Troubled waters

By Casey Bukro

Nestled into the Lake Michigan shore only 38 miles north of Chicago, Waukegan Harbor is a place of contradictions. The self-styled salmon capital of the Midwest, it is a mecca for sport fishing. Yet its waters are polluted by the largest concentration of PCB chemical wastes in the country. The harbor, filled with an estimated million pounds of toxic pollutants, is literally a PCB cesspool.

Polychlorinated biphenyls, more commonly known as PCBs, once were considered a miracle chemical because of their many industrial uses, such as in paints and plastics and as a flame retardant. But like their chemical cousin, the insecticide DDT, PCBs are now banned from general use. Both chemicals are able to enter the food chain and build up to poisonous levels in the fatty tissue of animals and humans—a process known as biomagnification. Both chemicals are suspected of causing cancer.

Eight years ago, it was discovered that Waukegan's giant Johnson outboard motor die casting plant, operated by Outboard Marine Corporation, was unwittingly scattering potentially dangerous chemicals around the harbor.

The impact of this contamination on the health of the residents of Waukegan was at first uncertain, although tests showed that substantial traces of PCB could be found in fish caught in the harbor.

But Lake Michigan fish had been sending warning signals for years. The first clue came when mink ranchers reported in the late 1950s that minks fed Lake Michigan salmon were dying or having serious reproductive problems.

The U.S. Fish and Wildlife Service reported in 1973 that all Lake Michigan coho salmon and lake trout tested for PCB were found to be unfit for human consumption. A National Academy of Sciences researcher the same year declared Lake Michigan lost as a fisheries resource because "it's hard to find a large fish in Lake Michigan that does not contain more than the Food and Drug Administration's limit of 5 parts per million of PCBs.

Threats to aquatic food stocks have always been a major concern of environmentalists. Sport fishing in the Upper Great Lakes is estimated to be a $300 million industry. The Great Lakes commercial catch is valued at approximately $25 million a year.

The PCB discovery was doubly cruel because it came just as environmental control agencies were reporting success against older pollution targets, such as sewage and industrial wastes. It was a turning point in environmental control, in which scientists became concerned about the chemical wastes building up in our surroundings.

Hoping to head off an environmental and an economic disaster, the U.S. EPA convened a three-day conference in Chicago in 1975 to spell out PCB dangers.

Casey Bukro is *The Tribune's* environment writer.

The Battle of Waukegan Harbor is developing into an environmental Waterloo. When it ends, casualties on all sides will be high

Scientists testified that PCB contamination was "literally everywhere," and that it was causing serious trouble for fish, birds, and other wildlife. The compounds, witnesses declared, could be found all over the globe—in Arctic polar bears, New York chickens, humans, rainfall, and the world's oceans.

Calling for a national PCB ban, Nathaniel Reed, then an assistant secretary at the Interior Department for fish, wildlife, and parks, said the environment was in "mortal danger," and that it made no sense to stock lakes with fish that could not be eaten because of chemical contamination. He added: "Quite frankly, I am thoroughly disgusted by the smashing of teeth, wailing, and rubbing of hands. To the agencies which have the enforcement responsibilities, a few words on behalf of the bewildered but concerned American people: Get on with it!"

A month later, Russell Train, then EPA director, declared that the U.S. must stop using PCB. The Toxic Substance Control Act of 1976 outlawed production and sales of PCB by 1979, although some uses of the chemical can continue until 1988.

Yet in 1983, eight years after the discovery that Waukegan Harbor was severely contaminated by PCBs, fishermen still line its concrete south pier to cast their luck and skill. Every so often, the air is filled with the sounds of spinning reels as rods bend almost double under the weight of 20- or 30-pound salmon. There is excitement in fighting a big fish, and tension soars as fishermen shout advice and rush to net their catches.

It all appears normal enough, except for the signs posted by the Lake County Health Department signs that say the consumption of fish may be dangerous to your health. The warnings were posted at the pier because PCB concentrations are known to be unusually high in the sediments taken from the harbor bottom.

Tom Bellefeuille, 38, a small man with a red beard, scoffs at the warning. His favorite fishing spot is right next to the sign, he says.

"I been eating them all my life and I ain't dead yet," he says. "They talk about PCB and say it does this and that. Where's the proof? Everyone I know eats the fish, too. There are people who fished the lake all their lives and they won't quit now. When the fish are in, the fishermen are practically shoulder to shoulder here. They don't look at the sign, either."

Illinois is one of five states that warns against eating fish caught in the Great Lakes because of PCB dangers. The Illinois Department of Public Health says fishermen should limit their consumption of Lake Michigan fish — such as salmon or lake trout — to one meal a week if the fish weighs [illegible] pounds or [illegible]. Children and pregnant women are advised to avoid the fish altogether.

The larger and older the fish, the greater the concentration of PCBs. A warning in the state's fishing regulation handbook includes instructions on how to trim the fat out of the belly, back and sides of the fish — which is where most of the chemical is stored.

Most Waukegan Harbor fishermen say they ignore the warnings, although some of the Sunday afternoon crowd say. Gene DeVuito of Burrington [illegible] caught 283 pounds of salmon in a single [illegible] and that his family eats it all [illegible] eat 25 or 30 pounds a month because [illegible] says. "You'd have to have a fish tumor [illegible] a month. Nobody does that."

Other fishermen say they have [illegible] fish which removes some of the [illegible] along with PCBs.

Not all the fishermen ask what they bring home. Some of them don't mind if someone [illegible] Gesky of North Chicago. "I [illegible] There's people who eat it, no problem [illegible] prove was demonstrated by a bowl of [illegible] Waukegan East High School, who [illegible] big salmon ashore.

What would he do with the fish? "I'll get answers. To whom? Anybody who wants to [illegible] he should barb. Salmon roasts, I guess," he said. "I sell for 40 cents a pound, but I give [illegible] can sell the whole fish for $3 or $5."But [illegible]

It's illegal to sell fish [illegible] opera, released a cascade of yellow spoil [illegible] resembling small cereal marbles. [illegible]

Waukegan's unemployment rate [illegible] these days, and a fish that can [illegible] a few dollars is a bargain [illegible] PCBs, but Victor Cooke, [illegible] Conservation Department's fisheries division, [illegible] salmon are sport fish and that it is illegal to sell them or their eggs.

"I've heard that people who go out and [illegible] can make several hundred dollars a week at it," [illegible] cycles," says Cooke. "They rip open [illegible] eggs), then dump it in the harbor. [illegible] anyone selling Lake Michigan salmon or [illegible] fined at least $50 and any one caught [illegible] $200 worth of fish and artificial can be fined as much as [illegible] imprisoned for five years.

That is one of the reasons Lake Michigan salmon. The fish, which are not native to [illegible] Michigan, were stocked in the [illegible] hopes of creating a commercial salmon [illegible] try. But soon it was discovered that the salmon were tainted by DDT and PCB above what the [illegible] fish cannot be sold commercially. But sport fishermen [illegible] are allowed to catch and eat them at their [illegible]

David Foltz, a pesticides investigator for the Food and Drug Administration [illegible] plants. "Fishermen who catch the [illegible]

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know there is a risk." But if they sell the fish to someone else who is not aware of the hazard, says Foltz, that could be "unethical" and "a public health problem."

Waukegan Harbor, covering some 37 acres, is an old industrial harbor that has gained new life as a pleasure-boat port. From spring through fall, a forest of boat masts sways against a background of tall industrial smokestacks.

Tom Gockel is one of 27 charter-boat captains in Waukegan Harbor who take fishing parties into Lake Michigan, and he has a steadfast rule about PCBs: "The only time I volunteer [information] is when they ask." At one time, the boat captains distributed leaflets explaining how to remove PCBs from fish. The Waukegan Charter Boat Association, which Gockel co-founded, now hands out a salmon and trout recipe book that does not mention PCBs, although it contains a diagram showing where fat can be trimmed to "double your enjoyment."

A 1980 report on Lake Michigan charter-boat fishing in Illinois waters shows there were 4,880 charter trips that year carrying 24,781 anglers. Seventy-one percent of the charter catch was taken in Waukegan-area waters, and salmon accounted for more than 70 per cent of the charter-boat catch.

Gockel said his customers often inquired about PCBs a few years ago. Now they rarely ask, he says. "That tells me they are forgetting about it."

"PCB in Waukegan Harbor is not hurting one person," he insists. "It is pure personal judgment how toxic it is. Leave the stuff there. It's not hurting anything."

Waukegan Mayor Bill Morris wishes it was that simple. "We get 50 to 100 calls a year asking if the fish are safe because of the PCB problem. It is a black eye for the community. It is a possible health hazard. Whenever somebody lists the 100 worst toxic waste dumps in the world, we get named. We want to correct that image."

As for the PCBs, Morris says, "I want them out." And he doesn't care how it is done. "It's a case of state and federal politicians and big corporations playing games. Those of us who are little folks without sophistication are left to sit."

The mayor says Waukegan Harbor is important to the city's economy. It is a hub of industrial activity, the home of National Gypsum Company and other firms that rely on the port for commercial shipping.

"I would say we've got two years before the time bomb explodes," says Morris. "Not because of pollution, but because the harbor won't be navigable." Sand and silt are slowly filling in the harbor while authorities debate what to do about the PCBs in the sediment, which have prevented dredging. Harbor depths are 14 to 25 feet generally, but shallower in some places.

Who is at fault for what happened in Waukegan Harbor? How did it happen? What should be done about it? Who should do it? How much will it cost and who should pay? These are the questions that have been raised in lawsuits pitting the U.S. Environmental Protection Agency against Outboard Marine Corp.

A trial to decide these matters was scheduled to start in December in federal court in Chicago, but was delayed. There is [illegible] settlements are [illegible] to be completed. Aside from complex legal questions, the conflict [illegible] and vigorous personalities united in defending their views.

Valdas Adamkus, the Midwest EPA regional administrator, is one of them. Lithuanian-born, a teenage underground freedom fighter against Nazis forces, and a 1948 European Olympic medal winner in track—Adamkus is engaged in the toughest struggle of his environmental career. He came to the U.S. in 1949, served in the Army, earned a civil engineering degree from the Illinois Institute of Technology, speaks five languages, joined the federal government in 1970, and in 1979 won the EPA's top honor—a gold medal for exceptional service.

As Adamkus sees it, Waukegan Harbor is filled with a life-threatening poison. "We have hundreds of thousands of pounds of a carcinogenic [cancer-causing] chemical in the sediment there," he says. "That fact in itself is detrimental to the environment. I am in sympathy with a local community that is unnecessarily exposed to that health related threat."

Almost single-handedly, Adamkus forced state and federal officials to confront the Waukegan Harbor issue. When Illinois officials failed to act, Adamkus personally placed Waukegan Harbor on an EPA list of the 418 worst waste dumps in the nation. That qualifies the harbor for money from a $1.6 billion federal "superfund" that was established to clean up dangerous chemical waste sites.

"If there is a health hazard, I have authority to move ahead and do the job," says Adamkus. Showing signs of growing impatience, Adamkus says he could have bulldozers at Waukegan Harbor by August. He estimates the cleaning cost at $14 million.

The man who preceded Adamkus as EPA Midwest regional administrator, John McGuire, announced in 1980 that dredging would begin in the summer or fall of 1981 to get the PCB out of Waukegan Harbor. The project was expected to cost $20 million and take two years. The plan was to use a sort of giant vacuum cleaner—called an auger—to slurp tons of PCB-tainted muck from the harbor bottom and put it in lagoons on Outboard Marine property.

Adamkus himself, declaring late in 1981 that Waukegan Harbor "is one of my top priorities," vowed that dredging would begin in July of 1982. In both instances, the cleanup efforts announced by the officials faltered, although the harbor contamination continued to be described as an environmental "tragedy."

The latest EPA plans include several methods of easing the PCB problem, such as putting a dam across the harbor entry to Lake Michigan, draining the water and dredging up the bottom, dredging it in a variety of ways, or turning the harbor sediment into a concrete-like material through a process known as in-place fixation. Estimates of the cost of disposing of the muck, classified as a toxic waste because of its high PCB content, range from $6 million to $33 million.

EPA officials do not want to discuss details of any cleanup because of the pending court case and they will not say which alternative is favored.

Illinois environment officials rank Waukegan Harbor as the state's most hazardous waste dump. But there could be a hitch in moving ahead on a cleanup. Under the federal superfund program, the U.S. EPA would pay 90 percent of the cost of cleanup, while the state would pay the remaining 10 percent—more than $1 million in the case of Waukegan Harbor.

Richard Carlson, director of the Illinois Envi-

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A Waukegan Harbor fisherman and his catch. The lake was stocked with salmon in the 1960s.

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ronmental Protection Agency, points out that the Illinois legislature has not yet set aside money for Waukegan Harbor. State officials might be looking for a less costly solution.

Under the superfund law, Carlson explains, Congress gave the U.S. EPA, in partnership with the states, "a new set of legal tools to force polluting industries to clean up hazardous-waste sites. As a last resort, the act makes funds available to federal and state government so they can do the job themselves—if corporate parties do not. Why spend taxpayers' dollars when the polluters ought to be responsible for cleanup?"

Carlson also points out that "industries that fail to take ordered actions are liable for punitive damages equal to three times the government's cost." Outboard Marine is faced with paying triple damages in the cleanup if it doesn't come to terms with the government, and Carlson says, "That may spur them on."

With worldwide sales of $780 million in 1981, Outboard Marine is a strong corporation that shows no signs of being coerced into action. In fact, the company was the first to strike with a lawsuit filed in 1978 against the U.S. EPA. The company then sued Monsanto Chemical Co. in 1980 on charges of creating a nuisance by manufacturing a toxic chemical, PCB. EPA countersued Outboard Marine, and then Illinois sued the company.

Hugh Thomas, Outboard Marine secretary and associate general counsel, is the company's chief spokesman in the case. Thomas was born in a London air-raid shelter during World War II, but moved with his parents to the Midwest at age 3. He is a graduate of the University of Illinois law school. After working for Borg-Warner and the Caterpillar Tractor Co., Thomas, with solid credentials in corporate law, landed at Outboard Marine in 1976 in time for the PCB battles. PCB was discovered in Waukegan Harbor in 1975, and Outboard Marine was ordered to stop dumping waste into the harbor a year later.

"Our position is that nothing should be done [in Waukegan Harbor] unless there is proof of a real or significant potential hazard," says Thomas. "To date we have not seen any proof of an imminent health hazard, nor have we seen evidence of a potential health hazard or a threat to the environment. So we don't even get to the question of what should be done."

In the suit filed against the federal government, says Thomas, Outboard Marine contends that "the law specifically provides and requires that they (the U.S. EPA) determine what, if anything, should be done. So far in the lawsuit, the agency and its experts have come up with a list of potential remedies, and to my knowledge the agency has not taken the position that any specific one from that list should or must be implemented." Thomas adds that Outboard Marine has "grave concerns about many of them, because they may not be environmentally sound."

Dredging, for example, could stir up PCB now buried several feet under the harbor's floor. Once refloated in the water, the toxic chemical could drift into Lake Michigan and cause worse problems than now exist.

Thomas believes that Outboard Marine is "an innocent bystander" in the case. From the early 1950s until 1971, the company bought hydraulic fluid called Pydraul from Monsanto, the only major PCB producer in the U.S. The fluid, used in Outboard Marine's die-casting machines, contained PCBs. Thomas contends Monsanto kept the contents of its hydraulic fluid a secret. "The responsibilities of Outboard Marine and Monsanto" under that arrangement, says Thomas, "can only be solved in court."

Monsanto says it stopped manufacturing some products containing PCBs by 1971 because of scientific warnings of widespread PCB contamination in the environment and ended all PCB production by 1977. It produced PCBs under the trade name Aroclor. The company said it sold the PCB hydraulic fluid to Outboard Marine for about 20 years, at amounts varying from 20,000 gallons to 90,000 gallons a year. Monsanto described Outboard Marine as one of its major customers. The PCB content of the hydraulic fluid ranged from 30 percent to 100 percent.

Federal documents estimate that Outboard Marine used 11.6 million pounds of PCB products between 1955 and 1972—or an average of

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Hugh Thomas of Outboard Marine.

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724,000 pounds a year. EPA calculates that as much as 1.7 million pounds of PCB leaked out of the plant over that time. As much as 44 pounds of the chemical still flow into Lake Michigan each year from the contaminated areas, and it could have reached as much as 59,535 pounds a year in the past.

Outboard Marine Corporation is the world's largest producer of outboard motors, and the largest producer of boat engines in the United States. Its sprawling, 100 acre Johnson Outboards plant on the north side of Waukegan Harbor also is the nation's largest die-casting facility.

"This is where the machines were during the period involved, roughly 20 years, from the early 1950s to mid-1975," says Thomas, while standing in a huge building measuring about 200 by 1,000 feet. Built in the 1940s, the building once housed 110 die-cast machines used to mold engine parts from molten aluminum. It stands in the far northwest corner of the industrial complex.

Here hydraulic fluid leaking from the machines spilled onto the floor and flowed to small trenches designed to capture such spills. A piping system under the floor carried the spilled hydraulic fluid to a series of open ditches on the northern edge of the company's property. The overflow from the pipe system gushed into the northern tip of Waukegan Harbor on the other side of the plant.

Today, the old die-casting building is used as a warehouse. After the discovery of the PCB problem, the structure was stripped of its machines, its drains were sealed, the floors were covered with six to eight inches of concrete, and the interior walls and roof were sandblasted to remove all traces of PCB.

Thomas leads the way to the northern edge of Outboard Marine property, where a series of three connected ditches curve around the corner of the plant and ripple toward Lake Michigan. This is where Outboard Marine flushed most of its PCB wastes.

The innocent looking streams are PCB

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graveyards, although that is not evident to the naked eye. EPA considers any body of water with a PCB concentration above 10 parts per million (ppm) "highly polluted." Yet here, PCB deposits in these small streams have measured as high as 250,000 ppm.

They were anonymous little rivulets until EPA investigators gave them names so Outboard Marine's environmental sins could be cataloged: Crescent Ditch with an estimated 404,000 pounds of PCB; Oval Lagoon with 85,000 pounds; North Ditch with 4,000 pounds. But the big surprise came when the EPA tried to dig a trench in an employee parking lot near the ditches and ran into PCB deposits estimated at 278,000 pounds. Thomas said the parking lot probably was used as a chemical dumping ground and barrel-cleaning area long ago.

The area just north of the plant contains an estimated 775,000 pounds of discarded PCBs. But that's not counting Waukegan Harbor, which was used for waste overflows. The northern tip of the harbor, known as Slip 3, once was a discharge point for Outboard Marine. It is a small boat shelter now, from which the company draws a million gallons of cooling water each day and flushes it into the lake. All waste discharges from the plant, except for cooling water, were shut off in 1976.

EPA believes another 275,000 pounds of PCB are in various parts of Waukegan Harbor, although most of it is believed to be in Slip 3.

Put it all together, and there are more than a million pounds of PCBs strewn over the Waukegan Harbor area. EPA calls it "the largest known reservoir of PCBs existing in the free environment." By some accounts, about 325,000 cubic yards—or more than 100,000 truckloads—of sediment must be dug up and hauled away.

Why not just let it stay there, so the forces of nature can bury it where it lays? EPA answers that by saying that approximately 20 to 40 pounds of the PCBs in Waukegan Harbor will flow into Lake Michigan every year. Another two pounds of PCB already flows into the lake each year from the plant by way of the open ditches, the agency says.

If there is an encouraging side to the PCB story, it is that the PCB content of Lake Michigan fish is dropping.

"The PCB concentrations in our samples over the last several years have fallen," says Rich Hess, Lake Michigan biologist for the Illinois Conservation Department. "Everyone else says the same thing. They are seeing a decline." However, the EPA warns that fish that remain in Waukegan Harbor for even a short time should not be eaten.

It is too soon for victory celebrations, though. "Chemists are talking about

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several hundred chemicals that have been identified in fish flesh in the Great Lakes," says Hess, who has been involved in a program aimed at restoring a naturally reproducing lake-trout population to Lake Michigan. For some reason, the fish keep dying.

"Lake trout eggs show a tendency to develop in water other than Lake Michigan water," explains Hess. "If you take them out of Lake Michigan water and place them in a hatchery, you get successful development at least until early-fry stage (just hatched). It leads one to believe there may be a problem with contamination in Lake Michigan water itself."

PCB's impact on wildlife has been clear ever since a Swedish scientist in 1966 identified the chemical in the tissue of a dead eagle. He found enormous amounts of the substance in nature, although it was long mistaken for its chemical look-alike, DDT, another chlorinated hydrocarbon. PCB, a man-made chemical, resists breaking down although it dissolves easily in fat and oil. But its most sinister trait is called biomagnification.

It works like this: When a microorganism in the lake, such as an algae, feeds on sediment tainted with PCB, the chemical is stored in the algae's body. When a tiny insect eats the algae, the PCB in the algae settles into the insect's body. This process continues through the food cycle. By the time a human eats a fish, all the PCB that was in the algae, the insect, and the fish settle into the human's body. In this way, PCB biologically magnifies 10 to 100 per cent at each step.

Less clear is the impact on human beings, although the EPA contends that tests show "substantial evidence of carcinogenicity" in PCB, meaning it is cancer-causing. The classic case of human PCB poisoning happened in 1968 in Japan, when rice oil used for cooking was accidentally contaminated with PCB in a factory. Some 15,000 victims were stricken with a disease that came to be known as "Yusho." Skin problems, including pimples covering the face and body, birth defects, nerve disorders, and intestinal illnesses were among the symptoms. Some deaths also were reported. Japan outlawed PCB in 1972.

Recently, Edison Electric Institute in Washington, D.C., has challenged assertions that PCBs are dangerous. The institute is a consortium of 65 electric utilities, many of whom are major PCB users. "You look at this health information, and you conclude there is no significant risk," says Corey Trench, the institute's environmental scientist. He referred to a study done by toxicology consultants for the institute, which said there is no connection between PCB exposure and cancer in people, and little evidence of PCB contamination in humans. The study contends that people working in the PCB manufacturing industry for years were exposed to high levels of PCB without suffering ill effects, except for temporary skin rashes. The risk of birth defects in humans because of PCB was called "quite low." The institute also downplayed the Yusho incident, saying two chemical impurities in the PCB caused the illnesses, not the PCB itself.

As often happens in such environmental clashes, experts disagree. Dr. Renate Kimbrough of the Center for Environmental Health at the Centers for Disease Control in Atlanta, said: "I don't have any doubts that it's hazardous to health," although she admits that such disorders as liver cancer and reproduction failure have been seen

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so far only in animal tests. Little information exists on what small exposures of PCB over long periods of time will do to people.

Scientists sometimes have a way of looking upon such problems in an abstract, theoretical way. Dr. Thomas Nedved, Lake County environmental health director, was worried enough to post warnings against fishing in Waukegan Harbor. But he believes more than that needs to be done.

"If we had gone in there and dredged the harbor four years ago, we'd be better off. Here we have one of the major pollution problems in the Midwest and nobody is doing anything about it. That is totally frustrating and unacceptable. It suggests to me that somebody is being irresponsible. People deserve better than that, especially when an unknown health hazard is involved."

The Waukegan water filtration plant also sits at the mouth of the harbor, and a water intake occasionally draws drinking water for the city from the harbor. "There is no evidence that the water supply is contaminated with PCB," Nedved said.

Another local environmental official, Roger Harrison, director of the Waukegan Environmental Control Department, believes Waukegan Harbor is a symbol of governmental failure.

"It's been a sad example of government at work," asserts Harrison. "Local government does not have the funds to clean it up. The problem I see is that the 'superfund' program isn't working the way it was proposed. It was supposed to show what government can do—go in and clean a place up and resolve a problem while the courts decide later who pays and who is at fault."

Instead, the Waukegan Harbor community is just as paralyzed by uncertainty and inaction today as it was before superfund legislation was enacted. Says Harrison: "It's frustrating." ■

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