

Polychlorinated Biphenyls (PCBs) in New England Coastal Waters

By Charles J. McCreery

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INTRODUCTION

About a year has passed since I issued my research addendum, “Ocean Dumping of Toxics, a Newly-Recognized Potential Source of Human Carcinogens,” which can be found on my LinkedIn profile. That addendum pertained to ocean dumping of chlorinated hydrocarbons, including PCBs, DDT and dioxins. My research indicates that vast volumes of these drummed waste products were covertly ocean-dumped in 1973-1977 at up to 40 coastal ocean sites around the continental US and Great Lakes. I concluded that these dumpsites are still open, drums have rusted, chemicals have entered the food chain and are a new-to-us potential source of human carcinogens. I began this research in New Orleans in 2016 after hearing from medical professionals about the high rate of illness from an unknown source. At the time I wrote the addendum in April 2022, ocean dumping was not known by health professionals and cancer researchers as a potential source of human carcinogens. Please note that findings presented here are based on public information.

My April 2022 paper focused on a dumpsite in the northern Gulf of Mexico 60 miles offshore of the Mississippi Delta in mile-deep water, where more than 1.5 million drums are believed to exist, based on ocean dumping permits I obtained from EPA pursuant to a Freedom of Information Act (FOIA) request. The permits reveal an ocean dumping program conducted by EPA under the Marine Protection, Research & Sanctuaries Act (MPRSA) of 1972.

RESEARCH METHOD

Direct evidence of the MPRSA ocean dumping program is scant, except permits received pursuant to the FOIA for the Gulf of Mexico site. Because direct evidence is scant, I necessarily had to use multiple lines of evidence from available public information to draw conclusions. Generally, I considered four or more lines of evidence necessary to draw reasonable conclusions by this method. The lines of evidence were based on common properties observed for the Gulf of Mexico site and Massachusetts IWS-1, both known MPRSA dumpsites.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1600 PATTERSON, SUITE 1100
DALLAS, TEXAS 75201

PERMIT

Permit No. 730D008A
Name of Permittee Shell Chemical Company
Effective Date June 13, 1973
Expiration Date November 1, 1973

MARINE PROTECTION, RESEARCH AND
SANCTUARIES ACT (OCEAN DUMPING) PERMIT.

Some of these lines of evidence include:

- the dumped material consists of toxic and persistent chlorinated hydrocarbons;
- existence of chlorinated hydrocarbon sediment contamination at nearby harbors and rivers used as embarkation points and routes for the ocean-dumped waste;
- the waste was dumped between 1973 and 1977;
- the waste was generated at military/contractor facilities during remediation projects performed in the early 1970s;
- the waste was oil-soluble, mixed with fuel oil to make it flow, and was contained in steel, 55-gallon closed-head drums;
- the drums were dumped evenly-spaced in lines from a moving barge with precise navigation;
- the sites are close to but not at National Marine Sanctuaries permitted under the MPRSA;
- the sites are located near but not at the pre-1970s dumpsites;
- fish consumption advisories in the area pertain to chlorinated hydrocarbons;
- Many of the waste generation sites and embarkation locations are now Superfund Sites, and
- Naval Construction Battalion Center facilities were used as embarkation locations.

NEW ENGLAND OCEAN DUMPSITES

One of EPA's first actions in 1970 was to contract an inventory of pre-1970 offshore industrial waste sites. Within EPA Region 1 waters, there are two waste sites located offshore Maine, one off of Massachusetts (IWS-1), one off Rhode Island, and two offshore Long Island. The pre-1970 industrial waste sites were used by EPA for disposal of chlorinated hydrocarbons in 1973-1977 under Section 102 of the MPRSA.



The two industrial waste sites offshore Maine were correlated to the former Dow Air Force Base (a Superfund Site) via the Penobscot River, and Cutler Naval VLF Transmitter Station. Massachusetts IWS-1 was correlated to New Bedford Harbor (a Superfund Site) via the Cape Cod Canal and Massachusetts Bay. The industrial waste site offshore Rhode Island was correlated to Blue Beach (a Superfund Site) at Davisville Naval Construction Battalion Center. The two industrial waste sites offshore Long Island were not correlated.

WASTE CHARACTERIZATION

In April 2022, I conducted a brief survey of chlorinated hydrocarbons detected in harbor sediments around the continental US. PCBs were detected in harbor sediments of most coastal states. PCBs are the most common contaminants in harbor sediments within the New England states. Dioxin was also detected in Penobscot River sediments in Maine, the only such detection I found in the New England Region.

To obtain waste characterization information, I referred to EPA site cleanup documents for the General Electric (GE) Housatonic River cleanup (a Superfund Site) in western Massachusetts. The Housatonic River discharges to Long Island Sound. According to the documents, waste PCBs were discharged directly to the river by GE with EPA permission for over 30 years. The GE site is the largest PCB site in the New England Region. GE is a military contractor; the site underwent remedial actions in the early 1970s, and the site is located about 130 miles from New Bedford. As such, the GE Housatonic site was considered an analog for material dumped at IWS-1.

The GE Housatonic River site was subject of a Public Health Assessment conducted by the Agency for Toxic Substances and Disease Registry (ATSDR), documented in a report, dated August 25, 2008. Sediments previously dredged from the Housatonic River exhibited total PCB concentrations up to 20,200 mg/kg and total dioxins up to 0.00623 mg/kg. Dioxins are formed when PCB transformer oil is

heat-damaged. The association of dioxins with PCBs in the river suggests the waste may have originated from burned transformers returned to GE after a fire, a common practice.

ATSDR was clear that dioxins should be considered Contaminants of Concern for the site. However, all subsequent site documents prepared by GE and EPA referred only to PCBs and did not mention dioxins, resulting in understated human risk. I commented on this omission in public comments and suggested that, in the European Union, toxicity from PCBs and dioxins are combined for human health risk characterization. EPA's response is paraphrased below:

"The dioxin and furans present in the Rest of River media are not a hazardous waste as defined by the federal Resource Conservation and Recovery Act (RCRA). For contaminated soil or sediment to be such a waste, the material must contain a waste listed under RCRA. The contaminated sediment, which came from the GE plant in Pittsfield, does not contain a listed RCRA waste."

In other words, dioxin is not a hazardous waste because EPA elected not to list it as a hazardous waste. In reality, dioxin is one of the most toxic chemicals known to man. Based on this analysis, it is reasonable to believe that all of the PCB offshore dumpsites around the continental US also contain dioxin. Because, who would discard undamaged PCBs?

FISH CONSUMPTION ADVISORIES

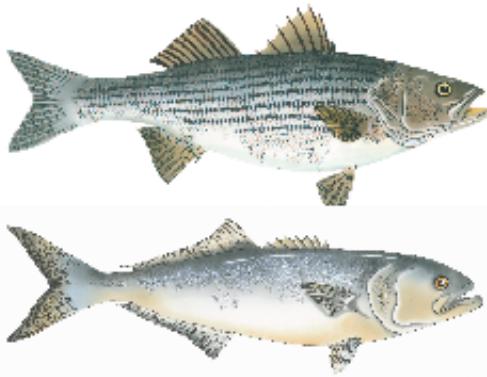
Many of the continental US coastal states updated their saltwater fish advisories in 2021 and 2022, issued by state public health agencies. The Striped Bass and Bluefish Advisory (attached below), issued by the Maine Center for Disease Control & Prevention in April 2021, summarizes the condition of coastal New England waters. These two species are now contaminated by PCBs and dioxin from the Hudson River to Maine. Sensitive populations are instructed not to eat any of these fish, and everyone else is allowed four palm-sized servings per year. The Advisory states that, prior to 2001, maximum PCB concentrations in these fish were 50 parts per billion (ppb). As of 2008, these two species of fish contained PCBs at concentrations up to 600 ppb. No data were released for the period of 2008 to present.

The Striped Bass and Bluefish Advisory mentions the Hudson River in New York as a source of PCBs in these species. That PCB contamination is attributed to the GE Hudson Falls Plant (a Superfund Site) which originated in the same manner with similar contaminants as the GE Housatonic River site. Other potential sources of PCBs/dioxins in the New England coastal offshore include the six industrial waste sites, embarkation locations, and discharge from contaminated rivers mentioned above.

In my next research addendum, I will return to the Gulf of Mexico to discuss fish consumption advisories for the coastal states, and share updates from involved agencies.

Striped Bass and Bluefish Advisory

April 2021



Safe Eating Guidelines

Pregnant and nursing women, women who may get pregnant, nursing mothers and children under 8:

Should not eat any striped bass or bluefish.

Everyone else should eat no more than 4 meals per year.

It's hard to believe that fish that looks, smells, and tastes fine may not be safe to eat. But the truth is that striped bass and bluefish have PCBs, dioxins and mercury in them.

Why does Maine have this advisory?

Data from 2001 to 2008 from Maine's striped bass and bluefish have shown PCB levels between 200 and 600 ppb. Previous data showed levels between 10 and 50 ppb. PCB levels in foods are mostly below 30 ppb. Maine worked with other East Coast states to develop consistent advisories based on these data.

Why are PCBs found in striped bass and bluefish?

PCBs are a class of chemicals that don't easily break down, even though they have been banned for over 30 years. These chemicals collect in fat and build up in fish that are fatty and in fish that eat other fish.

As striped bass and bluefish migrate up and down the East Coast, they pick up PCBs from eating other fish. This is especially true for striped bass as they eat fish when spawning in the Hudson River, Delaware Bay or Chesapeake Bay. Generally speaking, striped bass from the Hudson River have the highest levels of PCBs while the lowest levels are found in striped bass that have spawned in North Carolina.

Why should I be concerned about PCBs?

PCBs build up in the fat in our bodies and stay there a long time. When babies are developing in the womb, PCBs can damage the growing brain. This can cause the child learning difficulties as they get older. For that reason, the advisories focus on pregnant women, women of childbearing age, nursing mothers and children under the age of 8.

PCBs can also cause cancer. The advice for everyone else makes sure there is a minimal increase in cancer risk.

What about PCB levels in other marine fish and shellfish?

There are many other marine species that are low in PCBs and can be eaten more frequently. Commonly eaten marine species low in PCBs and other contaminants include Atlantic mackerel, cod, haddock, hake, pollock, shellfish, shrimp, wild salmon and lobster (except for the tomalley which should not be eaten).

Protect your family. Eat fish low in contaminants.

- Check this website: maine.gov/dhhs/eohp/fish
- Call for advice: 866-292-3474 • TTY users call Maine Relay 711



CORRECTION

In my April 2022 research addendum, “Ocean Dumping of Toxics, a Newly-Recognized Potential Source of Human Carcinogens,” I focused on the carcinogenic properties of dioxin. I failed to mention other hazards of the chemical, most importantly that dioxins are endocrine disruptors, which cause low sperm count and reproductive failure. Therefore, the effects of dioxins in the ocean will not be seen as fish kills, but as a population decline as species fail to reproduce.

AUTHOR BIOGRAPHY

Mr. McCreery has a Bachelor of Science degree in geology and a Master of Science degree in geological oceanography from the University of Rhode Island. His work toward his MS degree, including training in marine geophysics and geotechnical engineering, was funded by the US Department of Energy Low Level Waste Ocean Disposal Program. After graduate school, he worked as a geologist and geophysicist for Gulf Oil and Chevron in New Orleans for several years. He returned to New England in 1989 where he became licensed to direct subsurface environmental assessment of hazardous waste sites.

In 2013, he was called back to New Orleans to work for the US Department of Interior Bureau of Ocean Energy Management (BOEM). His role at BOEM was to conduct environmental research of the northern Gulf of Mexico following the Deepwater Horizon accident. He worked in a multi-disciplinary team to write National Environmental Policy Act (NEPA) documents for public disclosure of offshore drilling activities. It was there he began public research into ocean dumping practices as a cumulative impact on water quality. His research on ocean dumping has continued to the present. Mr. McCreery has never held a secret clearance which could restrict his ability to disclose his public research. His preliminary report, “Ocean Dumping of Chlorinated Hydrocarbons under the Marine Protection, Research & Sanctuaries Act of 1972,” can be found on Amazon.