or possessor(s) of real property and resides or resided on those properties.

236. Defendants negligently, recklessly, and/or intentionally failed to properly control, apply, use and/or dispose of causation chemicals resulting in its discharge into the environment entering, invading, intruding, and injuring the rights of Plaintiff to possess and enjoy his properties.

237. Plaintiff has not consented and does not consent to the contamination alleged herein, and Defendants knew or reasonably should have known that Plaintiff would not consent to such.

238. Defendants, Solvay, Arkema, DuPont, Chemours, and Covanta and the Incinerator Defendants all contributed to the

contamination of the environment with causation chemicals, and all subsequently contributed to the past and continuing trespass imposed on Plaintiff.

239. As a direct and proximate result of Defendants' acts and omissions as alleged herein, the soil and drinking water wells on Plaintiff's properties and the space over his property have been contaminated with causation chemicals, causing significant personal injuries and damage, including actual, consequential, and nominal damages as described above.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count VI: Strict Liability (Abnormally Dangerous Activities)

Plaintiffs v. Solvay, Arkema, DuPont, Chemours, 3M, Covanta and the Incinerator Defendants, and John Doe Entities #1-10

240. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

241. At all relevant times, Defendants Solvay, Arkema, DuPont, Chemours, 3M, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 sold, disposed of, discharged, and emitted hazardous substances (causation chemicals) from their facilities which they owned, controlled, and operated.

242. As a result of Defendant 3M selling and Defendants Solvay, Arkema, DuPont, Chemours, Covanta and the Incinerator Defendants, and John Doe Entities #1-10 discharging such substances from their sites, the groundwater under Plaintiff's property and the space over and around his property was contaminated with hazardous substances, creating actual harm to Plaintiff.

243. The manufacturing, utilization, disposal, and discharge of PFAS and other causation chemicals constitute abnormally dangerous activities that introduce an unusual danger into the community.

244. Defendants' activities in selling, manufacturing, utilization, disposal, and discharge of these products presented a high degree of risk of harm to the person, land, and/or chattels of others.

245. It was likely that the harm resulting from Defendants' activities would be great.

246. The exercise of reasonable care does not eliminate the risk of harm posed by Defendants' activities.

247. Defendants' activities are not a matter of common usage in the areas in which they were carried out.

248. Defendants' activities were inappropriate to the locations in which they were carried out.

249. The dangerous attributes of and risk posed by Defendants' activities outweighed their value to the community.

250. The manufacturing, utilization, disposal, and discharge of these products are not matters of common usage in the areas where these activities were carried out.

251. At all relevant times, the risk of the Defendants' abnormally dangerous activities outweighed the value to the community.

252. Defendants' acts and omissions in selling, manufacturing, utilizing, disposing, and discharging hazardous chemicals proximately caused the contamination to Plaintiff's properties and the air he breathed and injuries to Plaintiff, making Defendants strictly liable for the harm caused by such contamination.

253. Defendants Solvay, Arkema, DuPont, 3M, Chemours, and the Incinerator Defendants and Covanta all foreseeably contributed to the contamination of the environment with causation chemicals, and all subsequently contributed to Plaintiff's exposure to these chemicals, thereby causing injury to him.

254. As a direct and proximate result of Defendants' discharges of hazardous substances and contaminants, Plaintiff has and will continue to suffer damages.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants for compensatory, non-compensatory damages, and

punitive damages together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count VII: Strict Liability (Failure to Warn)

Plaintiffs v. 3M & John Doe Entities #1-10

255. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

256. Defendant 3M developed, tested, assembled, manufactured, packaged, labeled, prepared, distributed, marketed, and/or supplied PFAS and other toxins for sale and sold such products to Defendants DuPont, Chemours, Solvay, Arkema, Covanta, and John Doe Entities #1-10 in the ordinary course of their businesses.

257. Upon information and belief, Defendants DuPont, Chemours, Solvay, Arkema, Covanta, and John Doe Entities #1-10 utilized the PFAS chemicals supplied by Defendant 3M in a reasonably foreseeable and intended manner.

258. The PFAS sold by Defendant 3M were unreasonably dangerous to residents of surrounding communities, including Plaintiff, without adequate warnings and instructions to prevent discharge of PFAS and other toxins into the environment and to prevent the accumulation of these chemicals inside the bodies of residents in surrounding communities, including Plaintiff.

259. Defendant 3M knew or should have known and it was foreseeable to 3M that the PFAS it manufactured would be discharged into the environment and cause contamination of the water supply

of residents and accumulation in the blood serum and bodily tissues of residents living in the surrounding communities, including Plaintiff.

260. Defendant 3M failed to advise Plaintiff as well as Defendants Solvay, Arkema, DuPont, Chemours, the Incinerator Defendants, and Covanta, and John Doe Entities #1-10 which were purchasers, users or those foreseeably exposed, to their PFAS about the risks these products posed to foreseeable third parties, such as Plaintiff, and about techniques that could be employed to reduce or eliminate these risks.

261. Defendant 3M had actual knowledge of the health hazards associated with PFAS through both animal studies conducted by researchers employed or contracted by itself and others and though experience with Defendant's own workers, but, upon information and belief, failed to share such information with purchasers, users or those foreseeably exposed to their products, including Plaintiff, Defendants, DuPont, Chemours, Solvay, Arkema, the Incinerator Defendants, Covanta, and John Doe Entities #1-10, or with governmental agencies.

262. Defendant 3M acted with reckless indifference to the health and safety of residents in surrounding communities where its PFAS and other toxins were used by failing to provide adequate warnings of the known dangers of such products when discharged

into the environment and ingested by nearby residents, such as Plaintiff.

263. Defendant 3M had a duty to warn users of their PFAS products and other toxins of the dangers of releasing PFAS into the environment.

264. Defendant 3M breached the above-stated non-delegable duty by failing to adequately warn and provide sufficient instructions to purchasers such as Defendants, Solvay, Arkema, DuPont, Chemours, Covanta, the Incinerator Defendants and John Doe Entities #1-10, to avoid discharging PFAS into the environment where it was likely to enter groundwater and be ingested by residents in surrounding communities, including Plaintiff.

265. As a direct and proximate result of Defendant 3M's acts and omissions, Plaintiff has and will continue to suffer damages.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants, 3M and the John Doe Entities #1-10, for compensatory, non-compensatory damages and punitive damages, together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

Count VIII: Strict Liability (Defective Design)

Plaintiffs v. 3M & John Doe Entities #1-10

266. Plaintiff incorporates the allegations contained in all preceding paragraphs as if fully restated herein.

267. Defendant 3M designed, manufactured, and sold PFAS that was used and/or discharged at the Chambers Works and West Deptford facilities and elsewhere by Defendants DuPont, Chemours, Solvay, Arkema, the Incinerator Defendants, Covanta and John Doe Entities #1-10.

268. As a manufacturer and seller of PFAS, Defendant 3M had a duty to make and sell products that are reasonably fit, suitable, and safe for their intended or reasonably foreseeable uses.

269. Defendant 3M owed that duty to direct users of its products, to reasonably foreseeable users of its products, and to any person who might reasonably be expected to come into contact with these products, including Plaintiff.

270. Defendant 3M's PFAS products were used in a reasonably foreseeable manner and without substantial change in the condition of such products and were defective and unfit for their reasonable use.

271. Defendant 3M knew or should have known that use of its PFAS products used by Defendants DuPont, Chemours, Solvay, Arkema, Covanta, and John Doe Entities #1-10 would result in the spillage, discharge, and/or release of PFAS into the environment and would contaminate the environment including the groundwater, air, soil, and drinking water of surrounding communities, including Plaintiff's.

272. Defendant 3M knew or should have known that its PFAS would eventually come into contact with and harm residents in communities where its products were used, including Plaintiff.

273. Defendant 3M's PFAS products were defective in design and unreasonably dangerous because, among other things:

a. PFAS cause extensive and persistent contamination when used in a reasonably foreseeable and intended manner; and

b. PFAS contamination in the environment, including the air, soil, and groundwater, which are the sources of drinking water to citizens in the surrounding communities, including Plaintiff, poses significant threats to their health, safety, and welfare.

274. At all relevant times, Defendant 3M's PFAS which it designed, manufactured, and sold were dangerous to an extent beyond that which would be contemplated by the ordinary consumer.

275. The foreseeable risk to public health and welfare, including that of Plaintiff, posed by Defendant 3M's PFAS outweighed the cost to Defendant 3M of reducing or eliminating such risk.

276. Defendant 3M knew or should have known about reasonably safer and feasible alternatives to PFAS.

277. As a direct and proximate result of Defendant 3M's acts and omissions, Plaintiff has and will continue to suffer damages.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants, 3M and the John Doe Entities #1-10, for compensatory and non-compensatory damages, together with interest, costs, attorneys' fees and all such other relief as the Court deems proper.

WHEREFORE, Plaintiff requests that this Court enter judgment against Defendants, 3M and the John Doe Entities #1-10, for compensatory, non-compensatory damages and punitive damages, together with interest, costs, attorneys' fees, and all such other relief as the Court deems proper.

DEMAND FOR JURY TRIAL

Plaintiffs hereby demand a trial by jury on all issues so triable.

DESIGNATION OF TRIAL COUNSEL

Steven Phillips, Esq. is designated as trial counsel on behalf of Plaintiffs.

RULE 4:5-1 CERTIFICATION

I hereby certify, pursuant to Rule 4:5-1:

1. The matter in controversy is not the subject of any action pending in any court or any pending arbitration proceedings. No other action or arbitration proceeding is or

contemplated. However, other Plaintiffs have filed similar complaints against these Defendants. They have been removed to the United States District Court by Defendants E.I. DuPont, de Nemours & Company. Plaintiff in those cases has filed a motion to remand to this Court which has not yet been resolved.

2. There is no other party who should be joined in this action.

3. Confidential personal identifiers have been redacted from documents now submitted to the court and will be redacted from all documents submitted in the future in accordance with Rule 1:38-7(b).

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SZAFERMAN LAKIND
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BY: *s/Arnold Lakind*
Arnold Lakind, Esq.

Dated: December 5, 2022

EXHIBIT A

State of New Jersey
Department of Environmental Protection
P.O. Box 420
Trenton, New Jersey 08625

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

IN THE MATTER OF POLY- AND PERFLUOROALKYL SUBSTANCES (PFAS) GENERATED BY:

SOLVAY SPECIALTY POLYMERS USA, LLC;
SOLVAY SOLEXIS, INC.;
E.I. DU PONT DE NEMOURS & COMPANY;
DOWDUPONT, INC.;
DUPONT SPECIALTY PRODUCTS USA, LLC;
THE CHEMOURS COMPANY FC, LLC;
THE CHEMOURS COMPANY; and,
THE 3M COMPANY

STATEWIDE PFAS DIRECTIVE, INFORMATION REQUEST AND NOTICE TO INSURERS

This Directive, Information Request, and Notice to Insurers (hereafter, "Directive") is issued pursuant to the authority vested in the Commissioner of the New Jersey Department of Environmental Protection ("Department") by N.J.S.A. 13:1D-1 et seq., the Spill Compensation and Control Act ("Spill Act"), N.J.S.A. 58:10-23.11 et seq., the Water Pollution Control Act ("WPCA"), N.J.S.A. 58:10A-1 et seq., the Air Pollution Control Act ("APCA"), N.J.S.A. 26:2C-1 et seq., and the Solid Waste Management Act ("SWMA") N.J.S.A. 13:1E-1 et seq., to Solvay Specialty Polymers USA, LLC and its predecessor Solvay Solexis, Inc. (collectively, "Solvay"), E.I. du Pont de Nemours & Company, ("DuPont"), DowDuPont, Inc. ("DowDuPont"), DuPont Specialty Products USA, LLC, The Chemours Company FC, LLC ("Chemours FC, LLC"), The Chemours Company ("Chemours") and The 3M Company ("3M") (collectively, the "Respondents") to notify them that the Department believes them to be responsible for the significant contamination of New Jersey's natural resources, including the air and waters of the State, with poly- and perfluoroalkyl substances ("PFAS"), including perfluorononanoic acid ("PFNA"), perfluorooctanoic acid ("PFOA"), and perfluorooctanesulfonic acid ("PFOS"), and their replacement compounds, including but not limited to "GenX".

PFAS are being discovered in drinking water, groundwater, surface waters, sediments, soils, air, fish, plants, and other natural resources across New Jersey on a near daily basis. These PFAS compounds constitute a substantial threat to human health and the environment and a statewide public nuisance: they are extremely resistant to degradation and thus persist indefinitely in the environment; they bioaccumulate; they are commonly contained in consumer and household products; and contamination from PFAS is now ubiquitous in New Jersey. While Respondents and their predecessors in interest have understood the toxic characteristics of PFAS for decades, regulatory agencies around the world are only now coming to understand the true nature and dangers of these global contaminants. As further detailed below, the Department has expended and will continue to expend tremendous resources to identify and investigate the presence of PFAS in New Jersey's environment, as well as to monitor, treat, clean up, and/or remove PFAS in impacted areas. As a result, the Department has determined that it is imperative

to the protection of public health and safety and the environment of New Jersey that such investigation, monitoring, testing, treatment, cleanup and removal continue, and that Respondents, not New Jersey residents, pay for these activities.

To protect public health and the environment, the Department requires a full understanding of Respondents' historical development, manufacture, transport, use, storage, release, discharge, and/or disposal of PFAS in New Jersey. The Department likewise requires an immediate understanding of Respondents' current development, manufacture, transport, use, storage, release, discharge, and/or disposal of any chemical replacements for PFAS in New Jersey. While these replacement chemicals have been touted as short-chain and having shorter half-lives, some may have similar toxicity and, like their predecessors, they do not break down in the environment and have also been detected in drinking water, groundwater and surface waters in New Jersey. Therefore, the Department is directing that Respondents provide a complete accounting of their historical and current activities with respect to these chemicals in New Jersey.

Under the Spill Act, WPCA, SWMA, and APCA, the Respondents are responsible for PFAS—including PFNA, PFOA, PFOS and their replacement PFAS compounds—that have been discharged or released into New Jersey's air, water and other natural resources, as set forth below.

FINDINGS

A. PFAS Contamination in New Jersey

PFAS: Contaminants of Emerging Concern

1. Poly- and perfluoroalkyl substances, collectively referred to as PFAS, are man-made chemicals manufactured and used in the United States since the 1940s. PFAS have fire-resistant properties and act as oil, grease and water repellants. They have been used to make numerous household products, including name brands such as Stainmaster®, Scotchgard®, Teflon®, Gore-Tex®, and Tyvek®. PFOS has long been used in aqueous film-forming foam ("AFFF") used to fight fires. There are literally thousands of PFAS compounds.

2. PFAS are highly persistent in the environment and are resistant to metabolic and environmental degradation processes. They are also bioaccumulative, resulting in the buildup of these toxins in living tissue. As a result, people exposed to these substances through drinking water or other means accumulate increasing concentrations of PFAS in their blood. Some PFAS are classified as likely human carcinogens. Studies show that exposure to PFAS may cause testicular cancer, kidney and liver cancer, and autoimmune and endocrine disorders in adults as well as developmental effects to fetuses during pregnancy or to breastfed infants. Other associated human health effects include reduced vaccine response, and increased cholesterol and liver enzymes.

3. DuPont and 3M knew of the health and environmental impacts of PFAS for decades but continued to use them in products and to release them into the environment. 3M knew that PFOA and PFOS were harmful to people and the environment, including based on its own studies from as early as the 1970s. 3M also knew that the chemicals could leach into groundwater and contaminate the environment. DuPont knew for decades that PFOA was toxic, including through studies of its own workers. DuPont also knew that PFOA was being discharged into the environment, but failed to disclose the risks to regulators or the public. Likewise, through its membership in an industry

trade group that conducted toxicology studies on PFNA in the 2000s, Solvay knew or should have known of the adverse effects of PFNA exposure. Solvay knew that it was discharging large amounts of PFNA into the environment from their West Deptford, New Jersey facility at least as early as 1991.

4. The United States Environmental Protection Agency ("EPA") has identified PFAS as "emerging contaminants," which are currently unregulated at the federal level. In 2009, EPA issued preliminary health advisory values for PFOA and PFOS in drinking water of 400 parts per trillion ("ppt") and 200 ppt, respectively. In 2016, EPA reduced its advisories for the chemicals in drinking water to 70 ppt, combined. Other federal agencies have suggested drinking water values should be much lower. Then, in 2018, the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry ("ATSDR") released draft minimum risk levels—the amount of a chemical a person can eat, drink or breathe each day without a detectable risk to health—for PFOA and PFNA equivalent to 21 ppt, and for PFOS 14 ppt.

A. Regulation of PFNA, PFOA and PFOS.

5. In the absence of action at the federal level to meaningfully regulate these contaminants of emerging concern, New Jersey has acted to protect its citizens and environment and to regulate PFNA, PFOA and PFOS, including by seeking to establish Maximum Contaminant Levels ("MCLs") and Groundwater Quality Standards ("GWQS") for these chemicals, and to add these chemicals to the Department's List of Hazardous Substances at N.J.A.C. 7:1E-Appendix A, as well as taking other necessary actions.

6. The New Jersey Drinking Water Quality Institute ("DWQI") is established pursuant to the Safe Drinking Water Act ("SDWA"), N.J.S.A. 58:12A-1 et seq. It is an advisory body that, among other items, provides the Department with maximum contaminant level recommendations for New Jersey-specific drinking water contaminants.

7. The Department establishes MCLs at N.J.A.C. 7:10 pursuant to the SDWA to protect the public against consumption of drinking water contaminants that present a risk to human health. N.J.S.A. 58:12A-13(b). MCLs apply to public community and public non-community water systems, which are required to monitor for contaminants for which MCLs have been established, and to take actions to reduce contaminant levels or other appropriate actions when there is an exceedance of the MCL.

8. GWQS are set forth at N.J.A.C. 7:9C and are implemented as limits on discharges to groundwater pursuant to the New Jersey Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, and as groundwater remediation standards, N.J.A.C. 7:26D-2.2(a).

9. In July, 2015, DWQI recommended to the Department that an MCL for PFNA of 13 ppt be established, and on November 25, 2015, the Department established an interim GWQS for PFNA of 10 ppt pursuant to N.J.A.C. 7:9C-1.7(c).

10. In March 2017, after public comment and a vote, DWQI recommended to the Department that an MCL for PFOA of 14 ppt be established.

11. In November 2017, after public comment and a vote, DWQI recommended to the Department that an MCL for PFOS of 13 ppt be established.

12. On January 16, 2018, the Department adopted a specific GWQS for PFNA of 10 ppt and added PFNA to the Department's List of Hazardous Substances (see 50 N.J.R. 334(a)).

13. On September 4, 2018, consistent with the recommendation of DWQI, the Department adopted an MCL for PFNA of 13 ppt (see 50 N.J.R. 1939(a)).

14. On January 17, 2019, the Department solicited public input and posted on its website technical documents in support of its draft Interim Specific Groundwater Quality Criteria for PFOA and PFOS of 10 ppt. *See* https://www.nj.gov/dep/dsr/ISGWQC_Public_Comment_PFOS_PFOA.html.

15. On March 13, 2019, the Department established interim specific groundwater quality criteria for PFOA and PFOS of 10 ppt, pursuant to N.J.A.C. 7:9C-1.7(c). *See* https://nj.gov/dep/wms/bears/gwqs.htm. These interim specific criteria became effective on posting to NJDEP's website, and will remain in effect until replaced with specific criteria. N.J.A.C. 7:9C-1.7(c)(ii).

16. The Department has submitted to the Office of Administrative Law a notice of proposed rule amendments concerning PFOA and PFOS, which is anticipated to be published in the New Jersey Register on April 1, 2019. The Department will propose amending the Safe Drinking Water Act rules establishing MCLs for PFOA of 14 ppt and for PFOS of 13 ppt; establishing groundwater quality criteria standards for PFOA of 14 ppt and PFOS of 13 ppt; and adding PFOA and PFOS to the List of Hazardous Substances.

B. **PFAS Contamination in New Jersey**

17. The Department's first statewide occurrence study of PFAS in drinking water in 2006, which focused on PFOA and PFOS near facilities that used, handled, stored and/or manufactured PFOA and/or other chemicals, revealed that, out of the 23 drinking water sources sampled, PFOA and PFOS were detected in 65-percent and 30-percent of the systems tested, respectively.

18. In order to gain further knowledge on the occurrence of PFOA, PFOS and other PFAS in New Jersey's drinking water sources, the Department initiated a second occurrence study in 2009 and early 2010. The results of this second occurrence study revealed that, out of 33 drinking water samples from 20 of New Jersey's 21 counties, between one and eight PFAS compounds were detected in 70-percent of the samples. In the samples tested, PFOA was detected in 57-percent (up to 100 ppt), PFOS was detected in 30-percent (up to 43 ppt), and PFNA was found at the highest reported level in drinking water anywhere in the world, at 96 ppt.

19. The Department is continuing to study PFAS compounds and their impact on New Jersey's environment. In 2018, the Department performed an assessment of 13 PFAS compounds in the ecosystems of 11 waterways across New Jersey, which included analyzing surface water, sediment and fish tissue samples. The results of this study revealed all surface water samples and most sediment samples to have multiple PFAS compounds. Fish from all waterbodies also contained PFAS compounds, resulting in the need for the Department to issue more restrictive fish consumption advisories for 10 of these sites.

20. As of March 19, 2019, 564 of 1,069 public water systems (53-percent) have reported the results of PFAS sampling under N.J.A.C. 7:10-5. 70 public water systems not previously identified through

other sampling events – 12-percent of the public water systems reporting – reported levels at or above the recommended MCL for PFNA, PFOA, PFOS, or a combination of the three. Prior to the first quarter monitoring required by N.J.A.C 7:10-5 described above, another 46 water systems reported levels at or above the recommended MCLs for PFNA, PFOA, PFOS or a combination of the three.

21. The Department has also sampled for PFAS as part of remedial investigations in specific locations around the State, including 992 private wells sampled as of June 2018. Through this targeted effort, the Department has detected PFOA in 427 private wells – or 43-percent of the wells sampled – and 284 private wells were found to have levels of PFOA exceeding the proposed MCL. PFOS was found in 304 private wells – or 31-percent of the private wells tested – with detections at 40 wells above the proposed PFOS MCL. As of April 3, 2018, out of the 400 wells sampled as part of the remedial investigation emanating from Solvay's site, 83 wells – 21-percent – required installation of a point of entry treatment ("POET") system for PFNA or PFOA.

C. Responsible Parties

22. Respondents are responsible for the significant PFAS contamination across New Jersey and the costs the Department has incurred, and will incur, responding to this threat to public health, safety and the environment.

1. Solvay

23. Solvay Specialty Polymers USA, LLC (and its predecessor Solvay Solexis, Inc.) (collectively "Solvay") is a Delaware Corporation with its principal place of business at 10 Leonard Lane, West Deptford, New Jersey.

24. Solvay (formerly known as Ausimont USA, Inc.) has been the owner and operator of a manufacturing facility located at 10 Leonard Lane and Crown Point Road, Block 328, Lots 1.01 and 1.07 on the tax maps of West Deptford Township, Gloucester County, from 1990 to the present (the "Solvay Site"). From approximately 1990 to 2012, Solvay manufactured polyvinylidene fluoride ("PVDF") at this facility, which is a specialty plastic that is utilized in conjunction with lithium batteries, medical and defense uses, semi-conductors, or other instances when a higher level of purity is required. During most of this time, Surflon S-111 was used in the manufacturing process for PVDF. Surflon S-111 is composed of approximately 74% PFNA. Solvay's facility was considered to have the second highest capacity in the world for purposes of using Surflon S-111 to make PVDF. As a result of Solvay's operations at the facility, it discharged massive amounts of the Surflon S-111 (primarily, PFNA) into the surrounding air and water. The site, off-site properties, and New Jersey's natural resources, including air, surface waters, groundwater, and drinking water sources, are contaminated with PFNA.

25. Additionally, Solvay also used sodium perfluorooctanoate (NaPFO) as a surfactant at its facility. The NaPFO (which is a salt of PFOA) was supplied to Solvay by 3M. NaPFO degrades into PFOA. The site and surrounding area are also contaminated with PFOA as a result of Solvay's activities at the facility.

26. As of March 19, 2019, out of the 400 wells sampled as part of the remedial investigation around the Solvay Site, 83 wells – 21-percent – required installation of a POET system for PFNA or PFOA.

27. Currently, Solvay is using a replacement chemical for PFNA for use in the manufacture of its polyvinylidene product. This compound, identified in Wang, 2013, as "Solvay's product" (CAS No. 329238-24-6) is a chloro perfluoro polyether carboxylate and has been identified in environmental matrices in Salem and Gloucester Counties.

2. DuPont / DowDuPont

28. DuPont is a Delaware Corporation with its principal place of business in Wilmington, Delaware. DowDuPont is a Delaware Corporation with its principal place of business in Wilmington, Delaware.

29. DuPont owned and operated Chambers Works, 67 Canal Road and Route 130, located in Pennsville and Carneys Point Townships, Salem County, from 1891 to 2015. PFOA was used at Chambers Works beginning in the late 1950s. At varying times PFOA was used to, among other things, manufacture fluoroelastomers, perfluoroelastomers and specialty fluoroelastomers used in a variety of consumer and other products for their chemical non-stick and heat-resistant properties. Telomers were also used and manufactured at Chambers Works, and PFOA is a by-product of the telomer manufacturing process. DuPont also accepted large quantities of PFOA-containing waste from off-site facilities, including its Washington Works facility in Parkersburg, West Virginia, and discharged this waste along with wastewater from its on-site PFOA-related processes through its wastewater treatment plant. As a result of the above, DuPont has discharged PFOA as well as other PFAS, including PFNA, from Chambers Works for decades, which has contaminated the site and the surrounding area.

30. As set forth below, DuPont spun-off its "performance chemicals" business lines (including Teflon and various other products associated with PFAS constituents) by creating Chemours on July 1, 2015. As part of a series of related transactions, DuPont also transferred its Chambers Works property to Chemours FC, LLC at that time. Nonetheless, DuPont continued to operate an industrial facility on the Chambers Works property, manufacturing aramids and fluoroelastomers on a portion of the Chemours Chambers Works site pursuant to an industrial lease (whereby DuPont was the tenant and Chemours FC, LLC was the landlord). In March of 2018, DuPont announced that would cease production of aramids on its Chambers Works leasehold but that it would continue to produce fluoroelastomers on the Site.

31. With respect to the area surrounding Chambers Works, sampling of residential drinking water wells in the area has revealed contamination at least five miles away from the facility. In total, 341 individual drinking water wells have been sampled, and 168 have exceeded applicable screening criteria, based on the concentrations of PFOA, PFNA, or PFOA and PFOS combined. GenX was also detected in residential drinking water. Investigation of contamination in this area, aside from these selected wells, remains necessary in order to fully assess impacts to groundwater, surface water, soils, sediments and biota.

32. Additionally, DuPont has been the owner and operator of its Parlin Facility, located at 250 Cheesequake Road, Sayreville Borough, Middlesex County since 1904. Currently, some or all of the facility is owned by another DuPont entity, DuPont Specialty Products USA, LLC. Beginning in the late 1970s, DuPont blended fluoropolymers at its Parlin facility, and produced Teflon® finishes. As a result of these activities PFOA was released into the environment from the facility. In 2006 and 2007, DuPont discovered PFOA releases, both on-site and off-site. Among other things, those releases have contaminated groundwater, including off-site. In an email dated February 4, 2019,

DuPont provided sampling results to the U.S. Environmental Protection Agency and the Department of sampling conducted in several groundwater monitoring wells at the DuPont Parlin facility. Those results show that GenX was detected in several groundwater monitoring wells at the DuPont Parlin facility. Also, previous sampling of finished water at the Perth Amboy Wellfield has documented the presence of PFOA at concentrations both above and below the Department's Interim Specific Ground Water Quality Standard (ISGWQS) of 10 ppt; individual supply wells may exceed the PFOA ISGWQS. The Perth Amboy Wellfield is located approximately one and a half miles south of the Parlin facility.

33. DuPont also manufactured PFOA in North Carolina that was then transported, used, disposed of, or discharged in New Jersey, further making it in any way responsible for such contamination. After 3M decided to stop manufacturing PFOA due to its toxicity, DuPont began producing its own feedstock of the chemical in 2002. DuPont manufactured PFOA until replacing it with GenX. DuPont manufactured and utilized GenX until transferring its performance chemicals business and liabilities to Chemours.

34. In 2017, DuPont merged into a direct subsidiary of DowDuPont, Inc., becoming owned and controlled by DowDuPont. DowDuPont is restructuring and moving the vast majority of the assets of DuPont to itself and other entities, which it will spin off into independent, publicly traded entities. These transactions, along with the transfer of the Parlin Site to DuPont Specialty Products USA, LLC and the industrial lease at Chambers Works, may trigger the requirements of the Industrial Site Recovery Act, N.J.S.A. 13:1K-6, et seq. ("ISRA"), which would require the establishment of an appropriate remediation funding source, among other requirements.

3. The Chemours Entities

35. The Chemours Company is a Delaware Corporation with its principal place of business in Wilmington, Delaware. The Chemours Company FC, LLC is a Delaware Limited Liability Company with its principal place of business in Wilmington, Delaware.

36. In 2013, confronted with mounting PFAS liabilities, DuPont announced its plans to spin off its performance chemicals business into a separate publicly traded company, Chemours. In order to effectuate the spin off and transfer of certain assets and liabilities, a number of corporate entities were created. In 2014, Chemours FC, LLC was created. In 2015, DuPont transferred ownership of the Chambers Works property to Chemours FC, LLC. Following the spin-off, Chemours FC, LLC became a subsidiary of Chemours. Chemours FC, LLC remains the owner of the Chambers Works property, while Chemours operates the site. The Chemours transactions may have also triggered the requirements of ISRA, which would require the establishment of an appropriate remediation funding source, among other requirements.

37. Chemours FC, LLC, as well as Chemours, accepted the transfer of Chambers Works knowing that the site was contaminated with PFOA and other PFAS, that PFAS was discharged at the site, that there was PFAS contamination in the surrounding area, that remediation of the site and the surrounding area would be required as a result of this contamination, and that funds would need to be available for the same.

38. Additionally, since Chemours FC, LLC became the owner and Chemours the operator of Chambers Works, PFOA and other PFAS continue to be discharged at the site.

39. Further, Chemours has agreed to assume certain liabilities of DuPont's with respect to PFOA and other PFAS.

40. Currently, Chemours is using PFAS replacement chemicals, including GenX technology and associated chemicals hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt, in its manufacturing processes for Krytox® at Chambers Works. As a result of this process, HFPO-DA is discharged into New Jersey's water and emitted into New Jersey's air.

41. HPFOA-DA has been detected in residential drinking water wells surrounding Chambers Works.

4. The 3M Company

42. 3M is a Delaware Corporation with its principal place of business in St. Paul, Minnesota.

43. 3M is a person in any way responsible for PFOA and PFOS discharged in New Jersey as the primary manufacturer of PFOA, which it supplied to DuPont, Solvay and others, and PFOS, which were both discharged across New Jersey's environment.

44. 3M has been identified by the United States EPA as the dominant global producer of PFOA and related chemicals, manufacturing approximately 85 percent or more of total worldwide volumes of PFOA. 3M supplied PFOA to DuPont for use in its manufacturing processes until at least the early 2000s. DuPont discharged this PFOA in New Jersey, including at Chambers Works and its Parlin facility, resulting in contamination of New Jersey's environment. 3M also supplied NaPFO to Solvay, which it discharged in New Jersey's environment.

45. 3M was also a primary manufacturer of PFOS, and produced AFFF containing PFOS and PFAS. 3M sold AFFF from the 1960s to the early 2000s, which was used at military bases, airports and firefighting training facilities.

46. Use of AFFF in New Jersey has discharged PFOS and other PFAS into New Jersey's environment. For example, AFFF use at Joint Base McGuire-Dix-Lakehurst and FAA William J. Hughes Technical Center has resulted in significant contamination of surrounding drinking water sources and natural resources. The Department's efforts to identify sites where AFFF was used is ongoing.

D. New Jersey PFAS-Related Costs.

Costs Previously Incurred by the Department

47. As of March 4, 2019, the Department has incurred at least $3,105,084.91 to investigate, monitor, test, treat, remediate, clean up and remove PFNA and PFOA from the area surrounding Solvay's facility in West Deptford. And, the Department continues to incur costs associated with PFNA and PFOA on a daily basis.

48. The above-referenced costs do not include all costs previously incurred by the Department, and will be supplemented. Among other things, the Department may seek reimbursement from Respondents for its statewide studies of the occurrence of PFAS and related research and the cost of the Division of Science & Research's labor on PFAS studies.

Future Costs to be Incurred by the Department

49. The Department expects to incur hundreds of millions of dollars in costs assessing and responding to the discharge of PFAS into the environment of New Jersey.

50. The Department anticipates incurring additional costs related to ongoing and new studies and research projects to further assess the impacts of PFAS on groundwater, surface waters, marine and freshwater fish and other aquatic life, biota, and human health.

51. The Department anticipates incurring costs to investigate, monitor, test, treat, remediate, clean up and remove PFNA, PFOA and PFOS from New Jersey's drinking water and waste water systems.

52. The Department anticipates incurring costs to investigate, monitor, test, treat, remediate, clean up and remove PFNA, PFOA and PFOS from New Jersey's private drinking water wells.

53. The Department anticipates incurring costs to investigate, monitor, test, treat, remediate and clean up and remove PFNA, PFOA and PFOS from New Jersey's natural resources, including groundwater, surface water, soil, sediments and biota.

54. The above list of future costs the Department anticipates incurring is not exhaustive. Rather, this list is meant to provide a framework for estimating future costs related to PFNA, PFOA and PFOS for the purposes of establishing a funding source for these costs to be maintained by Respondents.

DIRECTIVE

55. The Department is broadly empowered to take appropriate action to prevent the pollution of New Jersey's environment and abate nuisances in connection therewith. N.J.S.A. 13:1D-9(e). The Department is also charged with enforcing New Jersey's environmental laws, including the Spill Act, the WPCA, the SWMA, and the APCA. The Department may direct persons to post a performance bond or other security for the full estimated cost to correct violations of New Jersey's environmental laws. N.J.S.A. 13:1D-9(u).

56. The substances referenced in the paragraphs above are hazardous substances pursuant to the Spill Act, N.J.S.A. 58:10-23.11(b), pollutants pursuant to the WPCA, N.J.S.A. 58:10A-3(n), solid waste pursuant to the SWMA, N.J.S.A. 13:1E-3(a) and air contaminants pursuant to the APCA, N.J.S.A. 26:2C-2.

57. The Department is authorized to seek and obtain information from persons related to discharges or potential discharges of pollutants into the waters of the State, discharges of hazardous substances, disposal of solid waste, and releases of air contaminants. Pursuant to the WPCA, the Department is empowered to assess a person's compliance with the Act, and may request from any person who has information relevant to discharges of pollutants to provide certain documents and/or information to the Department. N.J.S.A. 58:10A-5(a)-(b), -10.3(a). Additionally, pursuant to the Spill Act, persons who may be subject to liability for discharges must immediately notify the Department of same. N.J.S.A. 58:10-23.11e. Further, pursuant to the APCA, the Department is empowered to require the filing of reports concerning information related to emissions, and

persons who cause a release of air contaminants which pose a potential threat to the public health, welfare or the environment are obligated to immediately notify the Department of same. N.J.S.A. 26:2C-9(b)(3), -19(e).

58. Further, pursuant to the Spill Act, when a hazardous substance is discharged, the Department may act in its discretion to clean up and remove or arrange for the cleanup and removal of the discharge or may direct the discharger to clean up and remove, or arrange for the cleanup and removal of, the discharge. N.J.S.A. 58:10-23.11f.a(1). The Department is authorized to direct a responsible party to pay for the cleanup and removal of the discharge prior to the Department cleaning up and removing or arranging for the cleanup and removal of the discharge. The Department is also authorized to seek compensation for damages incurred by all parties injured by these discharges. N.J.S.A. 58:10-23.11u.b. Any discharger that fails to comply with a directive shall be liable to the Department in an amount equal to three times the cost of such a cleanup and removal, and shall be subject to the revocation or suspension of any license issued or permit held authorizing that person to operate a hazardous waste facility or solid waste facility. N.J.S.A. 58:10-23.11f.7.a(1).

59. Pursuant to N.J.S.A. 58:10-23.11g.c. any person who has discharged a hazardous substance or is in any way responsible for any hazardous substance, shall be strictly liable, jointly and severally, without regard to fault, for all cleanup and removal costs no matter by whom incurred. Such person shall also be strictly liable, jointly and severally, without regard to fault, for all cleanup and removal costs incurred by the Department.

60. Pursuant to N.J.S.A. 58:10-23.11g.c., Respondents are or will be persons who discharged a hazardous substance or are in any way responsible for the discharge of a hazardous substance.

61. Respondents are persons whom the Department believes have, or may have, information relevant to a discharge or potential discharge of hazardous substances and pollutants, the disposal of solid waste and the release of air contaminants in a quantity or concentration which poses a potential threat to public health, welfare or the environment.

62. In accordance with the above, the Department hereby directs Respondents to take the following actions.

Payment of Previously Incurred Costs

63. Solvay, within 30 days after receipt of this Directive, shall reimburse the Department for the Department's previously incurred costs to investigate, treat, cleanup and remove PFNA, PFOA and other PFAS at and the area around its West Deptford facility, as recounted in paragraph 47 and 48 above. Solvay shall pay $3,105,084.91 to the Department as reimbursement for the currently calculated past costs incurred.

64. The Department hereby directs Solvay to assume responsibility for operation and maintenance of all of the POETs installed to address PFNA associated with the Solvay Site by taking the following actions according to the following expedited site-specific timeframes, established pursuant to N.J.A.C. 7:26C-3.4. Note the timeframes specified herein do not represent an extension to any past due timeframes and the Department reserves the right to pursue penalties back to the original due dates:

a. Solvay shall maintain a licensed site remediation professional for the remediation of the entire Solvay Site, pursuant to N.J.A.C. 7:26C-2.3(a)2;

b. Solvay shall assume the monitoring and maintenance of the POET Systems at the Solvay Site pursuant to N.J.A.C. 7:26C-2.3, including but not limited to the following:

1) As first priorities, Solvay shall conduct the following:

i) Within ninety (90) days after receipt of this Directive, assume operation and maintenance of the POETs installed by the Department at the following locations to address PFNA contamination associated with the Solvay Site:

West Deptford Township, Gloucester County

1) Block 128, Lot 2, 1692 Crown Point Road; and
2) Block 351, Lot 8.03, 963 Kings Highway; and
3) Block 351, Lot 8.01, 965 Kings Highway.; and
4) Block 346.07, Lot 21.02, 643 Mantua Grove Road; and
5) Block 346.07, Lot 21.05, 639 Mantua Grove Road; and
6) Block 358, Lot 6.02, 667 Mantua Pike.; and
7) Block 350.03, Lot 45, 1043 Kings Highway, and
8) Block 346.07, Lot 21.01, 619 Mantua Grove Road, and
9) Block 325, Lot 7.02, 1752 Crown Point Road, and
10) Block 353, Lot 1.03, 350-352 Parkville Station Road, and
11) Block 354, Lot 1.03, 1098 Jessup Road, and

Greenwich Township, Gloucester County

12) Block 253, Lot 5, Greenwich Lake Park; and
13) Block 263, Lot 3, 665 Swedesboro Road, and
14) Block 263, Lot 4, 625 Swedesboro Road, and
15) Block 255, Lot 1, 631 Swedesboro Road, and
16) Block 255, Lot 4, 656 Swedesboro Road, and
17) Block 261, Lot 4, 465 Swedesboro Road, and
18) Block 249, Lot 1, 405 Tomlin Station Road, and
19) Block 358, Lot 6, 671 Mantua Pike, and

Logan Township, Gloucester County

20) Block 2801, Lot 8, 284 Pedricktown Road, and
21) Block 2801, Lot 8, 286 Pedricktown Road, and
22) Block 2801, Lot 8, 288 Pedrickton Road, and
23) Block 2801, Lot 8, 290 Pedricktown Road, and
24) Block 2801, Lot 14, 300 Pedricktown Road, and
25) Block 43, Lot 8, 288 Floodgate Road, and

26) Block 2304, Lot 5, 2510 Oldmans Creek Road, and
27) Block 501, Lot 28.02, 548 Route 44, and
28) Block 1003, Lot 11, 676 Oak Grove Road, and
29) Block 101, Lot 7, 104 Route 130, and
30) Block 2706, Lot 48, 2251 Township Line Road, and
31) Block 3103, Lot 10, 42 Jackson Street, and
32) Block 1303, Lot 8, 32 Jackson Street, and
33) Block 3103, Lot 9, 36 Jackson Street, and

Swedesboro Borough, Gloucester County

34) Block 2, Lot 15, 320 Floodgate Road, and Oldmans, Salem County
35) Block 11, Lot 7.01, 59 South Railroad Avenue, and
36) Block 11, Lot 7.03, 67 S. Railroad Avenue, and
37) Block 3, Lot 13, 187 N. Railroad Avenue, and
38) Block 28.01, Lot 61, 22 Seminole Lane, and
39) Block 28.01, Lot 35, 171 Straughns Mill Road, and
40) Block 28.01, Lot 37, 157 Straughns Mill Road.

ii) Within ninety (90) days after receipt of this Directive, assume operation and maintenance of the thirty (30) POETs installed by the Department at the following locations to address PFOA contamination associated with the Solvay Site:

Logan Township, Gloucester County

41) Block 502, Lot 5, 43 Floodgate Road
42) Block 605, Lot 8, 139 Repaupo Station Road
43) 605, Lot 17.01, 204 Repaupo Road
44) Block 1003, Lot 13.01, 738 Oakgrove Road
45) Block 1003, Lot 12.01 736 Oak Grove Road
46) Block 1003, Lot 3.01 82 Coontown Road
47) Block 11102, Lot 22, 2789 Route 322
48) Block 2801, Lot 11, 304 Pedricktown Road
49) Block 1102, Lot 21, 2799 Route 322
50) Block 3102, Lot 1, 133 Route 130
51) Block 3102, Lot 9, 139 Route 130
52) Block 3102, Lot 3, 2537 Center Square Road
53) Block ___, Lot___, 137 Route 130 [To Be Updated]
54) Block 3101, Lot 10, 42 Jackson Street
55) Block 1301, Lot 8, 32 Jackson Street
56) Block 3103, Lot 9, 36 Jackson Street
57) Block 3103, Lot 7, 26 Jackson Street

Swedesboro Borough, Gloucester County
58) Block___, Lot___, 324 Floodgate Road [To Be Updated]

Greenwich, Gloucester County
59) Block 255, Lot 1.01, 641 Swedesboro Road

Oldman's Township, Salem County

60) Block 2801, Lot 56, 16 Pedricktown-Woodstown Road
61) Block 28.01, Lot 60, 18 Seminole Lane
62) Block 28.01, Lot 59, 6 Seminole Lane
63) Block 3, Lot 13, 191A North Railroad Avenue
64) Block 29, Lot 8.01, 158 Straughns Mill Road
65) Block 28.01, Lot 10, 52 Pedricktown-Woodstown Road
66) Block 28, Lot 27, 80 Tighe Road
67) Block 29, Lot 8.02, 162 Straughns Mill Road
68) Block 28, Lot 27.04, 379 Perkintown Road
69) Block 28.01, Lot 54, 24 Seminole Lane
70) Block ___, Lot___, 178 Pedricktown-Woodstown Road [TO BE UPDATED]

c) Within ninety (90) days after receipt of this Directive identify and sample all potable wells within 500 feet down gradient, 500 feet side gradient and 250 feet up gradient of each previously identified impacted potable well, pursuant to N.J.A.C. 7:26E-1.11.

d) Within one hundred twenty (120) days after receipt of this Directive implement treatment and monitoring, in accordance with N.J.A.C. 7:26E-1.11, for potable wells with documented exceedances of the 13 ppt PFNA MCL attributable to the Site, and/or with documented exceedances of the 14 ppt action level for PFOA.

65. Solvay shall submit an updated Remediation Cost Review and Remediation Funding Source/Financial Assurance Form to include the cost of additionally required potable sampling and implementation of treatment and monitoring.

66. Payments made pursuant to paragraphs 47, 48 and 63 above shall be made by certified check or cashier's check payable to "Treasurer, State of New Jersey" and mailed to:

Division of Revenue and Enterprise Services
P.O. Box 417
Trenton, New Jersey 08646-0417

With a copy to:

Catherine R. McCabe
Commissioner
New Jersey Department of Environmental Protection
401 East State Street
Trenton, New Jersey 08625

Funding of Future Costs of Investigation, Treatment, Cleanup and Removal, and Liability of the Spill Fund

67. Respondents, within 30 days of receipt of this Directive, shall meet collectively with the Department to discuss a good faith estimate for future costs to investigate, test, treat, cleanup, and remove PFNA, PFOA, and PFOS from New Jersey's environment and discuss Respondent's establishment of funding sources for same. Future costs include, but are not limited to:

    a. The Department's continued studies and research on the presence of PFAS in New Jersey's environment, as referenced above in paragraphs 49 to 54;

    b. Costs to investigate, test, treat, remediate, clean up and remove PFNA, PFOA and PFOS from New Jersey's drinking water systems and waste water systems;

    c. Costs to investigate, test, treat, remediate, clean up and remove PFNA, PFOA and PFOS from New Jersey's private drinking water wells and irrigation wells;

    d. Costs to investigate, test, treat, remediate and clean up and remove PFNA, PFOA and PFOS from New Jersey's natural resources, including air, groundwater, surface water, soil, sediments and biota;

    e. Costs of assessment, replacement, restoration and compensation for all injured natural resources, including but not limited to, all lost use and value and ecological injury;

    f. All damages incurred by persons other than the State who are injured by the conduct of Respondents and recoverable by the Department on their behalf;

    g. All damages and economic impacts incurred by the State as a result of the conduct of Respondents; and

    h. All liabilities and damages incurred by the Spill Fund as a result of the conduct of Respondents.

Information Related to Historic Use of PFNA, PFOA and PFOS, and Current Use of Replacement Chemicals

68. Each Respondent, as applicable, within 21 days of receipt of this Directive, shall provide the following information to the Department regarding its historic use of PFNA, PFOA and/or PFOS in New Jersey:

    a. Identify all PFNA, PFOA and PFOS manufactured, supplied, transported, stored, used, treated, disposed, and/or discharged in New Jersey;

b. Identify the nature, extent, source and location of discharges of PFNA, PFOA and PFOS into the waters of the State;

c. Identify the nature, extent, source and location of emissions of PFNA, PFOA and PFOS into air;

d. If the Respondent is not the manufacturer, supplier, or transporter of PFNA, PFOA and PFOS, identify any such manufacturer, supplier or transporter; and

e. The Respondent's ability to pay for, or perform, the cleanup and removal of PFNA, PFOA and PFOS from New Jersey's environment, and every "change of ownership" (as defined in N.J.S.A. § 13:1K-8) involving Respondents' current or former sites in New Jersey.

69. Each Respondent, as applicable, within 21 days of receipt of this Directive, shall provide the following information to the Department regarding its use of PFAS replacement chemicals (i.e., those short-chain PFAS chemicals used in any manufacturing process as a replacement for PFNA, PFOA and/or PFOS) in New Jersey:

a. Identify all replacement chemicals manufactured, transported, stored, used, treated, disposed, and/or discharged in New Jersey, and the toxic characteristics of any such chemicals;

b. Identify the nature, extent, source and location of discharges of replacement chemicals into the waters of the State;

c. Identify the nature, extent, source and location of emissions of replacement chemicals into air;

d. If the Respondent is not the manufacturer or transporter of the replacement chemicals, identify any such manufacturer or transporter; and

e. The Respondent's ability to pay for, or perform, the cleanup and removal of replacement chemicals from New Jersey's environment.

70. Each Respondent, as applicable, in responding to the above-referenced information requests, must conduct a diligent search of its records and make reasonable inquires of its employees, and further has the continuing obligation to supplement such information if additional relevant information is discovered, or if it determines information previously provided to the Department was false, inaccurate or misleading. N.J.S.A. 58-10A-10.3c(1)-(2).

71. For the avoidance of doubt, this Directive is not a formal enforcement order, a final agency action or a final legal determination that a violation has occurred. This Directive is not subject to pre-enforcement review and may not be appealed or contested.

NOTICE

72. Failure to comply with this Directive and Notice to Insurers will increase Respondents' potential liability to the Department in an amount equal to three (3) times the cost of arranging for the cleanup and removal of the discharge and may cause a lien to be placed on Respondents' real and

personal property pursuant to the Spill Act, N.J.S.A. 58:10-23.11f., including a first priority lien on the properties where the discharge(s) have occurred.

73. Pursuant to N.J.S.A. 58:10-23.11u., N.J.S.A. 58:10A-10, N.J.S.A. 26:2C-9, and N.J.S.A. 13:1E-9, the Department may require through a court action compliance with the Spill Act, WPCA, APCA, and SWMA. Failure by Respondents to comply with this Directive may result in an enforcement action by the Department, which will subject each Respondent to penalties of up to $50,000 per day and each day of violation constitutes an additional, separate and distinct violation.

RESERVATION OF RIGHTS

74. The Department reserves the right to direct Respondents to take or arrange for the taking of any additional remediation that the Department determines to be necessary to protect the public health and safety and/or the environment and to seek full reimbursement and treble damages for all costs incurred in taking such additional remediation if Respondents fail to comply with the applicable provisions of this Directive.

75. The Department reserves all rights and remedies under the Spill Act, WPCA, SWMA and APCA as well as all other applicable statutes not set forth herein and the common law of New Jersey, including its right to bring an action in the Superior Court for appropriate relief.

NOTICE TO INSURERS

76. Pursuant to N.J.S.A. 58:10-23.11s, any claims for costs of cleanup or damages by the State may be brought directly against the bond, insurer or any other person providing evidence of financial responsibility, and Respondents are directed to put their insurers on notice of such.

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DATE: March 25, 2019 By: _____
Catherine R. McCabe, Commissioner

EXHIBIT B

Table 4-7
Summary of DNAPL Analytical Results
Comprehensive RFI Report
DuPont Chambers Works Complex
Deepwater, New Jersey

Analytes	Field Sample ID Location Sample Date Units	F09-M03BDNAPL-111913 F09-M03B 11/18/2013
Volatile Organic Compounds		
1,1,1,2-TETRACHLOROETHANE	UG/KG	<2,000 UJ
1,1,1-TRICHLOROETHANE	UG/KG	<2,000 UJ
1,1,2,2-TETRACHLOROETHANE	UG/KG	<2,000 UJ
1,1,2-TRICHLOROETHANE	UG/KG	<2,000 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE	UG/KG	930,000 J
1,1-DICHLOROETHANE	UG/KG	<2,000 UJ
1,1-DICHLOROETHENE	UG/KG	2,500 J
1,2,3-TRICHLOROBENZENE	UG/KG	7,100 J
1,2,3-TRICHLOROPROPANE	UG/KG	<2,000 UJ
1,2-DIBROMO-3-CHLOROPROPANE	UG/KG	<4,000 UJ
1,2-DIBROMOETHANE (EDB)	UG/KG	<2,000 UJ
1,2-DICHLORO-1,1,2-TRIFLUOROETHANE	UG/KG	14,000 J
1,2-DICHLOROBENZENE	UG/KG	140,000 J
1,2-DICHLOROETHANE	UG/KG	8,200 J
1,2-DICHLOROPROPANE	UG/KG	<2,000 UJ
1,3,5-TRICHLOROBENZENE	UG/KG	<2,000 UJ
1,4-DICHLOROBENZENE	UG/KG	54,000 J
1-METHYL-4-NITROBENZENE	UG/KG	22,000 J
2-CHLORO-1,1,1-TRIFLUOROETHANE	UG/KG	<4,000 UJ
2-HEXANONE	UG/KG	<6,000 UJ
ACETONE	UG/KG	<14,000 UJ
ACETONITRILE	UG/KG	<50,000 UJ
ACROLEIN	UG/KG	<40,000 UJ
ACRYLONITRILE	UG/KG	<8,000 UJ
ALLYL CHLORIDE	UG/KG	<2,000 UJ
BENZENE	UG/KG	130,0000 J
BROMODICHLOROMETHANE	UG/KG	<2,000 UJ
BROMOFORM	UG/KG	<2,000 UJ
CARBON DISULFIDE	UG/KG	22,000 J
CARBON TETRACHLORIDE	UG/KG	<2,000 UJ
CFC-1113	UG/KG	<4,000 UJ
CHLOROBENZENE	UG/KG	14,000,000
CHLORODIBROMOMETHANE	UG/KG	<2,000 UJ
CHLOROFORM	UG/KG	800,000 J
CHLOROPRENE	UG/KG	<2,000 UJ
CIS-1,2 DICHLOROETHENE	UG/KG	12,000 J
CIS-1,3-DICHLOROPROPENE	UG/KG	<2,000 UJ
DICHLORODIFLUOROMETHANE	UG/KG	<4,000 UJ
DICHLOROFLUOROMETHANE	UG/KG	<4,000 UJ
ETHYL CHLORIDE	UG/KG	<4,000 UJ
ETHYL METHACRYLATE	UG/KG	<2,000 UJ
ETHYLBENZENE	UG/KG	8,400 J
IODOMETHANE	UG/KG	<6,000 UJ
ISOBUTYL ALCOHOL	UG/KG	<200,000 UJ
METHACRYLONITRILE	UG/KG	<10,000 UJ
METHYL BROMIDE	UG/KG	<4,000 UJ
METHYL CHLORIDE	UG/KG	<4,000 UJ
METHYL ETHYL KETONE	UG/KG	<8,000 UJ
METHYL ISOBUTYL KETONE	UG/KG	<6,000 UJ
METHYL METHACRYLATE	UG/KG	<2,000 UJ
METHYLENE BROMIDE	UG/KG	<2,000 UJ
METHYLENE CHLORIDE	UG/KG	29,000 J
NAPHTHALENE	UG/KG	15,000 J
NITROBENZENE	UG/KG	32,000 J
P-CHLORONITROBENZENE	UG/KG	11,000 J
PENTACHLOROETHANE	UG/KG	<2,000 UJ

Table 4-7
Summary of DNAPL Analytical Results
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Analytes	Field Sample ID Location Sample Date Units	F09-M03BDNAPL-111913 F09-M03B 11/18/2013
PROPIONITRILE	UG/KG	<60,000 UJ
STYRENE	UG/KG	<2,000 UJ
TENTATIVELY IDENTIFIED COMPOUND	UG/KG	79,000 J
TETRACHLOROETHENE	UG/KG	130,000 J
TOLUENE	UG/KG	130,000 J
TRANS-1,2-DICHLOROETHENE	UG/KG	2,100 J
TRANS-1,3-DICHLOROPROPENE	UG/KG	<2,000 UJ
TRANS-1,4-DICHLOROBUTENE-2	UG/KG	<20,000 UJ
TRICHLOROETHENE	UG/KG	300,000 J
TRICHLOROFLUOROMETHANE	UG/KG	<4,000 UJ
VINYL ACETATE	UG/KG	<4,000 UJ
VINYL CHLORIDE	UG/KG	<2,000 UJ
XYLENES	UG/KG	48,000 J
SemiVolatile Organic Compounds		
1,2,4,5-TETRACHLOROBENZENE	UG/KG	21,000
1,2,4-TRICHLOROBENZENE	UG/KG	92,000
1,2-DICHLOROBENZENE	UG/KG	35,000,000
1,3,5-TRINITROBENZENE	UG/KG	<100,000
1,3-DICHLOROBENZENE	UG/KG	26,000
1,3-DINITROBENZENE	UG/KG	14,000,000
1,4-DICHLOROBENZENE	UG/KG	4,600,000
1,4-DIOXANE	UG/KG	<60,000
1,4-NAPHTHOQUINONE	UG/KG	<500,000
1-NAPHTHYLAMINE	UG/KG	<100,000
2,3,4,6-TETRACHLOROPHENOL	UG/KG	<40,000
2,4,5-TRICHLOROPHENOL	UG/KG	<10,000
2,4,6-TRICHLOROPHENOL	UG/KG	<10,000
2,4-DICHLOROPHENOL	UG/KG	<10,000
2,4-DIMETHYLPHENOL	UG/KG	<10,000
2,4-DINITROPHENOL	UG/KG	<180,000
2,4-DINITROTOLUENE	UG/KG	160,000,000
2,6-DICHLOROPHENOL	UG/KG	<10,000
2,6-DINITROTOLUENE	UG/KG	50,000,000
2-ACETYLAMINOFLUORENE	UG/KG	<40,000
2-CHLORONAPHTHALENE	UG/KG	<4,200
2-CHLOROPHENOL	UG/KG	<10,000
2-METHYLNAPHTHALENE	UG/KG	60,000
2-METHYLPHENOL (O-CRESOL)	UG/KG	<10,000
2-NAPHTHYLAMINE	UG/KG	<100,000
2-NITROANILINE	UG/KG	<10,000
2-NITROPHENOL	UG/KG	<10,000
2-PICOLINE	UG/KG	<60,000
3,3'-DICHLOROBENZIDINE	UG/KG	<60,000
3,3'-DIMETHYLBENZIDINE	UG/KG	<300,000
3-CHLOROANILINE	UG/KG	<20,000
3-METHYLCHOLANTHRENE	UG/KG	<10,000
3-NITROANILINE	UG/KG	<40,000
4,6-DINITRO-2-METHYLPHENOL	UG/KG	<100,000
4-AMINOBIPHENYL	UG/KG	<100,000
4-BROMOPHENYL PHENYL ETHER	UG/KG	<10,000
4-CHLORO-3-METHYLPHENOL	UG/KG	<10,000
4-CHLOROANILINE	UG/KG	<10,000
4-CHLOROPHENYL PHENYL ETHER	UG/KG	<10,000
4-DIMETHYLAMINOAZOBENZENE	UG/KG	<40,000
4-METHYLPHENOL (P-CRESOL)	UG/KG	<10,000
4-NITROANILINE	UG/KG	<40,000
4-NITROPHENOL	UG/KG	<100,000

Table 4-7
Summary of DNAPL Analytical Results
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Analytes	Field Sample ID Location Sample Date Units	F09-M03BDNAPL-111913 F09-M03B 11/18/2013
4-NITROQUINOLINE-N-OXIDE	UG/KG	<200,000
5-NITRO-ORTHO-TOLUIDINE	UG/KG	<100,000
7,12-DIMETHYLBENZ[A]ANTHRACENE	UG/KG	<10,000
ACENAPHTHENE	UG/KG	48,000
ACENAPHTHYLENE	UG/KG	<2,000
ACETOPHENONE	UG/KG	<10,000
ALPHA,ALPHA-DIMETHYLPHENETHYLAMINE	UG/KG	<60,000
ANILINE	UG/KG	<100,000
ANTHRACENE	UG/KG	27,000
ARAMITE	UG/KG	<40,000
BENZO(A)ANTHRACENE	UG/KG	11,000
BENZO(B)FLUORANTHENE	UG/KG	8,800 J
BENZO(G,H,I)PERYLENE	UG/KG	2,500 J
BENZO(K)FLUORANTHENE	UG/KG	4,200 J
BENZO[A]PYRENE	UG/KG	5,400 J
BENZYL ALCOHOL	UG/KG	<100,000
BIS(2-CHLOROETHOXY)METHANE	UG/KG	<10,000
BIS(2-CHLOROETHYL)ETHER	UG/KG	<10,000
BIS(2-CHLOROISOPROPYL)ETHER	UG/KG	<10,000
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	<40,000
BUTYL BENZYL PHTHALATE	UG/KG	<40,000
CHLOROBENZILATE	UG/KG	<20,000
CHRYSENE	UG/KG	13,000
DIALLATE	UG/KG	<20,000
DIBENZ(A,H)ANTHRACENE	UG/KG	<2,000
DIBENZOFURAN	UG/KG	41,000
DIETHYL PHTHALATE	UG/KG	<40,000
DIMETHOATE	UG/KG	<100,000
DIMETHYL PHTHALATE	UG/KG	<40,000
DI-N-BUTYL PHTHALATE	UG/KG	<40,000
ETHYL METHANESULFONATE	UG/KG	<40,000
FLUORANTHENE	UG/KG	61,000
FLUORENE	UG/KG	<2,000
HEXACHLOROBENZENE	UG/KG	500,000
HEXACHLOROBUTADIENE	UG/KG	<10,000
HEXACHLOROCYCLOPENTADIENE	UG/KG	<100,000
HEXACHLOROETHANE	UG/KG	<20,000
HEXACHLOROPROPYLENE	UG/KG	<60,000
INDENO (1,2,3-CD) PYRENE	UG/KG	2,800 J
ISODRIN	UG/KG	<10,000
ISOPHORONE	UG/KG	<10,000
ISOSAFROLE	UG/KG	<40,000
METHAPYRILENE	UG/KG	<1,000,000
METHYL METHANESULFONATE	UG/KG	<20,000
NAPHTHALENE	UG/KG	950,000
N-DIOCTYL PHTHALATE	UG/KG	<40,000
NITROBENZENE	UG/KG	26,000,000
N-NITROSO(METHYL)ETHYLAMINE	UG/KG	<40,000
N-NITROSODIETHYLAMINE	UG/KG	<10,000
N-NITROSODIMETHYLAMINE	UG/KG	<40,000
N-NITROSO-DI-N-BUTYLAMINE	UG/KG	<40,000
N-NITROSODI-N-PROPYLAMINE	UG/KG	<10,000
N-NITROSODIPHENYLAMINE	UG/KG	<10,000
N-NITROSOMORPHOLINE	UG/KG	<40,000 UJ
N-NITROSOPIPERIDINE	UG/KG	<10,000
N-NITROSOPYRROLIDINE	UG/KG	<10,000
O,O,O-TRIETHYLPHOSPHOROTHIOATE	UG/KG	<40,000

Table 4-7
Summary of DNAPL Analytical Results
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Analytes	Field Sample ID Location Sample Date Units	F09-M03BDNAPL-111913 F09-M03B 11/18/2013
O-TOLUIDINE	UG/KG	<120,000
PARA-PHENYLENEDIAMINE	UG/KG	<7,000,000
PENTACHLOROBENZENE	UG/KG	<10,000
PENTACHLORONITROBENZENE	UG/KG	<40,000
PENTACHLOROPHENOL	UG/KG	<20,000 UJ
PHENACETIN	UG/KG	<40,000
PHENANTHRENE	UG/KG	130,000
PHENOL	UG/KG	<10,000
PRONAMIDE	UG/KG	<20,000
PYRENE	UG/KG	37,000
PYRIDINE	UG/KG	<40,000
SAFROLE	UG/KG	<40,000
TENTATIVELY IDENTIFIED COMPOUND	UG/KG	93,000 J
TETRAETHYL DITHIOPYROPHOSPHATE	UG/KG	<40,000
THIONAZIN	UG/KG	<40,000
MNA Parameter		
METHANOL	UG/KG	<200 UJ
Herbicides/Pesticides		
4,4'-DDD	UG/KG	1,500 J
4,4'-DDE	UG/KG	<990
4,4'-DDT	UG/KG	<1,100
ALDRIN	UG/KG	<570
ALPHA-BHC	UG/KG	<510
BETA-BHC	UG/KG	<900
CHLORDANE	UG/KG	<12,000
DELTA-BHC	UG/KG	150,000
DIELDRIN	UG/KG	<990
ENDOSULFAN I	UG/KG	<660
ENDOSULFAN II	UG/KG	4,600 J
ENDOSULFAN SULFATE	UG/KG	<990
ENDRIN	UG/KG	<1,500
ENDRIN ALDEHYDE	UG/KG	2,000 J
HEPTACHLOR	UG/KG	<510
HEPTACHLOR EPOXIDE	UG/KG	<510
KEPONE	UG/KG	<6,900
LINDANE	UG/KG	<650
METHOXYCHLOR	UG/KG	<5,100
TOXAPHENE	UG/KG	<42,000
2,4,5-T	UG/KG	<24,000
2,4-DICHLOROPHENOXYACETIC ACID	UG/KG	<380,000
DINOSEB	UG/KG	<27,000
HEXACHLOROPHENE	UG/KG	<24,000
SILVEX	UG/KG	<2,300
Dioxins and Furans		
1,2,3,4,6,7,8-HPCDD	PG/G	1,200
1,2,3,4,6,7,8-HPCDF	PG/G	1,220
1,2,3,4,7,8,9-HPCDF	PG/G	145
1,2,3,4,7,8-HXCDD	PG/G	19.6 J
1,2,3,4,7,8-HXCDF	PG/G	57
1,2,3,6,7,8-HXCDD	PG/G	79
1,2,3,6,7,8-HXCDF	PG/G	42.8 J
1,2,3,7,8,9-HXCDD	PG/G	53
1,2,3,7,8,9-HXCDF	PG/G	14.7 J
1,2,3,7,8-PECDD	PG/G	7.42 J
1,2,3,7,8-PECDF	PG/G	14.2 J
2,3,4,6,7,8-HXCDF	PG/G	29.3 J
2,3,4,7,8-PECDF	PG/G	17.2 J

Table 4-7
Summary of DNAPL Analytical Results
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Analytes	Field Sample ID Location Sample Date Units	F09-M03BDNAPL-111913 F09-M03B 11/18/2013
2,3,7,8-TCDD	PG/G	2.06 J
2,3,7,8-TCDF	PG/G	252
HPCDDS	PG/G	3,270
HPCDFS	PG/G	2,710
HXCDDS	PG/G	1,680
HXCDFS	PG/G	716
OCDD	PG/G	17,900
OCDF	PG/G	11,600
TCDDS	PG/G	159
TCDFS	PG/G	4,680
TOTAL PECDDS	PG/G	455
TOTAL PECDFS	PG/G	766
Metals		
ANTIMONY	MG/KG	<0.725
ARSENIC	MG/KG	<0.686
BARIUM	MG/KG	0.195 B
BERYLLIUM	MG/KG	<0.0657
CADMIUM	MG/KG	<0.0745
CHROMIUM	MG/KG	2
COBALT	MG/KG	4
COPPER	MG/KG	22
LEAD	MG/KG	0.655 J
NICKEL	MG/KG	30
SELENIUM	MG/KG	1.18 J
SILVER	MG/KG	<0.167
TETRAETHYL LEAD	MG/KG	<100
THALLIUM	MG/KG	<0.510
TIN	MG/KG	1.44 J
VANADIUM	MG/KG	6
ZINC	MG/KG	0.532 B
MERCURY	MG/KG	6
Miscellaneous		
AMENABLE CYANIDE	MG/KG	0.74 J
CYANIDE	UG/KG	880
PH	STD UNITS	7.22 J
TOTAL ORGANIC CARBON	MG/KG	259,000
KINEMATIC VISCOSITY	CST	4
FLASHPOINT	deg F	188
PCB 1016	UG/KG	<5,000
PCB 1221	UG/KG	<5,000
PCB 1232	UG/KG	<5,000
PCB 1242	UG/KG	<5,000
PCB 1248	UG/KG	<5,000
PCB 1254	UG/KG	<25,000
PCB 1260	UG/KG	<5,000
REACTIVE SULFIDE	MG/KG	<53.6
SPECIFIC GRAVITY	NONE	1

Notes:
J = Estimated Value
UJ = Not detected. Reporting limit may not be accurate or precise.
B = Analyte is present in the associated method blank at a reportable level
< = Non detect at stated reporting limit

Table 6-1
Summary of Carneys Point SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes/No/Not Applicable)[2]
13	Cell 1 of the Secure "C" Landfill	NFA Approved EPA Letter 2002	No soil data collected. Groundwater data collected.	Not applicable	Not applicable
19	Nitrocellulose Waste Disposal Area	NFA Approved EPA Letter 1993	Soil stabilized or removed; data not included in summary tables.	Not applicable	Not applicable
37	Carneys Point Manufacturing Disposal Area	NFA Approved EPA Letter 2002	Soil data included in SWMU 37 summary tables.	NJRDCSCC - None	No.
42	Henby Creek	NFA Recommended PAR 2006 and Summary of Carneys Point Ecological Investigations 2010	No soil data collected.	Not applicable	Not applicable
44	Carneys Point Surface Impoundments	NFA Recommended PAR 2006	Determined not to be SWMU; no soil data collected.	Not applicable	Not applicable
45-1	Carneys Point Manufacturing Area 1	NFA Recommended PAR 2006	Soil data not included in summary tables. Sample locations include B-45-1.1, B-45-1.2, B-45-1.3	NJNRDCSCC - Slight exceedance of benzo(a)pyrene and arsenic NJIGWSCC - None	No.[3]
45-2	Carneys Point Manufacturing Area 2	CMS Recommended 2013	Soil data included in SWMU 45-2 summary tables.	Pre-2011 Investigations NJNRDCSCC - Arsenic, copper, lead, zinc, 5 PAHs and 2,4-DNT GWIA - SPLP arsenic and lead Interior Investigation NJNRDCSRS - arsenic and lead	No.
45-3	Carneys Point Manufacturing Area 3	NFA Recommended PAR 2006	Soil stabilized or removed; data not included in summary tables.	Not applicable	Not applicable
45-4	Carneys Point Manufacturing Area 4	NFA Recommended PAR 2006	Soil stabilized or removed; data not included in summary tables.	Not applicable	Not applicable
45-5	Carneys Point Manufacturing Area 5	NFA Recommended PAR 2006	Soil data not included in summary tables. Sample locations include B-45-5.1, B-45-5.2, B-45-5.	NJNRDCSCC - Slight exceedance of arsenic NJIGWSCC-None	No.[3]

Table 6-1
Summary of Carneys Point SWMUs and Soil Data Status
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DuPont Chambers Works Complex
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes/No/Not Applicable)[2]
45-6	Carneys Point Manufacturing Area 6	NFA Recommended P3RFI 2002 and PAR 2006	Soil data included in SWMU 45-6 summary tables.	NJRDCSCC – None NJNRDCSCC - None NJIGWSCC - None	No.
45-7	Carneys Point Manufacturing Area 7	NFA Recommended P3RFI 2002 and PAR 2006	Soil data included in SWMU 45-7 summary tables.	NJRDCSCC –None NJNRDCSCC – None NJIGWSCC - None	No.
45-8	Carneys Point Manufacturing Area 8	NFA Recommended PAR 2006	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable
45-9	Carneys Point Manufacturing Area 9	NFA Recommended PAR 2006	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable
46	Dredge Spoils Area	NFA Approved EPA Letter 2002	Soil not included in summary tables. Sample locations include B-1, B-2, B-3, B-4, B-5	NJNRDCSCC - None	No.
47	Carneys Point Area of Fill Deposition	NFA Approved EPA Letter 2002	Soil data included in SWMU 47 summary tables.	NJNRDCSCC - Slight exceedance of arsenic	No.
48-1	Carneys Point Drum Storage/Cleaning Area 1	NFA Recommended P3RFI 2002	Soil data included in SWMU 48-1 summary tables.	NJNRDCSCC - Slight exceedance of arsenic	No
48-2	Carneys Point Drum Storage/Cleaning Area 2	NFA Recommended P4RFI 2006	Soil was stabilized or removed; data not included in summary tables; samples outside of remediated area included in SWMU 48-2 summary tables.	NJNRDCSCC – None NJIGWSCC – None	No.
48-3	Carneys Point Drum Storage/Cleaning Area 3	NFA Recommended P3RFI 2002 and BEE 2006	Soil data included in SWMU 48-3 summary tables.	NJRDCSCC – None NJNRDCSCC - None NJIGWSCC - None	No.[4]
48-4	Carneys Point Drum Storage/Cleaning Area 4	NFA Approved EPA Letter 1993	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable
48-5	Carneys Point Drum Storage/Cleaning Area 5	NFA Recommended P3RFI 2002 and BEE 2006	Soil data included in SWMU 48-5 summary tables.	NJRDCSCC – None NJNRDCSCC - None NJIGWSCC - None	No.[4]
48-6	Carneys Point Drum Storage/Cleaning Area 6	NFA Recommended P3RFI 2002 and BEE 2006	Soil data included in SWMU 48-6 summary tables.	NJRDCSCC – None NJNRDCSCC - None NJIGWSCC - None	No.[4]

Table 6-1
Summary of Carneys Point SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes/No/Not Applicable)[2]
48-7	Carneys Point Drum Storage/Cleaning Area 7	NFA Recommended P3RFI 2002 and BEE 2006	Soil data included in SWMU 48-7 summary tables.	NJRDCSCC – None NJNRDCSCC - None NJIGWSCC - None	No.[4]
49	Dewatering Pad	NFA Approved EPA Letter1993	Soil data not included in summary tables. Sample locations include B49-1, B49-A, B49-B, B49-5	NJNRDCSCC - Slight exceedance of benzo(k)fluoranthene and dibenzo(a,h)anthracene NJIGWSCC - None	No.
52	Debris Disposal Area	NFA Recommended SWMU 52 ISM RAR 2007	Soil was stabilized or removed; data not included in summary tables; samples outside of remediated area included in SWMU 52 summary tables.	NJNRDCSCC - Slight exceedance of lead	No.
53	Carneys Point Water Treatment Facility	NFA Recommended PAR 2006	Determined not to be SWMU; no soil data collected.	Not applicable	Not applicable
54	Solvent Recovery Units	NFA Approved EPA Letter 2002	Soil data included in SWMU 54 summary tables.	NJRDCSCC- None	No.
61	Carneys Point Disposal Area 2	NFA Approved EPA Letter 2002	Soil data included in SWMU 61 summary tables.	NJNRDCSCC - Arsenic and lead	No.

Notes:
[1]Criteria standards cited are those used for screening during the SWMU investigation.
[2]Current SRS criteria were used to re-screen soil data, and summary results are provided in Appendix C.1. Constituents that exceeded criteria were compared to those previously identified during the SWMU investigations, which mostly used SCC criteria. Significant deviations between the screenings were identified by a Yes or No in conjunction with the NFA or CMS recommendation for the SWMU. Not applicable means that either there were no soil data or the SRS criteria were used during the SWMU investigation and comparison between SCC and SRS screening of soil data is not applicable.
[3]Some additional exceedances of NJIGWSRS for metals (lead, cadmium, and mercury) were identified but are not significantly greater than the criteria. Exceedances of NJNRDSRS and NJIGWSRS for methylene chloride do not alter the recommendation for the SWMU.
[4]There were no IGWSCC criteria for metals developed at the time of the SWMU investigations. Some additional exceedances of NJIGWSRS for metals (aluminum, manganese, and mercury) were identified but are not significantly greater than the criteria.
NJRDCSCC = New Jersey Residential Direct Contact Soil Clean-up Criteria
NJNRDCSCC = New Jersey Non-Residential Direct Contact Soil Clean-up Criteria
NJIGWSCC = New Jersey Impact to Groundwater Soil Clean-up Criteria
Constituents that do not have a NJ soil criterion are not presented. Refer to SWMU Fact Sheets for more detailed information.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
1-2	Incinerators I and II	NFA Recommended Interior Investigation Technical Memorandum 2013	Soil data included in SWMU 8 summary tables.	NJNRDCSRS - 1,4-Dichlorobenzene, Benzene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Naphthalene, and Lead NJIGWSRS - VOCs, SVOCs, and metals	Not Applicable.
3	Incinerator III	NFA Recommended Interior Investigation Technical Memorandum 2013	Soil data included in SWMU 8 summary tables.	NJNRDCSRS - None NJIGWSRS - Aluminum	Not Applicable.
4	Incinerators IV	NFA Recommended Interior Investigation Technical Memorandum 2013	Soil data included in SWMU 8 summary tables.	NJNRDCSRS - Lead NJIGWSRS - VOCs, SVOCs, and metals	Not Applicable.
5A	Landfill I	NFA Recommended SWMU 5 ISM-RAR 2002	Soil data included in SWMU 5A summary tables.	NJNRDCSCC - PAHs and Lead NJIGWSCC – Chlorobenzene NJGWMA - SPLP VOCs, SVOCs, antimony, arsenic, and lead.	No.
5B	Landfill I Beach Area	NFA Recommended SWMU 5 ISM-RAR 2002	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not Applicable.
6	Landfill II	NFA Recommended Phase II RFI 1998	Soil data included in AOC 2 summary tables.	NJNRDCSCC - Lead	No.
7	Landfill III	NFA Recommended Interior Investigation Technical Memorandum 2013	Area was remediated prior to SWMU investigation. Soil data included in SWMU 8 summary tables.	NJNRDCSRS - Benzo(a)pyrene and lead NJIGWSRS - Benzene, Chlorobenzene, 1,2,4-Trichlorobenzene, 4-Chloroaniline, Benzo(a)anthracene, Benzo(a)pyrene and metals	Not Applicable.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
8	Landifil IV	CMS Recommended SWMU 8 CMS-RASR 2007	SWMUs 1-4, 7, 21, 22, 24, 30, 39-4, 39-7, 55-5, 55-6 and portions of 17/17A, 55-2 and 56A are within the SWMU 8 boundary. Data from SWMU 8/interior investigations as well as from SWMUs (as appropriate) included in SWMU 8 summary tables.	NJNRDSRS – VOCs, SVOCs,dieldrin, total PCBs and Metals NJIGWSRS - VOCs, SVOCs and Metals	No.
9	Solvent Recovery Unit I	NFA Approved EPA Letter 2002	Soil data included in AOC 6 summary tables.	NJRDCSCC - None	No.
10	Solvent Recovery Unit II	NFA Approved EPA Letter 2002	Soil data included in AOC 6 summary tables.	NJRDCSCC – None	No.
11	Storage Tank	NFA Approved EPA Letter 2002	Soil data included in AOC 8 summary tables.	Detections of sulfate and sodium had no criteria for comparison.	No.
12	WWTP Storage Pad	NFA Recommended SWMU 12 IRM Report 1999	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.
14-16	A, B, C Basin Surface Impoundments	NFA Approved EPA Letter 2002	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.
17/17A	Process Water Ditch System/Sidewalls	NFA Recommended Phase II RFI 1998	Soil data included in summary tables for AOCs 1-10, SWMU 8 as appropriate. Remediated soil not included in summary tables.	NJNRDCSCC – 2,4-DNT, 2,6-DNT, PAHs, Lead and Copper NJIGWSCC – VOCs and SVOCs NJGWIIA – SPLP VOCs, SVOCs Antimony, Arsenic and Lead	No.
18	WWTP	RCRA Part B Operating Unit	Soil data not collected.	Not applicable.	Not applicable.
18A	WWTP Pump Pit	NFA Recommended Phase II RFI 1998	Soil samples collected below the water table. Soil data is not included in summary tables.	Not applicable.	Not applicable.
20	Ethyl Chloride Incinerator	NFA Recommended Interior Investigation Technical Memorandum 2013	Soil data included in AOC 1 summary tables.	NJNRDCSRS – None NJIGWSRS – Aluminum, cadmium, lead, and manganese	Not applicable.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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DuPont Chambers Works Complex
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
21	Thermal Decon Furnace (FR-65) and Satellite Storage Area	NFA Recommended Phase III RFI 2002	Area was remediated prior to SWMU investigation. Soil data included in SWMU 8 summary tables.	NJNRDCSCC - Lead	No.
22	Multipurpose Incinerator (FR-01)	NFA Recommended RCRA Clean Closed 1989	No soil data collected.	Not applicable.	Not applicable.
23	Chemical Waste Tank Storage Area	RCRA Part B Operating Unit	No soil data collected.	Not applicable.	Not applicable.
24	Chemical Waste Container Storage Area	RCRA Part B Operating Unit	No soil data collected.	Not applicable.	Not applicable.
25	Lead Flue Dust and Lead Furnace Slag Storage Area	NFA Recommended Phase III RFI 2002	Soil data included in AOC 2 summary tables.	NJNRDCSCC - Lead	No.
26	Freon Spent Catalyst Storage Area	NFA Recommended Phase III RFI 2002	Soil data included in AOC 1 summary tables.	NJRDCSCC - Antimony NJNRDCSCC – None	
27	Oil/Water Separator	RCRA Part B Operating Unit	No soil data collected.	Not applicable.	Not applicable.
28	Telomer "A" Waste Container Storage Area	NFA Recommended Phase III RFI 2002	Soil data included in AOC 3 summary tables.	NJRDCSCC – None NJNRDCSCC – None NJIGWSCC - None	No.
29	Telomer "A" Waste Treatment (RCRA Part B Operating Unit)	RCRA Part B Operating Unit	No soil data collected.	Not applicable.	Not applicable.
30	Sanitary Landfills A and B	NFA Recommended SWMU 8 CMS-RASR 2007	No soil data collected.	Not applicable.	Not applicable.
31	Fly Ash Disposal Area	NFA Recommended Phase III RFI 2002	Soil data included in SWMU 31 summary tables.	NJRDCSCC – None NJNRDCSCC – None NJIGWSCC - None	No.
32A	Co-Gen Area A	NFA Recommended EPA Letter 1993	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
32B	Co-Gen Area B	NFA Approved EPA Letter 2002	Soil data not available in database; not included in summary tables. Sample locations include B32-5A, B32-5B, B32-6A, B32-6B, B32-7A, B32-7B, B32-8S, B32-8D, B32-9S and B32-9D.	NJNRDCSCC - Arsenic	No.
33	Manhattan Project	USACE Lead	Soil data not included in summary tables.	Not applicable.	Not applicable.
34	Gypsum Disposal Area	NFA Recommended Phase II RFI 1998	Soil data included in AOC 1 summary table.	NJNRDCSCC – None NJGWMA – SPLP Antimony, Arsenic, Lead and Thallium	No.
35	Freon Disposal Area	NFA Recommended PAR 2006	Determined not to be SWMU; no soil data collected.	Not applicable.	Not applicable.
36	Building 1082	NFA Recommended PAR 2006	Determined not to be SWMU; no soil data collected.	Not applicable.	Not applicable.
38	Clean Water Injection Wells	NFA Approved EPA Letter 1993	Determined not to be SWMU; no soil data collected.	Not applicable.	Not applicable.
39-1	UST-1	CMS Recommended RI-RASR 2009	Soil data included in AOC 9 summary tables.	NJNRDCSCC – None NJIGWSCC - Benzene	No.
39-2 through 39-9	Underground Storage Tanks	NFA Approved EPA Letter 1993	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.
40	Fuel Oil Storage Tanks	CMS Recommended Phase II RFI 1998	Soil data included in SWMU 40 summary tables.	NJNRDCSCC – Benzo(a)pyrene TPH ranges from 20-4,400 mg/kg	No.
41-1	Drum Storage Area 1	NFA Recommended Phase III RFI 2002	Soil data included in AOC 9 summary tables.	NJNRDCSCC – None NJIGWSCC – None	No.
41-2	Drum Storage Area 2	NFA Recommended Phase III RFI 2002	Soil data included in AOC 9 summary tables.	NJRDCSCC – None NJNRDCSCC – None NJIGWSCC - None	No.
41-3	Drum Storage Area 3	NFA Recommended Phase III RFI 2002	Soil data included in AOC 6 summary tables.	NJRDCSCC – None NJNRDCSCC – None NJIGWSCC - None	No.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
41-4	Drum Storage Area 4	NFA Approved EPA Letter 2002	Soil data included in AOC 9 summary tables.	NJRDCSCC – None	No.
41-5	Drum Storage Area 5	NFA Approved EPA Letter 2002	Soil data included in SWMU 41-5 summary tables.	NJRDCSCC – None	No.
41-6	Drum Storage Area 6	NFA Approved EPA Letter 2002	Soil data included in AOC 6 summary tables.	NJNRDCSCC – None	No.
41-7	Drum Storage Area 7	NFA Approved EPA Letter 2002	Soil data included in AOC 6 summary tables.	NJRDCSCC – None	No.
41-8	Drum Storage Area 8	NFA Recommended Phase II RFI 1998	Soil data included in AOC 6 summary tables.	NJNRDCSCC – Benzo(a)pyrene	No.
43	Former Unified Basin Outfall	NFA Recommended SWMU ISM-RAR 2002	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.
50	Asbestos Disposal Area	NFA Approved EPA Letter 1993	Soil stabilized or removed; data not included in summary tables.	Not applicable.	Not applicable.
51	Well DW-8	NFA Approved EPA Letter 1993	No soil data collected. Groundwater data only collected.	Not applicable.	Not applicable.
55-1	Area of Fill Deposition 1	NFA Recommended in Comprehensive RFI 2014	Soil data included in AOC 5 summary tables.	Phase II RFI NJNRDCSCC – None NJIGWSCC – None NJGWIIA – SPLP Antimony, Arsenic and Lead Data Gap Investigation NJNRDCSRS – None NJIGWSRS – 1,2,4-TCB, aluminum, beryllium, lead, manganese and mercury	No.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
55-2	Area of Fill Deposition 2	NFA Recommended Phase II RFI 1998	Soil data included in SWMU 8 summary tables.	NJRDCSCC - None NJNRDCSCC – None NJIGWSCC – None NJGWIIA – SPLP None	No.
55-3	Area of Fill Deposition 3	NFA Recommended . PAR 2006	Soil data included in AOC 5 summary tables.	NJNRDCSCC – Antimony, Arsenic, Copper, Benzene, Chlorobenzene, Naphthalene, Benzo(a)anthracene NJIGWSCC – Benzene, Chlorobenzene, Tetrachloroethene, Naphthalene, N-nitrosodiphenylamine, 1,2,4-TCB, 1,2-DCB. 1,3-DCB and 1,4-DCB NJGWIIA – SPLP Antimony, Arsenic, Lead, Benzene, Chlorobenzene, Tetrachloroethene, 1,2,4-TCB, 1,2-DCB, 1,4-DCB, benzidine, naphthalene, N-nitrosodiphenylamine	No.
55-4	Area of Fill Deposition 4	NFA Recommended in Comprehensive RFI 2014	Soil data included in AOC 1, AOC 4, and AOC 5 summary tables.	Phase II RFI NJNRDCSCC – Antimony, Arsenic, Copper, Lead, Hexachlorobenzene, and PAHs NJIGWSCC – VOCs and SVOCs NJGWIIA – SPLP Antimony, Arsenic, Lead, Thallium, Benzene, Chlorobenzene, Tetrachloroethene and benzidine Data Gap Investigation NJNRDCSRS – None NJIGWSRS – Aluminum, Lead and Manganese	No.
55-5	Area of Fill Deposition 5	NFA Recommended SWMU 8 CMS-RASR 2007	Soil data included in SWMU 8summary table.	NJNRDCSCC – Lead, Hexachlorobenzene and PAHs NJIGWSCC – Chlorobenzene, PAHs NJGWIIA – SPLP Antimony, Arsenic, Beryllium, Lead, Methylene Chloride and 1,2,4-TCB	No.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
55-6	Area of Fill Deposition 6	NFA Recommended Interior Investigation Tech Memo 2013	Soil data included in SWMU 8 summary tables.	NJNRDCSRS – None NJIGWSRS – Aluminum, Lead, Manganese and Mercury	Not Applicable.
55-7	Area of Fill Deposition 7	NFA Recommended Phase II RFI 1998	Soil data included in SWMU 55-7 summary tables.	NJRDCSCC - None NJNRDCSCC – None NJIGWSCC – None NJGWIIA – SPLP None	No.
56	ODCB in B-Ditch	NFA Recommended SWMU 56 RAR – OCDB Area 2000 and SWMU 56 RAR – Aramids Pond 2004	Remediated soil not included in summary tables; otherwise, soil data included in AOC 5 summary tables as appropriate.	NJNRDCSCC - ODCB	No.
56A	Historic PWDS	NFA Recommended Remedial Action Report HWPDS Lead Area 1998	Remediated soil not included in summary tables; otherwise, soil data included in summary tables for AOCs1, 2, 4-7, 9, SWMU 8 as appropriate.	NJNRDCSCC – Antimony, Arsenic, Hexachlorobenzene and Lead	No.
57	Anti-knocks Area	NFA Recommended Phase II RFI 1998	Soil data included in AOC 2 summary tables.	NJNRDCSCC – Lead NJGWIIA – SPLP Lead TEL detected in soil and SPLP but no criteria available	No.
58	Former Sludge Pit	NFA Recommended Phase II RFI 1998	Soil data included in AOC 5 summary tables.	NJNRDSCC – None. NJIGWSCC – None.	No.
59	Disposal Area V	NFA Recommended Phase II RFI 1998	Soil data included in AOC 1 summary tables.	NJNRDCSCC – Lead NJIGWSCC – None NJGWIIA - SPLP Arsenic, Lead and Thallium	No.
60	Drum Disposal Area	NFA Recommended Ecological Investigation Report 2009	Soil data included in AOC 11 summary tables.	NJNRDCSCC – 2,4-DNT and PAHs NJIGW – None NJGWIIA – SPLP Antimony, Arsenic, Cadmium, Lead, bis(2-ethylhexyl)phthalate, and nitrobenzene	No.

Table 7-1
Summary of Manufacturing Area SWMUs and Soil Data Status
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SWMU	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (criteria specified by SWMU)[1]	Significant Deviation of Exceedances (Yes, No, Not Applicable)[2]
62	Aramids/Nitrators Sump	NFA Recommended Phase II RFI 1998	Soil data included in SWMU 62 summary tables.	NJRDCSCC – 2,4-DNT NJNRDCSCC – None NJIGWSCC - Benzene.	No.
63	Azo-Dye Area	NFA Recommended Phase IV Supplemental RFI 2007	Soil data included in AOC 6 summary tables.	NJNRDCSCC – SVOCs NJIGWSCC – Chlorobenzene and SVOCs	No.

Notes:
[1]Criteria standards cited are those used for screening during the SWMU investigation.
[2]Current SRS criteria were used to re-screen soil data, and summary results are provided in Appendix C.1. Constituents that exceeded criteria were compared to those previously identified during the SWMU investigations, which mostly used SCC criteria. Significant deviations between the screenings were identified by a Yes or No in conjunction with the NFA or CMS recommendation for the SWMU. Not applicable means that either there were no soil data or the SRS criteria were used during the SWMU investigation and comparison between SCC and SRS screening of soil data is not applicable. In some cases, soil data collected below the water table was included in the comparison of criteria in the Fact Sheets but the data is not included in the summary tables in Appendix C.1.
NJRDCSCC = New Jersey Residential Direct Contact Soil Clean-up Criteria
NJNRDCSCC = New Jersey Non-Residential Direct Contact Soil Clean-up Criteria
NJIGWSCC = New Jersey Impact to Groundwater Soil Clean-up Criteria
Constituents that do not have a NJ soil criterion are not presented. Refer to SWMU Fact Sheets for more detailed information.

Table 7-2
Summary of Manufacturing Area AOCs and Soil Data Status
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AOC	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (NJNRDSRS)[1]
AOC 1	Fluoroproducts	Recommendation in 2014 RFI required	SWMU 20, 26, 35, 39-3, 59 and portions of 17/17A, 34, 55-4 and 56A are within AOC 1 boundary. Data from perimeter/interior investigation/RFI data gap as well as from SWMUs (as appropriate) included in AOC 1 summary tables.	1,4-Dichlorobenzene Chloroform Tetrachloroethene 6 PAHs Hexachlorobenzene Total PCBs Antimony Arsenic Lead Mercury
AOC 2	TEL	Recommendation in 2014 RFI required	SWMU 6, 25, 39-2, and portions of 17/17A, 56A, and 57 are within AOC 2 boundary. Soil data from perimeter/interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 2 summary tables.	1,2-Dibromoethan (EDB) 1,2-Dichloroethane 1,2-Diphenylhydrazine 6 PAHs Lead TEL
AOC 3	Jackson Lab	Recommendation in 2014 RFI required	SWMUs 28, 29, and portions of 17/17A, and 57 are within AOC 3 boundary. Soil data from perimeter/interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 3 summary tables.	4 PAHs Hexachlorobenzene Total PCBs Lead Mercury
AOC 4	Aramids	Recommendation in 2014 RFI required	SWMUs 39-6 and portions of 17/17A, 55-4, and 56A are within AOC 4 boundary. Soil data from interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 4 summary tables.	7 PAHs Arsenic Lead
AOC 5	Historical Basin Footprint and Ditches	Recommendation in 2014 RFI required	SWMUs 12, 27, 55-1, 55-3, 58 and portions of 17/17A, 18, 56, and 56A are within AOC 5 boundary. Data from interior/RFI data gap investigations as well as from SWMUs (as appropriate) included AOC 5 in summary tables.	1,4-Dichlorobenzene Benzene 2,4-Dinitrotoluene 2,6-Dinitrotoluene 8 PAHs Total PCBs Antimony Arsenic Lead

Table 7-2
Summary of Manufacturing Area AOCs and Soil Data Status
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AOC	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (NJNRDSRS)[1]
AOC 6	Dyes	Recommendation in 2014 RFI required	SWMUs 9, 10, 38, 41-3, 41-6 through 41-8, 63 and portions of 17/17A and 56A are within AOC 6 boundary. Data from perimeter/interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 6 summary tables.	1,2-Dichlorobezene 1,4-Dichlorobenzene Benzene Chlorobenzene Chloroform Tetrachloroethene Trichloroethene 1,2-diphenylhydrazine 2,4-Dinitrotoluene 2,6-Dintirotoluene Benzidine 7 PAHs Hexachlorobenzene Total PCBs Arsenic Cadmium Lead
AOC 7	Elastomers	Recommendation in 2014 RFI required	Portions of SWMUs 17/17A and 56A are within AOC 7 boundary. Data from interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 7 summary tables.	1,2-Dichlorobenzene 1,4-Dichlorobenzene Benzene Chlorobenzene Trichloroethene 1,2-Diphenylhydrazine 2,4-Dinitrotoluene 2,6-Dinitrotoluene 5 PAHs Total PCBs Arsenic Lead
AOC 8	Warehouse, Transport and Construction	Recommendation in 2014 RFI required	SWMU 11 and portions of SWMU 17/17A are within AOC 8 boundary. Data from interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 8 summary tables.	1,4-Dichlorobenzene Benzo[a]pyrene Lead
AOC 9	Monastral	Recommendation in 2014 RFI required	SWMUs 39-1, 41-1, 41-2, 41-4 and portions of 17/17A, 55-5, and 56A are within AOC 9 boundary. Data from interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 9 summary tables.	4 PAHs

Table 7-2
Summary of Manufacturing Area AOCs and Soil Data Status
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AOC	Description	RFI Status	Soil Data Set Status	Fact Sheet Soil Exceedances (NJNRDSRS)[1]
AOC 10	White Products	Recommendation in 2014 RFI required	Portions of SWMU 17/17A are within AOC 10 boundary. Data from perimeter/interior/RFI data gap investigations as well as from SWMUs (as appropriate) included in AOC 10 summary tables.	Benzo[a]pyrene
AOC 11	Former Drainage Ditch	NFA Recommended Perimeter Investigation 2011.	SWMU 60 is mostly within AOC 11 boundary. Data from perimeter investigations as well as from SWMU 60 included in AOC 11 summary tables.	2,4-Dinitrotoluene 5 PAHs

Note:
[1]All soil data included within the boundary of each AOC was compared to NJNRDSRS and NJIGWSRS and is provided in Appendix C.1 by AOC. Constituents listed above are those that exceeded NJNRDCSRS at one more locations within the AOC. Constituents that do not have a NJ soil criterion are not included here. Refer to the AOC soil tables in Appendix C.1 and the Fact Sheets in Appendix A for more detailed information.
NJNRDCSRS = New Jersey Non-Residential Direct Contact Soil Remediation Standards
NJIGWSRS = New Jersey Impact to Groundwater Soil Remediation Standards.