The PBB Disaster at 50: Reflections, Critical Lessons, and a Path Forward collects documents, accounts, and images inspired by the 50th anniversary of the PBB Disaster in St. Louis, MI. The volume is edited by Brittany B. Fremion and Benjamin L. Peterson and contributors include Norman B. Keon, Margaret Hoyt, Terri Shafer/Pell/Fountain, Carol Norman, Thomas H. Corbett, Edward Lorenz, Adam Ellsworth, Kathleen Gregones, Jane-Ann Crowley, Jennifer Knowles, Joy Vosburg, Debra Shore, Sheryle Dixon, and the Michigan PBB Registry Team (Emory University).

THE PBB DISASTER AT 50: REFLECTIONS, CRITICAL LESSONS, AND A PATH FORWARD FREMION & PETERSON

THE PBB DISASTER AT 50

Reflections, Critical Lessons, and a Path Forward

Edited by Brittany B. Fremion
and Benjamin L. Peterson

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Oral histories, the PBB & Community Panel Transcription, and Administrator Debra Shore's essay are protected under copyright and included in this collection with permission.

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MIHumanities

Paintings and mixed media artwork by Kathleen Haffey, Starr Koon, Tina Vivian, and community members who participated in the spring 2023 "Artistic Expression of the Poisoning of Michigan" workshop, sponsored by the Pine River Arts Council.

Photographs by Bruce William Maki unless otherwise noted.
Cover and Book Design by Charlayne-Aye Olegario

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ACKNOWLEDGEMENTS & SPECIAL THANKS

The PBB Disaster at 50 Conference commemorated the 50th anniversary of Michigan's PBB disaster by bringing together scientists, artists, policy makers, and community members to explore the history and legacy of this large-scale contamination. The three-day conference sought to bring the critical lessons of the disaster back into public discussion and consciousness with the hope it would inspire continued action to address long-term environmental and human health outcomes. This collection continues that work by sharing the stories and reflections of community members who witnessed the PBB disaster unfold firsthand, as well as perspectives and insights from their partners.

The conference, and this collection, were made possible because of generous support from the Michigan Humanities Council, the Pine River Arts Council, Alma College, Emory University's Rollins School of Public Health and the Michigan PBB Registry, which is funded by the National Institute of Environmental Health Sciences (National Institutes of Health), and Central Michigan University.

While funding is critical to hosting a conference, so too are the contributions, ideas, and support from PBB community members who served as conference co-organizers, particularly Thomas H. Corbett, Tribal Elder Joseph Sowmick, Troy Techlin, Gary Smith, Jim Hall, Norman B. Keon, and Jane Jelenek, along with officers for The Pine River Superfund Citizen Task Force and the PBB Citizens Advisory Board. Gary, Norm, and Jim helped make the conference tour of St. Louis both possible and personal, as did Tom Alcamo and his team at the Velsicol Superfund Sites, Jamie Stoik, and Diane Russell (US EPA Region 5), Scott Pratt's CH2M Hill team, Andrea Peak's AECOM team, Ethan Nordstrom's US Army Corps of Engineers team, and Kurt Giles (St. Louis City Manager). The Michigan PBB Registry group at Emory, led by Michele Marcus and Melanie Pearson with support from Metrecia Terrell, Robert Hood (co-organizer), and Hillary Barton, shared their time and knowledge, participated in the conference, and enhanced the proceedings with a community meeting. Many amazing faculty, staff, and students at Alma College, including Ben Peterson (lead organizer), Sheryle Dixon (co-organizer), Alex Montoye (co-organizer), Ed Lorenz (co-organizer), Kayt MacMaster (co-organizer) and students in her spring 2023 site-specific dance class, along with Kathleen Gregones, Mallory Fenskie, Starr Koon, Charlayne-Aye Olegario, and Alex Kennedy contributed to the conference in a variety ways, from helping write grant proposals, securing a venue, and bringing in guest speakers to producing

a podcast, hosting a community art workshop, and coordinating a dance performance. Public History students at Central Michigan University, Audrey Fendt, Fern Borus, Evan McBride, Toni Davis, Liz Uzarski, Matt Black, and Maddie Weber, helped research and write PBB Hero Profiles, as well as design the conference program and develop a prototype of the conference website. Mark Boardman and his team filmed the proceedings and produced a highlight reel, further documenting these efforts.

There would also be no conference without guest speakers and panel participants, many of whom traveled from across and beyond Michigan, while others shared heartfelt recorded messages. Elena Conis, a historian at UC-Berkeley, delivered a keynote address with three important lessons and a call to action that helped inspire this collection. Administrator Debra Shore (US EPA Region 5) toured the Velsicol Superfund Sites and delivered moving opening remarks, which resulted in written reflections originally shared in an agency newsletter and included within this volume. US Senator Gary Peters (Michigan), President Jeff Abernathy (Alma College), and Liam O'Fallon (NIEHS Program Officer), thank you for your special remarks, too. Panels on community experiences, public policy, environmental justice, philosophy, art, and ethics, as well as a conversation about the long impact of PBB and importance of preserving community stories grounded the conference in the present and fostered discussions about the future. Many, many thanks to our panelists and moderators, especially Edie Clark, Kory Groestch, Liz Braddock, Jane-Ann Crowley, Francis "Bus" Spaniola, Nicholas Dixon, Tina Vivian, Kathy Haffey, Eric Nordman, and Marian Matyn. You helped give the proceedings shape and meaning.

April 19, 2024, marks the 50th anniversary of the day a chemist-turned-farmer, Ric Halbert, with the help of the Wisconsin Alumni Research Foundation and US Department of Agriculture scientist George Fries, provided the state of Michigan with irrefutable evidence of the PBB disaster. In many ways, the burden of proof still falls upon communities and their partners. This collection and the Heroes listed within are both a reminder of that and a reflection of community power. The PBB community, estimated to include anywhere from 8 to 40 million people, is strong and also has a legacy. Your stories are not lost. Your efforts and your lives matter. We dedicate this collection to you.

Brittany B. Fremion (co-organizer)
Mt. Pleasant, MI
February 19, 2024

LIST
HERO

OF
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PBB Heroes are individuals, community partners, and citizen groups who have dedicated their time and energy to advancing knowledge and raising awareness about Michigan's PBB Disaster.

LIST OF HEROES

Donald Albosta
Dick Allen
The Bernstein Panel
Jim Buchanan
Ed Chen
Alpha Clark
Edith "Edie" Clark
Thomas Corbett
Bobby Crim
Peter Crum & Gerry Woltjer
Adam Ellsworth
Joyce Egginton
Farm Families
Shannon Finnegan
Brittany Fremion
Alvin & Hilda Green
Paul Greer
Frederic "Ric" Halbert
Sandra Halbert
James Hall
Margaret Hoyt
Harold E. Humphrey
Ted Jackson
Jane (Keon) Jelenek
Norman B. Keon
Pat (Miller) Kidder
George Kubin
Ed Lorenz
Michele Marcus
Walter Meester
Michigan PBB Oral History Project Participants
The Michigan PBB Registry Team
Patrick "Pat" Muldoon
Christine "Chris" Muldoon
Thomas Ostrander
Melanie Pearson
NIEHS, NIH
PBB Action Committee (1970s)
PBB Citizen Advisory Board
Pine River Superfund Citizen Task Force (CAG)
Larry Robertson
David Salvati
JoAnne Scalf
Irving Selikoff
Gary Schenk
Ray Shunk
Gary Smith
Francis "Bus" Spaniola
Chad W. Strickfaden
Valerie Suszko
Roy & Marilyn Tacoma
Metrecia Terrell
Louis Trombley
Douglas & Mary Jo Warner

CONFER
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The conference held on May 18-20, 2023, commemorated the 50th anniversary of Michigan's PBB disaster by bringing together scientists, artists, policy makers, and community members to explore the history and legacy of this large-scale contamination.

THURSDAY, MAY 18TH

7:00 PM: Welcome Reception & Keynote
Art Smith Arena in the Hogan Center at Alma College

- Upon arrival, please check-in at the registration table in the lobby outside the Art Smith Arena.
- Welcome Reception and Art Exhibit Opening
- Welcome to Alma College by **Rev. Dr. Andrew Pomerville**, Alma College Chaplain
- Introduction to Exhibits and Welcome from the Conference Organizing Committee
- Opening remarks by **U.S. Senator Gary Peters**, **Debra Shore**, U.S. EPA Region 5 Administrator, and **Norm Keon**, PBB Community Member and Epidemiologist for the Mid-Michigan District Health Department
- Keynote address by **Dr. Elena Conis**, historian of medicine, public health, and the environment. She is the author of *How to Sell a Poison: The Rise, Fall, and Toxic Return of DDT*; *Vaccine Nation: America's Changing Relationship with Immunization*; and, with Aimee Medeiros and Sandra Eder, *Pink and Blue: Gender, Culture, and the Health of Children*.
- Dance performance by **Alma College Site-specific Dance Class**, led by Professor Catherine MacMaster

FRIDAY, MAY 19TH

Welcome and Opening Remarks by Alma College President Jeff Abernathy

9:00 - 10:30 AM: PBB & Public Policy

- Benjamin Peterson (moderator), Alma College
- Edie Clark, Former Legislative Aide
- Kory Groetsch, Michigan Department of Human and Health Services
- Liz Braddock, Mid-Michigan District Health Department
- Diane Russell, U.S. EPA
- Tom Alcamo, U.S. EPA

10:45 AM - 12:30 PM: PBB & the Community

- Brittany Fremion (moderator), Central Michigan University
- Jim Hall, Pine River Superfun Citizen Task Force
- Tom Corbett, PBB Citizens Advisory Board
- Jane-Ann Crowley, PBB Citizens Advisory Board
- Joseph Sowmick, Saginaw Chippewa Indian Tribe
- Troy Techlin, Saginaw Chippewa Indian Tribe

12:30 - 1:30 PM: PBB & Environmental Justice

- Lunch Provided by Metz Culinary Management and the Pine River Superfund Citizen Task Force

1:30 - 5:30 PM: Field Trip

- Registration required (QR code for spot reservation)
- Hiking gear recommended (e.g., close-toed shoes, comfortable clothing, long pants, and SPF).
- Charter buses depart from the Hogan Center at 1:30 PM and return by 5:30 PM.
- The field trip includes a guided driving tour of St. Louis and greater Gratiot County, as well as an on-site, walking tour of the Velsicol Chemical Superfund Site.

OR 1:30 - 4:30 PM: Participate in a Mini-Oral History Interview

- *Sign up* to participate in an oral history interview with an Alma College student.
- *Grant consent* to participate in an interview. This process provides information about the oral history project, the interview and preservation processes, and potential future use(s) of your oral history.
- *The interview* will be audio-recorded and drive by a series of open-ended questions asked by a trained student researcher about your memories of the PBB disaster and experience at the conference. Interviews should take approximately 10 to 15 minutes.
- *Photographs* may be taken before, after, or during the interview.

Dinner Break

7:00 PM: Film Screening & Panel Discussion

- Introduction by Alma College **President Jeff Abernathy**
- Screening of "The Poisoning of Michigan" (documentary) Thames TV, 1977
- Followed by a panel discussion with:
  - ***Ed Lorenz*** (moderator), PhD, Reid-Knox Professor Emeritus of History and Political Science at Alma College, Pine River Superfund Citizen Task Force Vice Chair, conference cultural advisor, and PBB community partner.
  - ***Francis "Bus" Spaniola*** served in the Michigan House of Representatives from 1975 to 1990 and played a critical role in the enactment of legislation that reduced PBB levels, provided funding for the long-term health study, and provided loans to farmers.
  - ***Tom Corbett***, MD and MPH, has written about the PBB disaster in Cancer and Chemicals (1977) and a fortcoming book. He is also a member of the PBB Citizen Advisory Board and the Pine River Superfund Citizen Task Force.
  - ***Michele Marcus***, PhD and MPH, is an environmental epidemiologist and lead scientist for the Michigan PBB Registry maintained by the Rollins School of Public Health at Emory University.

SATURDAY, MAY 20TH

9:00 - 10:15 AM: Philosophy, Art, History, and the Environment

- Sheryle Dixon (moderator), Alma College
- Catherine MacMaster, Alma College
- Nicholas Dixon, Alma College
- Ed Lorenz, Alma College
- Tina Vivian, Artist
- Kathy Haffey, Artist

10:15 - 11:15 AM: Environmental Justice, Law, and the Long Impact of PBB

- Robert Hood (moderator), Emory University
- Michele Marcus, Emory University
- Tom Corbett, PBB Citizens Advisory Board
- Eric Nordman, Grand Valley State University

11:30 AM - 12:30 PM: Public History & the PBB Disaster

- Brittany Fremion (moderator), Central Michigan University
- Marian Matyn, Clarke Historical Library, CMU
- Benjamin Peterson, Alma College
- Alma College Public History Students

12:30 PM: PBB Heroes Luncheon

- 50 Seconds of Silence for 50 Years
- Pine River Superfund Citizen Task Force Hall of Fame Inductee: George Kubin
- PBB Heroes Recognition
- Lunch provided by Metz Culinary Management and the Pine River Superfund Citizen Task Force

1:30 - 3:00 PM: Michigan PBB Registry Community Meeting and Youth Caucus

- The Michigan PBB Registry Team will provide updated research results and community members will have the opportunity to share ideas for future research priorities.
- Youth Caucus: Discussion with second and third-generation community members, which includes interested middle and high schoolers, as well as college-aged people.

3:00 PM: Closing Remarks

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Dr. Benjamin Peterson
Co-Director of the Center for College and Community Engagement
Lecturer of History and Political Science, Alma College

Dr. Benjamin Peterson has worked as a lobbyist, union organizer, photographer, academic journal coordinator, elections official, public historian, and professor. Currently he works at Alma College helping to direct community-engaged learning and engagement, and civil discourse programs. He has been the recipient of two Michigan Humanities Council grants, a Network for Vocation in Undergraduate Education grant, and most recently an EPA Environmental Justice grant.


DO NOT EAT THE FISH

Dr. Benjamin Peterson

When I moved to Alma, Michigan, from the west coast, I knew nothing of the PBB disaster or the tragedy inflicted upon the neighboring community of St. Louis. The story, sadly, has rarely been told to those who were not directly impacted by it. Lack of awareness of the tragedy has silenced one of the most compelling stories of environmental damage, and the activism required to uncover and recover from it, in our nation's history.

I had the honor of coordinating a committee that organized and hosted the PBB Disaster at 50 conference. During the conference we sought to create a space where people could tell this story, learn about the current science around PBB, and experience art inspired by the tragedy. The conference was a tremendous success with around 200 people in attendance. Much to our surprise, the conference grew so much that we had to change venues, as the only space at Alma College that could accommodate it was the Art Smith Arena at the Hogan Center. It attracted media attention across the state and vividly demonstrated that people were interested in and willing to learn about this story.

For me, the conference was a transformational experience. After countless hours of minute planning, I finally found time to really listen to people's stories and reflect on the disaster's legacy. Every story hit hard. More than once tears ran down my face as people recounted the lasting harm that the failures of the Michigan Chemical Corporation (owned by Velsicol Chemical Corporation) to exercise even minimal care caused. Other times, I felt exhilarated by the stories of successful activism and hard perseverance in the face of tragedy. Hearing the story of the PBB disaster changes you. It is impossible to live with the same certainty about the safety of the food you eat and drink or the air you breathe after you have truly engaged with it. Facing its enduring legacy and impact on the land and on people's lives resets the stakes of environmental justice to a human-level. The story turns environmental protection into a critical, moral imperative.

After the conference, we sought ways to capture that experience in various enduring formats. What you hold in your hands is one attempt to do that by giving the conference participants the opportunity to share their experiences and wisdom through text. The collected essays, reflections, and works of art each connect with a different part of this experience. Some participants wanted to share more of their stories, which is why we included oral history transcriptions. A conference community panel evoked particularly strong emotions, which is why we included it. Together these narratives weave a story that can neither be forgotten nor ignored. Let us all learn the hard-won lessons here, sit in solemn reflection upon the damage caused and envision a path forward, and celebrate those brave people who uncovered the disaster and still seek to heal its wounds.

OPENING REMARKS
PBB DISASTER AT 50 CONFERENCE
MAY 18, 2023

Norman B. Keon
Epidemiologist for the Mid-Michigan District Health Department
Member of Emory University's PBB Leadership Team and
PBB Citizens Advisory Board
Long-Serving Officer of the Pine River Superfund Citizen Task Force


PINE RIVER / RIO PINE
DO NOT EAT ANY FISH - NO COMA PESCADO
CAUTION
PRECAUCION
Alma Dam to the Chippewa River due to Chemical Contamination
Desde el Alma Dam hacia el Rio Chippewa por razón de contaminación química
Why? Although our river looks clean and the fish look healthy, chemicals found in the river bottom mud continue to pollute the fish. Among these chemicals are DDT and PBB. If you eat these contaminated fish, the chemicals may enter and build up in your body to possibly unhealthy levels. Clean-up efforts now underway will one day make the fish caught from this section of Pine River safe to eat.
Catch and Release is Safe. Handling the fish is safe. Catch and release is a good way to enjoy fishing on this section of the river. Some fish you may expect to catch are smallmouth and largemouth bass, catfish, carp, white bass, perch, crappie, northern pike, rock bass, suckers, and bullheads.
¿Por qué? Aunque nuestro río parece limpio y los peces parecen sanos, la contaminación de los peces continúa debido a los químicos esparcidos en el lodo en el fondo del río. Algunos de los químicos encontrados son el DDT y el PBB. Si comes estos peces contaminados los químicos pueden entrar en su cuerpo y acumularse - posiblemente a niveles dañinos. La limpieza del río que están haciendo ahora hará que en el futuro los peces cogidos en este sector del Río Pine sean seguros para comer.
Pescar y Lanzar Es Bien. Es seguro el manejar los peces. El pescar y lanzar es una buena manera de disfrutar la pesca en esta sección del río. Algunos de los peces que se pueden encontrar son: Bajo Pequeno de la Boca, Bajo Grande de la Boca, Siluro de Canal, Carpa, Bajo Blanco, Perca Amarillo, Tipo de Pez Negro, Lucio Norteno, Bajo de la Roca, Siluro Negro.
For Complete Fish Consumption Information:
Michigan Department of Community Health
1-800-MI-TOXIC (648-8942)
http://www.michigan.gov/mdch-toxics

Norman B. Keon

I grew up here in St. Louis. And still live just north of town on the Pine River. I still work, after 54 years, in Public Health.

My maternal grandfather helped start the Chemical Plant around 1935. He ran the power plant (steam). Do you ever wish you could bring back a relative and ask them just a few more questions? Yeah. I remember sitting on my dad's desk in the accounting office and playing with his manual adding machine at the Michigan Chemical Corporation. He didn't work in the production areas. You could say that the plant was part of my family for generations.

Until the age of five I lived three blocks east of the plant. Then we moved downstream, a block from the dam. I grew up playing along the Pine River. Hours and hours, days and days, my dog Peggy and I explored along it. My father said, "Don't go in the water, Normie."

Through junior high and high school I played with my friend Joe who lived a block south of the main entrance. We used to sneak into the back property of the plant to hunt frogs and get some sulfur to experiment with. You know, you can create some interesting stuff with it! His father used to repaint their house every few years because he said the chemical plant fumes would ruin it quickly.

My friend Tom's dad was a machinist at the plant. He went everywhere in the plant to fix anything mechanical, meanwhile being exposed to everything. I began riding a motorcycle then and he enjoyed discussing engines and machinery with me. After retiring, he and his wife lived in town for a number of years and then moved to Florida where Tom was living. Mr. Brady died of a rare stomach cancer…and Tom is in a nursing home with advanced Parkinson's disease right now as I speak.

I'm an epidemiologist. I understand that we need cause and effect in investigations. Because there is always that lingering "Association isn't Causation" mantra, isn't there? I wonder about that with Tom and his dad. And many other stories of sickness that may be related to the plant–either from employment or geography.

Time went by and I worked my first whole career at the Michigan Department of Public Health in Lansing starting in 1971. I ran the State Tuberculosis program for 27 years, designed and supported the first microcomputer-based communicable disease reporting system in our state, worked on large outbreaks,

routinely visited all of the Local Health Departments (LHDs) in our state, taught epi analysis to other employees and LHD personnel. And, yes, I knew some of what was going on at the state level with their response to the PBB catastrophe. You have read the names of Doctors Isbister, Hayner, Humprey. I knew them all well. I did get pulled into their efforts in a small way, but I had other work to do.

We moved back to St. Louis in 1975 and ate carefully. We had our own goats for milk and chickens and rabbits. But we still got PBB in our bodies. I have a low blood level. We saw the plant demolished and the clay cap put on. The clay came from a farm a half-mile from where we lived. It created a nice, small lake for the owner of the clay. But it didn't end up helping protect the plant site very well…

Upon retirement, the LHDs wanted me as their epidemiologist. I knew that the state had stopped following the cohort of farm families and employees but I didn't know that Emory University researchers had picked up the ball and were continuing broader research. Then, ten years ago, I heard through my friends at District Health Department 10 (one that I work for) that they had been in Big Rapids meeting with our citizens. I saw a way for Public Health to keep advocating for research and the follow up of our exposed citizens.

I immediately wrote (yes, a real letter!) to Michele Marcus at Emory (who is with us at this conference) and we began working together. I aroused interest at my Mid-Michigan District Health Department and my health officers and nurses have rallied to support Emory's work. I have been on Emory's Citizens Advisory Board for many years. And our local Pine River Superfund Citizens Task Force continues to support Emory's work.

I believe strongly in Public Health and the impact that it does have and can have on our communities. I love the history of Public Health and the knowledge that history helps us to understand and shape our future. Again, through a nurse at District 10, I met and became friends with Dr. Alpha Clark, a veterinarian who investigated what was happening to the herds he cared for even before anyone knew what was happening. I wanted his legacy to live on. A presentation I gave to the historians at the Clarke Historical Library at Central Michigan University ignited their interest in preserving his important research records and papers on PBB. Interestingly, and sadly, he passed away one year ago today. Still working at that time as a vet for over sixty years. The family mentioned me in his obituary. What an honor!

My desire to preserve PBB history led me to Professor Brittany Fremion at Central Michigan University. You will hear from her at this conference. She is leading their oral history project to save the memories and emotions that our

citizens have of the PBB Disaster. I have seen her student assistants choke up when recalling interviews that they had. If I could leave a legacy it would be that I helped preserve, detail, and bring awareness to one of the most tragic events in United States history.

So, here we are, 50 years out! Saying that just seems strange, other worldly…like a science fiction story. As we all know there are many other similar stories across America that have happened during all of these years. But, uniquely, we and the farm families mainly ate our way into being exposed, while the plant workers contended with immediate exposure, even in the room where they ate lunch some kind of 'dust' was all over the place.

Do you ever wonder once in a while how you got where you are right now in life? I do. All the twists and turns that happened. And sometimes we may not know how it all happened. But, today, We Know Exactly Why We Are Here, Right At This Moment!

Thank you.

REFLECTIONS FROM A MICHIGAN CHEMICAL EMPLOYEE

Margaret Hoyt
Former Michigan Chemical Company Employee
Pine River Superfund Citizen Force (PRSCTF) Member

Margaret Hoyt grew up in a suburb north of Detroit, married in the spring of 1970, and settled in St. Louis where she and her husband continued their partnership in the family farm. They were blessed with three sons, two of whom tragically passed away at ages 15 and 26 following complications of a birth defect. With no family history, she questions if her chemical exposures from Michigan Chemical were responsible for changes in her DNA. Fortunately, a third son did not have the birth defect, and today, Margaret and her husband have three grandsons. She became involved with the PRSCTF once she became aware of her PBB levels.

Margaret Hoyt

In 1970, I hired in at the now infamous Michigan Chemical Corporation/Velsicol plant in St. Louis as secretary to the plant manager. A newlywed at the time and new to this area, my first impression of the company wasn't a pleasant one, but rather one of pollution. Crossing the narrow one-lane bridge on Mill Street, looking to the west, one couldn't help but notice the frothy discharge flowing in the river. Even though young and naïve at the time, it didn't sit well with me. Weren't there laws prohibiting companies from using rivers as personal sewers? Shortly after I began work there, a co-worker casually commented about the deformed fish that swam in the Pine River. She also told me of screen doors at neighboring properties being eaten away and of the dust in the air that settled on our parked vehicles, causing further pollution of the air we breathed. Today, as one crosses the M-46 bridge going west out of town, we see the swollen piles of excavated soil, containing contaminants left behind and buried deep in the ground. It's an excavation that requires hazmat suits to protect the workers cleaning up the former plant site. We, as taxpayers, get a share in the cost of clean-up, not only at the plant site, but other dump sites MCC/Velsicol used in the county as well. It's a crime against nature and the once pristine waters and fertile land of our forefathers.

Firemaster was all the buzz when I worked there, and I typed countless papers on it. My in-box tray had a steady supply of long handwritten manuscripts, the lion's share coming from men who worked in the back offices. By the next summer (1971), I was asked by my boss to fill test tubes with a powder – one that was 'safe' and 'wouldn't hurt me.' By then, another girl was added to help with the heavy typing load. My one time only work requirement was short lived and able to be completed in a weeks' time. Contrary to what I was told though, an accidental spill ruined the new dress I was wearing. It was then that I questioned 'safety' and 'wouldn't hurt me.' I was very careful finishing the few remaining test tubes, suspicious by then about just what this stuff was. I believe those test kits containing multiple vials were in fact PBB, something I have thought about many times over the years. Why wasn't I told Dow Chemical thought it might be too damaging to human health to produce? They surely were aware of health concerns by a competing chemical company. Today, we have Emory University to outline the dangers of PBB: how it could potentially change one's DNA, affect a person's thyroid, cause fertility issues, cancer and other health issues.

Many who had a front row seat to the chemical catastrophe of 1973 are no longer here to give a first-hand account of the happenings of the time, but after the cattle

nutrient (Nutrimaster)/PBB (Firemaster) mix-up, the story dominated the news. It remained that way for years following the tragic event, as politicians and others in authority argued about health concerns. The state government leaders wanted it to all go away, as well as the responsible parties of Michigan Chemical and Farm Bureau. The last thing they wanted was to be slapped with another lawsuit, and no one knew how to fix this crisis or back track on the perceived harm that had been done. Safety levels were always downplayed to prevent hysteria among the masses. To reassure the public, it was reported that exposure levels were low enough to silence alarm, but there were dissenters as well who argued otherwise. Fire retardants were not meant for cattle feed any more than ingesting meat or dairy products were safe for human consumption. Much of what you heard or read was tainted news back then. In truth, there were no safe levels of polybrominated biphenyls.

It was why I wanted to be included in the first round of testing when it was offered to Mid-Michigan in 2013. Were it not for Emory's team and their willingness to test our blood, no one would be the wiser. None of us would know our PBB levels or the risk factor associated with the results much less where to go to find them. Even all these years later, it's something important to share with your physician. While it's true that not all ill health can be attributed to PBB, especially as we age, there are to me at least, those diagnoses too suspicious to be dismissed. Some families have paid a high price for being exposed to a highly toxic compound.

In closing, we certainly need to thank our local group of highly dedicated volunteers, some who have been there from the beginning. The Pine River Superfund Citizen Task Force was formed in 1998 to represent the city of St. Louis in getting the best possible contamination clean-up. They spent countless hours over the years and kept the project moving forward. They've accomplished much, working with politicians, the EPA, and getting grants to see the project to completion. Michigan Chemical/Velsicol will always be a stain on the city of St. Louis, but thanks to their efforts we can look forward to a new tomorrow.

A big thank you too, for Alma College hosting the 50th commemoration of this event, and for helping educate those who know so little of its history.

Margaret Hoyt
St. Louis, Michigan
Fall 2023

REFLECTIONS FROM A FAMILY FARM MEMBER

Terri Shafer/Pell/Fountain

Terri Shafer/Pell/Fountain

It cannot be 50 years. Wasn't it just 1975 yesterday? I was 15. I was in the prime of adolescent angst. I was rebelling against everything and everyone. Now, in retrospect, I see that I was trying out my pre-adult wings and falling down a lot. In the midst of this I fell in love with a cute farm boy. He had a car and snuck off the farm and took me for rides. He was six months younger than me. He said he loved me first. We went snowmobiling after we milked the cows. Riding in the snow at 9:30 at night, it was pitch black and so romantic to a 15 year old.

The farm was owned by his dad. He was the middle boy. All his sisters were older, all but one, married and gone. Both his older brother and younger brother were at home. They had a prize Jersey herd. Many of the cows he had raised as 4-H calves. They milked in a stanchion barn. When you walked into the barn in the winter, the warmth of the cows heated the barn. Their breath was warm when you fed them the grain. But the smell was what always got me. It smelled like him, musty and warm. There was a milker he hooked to the cow, before he took a cigarette break. Then he lifted the milker into the can with the filter and it went into the bulk tank. He gave me a milk filter once. I still have it. He taught me about cows, milking, and how the milk check came on the first and the 15th. I was surprised that he knew how to estimate the pounds of milk by just lifting the milkers. He could tell how much that cow was making the farm that day by taking her records from last month, and how much she gave and her butterfat level, and how much MMPA [Michigan Milk Producers Association] was paying. This from a boy who copied my homework just to pass with a "C" in English class. He always amazed me.

In an unexpected move, my mom got remarried and I had to move to California. I was devastated. He stated we could get married as soon as I was 18. In only two and a half years. Wow, that sounded like forever. He called from the barn phone every Saturday night at 6 PM. As soon as I left Michigan the news got worse–something about a strange chemical called PBB. Somehow it got mixed with the cow grain. I heard it all the way in California, on TV. He sounded worse with every call. By spring I was ready to come home. In June I did. But the cows looked different. They were bone thin. Their eyes were sad. Their hoofs looked like elf shoes. But most of all, their milk production was way down. He was so very sad. That made me sad. His bright blue eyes were haunted. The seven weeks I visited went very fast. I had to go back to California. I wrote one of my school papers that year about PBB. That year he had to kill his herd, his cows, his 4-H calves, with his hunting rifle. By himself. That vision never left him.

His dad was the last one to sign the agreement with Farm Bureau for $80,000. Cows were $2,500 on average at that time. The interest rate at the bank was 21%. His dad thought that the farm needed a whole makeover. He built a pole barn with a milking parlor. There was a 4-inch low-line Surge Milking System put in. Two Harvestore 80 foot silos were bought at auctions. And two used tractors with air conditioning were also purchased. Top of the line. Brand new technology. They bought over 150 cows and started back up milking. It had been months with no income. And I moved back to Michigan. I was lost in my teenage drive to move on to the next part of MY life, getting married. The next year, we did. And we had our first baby in that same year. My life was perfect. We bought 10 cows of our own and got a portion of the milk check twice a month. The next three years went fast. Then, all the talk was about losing the farm. The cows were not supporting the debt and the bank was foreclosing. Other farms in town were also foreclosed on. We got divorced. My heart broke. The auction was held. He got remarried and moved out of state.

His dad died of brain cancer. His brother had bladder cancer. His sister had MS [Multiple Sclerosis]. The girls and I just survived. I went to college, they went to school. I truly don't remember a lot of those years. My depression was so thick. I started working. Just surviving. Authority figures were my target. He moved back. We were still friends. We talked. The farm failure was the catalyst for the divorce. The girls resumed their visitation. Then 1981 arrived. My brother, at age 29, died. My best friend died two weeks later. My best stepfather died six months after that. He came to my brother's funeral and said it should have been him, not Scott in the casket. I cried and said, "no, I couldn't bear it" if he died too. Then, in 1994, both high and drunk, he tried to outrun the cops going 80 miles per hour on a motorcycle. I was woken by a phone call from his sister. I screamed! The only solace is that he died instantly and all his suffering was gone. Now ours began. My girls were 15 and 9 (she turned 10 that week). The next eight years were filled with family court, yelling, screaming, lost jobs, changing jobs, the girls turning to others for the love I couldn't give. And I got older.

With age came what I thought of as old age pains. I had total knee surgery, thyroid issues (loss of hair, weight gain, and tiredness), depression, a fatty liver, rheumatoid arthritis, and blood clots. And no specialty doctor could find a definitive reason for my symptoms. My medicine is from four different doctors. None of which has ever heard of PBB.

Then one day, I saw an article about the folks in St. Louis who formed a group called The Pine River Superfund Citizen Task Force. I talked to my new husband and we went to their meeting. I listened to these people who had similar symptoms and experienced the same dismissiveness from doctors that I suffered.

There were people from Emory University in Atlanta there. They were suggesting retesting the farm families that were originally tested in the 1970s. I was finally with the people who understood my problems. I went to the Emory University community meeting. Dr. Marcus said the problems I had could be related to PBB. But how? I was in California when the farm was quarantined and the cows killed. When there was time for questions, I stood up and said, "but I wasn't on the farm, only married onto it. Why do I have the symptoms? Why do I not qualify for testing?" And, true to her words, the focus of the research was changed to be community driven. The Emory team followed the trail that their subjects led them to. The research has been amazing. Epigenetics? We did not learn that in nursing school. After being tested, I found out my blood level is 3.0 ppm, which is considered high. My oldest daughter also has measurable levels of PBB in her body.

The 50th anniversary conference was all-encompassing of the people affected and the entities involved. The tour of St. Louis and the Velsicol Superfund Site was informative. The way Alma College had both dancers and the people who made the posters to interpret the disaster was amazing. In total, the conference was what I needed to wrap the PBB disaster around my experiences with this forever chemical. It also put into the permanent record the timeline and captured the present state of affairs of the research that is ongoing and that will be important in other chemical disasters that will be exposed in the future.

I would like the following things continued:

1. The death records of the previously tested people released. This will tie together symptoms more concisely.
2. The release of all past records to the researchers, to be able to see if theorized treatments do eliminate PBB and other chemicals.
3. Testing of all those people that through education and doctor diagnosis want testing.
4. Mandated education of ALL doctors in the state of Michigan on the PBB disaster and the symptoms and disease processes of this forever chemical.
5. Keep the PBB disaster in the minds of the people of Michigan by having high school and college biology classes do PBB education yearly.

I am proud to be a part of the farm families and a part of the CAG [Task Force] and a part of Emory University's Research Data Collection team for the Michigan PBB Registry. Thank you to all those who put on or participated in the three-day conference of the 50 year anniversary of the PBB disaster.


DO NOT ENTER
NO
SWIMMING

RNING
DO NOT EAT THE FISH

The Michigan PBB Oral History Project

Oral History of CAROL NORMAN

Interviewed by Brittany Fremion on January 23, 2020

Transcribed & Edited by
Djemila Fields, CMU Graduate Student (2020)
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Prepared for this collection by Carol Norman and Brittany Fremion.

To be preserved in the Museum of Cultural and Natural History (MCNH) at Central Michigan University, Mount Pleasant, Michigan 48859*

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MICHIGAN PBB ORAL HISTORY PROJECT INTERVIEW TRANSCRIPTION (EXCERPT): CAROL NORMAN

Carol Norman grew up on a family farm in Remus, Michigan, and comes from a family of firsts. She is a direct descendent of the first African American farmers who settled in Mid-Michigan, celebrated today as the Old Settlers (www.oldsettlersreunion.com). Carol's ancestor, Emma Norman Todd, was one of the first African American women to graduate from Central Michigan University (along with Fannie Baty). As a young adult, Carol was among the first women to work in the US oil industry and the first to service wells for a sister company of Dow Chemical, Dowell, in the mid-1970s. In her interview for the Michigan PBB Oral History Project, Carol noted that her grandmother, Irene Todd Norman, "always talked about" her PBB exposure. Carol attended a Michigan PBB Registry community meeting in 2019 with her cousin after hearing Michigan Public Radio's coverage on the PBB disaster. Thereafter, she made important connections between the large-scale contamination, her family's health, and her work for Dowell: Carol helped prepare the state's first burial pit for condemned farm animals and contaminated feed and foodstuffs on public lands in southeastern Kalkaska County.

As you read excerpts from Carol's oral history interview, please remember that the transcript represents the spoken word and a conversation between a trained interviewer, CMU Professor Brittany Fremion, and Carol, the narrator. People do not speak in complete sentences, nor can a transcript fully capture or convey the full range of emotions, cadence of speech, or nonverbal aspects of communication. Repositories–museum collections and archives–therefore often preserve both transcriptions and audio files, and researchers are encouraged to engage with both to try to best understand the nuances of speech, the relationship between interviewer and narrator, and consider the dynamic ways in which memories work.

We have done our best to convey Carol's story in the excerpts included here.

In the first excerpt, Carol reflects upon her family's concerns about PBB exposure. She also explains her work for Dowell to help prepare the state's burial pit for condemned farm animals, feed, and food. The site, which Carol identifies as being in Grayling, is located in the Higgins Lake State Forest and is part of the Camp Grayling Military Reservation in southeastern Kalkaska County.

Carol Norman

Brittany Fremion: I wanted to ask you about your family farm too, because I think it's really fascinating that you have a connection to a farm, given that we'll be talking about PBB. Because I can't help but think that that might have influenced your perception.

Carol Norman: My grandmother—everybody will say this, all the grandkids—the first thing out of her mouth when it first came out was she believed she [was exposed to PBB]. I don't know why she thought that, but she believed she had it [in her body].

BF: Really?

CN: She told everybody she had it, my grandmother did. I don't know why, but she was a little petite lady, my grandma. Her name was Irene Todd Norman. Anyway, she always talked about, you know, having that disease. When I was working on this, I always called it the 'PCB.' …

BF: Yeah. So, PCB is a similar—it's in the same chemical family.

CN: Right.

BF: When the PBB mix-up happened, it was a new, you know, compound in terms of like, we had very little knowledge—the state did, federal and state agencies had little knowledge about what the potential long-term impacts could be. But there was some existing research on PCBs…

CN: I told [my cousin] to give me something on [the PBB disaster] because I don't have anything on it. But back in 1976 or 1977, I went to work for Dowell, which was a sister company to Dow Chemical and it also is into mining. This friend I worked with … his brother worked in mining in Pennsylvania and so he had his brother up here at Dowell to help him out. [They] put me on the committee with him and what we did is we ended up—I had an empty truck we loaded. We put gel [Polymer Bentonite Soil Sealant (Dowell M-179)] in it. Well, this gel they used in the oil field.

BF: Okay.

CN: We spread it on the ground, and it gelled up so nothing could get through it. So, what they did is they had railroad cars coming into Grayling. My job was to go to the railroad tracks, load up [the gel] from the cars—because they were all in the line there—and to load up, then go to this location. I'm thinking where the location is; it's before you go into Grayling, they have Military Road, somewhere in there. …After I loaded up, I went out to this location down this two-track road, out in no-man's land—I mean trees, and trees, and more trees. There were signs on both sides that said, 'unlawful to enter,' all the way back to where we were going. It was a little ways back, I can't remember how far, but it was far enough for me to be driving back there. And when I got back there, it was like a lake without water. This was nothing but a great big hole … What they had to do is blow this gel all over that area, sides, bottom, whatever. It was in [19]77, '78, somewhere in there when they did this. …When I went back the next time, I was looking for cows, not pigs, chickens, goats, you name it— all of God's animals were in that hole. I mean, it just brought tears to your eyes and I just couldn't believe it. …

BF: In state land, right?

CN: Right. In state land is where they buried the animals. But like I said, they had signs saying 'unlawful to enter' all the way back. …This is the gel on the [burial site], you know, where it was empty. … [points to sketch] They put the gel down, and then this, the 'x' is the animals, and then they put the gel on top of the animals and then they put the dirt on top of it. Then they spread more gel on top of that.

In the next excerpt, Carol reflects upon her work on a farm near Falmouth, Michigan, during the PBB disaster. She was hired to help service a new rig on the farmer's property and had a conversation with the farmer, who lost his herd to PBB.

CN: I had to go up there to [Falmouth to] do a cement job for Dowell. When I got there, I talked to the farmer. But before he talked to me, a helicopter came in and landed on location. It was Hunt Energy, a big oil company. These four men got out of that helicopter in suits looking nice. They threw on these coveralls. If you have ever been on a rig or seen a rig, they have, like, so many feet off the ground a 'floor' and then [gestures] this is where they put the pipe and lower it in the hole. All this is up on the floor up on top, but they had tarp curtains all the way around, so you couldn't see what was going on. So what happens is they run the bit that makes the hole, then they run the drill pipe, and it's real heavy. They ran so many joints or so many of the pipes down in the hole that everybody got off the floor. Then they had this great big old heavy metal box and it was welded shut. So what they did is they had the rig people to carry it up on the floor and

throw it down, then they had this welder come up on the floor. He unlatched it by taking the seal off—the welding man did—and when he did that, he couldn't see inside because they made him get off the floor. Next thing you know, they had the tarp curtains closed and you could hear them up there just working. And what they did is they put this special tool on this line when it went in the ground after so many joints.

In the meantime, I was talking to the farmer who owned this land. He had a lot of cows. He was telling me about what happened. He said, 'I went and had a 'dozer come. The 'dozer made a hole for me.' He said, 'the state wanted to shoot my cows and I wouldn't let them shoot them. I said I'll shoot my own.' He ran his animals down in that hole and shot every one of them—his family did. I mean it brought tears to my eyes. I said, 'When they get done with this well, you will be rich.' And it did. It brought him money.

What this tool was [in the metal box] … it would bend and start drilling sideways. We have five or six of them in Six Lakes right now, and I was on the first job that it had ever been done.

BF: Cool!

CN: Isn't that neat? So anyway, when it came to that farmer, he just brought tears to your eyes.

Carol also shared memories of growing up on her family farm in Remus, Michigan, and concerns among family members about PBB exposure, especially given the news coverage and uncertainties about long-term health outcomes in the 1970s.

CN: People sold their milk in Remus. At that time, I think they made butter. They either made butter or cheese, I can't remember when the cheese plant started, but we were well-known in Remus for the butter—Remus Butter.

BF: Okay.

CN: All the farmers. We even sold our milk to them.

BF: Okay. So, you had the animals on your family farm?

CN: Oh yeah. We had cows. We weren't big farmers; it was a small [farm]. Me and my brother, together, we owned eighty acres. I got twenty and he got sixty. I helped him get the land. We went to the bank and he bought it from our aunts. My grandma left it to my dad and his three sisters. …My father got the

house and the barn which I own today. On the barn, it says 1913. …it's over a hundred years in the family.

BF: That's incredible.

CN: Um-hmm. …

BF: So when your grandma said that she had PBB, do you mean in her livestock, in the animals, or in her body?

CN: In her body.

BF: Okay.

CN: She talked about her joints hurting her. The joints and, like I said, her health wasn't the greatest anyway, but she wanted to say it's [because of PBB]. I couldn't understand why. But she said her joints were hurting her so bad. So with her [seeing news footage, especially of curved hooves on cattle], she probably figured that was related to whatever her joint problems were, you know, that's what I'm thinking. …We had animals, but we didn't buy [contaminated feed or] anything like that.

BF: Oh, so you didn't have, like, feed, that could have been contaminated.

CN: No. We used our own stuff from our farm, you know, [the feed topper or ration,] that's for rich people, the ones that have a lot of cows, milking cows and chickens. We fed them the corn from the farm. You know, we weren't the type of person that was rich to go out and even to buy coal for the stove, we always had wood.

BF: Well, so the cruel irony of the PBB mix-up is, right, that this fire retardant ends up in livestock feed and it hurts the farmers who are like the biggest dairy operations and have like these massive herds of pedigree animals—

CN: Right!

BF: Because they knew that this nutritive supplement would increase their milk production and help them, you know, grow and expand. But that it shielded some small farm from that exposure but then those farmers ended up exposed through—

CN: We would go to town and buy that milk.

PBB Found In Mother's Milk

Preliminary scientific reports have found traces of PBB in mother's milk, the state health director revealed last week.

Dr. Maurice Reizen, state health director, said that 22 samples of milk taken from 26 nursing mothers in Michigan contained PBB, the substance that was identified as the cause of death for several thousand cattle in the state during 1973 and 1974.

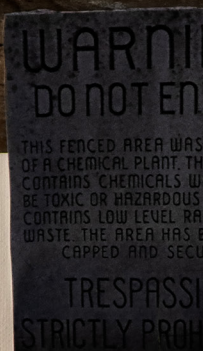
PBB—polybrominated biphenyls—is a fire-retardant chemical that was accidently mixed with cattle feed and sold to farmers in the lower peninsula.

Because PBB is biologically magnified as it moves up the food chain, people eating PBB-contaminated food end up with a higher percentage of PBB than they actually consumed.

The level of PBB found in the breast milk of the women tested averaged 90 parts per billion (ppb), with the highest amount found reaching 500 parts per billion. The Food and Drug Administration allows food to be sold containing up to 100 ppb.

Because the study was actually done to find the level of pesticides in mother's milk, officials are not recommending the end of breast feeding as yet.

Reizen said a further study is now underway to determine the level of PBB in breast milk, and until the results are in he is recommending caution.



BF: Right. Right.

CN: We'll go to town and buy the butter, we'll go buy the chicken, we'll go buy whatever, the eggs and stuff like that because we sold our own eggs, but our eggs, I know they weren't contaminated. …

In the final excerpt, Carol revisits what she witnessed at the Kalkaska burial site and explains when she first learned about the PBB disaster. She also expresses concern about the lack of accountability or a concerted response to this large-scale contamination. Her experience is a reminder of why ongoing efforts to raise awareness about the disaster 50 years later matter.

BF: So you helped to lay the cap, the gel [Polymer Bentonite Soil Sealant (Dowell M-179)], the chemical—

CN: We spread it on the ground.

BF: You spread it into the pit before the animals were introduced, and then after to help seal it.

CN: Right. And I took [the gel] up there, but they wouldn't let me [cap] it afterwards. …[They didn't want a woman] up there looking at that mess. But what I saw, it was nasty. I knew what they did. …You could smell it. You could smell it. …the death smell of those animals was terrible. So I think they knew I couldn't handle it.

BF: Okay.

CN: I'm an animal lover.

BF: Yeah, that would've been hard to see.

CN: It was.

BF: So you mentioned also that that was, you know, your first introduction to PBB—was that the first time you heard [about it]?

CN: I saw it on TV.

BF: You did see it, because it was [19]74 when they discovered the mix-up.

CN: Well, all I can remember is I saw it on TV because it was always on the news.

BF: Okay.

CN: It was. The news showed animals …in the yard—barnyard. You'd see them out there and they were falling over. You'd see that all the time on TV when they first discovered it. But like you're saying, they didn't want to tell it. …look how long it took them to bury those animals. And you figured, in the beginning, people buried their own animals on their own farms, which you figured it got in the water system—it had to. And they sold the eggs and chickens, even when they were sick probably because they needed that money.

BF: Yeah. So, when you say, 'they didn't wanna tell it,' what do you mean by that?

CN: I'm saying that when the government or whoever, the state, let's say, they didn't want this out. Because look what happened afterwards.

BF: Yeah it was pretty devastating.

CN: Um-hmm. Then when it all came back to the [chemical] company, of course, I heard they wanted to blame it on someone who couldn't read at [the chemical plant or Farm Bureau feed mill].

BF: Yeah.

CN: They didn't read it because they—the label was about the same, so they just mixed it up. And that's a big [mistake]. …

BF: Yeah. And from what it sounds like, you know, the mix-up was a disaster kind of waiting to happen, just given that the magnesium oxide, which was the supplement, was in the same bag with similar labeling, it was called Nutrimaster, right next to the fire retardant or PBB, which was called Firemaster, right in the same warehouse, side by side. And then beyond that, I mean, the accidental shipment to one of the feed mills, and, you know, reportedly, someone who was working in the mill said this is a different product, and the manager says, 'No, it's all the same, mix it,' and they did. …Placing blame on farmers for poor husbandry—

CN: Oh yeah.

BF: Or you know, just dismissing community concerns and voices whether it was the state or the feed mill or Farm Bureau or Michigan Chemical or Velsicol, it's—yeah.

CN: So, in a way I was thinking that maybe that's why I never had children.

BF: Okay, so you tried, but you just—

CN: They said I was okay, but I never had any.

BF: Okay. I wonder, and you've had breast cancer, and that's one of—

CN: Yeah, I had that twice. But then my mother had cancer.

BF: She did?

CN: My mother had cancer, my uncle had cancer… Cancer runs in our family, period. But we're all from Michigan too.

BF: Yeah. Do you—have you ever, or anyone in your family that you know of, did they ever have their blood tested? Because there is a study—

CN: No. No. Nobody ever came to us. Because did they really actually want to know? That's the way I look at it, because my cousin, she said she got tested because of the way she was feeling or acting, that [the Michigan PBB Registry] tested her blood. But I never heard of being tested until she told me.

BF: Okay.

CN: I didn't even know about this until she went to that [community meeting] and she told me.

BF: Yeah, the community meeting in December. So the state actually started investigating the health issues in I think it was [19]74 or '75 was their first study, and then they started a long-term health study that's ongoing that now this university in Atlanta, Georgia, Emory University, they have a team of researchers—

CN: Yeah, but why would it be way down there when it happened up here?

BF: Well, so those are two big and important questions. I mean the first is that Dr. Michele Marcus, who is the lead scientist and researcher for the Registry, she knew that this study was really important through previous work. And when the state decided that it was no longer going to fund this study she took it on, thankfully. Then beyond that, how far did PBB go? I mean, I've heard all kinds of stories about haulers, you know, destined for Kalkaska actually going into Indiana or Ohio with cattle that had been condemned and quarantined.

CN: And then plus the chickens and their eggs.

BF: Yeah. It's raised all kinds of questions about, you know, how much the contaminated food made it beyond state lines, you know, how much of that food went into public schools, went into welfare recipients' homes, and how much of that food ended up in prisons and beyond that.

CN: They can take your blood and test to see if you have it at all? That'd be awfully hard to believe after all these years.

BF: So with the long-term health study…they're finding that a lot of Michiganders still have elevated levels of PBB in their body. But the people that they're able to test are those who were initially part of that long-term study that the state started. Although they're able to expand that a little this year to include people who can demonstrate that they were likely exposed, that they worked in the chemical plant or were a relative of someone who worked in the chemical plant, grew up in St. Louis, that they are a relative of someone who was on a quarantined farm, whether they were a kid of a farm family.

CN: But I had never heard of a quarantined farm and stuff like that.

BF: You didn't?

CN: Like I said, it was hidden. …

REFLECTIONS OF A PHYSICIAN INVOLVED IN THE PBB DISASTER

Thomas H. Corbett, MD, MPH

Dr. Corbett is a retired physician and member of the Pine River Superfund Task Force and the Emory University PBB Leadership Team for the Michigan PBB Registry. He is also the author of *Chemicals and Cancer* (1977) and *PBB-An Environmental Disaster* (2023). Dr. Corbett's academic publications explore operating room pollution, anesthetics (teratogenic and carcinogenicity studies), and PBB (teratogenic and carcinogenicity studies).

Thomas H. Corbett

As one of the few surviving physicians from the early 1970s who responded to the introduction of PBB into the food chain, and after hearing several whitewashed and revisionist histories at the conference, I feel the need to correct the record. After fifty years, it is easy for those who were not there to alter the history of what really happened and not know the misdeeds of those who prolonged the disaster.

I was there in the trenches. It was a contentious time. I was witness to the efforts of the Michigan Chemical Corporation and the Michigan Farm Bureau Services to cover up the problem. I was witness to the incompetence of the Michigan Department of Agriculture, the Michigan Department of Public Health and the Governor's office. The actions and inactions of these state agencies resulted in the prolongation of the disaster, the subsequent continued contamination of food supplies with PBB for a period of four years, and increased the risks to consumers for the numerous long-term health problems caused by PBB. Many of these health problems are only now becoming evident.

These agencies and Governor Milliken failed in their duties to protect the public. The actions and inactions of each will be discussed separately. The Michigan Department of Agriculture failed in its obligation to protect the state's food supply from contaminated products. The Michigan Department of Public Health failed in its duty to protect the public from preventable serious illness. The Governor, the state's chief executive, also did nothing to halt the misdeeds of the two agencies.

The Michigan Department of Agriculture

The Michigan Department of Agriculture (MDA) chose to protect Michigan agribusiness and totally disregarded its responsibility to protect the public from contaminated foods. Notified early of the discovery by experts that PBB was known to produce birth defects in animals and that the chemical was a suspected carcinogen, the MDA totally disregarded this information. The MDA's only concern was "how to get out of this mess as cheaply as possible." Despite knowing the dangers, they continued to allow the sale of sick PBB-contaminated animals and the distribution of contaminated farm products into the food chain for four years. The MDA also developed adversarial relationships with those who opposed their policies. Veterinarian Dr. Alpha Clark was a particular target of the MDA's "dirty tricks" department.

The Michigan Department of Public Health

The Michigan Department of Public Health (MDPH) failed or refused to recognize early health effects of PBB poisoning among farmers and their families despite warnings by several physicians who had personally examined and tested patients with serious symptoms.

Dr. David Salvati (now deceased) was a family physician in Big Rapids, Michigan. He also had a small farm that had been contaminated with PBB. After eating their own contaminated products, his family became ill. Upon testing, he learned that five of his eight children had abnormal liver function. He correlated his family's symptoms with other farm families experiencing similar problems and concluded that PBB was the common denominator. His efforts to convince the MPDH of the relationship were met with derision and claims that the symptoms were due to either hypochondria or hysteria. The controversy became ugly when the doctor and his nurse both received death threats, warning them to stop seeing and reporting on the affected patients. Dr. Salvati's family later paid the ultimate price when one of his sons, who also became a physician, died at age 53 from a gastrointestinal cancer.

Dr. Walter Meester was an eminently qualified physician and toxicologist in Grand Rapids. He, too, saw numerous PBB-affected farm family patients. He performed extensive histories and physical examinations on them, as well as performed numerous laboratory tests, including measuring their PBB levels. He concluded, as did Dr. Salvati, that these patients did have PBB-related illnesses. As a toxicologist, he, (as well as myself) was also concerned about the probable carcinogenicity of PBB. However, our warnings were also rebuffed by the MDPH.

The MDPH also refused to issue warnings to mothers to not breast feed their babies in spite of the urging of knowledgeable physicians and scientists (including myself) who warned in 1974 that PBB in breast milk would be passed on to infants. The department did not even test for PBB in breast milk until 1976, and expressed great surprise when they found 96 per cent of women tested in the lower peninsula had levels of PBB as high as 1.22 ppm, more than four times the limit for cows' milk at the time. Even then, the department only stated that mothers should make their own decision regarding breast feeding. Because of the MDPH's disastrous policies, many of these breast-fed children are now experiencing PBB-related health problems as adults.

Governor Milliken

In October 1974 Dr. Irving Selikoff offered to send his team of epidemiological investigators to Michigan after I notified him of the PBB contamination problem. His offer was contingent on receiving an invitation from an official of the state government. After his invitation was rebuffed by the MDA, I then called the governor's office and asked to speak with the governor. My request was denied, but I told the governor's aide about Dr. Selikoff's offer, emphasized that he was a world expert in environmental contamination problems, and if invited, would bring his entire team to Michigan, free of charge, and give advice regarding how to quickly end the problem. The aide promised that he would pass the offer on to the governor. The invitation from the governor was never issued. Governor Milliken refused the offer, causing a two-year delay in Dr. Selikoff's investigation. He was finally invited in 1976 by a leader of the Michigan House of Representatives. The two-year delay resulted in the continued ingestion of PBB-contaminated foodstuffs by the residents of Michigan, increasing their risk of long-term health effects from the chemical.

A more detailed account of these issues is written in my recent book, *PBB – An Environmental Disaster*. It is important to know what happened. It is important to have knowledgeable, competent, and scrupulous people in important positions requiring crucial decisions. History often repeats itself. As George Santayana observed:

"Those who cannot remember the past are doomed to repeat it."


CITY


WE DECLARE OUR MUTUAL AIM:
THAT OUR RIVER AND LAND BE RESTORED
TO THEIR NATURAL CONDITION
SAFE FOR ANY USE
OF ST. LOUIS & PINE RIVER SUPERFUND CITIZEN TASK FORCE

REFLECTIONS FROM A POLICY HISTORIAN AND ACTIVIST

Edward Lorenz
Emeritus Professor of History and Political Science, Alma College

Edward Lorenz is Emeritus Professor of History and Political Science at Alma College, where he taught from 1989 to 2018. He is the author of *Civic Empowerment in an Age of Corporate Greed* (East Lansing: Michigan State Univ. Press, 2012), which examines the history of the wider global and national context of the region's pollution. He has served as an officer of the Pine River Superfund Citizen Task Force since its founding in 1998. He has had a number of his students work on projects related to the region's contamination.


ARNING
ENVIRONMENTAL
AMINATION INVESTIGATION
NGOING AT THIS SITE
NO TRESPASSING
WARNING
DO NOT ENTER
THIS FENCED AREA WAS THE SITE OF A CHEMICAL PLANT THE GROUND CONTAINS CHEMICALS WHICH MAY BE TOXIC OR HAZARDOUS AND ALSO CONTAINS LOW LEVEL RADIOACTIVE WASTE THE AREA HAS BEEN CAPPED AND SECURED
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Ed Lorenz

As I watched, listened, and met attendees at the 50th Anniversary Conference, I mostly felt glad the Pine River Task Force has taken the course we struggle with, always trying to take the big picture approach. While many panelists and commentators from the audience said good things, I think three exemplified the wisdom of our approach over the years: Elena Conis, Erik Nordman and Joe Sowmick. In saying this, I don't mean to minimize the wisdom of many others. It simply is that these three differed from each other and captured three different important lessons from our experience.

Elena Conis knows us well, if largely because of our struggles with DDT, not PBB. But she sees the common thread, dealing with corporate behavior that ignores caution, all in the name of quick profits. Worse, Velsicol and its corporate allies have repeatedly been willing to threaten or corrupt environmental and human health experts. Her reflections on us did an essential job of stating what we say on our website: "Respecting the Precautionary Principle." This is a term with deep links to PBB and our site. It was Dr. Irving Selikoff, one of the modern leaders of the occupational health movement, who both helped us in the 1970s begin research to understand the human health effects of PBB and then in the early 1980s was a founder of the Collegium Ramazzini that annually brings together experts on the need for the precautionary principle.

Erik Nordman articulated a different set of lessons both from the cause of our local problems and more importantly the solution. A leader of both the Society of Ecological Economics and the continuing study at Indiana University of Elinor Ostrom's wisdom, Dr. Nordman explained and defended the need and methods to practice economic responsibility. Much like the precautionary principle itself, Dr. Nordman described the need to develop an economic policy system that controls the temptations, exemplified in Velsicol's behavior, to seek short-term economic advantage while leaving to government and those forced to live around contamination to figure out how to clean-up and pay for remediation and the human health consequences of exposures. Directly related to the Pine River Task Force experience, Dr. Ostrom won the Nobel Prize in economics because of her proof that sustainable economic behavior, **over centuries not years**, can best be achieved where the local community is empowered **to control individual economic choices**.

The third lesson for the wider world from the Pine River experience is the responsibility of elders to be good ancestors for their children and those generations to follow them. As Joe Sowmick from the Saginaw Chippewa Tribe emphasized at the Conference, we have an obligation to the seventh generation after us. The behavior of Velsicol demonstrated the consequences when people have contempt for this obligation, As the Task Force has emphasized, we should be familiar with the thinking of Ramon Krznaric summarized in his book *The Good Ancestor*. It is utter foolishness that needs to be exposed to mockery for trying to celebrate quick profits that curse the descendants the elders claim to love to clean their mess and its multi-generational human health consequences.

While the Michigan PBB accident did terrible harm to future generations who unknowingly consumed food tainted by a flame retardant, our most important lesson is that our culture has learned nothing from the PBB accident. Rather than launch an emergency learning effort, beginning in 1974 we allowed our political and economic leaders to cover-up any learning from the mistake in 1973. The results of that cover-up – still on-going in 2023 at the highest level of the state public health and agricultural establishment – meant the lesson along the Pine River was that we would allow contamination of millions of people with no consequence. Not surprisingly a decade after the accident along the Pine River, another careless U.S. chemical company killed thousands through the Bhopal accident in India. Why had we learned nothing in a decade? Why have we still learned nothing after a half-century, as we pollute the Pine River and other watersheds in the U.S. with contaminants from over-population of our farm land with livestock?

The time has come to learn from our foolish pursuit of quick profits instead of sustainable production. As the Society for Ecological Economics seeks and our experience confirms, we urgently need a new system of use of our resources. Pondering the messages from the 50th Anniversary Conference is an urgent need. Those who joined together from May 18-20, 2023, in our watershed need to be heard and thanked for their willingness to seek change. Those of us from the Pine River watershed who have been blessed with children and grandchildren need to demand to be heard to spare our descendants from the irresponsibility of those who would use pursuit of short-term profits as an excuse to poison those who erroneously think them wise and responsible.

REFLECTIONS FROM A STUDENT-ACTIVIST

Adam Ellsworth

Adam Ellsworth is a Greenville, Michigan, native and 2012 graduate of Alma College, where he majored in Communication and took a minor in Environmental Studies. He was also a Center for Responsible Leadership fellow, member of the Pine River Superfund Citizen Task Force, and one of many student members of Dr. Edward Lorenz and Professor Murray Borrello's courses in public affairs and environmental issues. After completing his degree, Ellsworth held a series of third shift and part-time jobs that allowed him to coach high school track and field which, coincidentally, resulted in his involvement with the Michigan PBB Registry. Today he continues to coach and works as a substitute teacher in Mid-Michigan, raising awareness about the Gratiot County Superfund Sites and PBB disaster whenever it is appropriate.

Adam Ellsworth

Some lazy fall Sundays wind up being less lazy than others. In the fall of 2012, I was an underemployed recent Alma College grad, receiving my degree in August of 2012, and channel surfing at home when something caught my attention. Archival footage of the 1970's PBB Disaster, which I had seen before (it is hard to forget images of horribly deformed animals and farmers executing their cattle en masse), and voices I recognized discussing a new research project from Emory University for the Michigan PBB Registry, the long-term health study. When I was still in college I had helped with an early draft of a video that went to the EPA Remedy Review Board and the PBB disaster footage was part of it. According to the news report, a team of researchers had resumed work on the Michigan PBB Registry, which the state started after the disaster but ceased at some point for various reasons. The Emory researchers were finding PBB in people who were not even born at the time of the disaster but had parents who were – and some were multiple generations removed. I thought the video must have been something Ed Lorenz or Murray Borrello would have been aware of, especially since Murray's voice was used in the documentary.

Then the credits rolled and it never mentioned Murray or Ed or the Pine River Superfund Citizen Taskforce, or Alma College… or anyone from Gratiot County that I recognized in the credits. So of course my first thought was "I should probably email Dr. Lorenz." And, as I suspected, no one with the CAG or the college was aware of Emory's research project mentioned in the documentary.

Most email or text exchanges bringing something to the attention of a friend or colleague end at this point, with a simple "thank you for this" and you move on. It turned out, however, that Emory's project was a much bigger deal than I knew. Ed made it clear to me that it was absurd such a study was undertaken without anyone who had been actively working to clean up the legacy contamination from Michigan Chemical and Velsicol being informed about it (many of whom carry the legacy in their own blood and tissues).

Some time went by and then I saw a story on *The Morning Sun* (a local newspaper) website with the headline "New video on PBB contamination ignores St. Louis altogether" and the absurdity of the situation was made clear to all who would listen. And, thankfully, the researchers at Emory University and all involved with the revived Michigan PBB Registry understood the community's frustration.

Years went by and my various jobs came and went, none of which providing much more than paychecks, all the while I would get updates about the PBB Registry from Ed via email or sporadic visits to Alma. Ed made it clear each time we interacted that while it might have been what is called "slacktivism" (for example, staying at home making social media posts or writing emails versus doing the actual marching, in–person canvassing, or going in the field to gather data of traditional activism), in my case, watching TV and sending an email afterwards, resulted in outcomes that were impactful for all involved with the Registry, the CAG, and ultimately the science of understanding the intergenerational effects of the PBB Disaster.

After Ed told me there would be a conference commemorating the 50th anniversary of the PBB Disaster, I made a point to bring it up to anyone who would listen. Getting people to listen was easy, and in a few cases I did little talking because they had much more to share about their experience than I had information about the conference. One man had terrible memories of his parents losing their entire dairy operation while another was a neighbor to families mentioned in Joyce Egginton's *The Poisoning of Michigan*. When it came time for the conference this past spring, it became clear that the PBB Disaster was not actually forgotten but suppressed intentionally as a traumatic incident by those affected both physiologically and socio-economically, and by industry and government interests because it jeopardized their finances and the institutional trust they had built up to that point (an argument made much more eloquently by Elena Conis in the conference's opening keynote).

However sad it is, getting people to open up to strangers with anecdotes of personal experiences for Dr. Fremion and the Michigan PBB Oral History Project archive and getting them to donate both their time to a questionnaire and blood to Dr. Marcus for the Michigan PBB Registry is immeasurably easier than preemptively holding corporations accountable for the damages they could potentially cause. With billions of dollars on the line, industry scientists would rather bury internal memos and proprietary information harmful to profits while colleges, universities, and independent researchers spend years or decades to confirm what was already secretly known (all the while harms are occurring because of the delay caused by greed). The actions that are taken by legislators, regulators, and enforcement agencies once problems do occur after events like the PBB Disaster or the East Palestine Train Derailment in spring 2023 then typically get delayed by lawsuits or watered down via industry lobbying. At least with PBB the harms are now public and no longer a mystery. I just hope the years between the 50th anniversary and the 60th anniversary of the disaster make for more advancements in learning how to help those with PBB–related conditions and more public discussion of the disaster than the prior years did. The conference this past May was a solid first step.

Screencaps from "Varied Accumulation," a performance on Thursday, May 18, 2023 by Alma College Professor Catherine MacMaster's site-specific dance class.

PBB & THE COMMUNITY PANEL TRANSCRIPTION, PBB DISASTER AT 50 CONFERENCE FRIDAY, MAY 19, 2023

Panel Moderator: Brittany Fremion, Central Michigan University
Panelists: Jim Hall, Pine River Superfund Citizen Task Force
Dr. Thomas Corbett, PBB Citizens Advisory Board
Jane-Ann Crowley, PBB Citizens Advisory Board
Tribal Elder Joseph Sowmick, Saginaw Chippewa Indian Tribe of Michigan
Troy Techlin, Saginaw Chippewa Indian Tribe of Michigan

Panel video recording: https://www.youtube.com/live/40cnB6QufEs?si=y5WA0leFlVslpaKf

Panel video transcribed by Kathleen Gregones and edited for this collection by Brittany Fremion with additional support and feedback from the panelists.

Ojibwe translation provided by Saginaw Chippewa Tribal Elder Isabelle Osawamick, Anishinaabe Language Outreach Specialist, and supporting documentation by Ziibiwing Center of Anishinabe Culture & Lifeways Research Center Staff, Anita Heard and William Johnson.

PBB & Community Panel Transcription, PBB Disaster at 50 Conference

Brittany Fremion: We are a team up here, I think, united by our shared experience of this large-scale contamination. I'm going to begin first with our land acknowledgement, though. Today, we are here on the beautiful lands maintained for generations by the Anishinaabe people, the indigenous inhabitants of Michigan, with whom we have partnered for this conference. *Boozhoo* and welcome… [Let's begin by introducing our panelists.] Jane-Ann, of course, grew up in Michigan, and has six siblings. [She is a founding member of the PBB Citizens Advisory Board and Michigan PBB Registry Team, partnering with Emory University and providing critical support] to continue their research efforts and ensure that the data they have collected is securely maintained and made available for further research. Welcome, Jane-Ann.

[applause]

Doctor Tom Corbett is a name you might recognize if you're familiar with this history. He conducted laboratory experiments showing that PBB produced birth defects in mice. He was the first to warn the public not to eat contaminated farm products and advise mothers to not breastfeed their babies. He is the author of two books about the PBB disaster, *Cancer and Chemicals* published in 1977, and most recently, *PBB: An Environmental Disaster: Michigan Chemical Poisoning Reverberates 50 Years Later*. Welcome back, Dr. Corbett.

Dr. Thomas Corbett: Thank you.

[applause]

Saginaw Chippewa Tribal Elder Joseph Sowmick was born in 1960 and raised on the Isabella Indian Reservation in Mount Pleasant. His spirit name is *Chi Mickinic ndishnikas* (Snapping Turtle). He hails from the *Amik ndodem* (Beaver Clan). He has many accolades. One that I'm most excited about, however, is his honorary doctorate in Public Service Administration from Central Michigan University in 2008. He served on numerous boards and committees on local, state, federal, and tribal levels, and is considered a very valuable resource for his cultural and technical insights. He currently serves on the Isabella County Economic Development Board, Region Seven Triple-A Board of Directors, state of Michigan Advisory Council on Aging, and the Saginaw Chippewa Elders Advisory Board. Welcome.

[applause]

Troy Techlin is an Environmental Manager for the Saginaw Chippewa Indian Tribe of Michigan where he coordinates and oversees the Environmental and Natural Resource Programs and staff. He has been involved with the tribe for many years. Before that, he even worked as an environmental consultant to clean up some of the private sector *Boozhoo*, and welcome.

[applause]

Jim Hall. I have so many things to want to say about Jim...Jim is a PBB community member, a former resident of St. Louis who grew up a couple of blocks from the chemical firm. He spent many, many years hanging out with his grandparents, who lived about three doors away from the chemical firm. He is a long-serving officer for the Pine River Superfund Citizen Task force. He is one of our tour guides for the field trips this afternoon and you will, I'm sure, hear many powerful comments from him, not only during this panel today, but if you're sitting on his bus.

[applause]

So we thought we might run this panel a little differently than the previous one. I wanted to work with our panelists and come up with a list of questions that we thought might help to impart their stories and memories and experiences and perspectives, as well as to provide for those of you who might be newcomers to this history, some more insight to, again, the really profound personal implications of this and what the last 50 years means, and then how we can continue to move forward in response to these community voices and wants and desires. We'll begin with this question: How were you personally affected by the PBB disaster or what is your memory of the disaster? How do you remember the people around you responding and reacting to it? Maybe we can just start with you, Jane-Ann, and then we can pass the mic…

[00:07:32] Jane-Ann Crowley: Okay. Hey, everybody. I'll try to get this in under twenty minutes. My family, who lived on a farm in Remus…our grain that my dad took to the farm and the feeding ground had PBB added to it, which we gave to our livestock. Then we consumed their by-products and we became contaminated. It was a couple of years after that event that we all started having health impacts. I was eight when I was first exposed.

My family believes that we continue to experience ongoing contamination through the soil and stuff because even later in life, our exposure is still really

prevalent, and we could see among ourselves we still have many problems. I started having seizures right around the time I was eight. And I have had them sporadically throughout the rest of my life. It's been about maybe 10 years since my last one.

The neurologists have always said I didn't have epilepsy. It wasn't a neurological problem. I spent some time at the Cleveland Clinic, where the top neurologist at the Cleveland Clinic spent quite a bit of time with me, was very fascinated with the situation –very interested in learning about the poisoning–and felt that that could very possibly be the cause of my problems, but couldn't say definitively that it was, which is something that I have heard consistently over and over and over again. I had ten miscarriages, two ectopic pregnancies, and two heterotopic pregnancies and one live birth. When I first spoke to my doctors about my concerns of PBB and passing it on to my child when I knew I was going to have a viable pregnancy, they said, 'Oh, don't worry, PBB doesn't pass the placental barrier.' But we now know that that's not true. We know that PBB is passed through breast milk. We know that there are epigenetic changes in the next generation, and my daughter has her own health issues now that are most likely, but not definitively, related to her exposure to PBB.

I hear these stories from my community, from my family, over, and over, and over again. They look to me and say, 'What can you do about it? What can we do about it now?,' and I just don't have the answers. I do everything that I can in my power to continue to tell this story, but I'm just one person. We need all your voices to tell your stories–don't think to yourself, 'It's 50 years, who cares?' It may be 50 years since the contamination, but it's a forever chemical. This is a forever problem. If we just let it go and not try to do something to prevent this from happening anymore, then why do we suffer?

[applause]

[00:12:06] Dr. Thomas Corbett: In 1974 when I was an anesthesiologist with a laboratory studying the toxic effects of anesthetic gasses on operating personnel. I made somewhat of a name for myself in that field and gave talks around the country in various meetings. …

I presented [my research on PBB] at a meeting in late July or August 1974 to the Michigan Department of Agriculture and the Farm Bureau. At the meeting, I was astounded to find out that the personnel, before I presented my findings, all they could talk about was how they're going to get out of this mess as cheaply as possible. When I finally raised the concern for human health effects, they weren't too happy.

I said, 'Listen it produces birth defects in laboratory animals, there's a good chance it will produce birth defects in the human population. Not only that, but a lot of the time, chemicals which will cause birth defects may also cause cancer.'

At the time, PCBs were a pretty well-known entity, and PBBs are very closely related. I call them chemical cousins. Brominated compounds are usually more toxic than the chlorinated ones. One would anticipate that PBBs are going to be worse than PCBs in terms of toxicity. They told me afterwards they didn't want me to tell anybody about this, not to mention it. Somebody [from the meeting] even reminded me that the state funded the University of Michigan, and that might come as a consideration. I said, 'I don't care what you do. My funding comes from the [Veterans Association] and I'll tell whoever I please.' Anyway, I–

[applause]

I was very concerned about the extent of the contamination. I took to reading the newspapers in May about additional farms being contaminated, and when I found out it was PBB, I called … Dr. Renate Kimbrough, the leading expert in PCBs. I spoke with her and told her I was interested in her studies in the laboratory, and she reminded me to be extremely careful not to expose myself or any of the laboratory personnel to the chemical. We kept conducting our studies. I talked to Dr. Benjamin Van Durren, who was an expert in being able to look at a chemical and predicting its carcinogenesis. …

After the contamination seemed to be totally out of hand with the Michigan Department of Agriculture and the Michigan Department of Public Health–and I'd like to reiterate Edie Clark's comment that the Department of Public Health back then was totally different from the Department of [Health and Human Services] now and today–but back then, there were a lot of problems.

I started warning people not to eat the Michigan farm products because of the toxic chemical and the risks for women that breastfed their babies. The reason was that if PBB was in cow's milk, it was going to be in human milk, and I expressed my concern to the Michigan Department of Public Health. They didn't seem to be interested in listening to the complaints of the farmers who had been arguing with them. Eventually I felt that the Michigan Department of Agriculture and the Department of Public Health were not doing what they needed to do to protect the public.

I presented a paper on my anesthesia work at a national meeting. Afterwards, a gentleman came up on the stage carrying a briefcase. I recognized him right away. It was Dr. Irving Selikoff. He came up on the stage and he said, 'Tom, I

really enjoyed your presentation. I'd like you to keep me involved on your work with anesthetics.' He and I had a professional relationship from then on, I talked to him on the phone whenever I had some new discovery. But then when PBB came up, I called him and I told him the whole story about PBB. I said, 'Irving, you've got to help. We've got to figure out a way to help these people because this is totally out of hand. They're letting people eat these contaminated products and they're not doing anything to help protect the people.'

So he sent Dr. Anderson out to visit me for two days. I told him the whole story about PBB, including the newspaper articles and some other materials. He went back and a couple of days later, Dr. Selikoff called me and said, 'I'd like to bring my team to Michigan to investigate the problem. But I can't come without an invitation from some state official.' So I called the Michigan Department of Agriculture, and I spoke with one of the representatives, a higher-up member of the Michigan Department of Agriculture.

His attitude was, 'We don't need any outsiders coming in here telling us what to do.' With that attitude, I thought, well, maybe I will go to the governor's office. I called the governor's office, and the governor's aide I spoke with wouldn't let me speak with the governor. I said, 'Well, look, this is extremely important. Dr. Selikoff is probably the world's leading expert in environmental medicine. He has a team right here, for free to investigate the problem.' This was 1974. I never heard anything more. Dr. Selikoff never got his invitation.

I called a few weeks later and asked, 'What happened to the invitation?' He said, 'I don't know, I don't know.' I said, 'Well, don't you need to keep a log of your conversations?' He said, 'Well, we do.' I said, 'Well, why don't we look it up? I told you about the importance of this and you told me that you would tell the governor.' He said, 'We can't find the log book right now. It's missing.'

Anyway, further studies by some of the people investigating the contamination, reporter Ed Chen, did find out that apparently [my request to invite Dr. Selikoff] was passed on and they didn't invite him. Two years passed, during which time people were eating large amounts of PBB still. Edie Clark [then a legislative aide to Representative Bobby Crim] called me up and said, 'I'd like to come and talk to you about PBB.' She brought Representative Dan Stevens with her…When I told her about the situation, Edie lit up like a Christmas tree. [laughs] Two days later, Dr. Selikoff had his invitation. That's how Dr. Selikoff finally got [the invitation], but it took two years of the government [and] the state agencies just fiddling [around] and not doing what they were supposed to do.

Anyway, I did end up getting a lot of hot water for my predictions. I predicted that PBB would probably produce birth defects in people and probably produce cancer in people. Nowadays, there are even more concerns, and we have to give a lot of credit to Dr. Michele Marcus for her work and picking up the torch and carrying it. …

Another thing that's not been explored well is the area of neurological diseases. This is another area which is totally lacking in investigations. What we really should have done is good surveys of these people [from the start]. Find out what people in the meantime have died from, and finding out for sure, proving beyond the shadow of a doubt that PBB is causing birth defects, cancer, neurological diseases.

I hope that this proceeding will lead the funding agencies to do surveys, epidemiological studies of not only the farmers and families which are being done now, but still have money available for cancer investigation. We need money made available to study these things to show whether they do or do not exist. Most likely they do. There should also be clinics set up for people that need to be examined for these diseases earlier on. There is great concern that gastrointestinal cancers, lymphomas, and breast cancers are related to PBB. We need to have clinics to determine early diagnoses of people because that is the best way to cure these diseases [by early diagnosis]. We have a new category of diseases that we should be worried about…that deserves a lot more attention…

[applause]

[00:24:20] Tribal Elder Joseph Sowmick: *Chi Mickinic ndishnikas. Amik ndodem. Saginaw Chippewa Anishnaabe Shkwangan ndoonjiba. Anishnaabe ndaa'aw.* [Ojibwe translation: Snapping Turtle is my name. I am of the Beaver clan. I am from the Saginaw Chippewa Indian Tribe. I am a Native/First Nations person.]

Why is the Chippewa Indian Tribe here? As Dr. Fremion mentioned, we're on the ancestral lands with that land acknowledgment. The Treaty of 1855, the Treaty of 1864, signed by my ancestor, Chief O-saw-waw-bun, went ahead and declared this land of the Saginaw Chippewa, Swan Creek, and Black River Bands. One of the things that we've been talking about this morning is how has this impacted the community? Certainly, if it's impacted your community here, wouldn't you think it's impacting other communities, including the Saginaw Chippewa Tribe? Sometimes when you look at the Seventh Generation Concepts…to its core being, you're looking at about 30 years in length. Take for example in 1973, when…this disaster happened, if that was the first generation that

experienced this–we've heard through testimonies and personal experiences, that this has already crossed over into the Generation Concepts. We've heard from our medical professionals, this is a public health emergency. This is an economic emergency. I had the opportunity to serve on the State Advisory Council of Michigan State AgBioResearch, and one of the things we talked about is agriculture. Michigan is number two in the nation. We have an economic responsibility to this, but we also are environmental stewards.

We've got to protect our environmental sovereignty, and this has affected the families in the area, and if you look at that Seventh Generation Concept, if we're the first generation right now, what are we going to do 210 years from now for our children's, children's, children? What are the effects of this economic disaster that happened, this environmental disaster that happened? How can we be good stewards of bringing resources to bear? From the federal government, from the state government, from the local governments, from the tribal governments, is very important.

There may be some of you that look at this and say, 'Well, I didn't know the Saginaw Chippewa Tribe had a tribal college. I didn't know the Saginaw Chippewa Tribe had an environmental team.' Well, maybe there's a lot of things that we don't know about each other, but it takes conferences like this that get us to go ahead and start the dialogue, and I have a friend that I brought with me that's going to give you a little more information.

[applause]

[00:28:03] Troy Techlin: Thank you, Joe. Back in 1973…that was probably 13 years before I was even born, but like Joe said, my job is to oversee all environmental and natural resource programs for the tribe. One of my day to day tasks is building those relationships with our state and federal, local agencies. With that, we can learn from these mistakes. My job is to find those mistakes, inform our community of those mistakes, and give them information on what we can do to prevent [mistakes], and to get treatment.

One of the big issues that I dealt with in my career is PFAS and building those relationships with our state and federal partners. …I was on many phone calls right away before it even got released to the public. I got to develop outreach materials, inform our community what's happening, where we're seeing the PFAS contamination and so, unfortunately, these environmental disasters aren't just going to stop. It happens, unfortunately, but I think with good relationship-building and research, we can find the best ways to mitigate the harm and that's why the tribe has people working on that. We have our own medical facility

that can pass information back and forth, and inform people, which can help. Thank you.

[applause]

[00:30:44] Jim Hall: …Twenty-five years later it is definitely not what we expected... When it started in 1973, I was 10 years old. I don't think we remember much when you're 10 years old. I was worried about my paper route and lawn mowing jobs. I grew up a couple blocks away from my grandma and grandpa. [pause] It was three houses away from [Michigan Chemical]. They were right on the block. My paper routes [pause] my lawn mowing jobs [pause] were all in that area. When you're mowing and the dust is flying–you didn't wonder what was in the dust then because I was 10, but knowing what I know now makes you question what was in the dust? I don't know.

Then as I continued to grow up, I went through it. Once again you're just a kid, so you don't think much of it. In 1985, my brother passed away with cancer, and still not knowing what PBB could do to the body you didn't know what caused the cancer.

It wasn't until 2003 when my daughter was diagnosed with HLHS [Hypo Plastic Left Heart Syndrome]. First of all, who here has children? Raise your hand. Keep your hand up. Who's had children that have passed away? Keep 'em up.

That's the worst feeling in the world. When your child passes away.

In 2003, my daughter…[emotional pause] It's supposed to be easier as time goes by [the hurt from the loss of a child but it has its moments of deep pain]. … Anyway, in 2005 she passed away. [emotion] She had multiple, multiple things wrong with her–birth defects. I lost my job through it because I missed three months, six months, going to the hospital. We were broke. Lost a lot of money going again and again to the hospital–a lot. This is the rest of the story. …

It started in '73, right?

[00:33:20] Crowd: Right.

[00:33:21] Jim Hall: …Some of us go through it, some of us don't. So. [emotional pause] Eighteen years later, it still hurts like you know what. [emotional pause] …That's the rest of the story. Someone reminded me of this last night. It's the dash. There are people that are still here. From 2003 to 2005, the dash of her life, she fought through it. We had to watch her. We held her in our arms when she

took her last breath. [emotional pause] I want to say that as I talk about this dash [emotional pause] …when I expire, what I do in that dash is going to be all the difference in the world.

I hope everybody up here today will fill your dash with the things that make a difference because I think that makes a difference. [emotion] Like you've done. I know Jane's done it, Ed's done it, Michele's done it. Spread that work also. It can be very helpful–in any way you can. I think I've gotten up to it, what I've done. …[The dash on your headstone is what you have done in your life to make a difference in the world].

[applause]

[00:35:42] Brittany Fremion: Thank you all so much for being here and for making that dash matter. I'd love to revisit something that you, Elder Sowmick, you talked a little bit about the Seventh Generation Concept. On your tables, you can find a handout for some more insight into this. I wonder if you can speak to that a little bit more. …these principals. Would you be willing?

[00:36:32] Tribal Elder Joseph Sowmick: Along with the Seventh Generation concept, we talk about the Seven Grandfather Teachings. The Seven Grandfathers–Honesty, Truth, Wisdom, Bravery, Love, Respect, and Humility.

…[During ceremony at Lake Superior, my elder] asked me which one of those Grandfathers is most important that makes all those other Grandfathers work. First thing I thought about is my upbringing on the reservation of the Chippewa Methodist Church. I was thinking about 1 Corinthians 13… 'Love is patient, love is kind.' Maybe he was talking about the Grandfather, Love. He said, 'Well, that's important, but that's not what I was thinking about.' Then I remember my father who was the chief of the tribe. He was talking about the importance of respect.

Respect of Mother Earth. Respect for our language. Respect for our culture. Respect for our own. When we looked at that, he said, 'Well, let me give you an example.' He went ahead and he reached out on the banks of Lake Superior, picked up a handful of sand, and said, 'This is all we are. Grains of sand on Mother Earth who are only here for a short period of time.' He started to talk about the Grandfather Humility. In that idea, he shared, spiritual beings have a human experience we're no greater than, we're no less than, we're all the child of the Creator, and we're here for a purpose.

In that idea, humility, he talked about being teachable and knowing that we know that we don't know. You've heard from the professionals that support it. There's a

lot that we don't know about exactly what happened in this disaster. You've heard generational trauma happening here. Our brother just shared how many people they have lost through what happened. We've got to go ahead and remember that this is generational. Regardless of if you want to get into the semantics of it, is it a public health emergency? Is it an environmental disaster? Is it a government problem? Is it an economic problem?

Well, maybe it impacts all of our communities. Maybe it's something that we need to go ahead and address. I appreciate people like Dr. Corbett. *Tombstone Town* from Jane Keon. Dr. Lorenz talking about civic empowerment. We need to go ahead and tell these stories, but we need to put a face on it. With that Grandfather, Humility, the work that's being done at this conference is very important, but we can't let it stop here. Even though it's 50 years, there's still a story that needs to be told.

[applause]

[00:40:36] Brittany Fremion: Thank you very much. If you would like to learn more about [the Seventh Generation Concepts and the Seven Grandfather] Teachings, you can go to www.sagchip.org, and there's also the Ziibiwing Cultural Center [in Mount Pleasant], which is beautiful and an incredible cultural heritage institution that will lend tremendous insight into Anishinaabe lifeways.

Jane-Ann, Dr. Corbett, and Jim, what do you identify as a major lesson from this disaster? What is it that you want others to learn from your story? From your experience?

[00:41:43] Jane-Ann Crowley: I think that the major takeaway from this experience is very much in line with what you were saying about the generational experience. I think one of the reasons why we're at the junction that we are now with [the PBB disaster] being so under acknowledged, is that in our own families we didn't talk to each other the way we should have about what we were experiencing, why it happened and what we could do collectively to prevent it from happening again.

That silence among us kept us from talking to people even outside of our families. Talking to our children about it… Having a real serious conversation about struggles that we experienced. About struggles they are going to experience, and how if we all work together we can reduce the struggle for future generations. People are too concerned about [themselves], the here, the now, and they don't think about the later. That's where we have to focus our attention.

[00:43:44] Dr. Thomas Corbett: The reason that the PBB problem persisted for so long was because the people in charge were not capable of handling the situation. They didn't have the background, they didn't have the education, the expertise, the experience, and perhaps in some cases, the honesty to do what really needed to be done. What we need to do is, in appointing people to these positions, we have to make sure that they know, that they have the proper background to do what is necessary, and realize the significance of the problem.

As I mentioned with the Michigan Department of Agriculture, when I talked to the representative there, he said, 'We don't need anybody coming up and telling us what to do.' It just shows the lack of background expertise, and as I mentioned in some cases, probably the honesty of people in charge, and their connections with political and business ties that might influence them in making the proper decisions.

This holds true not only with state government positions like the Michigan Department of Agriculture, the Michigan Department of Public Health, this holds true for government officials everywhere and in business as well. If you have other people who just don't know what they're doing, you're going to end up with a disaster. It happens every time. We need to make sure that our officials in charge of making important decisions affecting the environment, affecting public health, have the proper background and training and experience to do the job properly.

[applause]

Jim Hall: …I do want to make sure that for the most part these people are [aware]. And that may be sooner or later we'll have that light at the end of the tunnel, and we can see things like a healthy Pine River, [the chemical plant sites] get cleaned up. …Yes, there is hope.

[applause]

[00:47:06] Brittany Fremion: I like the mention of hope here. This is something as an instructor at CMU I know that I often find myself battling with in my environmental history class, because environmental historians are particularly good at talking about all the horrible things we as human beings, as a species, have done to our planet. I think what we've also tried to do is underscore our place within the environment, that we are a species that are part of ecosystems. We are responsible for being good stewards and making sure that our home is safe. That it's diverse. That it's healthy.

At the end of this past semester, as I always do, I ask, 'Did you find hope?' We just talked about the Flint Water Crisis, and the PBB disaster, and we're working to identify parallels, and they said, 'Yes, we found hope in community activism. We found hope in knowing that we are members of communities. That we have voices, that we have stories and we can use them.'...

Know that you give my students hope; you give me hope. You all being here gives me hope in this messy 50-year long disaster. This isn't just random, I think this is tied to something. I'd love to ask Elder Sowmick, and then all of you: Many tribes speak about the importance of coming together and being a part of a circle. How do you see that concept playing out…at this conference? Does it, can it?

[00:49:13] Tribal Elder Joseph Sowmick: …A lot of times when we come together in a circle, we're stronger. Have you ever been in a meeting where you're looking around the room, and you found out that there's someone that should be there that's not? A lot of times with our government processes, our politicians, sometimes they can get so political they can lose the face of our communities.

Sometimes, from an academic standpoint, we could be so focused on policies and the science part, we can lose how it's affecting families. To go ahead and to have a seat at the table. …To forge those relationships at a federal level, at a state level, at a local level, at a tribal level. ...

Just like ripples in a pond. I could've come to tears when our sister was giving me that example, of family members taking your livestock, looking into the eyes of those animals. Any of you that have ever lost an animal, and to go ahead and feel that connection, and to go ahead and to put them down. There are heartfelt stories that are happening at this conference. Last night the students were able to put this into dance, and to go ahead and to share with those students, and to share the Grandfather Teachings, to share the importance of coming together in a circle.

A lot of times it takes that humility to go ahead and say, 'We don't have all the answers,' but I will tell you this, just like the Rev. Dr. Martin Luther King said, 'The time is always right to do what's right.' There's no watch there. To go ahead and to look at it. Yes, it might have happened back in 1973, but don't you feel that it's [being handled] right now, and we're going through the trauma? Where we're talking about these things that have happened, and how it's affected us? A lot of times we have to bring those resources together.

[00:52:14] Troy Techlin: We're going to talk about, certainly, coming together. I think we have done that and we've seen that we have a community here. We have

the state, the federal workers, we have the tribal area. That's where nothing gets done wrong. You don't make change as individual people, the small steps, but the big steps on working together, and that's how we do things here too. …I'm not an expert on anything, but I like to think I know a lot about a lot of things, but I always count on the experts, the local partners, and talking about coming together, and supervising. This is what we're doing.

[applause]

[00:53:07] Brittany Fremion: Thank you so much for those comments and those insights. It reminds me of, again, just how significant community knowledge is in crises like these. Jim has a sister, JoAnne Scalf, who for the past seven, I think, years has spent a countless number of hours–paid out of her pocket–to do a voluntary health study of people who grew up in St. Louis. I think she ended up having over 600 respondents to this survey. You can find a copy of some of her early results out there on the CAG table–the [Pine River Superfund Citizen] Task Force's table.

This is popular epidemiology. These are community members going out and talking to one another to get information to document their experiences. To document the health outcomes, which are astonishing. There isn't a comprehensive health study of St. Louis–of that community. Yet it's home to the chemical firm. This kind of citizen science is critical. The fact that we have citizen science is remarkable. It speaks to, again, the importance of community knowledge, and insights, and the need for the engagement of those voices, of those perspectives, of that knowledge by public officials, by researchers and scientists, by everyone in the circle. Jane had asked me, coming into the conference, if she can speak to the significance of citizen science. I wondered if you might be willing to talk a little bit about that, and then I have a question for you all.

[00:55:18] Jane-Ann Crowley: Yes, sure, thank you. Citizen science, it's a popular term, and people might say, 'what is citizen science?' Well, a citizen is a person who's a member of a community or a circle, and a scientist is a person who asks a question. They form a hypothesis, they do research to support their hypothesis, and they report their findings. Sometimes they're right, sometimes they learn something unexpected that is even more relevant and important than the original question.

I was at a conference earlier this week for data science, that's my profession, and the keynote speaker asked the group, 'What drives humanity?' Some people were kind of joking, said it's money…but then I raised my hand, and I offered what

drives humanity is the desire to know why. I talk about this a lot. Why did this happen to us? Why has this continued for 50 years? Why can't we get funding to do basic human health research? Why?

When we're children, when we ask why. We can ask why is the sky blue and why is the grass green? Our parents get tired and they say stop asking why. Eventually, we became trained to stop asking. I think it's very important for us…that we need to be asking why and not just let other people tell us to shut the f*** up.

[applause]

[00:57:52] Brittany Fremion: Powerful words. Okay. Do any of you [in the audience] have a story you would like to share?

Please watch the panel recording, hyperlinked at the beginning of this transcription, to hear the many, powerful stories shared after the panel discussion. Start at the 00:58:22 mark.

PBB HERO AWARD RECIPIENT REMARKS
PBB DISASTER AT 50 CONFERENCE

Jane-Ann Crowley
Michigan PBB Citizens Advisory Board
Emory University Leadership Committee
Pine River Task Force

Jane-Ann grew up on a farm in Remus, Michigan, with her family. They became a part of the original health registry when she was a preteen, when their farm was quarantined. Many years later she became involved with the Michigan PBB Citizens Advisory Board, the Emory University PBB Leadership Committee, and the Pine River Superfund Citizen Task Force. Jane-Ann has spoken at multiple conferences, participated in many PBB Community events, and sponsored several grant funding efforts.

Jane-Ann's comments after receiving a PBB Hero Award for her ongoing work with the Michigan PBB Registry team and leadership on the PBB Citizens Action Committee reflects the need for ongoing community involvement in PBB activism and advocacy.

Transcribed by Brittany Fremion. Please watch Jane-Ann deliver her remarks as you read the transcription below at the following hyperlink by fast-forwarding to the 00:47:00 minute mark: https://www.youtube.com/watch?v=qGo-hE1INn0&t=5184s.

Jane-Ann Crowley

Jane-Ann Crowley: I have talked to so many people who say, "I'm just one person, what can I do?" Beyond telling your stories, take a look at your skill set. Everyone has unique gifts to offer and there are so many aspects of this research and work that we need to do. Bonnie [Havilcek] makes significant contributions as a nurse drawing blood samples. I'm a data scientist and am able to work with the university to structure their data to get grant funding for further research and maintenance of the data. Jane [(Keon) Jelenek] is a writer–a journalist. She writes so much material for us.

You have skills. Bring them to us. We need you. Thank you.

The Michigan PBB Oral History Project

Oral History of JENNIFER KNOWLES

Interviewed by Kathleen M. Gregones on February 9, 2024

Transcript edited by Brittany Fremion,
Project Director and CMU Professor of History (2024)

Prepared for this collection by Jennifer Knowles,
Kathleen Gregones, and Brittany Fremion.

To be preserved in the Museum of Cultural and Natural History (MCNH)
at Central Michigan University, Mount Pleasant, Michigan 48859*

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MICHIGAN PBB ORAL HISTORY PROJECT INTERVIEW TRANSCRIPTION (EXCERPT): JENNIFER KNOWLES

Jennifer Knowles kindly agreed to an oral history interview following the PBB Disaster at 50 conference to share her experience with this large-scale contamination. She has been an engaged community member, activist, and advocate for decades, sharing her knowledge about the PBB disaster with everyone she can, including doctors and strangers at the grocery store. The following transcription reflects her lived experience both during the PBB disaster and in the decades after, highlighting the ongoing concerns community members have about their exposures, the challenges they face, and their activism.

As you read excerpts from this oral history transcription, please remember that it represents the spoken word and a conversation between a trained interviewer, Alma College student Kathleen Gregones, and Jennifer, the narrator. People do not speak in complete sentences nor can a transcript fully capture and convey the full range of emotions, cadence of speech, or nonverbal aspects of communication. Repositories–museum collections and archives–therefore often preserve both transcriptions and audio files, and researchers are encouraged to engage with both to try to best understand the nuances of speech, the relationship between interviewer and narrator, and consider the dynamic ways in which memories work.

We have done our best to convey Jennifer's story in the excerpts that follow.

Jennifer Knowles

Jennifer Knowles: Well, when I was a toddler, we lived on a dairy farm in Barryton, Michigan, in Mecosta County. I was born in 1971, so I was pretty young when the incident happened. I never know what to call it–the incident, the poisoning, the tragedy. It depends on your outlook. My parents had moved up from the Saginaw area and took over my grandparent's, their parents', dairy farm when I was three in 1974. And so that's how I came to be there. We had a dairy farm. I'm not sure how many cattle they had. At least 100 head, I'm sure of. We had other animals, horses and chickens and whatnot. I have five brothers and sisters, one younger and four older…born 1971 to 1981. There was ten years between the oldest and the youngest.

So the story goes, you know, my parents normally got their feed in Barryton at the granary there, but it had burned down. So they were instructed to get their feed from the Farm Bureau in Remus at the granary there, where the train came through, and that's where they got the contaminated feed. And so, if it weren't for that luck…

Anyhow, from what I know of, from what my parents have told me as time passed, they noticed of course the animals acting strangely. My brothers and my father, who worked more closely with the animals, with the feed and everything–sores and things on them and not feeling well. And because we were a dairy farm we drank the milk right from basically the cattle. You know, they milked day and night and they brought it in. I was a toddler, my sister was a baby, so we drank a lot of the milk ourselves, we were told probably out of all of us kids, my younger sister and I, drank and majority of the milk. Plus we had an older sister who would have been just probably going through puberty. So she drank milk and I think that affected her quite a bit too.

We also ate, you know, chickens and eggs and things off of the land. We played in the dirt. We were out there with the animals…There is, as gross as it sounds, you know, animal urine and feces all around because you're out there in the middle of it. I remember my brothers playing in a silo where the feed was and things like that…So anyhow, we were exposed to it, right to a fault. Internally and externally.

I remember as a kid when this all went down–my only memories, because like I said, I was quite young, was when this happened my parents lost the farm because they came out and took everything. My memory of it was when they sold everything off, Farm Bureau and [creditors] wanted their money, of course.

So to me it was like a fair cause I remember all these people being out there and things going on. And that was my memory of it because I was so little.

From what my parents have told me, there was no help for them. They came out, and this is kind of what gets me, they wanted their money–that with our animals, they didn't take them, shoot them, and take them off to other places and shoot them and bury them. They took the animals that looked good, took them to Clare auction and sold them off to be put into the food chain. The ones that didn't look good, they shot on site and buried them in our fields…So those animals are still there, decaying or decayed, and in that field. So then they sold off all my parents' property, they auctioned all their equipment off. Basically, signed off on the farm and they had to, you know, beg for help from welfare to feed the kids and try to find work.

That's where I get emotional [emotion] because they worked so hard and they lost everything, not knowing that [emotion] that wasn't even the trade off. That our health was going to be affected too. [emotion] But yeah, we ended up moving to Evart. [emotion]

Kathleen Gregones: If you need to take a minute, it's okay.

JK: Yeah. It's okay. We did end up moving to Evart and they kind of moved on from there. But that land was never to be farmed again–and the other farms in the area that were affected too. I know the same things happened down the road, to the cattle, the same thing. They were taken off to auction that were good enough or then buried in the yards. And then you have to think about the sewage. There were sewage ponds that were there that just dried up and put right back into the ground and that stuff we find now didn't go anywhere. It just stayed just like it does in our system. It stays in the land like down in Saint Louis where that happened, we find that it didn't go anywhere, no matter how much we dig, and they're still hauling. We went down to [St. Louis] this last spring, last year, and I was so surprised to see the EPA was still there doing their job. I went by [the Velsicol Superfund Site] a month ago and I see the EPA's gone, but I stopped at that bench. [emotion] This gets me too. [emotion] I'm still so effing mad at them. I just sat there in my car and I screamed at that bench because I am so ill these days [emotion] and I know it's linked. I know it's linked to the PBB. [emotion] Anyhow, I'm gonna go back.

I'm gonna fast forward to about 2016. I was a social worker for the Commission on Aging locally, and I went to go visit one of our new clients and I thought, 'oh, she's on Truman Road in Barryton. That's the same road our farm was on. I wonder if she's by there.' It was the same place and so I talked to her about this

and she said that when they bought the farm, it was about 1981. And that the farm was empty for about six years she thought. And I said, 'yeah, that sounds about right.' And I said, 'you guys didn't ever farm it, did you?' And she said 'yes,' they'd come from Hudsonville and they never heard of PBB, which is more on the western side of the state. And I said 'what did you raise?'And she said beef cattle and their son bought a farm down the road and raised dairy cattle. And that was another farm that had buried cattle on the land that was contaminated too.

KG: Were most of the farms by your parents' farm sold off basically after that?

JK: I think so, from what my mom said, there were several in the area because they couldn't afford it after they [lost] their livelihood and you know you can't farm again, they were told, which you shouldn't have, and these people did, they continued to farm for a couple decades. And as we know now too, the silos were never cleaned out like they perhaps should have been–properly cleaned out so anything that was put in those silos as far as feed or, you know, or stored anything was contaminated again. Everything that grew up in that dirt. I can't imagine how much contamination must still be going on in our food chain supply, if it was never taken care of. She said that they farmed for a couple of decades and never knew anything of it until I just mentioned it to her.

KG: Wow.

JK: She never even heard of PBB, and there she sat on the same site that we had had that happen. It had never been logged into any records that that farm had had anything to do with PBB, so I wonder how many, how many–if they weren't in that initial little lawsuit that happened back in the day, how many of the rest were not marked for that? I mean, so how many people are sick and don't know why?

In the next portion of the oral history interview, Jennifer talks about how her health conditions, and those in her family, have shaped her quality of life. She also talks about the uncertainty of the relationship between her health issues and PBB exposure, highlighting the significance of ongoing human health research undertaken by experts at Emory University for the Michigan PBB Registry in partnership with community members. Finally, Jennifer reflects upon the toll the PBB disaster had on her family's mental health, particularly her father's, and the threat other forever chemicals pose to public health.

JK: So, as far as myself, you know, we found out through, thankfully, through Emory University and the research, we found out a lot because the State of Michigan didn't do a whole lot for us. They followed us for 40 years. I remember as a kid, after we moved off the farm and moved into Evart, they did some blood work. They'd come and do samples–want to take fat samples from us kids. My four older brothers and sisters went down to the doctor's office and they did it, but my younger sister and I were just scared to death. 'They're gonna do what?!' [laughs] And we begged and pleaded and we would not do it. As far as I know, Emory University has not got our records. They [State of Michigan] have not released my family's records yet. I've even signed for my dead father's records. My mom signed for hers. I've signed for mine and I've asked my brothers and sisters but I'm not sure if they have or not. So as far as I know, they have not received those.

I have had my blood drawn…last year, I believe it was, [lab results] said that I'm down to nil to trace amounts [of PBB]. Before that there was some left and I'm 52. So it's taken a long time to get down to at least that mark, but I don't know what my mark was in the beginning, so I don't know where I was at. I know that people have a lot higher [levels], so I feel bad for them. But the things that I know they are finding are things that have happened to us. My sisters and I all lost–have had miscarriages. And my oldest sister died of cancer. But it's inconclusive. It was a reproductive cancer, but there were other things that came on with it that we're not sure if it's like everything else, whether it's related to PBB or not. And we have a lot of asthma in our family. A lot of allergies. I have three daughters who all started their periods as early as nine years old, which is awful young. I have gastrointestinal issues, everything from swallowing and tongue issues clear on all the way through to the other end. I have eosinophilic esophagitis, I have GERD, I have hiatal hernia, I have colitis, and I have hemorrhoids and polyps and things like that. And my father died of throat cancer and he had colon cancer. But he also smoked so it's hard to say with those things, too. I have arthritis to the point where it takes surgeries because it breaks my bones and my discs breakdown. I have different growth issues in my bones, where my right leg didn't grow right and my hip was tilted and just different things that they can't

say whether its PBB because of being poisoned or you know, different tissues didn't continue to grow right or things like that. But I have terrible migraines. I'm on disability for several different issues and I got on disability at age 50. I have different nerve issues. They can never pinpoint it. They label it as fibromyalgia, so they could treat it, but everything comes back as either negative or borderline. They could never put their finger on it. They went as far as to do a Spinal Tap because they thought I had MS, but I have–I present as everything as MS without having MS and I think I read that that's one of the newer findings they are finding with the PBB now, is they have MS-type, some symptoms. I forget my words, I have memory issues and things like that. But in my family also, we have vision problems, I had cataract surgeries early–like I just had cataract surgery. And heart problems. Just a whole host of things. [laughs] That's crazy. And it produced, you know, just a lot of stress on my folks and my dad died at 66. And my mom had health issues young, and she's still alive thankfully. My sister died at 20, though, with that cancer. …

I have asthma real bad. That started when I was young too. Now it's worked into a little bit of emphysema. It stinks. I'm on a lot of medications. And, you know, like I said, I'm on disability–on Medicare in my 50s. I'm going to have surgery on my feet because the arthritis in my right foot is really bad and that'll put me off my feet for a couple of months and, so yeah, there's a lot of issues that go on. Lots of struggle.

My brothers and sisters all have asthma. And you know, we don't know if that's something to do with PBB either. I mean, there's not much direct asthma in our family…My sisters and I, my younger sister and I, would go to the emergency room. Especially me, I would full out quit breathing and I would, I would just quit breathing. They'd have to bring me back, and I've been bagged to the hospital. I've been resuscitated several times. It didn't help that I did smoke years back, but, even when I didn't, when I was a young child before that happened, before I started drinking or smoking or anything, I would be in the emergency room quite often.

But I think the biggest impact was on my mom and dad's mental health. And then for sure on our physical health. It's just for something–I can't believe it's been swept under the rug all these years so then I get upset not at people, but at institutions when you hear about, you know, the lead and the PFAS and everything else that goes on. And I'm like, yes, take care of those people. But what about us? And all the other people that were supposed to be taken care of, or at least something done. So let's do something. I'm encouraged to see that they're trying–they're gonna do a documentary out of California. I just read about that. Yay! [laughter]

In the following excerpt, Jennifer reflects upon her experiences with healthcare providers and efforts to raise awareness among them about the PBB disaster, as well as people she encounters in her day-to-day routine. Her advocacy is emblematic of community efforts to keep the disaster and long-term health outcomes at the forefront of public consciousness.

JK: Yeah, doctors know nothing. I will go to a doctor and they'll be like PCB and I'm like no, PBB, here, let's look this up so you know. I go to get my throat stretched and they'll be, you know, whatever medicine, aesthetician, or whoever's in the room, and I'll talk to him about it and they'll be like what? And I'm like, your homework is next time I come down, you better know all about this. And they will! My gastroenterologist, when I first met him ten years ago or whatever it's been, he had no idea. He's in Grand Rapids, Wyoming. He says, 'You're telling me what? My brothers, my dad have been in agriculture all my life' and he says, 'I bet they don't know about this.' I come back the next visit, he goes, 'They knew all about this! I'm a doctor, I knew nothing!' I said, 'Yeah, and you're the same age I am.' He had absolutely–I had to clue him in. Every single person I come in contact with, I swear to God I tell, always–standing in the grocery line and I'll talk about it. Two months ago I was in Walmart and I don't even know how it came up, I was telling the lady at the cashier telling her about it and a lady behind me, she goes, 'I know all about it. I'm so sorry you went through that,' [laughs] but I'm like, this is how we fight, you know? That's how–people don't know, if they're from, you know, obviously Alma, St. Louis, living in Mount Pleasant, along that line, and if there is some age, whether they were, you know, my parents age, my age, or had a grandparent, that if we're in that little bracket, they know something about it, the rest of the state's clueless, unless they happen to be in one of those hot spots. And it's like, I can't believe, you know–I have a page on Facebook about it. And I put everything that comes out from Michele Marcus and you guys or anywhere, I put it on that page. I'm trying to let everybody know about it as much as I can. And I'll find something about PFAS and I'm like, 'hey, did you ever heard about PBB?' It's like, 'no, what?' I don't care. People should know, they just have no idea. They have no idea–then, they'll be like. 'oh yeah, I do remember something about all the food coming off the shelves back then. I had no idea what it was.' I think, yeah, you were poisoned.

In the final excerpt from Jennifer's interview below, she and Kathleen talk about historical amnesia–the lack of public memory about the PBB disaster or collective forgetting, as well as the consequences. They also consider the importance of community discussions about the disaster and sharing personal, lived experiences in the time since. The narrative closes with Jennifer's reflections on what has helped to amplify PBB stories and the significance of carrying on.

KG: It all went into the food chain, and I think that's like a big reason why they don't want people to know because these cattle were infected, they were living alongside even more highly affected cattle.

JK: Yeah, they were. It just dumb founds me in that really, that property of ours never should have been farmed again. Never should have had anybody living on it again. You know their children were grown, thankfully, but they had grandchildren. They came and played out there. They played in that dirt. So you know, who knows? Who knows what, you know, they've given to their family. So it passes on and on and on. You know, my brother, I talked to him not too long ago, he said, "yeah, one day I drove by there and that was probably about 30 years ago.' He said, 'I was home visiting. Just happened to drive by the old farm, saw a man standing out in the yard' and he said, 'I stopped by and tried to tell him about that and he ran me off.' He didn't believe him, thought he was just some crazy man. [laughs]

KG: No.

JK: Because there was nothing in the records back then, you couldn't find nothing in–30 years ago, you know. Well, we didn't really have the internet 30 years ago. …

KG: Like you said, you don't know too many other people that have been affected by PBB or that know that they have direct links to the PBB disaster. Do you think there's any way to do so, almost like a support group? Like I know a lot of people felt that at the conference, but do you think we should continue on with that, do you think it would be helpful?

JK: I think it would be great. You know, I'm a recovering alcoholic, I've been sober 22 years and you don't you know, those support groups are, they're awesome cause nobody knows what you go through. And PBB they think, well, we just get over it, that happened 50 years ago. They don't understand the emotional and physical effects it's put on people. And the last thing, in fact, it has–they don't understand they were poisoned too. They just don't understand the direct, you know, poisoning. It's terrible. …

I watched that movie with Ron Howard…'Bitter Harvest' and I found out what year that movie was made in and I'm like, really? That was 1981 or something like that! And I had never seen it, you know? People don't know about this. And I tell people about it and they're like, really, it was made this long ago and we're just now seeing it? I'm like, yes. I put it out everywhere because if Ron Howard's in it, they're gonna believe it. I am telling you if it was anybody else in that movie, they wouldn't even believe it was true. Little Opie.

KG: I was about to say America's sweetheart.

JK: Yes, and he still is. He's just grown into an honest person from an honest-looking little kid, and anything he has anything to do with, they're gonna believe. …I'm just glad that we have Emory University and I wish we could have had them sooner. And I would like to get my kids tested.

KG: Oh so, have you been tested like in recent years? Like did you get tested by Emory or did Emory just take the data from previous things?

JK: I got tested with Emory twice.

KG: I know they're working very, very hard to try to keep the Registry going and get it more streamlined so people can find out…Do you think there's a reason– also, I don't know if this is a triggering question, you don't have to answer–

JK: You're not going to trigger me.

KG: Do you think there's a reason why this hasn't been a big deal until now?

JK: Yeah, 'cause they were hiding it and then we're just–people are bringing it to light. Like I said, they had that 40 years they were following us. That wasn't to follow us. That was to silence us. That was, for whatever their reason, to keep our mouths shut, to keep somebody protected or people protected. And I'm not a conspiracy theorist. I think a lot of that stuff is B.S. This is to keep things, people, places protected for whatever reason. That's why it didn't become a big deal. Because each time I think anybody tried to talk about it before, it's been pushed down. But Emory University's research has brought it to light, that's what's brought it to light. And that's why I said thank God for them. I don't know how they picked it up or why. I mean, I think I've read about it, but whatever got their interest, thank God, because that's the only reason why it's been brought to light. Then now, people like that director out of California, people like that, people who finally say, 'hey, this isn't right and we gotta do something about it.'

Because you know what? We have our so-called Attorney Generals in Michigan. We've been writing to him for years. I have personally. Governors, attorney generals. I had an ex-boyfriend just a few years ago who was so pissed off when I told him about this story, he called that office and they told him, 'well, nobody's ever made a report to this office before.' And I said that is B.S. That is B.S. You mean no one in this entire state ever told the Attorney General that we've been poisoned by PBB and we want something done about it? He said, 'yes, that's what they told me.' I said, 'oh, okay, I don't buy that.' So yeah, I saw. You know, some things, I'm not a big–I hate to say the word 'Bible Thumper,' but I'm religious. Spiritual, whatever. But sometimes some things are kept behind light and it's brought to light when the time is right, I guess, when there's a time of reckoning for things. And I guess it's a time of reckoning when we can actually have somebody like Emory University to have the proof behind the pudding. Maybe that's why.

KG: So kind of like one last question. What do you think the conference and now everything that's going off from that, like the historical side, because I know like CMU, like the oral history program is now working with Emory, and now with the documentary coming out of California and our own little small documentary coming out of the conference, and now this book. Do you feel like this is, like now's the time to start really pushing for, I guess, restitution I guess and closure? Do you feel like these movements will help people get that closure?

JK: I doubt anything monetary will ever come of it because who are you gonna hold responsible. But I think validation is a big thing. [emotion and long pause] Just so we know, we're not crazy. [emotion and long pause] I'm going through the process of trying to figure out what my medical problems are. I have literally been poked and prodded. They've taken out–they call fibroticious plugs, where they take little plugs out of my legs of skin and tissue where they can test your nerves. They've hit me with EMG's where they test my nerves, and that's electrodes that go through your body and pulses to your brain and back through. Like I said, I've had a spinal tap. I've actually glowed from all the tests. I've had MRIs and CAT scans and just everything. To be told they really don't know what's wrong anyways [emotion] and I know it has to do with PBB. A lot of it. And I just know in my mind, if we could validate some of this research. To come back to this PBB, that I would feel like I'm not crazy and that people would think that I'm not some kind of, ugh, not just always looking for attention or something. I just want help. [emotion]

And just to validate what happened to my parents. You know, like I said, it's not on the books that that land had PBB. And I'm so pissed off about that, that other people farmed that land. And then they were, they were poisoned. There's no doubt about it, my mind. So validation, whatever you want to call it. Yeah, let's shed some light. …

The problem is a lot of people from back in that day are gone. And they're not gonna have to answer for it. And we may not ever have answers, but at least let's look at it. In an honest [way]. What I want is those records released, that we initially had from back in the day. Everybody's blood samples, all of our information. There's no reason for them to hold that under lock and key. That was the 40 years. That's up. They need to give it up. We need to know what our blood levels were back then, our PBB levels and things. You know, my brother and sisters didn't go down there and have their fat tissue samples taken for nothing. I didn't put up a protest for nothing. Let's not let those people die in vain or be sick in vain, or lost their livelihoods and you know. Hopefully my sister didn't die in vain, if that's what she died from. Or our lost babies. So let's do something. Let's do it, and that's what it should be about. …

A MOTHER'S DIRE PLEA FOR HELP

Joy Vosburg

Joy Vosburg

I was raised on a second-generation family farm in southwestern Michigan. My family raised livestock and grew crops there for our livelihood. To meet the demand required by the size of our herds of cattle and hogs, feed was purchased from the Farm Bureau feed mill in Battle Creek. In 1973, unknown to my parents, PBB had been mixed into the feed delivered to our farm instead of nutrients. PBB is a fire retardant made from chemicals harmful to animals and humans. This was the beginning of the poisoning of the livestock, of the land, and generations of my family!

Out of nowhere a loud rumble of livestock trucks and police cars stormed our property, blocking our driveway and front yard. Without warning, they informed my parents that our farm was quarantined and loaded up all of our livestock. The men, trucks, police, and police cars left as fast as they appeared with all our livestock. They left us without a way to survive and they did not pay for any of the animals that they took. My family was not reimbursed for the loss of use of our land either. I couldn't understand why my family was treated so badly and had no rights. They treated us like it was all our fault! We survived because of the help from our friends, community, and church family.

I lived on my family's farm at the time of contamination in 1973, having just graduated from high school the year prior. I married in 1974. Our family grew quickly. My son was born that year. My daughter was born in 1976 and I gave birth to twins in 1980. My son always had a basketball in his hands and dreamed of playing college ball. His junior year in high school we talked with scouts. But he became sick with IBS and did not play his senior year. In 2018 he became very sick. His doctor sent him to Cleveland Clinic, where he was treated for colon cancer and had his large colon removed. He had three surgeries and is still dealing with meds to control inflammation. My son's daughter has hypothyroidism and had heart surgery at the University of Michigan. She played Volleyball in High School. She was very good but limited by health issues.

My oldest daughter was top of her class and played basketball and volleyball. During highschool she had problems with stomach pain and choking. She now has thyroid problems, Hashimoto's disease, chemical sensitivities, weight gain, and eczema. My oldest daughter has two daughters. They both have allergies and chemical sensitivities, and her oldest daughter has ADHD.

My oldest twin daughter has been going to doctors for the last three years to find out why her body can't keep a stable level of ferritin in her blood. She has to have infusions to stay alive. She also has chemical sensitivities, Hashimoto's disease, and pain from fibromyalgia.

My youngest twin daughter has the fewest health problems, but has issues with her tonsils and choking. Her oldest child, a daughter, has ADHD. Her son has bad allergies and also had his tonsils removed at a young age.

As the years passed, Mom mentioned problems with her thyroid and issues with the medicine she took for it and osteoporosis. Dad had problems with his heart and diabetes. One night I received a call from him. He said to pack a bag and come home, that he needed help with Mom. We found out Mom had colon cancer and, soon after, we found out Dad had cancer too–non-hodgkin's lymphoma. Dad's doctor said it was caused by chemicals from his work as a farmer, exposures he passed on to Mom. Dad's oncologist studied cancer and how chemicals affect farmers' health in Mt. Pleasant, Michigan. It was 2009 and he didn't mention PBB specifically, he just mentioned chemicals. This was also before my first community meeting for the Michigan PBB Registry with Emory University and meeting Dr. Michele Marcus. I became Mom and Dad's caregiver until they passed away; Dad had a major heart attack and Mom passed from complications of colon cancer surgery. But we beat cancer. They had a great team of doctors.

I too have thyroid issues and take medication. Like my Mom, I have osteoporosis but do not take medicine because of chemical sensitivity. My thyroid medicine has to be gluten-, dye-, and preservative-free. I also have Hashimoto's disease.

We need to be able to get blood tests for PBB, which gives doctors a place to start instead of testing for years and still not knowing what is wrong. We need understanding doctors with knowledge about the history of PBB and how it passess from the mother to the fetus in the placenta. We need doctors who know that our bodies have PBB exposure–exposure to an endocrine disrupting chemical. We are not making excuses that chemicals affect us differently nor do we want our concerns or experiences to be dismissed. Rather, we need help. I want doctors to hear our pleas and respond to our needs. I want them to know about a desperate call from my daughter, where she said, "Mom nothing helps! Please, I just need help! Who can help me!"

THE PBB DISASTER: REFLECTING ON THE PAST AND ENVISIONING THE FUTURE

Michigan PBB Registry, Emory University

Research Team: Michele Marcus, Lead Scientist; Metrecia Terrell, Biostatistician; Robert Hood, Epidemiologist; Hillary Barton, Project Manager, and Melanie Pearson, Director of Community Engagement

The Michigan PBB Registry, comprising over 7,500 individuals impacted by PBB exposure, is a collaborative, long-term research initiative. Through a community-academic partnership, we aim to understand the lasting health effects of PBB exposure. Our efforts include researching PBB health risks (yielding over 60 scientific publications), mentoring over 100 graduate students, hosting numerous community meetings to share research findings, and actively incorporating community feedback and insights into the research. Our overarching goal is to conduct impactful and community-driven research that serves the needs of those affected by PBB exposure.

Website: https://pbbregistry.emory.edu/
Facebook: www.facebook.com/PBBRegistry

Michigan PBB Registry, Emory University

The PBB Disaster, a catastrophic event that occurred over 50 years ago in Michigan, has left a lasting impact on the affected communities and the environment. The Velsicol Chemical Company plant in St. Louis, Michigan, closed its doors in 1978, leaving behind a toxic legacy of three superfund sites and a contaminated residential neighborhood that persists even after five decades. In 1973, the company shipped PBBs instead of nutritional supplements for livestock feed, leading to the largest agricultural disaster in U.S. history. Millions of Michigan residents unknowingly consumed tainted farm products, resulting in lasting health consequences.

The Michigan PBB Registry, established in 1976, is a long-term research study involving over 7,500 individuals affected by PBB exposure. Research findings have demonstrated that PBB disrupts the endocrine system and that those exposed face significant health risks, including thyroid problems, lymphoma, gastrointestinal cancers, and breast cancer. Unfortunately, the children of those exposed also experienced increased health risks: earlier menarche and miscarriages among female children and more urogenital problems among male children. Many of these health effects have been documented in those born years after the initial contamination.

While there are many lessons to be learned from the PBB Disaster, one crucial lesson is the power of an affected community diligently pursuing knowledge and seeking justice. The discovery of the contamination and the subsequent commitment to human health research and environmental clean-up were driven by the determination of the community members impacted by this tragedy. Their perseverance in demanding accountability and seeking answers has been instrumental in uncovering the long-term health impacts and bringing attention to the ongoing environmental and economic repercussions.

Another important lesson is the recognition of the disaster's long-term, multigenerational impact. The PBB contamination occurred half a century ago, yet its effects persist today. This disaster serves as a stark reminder that the consequences of environmental negligence can endure for generations, necessitating continued research, remediation, and support for affected communities.

To address critical, ongoing community needs, it is essential to continue health research to better understand the full impact of PBB exposure in Michiganders and its associated health risks. Medical monitoring should be provided for individuals at risk of negative health outcomes, regardless of their access to medical insurance, to ensure early detection and intervention.

Over the decades, various stakeholders have contributed to addressing the PBB Disaster. The diligent work of a farmer-scientist played a crucial role in uncovering the contamination, highlighting the importance of community members in science. Furthermore, the affected community's request to allow state health department records to be available for research purposes facilitated ongoing PBB research. The PBB Citizens Advisory Board, the Pine River Superfund Citizens Task Force, and the Mid-Michigan District Health Department co-lead the PBB Research, ensuring that the research addresses community concerns and leads to tangible benefits for those affected. PBB Community members share their stories, concerns, and experiences at community meetings across the state, ensuring that research remains community centered.

Attending the 50th Commemoration of the PBB Disaster was a poignant experience for the PBB Research Team from Emory. It reinforced the importance of ongoing research as the disaster continues to impact health and quality of life, not only for those directly affected but also for future generations. The conference served as a reminder of the collective responsibility to prevent environmental disasters and support communities in their recovery.

In conclusion, the PBB Disaster serves as a sobering reminder of the far-reaching consequences of environmental pollution and the importance of community-driven efforts in seeking justice, conducting research, and cleaning up the contamination. As we reflect on the past, it is crucial to apply the lessons learned to other contaminants currently polluting numerous communities across the country. We need to work harder to prevent pollutants from entering our food and water supply and to support affected communities in their path to recovery. The 50th anniversary conference provided a platform to honor those impacted by the disaster and renew the commitment to safeguarding human health and the environment for future generations.

“SHARED SPACE - NEVER FORGET”

Debra Shore
Regional Administrator
Great Lakes National Program Manager,
U.S. Environmental Protection Agency

U.S. Environmental Protection Agency (EPA) Region 5 Administrator, Debra Shore, attended and delivered opening remarks at the PBB Disaster at 50 Conference. Following the event, she shared her reflections on the disaster with Region 5 staff in a digital newsletter, which are reproduced below with her permission.

Debra Shore

I didn't know. Until I began preparing for a visit to the former **Michigan Chemical Company site** in St. Louis, Michigan along the Pine River, I didn't know this plant was the genesis of one of the worst chemical disasters in US history. Yet it seems to have been forgotten. I didn't know that nine million people in Michigan had drunk contaminated milk or eaten contaminated meat and dairy products, after the highly toxic fire-retardant chemical known as PBB (for polybrominated biphenyl) had been accidentally mixed into cattle feed. I didn't know that 30,000 head of cattle had to be killed; that a few dogged farmers insisting that something was wrong with the feed were instead blamed for poor management of their herds; that state and federal agencies were catastrophically slow to act commensurate with the damage. I didn't know that the parent company, Velsicol, declared bankruptcy and ultimately paid a fraction of the costs of cleaning up the contaminated soil and sediment caused by its careless, unknowing, and persistent release of toxic chemicals into the Pine River and at its plant. I didn't know that the contamination of food and the people who consumed it would cost more than $480 million – so far – and that the cleanup of the Superfund site and Burn Pit are still underway.

"Why do we remember what we remember and why do we forget what we forget?" asked UC Berkeley Professor **Elena Conis**, keynote speaker at a conference commemorating the 50th anniversary of the PBB disaster in Michigan hosted by Alma College in Michigan. An historian of medicine, public health, and the environment, Professor Conis told of searching through a trove of documents made public during the tobacco litigation and finding a memo proposing a new campaign to resurrect DDT (which had been banned in the US in 1972) for use against malaria in Africa. The author, she discovered, cared less about malaria than about launching a subversive effort to challenge regulations governing harmful chemicals. This led to her book, titled *How to Sell a Poison: The Rise, Fall, and Toxic Return of DDT* (New York: Bold Type Books, 2022).

I had been invited to provide opening remarks at the conference and – in preparation – watched a 1981 movie about the PBB disaster called ***Bitter Harvest***, starring Ron Howard as the Michigan dairy farmer Rick Halbert, who saw the first damage of PBB consumption on his herd of dairy cows and who latched on and wouldn't let go until he found out what was wrong. I also began reading *The Poisoning of Michigan* (East Lansing, Michigan: Michigan State University Press, 2009 [1980]) by Joyce Egginton, which thoroughly **documents the tragedy** that unfolded in 1973 and 1974 in Michigan.

The PBB disaster in Michigan, following the publication of Rachel Carson's indictment a decade earlier of DDT and other synthetic chemicals that caused devastating environmental damage, eventually led to the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – otherwise known as Superfund – enshrining the foundational principle that the company (or person) responsible for polluting the environment must pay for cleaning it up.

Now I know. It's all here. Embedded in Region 5. In our fatty tissue. In our DNA. In our history, our narrative, our purpose, and our mission. We're cleaning it up.


of Michigan
EPA

A MOVING EXPERIENCE

Dr. Sheryle Dixon
Assistant Professor of Philosophy and
Director of Grants Support, Alma College

Dr. Sheryle has taught and researched in the areas of aesthetics, fine arts education, philosophy of sport and grant writing. Currently, she teaches at Alma College as well as assists her colleagues in writing and managing grants.


GEBS

Sheryle Dixon

"I've had 10 miscarriages," "we had to bury our baby daughter who suffered a heart defect," "did I do the wrong thing by nursing my baby?" – these were stories heard at the "PBB at 50 Conference." These stories have to be heard by more people; people who can try to make a difference – who can help the people who are still suffering and make sure something like this does not happen again.

I moved to Alma, Michigan, in 2003 from Canada. I had not heard of the PBB disaster in Central Michigan. The strange thing is that, even when moving to a town three miles from where the disaster began, I only heard about it because one of my colleagues at Alma College had written a book about it. What is even stranger is that my children, who went to school in Alma, had never heard of the PBB disaster - one of the largest environmental disasters in America.

I am a professor and have attended countless conferences in my career. I must say that the "PBB at 50 Conference" was the most moving conference I have ever attended. Never have I seen a box of tissue on the presenters' table; never have I found myself wiping away tears. The moment that stands out for me as one of the most moving was when a presenter started the panel discussion saying that she had had 10 miscarriages! I have had one – and it was devasting; and this woman had 10. The next speaker on the panel was a doctor who had researched PBB in the 1970s. He had found a connection between high levels of PBB and miscarriages and birth defects. However, he had been discouraged from sharing these findings! I was still in shock from this statement when another speaker on the panel shared the story of burying his baby daughter – who had died of a heart defect!

How can we hear stories like this and not feel motivated to do something? When I started planning this conference, I was thinking that we had to share a history to make sure something like this does not happen again. However, as the conference progressed and I heard more stories, I realized that this is not only an issue of sharing the past to avoid a repeat situation, it is an issue of helping people who are still suffering today. PBB is a forever chemical. I had no idea what that meant until I was in a session and a woman spoke up, holding back tears, asking if her daughter's recent miscarriage is a result of the woman having breastfeed her daughter, born during the PBB disaster. Her story was heart-wrenching – "I thought we were supposed to breastfeed our babies; I thought I was doing the right thing."

Not only are people suffering who were part of the disaster, people who were not even there could now be exposed. One of the members in the audience shared a very moving story. She spoke of the situation where farmers were supposed to bring their fire-retardant laced cows to Kalkaska burial site. However, some farmers could not bear to bring their cows to a mass grave so they shot their cows themselves and buried them on their own farms. The woman speaking was almost pleading, "do we know where these farms are? Could we be building houses on PBB infested ground?"

There are so many issues raised in the stories shared at the conference. Just as this was the most moving conference I have ever attended, it was the one that I left feeling so motivated to do something with what I had heard! I think the first thing to do is to get these stories out to more people – hence, this book. This book, along with other information (including a website and documentary), would be useful in creating curriculum that local schools (and schools across the country) could use in sharing the story of this environmental disaster. Alma College received a grant from the EPA (Environmental Protection Agency) and part of this grant will fund the creation of curriculum as well as a website and documentary.

What awareness of this disaster should bring is not only the communal desire to avoid such a disaster in the future, but also the desire to help the people who are still suffering. One of the stories from an audience member concerned her reproductive health issues and her high level of PBB. Her doctor did not believe there was a connection. However, the high levels of PBB in this area as well as the high levels of certain cancers and reproductive issues needs to be taken seriously – at least doctors should be aware of this possible connection. One way more data can be collected and people could find support from others who may have experienced similar issues is to host workshops for people affected by the disaster. Once again, the EPA grant provides funds for these sorts of workshops.

The "PBB at 50 Conference" was incredibly moving; with stories that brought me to tears. However, these stories also inspired me to want to do something to help make sure this does not happen again and to help the PBB community. I am grateful that Alma College received an EPA grant which will help create awareness and help those for whom this disaster did not end 50 years ago.

CONCLUDING REMARKS AND REFLECTIONS

Britanny Fremion
Professor of History, Central Michigan University (CMU)
Project Director of the Michigan PBB Oral History Project
Officer for the Pine River Superfund Citizen Task Force
Member of Emory University's PBB Leadership Team

Brittany Fremion is a Professor of History in the Department of History, World Languages & Cultures at CMU. She began her partnership with PBB community members in 2018 when she helped pilot and establish the Michigan PBB Oral History Project in collaboration with Emory University's Michigan PBB Registry Leadership team and partners at the University of Michigan. Brittany is the current chairperson of the Pine River Superfund Citizen Task Force, a community advisory group (CAG) in St. Louis, Michigan, working to address contamination in the watershed from the chemical firm responsible for the PBB disaster.

Britanny Fremion

During the PBB Disaster at 50 conference community members and partners shared their memories and knowledge, voiced concerns about both the present state and future of human health, and identified questions that remain unanswered. Several themes emerged during the three-day conference, which underscore the significance of the PBB disaster as well as demonstrate that efforts to address it are far from over.

Accountability. In the 1970s community members called upon public and elected officials, state and federal agencies, and Velsicol Chemical Corporation and Michigan Farm Bureau to address the PBB disaster. They protested at the state capital and during public hearings. They called upon the Michigan Department of Agriculture, the then-Department of Public Health, and the Department of Natural Resources for help. Community members—and the state—looked to the US Food and Drug Administration and a consortium of federal health agencies for guidance. They sought assistance from the governor as well as local and state representatives. Today, the call for accountability persists. The call can be heard in the work of the Pine River Superfund Citizen Task Force, which holds the US Environmental Protection Agency and Michigan Department of Environment, Great Lakes, and Energy accountable in the clean-up of the Velsicol Superfund Sites in St. Louis. Accountability can be found in the collaboration between the Task Force and PBB Citizens Advisory Board, both of which work closely with the Michigan PBB Registry team at Emory University to identify long-term health outcomes from PBB exposure. This partnership grows accountability of the Michigan Department of Health and Human Services to address PBB community health and wellbeing. Their work includes tireless efforts to acquire funding to continue PBB Registry research that can provide answers to the many questions and concerns about community health. The drive for accountability is ongoing.

Community power. Former state representative Francis "Bus" Spaniola and Edie Clark, a former aide to representative Bobby Crim, helped spearhead legislative initiatives to address the PBB disaster and remarked upon the significance of community power. During their panel discussion, they reminded participants, "don't underestimate your strength." The PBB community is strong. Their participation in and support of this conference, marking 50 years, is a powerful example of their strength and commitment to raising awareness about the disaster. The community includes farm families, chemical workers and their families, St. Louis residents and environmental advocates, Michigan resident

consumers, physicians and veterinarians, attorneys and journalists, and citizen scientists. They represent the nearly nine million people exposed. Their descendants—kids, grandkids, and great grandkids—are community members too, and for whom many take action. During a conference panel, Saginaw Chippewa Indian Tribal Elder Joseph Sowmick spoke about the relevance of the Seven Grandfather Teachings, the Seventh Generation Concept, and the importance of "coming together and being 'a part of a the circle.'" His comments remind us that we must seek out and amplify missing or lost stories, and the significance of taking action now for future generations.

Why? There are many 'whys' tied to the PBB disaster. During her opening keynote address, Elena Conis, UC-Berkeley historian, provided answers to three important questions about chemical exposure: what stories are told, whose stories are shared (and whose are not), and why these disasters happen. Her answers to the first two resonate with the emerging themes identified here within. Regarding the latter and perhaps most notably, she made the case that we have an inadequate and deeply flawed approach to responding to large-scale contaminations and exposures: one at a time. Rather than address one at a time, scientists, manufacturers, and policymakers should consider entire classes of chemicals and heed the precautionary principle. The 'whys' behind the PBB disaster prompt us to reevaluate our response to large-scale contaminations and apply knowledge learned from past mistakes to prevent future disasters.

The significance of historical knowledge. Several participants observed that we haven't learned from the past because these disasters keep happening. Bus Spaniola argued, "community safety has to be a number one priority." What lessons can we learn from the PBB disaster to better respond to community needs in the present and future? Perhaps we can continue to document community stories and seek to learn from them. Vintage signs and artifacts shared by members of the Pine River Superfund Citizen Task Force, as well as the many histories and memoirs sold during the event, lend additional insight and provide important context for the PBB disaster. They also serve as a reminder that community papers and collections provide critical documentation from their perspective, as emphasized by CMU Clarke Historical Library Archivist, Marian Matyn. Nick Dixon, Alma College Dykstra Professor and Chair, spoke about the ways in which philosophy, morals, and ethics drive laws and policy, and therefore action. They too have a history. Artwork developed for the conference and displayed throughout the proceedings provided visual interpretations of the disaster 50 years later. The Humanities can lend additional insights and offer perspectives that help us to better understand the PBB disaster, as well as guide us forward. The fact that the conference was sponsored by a Humanities Grant from the Michigan Humanities Council is another testament to this.

The importance of listening. As members of a civil society, we must be willing to hear community concerns. We must seek community knowledge. For instance, community member Jane-Ann Crowley spoke about references to the PBB disaster as an "accident." She asked, "when does something stop being an accident?" In doing so, she pointed to the neglect of community concerns and observations, the dismissal of collective and individual pain by those in power. The conference's inclusion of oral histories via podcasts, panels with community members, and open discussions where additional testimonies were shared further underscore the importance and diversity of individual experiences and the insights they can glean.

Collaboration. Collaboration between community members in civic organizations and their partnerships with researchers is a powerful characteristic of the PBB community. It is embodied in the model of community-engaged participatory research implemented by Dr. Michele Marcus, environmental epidemiologist and lead scientist for the Michigan PBB Registry, and her team at Emory University. The continuing medical education course the Registry team is developing with Full Tilt Ahead is a product of that work. Using PBB as a case study and by directly engaging community stories, the course will educate healthcare providers about the disaster, something community members have identified as a critical need. The conference is another example of collaboration between multiple stakeholders: Alma College, the Task Force, Mid-Michigan District Health Department, the PBB Citizens Advisory Board, Emory University, the Saginaw Chippewa Indian Tribe, Central Michigan University, Michigan Department of Health and Human Services, and the US Environmental Protection Agency.

The future. Over the past 50 years community members have consistently pointed to the importance of taking action now to protect future generations. How can we build upon the momentum of the conference? For example, might we form a PBB Community Youth Caucus to help engage and mobilize a new generation of community members? This work needs to be carried forward, perhaps through partnerships with Alma College and CMU, as well as local high schools. We might also seek to engage migrant farm workers and their families, as this community is missing from our circle. Our work is not done. And we invite you to help us as we move forward, together.

As we reflect on the PBB disaster, it is clear that the work is far from over. The lessons learned and the ongoing efforts of the PBB community serve as a call to action. Engaging with public officials, community partners, experts, and research sponsors, as well as growing our circle is essential to support and sustain the momentum gained at the conference so that together, we can ensure a safer and healthier future for all.

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DIGITAL RESOURCES

The PBB Disaster at 50 Conference website (2023)
https://storymaps.arcgis.com/stories/c2128b4087d647babfd65533a29d83d1

Alma College Histories & Mysteries Podcast (2023)
https://open.spotify.com/show/6FwbCurvDVDAEIeTG42W9q?si=2885cbabd8494933

The Michigan PBB Registry, Emory University
https://sph.emory.edu/pbbregistry/index.html

"The History of PBBs in Michigan," Michigan Department of Health and Human Services
https://www.michigan.gov/mdhhs/safety-injury-prev/environmental-health/topics/dehbio/pbbs/history

The Pine River Superfund Citizen Task Force, St. Louis, Michigan
https://www.pinerivercag.org/

Velsicol Chemical Corp. Superfund Sites, St. Louis, Michigan
Former Plant Site:
https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0502194
Burn Pit Site:
https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.redevelop&id=0510389

Mid-Michigan District Health Department
https://www.mmdhd.org/

U.S. Environmental Protection Agency, Region 5
https://www.epa.gov/aboutepa/epa-region-5

FILM & MOVING IMAGES

The Poisoning of Michigan, Thames TV (1977)
https://youtu.be/Ow3QdICXzas?si=Rik7g1Rwo_sq3FlM

Bitter Harvest, TV Movie (1981)
https://www.imdb.com/title/tt0082077/

Cattlegate: Documentary, Thaos Land & Film (2011)
https://www.taoslandandfilm.com/independent-films/Cattlegate-Michigan-PBB-documentary

Valerie Lego, "Tainted Michigan: 40 Years of PBB Contamination" (2019 documentary)
https://youtu.be/qhJNpIKQvuc?si=a8Uu_TMod6SkDfSA

Matt Jaworowski, "PBB: How a simple shipping error poisoned most of Michigan," Wood-TV 4-part series (2023)
https://www.woodtv.com/news/michigan/pbb-how-a-simple-shipping-error-poisoned-most-of-michigan/

PUBLICATIONS: PRINT & DIGITAL

Carrie Arnold, "Uncertain Inheritance: Epigenetics and the Poisoning of Michigan," *Undark Magazine* (2017) https://undark.org/2017/12/18/pbb-michigan-epigenetics/.

Edwin Chen, *PBB: An American Tragedy* (Prentice-Hall, 1979).

At the time of his authorship, Chen was a reporter for the *Detroit News*. The book recounts the perseverance of individual farmers, veterinarians, and researchers in the face of ridicule, denials, false news, and ambushes from government agencies. As the editor of the *Atlantic Monthly* wrote at that time, "Neither corporation nor public health officials can be counted on to act responsibly on behalf of the society that supports them."

Elena Conis, *How to Sell a Poison: The Rise, Fall, and Toxic Return of DDT* (Bold Type Books, 2022).

Conis delivered the keynote address at the conference and has followed the work of the Pine River Superfund Citizen Task Force, as well as explored the history of the PBB disaster and Michigan Chemical/Velsicol Chemical's production of DDT. Her book explores "The story of an infamous poison that left toxic bodies and decimated wildlife in its wake is also a cautionary tale about how corporations stoke the flames of science denialism for profit…In an age of spreading misinformation on issues including pesticides, vaccines, and climate change, Conis shows that we need new ways of communicating about science—as a constantly evolving discipline, not an immutable collection of facts—before it's too late."

Thomas H. Corbett, *Cancer and Chemicals* (Nelson-Hall, 1977).

In his book, Tom Corbett, M.D. and MPH, explores the consequences of chemical contamination and environmental diseases. Chapter 10 specifically addresses the PBB incident. Corbett is credited with alerting the state to the potential human health risks from PBB exposure in the early 1970s. As a result, his book is a call to action. He argues that prevention is key, insisting that cooperation among government, industry, and communities is the only way we can "achieve new, life-affirming alternatives to the pollution that has created and is enlarging the chemical connection to cancer."

Thomas H. Corbett, *PBB: An Environmental Disaster: Michigan Chemical Poisoning Reverberates 50 Years Later* (Mission Point Press, 2023)

"This investigative probe by Corbett unveils the chilling consequences of environmental pollution that threaten to change the DNA structure of future generations. They affect our reproductive ability, our embryonic development, our biochemistry, our brain development and thought processes, our cultures and even evolution itself. Board-certified in occupational and environmental medicine, Corbett meticulously unravels the timeline of events, the harrowing repercussions on both humans and animals, and the arduous efforts made to rectify the situation. Questions of justice loom large."

Joyce Egginton, *The Poisoning of Michigan* (second edition, Michigan State University Press, 2009).

This book was originally published in 1980 by the author, who was then the New York Correspondent of *The Observer* newspaper in London. Happily, it was reprinted by MSU for twenty-first-century readers. It meticulously and compellingly recounts the history of the PBB Disaster through the voices of those involved. As the director of the Sierra Club states, "Even more sobering today, however, is the realization that many of the protections which arose out of this tragedy have been weakened, set aside or simply left unfunded…"

Frederic & Sandra Halbert, *Bitter Harvest* (Wm. B. Eerdmans, 1978).

Later made into a movie by Ron Howard, this is the story of one farmer's search for the contaminant that had sickened his cattle. Because Rick Halbert held a master's degree in chemical engineering, he had the knowledge to recognize the cows' symptoms as caused by a foreign substance in the feed. Despite pushback and ridicule from government agencies, he persevered until he learned that PBB was the culprit.

Jane Keon, *Tombstone Town: Left for Dead, Marked with a Tombstone, a Toxic Town Fights Back* (2015).

The author is a founding member of the Pine River Superfund Citizen Task Force in St. Louis, Michigan, and her memoir recounts the struggles and successes of the group as it oversees the cleanups of three Superfund sites, a radioactive site, and a wildlife toxicology study that showed robins are still dying of DDT poisoning from the Velsicol Chemical Corporation. After the first EPA 1980s remediation of the chemical plant Superfund site, in place of a typical sign, the government agencies erected a tombstone to mark the spot of the dead and buried chemical company, and they predicted the town would die, too.

Edward Lorenz, *Civic Empowerment in an Age of Corporate Greed* (Michigan State University Press, 2012).

This book examines the intersection of corporate irresponsibility and civic engagement, using case studies from the seven most contaminated Superfund sites in the U.S. The corporate underbelly of Velsicol Chemical Corporation is exposed, including its decision to manufacture PBB when Dow and Dupont had considered it too dangerous, and Velsicol's poor management practices that led to the 1970s PBB Disaster. The author is the Reid-Knox Professor Emeritus of History at Alma College, and a founding member of the Pine River Superfund Citizen Task Force.

Valerie Suszko, *Helpless and Hopeless: My Personal Memories of PBB, a Michigan Agricultural Disaster* (2010).

Each chapter of this memoir is accompanied by newspaper articles, photos and documents from the time of the PBB Disaster. The author's family farm was located in Gibson Township, Bay County, Michigan. It is a treasure of saved history.

Lois Touzeau, *Our Side of the Story: Other Victims of PBB Contamination in Michigan* (Vantage Press; 1985).

The author is the wife of the former plant manager, Charles Touzeau, of the Velsicol Chemical factory in St. Louis, Michigan. Her story tells of the indictment of her husband for the accident of sending bagged PBB instead of a mineral supplement to the Farm Bureau Services facility where it was mixed into livestock feed, and also points out how 300 people lost their jobs when the State forced Velsicol to leave Michigan.

RESEARCH COLLECTIONS & REPOSITORIES

The Clarke Historical Library, Central Michigan University

Home to a growing PBB community collection, the Clarke preserves critical records tied to the PBB disaster, such as Dr. "Doc" Alpha Clark's personal papers, Alfred and Hilda Green's papers, Patricia (Miller) Kidder's papers, Ric Halbert's papers, the Pine River Superfund Citizen Task Force collection, and more.

The Museum of Cultural and Natural History, Central Michigan University

The Michigan PBB Oral History Project materials will be donated to the Museum at a future date. The Museum preserves many significant material culture and biological specimen collections, in addition to housing oral history materials relevant to the university and mid-Michigan communities. The Museum is also a learning laboratory for CMU students and provides educational programming for primary and secondary schools.

The Archives of Michigan, Lansing, Michigan

The state archive preserves agency and county records related to the disaster, such as the Michigan Department of Public Health, Department of Agriculture, and Department of Natural Resources.