IN THE CIRCUIT COURT FOR BALTIMORE CITY

STATE OF MARYLAND, 200 St. Paul Place Baltimore, Maryland 21202,	*	
Plaintiff,	*	
v.	*	Civil Action No.
MONSANTO COMPANY, c/o CSC-Lawyers Incorporating Service Company 7 Saint Paul Street, Suite 82 Baltimore, Maryland 21202,	*	
PHARMACIA LLC, c/o The Corporation Trust Incorporated 351 West Camden Street Baltimore, Maryland 21201, and	*	
SOLUTIA, INC., c/o The Corporation Trust Incorporated 351 West Camden Street Baltimore, Maryland 21201,	*	
Defendants.	*	

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COMPLAINT

Plaintiff, the State of Maryland, by and through Brian E. Frosh, Attorney General of Maryland, brings this action under Maryland common law to recover for harms caused by Defendants Monsanto Company, Pharmacia LLC, and Solutia, Inc., (collectively, "Defendants" or "Monsanto"), and alleges as follows:

INTRODUCTION

1. The State of Maryland ("the State"), brings this action to protect the health, safety, and welfare of its people and its natural environment.

2. Maryland possesses a broad diversity of aquatic resources, from beaches and tidal marshes along the coast to high-elevation peatlands and ravines of old-growth hemlock in the mountains. With more than 19,000 miles of rivers and streams, 843,884 acres of lakes and wetlands, 3,190 miles of shoreline, and 2,451 square miles of estuaries and bays, Maryland's waterways define the character of the state. Maryland's tidally influenced rivers, tributaries, and embayments of the Chesapeake Bay, as well as the coastal lagoons behind the Atlantic barrier islands, account for 20 percent of the State's total surface area.

3. Maryland is home to more than 800 species of mammals, reptiles, amphibians, birds, and marine and freshwater fishes along with an untold number of insects and other invertebrate species. The State contains a diversity of forested habitat including hemlock forests, loblolly pine woodlands, moist upland forests, dry upland forests and riparian forests, as well as meadows, forested wetlands, and tidal and non-tidal marshes, all of which provide habitat for the State's birds and mammals. Maryland's lakes, rivers and streams are home to fish such as bass, shad, catfish, perch, and trout. The Chesapeake Bay, the coastal bays of Worcester County, and the Atlantic Ocean all provide wintering habitat for a wide array of waterbirds, including ducks, geese, swans, loons, and grebes.

4. Maryland's shorelines, rivers, lakes, wetlands, tidal and non-tidal marshes all support important sectors of the state's economy, including watermen on the Eastern Shore

who make a living harvesting crabs, fish, and oysters, and commercial fisheries in the Baltimore Harbor. For generations, these waters have been at the center of Maryland life, and Marylanders have a right to depend on the quality of the waters, and a right to use and enjoy these resources for commerce, sustenance, recreation, and tourism.

5. Many of Maryland's natural resources and environments are contaminated with polychlorinated biphenyls—persistent, bioaccumulative, and toxic chemicals known more commonly as "PCBs." PCBs do not occur naturally, yet today they persist throughout Maryland's waterways, upland areas, soils, sediments, aquatic life, birds, and mammals. Even where PCBs are present in very low concentrations in water and sediment, they bioaccumulate in organisms and become concentrated within those organisms at much higher levels than in the surrounding water and sediment.

6. PCBs are readily absorbed but not easily metabolized. Because PCBs are highly lipid-soluble, they accumulate in fatty tissues. Bioaccumulation repeats at each step of the food chain, such that the PCBs are increasingly concentrated in the bodies of predators, such as larger fish and fish-eating birds and mammals. This process is called biomagnification.

7. PCBs cause a wide range of systemic toxic effects in humans and animals, and they can seriously impair the endocrine, neurologic, and reproductive systems. PCBs harm eagles, osprey, herons, and other resident birds, as well as various fish species and mammals throughout Maryland.

8. This PCB contamination throughout Maryland is a result of the actions of one company: Monsanto. Between 1935 and 1977, Monsanto was the only company in

the United States to manufacture PCBs for widespread commercial use. Monsanto distributed PCBs widely and continuously, including throughout Maryland, for use in a broad array of products such as electrical equipment, lighting ballasts, paint, and caulking.

9. Despite knowing as early as 1937 that PCBs were toxic to humans and animals and that PCBs could escape into and contaminate the environment, Monsanto manufactured and sold PCBs continuously until they were finally banned under federal law. *See* Toxic Substances Control Act, 15 U.S.C. § 2605(e)(3)(A)(i) (eff. Jan. 1, 1977) ("[N]o person may manufacture any polychlorinated biphenyl after two years after January 1, 1977"). Even when Monsanto had overwhelming evidence of the hazards that PCBs create, Monsanto continued to produce and sell these toxic chemicals throughout the country, including in the State of Maryland. Monsanto's own internal documents show that it was not interested in protecting people or the environment. Rather, its only concern was in protecting its balance sheet.

10. As public concerns about PCBs began to grow in the 1960s, Monsanto did not alert its customers or the public to its knowledge of the dangers of PCBs. Instead, Monsanto assembled an internal team and tasked it with deflecting criticism of both PCBs and the company itself. The team was told that Monsanto "can't afford to lose one dollar of business" from its PCB sales. Despite knowing that millions of pounds of highly toxic PCBs were being released into the environment every year, Monsanto worked to hide the dangerous and persistent effects of the PCBs because, in the company's own words, "selfishly too much Monsanto profit" would be lost if it told the truth. Monsanto concealed from consumers, the State, the federal government, and the general public its knowledge

of the harmful effects of PCBs and Monsanto's role in introducing these toxins to the surrounding environment, deciding instead that its financial bottom line—and, later, its corporate reputation—were more important than the health and well-being of humans and the environment.

11. Today, Maryland suffers the consequences of Monsanto's decision to place profit above all else. The toxic legacy that Monsanto left Marylanders continues, as PCBs persist in Maryland's lands, rivers, and waterways, in its sediments and soils, and in the bodies of fish, animals, and humans. According to water quality data from 2018, approximately 968 square miles of the State's estuarine waters are impaired by PCB contamination. In addition, approximately 262 miles of Maryland's rivers and streams, and approximately 3,147 acres of the State's lakes and reservoirs, are similarly impaired. Monsanto's PCBs have caused harm to aquatic, marine, and avian species, and pose ongoing risks to the health of Maryland's residents.

12. The State has incurred significant costs in conducting fish tissue monitoring, investigating and developing a list of Maryland waters impaired by PCBs, and investigating and remediating sites that are contaminated with PCBs. The State will continue to incur such costs long into the future, because PCBs break down only slowly, if at all, depending on environmental conditions and the degree of chlorination of the PCB. The presence of PCBs in Maryland's waterways and sediments, in Maryland's fish and wildlife, on Maryland's land, and throughout the State's natural environment has had significant adverse impacts on the availability of natural resources for recreational, commercial,

cultural, and aesthetic uses. Their presence will continue to have such adverse impacts as long as PCBs persist in Maryland's natural environment.

13. The State brings this action in its sovereign capacity as trustee for all natural resources within its borders, which it holds in trust and protects for the benefit of all Marylanders, and to protect its quasi-sovereign interest in those natural resources. Those public trust resources include the land beneath all navigable waterways within the State; all waters within the State from all sources of water supply; and all fish, wildlife, and fish and wildlife habitat areas throughout the State. The State also brings this action in its capacity as proprietor and owner of certain lands within its borders, including submerged lands, that have been contaminated by PCBs, and for reimbursement of the costs it has incurred, and will incur in the future, to investigate, remediate, and monitor known PCB contamination throughout the State. Through this action, the State seeks to recover damages from Monsanto for the harms that Monsanto's PCBs have caused to the State's lands and natural resources, including the costs that the State has incurred, and will continue to incur, to investigate and remediate the widespread damage caused by the presence of Monsanto's PCBs on Maryland's lands, in Maryland's waters, and throughout Maryland's natural environment.

PARTIES

Plaintiff

14. The State has a sovereign interest in the protection of, and in the remediation of harm to, Maryland's environment and natural resources. The State holds Maryland's navigable waterways and natural resources in public trust for the people of Maryland. The

State has a quasi-sovereign interest in the health and well-being of Maryland residents. Finally, the State has a proprietary interest in the land and natural resources that it owns.

15. The responsibilities of the Attorney General of Maryland include the investigation, commencement, and prosecution of civil suits on the part of the State. *See* Maryland Constitution, Art. V, § 3. The Attorney General has "general charge of the legal business of the State." Md. Code Ann., State Gov't § 6-106.

16. The State holds in trust for the public all navigable waterways within the State. By virtue of its public trust responsibilities, all such waterways are to be preserved for public use in navigation, fishing, and recreation. The State is also the trustee of all natural resources—including land, water, wildlife, and habitat areas—within its borders. As trustee, the State holds these natural resources in trust for all Marylanders, preserving, protecting, and making them available to all Marylanders to use and enjoy for recreational, commercial, cultural, and aesthetic purposes.

17. The State also brings this action in its *parens patriae* capacity and thereby seeks to protect the public rights of all Marylanders, which rights are threatened by the presence of PCBs in Maryland's environment. The State has a quasi-sovereign interest in protecting the State's public trust lands and natural resources, and in the well-being, health, and comfort of all Marylanders, which are threatened by the persistence of Monsanto's PCBs throughout the State's lands and natural environment. That threat includes increased risk of harm to human health, increased risk of harm to the vitality of Maryland's fish and wildlife species, harm to Maryland businesses, and decreased availability of Maryland's natural resources for commercial, recreational, tourist, cultural, and aesthetic purposes.

18. The State also has a proprietary interest in the land and resources it owns, controls, or holds in trust, including submerged lands. The persistence of Monsanto's PCBs in and on lands owned, controlled, or held in trust by the State has caused injury to, and has threatened, the State's proprietary interests. The State has suffered injuries to those interests including, but not limited to, costs that it has incurred investigating PCB contamination. The State anticipates that it will incur significant additional costs to clean up and remediate lands and natural resources that it owns, controls, or holds in trust and that are contaminated by Monsanto's PCBs.

19. The State seeks all damages, including punitive or exemplary damages, to which it is entitled as a result of Defendants' ill will, evil motive, or actual malice.

Defendants

20. Defendant Monsanto Company ("New Monsanto") is a Delaware corporation with its principal place of business in St. Louis, Missouri. New Monsanto is a wholly owned subsidiary of Bayer AG.

21. Defendant Pharmacia LLC ("Pharmacia"), formerly known as "Pharmacia Corporation" and successor by merger to the Monsanto Chemical Company, is a Delaware limited liability company with its principal place of business in Peapack, New Jersey. Pharmacia is a wholly owned subsidiary of Pfizer, Inc.

22. Defendant Solutia Inc. ("Solutia") is a Delaware corporation with its headquarters and principal place of business in St. Louis, Missouri. Solutia is a wholly owned subsidiary of Eastman Chemical Company.

23. During the period between 1929 and 1977, the Monsanto Chemical Company ("Original Monsanto") owned and operated an agricultural products business, a pharmaceutical and nutrition business, and a chemical products business. As part of its chemical products business, Original Monsanto began manufacturing PCBs in the 1930s. It continued manufacturing PCBs until 1977.

24. Beginning in approximately 1997, Original Monsanto underwent a series of corporate transactions that caused its businesses to spin off into three separate entities.

25. Defendant Solutia now operates Original Monsanto's chemical products business. Solutia was organized for the purpose of owning and operating the chemical products business, and it has assumed all operations, assets, and liabilities of Original Monsanto's chemical products business, including any such liabilities imposed on Pharmacia.

26. Defendant Pharmacia is the successor to Original Monsanto, which manufactured and sold PCBs, and Pharmacia now operates Original Monsanto's pharmaceutical business.

27. Defendant New Monsanto now operates Original Monsanto's agricultural products business and agreed to assume the chemical liabilities that Defendant Solutia had assumed from Pharmacia, to the extent that Solutia failed to pay, perform, or discharge those liabilities.

28. All Defendants have entered into agreements to share or apportion liabilities, or to indemnify one or more other entities, for claims and liabilities arising from

Monsanto's chemical products business, including claims arising from Original Monsanto's manufacture and sale of PCBs.

A. Solutia is liable for Original Monsanto's PCB liabilities it assumed from Pharmacia.

B. Pharmacia is liable for Original Monsanto's PCB liabilities.

C. New Monsanto is liable for Original Monsanto's PCB liabilities it assumed from Pharmacia and continues to have indemnity obligations to Pharmacia for those liabilities. New Monsanto has indemnified Solutia for Original Monsanto's PCB liabilities that Solutia assumed from Pharmacia.

29. New Monsanto, Pharmacia, and Solutia are jointly and severally liable to third parties such as the State for the liabilities resulting from the acts and omissions of Original Monsanto as a matter of law.

30. Throughout this complaint, and for the purposes of this litigation, New Monsanto, Pharmacia, and Solutia collectively are referred to as "Defendants" or "Monsanto."

JURISDICTION AND VENUE

31. This Court has subject matter jurisdiction over this matter under § 1-501 of the Courts and Judicial Proceedings Article of the Annotated Code of Maryland and Maryland Rule 2-305(b) because this civil case seeks and demands money damages in excess of $75,000.

32. This Court has personal jurisdiction over Defendants because each Defendant took one or more of the following actions within the time period relevant to this

complaint: transacted business in Maryland or performed work in Maryland; contracted to supply goods or manufactured products in Maryland; caused tortious injury in Maryland by an act or omission in Maryland; caused tortious injury in Maryland by an act or omission outside of Maryland while also regularly conducting business in Maryland, or deriving substantial revenue from the sale of goods or manufactured products used in Maryland; contracted to insure or act as surety for, or on, any person, property, risk, contract, obligation, or agreement located, executed, or to be performed within Maryland at the time the contract was made; or has other significant contacts with Maryland. Each Defendant has contacts with Maryland sufficient to give rise to the current action, has continuous and systematic contacts with Maryland, or has consented either explicitly or implicitly to the jurisdiction of this Court.

33. Venue is proper in this Court as to all Defendants under §§ 6-201(b) and 6-202(3) of the Courts and Judicial Proceedings Article of the Annotated Code of Maryland.

Maryland Seeks Assignment to Business and Technology Case Management Program

34. Pursuant to Maryland Rule 16-308, the State seeks assignment of this case to the Business and Technology Case Management Program because the case implicates commercial and technological issues stemming from the nature of the relief sought in the case and the amount of compensatory and punitive damages at issue. These commercial and technological issues include the complexity of the science relating to remediation and clean-up of PCB contamination in Maryland, as well as the complexity of the anticipated

factual, legal, and evidentiary issues that will need to be adjudicated, such as discovery of Maryland state agencies by Monsanto, the scope of anticipated motions practice, and the management of expert scientists and economists.

GENERAL ALLEGATIONS

PCBs are Toxic Chemicals That Persist in the Natural Environment.

35. Polychlorinated biphenyls are a group of human-made organic compounds formed by the addition of between one and ten chlorine atoms to the aromatic hydrocarbon "biphenyl." In each molecule of PCB, the number and location of chlorine atoms determines the compound's physical and chemical properties. Currently, 209 unique chemical configurations of PCBs have been identified; these configurations are known as "congeners."

36. Based on their chemical composition, PCBs fall within the family of chemical compounds known generally as "chlorinated hydrocarbons." Other chlorinated hydrocarbons include dioxins (for example, Agent Orange), DDT, Chlordane, Aldrin, and similar pesticides.

37. PCBs are not naturally occurring substances. There are no known natural sources of PCBs in the environment.

38. The physical properties of each PCB congener vary depending on the congener's degree of chlorination. Most congeners are colorless or slightly yellow, odorless, crystalline compounds. Others, however, may be liquid mixtures with varying

degrees of viscosity. Commercially, PCBs generally were manufactured and produced as complex mixtures of PCB congeners, not as single PCB compounds.

39. Monsanto manufactured and distributed PCBs using the trade name "Aroclor." Monsanto assigned each Aroclor mixture a unique number (e.g., Aroclor 1221, Aroclor 1232, Aroclor 1242), the last two digits of which generally referred to the proportion of chlorine in the mixture.

40. Since the onset of their commercial production in the United States by Monsanto, PCBs were used extensively for industrial and commercial purposes, as well as in consumer products. PCBs are relatively insoluble in water and fire-resistant because of their high flash points, and they possess excellent dielectric properties.

41. PCBs do not easily degrade, and they do not react to acids, alkalis, or oxidants. The ability of PCBs to be degraded or transformed over time in the environment depends on the degree of chlorination of the biphenyl molecule and the physical location of the PCB molecule, whether in the atmosphere, water, or in sediments. PCBs already have persisted in the natural environment for decades and may persist in the natural environment for centuries if they are not remediated.

42. PCBs are also lipophilic, which causes them to accumulate in lipid-rich tissues and substances, such as the fatty tissues of birds, fish, wildlife, and other animal life, including humans.

43. PCBs are highly toxic chemicals that adversely impact human health and the environment. For humans, PCB exposure can cause cancer, depressed immune system function, skin conditions such as acne and rashes, irritation of the nose and lungs,

gastrointestinal discomfort, changes in the blood and liver, depression, fatigue, and impaired learning capacity.[1] The Environmental Protection Agency ("EPA") has concluded that PCBs are probable human carcinogens. Children are particularly susceptible to harm by PCB exposure, and they can be exposed to PCBs both prenatally and through breast milk. Because of their physiology and behavior, children may also be particularly vulnerable to altered development due to PCBs.

44. In 1996, EPA reassessed PCB carcinogenicity based on data related to Aroclors 1016, 1242, 1254, and 1260. EPA's reassessment was peer-reviewed by 15 experts, all of whom agreed that PCBs are probable human carcinogens. EPA also confirmed in its reassessment what scientists established years earlier—that PCBs are associated with other serious non-cancer health effects, including harm to human and animal immune, reproductive, nervous, and endocrine systems.[2]

45. PCBs are toxic to animal species, including invertebrate, fish, mammal, pinniped (e.g., seals and sea lions), and bird species. Because PCB transport patterns show a gradual redistribution toward the marine environment, fish-eating marine mammals are potentially the wildlife receptors most affected by PCB exposure. Studies show that PCB accumulation impairs fish and wildlife reproduction because of increased embryotoxicity

[1] *See generally* Agency for Toxic Substances & Disease Registry ("ATSDR"), U.S. Dep't of Health & Human Servs., *Toxicological Profile for Polychlorinated Biphenyls (PCBs)* 5-7, 22-24, 90-283 (Nov. 2000), https://www.atsdr.cdc.gov/toxprofiles/tp17.pdf [hereinafter ATSDR Toxicology Profile].

[2] *See* United States Environmental Protection Agency, *PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures* (Sept. 1996), https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12486.

and decreased egg viability and hatchability, due, in part, to eggshell-thinning. PCBs also can cause neurological impairment in wildlife, including disruptions to the nervous system and changes in behavior, as well as endocrine-related impairments and dermal and ocular effects. Moreover, studies of minks and certain bird species have shown that PCB contamination correlates to population decline and reproductive impairment, particularly in fish-eating species.[3]

Monsanto Caused Hundreds of Millions of Pounds of PCBs to Enter and Contaminate the Natural Environment.

46. Commercial production of PCBs in the United States began in 1929 in Anniston, Alabama, by Swann Chemical Company, the corporate predecessor to Monsanto. Swann Chemical Company manufactured and distributed PCBs under the trade name "Aroclor," which Monsanto later trademarked. Monsanto took over Swann in the early 1930s and had fully assumed control of Swann's PCB manufacturing by 1935.

47. Monsanto—and its corporate predecessor Swann Chemical Company—was the only manufacturer in the United States that intentionally produced and distributed PCBs for widespread commercial use between 1929 and 1979.

48. Monsanto produced and distributed PCBs to its customers on a widespread basis. Its annual production peaked in 1970, when Monsanto produced a total volume of 39,000 metric tons of PCBs. Between 1957 and 1971, Monsanto produced 12 different types of PCB "Aroclors," each with a different chlorine content ranging from 21 percent to 68 percent chlorine by weight. Between 1935 and 1977, Monsanto produced a total of

[3] *See, e.g.*, ATSDR Toxicology Profile at 285-95.

641,246 metric tons of PCBs in the United States. Monsanto produced PCBs at two plant locations: Anniston, Alabama, and Sauget, Illinois.

49. Monsanto developed, produced, and marketed PCBs for use in a wide range of commercial and industrial applications. PCBs were advertised and predominantly used as components of dielectric fluids, which provide electrical insulation in capacitors, transformers, and other electrical systems. During the 1960s, dielectric fluid in capacitors and transformers accounted for 50 to 60 percent of the sales of PCBs in the United States. Other uses included hydraulic systems, heat-transfer and cooling systems, sealants and flame-retardant coatings, inks, adhesives, rubber products, plasticizers, carbonless copy paper, and paints.

50. Monsanto introduced PCBs to the natural environment in a variety of ways. Monsanto described the use of PCBs as coolants, flame retardants, plasticizers, and paint as "open applications," which allowed chemicals to enter the environment simply through use of the PCB-containing materials. Monsanto described other uses of PCBs as "closed applications," for example in capacitors and transformers, but even those PCBs escaped through leaks, routine maintenance, or by volatilizing into the air. And, because Monsanto did not tell the public about the dangers of PCBs, PCB-containing materials routinely were disposed of without regard to where the PCBs ultimately would end up. For example, old transformers filled with Monsanto's PCB-containing fluids were left on the ground outside or in junk yards, allowing PCB-containing fluids to drain onto the ground. As a result, hundreds of millions of pounds of PCBs have entered the natural environment, causing widespread contamination.

PCBs Persist in Humans and in Wildlife and Throughout the Natural Environment.

51. PCBs are now found worldwide at measurable levels throughout the environment, including in soils and sediments, water, fish, and wildlife.

52. Once released into the environment, PCBs can migrate significant distances, transported by water or through the air. Because they are relatively insoluble in water, PCBs tend to fall through the water column when they reach a waterway, ultimately binding to sediments or other particulates. There, most PCBs either persist, or are transported downstream with sediment. PCBs also migrate through the air, either in the vapor phase or bound to particulates.

53. PCBs enter the food chain when plants or animals ingest them. The impact of PCBs on animals is magnified through the twin processes of bioaccumulation and biomagnification. Because PCBs are lipophilic, they tend to accumulate in animals' fatty tissues rather than be excreted. Biomagnification starts when a small animal—perhaps an insect—ingests materials containing PCBs. When a fish eats thousands of such insects over its lifetime, the PCBs in the insects accumulate in the fish's fatty tissues. Over the life of the fish, the concentration of PCBs in its tissues can reach significant levels. And when a predator—for example, an eagle, whale, or human—eats PCB-contaminated fish, the concentration of PCBs will increase yet again. Seals, whales, and eagles may eat thousands of fish over their lifetimes, and all the PCBs in those fish will remain in the predators' fatty tissues. According to the EPA, the concentration of PCBs in the fatty

tissues of top predators can be millions of times higher than the concentration in the open water.

54. After they enter the natural environment, PCBs also undergo a process known as "weathering." During the weathering process, a PCB compound goes through physical or chemical changes due to natural processes such as bacterial action, accumulative and metabolic processes in higher biological organisms, or exposure to sunlight. Because weathering can change the chemical composition of PCBs, it can result in PCBs with higher chlorination or congeners with higher bioaccumulative properties. As a result of those changes, PCB congener patterns found in humans and in wildlife often are different from, and sometimes have a higher concentration of more highly chlorinated congeners than, congener patterns found in the commercially produced PCB-containing materials themselves.

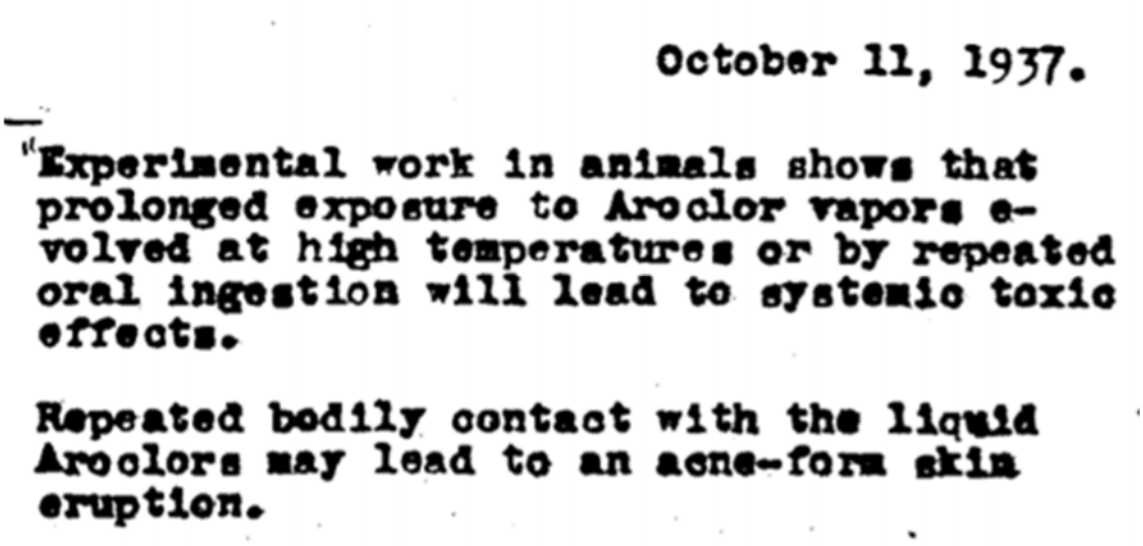
55. Human beings are exposed to PCBs through ingestion, inhalation, or direct contact with PCBs or PCB-containing materials and food. Humans may inhale PCBs that are emitted into the air, or they may be exposed through consumption of PCB-contaminated food. They may also absorb PCBs upon direct physical contact—for example, through direct contact with contaminated sediment at a swimming beach. Because PCBs bioaccumulate in fish and other wildlife species and in domestic animals, humans often are exposed through the consumption of PCB-contaminated fish and other food products.

56. PCBs are transported through soil, sediment, and water. Because they attach so readily to particulate matter, they often are transported to areas distant from their initial release.

Monsanto Has Known Since 1937 That PCBs Are Toxic.

57. Today, it is commonly known that PCBs are some of the most toxic and persistent chemicals in our environment. Monsanto, however, has known that since at least 1937. And by at least the 1950s, if not earlier, Monsanto had overwhelming evidence that PCBs escaped into the environment—even from closed systems—where they would persist indefinitely. Nevertheless, Monsanto continued to produce, market, and distribute these dangerous substances for decades, despite knowing that they could cause serious and significant harm to the environment and to humans.

58. Ample evidence shows that Monsanto knew of the dangers of PCBs at least as early as 1937, as set out in an internal Monsanto memorandum:



October 11, 1937.

"Experimental work in animals shows that prolonged exposure to Aroclor vapors evolved at high temperatures or by repeated oral ingestion will lead to systemic toxic effects.

Repeated bodily contact with the liquid Aroclors may lead to an acne-form skin eruption.

Source: L.A. Watt internal memorandum (Oct. 11, 1937), *available at* https://cdn.toxicdocs.org/3Q/3QmvryyBGyG9mMZdvd9yZ0Mwy/3QmvryyBGyG9mMZdvd9yZ0Mwy.pdf.[4]

[4] Transcription: "Experimental work in animals shows that prolonged exposure to Aroclor vapors evolved at high temperatures or by repeated oral ingestion will lead to

59. The next year, Dr. Cecil Drinker of the Harvard School of Public Health presented Monsanto with the findings of his research, which explained the toxic effects of PCBs and demonstrated that PCB exposure resulted in permanent liver damage in test animals.[5] Despite learning of the serious effects of PCB exposure through this and other sources, Monsanto nevertheless continued to produce and sell PCBs.

60. On the occasions when its customers sought information about the hazards of PCBs, Monsanto often minimized those risks and suggested that the only health risk was from workplace exposure to higher-chlorinated Aroclors.

61. For example, in December 1947, in response to an inquiry from a customer, the Celanese Corporation of America, Monsanto directed the customer to Dr. Drinker's publications and noted that, according to that research, "Aroclor 1268 is almost non-toxic" but "[t]he vapors of other Aroclors studied are toxic and should be avoided."

62. Similarly, in 1949, Monsanto developed its own statement regarding the risks of Aroclors that it would give to inquiring clients and customers. That statement noted "systemic toxic effects" but said the risk was "not significant":

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systemic toxic effects. Repeated bodily contact with the liquid Aroclors may lead to an acne-form skin eruption."

[5] Cecil K. Drinker, *Report to the Monsanto Chemical Company* (Sept. 15, 1938).

"TOXICITY - Prolonged exposure to AROCLOR vapours will lead to systemic toxic effects. However, this is not significant except at high temperatures and then normal draught ventilation will remove any risk. Acne-form skin eruptions may arise from continued bodily contact with liquid AROCLORS, but normal precautions and, if necessary, suitable garments provide adequate protection. Toxic effects will follow considerable oral ingestion, but this hazard is unlikely to be encountered".

Source: Interoffice Memorandum on Aroclor Toxicity from M.N. Strachan to J.R. Barrett (Aug. 30, 1949).[6]

63. Thus, while Monsanto knew PCBs were toxic, it played down the risk of acute toxic effects of PCB exposure. For example, an internal memorandum dated September 1, 1953, from Elmer P. Wheeler, Monsanto's Manager of Environmental Health, to Mr. E. Mather, Monsanto's Chief Chemist, made clear that Monsanto knew that "Aroclors cannot be considered nontoxic."

64. In 1955, Mr. Mather authored an internal report summarizing the "Process for the Production of Aroclors, Pyranols,[7] etc. at the Anniston and at the Wm. G. Krummrich Plant." Attached to that report was an article authored by Robert M. Brown, Chief of the Industrial Hygiene Section of the City of St. Louis Department of Public

[6] Transcription: "TOXICITY—Prolonged exposure to AROCLOR vapours will lead to systemic toxic effects. However, this is not significant except at high temperatures and then normal draught ventilation will remove any risk. Acne-form skin eruptions may arise from continued bodily contact with liquid AROCLORS, but normal precautions and, if necessary, suitable garments provide adequate protection. Toxic effects will follow considerable oral ingestion, but this hazard is unlikely to be encountered".

[7] Pyranol was the registered trademark for the PCB dielectric fluid developed for and sold to General Electric.

Welfare, entitled "On the Toxicity of the 'Aroclors'" and published in *The Chemical Analyst* in September 1947. That article explains,

> There is need therefore to give warning [about PCBs]. For the toxicity of these compounds has been repeatedly demonstrated, both from the standpoint of their absorption from the inspired air, as well as from their effects in producing a serious and disfiguring dermatitis when allowed to remain in contact with the skin.

65. Despite the abundance of research demonstrating that PCBs have systemic toxic effects, Monsanto's Medical Director, Dr. R. Emmet Kelly, recommended to Monsanto that it need not conduct any additional toxicity testing of the chemical. The company—referred to below as "MCC"—worried more about possible legal implications than any harm to humans or the environment:

> MCC's position can be summarized in this fashion. *We know Aroclors are toxic but the actual limit has not been precisely defined.* It does not make too much difference, it seems to me, because our main worry is what will happen if an individual developes [sic] any type of liver disease and gives a history of Aroclor exposure. I am sure the [civil] juries would not pay a great deal of attention to [maximum allowable concentrates].
>
> We, therefore, review every new Aroclor use from this point of view. If it is an industrial application where we can get air concentrations and have some reasonable expectation that the air concentrations will stay the same, we are much more liberal in the use of Aroclor. If, however, it is distributed to householders where it can be used in almost any shape and form and we are never able to know how much of the concentration they are exposed to, we are much more strict. No amount of toxicity testing will obviate this last dilemma and therefore I do not believe any more testing would be justified.
>
> Let's see what our discussions with Dr. Newman and yourself bring out.
>
> Source: Letter from R. Emmet Kelly, M.D. to Dr. J.W. Barrett (Sept. 20, 1955) (emphasis added).

66. Monsanto's disregard for human life and the environment, however, did not stop the most sophisticated consumers from conducting their own independent research on

the hazards of PCBs. For example, the U.S. Navy rejected the use of a PCB-containing hydraulic fluid, Pydraul 150, in its submarines because it concluded that it was too dangerous. The Navy reached that conclusion after conducting its own independent testing of Pydraul 150, which revealed that "[t]he inhalation of 10 milligrams of Pydraul 150 per cubic meter or approximately 2 tenths of a part of the Aroclor component per million for 24 hours a day for 50 days caused, statistically, definite liver damage." Monsanto tried to change the Navy's conclusion, but the Navy ultimately decided that PCBs simply "would not be suitable for use in submarines."[8] The Navy informed Monsanto that it "would not accept Pydraul 150 and probably no other fluid containing chlorine or chlorinated diphenyls."[9]

67. Since early in its commercial production of PCBs, Monsanto was well aware of PCBs' toxic effects. It knew that prolonged exposure to PCBs would lead to systemic toxic effects in both humans and animals. It knew that those systemic toxic effects could be caused either by inhalation of PCB vapors or direct contact with PCBs or PCB-containing materials. Despite such knowledge, Monsanto declined to conduct its own independent testing regarding the effects of prolonged exposure to PCBs, even though there was no entity better situated to conduct and analyze PCB-related studies. Others, however, did conduct testing, and that outside research confirmed what Monsanto had long known:

[8] Memorandum from Elmer P. Wheeler to Philip L. Slayton on Toxicity of Pydraul 150 (Sept. 25, 1957).

[9] *Id.*

Prolonged exposure to PCBs, even at relatively low concentrations, was harmful to the health of both humans and the environment.

68. Throughout the 1940s and 1950s, scientists reported to Monsanto on the widespread, harmful effects of PCBs. Dr. Kelly found himself in the position of learning from consumers of Monsanto products, that use of or exposure to Monsanto's PCBs may have harmed the customers' personnel.[10] Yet Monsanto kept increasing the volume of PCBs that it produced and sold.

Monsanto Also Knew, Since at Least the 1950s, That PCBs Escaped into the Environment, Where They Would Persist and Impair Natural Resources.

69. Meanwhile, public awareness of the harmful effects of chlorinated hydrocarbons—at the time, primarily dichlorodiphenyltrichloroethane or "DDT"—also increased throughout the 1940s and 1950s. Detailed accounts of the toxic effects of DDT on the environment became more accessible to the public, triggering widespread concern for the continued use of chlorinated hydrocarbons more generally. In 1962, for instance, Rachel Carson authored *Silent Spring*, which was then known as the most thorough explanation, and effective denunciation, of industry practices with respect to the use and misuse of chlorinated hydrocarbons:

> In the less than two decades of their use, [dangerous chemicals] have been so thoroughly distributed throughout the animate and inanimate world that

[10] *See, e.g.*, Memorandum from R. Emmet Kelly to O.F. Heasel on Pydraul Exposure (June 23, 1959) ("I think [they] are being overcautious in this matter, but I certainly can't give Pydraul an absolutely clean bill of health . . . ."); Memorandum from R. Emmet Kelly to Richard Davis on Aroclor Exposure at Hexagon Laboratories (Feb. 2, 1961) ("Yesterday, Mr. Allen of the subject company called and stated he had two employees nauseated from exposure to a leak in a heat transfer unit that used Aroclor 1248.").

> they occur virtually everywhere. They have been recovered from most of the major river systems and even from streams of groundwater flowing unseen through the earth. Residues of these chemicals linger in soil to which they may have been applied a dozen years before. They have entered and lodged in the bodies of fish, birds, reptiles, and domestic and wild animals so universally that scientists carrying on animal experiments find it almost impossible to locate subjects free from such contamination. They have been found in fish in remote mountain lakes, in earthworms burrowing in the soil, in the eggs of birds—and in man himself.

70. Much of the research that formed the basis for Rachel Carson's book was conducted by Maryland wildlife biologist, Dr. Lucille Stickel, at the U.S. Fish and Wildlife Service's Patuxent Wildlife Research Center. Dr. Stickel studied the effects of DDT on a mouse population.[11] While *Silent Spring* focused primarily on industry's use of DDT and other insecticide sprays made of chlorinated hydrocarbons, during the 1960s the scientific research on the environmental and ecological effects of PCBs, by Dr. Stickel and others, was also becoming more widely known.

71. In 1966, an article summarizing the findings of Swedish researcher Soren Jensen was published in an article in the Swedish daily paper, Dagens Nyheter. The article described Jensen's findings:

> [PCB] is found in salmon and in pike. It is found in sea eagle living on fish. It is found on the surface of the needles of the fir trees, that is in the air. It is found in the hair of a [five-month-old] baby . . . .
>
> The scientists working with biocides have [found that] a group of poisons, Polychlorinated Biphenols (for short PCB) . . . are closely related to, and equally poisonous as, DDT.

[11] Nancy C. Coon and Matthew C. Perry, *Lucille F. Stickel, 1915-2007*, 71(8) Journal of Wildlife Mgmt. 2827 (Nov. 2007), https://www.researchgate.net/publication/250147123 Lucille_F_Stickel_1915-2007.

> PCB is broken down considerably slower than DDT and gives rise to damage of liver and skin. PCB is not used as a herbicide. It is not manufactured in Sweden but is supposed to [be] used by the industry to quite some extent. . . .
>
> Research Asst. S. Jensen has tested 200 fishes and a number of birds. He has taken several samples of air and has reached the conclusion that PCB is equally common in Nature as chlorinated hydrocarbons of the type of DDT, DDE, and Lindane. . . .
>
> Source: Letter from Henry Strand to David Wood (Nov. 28, 1966) (including translation of article in Dagens Nyheter).

Monsanto circulated the article internally and, shortly thereafter, visited Jensen at Stockholm University to "discus[s his] programme of work." Based on that discussion, Monsanto concluded that "there is no doubt that the chemical which is the subject of [Jensen's] investigation and the news release, is chlorinated diphenyl i.e. Aroclor."

Brussels, Belgium

26th January, 1967

SWEDEN, AROCLOR

DW:gb

G. R. Buchanan - St. Louis

cc P. G. Benignus - St. Louis
D. S. Cameron - Brussels
Dr. D. V. N. Hardy - London
Dr. R. Emmet Kelly - St. Louis
R.A. Steenrod - St. Louis

We recently sent you a translation of a Swedish newspaper article referring to the identification in nature of polychlorinated biphenols. Because some of the uses claimed for the materials fell in line with the uses of our own chlorinated diphenyls, we made a point, during our recent visit, to Sweden, of visiting the research institute involved and discussing their particular programme of work.

To eliminate any earlier confusion that there may have been, I should like to emphasise that there is no doubt that the chemical which is the subject of the investigation and the news release, is chlorinated diphenyl i.e. Aroclor.

Source: Memorandum from D. Wood to G.R. Buchanan on Soren Jensen Research (Jan. 26, 1967).

72. Monsanto's own research, conducted in the waterways adjacent to its Anniston, Alabama manufacturing facility, demonstrated the seemingly limitless potential of PCBs for environmental destruction. In a study of bluegills caged in various locations, the results were dramatic:

> A branch of Snow Creek originating in the Monsanto Plant and flowing east . . . Result: All 25 fish lost equilibrium and turn on their sides in 10 seconds and all were dead in 3½ minutes.
>
> Snow Creek at a point where it is crossed by the Highway 21-Highway 78 cut-off . . . . Result: 10 fish were down after 1 hour and 40 minutes; all were down in 2 hours and 25 minutes. All were dead in 2 hours and 35 minutes.
>
> * * *
>
> Anniston Sewage Treatment Plant – near the out-flow to Choccolocco Creek. . . . Result: All 25 fish were dead when the first check was made after 23.5 hours. Their condition suggested that they had died several hours earlier.
>
> Source: Letter from Denzel Ferguson to L.C. Fuhrmeister on Caging Experiments (Nov. 2, 1966).

73. As Monsanto became more and more concerned about threats of negative publicity to its PCB business,[12] the reality of the toxic effects associated with the persistence of PCBs in the natural environment grew increasingly evident. Monsanto received reports of significant fish kills in waterways adjacent to its manufacturing plants. A later 1968 study of Snow Creek, the waterway adjacent to Monsanto's Anniston plant, characterized the creek as "a potential source of future legal problems":

---

[12] Memorandum from R. Emmet Kelly to D. Wood on Response to Aroclor Reports (Feb. 10, 1967) ("We are very worried about what is liable to happen in the states when the various technical and lay news media pick up the subject. This is especially critical at this time because air pollution is getting a tremendous amount of publicity in the United States.").

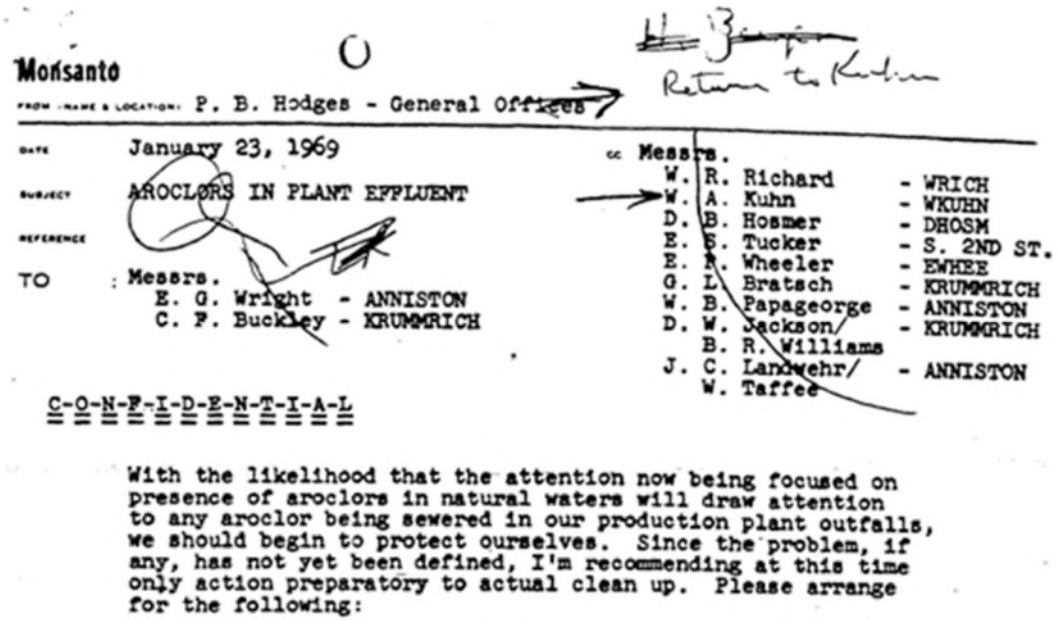
3. Snow Creek is a potential source of future legal problems. The stream does not support life and contains many materials that accumulate in water, fish, and muds downstream. Although there is no evidence that these materials are harmful to fish, their presence constitutes damaging evidence of pollution. The argument that these compounds impart undesirable palatability qualities to Choccolocco Creek fish would be very convincing and probably easy to prove.

Source: Monsanto Chemical Company, A Final Report, Investigations of Certain Pesticide-Wildlife Relationships in the Choccolocco Creek Drainage: A Contract Between the Monsanto Chemical Company and Mississippi State University (Sept. 1, 1966-Aug. 31, 1967).

74. In December 1968, Richard Risebrough, a researcher at the Institute of Marine Resources and the University of California, Berkeley, published a report entitled *Chlorinated Hydrocarbons in Marine Ecosystems* that identified chlorinated hydrocarbons generally as "the most abundant synthetic pollutants present in the global environment." The article reported significant concentrations of PCBs in the bodies and eggs of peregrine falcons and thirty-four other bird species. The report linked PCBs to the rapid decline in peregrine falcon populations in the United States. Professor Risebrough sent Monsanto a pre-publication copy of the manuscript for review. Internally, Monsanto employees acknowledged that "Risebrough has found PCBs along with chlorinated pesticides in a

number of species of fish and birds along the California coast as well as in waters off Baja California and Central America."[13]

75. By January of the following year, Monsanto employees recognized the need to respond, if only internally. In a memo dated January 23, 1969, and designated as "C-O-N-F-I-D-E-N-T-I-A-L," Monsanto's Paul Hodges, an official in its St. Louis General Offices, noted the need for Monsanto to begin to "protect" itself:



Monsanto

FROM (NAME & LOCATION): P. B. Hodges - General Offices

Return to Kuhn

DATE: January 23, 1969

SUBJECT: AROCLORS IN PLANT EFFLUENT

REFERENCE:

TO: Messrs.
E. G. Wright - ANNISTON
C. F. Buckley - KRUMMRICH

cc Messrs.
W. R. Richard - WRICH
W. A. Kuhn - WKUHN
D. B. Hosmer - DHOSM
E. S. Tucker - S. 2ND ST.
E. P. Wheeler - EWHEE
G. L. Bratsch - KRUMMRICH
W. B. Papageorge - ANNISTON
D. W. Jackson - KRUMMRICH
B. R. Williams
J. C. Landwehr - ANNISTON
W. Taffee

C-O-N-F-I-D-E-N-T-I-A-L

With the likelihood that the attention now being focused on presence of aroclors in natural waters will draw attention to any aroclor being sewered in our production plant outfalls, we should begin to protect ourselves. Since the problem, if any, has not yet been defined, I'm recommending at this time only action preparatory to actual clean up. Please arrange for the following:

Source: Memorandum from P.B. Hodges to E.G. Wright and C.F. Buckley on Aroclors in Plant Effluent (Jan. 23, 1969).

76. In August 1969, employees in Monsanto's PCB division formed an "Aroclor Ad Hoc Committee" and tasked themselves with preparing recommendations for actions that Monsanto could take to improve its reputation and salvage its bottom line,

[13] Memorandum from Elmer P. Wheeler to W.H. Richard on Polychlorinated Biphenyls in the Environment (Oct. 21, 1968).

notwithstanding the now publicly known damage resulting worldwide from PCBs. The committee's task was to develop a plan that would:

1) Permit continued sales and profits of Aroclors and Terphenyls.
2) Permit continued development of uses and sales.
3) Protect [the] image of Organic Division and of the Corporation.[14]

77. Monsanto's Aroclor Ad Hoc Committee first met on September 5, 1969. At that meeting, the committee acknowledged that PCBs had been found in fish, oysters, shrimp, birds, and in and "[a]long coastlines of industrialized areas such as Great Britain, Sweden, Rhine River, low countries, Lake Michigan, Pensacola Bay, and in Western wild life." The committee was aware that PCBs "may be a global contaminant." Moreover, the committee knew that ordinary usage of Monsanto's own PCB-containing materials was a cause of the environmental problem:

8. Environmental Contamination by Customers:

Our in-plant problems are very small vs. problems of dealing with environmental contamination by customers. In one application alone (highway paints), one million lbs/year are used. Through abrasion and leaching we can assume that nearly all of this Aroclor winds up in the environment.

Source: Confidential Minutes of Aroclor "Ad Hoc" Committee – First Meeting (Sept. 5, 1969).

78. On September 9, 1969, Monsanto employee W.R. Richard, who was a member of the Aroclor Ad Hoc Committee, wrote an interoffice memorandum entitled "Defense of Aroclor," in which he acknowledged that "[w]ater [p]ollution seems to be [the]

[14] Confidential Minutes of Aroclor "Ad Hoc" Committee First Meeting (Sept. 5, 1969).

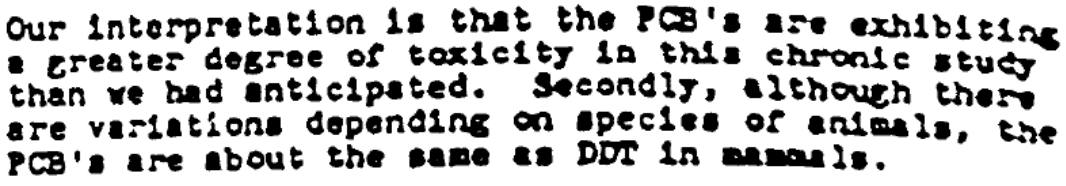
first issue" with Aroclor: "Aroclor product is refractive, will settle out on solids—sewerage sludge—river bottoms, and apparently has a long life." He noted that Aroclors 1254 and 1260 had been found in shrimp along Florida's Gulf Coast; in the San Francisco Bay, where it was reported to thin eggshells in birds; and in the Great Lakes. Richard also acknowledged that the company could not defend itself entirely:

> We can't defend vs. everything. Some animals or fish or insects will be harmed. Aroclor degradation rate will be slow. Tough to defend against. Higher chlorination compounds will be worse [than] lower chlorine compounds. Therefore, we will have to restrict uses and clean-up as much as we can, starting immediately.
>
> Source: Memorandum from W.R. Richard to E. Wheeler on Defense of Aroclor – F. Fluids (Sept. 9, 1969).

79. The Aroclor Ad Hoc Committee drafted a confidential report on October 2, 1969. In that report, the Committee explained its overall findings:

> The committee believes there is little probability that any action that can be taken will prevent the growing incrimination of specific polychlorinated biphenyls (the higher chlorinated—e.g. Aroclors 1254 and 1260) as nearly global environmental contaminants leading to contamination of human food (particularly fish), the killing of some marine species (shrimp), and the possible extinction of several species of fish eating birds.
>
> Secondly, the committee believes that there is no practical course of action that can so effectively police the uses of these products as to prevent environmental contamination. There are, however, a number of actions which must be undertaken to prolong the manufacture, sale and use of these particular Aroclors as well as to protect the continued use of other members of the Aroclor series.
>
> Source: Confidential Report of Aroclor "Ad Hoc" Committee (Oct. 2, 1969).

80. On January 29, 1970, Elmer P. Wheeler, Monsanto's Manager of Environmental Health, circulated laboratory reports discussing results of animal studies. He noted,


Our interpretation is that the PCB's are exhibiting a greater degree of toxicity in this chronic study than we had anticipated. Secondly, although there are variations depending on species of animals, the PCB's are about the same as DDT in mammals.

Source: Memorandum from E.P. Wheeler to D.S. Cameron on Status of Aroclor Toxicological Studies (Jan. 29, 1970).[15]

81. Rather than take steps to correct the impact of Monsanto's toxic, persistent, and bioaccumulative PCBs on the natural environment, Monsanto opted instead to take steps to protect Monsanto's reputation and bottom line. Although the Ad Hoc Committee recognized that ignoring the environmental damage that PCBs were causing worldwide was "unacceptable from a legal, moral, and customer public relations and company policy viewpoint," they ultimately concluded that Monsanto's profits were more important: "[T]here is too much customer/market need and selfishly too much Monsanto profit to go out [of the PCB business entirely]. To go out would require a write off of Aroclor net investment of $7M (10 cents/share) or if biphenyl included $8.8M (12 cents/share)."[16]

82. In an interoffice memorandum circulated on February 16, 1970, and entitled "Pollution Letter," Monsanto provided talking points for its employees when discussing the dangers of PCBs with inquiring customers: "We (your customer and Monsanto) are not

[15] Transcription: "Our interpretation is that the PCB's are exhibiting a greater degree of toxicity in this chronic study than we had anticipated. Secondly, although there are variations depending on species of animals, the PCB's are about the same as DDT in mammals."

[16] PCB Presentation to Corporate Development Committee, Nov. 17, 1969.

interested in using a product which may present a problem to our environment." But the memorandum also acknowledged that Monsanto "will continue to make" PCBs; "[w]e can't afford to lose one dollar of business," and admonished employees not to take any product back:

> We want to avoid any situation where a customer wants to return fluid. . . . We would prefer that the customer use up his current inventory and purchase [new fluids] when available. He will then top off with the new fluid and eventually all Aroclor 1254 and 1260 will be out of his system. We don't want to take fluid back. Sell him the replacement.
>
> Source: Pollution Letter from N. T. Johnson to P. Craska, et al. (Feb. 16, 1970) (underlining in original).

83. In 1970, the year after the Aroclor Ad Hoc Committee was formed, and despite Monsanto's knowledge of the global nature of PCB contamination, PCB production in the United States peaked at 85 million pounds.

84. Growing awareness of the ubiquity of PCBs led the U.S. Government to conduct an investigation of PCBs' health and environmental effects and any resulting contamination of food and other products. In May 1972, an interdepartmental government task force, which included Dr. Stickel from the Patuxent Wildlife Research Center, published a report, *Polychlorinated Biphenyls and the Environment*, confirming that PCBs were highly persistent, could bioaccumulate to relatively high levels, and could have serious adverse effects on human health.[17]

[17] Participating agencies included, among others, EPA and the Departments of Agriculture; Commerce; Interior; and Health, Education, and Welfare. *See generally* Interdepartmental Task Force on PCBs, *Polychlorinated Biphenyls and the Environment* (May 1972).

85. After that report, environmental sampling and studies suggested that PCBs were a "more serious and continuing environmental and health threat than had been originally realized."[18] To address these concerns, EPA undertook a study to assess PCB levels in the environment on a nationwide basis. That study revealed widespread occurrence of PCBs in bottom sediments in several states; in fish and birds; in lakes and rivers; in the Atlantic Ocean, the Pacific Ocean, and the Gulf of Mexico; in sewage treatment facilities; in a variety of foods, including milk, poultry, eggs, fish, meat, and grains; and in human milk, blood, hair, and tissue.

86. Starting in the 1960s, Dr. Stickel had been one of the leading scientists studying the roles that PCBs and other contaminants played in the deaths of eagles and other birds. Monsanto and Mr. Wheeler were aware of Dr. Stickel's work at the Patuxent Wildlife Research Center as early as 1968, because the Center was charged with research and habitat management of fish and wildlife throughout the country and routinely received the carcasses of bald eagles. Representatives of Monsanto visited Dr. Stickel at her lab. When Dr. Stickel pointed out that gas chromatograms from two eagles had positive identification for PCBs, the Monsanto representatives denied that the cause of the eagle's deaths was due to PCBs and maintained the narrative that it was simply a coincidence. Dr. Stickel continued her research, and in January 1984 published an article entitled *Aroclor*

[18] United States Environmental Protection Agency Office of Toxic Substances, *Review of PCB Levels in the Environment*, at 1 (Jan. 1976).

1254® residues in birds: Lethal levels and loss rates, reporting on her studies of the effects of lethal doses of PCBs on other bird species.[19]

87. Throughout the 1960s, Monsanto continued to promote the use and sale of Aroclor and other PCB compounds. In a 1960 brochure, Monsanto promoted the use of Aroclors in transformers and capacitors, utility transmission lines, home appliances, electric motors, fluorescent light ballasts, wire and cable coatings, impregnants for insulation, dielectric sealants, chemical processing vessels, food cookers, potato chip fryers, drying ovens, thermostats, furnaces, and vacuum diffusion pumps. According to the brochure, Aroclors also could be used as a component of any of the following: automotive transmission and industrial cutting oils; insecticides; natural waxes used in dental casting, aircraft parts, and jewelry; abrasives; specialized lubricants; adhesives; moisture-proof, tack, masonry, and other coatings; printing inks; papers; mastics; sealant; caulking compounds; plasticizers; resin; paints, varnishes, and lacquers; railway tank and gondola cars; and wood and metal maritime equipment.

88. A 1961 company brochure explained that Monsanto's Aroclors were being used in a wide variety of common household items, including in "lacquers for women's shoes"; as floor wax; as an adhesive for bookbinding, leather, and shoes; as invisible marking ink used to make chenille rugs and spreads; and as "a wax for the flame proofing of Christmas trees."

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[19] William H. Stickel, Lucille F. Stickel, Russell A. Dyrland & Donald L. Hughes, *Aroclor 1254 residues in birds: Lethal levels and loss rates*, 13 Archives of Envt'l Contamination and Toxicology 7-13 (1984), https://link.springer.com/article/10.1007/BF01055641.

89. Throughout the 1960s, and even before, Monsanto knew its Aroclors were being used in a variety of industrial, commercial, household, and consumer goods. Indeed, Monsanto encouraged these uses by affirmatively urging its sales team to market products for these and other applications.

90. A few years later, in 1970, Monsanto tried to distance itself from many of the applications of Aroclors that it proudly espoused just a few years earlier. In a press release the company claimed, "What should be emphasized . . . is that PCB was developed over 40 years ago primarily for use as a coolant in electrical transformers and capacitors. It is also used in commercial heating and cooling systems. It is not a 'household' item." Yet, in 1970, Monsanto was still marketing and selling Aroclors for use in common household items.

Monsanto Concealed the Harmful Effects of PCBs From Consumers and Government Entities.

91. While the scientific community and Monsanto knew that PCBs were toxic and becoming a global contaminant, the general public remained largely unaware because Monsanto repeatedly misrepresented those facts, telling consumers, the public, and government entities the exact opposite—that the compounds were not toxic and that the company would not expect to find PCBs widespread in the environment.

92. For example, in a March 24, 1969, letter to the Los Angeles County Air Pollution Control District, Monsanto advised that the Aroclor compounds "are not particularly toxic by oral ingestion or skin absorption." Addressing reports of PCBs found along the West Coast, Monsanto claimed ignorance as to their origin, explaining that "very

little [Aroclor] would normally be expected either in the air or in the liquid discharges from a using industry." A similar Monsanto letter to the Regional Water Quality Control Board explained that PCBs are associated with "no special health problems" and "no problems associated with the environment."

93. In May 1969, Mr. Wheeler spoke with a representative of the National Air Pollution Control Administration, who promised to relay to Congress the message that Monsanto "cannot conceive how the PCBs can be getting into the environment in a widespread fashion."

94. Monsanto delivered the same message to the New Jersey Department of Conservation in July 1969, claiming first that, "[b]ased on available data, manufacturing and use experience, we do not believe the PCBs to be seriously toxic." The letter then reiterated Monsanto's position regarding environmental contamination: "We are unable at this time to conceive of how the PCBs can become widespread in the environment. It is certain that no applications to our knowledge have been made where the PCBs would be broadcast in the same fashion as the chlorinated hydrocarbon pesticides have been."

Land, Waters, Fish, and Wildlife Owned or Held in Trust by the State of Maryland Have Been Impaired by Pervasive PCB Contamination.

95. The State owns or holds in trust for the benefit of the public all navigable waterways within Maryland, including the submerged lands beneath those navigable waters. The State, as trustee, holds title to such lands subject to the public's right to use the water for various beneficial purposes. The State also owns or holds in trust over 486,000 acres of public lands and protected open space, including Wildlife Management Areas

overseen by Maryland's Department of Natural Resources ("DNR"). Maryland's Department of the Environment ("MDE") and DNR are responsible for securing a sustainable future for Maryland's environment, including securing sustainable populations of living resources and aquatic habitat and healthy watershed lands, streams, and rivers. MDE and DNR have worked together to develop statewide wetland monitoring and assessment programs.

96. In its capacity as trustee of all natural resources situated within its borders, the State has the authority to protect and preserve, for the benefit of the public, those natural resources, including public waters, fish, and other wildlife.

97. As a result of Monsanto's manufacture, sale, and distribution of PCBs throughout the United States, including in Maryland, Monsanto's PCBs persistently pollute Maryland's natural environment.

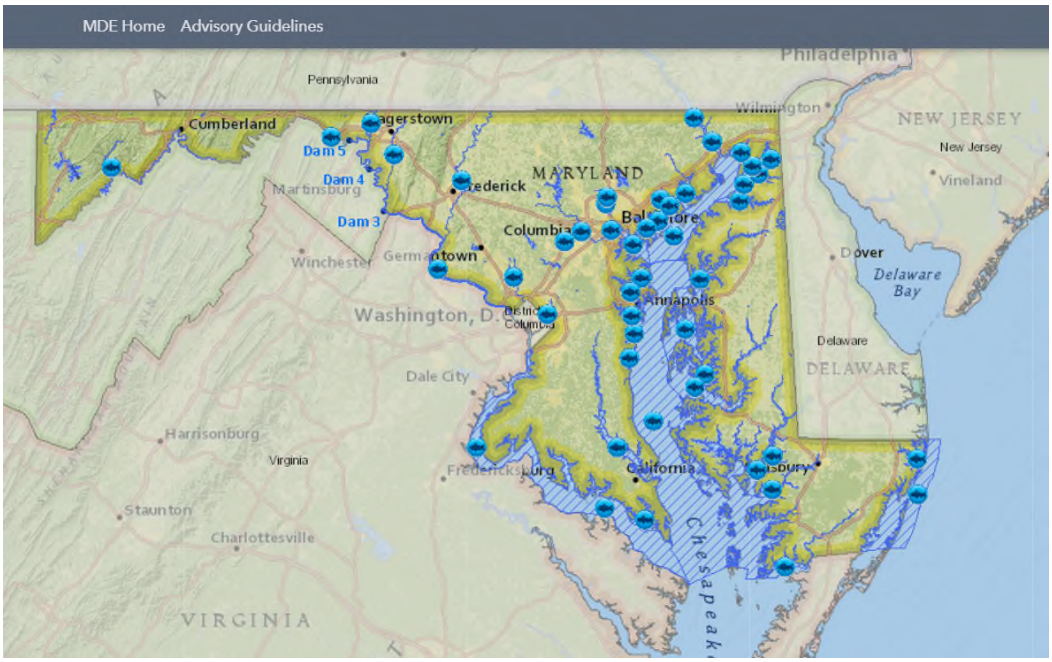
98. PCBs enter Maryland's waters both from point sources—for example, discharges from municipal storm sewer systems and wastewater treatment plants—and from nonpoint sources, including contaminated sediments, and atmospheric deposition. Some of Monsanto's PCBs now found in the fish and waters of Maryland may have originated outside the state of Maryland and entered Maryland through atmospheric deposition and movement of sediments in waterways.

99. Pursuant to its authority under state law, the State has investigated, monitored, and detected the presence of PCBs on its lands, in its waters, and in various wildlife species and other public trust resources within its borders.

100. MDE monitors chemical contaminant levels in Maryland's fish, shellfish, and crabs on a five-year cycle through its fish tissue monitoring program. MDE has focused its fish tissue analysis on PCBs, along with mercury, because both chemicals are risk-drivers—meaning that concentrations of PCBs and mercury found in fish tissue more frequently require limits on human consumption of fish in order to protect public health than do concentrations of other chemicals.

101. For the purpose of estimating the cancer risk to human health, the tissues tested include the edible portions of fish (fillet), crab (crabmeat and "mustard"), and shellfish ("meats"). Fish consumption advisories are issued if sampling shows that consumption of eight or fewer meals of fish from the waterbody each month is associated with a lifetime cancer risk greater than 10^{-5} (i.e., one additional possible cancer case in a population of 100,000 people). For PCBs, MDE's fish tissue consumption criteria is 39 ppb (ng/g), or the ability of a person weighing 76 kgs to consume at least four meals per month. When MDE finds that PCB contaminant levels for a particular species exceed the standard, it issues a fish consumption advisory, recommending limits on consumption of affected species caught in Maryland's fresh, estuarine, or marine waters. MDE also periodically conducts intensive surveys of contaminant levels in selected species in specific water bodies such as the Patapsco River and Baltimore Harbor.

102. PCBs have been found in fish tissue at all the locations identified by fish icons below.



Source: Fish Consumption Advisories, Maryland Department of the Environment, available at: https://mdewin64.mde.state.md.us/WSA/FCA/index.html (last visited Nov. 4, 2021).

103. Maryland has been forced to advise its citizens to restrict their consumption of fish due to the occurrence and persistent presence of PCBs in fish. Maryland's fish consumption advisories are calibrated in terms of "meals per month" and are set separately for adults, women of childbearing age who are pregnant or may become pregnant, and children. The level of PCB contamination has been so high for many Maryland waters that the recommended advisory has been absolute—no consumption of certain species, including, white catfish from the Patapsco River and Potomac River; white perch from Middle River; carp from the Anacostia River, Back River, and Potomac River; channel catfish from the Bush River, Middle River, and the Susquehanna River below Conowingo Dam; bluefish from the Atlantic Ocean if greater than 15 inches; blue catfish from the

Anacostia River and Potomac River; and American eel from the Back River, Elk River, Patapsco River/Baltimore Harbor, and the Susquehanna River below the Conowingo Dam.

104. Even blue crabs are subject to consumption advisories due to PCBs. The State recommends that the general population restrict consumption of blue crab from the Back River, Middle River, or Patapsco River, including Baltimore Harbor. And the State Advisory recommends that the "mustard" portion of the blue crab (which is the crab's digestive system) not be consumed at all if caught in these waters, and only sparingly if caught in other areas of the Bay.

105. MDE's Water and Science Administration has also conducted tracking studies of clams to locate sources of PCBs and to determine if PCBs will be found in fish and other animal tissue.[20] MDE conducted studies of Asiatic clams, which filter sediment from the water column where PCBs are typically found, by deploying clams for 14 and 28 days and then testing the clam tissue for the presence of PCBs. MDE carried out these studies in the Anacostia River, the Back River, and the Bush River and utilized the data to develop plans for future monitoring and mitigation of PCBs.

106. MDE's fish tissue sampling has guided and informed Maryland's substantial investment in the investigation and monitoring of PCBs in Maryland's waters. After a waterbody is found to be impaired by PCBs, Maryland works to develop a "total

[20] Charles Poukish, Chris Luckett, & Anna Soehl, *2005 Caged Clam Study to Characterize PCB Bioavailability in the Impaired Watersheds Throughout the State of Maryland*, Maryland Dep't of the Env't (Aug. 25, 2009), https://mde.state.md.us/programs/ResearchCenter/ReportsandPublications/Documents/www.mde.state.md.us/assets/document/2005_Corbicula_Study_final.pdf.

maximum daily load" limit, or "TMDL," for PCBs in that waterbody. A PCB TMDL is the calculation of the maximum amount of PCBs a waterbody can receive while still meeting water quality standards. The purpose of PCB TMDLs is to ensure that PCB levels in a given waterbody will be reduced to the point where eating fish from that waterbody will be safe and the use of that waterbody is supported.

107. PCBs have been found in the following waterbodies, among others:

a. Anacostia River
b. Antietam Creek
c. Back River
d. Big Pool – Washington County
e. Baltimore Harbor
f. Bird River
g. Bohemia River
h. Breton Bay
i. Bush River
j. Bynum Run
k. C & D Canal
l. Chesapeake Bay and Tributaries
m. Chester River
n. Chincoteague Bay
o. Choptank River
p. Coastal waters of the Atlantic Ocean
q. Conococheague Creek
r. Conowingo Reservoir
s. Deep Creek Lake
t. Double Pipe Creek
u. Eastern Chesapeake Bay: Miles & Wye Rivers
v. Elk River
w. Evitts Creek
x. Gunpowder River
y. Gwynns Falls
z. Herring Bay
aa. Isle of Wight Bay
bb. Jones Falls
cc. Lake Kittamaqundi
dd. Lake Roland
ee. Langford Creek

ff. Liberty Reservoir
gg. Little Blackwater
hh. Little Patuxent River
ii. Loch Raven Reservoir
jj. Lower Winters Run
kk. Magothy River
ll. Manokin River
mm. Mattawoman Creek
nn. Middle Chesapeake Bay: Middle River to Patapsco River
oo. Middle River
pp. Monocacy River
qq. Nanticoke River
rr. Northeast River
ss. Patapsco River
tt. Patuxent River
uu. Piscataway Creek
vv. Pocomoke River
ww. Potomac River
xx. Prettyboy Reservoir
yy. Rewastico Creek
zz. Rhode & West Rivers
aaa. Rock Creek (Montgomery County)
bbb. Sassafras River
ccc. Savage River
ddd. Severn River
eee. South River
fff. Southeast Creek
ggg. Stansbury Pond
hhh. St. Mary's River
iii. Stemmers Lake
jjj. Susquehanna River
kkk. Town Creek
lll. Tuckahoe Creek
mmm. Tred Avon River
nnn. Wicomico River
ooo. Youghiogheny River

108. Over the past twenty years, Maryland has expended substantial resources in developing and implementing TMDLs for the more than 25 waterbodies in Maryland impaired by PCBs, including lakes, tidal and nontidal rivers, and estuaries. After a TMDL

is approved by EPA, MDE oversees implementation by local governments and coordinates with local governments to find the specific sources of pollution, identifies cost-effective restoration opportunities, and continues to monitor water quality in response to the implementation plan. State general funds and other State funds have been required to perform this work.

109. Although PCBs adversely affect waterways throughout Maryland, they have been particularly well documented in the four areas discussed below: the Susquehanna River, Baltimore Harbor and the Patapsco River, Sparrows Point, and the Chesapeake Bay.

Susquehanna River

110. The Susquehanna River is the longest river in the eastern United States that empties into the Atlantic Ocean, draining 27,500 square miles across New York, Pennsylvania, and northeastern Maryland. The River enters at the northern end of the Chesapeake Bay and delivers half the fresh water in the Bay, along with a heavy load of sediment, including sediment contaminated with PCBs. One of the factors that influences the transfer of sediment from the Susquehanna River to the Chesapeake Bay is the series of dams along the River, including the Conowingo Dam. The Conowingo Dam has functioned as a sediment trap for sediments coming down the Susquehanna River, but its long term trapping capacity is now at or near zero, as sediment has filled much of the reservoir behind the dam. As a result, an increasingly greater upstream load of suspended sediment is now reaching the Bay and affecting the Bay's water quality, especially during major storm events.

111. The Susquehanna River is impaired by the presence of Monsanto's PCBs. MDE has worked to measure PCB contamination in the reservoir behind the Conowingo Dam and the tidal portions of the Susquehanna. The portion of the river below the Conowingo Dam—known as the Lower Susquehanna—has had an impairment listing in place for PCBs in fish tissue since 2002, and the waters impounded behind the Conowingo Dam have had an impairment listing for PCBs in fish tissue since 2008. MDE is developing TMDLs for both the Lower Susquehanna and the Conowingo Pool.

Baltimore Harbor and the Patapsco River

112. Baltimore Harbor is a major Mid-Atlantic port and has long been home to industrial and maritime activities. Baltimore Harbor is a tidal estuary that lies in the Patapsco River watershed, and it is estimated that 60 percent of the total freshwater entering Baltimore Harbor comes from the Patapsco River. The Baltimore Harbor watershed is approximately 117 square miles and includes parts of Baltimore City and portions of Anne Arundel and Baltimore Counties. For decades, PCBs have been released into these waters, and PCBs continue to enter the Patapsco River and nearby tributaries from countless diffuse sources, including runoff from urban and industrial sites. MDE historically has collaborated with the University of Maryland Center for Environmental Science on a long-term project called the Comprehensive Harbor Assessment and Regional Modeling Study to assemble data and develop models to predict and map where contaminants such as PCBs come from, where they go, and how they interact with the Bay's living organisms.

113. Where the Patapsco River reaches the Chesapeake Bay, the relatively weak freshwater outflow of the Patapsco interacts with both the strong inflows of diluted

freshwater from the Susquehanna River flowing in from the upper Chesapeake Bay and the higher salinity water from the lower Bay. The hydrologic effect of the confluence of these three water sources causes more rapid burial and greater retention of contaminated sediments originating from the harbor than occurs in other tributaries to the Bay. The Baltimore Harbor portion of the Patapsco River thus retains more contaminants and more PCBs in its waters than do other waterways that empty into the Chesapeake.

114. The Baltimore Harbor watershed has several discrete segments listed as impaired for PCBs. In 1998, the Baltimore Harbor portion of the Patapsco River Mesohaline Tidal Chesapeake Bay Segment was identified as impaired for PCBs in fish tissue; the Curtis Creek/Bay portion of the Bay Segment was identified as impaired by PCBs in fish tissue and sediment; and the Bear Creek portion of the Bay Segment was identified as impaired by PCBs in both fish tissue and sediment. MDE developed a TMDL for Baltimore Harbor that was approved in 2012.

Sparrows Point

115. The 2,300-acre Sparrows Point peninsula was originally rural marshland, home to Native American tribes and then farmers and hunters. The site was later acquired by the Bethlehem Steel Corporation, which operated the Sparrows Point Steel Mill for more than 80 years, making iron and steel and building ships. The steel mill polluted local waterways, including Bear Creek, the Patapsco River, and Old Road Bay.

116. In 1998, MDE identified the Bear Creek portion of the Mesohaline Tidal Chesapeake Bay Segment as impaired for PCBs in sediment. The Bear Creek portion was also identified as impaired for PCBs in fish tissue in 2010.

117. The Sparrows Point Environmental Trust was established in 2014 to investigate and address Sparrows Point-related offshore impacts in the water bodies surrounding the site. The investigation was organized jointly by MDE and the EPA, and in 2016 the Trust released its report for Phase 1 of the investigation, covering the northwest shoreline of the site. The Phase 1 offshore investigation found higher concentrations of PCBs in sediment near the center of Bear Creek, and also near the outlet of Tin Mill Canal, which had historically discharged wastewater from the site's facilities. PCBs were also found in the sediment in the southern portion of the Phase 1 study area, again likely derived from Tin Mill Canal.

118. The results of the Phase 1 offshore investigation led to further human health and ecological risk assessments of the Sparrows Point area. These assessments were performed using sediment data and results from fish and crab tissue collected from around Coke Point and Sollers Point, along with other data. The ecological risk assessment of the Tin Mill Canal concluded that wildlife that consume aquatic and benthic organisms are potentially at risk from total PCBs in this area. The results from the human health risk assessment indicated potential human health concerns too, primarily modelled on PCB concentrations via crab ingestion. Carcinogenic risks from the ingestion of field-collected fish and crab tissue in the Tin Mill Canal Effluent Area exceeded the applicable cancer risk threshold.

The Chesapeake Bay

119. The Chesapeake Bay is the largest estuary in the United States with 200 miles of coastline, encompassing 18 trillion gallons of water, a watershed of approximately

62,000 square miles, and hundreds of species of finfish and shellfish. The Bay receives half its water volume from the Atlantic Ocean in the form of saltwater and the other half is freshwater from various tributaries, including the Susquehanna River. The Bay watershed has 150 major rivers and streams, and more than 100,000 smaller tributaries. The Chesapeake Bay is also a focal point for accumulation of water contaminants, including Monsanto's PCBs, through its many tributaries.

120. The widespread contamination of sediment in the Bay is confirmed by the concentration of PCBs in tissue samples taken from fish in the Chesapeake Bay watershed. Maryland has determined that more than 30 segments in the Bay watershed are impaired for PCBs in fish tissue. Completed Maryland TMDLs show a range of PCB contamination in fish tissue from 22.1 to 608.9 ppb. Maryland has also documented impairments based on PCB concentrations in sediment for Bear Creek, Curtis Bay, and Baltimore Harbor.

121. Concentrations of PCBs in the tissues of many species of Chesapeake Bay wildlife have not declined since Monsanto stopped manufacturing, processing, and distributing PCBs in 1977. Nor has there been a universal decline in PCB concentrations in fish sampled from the Chesapeake Bay from 1999 to 2015.

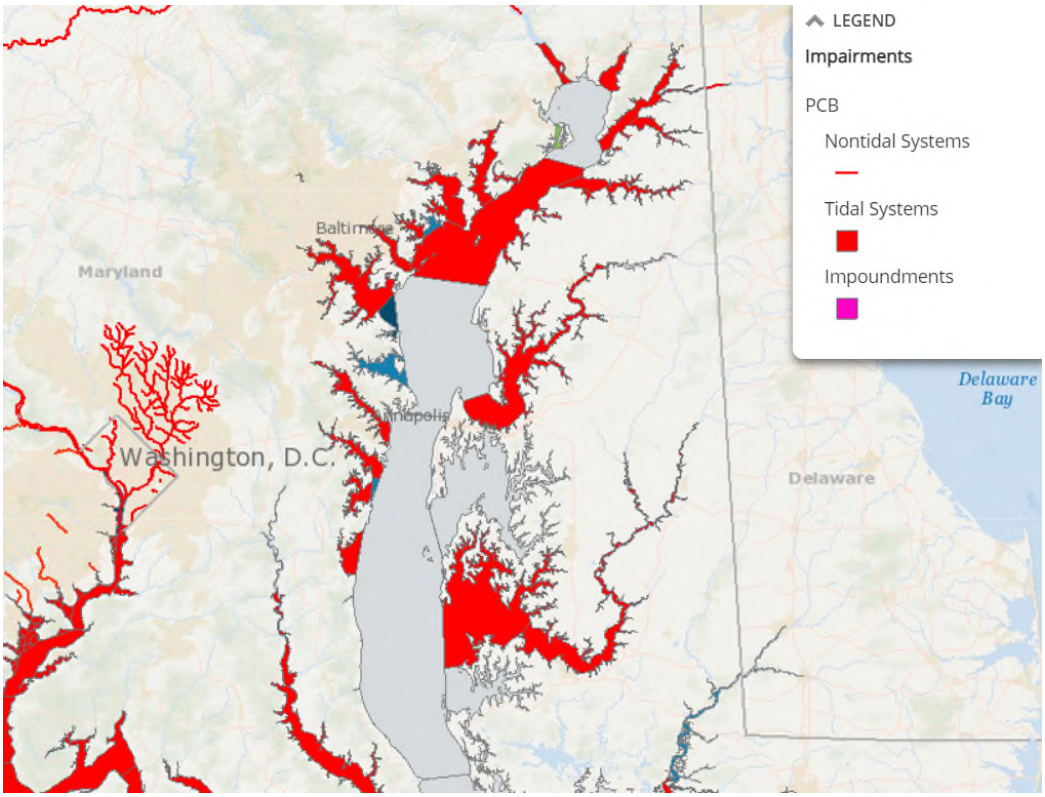
122. Species adversely affected by PCBs include the blue crab—the Bay's signature crustacean.[21] Blue crabs are vulnerable to pollution, including PCBs, and their

[21] The blue crab was designated Maryland's State Crustacean in 1989. 1989 Md. Laws ch. 724 (codified at Md. Code Ann., Gen. Prov. § 7-303). The blue crab's scientific name, *Callinectes sapidus*, translates as "beautiful swimmer that is savory." *Maryland at a Glance, State Symbols*, Maryland Manual On-Line, https://msa.maryland.gov/msa/mdmanual/01glance/html/symbols/crab.html (last visited Nov. 4, 2021).

abundance has fluctuated over time. They are both predator and prey: juvenile and adult blue crabs are food for fish and birds, and blue crabs consume bottom-dwelling organisms, including thin-shelled bivalves, smaller crustaceans, freshly dead fish, and plant and animal detritus. Blue crabs support a large recreational fishery in the Bay and are the estuary's highest-value commercial fishery. MDE's fish monitoring program has found elevated levels of PCBs in the "mustard" of blue crabs from the Chesapeake Bay, and its tributaries, including Cedar Point, Fairlee Creek, Middle River, and Patapsco River/Baltimore Harbor.

123. The Chesapeake Bay has been a major focal point for the State's water quality planning and restoration efforts. The State participates in the Chesapeake Bay Program, a multi-jurisdictional effort to address PCBs and other pollution in the Bay. The State has set water quality standards to protect human health and aquatic life uses of the Bay. Because PCB concentrations in fish and shellfish mean that some waters of the Bay do not meet "fishable" use designations, the State has been involved in developing PCB TMDLs for most tributaries of the Chesapeake Bay, including the Mattawoman Creek, the Anacostia River, the Potomac River, the Bird River, the Gunpowder River, the Patapsco River, the Back River, and the Patuxent River.

124. The map below shows areas of the Bay watershed where PCBs have been found at levels that the State has determined impair ecological health or make fish unsafe to eat.



Source: PCBs in Chesapeake Bay Watershed, available at https://chesbay.maps.arcgis.com/apps/MapSeries/index.html?appid=8c7f6ba4881e47a499aad4564e883242 (last visited Nov. 4, 2021).

125. In addition, well-documented historical PCB contamination in mammals and birds residing in the Chesapeake Bay estuary has adversely affected their populations by reducing their survival and reproductive success. PCBs have also been found in black-crowned night heron and bald eagle eggs, black ducks, little brown bats, big brown bats, wild mink, and bottlenose dolphins.

Maryland's Land Restoration Program Oversees Investigation and Remediation of Monsanto's PCBs.

126. Maryland law permits MDE to undertake any removal or remedial actions necessary to protect public health, safety, welfare, and the environment, and authorizes the State, by and through MDE, to take any action necessary to conduct such removal or

remedial actions and to carry out the policies and provisions of Maryland's environmental laws. Md. Code Ann., Envir. § 7-222.

127. The prevalence of PCBs throughout Maryland has required the State to fund monitoring, TMDL development and implementation, and cleanup costs for a variety of PCB-contaminated sites.

128. Under MDE's Land Restoration Program, the State has undertaken substantial efforts to investigate and remediate sites that are or may be contaminated by PCBs. MDE's Site Assessment Program assesses potential sites to determine the course of action if PCBs are found. And MDE's Voluntary Cleanup Program and Controlled Hazardous Substance Division provide State oversight for the investigation and cleanup of properties in Maryland contaminated with PCBs. Two such properties, by way of example, are located in the Anacostia River at Lower Beaverdam Creek and at Martin State Airport and Middle River.

Anacostia River/Lower Beaverdam Creek

129. The Anacostia River is classified as a Wild and Scenic River and is a major tributary to the Potomac River, one of the several large rivers flowing into the Chesapeake Bay. The mainstem of the Anacostia River is 8.4 miles long, beginning at the confluence of the Northwest Branch and the Northeast Branch and ending at the Potomac in the District of Columbia. The nontidal reaches are in Prince George's and Montgomery counties and the lower, tidal portion extends into Prince George's County. The State has had TMDLs for PCBs for the nontidal portions of the Anacostia River since 2002 and for the tidal portion since 2006.

130. Studies of the Anacostia River have confirmed substantial bioaccumulation of PCBs in invertebrate, fish, and turtle tissues, indicating that PCBs are present and bioavailable.[22] Aroclors were detected in fish and all invertebrates analyzed in the River. Aroclor 1260 was detected in fat, liver, and muscle tissue in snapping turtles. PCBs were also detected in belted kingfisher, green heron, and aquatic mammals such as the northern river otter.

131. Over the past decade, the Anacostia River has been the focus of much study and work to restore water quality. Cleanup of the sediments is underway, including remediation of PCB-contaminated sediments. While contamination in parts of the River is found in deeper sediments, in other areas it is closer to the surface of the river bottom, suggesting ongoing contamination. Potential on-going upstream sources of contamination include inputs from tributaries, including the Lower Beaverdam Creek.

132. Lower Beaverdam Creek is located in southern Prince George's County, and is a tributary of the tidal Anacostia River. Lower Beaverdam Creek is a mid-sized basin covering 14.9 square miles and it is fed by several small tributaries, including Cabin Branch and Cattail Branch. Near the confluence with the Anacostia River, Lower Beaverdam Creek is tidally influenced. Lower Beaverdam Creek has been the focus of multiple investigations over the past 20 years, many of which suggest that the Creek is a continuing source of PCB load to the tidal Anacostia River. The State entered into an inter-

[22] Tetra Tech, *Appendix I Baseline Ecological Risk Assessment, Anacostia River Sediment Project, Washington, D.C.*, Dep't of Energy & Env't (Oct. 31, 2019), https://www.dropbox.com/s/a3gpb486ybcwg17/Appendix_I_BERA%20Oct2019_withFigTabAtt.pdf?dl=0.

jurisdictional TMDL for PCBs in the tidal portions of the Potomac and Anacostia Rivers in 2007, which assigned a load reduction of over 98 percent to the Maryland portion of the Anacostia watershed.

133. The United States Geological Survey ("USGS") published a tributary study in 2019 that compared sediment samples for tributaries of the Anacostia River and found Lower Beaverdam Creek, notwithstanding its relatively small basin area, was the largest source of PCBs entering the Anacostia River, with the loading primarily due to transport via suspended sediments.[23] The USGS tributary study also concluded that the transport of suspended sediment during storm events was the most significant mode of PCB transport to the tidal Anacostia River.

134. The State has undertaken several studies in an effort to identify and control point sources of PCBs within the Lower Beaverdam Creek watershed. MDE's Water and Science Administration conducted several such studies between 2009 and 2011, but was not able to pinpoint the contributing sources. More recently, MDE's Land Restoration Program investigated five miles of the Lower Beaverdam Creek by collecting surface water and sediment samples at twenty locations along this stretch of river in an effort to characterize the PCBs in various environmental media and locate areas of elevated PCBs in sediment or surface water.[24] The maximum total PCB concentration detected in the

[23] Timothy P. Wilson, *Sediment and Chemical Contaminant Loads in Tributaries to the Anacostia River, Washington, District of Columbia, 2016-17*, U.S. Dep't of the Interior U.S. Geological Survey (2019), https://pubs.usgs.gov/sir/2019/5092/sir20195092.pdf.

[24] Maryland Department of the Environment Land Restoration Program, *Lower Beaverdam Creek PCB Investigation* (Feb. 2021), https://mde.maryland.gov/

sediments covered by this study was 2,450 micrograms per kilogram, and sediment samples from six locations out of twenty exceeded EPA's Region III Biological Assistance Technical Group total PCB sediment screening value of 59.8 micrograms per kilogram. The maximum total PCB concentration detected in surface water in this study was 119 nanograms per liter, and surface water samples from 6 out of 20 locations exceeded Maryland's Numerical Criteria for Toxic Substances in Surface Waters of 14 nanograms per liter. Surface water samples from 14 out of 20 locations exceeded the criteria of 0.64 nanograms per liter for human health fish consumption.

135. Elevated surface water concentrations of PCBs were detected in the same two stretches of the Lower Beaverdam Creek where sediment samples had high levels of total PCBs, suggesting the existence of two potential point sources adjacent to these stretches. Data from the study also suggested that PCB transport occurs during storms. MDE's Land Restoration Program will thus need to engage in future work to identify and refine the model regarding potential PCB sources associated with the two identified potential point sources and to mitigate other potential sources of PCBs within the Lower Beaverdam Creek.

Middle River and Martin State Airport

136. The Glenn L. Martin Company, a predecessor to Lockheed Martin Corporation, acquired approximately 747 acres of land just east of the Middle River area of Baltimore County in 1928 to build and test aircraft. The land is now part of the Middle

programs/LAND/MarylandBrownfieldVCP/Documents/Final%20LBC%20Results%20Nov%2019%20Sampling%2002-2021.pdf.

River Complex and the Martin State Airport. In 1975 the State acquired the airport, which the Maryland Aviation Administration currently operates. In 1995 Lockheed Corporation merged with Martin Marietta to form the Lockheed Martin Corporation, which conducted engineering activities at the Middle River Complex.

137. Studies conducted at Martin State Airport in cooperation with MDE revealed that the soils around and underneath buildings and parking lots and in secured, fenced-off areas along the waterfront had areas of elevated PCBs. PCBs were also found in storm drain sediment. After PCBs and other contaminants were found on the site, Lockheed Martin entered into MDE's Voluntary Cleanup Program. MDE has overseen Lockheed Martin's remediation efforts at the Middle River Complex, including the soil, sediment, and groundwater investigation, and preparation and implementation of a remedial action plan.

138. Remediation of PCBs in Maryland remains a complex and costly endeavor. Cleaning up legacy contamination is an imperfect solution to PCB remediation so long as more PCBs are moving into Maryland's waterways, including the Chesapeake Bay, where currents and tides carry them into the tributaries. After working for decades to create a strategy for reducing PCBs, Maryland faces a costly uphill battle in its effort to undo the harm caused by Monsanto.

FIRST CLAIM FOR RELIEF
(Public Nuisance)

139. The State incorporates by reference the allegations in the above paragraphs as if fully set forth herein.

140. Defendants' production, sale, and use of PCBs in various chemical and industrial applications continually from 1935 to 1977 contributed to the continuous and ongoing prevalence of PCBs on lands, in waters, in fish, and in other wildlife owned, controlled, managed, or held in trust by the State for the benefit of the public.

141. The continuous presence of PCBs on lands, in waters, in fish, and in other wildlife that the State owns or holds in trust presents ongoing risks to the health of humans, fish, wildlife, and the environment in Maryland and has resulted in a public nuisance that causes real, substantial, and unreasonable damage or interference with rights common to the general public.

142. The continuous presence of PCBs on lands and in waters that the State owns or holds in trust for the benefit of the public has resulted in a public nuisance, because it substantially, continuously, and unreasonably interferes with interests and rights of the general public to be free from injury to public health, safety, and welfare and the contamination of the lands and waters. PCB contamination of land and waters further interferes with the interests of the general public in the preservation of Maryland's natural resources—including fish, wildlife, and habitat—which the State is obligated to hold in trust for the benefit of, and for use by, members of the general public. The State also has incurred significant costs in abating the nuisance caused by Defendants and will continue to incur significant costs well into the future.

143. For multiple decades while Defendants were producing PCBs, Defendants knew, should have known, and/or were reckless in not knowing that, once the PCBs they had produced were released into the environment, it was substantially certain they would

interfere with the interests of the general public in human health and the health of fish, wildlife, and the environment.

144. Defendants' internal communications about the toxic properties of PCBs make clear that Defendants understood that, once PCBs were released into the environment, it was highly probable that the PCBs would remain in the environment and present serious risks to the health of humans, wildlife, and the environment. Defendants continued, however, to manufacture and supply PCBs, while consistently downplaying the risks of PCBs in communications with their customers and the general public.

145. Defendants intentionally acted with ill will, evil motive, or actual malice, and in a manner that was indifferent to the health, safety, and welfare of the general public and the natural environment, by continuing to manufacture and supply PCBs despite knowing that their PCBs would be released into the environment on a widespread basis and the risks that their PCBs presented to the health of humans, fish, wildlife, and the environment.

146. As a direct and proximate result of the public nuisance that Defendants caused, Maryland citizens have been injured in their ability to enjoy rights common to the general public.

147. As a direct and proximate result of the public nuisance that Defendants caused, the State has sustained economic harm, including by spending substantial monies addressing the toxic legacy of PCBs throughout the State.

148. The State has also suffered unique harms of a kind that are different from Maryland citizens at large, including that the State has been harmed in its proprietary interests.

SECOND CLAIM FOR RELIEF
(Trespass)

149. The State incorporates by reference the allegations in the above paragraphs as if fully set forth herein.

150. Defendants' production, sale, and use of PCBs in the various chemical and industrial applications described above have resulted in the continuous presence of PCBs on property that the State owns, possesses, controls, maintains, or holds in trust for the benefit of the public.

151. The presence of PCBs in the State interferes with the State's interest in the exclusive possession of State-owned or -controlled property and thereby constitutes a trespass. Defendants' conduct allowed or caused that interference to occur. Defendants had no license or other authorization to enter onto or leave contaminants on property that the State possesses. Any compliance by Defendants with applicable laws or permit conditions does not excuse Defendants' interference.

152. For multiple decades while Defendants were producing PCBs, Defendants knew that, once the PCBs that they produced were released into the environment, the PCBs were likely to remain in the environment, and be transported throughout the environment, on a widespread basis, including within Maryland. Thus, for decades, Defendants knew, should have known, or were reckless in not knowing that their decision to continue to release PCBs into the environment would likely result in interferences with the State's interests in the exclusive possession of its property.

153. The interference that Defendants' conduct has caused with the State's exclusive possession of property that the State owns, possesses, controls, or holds in trust for the benefit of the public is a continuing interference that, since at least the 1960s, Defendants have known of or have allowed to persist.

THIRD CLAIM FOR RELIEF
(Unjust Enrichment)

154. The State incorporates by reference the allegations in the above paragraphs as if fully set forth herein.

155. Under the laws of Maryland, Defendants owe a duty to the State and to the public to prevent Monsanto's PCBs from interfering with the use or possession of property Defendants do not own, and from causing harm to the health of humans, fish, wildlife, and the environment.

156. Defendants' production, sale, and use of PCBs in various chemical and industrial applications have resulted in the presence of PCBs on lands and in waters across Maryland, including but not limited to State-owned lands and waterways held in trust by the State for the public.

157. The presence of Defendants' PCBs on lands and in the waters of Maryland poses an ongoing threat to Maryland's public health, safety, and the environment. Defendants' PCBs already have caused, and will continue to cause, significant damage to Maryland's fish, wildlife, and habitat areas, among other resources.

158. Defendants were and are legally obligated to prevent PCB contamination that now exists in Maryland. For example, and without limitation, Defendants had and continue

to have a common law obligation to prevent their PCBs from creating a public nuisance and from trespassing on others' property.

159. Because of the significant risk that PCBs present to the health of humans, fish, wildlife, and the environment, and the damage that PCBs have caused to the natural environment, the State has performed Defendants' duty and undertaken remedial actions to monitor, investigate, and remove the PCBs in Maryland. As a result, the State has incurred significant remedial action costs, including the personnel and program costs for conducting fish tissue monitoring, investigations conducted by MDE's Integrated Water Planning Program to develop TMDLs, and investigations and cleanup oversight by the Land Restoration Program, among others. The State anticipates that it will continue to incur remedial action and other costs to monitor, investigate, and abate continuing hazards to public health, safety, welfare, and the environment from Defendants' PCBs.

160. The State has no contractual relationship with Defendants that obligates it to undertake these actions.

161. Monsanto knows that it profited from sales of PCBs into Maryland and that the State's investigatory and remedial actions to remove PCBs from Maryland have conferred an economic benefit upon it, and Monsanto has retained these economic benefits for itself. Monsanto knows, and has known for years, that the PCBs it manufactured are a pervasive environmental contaminant presenting significant risk to the health of humans, fish, wildlife, and fish and wildlife habitat areas. Monsanto is aware that states, including Maryland, have undertaken extensive efforts to monitor,

investigate, remediate, and remove PCB contamination, but Monsanto has done nothing to address and remediate the problems it created.

162. By way of the State having undertaken remedial actions necessary to abate the hazard created by Defendants' PCBs, certain economic benefits, including but not limited to the following, have been conferred upon or acquired by Defendants:

A. Reduction in the costs Defendants would have incurred from properly removing, taking back, or disposing of PCBs sold into Maryland;

B. Reduction in the costs Defendants would have incurred, or in the future will incur, to monitor and investigate the existence of and damages caused by the presence of PCBs in Maryland's natural environment;

C. Reduction in the costs that Defendants would have incurred, or in the future will incur, to remediate the damages caused by the presence of PCBs in the natural environment, including damages to Maryland's lands, waters, fish, wildlife, and habitat areas; and

D. Other and further economic benefits relating to the sale of Monsanto's PCBs into Maryland and the existence of Monsanto's PCBs in Maryland's natural environment, the retention of which by Monsanto would be unjust.

163. Given Defendants' duty and otherwise legally enforceable obligation to prevent their PCBs from interfering with the use or possession of property they do not own and from causing harm to human health and the environment, it is unjust for Defendants to retain the benefits described above without providing compensation.

164. As a result of the State's efforts and funding to remediate Defendants' PCB contamination in Maryland, the State seeks restitution and disgorgement to prevent Defendants from being unjustly enriched by retaining the amounts the State has spent investigating, monitoring, and remediating PCB contamination in Maryland. The State does not have a business justification for providing the Defendants with PCB remediation: Defendants receive all the benefits of the State's remediation activities while the State receives nothing in return. The State also seeks disgorgement of Monsanto's profits from PCBs.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff, State of Maryland, prays that this Court enter judgment in its favor against Defendants, and hold Defendants jointly and severally liable, as follows:

1. Damages according to proof;

2. Punitive or exemplary damages sufficient to punish Defendants' ill will, evil motive, or actual malice and to deter or warn others against commission of similar misconduct;

3. Award of the present and future costs to abate the ongoing public nuisance and to investigate, assess, analyze, monitor, remove, and remediate the contamination caused by Defendants;

4. Any such further relief requiring Defendants to pay for the abatement of the ongoing nuisance;

5. Award of compensatory damages in excess of $75,000 for the damages caused by Defendants' continuing trespass upon State lands and the costs of removing Defendants' PCBs from State lands;

6. Award of restitution of costs caused by Defendants' actions, including the personnel and program costs associated with investigation, monitoring, removal, and remediation of Defendants' PCBs paid for by the State;

7. Disgorgement of Defendants' profits from PCBs;

8. Litigation costs and attorneys' fees as permitted by law;

9. Pre-judgment and post-judgment interest at the highest allowable rate; and

10. Any other and further relief as the Court deems just, proper, and equitable.

JURY DEMAND

The State demands trial by jury of all issues so triable.

Respectfully submitted,

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