LEGACIES OF INDUSTRIAL CONTAMINATION: VOICES OF RESISTANCE IN WHITE LAKE, MICHIGAN

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Abstract

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This research presents a case study of resistance to contamination from three large chemical plants by activists in the communities of Montague and Whitehall located on White Lake, Michigan. Although clean-up efforts have met state and federal guidelines for brownfield and Superfund sites, the people and community of White Lake have continued to be vigilant regarding environmental protection and harbor many concerns regarding their future and redevelopment of sites that are likely still contaminated.

The connection to place and sense of community that the residents of White Lake honor is the foundation of their resistance. Using data collected from semi-structured interviews and archival research, this study addressed the community's resilience towards the generation of industrial pollution, the residents' perceptions of place, concerns about their environment, and the role activists played in their community's socio-ecological resilience. By sharing the narratives of local White Lake activists, my hope is that these stories of resistance and dissent will strengthen the socio-ecological resiliency of this community and other communities facing similar situations.

Acknowledgements

It takes a village.

To change.

To resist.

To scream at the top of their lungs, “NO MORE!”

To make a home.

This is the story of my home.

And the warriors who call it home.

Their names may have been changed to protect their identities, but I assure you,

it does not stop their voices.

And for that, I thank you.

And for Penny Lane, who never left my side the whole time I wrote this.

(I love you).

Table of Contents

List of Figures

List of Appendices

Introduction

"Dissent without action is consent."

- Henry David Thoreau

Mary and Ken Mahoney had just bought their first house on White Lake as a wedding present to each other. They were young, happy, and excited for a future together. After whisking off to their honeymoon, the two came home to their beautiful abode. They remember leaving the windows open while they were gone, allowing the fresh paint to dry and the fumes to air out while no one was home.

Upon their homecoming, Mary recalled seeing her newly painted window sills caked in a black soot. The candle sticks and champagne glasses, wedding presents from loved ones, on the dining room table had been coated as well. The happy couple knew that there had to have been a 'release' while they were gone, from one of the chemical companies down the road. These releases happened more often than not, but now they seemed to occur at night, so people didn't notice them as much. They smelled awful, you could identify which company had done which release if you got to know the chemicals well enough. C-56, that was a smell you never forgot.

This was cause enough for Mary and Ken to become catalyst in their own communities- to turn to activism and fight the good fight against the local plants of DuPont, Hooker, and the Tannery. They were done being victims in their own community- they were done seeing White Lake change for the worse. "The whole

community strives because of the lake, you mess with the lake, you mess with the community," Mary stated in a 2013 interview. She continued,

> I always thought the government was going to protect us… They aren't going to let this happen if there's harmful chemicals. And then, I found out that no, they don't know what's going on- WE know what's going on. (Mahoney, 2013).

Mary and Kent were two of the first residents in the White Lake area to become aware of the disturbances from plants like Hooker and DuPont, and spent the rest of their lives fighting for justice and their community.

The following research explores the history, regulation and legacy of industrial plants in White Lake and shares more stories like the Mahoneys' and other crusaders who helped change the local perspective on the environment and the community's well-being. These stories are told to inspire education, to teach vigilance, and encourage dissent among those who wish for a healthier community in the shadows of large, corporate, industrial polluters.

Nearly every corner of the world experiences industrial contamination. Pollutants have made their way into the air we breathe, water we drink, and homes we live in. They have degraded watersheds, created holes in the ozone, and made ghost towns out of once vibrant communities deceived by the promise of jobs, wealth, and economic stimulus. In other cases, and such cases are not well documented or reported about, towns and communities have persisted despite the contamination and their residents have been able to achieve environmental justice by utilizing their social and political power, forcing industries to clean up the mess they had left behind.

The United States, for example, is currently home to 1,347 Environmental Protection Agency defined Superfund sites, 450,000 brownfields, and the Great Lakes Region of the Midwest alone has 31 Areas of Concern (United States Environmental, 2018b; United States Environmental,2018c; United States Environmental, 2018d). The impacts of this pollution threaten socio-ecological systems at every scale, from the communities where toxins are waste products of industrial production and people die from exposure to them, out to the global atmosphere where the accumulation of contaminants from these and many other sources contribute to climate change (Landrigan, P., Fuller, R., Nereus, J., Olusoji, A., Arnold, R, Niladri, B., ... Haines, A 2017, p. 462). In 2017, the Lancet Commission on Pollution and Health concluded that 9 million premature deaths globally were caused by pollution and it is the largest environmental cause of death and disease today (Landrigan et al., 2017, p. 462). More than 140,000 new chemicals and pesticides have been created and placed on the global market since 1950 (Landrigan et al., 2017, p. 462). We inhale a pint of atmosphere with

every breath we take (Steingraber, 2010, p. 175). In 2007, more than one-third of all toxic chemical releases were emitted into the air, including ninety-one million pounds of known or suspected carcinogens (Steingraber, 2010, p. 175). Carcinogenic materials such as asbestos, benzene, polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT) (Landrigan et al., 2017, p. 462), and other pollutants can gravely affect the human body including damage to respiratory (lung-based), hematopoietic (stem cell-based), hepatic (liver-based), and renal (kidney-based) organs (WHO, 2014).

Industrial pollution is due in large part to the ignorance, indifference and/or incompetence of large chemical manufacturers and other industrial producers (Fagin, 2013; Steingraber, 2010; Situ & Emmons, 2000). While environmental pollution increased dramatically with the industrial revolution in general, the chemical industry in Europe took off in the late 19th and early 20th centuries and the environmental impacts on air, soils and water soon became significant. In order to avoid tariffs on trade, multi-national corporations based in Europe began to produce chemicals in the United States in the 1920's bringing the toxic byproducts of manufacturing with them (Fagin, 2013, ch.2). These corporations continued to expand, developing new chemicals and employing practices that would increase their profits, but endanger the communities that welcomed them in (Fagin, 2013; Situ & Emmons, 2000). These communities bore the brunt of industrial pollution and adverse environmental impacts (Fagin, 2013).

Rachel Carson's *Silent Spring* (1962) helped fuel the start of the environmental movement, educating readers on the effects of man-made chemicals, specifically the detrimental consequences of the synthetic compound pesticide

dichlorodiphenyltrichloroethane (DDT). Carson's analysis documented how humans were "misusing powerful, persistent, chemical pesticides before knowing the full extent of their potential harm to the whole biota" (Lear, 2018, para. 2). Carson's book planted the "seeds of social revolution" (Lear, 2018, para. 4), giving readers the ammunition to identify potential hazards and contaminants in their daily lives, "igniting a democratic activist movement" (Lear, 2018, para. 6).

Six years after the release of *Silent Spring,* another incident helped spark U.S. environmental legislation, protecting the nation's waters and air. In 1969, an oil rig off the shore of Santa Barbara, California began to leak 3 million gallons of oil into the Pacific Ocean (Grad, 2017). U.S. Interior Secretary state that, "The event galvanized the public awareness of the environment and support for a decade of profound change" (Grad, 2017, para. 3).

By the 1970s, upon revelation of the scale of industrial pollution and its environmental impacts, social outrage and the new environmental activism movement helped push a number of key environmental laws, including the National Environmental Policy Act (1969), the Clean Air Act (1970) and the Clean Water Act (1972) (Grad, 2017; Rosenbaum, 2014). These laws were passed in the United States and the Environmental Protection Agency (United States Environmental) was created to enforce them in 1970 (United States Environmental, 2018).

Today, many entities play a role in seeking to prevent or reduce harm caused by pollutants. Some enforce regulations; others provide research and data. In the United States, governmental agencies such as the Environmental Protection Agency (United

States Environmental) and National Oceanic and Atmospheric Administration (NOAA) help to shape environmental policy and research. While these entities have particular interests and responsibilities, almost all share a common interest in promoting the health and well-being of humankind.

For better or worse, people tend to place their health and well-being in the hands of institutions like the EPA. Yet, what if these institutions consistently fail them? What happens when funding gets cut, or when the priorities that a community has are no longer in line with those of the institution? The Union of Concerned Scientists posits that the EPA and other agencies, more often than not, are influenced by corporations and lobbyists in their search for profit (Union of Concerned Scientists, 2012). Agencies may also not get adequate political and funding support from government leadership (Union of Concerned Scientists, 2012).

Thus, despite the laws and environmental protections that have been put in place, environmental impacts of industrial production continue and are persistent, having long lasting effects on the places and communities where manufacturing occurs (Fagin, 2013). It becomes the communities' task to respond and to resist. The most high-profile, community-led protest to date was at Love Canal in Niagara Falls, New York. Residents discovered that poor business practices and careless disposal of chemical waste containments by Hooker Chemical Corporation had led to one of the United States' largest industrial disasters to date (Cruz, 2010).

Although in the decade leading up to the Love Canal disaster of 1978, the United States passed legislation and mandates and crafted regulations to better protect

communities and the environment from corporate destruction, corporations were still mismanaging hazardous and toxic waste. (Fagin, 2013; Steingraber, 2010). The United States government continues to regulate corporations like Hooker Chemical, to help prevent, respond to, and clean up industrial chemical pollution. However, government agencies are only as effective as the current administration allows them to be; priorities shift from administration to administration (Harder, 2017; Smith, 2017).

Meanwhile, industrial corporations often seek out low-income, minority communities to host their plants, hoping that any protests by residents will be over looked due to the increase in economic stimulus that their plants bring to the area (Fagin, 2013; Steingraber, 2010; Situ & Emmons, 2000). Stories of communities who fight against this greed and their hope for change and reform, are few and not very visible, but they do exist. It is important to tell these stories and to understand how communities that resist are able to do so. How are they able to be resilient (Walker & Salt, 2006), to adapt and continue on? In this thesis, three prominent questions guided my research and defined my scope.

Research Questions

1. What happens to communities when polluted sites are delisted by the EPA as harmful or hazardous threats to local communities and ecosystems, and reused or repurposed for public or private utility?

2. Does local residents' perceptions of place change? If so, how? *What concerns do they have about their environment and community?*

3. What role can communities have in their own socio-ecological resilience? *How do social and political capital aid in their resilience?*

This research addresses these questions by analyzing the impacts three chemical companies have had on the community of White Lake, Michigan. This small community in the Great Lakes Region, has been deemed an Area of Concern by the EPA, *and* is home to both Superfund and brownfield sites. Areas of Concern, Superfund sites, and brownfields are areas of land, that have been degraded by human activities, that are classified according to hazard and clean up requirements at various levels. These levels will be discussed in detail further on. This research explores the repercussions of industrial contamination on an area and its residents, as well as the work of residents turned activists to push back against corporate pollution and clean up their community.

In the following section, I will share current literature introducing the concept of socio-ecological resilience and the gaps in the literature surrounding this framework. I then address my positionality and research methods including interviews, participant observation and document analysis, followed by a background on the case study communities of White Lake, Michigan. I then apply the conceptual framework of socio-ecological resilience to ground the case of White Lake and the challenges to both the ecosystem and the community at large. The story of each of three chemical plants will be represented in the sections to follow, and each section will share a local activist's point- of-view. I have also addressed current issues or concerns from the residents and activists, all while focusing on one main theme: How has the community responded to changes in their environment and how have they moved forward? I conclude with recommendations

or suggestions on how the community can continue to move forward and share any

insight on what may be next for White Lake.

Literature Review

As I conducted my research, several themes became very clear: the rise of chemical industry and its accompanying environmental pollution; the emergence of laws and regulations through which legislators sought to protect people and the environment from the impacts of corporate industrial pollution; and the growing environmental and social justice movements and community activism that point out flaws in the system and kept these issues on the policy stage. These themes underlie the story of community resistance against chemical companies and their devastating impacts on ecosystems and communities.

History of Industrial Contamination

As Dan Fagin explains in his Pulitzer Prize winning *Toms River* (2013), communities have been impacted by chemical corporations since these companies started. Although some argue that these corporations brought wealth and economic stimulus into their towns and cities, others argue that the devastation that occurred to the environment, local ecosystems, and natural resources was not worth the monthly paychecks. It is hard to attach a price to industrial contamination, whether it be polluted drinking water, dirty air, other degraded ecosystem services or human exposure to carcinogens. The best place to start is at the beginning of corporate industrial pollution- with the history of chemical companies.

In 1856, William Henry Perkin was only eighteen years old when he separated a derivative of coal tar into aniline, formulating not only a brilliant shade of mauve, but

the foundation for toxic waste as we know it (Fagin, 2013, p. 8). Aniline, a blue oil, originally came organically from the indigo-yielding plant, *Indigofera anil*. The term Anil, is derived from the Sanskrit *nīla*, dark-blue, and *nīlā*, is the indigo plant (Krug, 2008). What was once created by crushing snail shells, Perkin was able to able to isolate, mix, and oxidize, turning a coal tar compound into a lusted after color that made dye companies turn to the young man for inspiration and industry trade secrets. Emerging corporations such as Geigy, Bayer, Ciba, BASF, and Agfa, changed their production lines, and soon were manufacturing their own synthetically brilliant color palettes from coal tar (Fagin, 2013, p. 10-11). As a result of Perkin's more efficient and effective method of dye production, the natural dye industry was essentially killed off overnight (OpenLearn, 2007).

Fagin described the new mass production in the following manner,

> [n]ow, upon the stable platform of the hydrocarbon polymers in coal tar, chemists began to build a galaxy of new materials that were stronger, more attractive, and cheaper than what nature provided. Dyes came first, soon followed by paints, solvents, aspirin, sweeteners, laxatives, detergents, inks, anesthetics, cosmetics, adhesives, photographic materials, roofing, resins, and the first primitive plastics-all synthetic and all derived from coal tar, the fountainhead of commercial chemistry (Fagin, 2013, p.12).

Fagin painted a vivid picture of the turning point for industry from use of organic materials to synthetic, coal-derived production.

The problem here was not the creation of new products. Rather, the problem lay in the synthetically derived by-products created during the manufacturing process, which had no use and needed to be discarded as waste. For the profit-driven corporation, the question then became: What was the cheapest and quickest way to manage industrial

waste? Companies in Switzerland and Germany offered up one historical example of a corporate "solution" to the problem. These companies built their factories along the Rhine, one of the widest and swiftest rivers in Europe (Fagin, 2013, p. 16) not for the scenery, but for the dumping grounds that came naturally with the property. The 'solution to pollution is dilution' was the guiding mantra in the 1800's as these plants started eliminating their waste into rivers like the Rhine (Fagin, 2013, p. 16). Some may argue that because little was known about the ramifications of chemicals on the environment, chemical manufacturers worldwide took advantage of their own local flowing currents as an easy waste management solution, and not because no other viable, cost-effective solution was present.

Although dumping may have been the cheapest and quickest fix for chemical companies, these actions did not go unnoticed (Fagin, 2013, p. 16). Communities neighboring chemical manufacturers have been complaining of air pollution, water contamination, and health concerns since Perkin's mauve hit the global market. However, as Fagin puts it, no one was in a position to make the companies stop (p. 16). Their economic boost to those same communities trumped any foul smells or drinking water advisories that plagued local water sources. It wasn't just the neighbors who started to complain; workers for these corporations started to understand how their nine to five jobs affected them outside of work hours. As one employee interviewed by Fagin recalled,

> Early on, we didn't really know much. In the sixties, if you said anything the supervisors could be pretty sarcastic. Some of them would say, *"What do you think this is, an ice cream factory?"* [emphasis added] (Fagin, 2013, p. 45).

This rhetorical sentiment was repeated, in different factories, in different locations, throughout different decades, but with the same undertone, illuminating the fact that these chemical companies and their products were laws unto themselves (Cabala, 2013; Fagin, 2013). The actions by chemical companies have been recorded throughout history and the consequences of ill-managed hazardous waste has jeopardized communities, creating conflict between the health and well-being of the communities and the economic stability brought in by the companies themselves.

Change in Community Perspective

As researchers have observed, deception and irresponsibility are at the root of the struggle between communities, corporations, and government (Brown & Mikkelsen, 1997). A shift in perspective in the 1960s altered Western society's view of the environment and their relationship to it (Kofinas & Chapin, 2009, p. 56). Before the 1960s, the environment was commonly seen as cache of unlimited or renewable resources that could be utilized for economic benefit without hesitation. Later, this view gave way to an understanding of the importance of sustainable resource use and maintenance of environmental quality (Kofinas & Chapin, 2009, p. 56). In the United States, new laws and regulations of the 1970s helped change this perspective into something much more tangible. During this time economists began to argue that spillover damage to unknowing third parties like pollution would cause harm, but that the cost of organizing and bargaining, both forms of social and political capital, would prevent these parties from influencing change (Sagoff, 1990, p. 35).

Although this argument may be dated, it was once the byline for every community being pressured by large corporate polluters. More and more communities have demonstrated the flaws in this concept by meeting those 'costs of bargaining' to 'influence' those who are applying pressure, flexing both their social and political capital. The rallying cry of the new environmental age positions community values and morals against the old industry-based culture of economic necessity and backroom deals (Sagoff, 1990, p. 29). During the 1960s, communities across the United States had a 'change of heart' and started to put health and well-being over economic stimulus and corporate greed (Sagoff, 1990, p. 34). This 'change of heart' came from public protests after the release of *Silent Spring* (1962), the Santa Barbara Oil Spill (1969), the Cuyahoga River burning in Ohio (1969), and the disaster at Love Canal (1978), and led the United States to pass laws protecting the environment and the communities that surrounded them.

Rachel Carson, author of *Silent Spring*, was not only a writer, but a scientist and ecologist too. The release of *Silent Spring* in 1962 warned the public about the misuse of pesticides, primarily focusing on DDT (Lear, 2018). Backlash from the chemical companies and the government portrayed Carson as an 'alarmist', but her 1963 Congressional testimony put these same chemical companies in the spotlight and raised public awareness of the long-term effects pesticides have on humans and the environment (McCarthy, 2012; Lear, 2018). Carson revolutionized the way that humans view pesticide use and how the United States governs the use of pesticides, particularly with the ban on DDT for agricultural use in 1972 (McCarthy, 2012).

The disaster at Love Canal in Niagara Falls, New York was another example that spurred public outrage. Between 1942 and 1953, Hooker Chemical used a partially dug canal there as a chemical waste dump, sanctioned by the government (Kleiman, 2018). In 1953, Hooker Chemical Company sold the property for one dollar to the city (Beck, 1979). Of the 21,000 toxic chemicals in the canal, at least 12 were known carcinogens, including halogenated organics, chlorobenzenes, and dioxin (Kleiman, 2018). Hooker capped the 16-acre landfill and the city purchased the plot of land for $1 and built an estimated 100 homes, as well as a school, on the site (Beck, 1979; Kleiman, 2018). Less than twenty years after the bill of sale, torrential rain exposed waste-disposal drums and caused leaching into nearby basements, homes, and schoolyards (Beck, 1979; Kleiman, 2018). Over time, children were subjected to burns from exposure to chemicals found on school grounds, birth defects increased in the area, and residents' well-being was jeopardized by the history *in* the land. In 1978, President Carter approved emergency financial aid to Love Canal and a total of 221 families were forced to relocate after the devastation (Beck, 1979).

Establishment of Laws and Regulations

Hazardous waste and the effects it has on the environment did not become the hot topic that it is today until the 1970s when the United States government decided to finally take action on the "problem" (Szasz, 1994) with the creation of the Environmental Protection Agency and the subsequent passage of key environmental laws. Such laws were aimed at leveraging the idea that if pollution and hazardous waste were controllable,

then corporations and persons could be held responsible for their offending behavior (Situ & Emmons, 2000, introduction). These laws were not only implemented to help protect the environment, but to also ensure that disasters like the Love Canal would tie corporate action to litigation and cleanup liability, with the intention of removing the affected community from the financial burden.

Today, politics and public policy are some of the most important tools we have to protect the environment (Dryzek, 2013). Because of sites like Toms River, Love Canal, and other noteworthy examples of communities that have fought back against large corporate polluters, the U.S. government began to take notice (Beck 1979; Fagin, 2013). Federal statutes were passed to address industrial pollution. The Resources Conservation and Recovery Act (RCRA) passed by Congress in 1976, gave the EPA a framework and guidance to enforce proper management and disposal of hazardous and non-hazardous solid waste (RCRA, 2016). The result of Love Canal included a push for new legislation holding polluters financially responsible for their cleanup (Kleiman, 2018). From this emerged the 1980 Comprehensive Environmental Response, Compensation & Liability Act (CERCLA), better known as Superfund. A Superfund site is any land in the United States that has been contaminated by hazardous waste and has been identified by the Environmental Protection Agency as a candidate for cleanup because it poses a risk to human health and/or the environment (United States Environmental, 2018d). For example, cleanup and liability costs for the Love Canal disaster exceeded $200 million, and this was only the most notorious of more than 50,000 hazardous waste sites across the nation (Situ & Emmons, 2000, p. 8).

The EPA established the Brownfield's Program in 1995, providing federal support for brownfield redevelopment. According to the EPA,

> Brownfields are properties that may have hazardous substances, pollutants or contaminants present… Cleaning up and reinvesting in brownfields protects human health and the environment, reduces blight, and takes development pressures off green-spaces and working lands (United States Environmental, 2018e).

The program was specifically designed to empower states, communities, and other stakeholders in economic development to work together to prevent further contamination, assess damage, safely clean-up sites, and sustainably reuse brownfields (United States Environmental, 2018e).

The Brownfield Reclamation Act of 1997, H.R. 3020, gives federal support for voluntary state cleanup programs with oversight by the Environmental Protection Agency (H.R. 3020, 1997). The Brownfield Reclamation Act requires state and tribal governments to clean up, redevelop, and reuse brownfields to a specified standard. State programs must include community participation in decision making regarding the future the site and must provide funding and technical assistance for site inventories, inspections, grants, and assessments. (HR 3020, 1997). It is estimated that there are more than 450,000 brownfields in the U.S. (United States Environmental, 2018e).

There are several challenges to brownfield cleanup and redevelopment. On the one hand they are hazardous sites, while on the other hand they can *become* valuable real estate for the affected community. According to the EPA's "Anatomy of Brownfields Redevelopment", part of their *Brownfields Solutions Series* (United States Environmental, 2006), there are several key challenges to brownfield redevelopment.

First and foremost is the timeline for cleanup and the cleanup considerations. Due to environmental policies and cleanup regulations, redevelopment of a brownfield site may take longer than typical real estate development (United States Environmental, 2006).

The second issue is the financial barriers that banks and other lenders have when providing loans on lands that are impaired (United States Environmental, 2006). Cleanup costs can sometimes dwarf the property's value. Extended cleanup timelines also have additional costs associated with them. There is also liability that comes with redeveloping a brownfield. Developers, property owners, and lenders want to ensure that environmental liability concerns are addressed. Government agencies may end up shouldering clean-up costs, while profits due to increased property value may be captured by private redevelopers (United States Environmental, 2006). Future liabilities that are associated with a property's history also must be managed with clear and concise legal guidelines (United States Environmental, 2006).

Lastly, and unfortunately, a reuse plan may not always address or be compatible with the goals of the local, existing community (United States Environmental, 2006). Redeveloped property may be hard to sell due to public knowledge of the environmental history of the land, or parcels may be marketed to out of town buyers, removing the land from the community, and benefiting only private interests (United States Environmental, 2006).

When done correctly, *a successful brownfield redevelopment will have the support of the community and will bring new life to the area*, overcoming any challenges associated with the project and the history of the land [emphasis added] (United States

Environmental, 2006). This community support can make or break the success of not only brownfield redevelopment, but of any site that had been once contaminated or ill-managed by an industrial landowner. The cleanup and development of these sites may be scrutinized by the local community who often seek justice for the disturbances that have occurred on the land, to the ecosystem, and their well-being as a whole.

Social and Environmental Justice

Social and environmental justice issues, like Superfund and brownfield sites, have plagued communities across the United States since the beginning of the industrial revolution (Situ & Emmons, 2000, p. 1). In some cases, these impacts can be attributed to lack of knowledge. In other cases, there is certainly a degree of neglect and corporate greed. Communities, or groups of people dedicated to a sense of place, often connect the health of their surrounding ecosystem with the health and well-being of their residents and vice versa. From a community scale to a global scale there is a fundamental connection between people and the Earth, and harm to one cannot be escaped by the other (Hansel, 2015). The decisions we make as a species have a direct impact on how the planet, and our ecosystems, function (Hansel, 2015). According to David Newton's *Environmental Justice Reference Handbook*, the environmental justice movement attempts to analyze patterns of disproportionate exposure to environmental hazards experienced by minority and low income communities and attempts to identify patterns in affected communities in order to prevent more cases from occurring or remedy current situations (Newton, 1996, preface). When supported by regulatory agencies and laws, environmental and social justice movements can often help communities find their voice against large corporations. Residents are the first ones to notice change in their

own communities and bring the public's attention to the matter. Residents who object, organize, and protest often become the community's strongest asset in protecting the community's well-being.

Sense of Place & Community Activism

In order to fully understand the well-being of a community, we must first decide what a community *is,* and define the concept of 'sense of place'. Researchers David Chavis, and Kien Lee of *Community Science*, describe community as "both a feeling and a set of relationships among people. People form and maintain communities to meet common needs" (2015, para. 5). The authors continue by stating that people seek trust and sense of belonging for themselves and each other and this helps influence their environments (Chavis & Lee, 2015, para. 6). These feelings and relationships help shape the idea of 'community' and create a connection, or sense of place. In David Hummon's *Community Attachment: Local Sentiment and Sense of Place,* Hummon states a sense of place as "people's subjective perceptions of their environments and their more or less conscious feelings about those environments" (Cross, 2001, p. 2). Similarly, researchers Bradley Jorgensen and Richard Stedman define a 'sense of place' as "a multidimensional construct representing beliefs, emotions, and behavioral commitments concerning a particular geographic setting" (Jorgensen & Stedman, 2006, abstract). The combination of the two is the creation of community, or the balance of people's perceptions of their environment and the beliefs and emotions that are tied to those perceptions.

Activism has been termed a new form of community science, a participatory approach to community health and well-being in which activists challenge expert-

driven scientific research by taking the research process into their own hands. They are able to analyze, define, and offer solutions for the health and well-being of their own communities (Coburn, 2002). Environmental activism requires individuals, businesses, and government to work together to find ways to preserve and protect the environment, (Britt, 2017, para. 14).

This concept of human engagement can be tied to a community's *social and political capital*. Social capital, as defined by Robert Putnam is "features of social organization, such as networks, norms and trust, that facilitate coordination and cooperation for mutual benefit" (Putnam, 1995, p. 67). Social capital can enhance a community's resilience by creating a source of power and resistance to external forces of injustice and fight against the exploitation of people and resources. Here, political capital refers to the community's level of organization and the ability of the government to gain and utilize resources for that same community (Flora & Flora, 2013). Political capital allows residents to contact and be heard by their government representatives, establishing a sense of trust and reciprocity. Being able to utilize these resources is vital to the environmental and social justice activists in communities where their well-being is being threatened or compromised.

When communities are overlooked and exploited, activists then have to fight companies, state regulatory agencies, politicians and businesses, just to protect the land, their homes, and the community at large (Situ & Emmons, 2000). At the present moment,we are witnessing an increase of community environmental activism (Perez et al., 2015). Groups across the county are emerging as registered environmental justice organizations and stepping in to fight against the impacts of industrial pollution on low

income neighborhoods (Perez et al., 2015). It will be this engagement of social capital and political that will continue to ensure the longevity and the social-ecological resilience of the community and the natural resources that reside there.

Stewardship & Socio-ecological Resilience

Social and environmental justice go hand in hand with concepts of biosphere stewardship and socio-ecological resilience. As defined by Carl Folke and others,

> [s]tewardship… is an adaptive process of responsibility to shepherd and safeguard the valuables of not just oneself, but also of others, a process that has potential to create meaning and build respect and dignity for the competencies and skills embedded with stewardship. (Folke et al., 2016, ch.4, para. 2).

Stewardship promotes trustworthy behaviors by reinforcing relationship-centered collaboration. As cited in Folk et al., people tend to accomplish tasks and are more motivated to do so when they have been entrusted with the task (Davis, J.H., Schoorman, F., & Donaldson, L., 1997), allowing them to both prove their worth as well as work with a sense of purpose (Folke et al., 2016).

Stewardship is essential for the longevity and sustainability of ecosystem services. These services are the benefits that people obtain from the ecosystem; food and water; flood and disease control; nutrient cycling, and cultural services (spiritual, recreational, etc.) (Alcamo & Bennett, 2003). By 'shepherding' these values, communities can ensure that ecosystems continue producing benefits for the community; thereby establishing what Berkes and Folke identify as socio-ecological systems (1998). These systems are complex, incorporating humans as a part of nature (Berkes & Folke, 1998), once again connecting and reiterating the human-nature relationship.

Additional authors (As cited in Folke et al, 2016, ch.5, para. 6) add that,

> [s]tewardship is not just about the management of ecosystem services but about the social, economic, and cultural contexts in which this management operates and how issues like justice, power, and politics shape the operation of social-ecological systems and institutional and governance challenges that this entails (Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A., Smith, A, ... Olsson, P., 2012; Mathevet, R., Thompson, J.D., Folke, C., and Chapin, S., 2016).

Without thoughtful, intentional, and meaningful management of human action, ecosystem resources can easily be over-exploited, strained, and diminished. Folke and others., highlighted the significance of these relationships, "democracy, health, poverty, inequality, power, justice, human rights, security, and peace all rest on the life support capacity and resilience of the biosphere," (Folke et al., 2016, p. 9).

People engage with the biosphere and respond to the needs and services provided by the ecosystem. These authors tie human well-being to a collaboration of several intrinsic elements: physical, social, environmental, economical, and psychological factors (Figure 1). This collaboration needs to be balanced and all elements must be equally present to establish a sense of well-being.

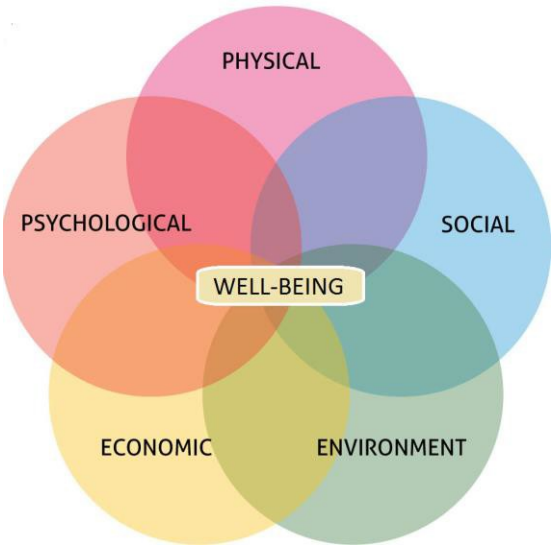


Figure 1 Folke's Illustration of Human Well-Being (Folke et al., 2016)

The health and well-being of a community can easily be traced back to its ecosystems services and the community's resources. Researchers have stated that,

> A dual focus on social-ecological resilience and well-being puts the debates on sustainable development into a dynamic context, raising questions about the sources of both social and ecological resilience available to groups seeking to change and navigate critical thresholds that may affect well-being (Kofinas & Chapin, 2006, p. 57).

This concept ties individuals to the community's environmental and social justice activism; people who invest their time and resources to help change the discourse around the connection between people and the environment.

Today, humans are the dominant force driving changes in the Earth System (Kofinas & Chapin, 2006), and their decisions can greatly affect the sustainability and livelihoods of generations to come. The sustainability of ecosystems and the various responses of systems under threat are all based on their ability to be resilient. Resilience is the capacity of a system to absorb disturbance and still retain its basic structure (Walker & Salt, 2006, p. 1). Socio-ecological resilience refers to people and their relationships with the ecosystems surrounding them, people are part of ecosystems (Folke et al. 2001, ch. 1). Socio-ecological resilience, as cited in Folke et al, 2016, is the 'flexibility' of an ecosystem and its community to embrace and adapt to change after it has been stressed, shocked, or slowly pressured by an outside force. It delineates the interconnection between social and natural systems and emphasizes that "people, communities, economies, societies, cultures are shaped by, dependent on, and evolving with the biosphere" (Folke et al. 2001, Intro, para. 2).

In order to improve longevity, ecosystems and their communities must

be adaptable. Researchers note that,

> the focus of vulnerability and resilience add important insight to these discussions by directing attention to exposure to risks, potentials for shocks and pulses of change, and the capacity of the system to absorb and shape those forces (Kofinas & Chapin, 2006, p. 57).

In this relationship, as cited in Folkes et al., vulnerability refers to the stress on the system and resiliency, the response to stress (Turner et al. 2003; Adger 2006).

To be effective, an economy must include all of the things people want and value**,** and we can apply that same reasoning to a system (Walker & Salt, 2006, p. 8). For an ecosystem, this means a continuation of its goods and services, for a community, that could be the economy, but also their morals, quality of life, and, as Walker and Salt state, their values. There is no sustainable 'optimal' steady state of a system (or social system, community, etc) (Walker & Salt, 2006, ch.1, p. 7). Instead, a system will react to change in one of two ways: by adapting to the stresses or by crossing a threshold. When faced with environmental issues like pollution and contamination, a community must either deal with the consequences that come with corporate operations in their community by resisting and protecting both the environment and their personal health, or they succumb to crossing a threshold, changing their community forever in ways that reduce community well-being. The dynamic use of social and political capital is key to the survival of a community. If the community chooses to resist, it can then leverage the resident's social and political capital to actively fight against environmental pollution and contamination. Under the umbrella of 'environmental or social justice', these community members are vigilant, becoming warriors against outside disturbances, adding to the discourse of activism and resilience.

Although discussions linking the themes of environmental justice and corporate

pollution are plentiful and are found throughout literature and history, there is less information focused on how communities and ecosystems have adapted to change caused by corporate pollution and remained socio-ecologically resilient over time. What is missing from this larger picture is information about the participants who help create change, battling against big corporations and their economic stimulus to the community, and the pollution that tends to follow. How can these participants, or activists, help marshal resources and trigger responses to protect ecosystems and entice other communities to participate in their own recovery, for their own well-being? How do communities move on after the money, both from the corporations themselves, and government funding for the reclamation of lands, has dissolved? Do these communities transform into new, vibrant, healthy places or do they become a shell of their former selves?

Literature in Action

My research focused on several decommissioned, large-scale industrial sites in White Lake, Michigan, operated by Hooker Chemical Corporation, Whitehall Leather Company, and DuPont de Nemours, and the impact they still have on the environment, especially the watersheds of the community. In this thesis, I explore how activists in the White Lake area have been at the forefront of protecting their local community. Individual residents were the first to notice that something was not right with the pollution caused by big chemical corporations that had plants in White Lake. They were the first to speak out, to identify that there was a problem, and the first to be on the front lines of protests. They were the ones who fought back for their community and they are still vigilant in monitoring legacy impacts after the companies have left. I believe that

their stories need to be added to the literature of activists, corporations, and socio-ecological resilience so that other small communities can learn from their accomplishments and encourage other residents to rise up and resist!

Positionality & Intent

When I was growing up in Montague, Michigan, I was never exposed to discussions surrounding the deteriorating environmental conditions of White Lake, what those conditions meant for Lake Michigan, or the environmental impacts that were attributed to industrial pollutants. These topics were either danced around when brought up for discussion, or they were avoided altogether. In spite of this, these issues eventually came to the forefront of my life when my step-father became fatally ill during the summer of my seventeenth birthday. He was out golfing with a family friend when he was exposed to a high dosage of pesticides that had drifted onto the golf course from an orchard that was being sprayed nearby. Five years later, he succumbed to his illness, one which the doctors were never able to truly diagnose. His death certificate gave his cause of death as "complications due to an immune deficiency". However, my family stands firm in our belief that he died due to toxic chemical contamination.

Researchers recognize that their own background shapes their interpretation, and they position themselves into their research, allowing personal, historical, and cultural experiences to aid in their interpretation (Creswell, 2003). I believe that my background is the fuel that drives my research.

When I started researching the impacts of industrial pollution in White Lake, I noticed one woman's call to action regarding the health issues in the area through a Facebook group she had started, *Cancer in White Lake.* Charlotte Schultz[1] spoke of a

[1] Names have been changed to protect interviewees and activists.

rare environmentally-caused cancer that her son, Dave[2], died of at the young age of 31. Charlotte's efforts to find the true cause of his cancer had spanned several years and she had taken note of an estimated 1180 people in the community who had been diagnosed with cancer (C. Schultz, personal interview, July 2017).

Due to many barriers in community research, it is hard to pinpoint cancer clusters and linkage between environmentally caused health issues. Quantifying adverse effects of toxins, pesticides, and other industrial pollutants is difficult, as the exposure assessment data requires patterns of people's mobility, as well as monitoring predictable and unpredictable exposures (WHO, 2014). The possibility of cancer clusters can also alter a community's perception, causing unsettling trust among residents and their sense of place.

My research focuses on community-based socio-ecological resilience in the face of production and insufficient clean-up of industrial waste at three chemical plants located on the shoreline of White Lake, Michigan. It summarizes the historical devastation of the area, gives voice to the experiences and insights of community activists who spearheaded the clean-up of their community, and discusses what may be in store for the White Lake area in the future. This research narrates the stories of many White Lake residents-turned-activists during the heyday of the chemical-induced economic boom and the ones who continue to fight for change. It shares the resilience of mothers who lost children to cancers caused by pollution, bus drivers that were scolded for not driving students through plumes, and environmental defender attorneys whose lives were threatened because of their beliefs.

[2] Names have been changed to protect interviewees and activists.

These stories not only show what a small group of thoughtful, committed citizens have done for their community, but may also help provide encouragement to other communities, who are facing environmental injustice, to resist and to fight for their own health and well-being.

Methods

In this research, I employed a case study approach using semi-structured interviews, archival research and document analysis. A case study examines a key issue or themes as they are experienced by a person place, event, or phenomenon, and thereby helps identify trends, and provides a means for greater understanding of an important research issue (Mills et al., 2010). By utilizing the case study method, I was able to document another example of corporate industrial pollution and community resistance to add to the environmental justice discourse and share this community's story.

The interviews were conducted by using snowball sampling and are divided into several 'categories' (i.e. local activists, county officials, and subject matter experts). In snowball sampling a researcher expands the number of research subjects by asking an initial subject to identify additional likely subjects for interviews and continuing momentum down the line (Lewis-Beck, 2004). I also obtained data by conducting archival research as well as document and photo analysis of lawsuits, EPA documentation, local activism, legal briefings, and law reviews. My familiarity with the community doubtless contributed to the effort.

Semi-structured Interviews

Over the summer months of June and July 2017, I conducted eight semi- structured interviews with community members using snowball sampling to identify participants. Interviews were conducted in a one-on-one setting with local residents, environmentalists, activists, and subject matter experts. I began by interviewing

Charlotte Schultz , who became an activist in the White Lake area after her son died at age thirty- one from a rare environmentally-caused cancer. After the interview, Schultz suggested a handful of additional people to consider for an interview and I followed up with them. In these interviews, I asked participants to tell me their recollections of the local chemical plants, how they felt about the environmental history of the area, and what they hoped the future will bring to the White Lake area (Appendix I).

Archival Research/Document Analysis

Much of my study was based on archival research. Historical documents showed the progression of environmental degradation that has occurred in the White Lake area as well as the community response. With help from the White Lake Community Library, I was able to access historical newspapers, legal documents, and visual aids that helped me explore the community activism that occurred in the early 1960s.

A previous project by local historians and activists called the White Lake Environmental History Project (WLEHP), for example, included interviews conducted with people who have now passed or no longer live in the community. I changed the names of my interview subjects to help protect the identities of local activists. However, names retrieved from public documents and the WLEHP were included.

White Lake, Michigan

Along Lake Michigan, about 200 miles north of Chicago, lies a small community known as White Lake, Michigan (Figure 2). Home to roughly 6,000 people (Census 2010), White Lake is comprised of two small towns and their respective townships, Montague and Whitehall.

The area is named after its large river and watershed, White Lake (Figure 3). Having emerged from glacial sand deposits, the lake covers 2,571 acres and is approximately 5 ½ miles long. At its greatest width, White Lake measures a mile wide, and in places, it reaches 70ft in depth (United States Environmental, 2005).

The White Lake area once attracted Native American tribes, such as the Potawatomi Indians, to the region. Later there were fur trappers, traders, and eventually European settlers. The lumber era began in the mid-1800s with thirteen mills operating along the eleven miles of shoreline (WLCC, 2018). By the end of the 19th century, the majority of white pines were gone and White Lake residents turned to fruit farming and the incoming industrial era for economic stability (WLCC, 2018).

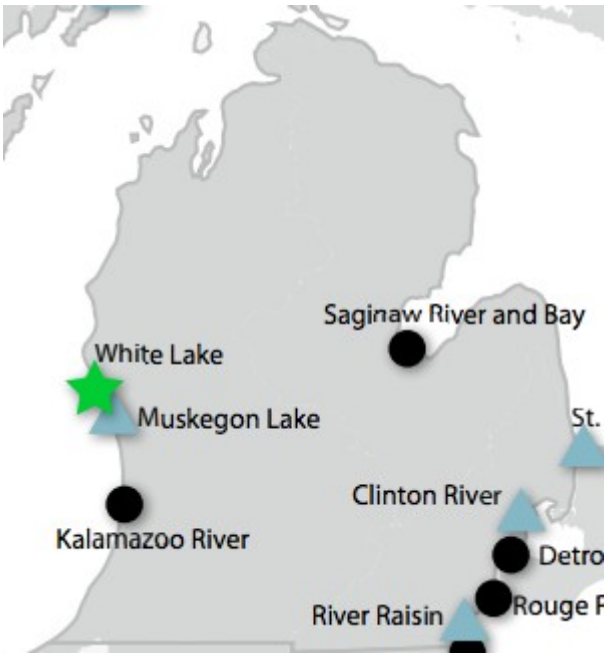


Figure 2 White Lake, Michigan (United States Environmental, 2018b)

Figure 3 White Lake Watershed (United States Environmental, 2016)

In the beginning of the 20th century, the Goodrich Steamship Line, a passenger ship, brought families from Chicago to the White Lake area. These vacationers enjoyed Lake Michigan summers, the fresh air, sandy beaches, and relaxing weekends out of the city. Resorts grew along West Michigan, and White Lake became a sought after tourist destination. The local community strived to live off the financial surplus of summer vacationers year round until the mid-1940s.

At the time of WWII, corporations like Whitehall Leather Company (the Tannery) and the Foundry in Montague, were among the few stable employers in the area that were not service industry-based. To keep up with the high demand for military boots, the Tannery stopped using bark and started using chromium to dye their leather. In the late 1940s and 50s, residents rejoiced at the arrival of companies like Hooker, DuPont, and Union Carbide, all of which started to manufacture in the White Lake area. These companies brought stable, year-round jobs and growth to the local economy. At one time, Hooker Chemical Company was the area's largest employer (E. Moses, personal communications, August 2017).

In the late 1960s residents started to notice a change in White Lake. The State of Michigan, alerted by local residents by way of environmental attorney Winton Dalhstrom, reported "a steep decline in benthos and high levels of sodium chloride at Hooker Chemical discharge site" (WLEH, 2018b, 1967). Hooker's effluent pipe ran from their facility, under the road, and through the neighboring community of Blueberry Ridge, before discharging directly into White Lake. In 1968, according to Eric Moses, Occidental Chemical purchased Hooker Chemical to help increase Oxy's production lines.

In 1974, the county wastewater facility opened, diverting industrial and municipal discharges, like Hooker's effluent, from White Lake (WLEHP, 2018b). Although wastewater was now being diverted, citizens were still concerned about their drinking water and the conditions of White Lake. Citizens utilized the power of their

local newspapers to share stories and letters to the editor about what was occurring in their own backyards (WLEHP, 2018b). The local governments of Montague and Whitehall hosted public meetings to allow residents to share their complaints and raise awareness on the state of White Lake (WLEHP, 2018b). Over the course of the following seven years, Michigan officials stepped in to investigate complaints and accusations of industrial contamination in the lake and in the drinking water of small communities like Blueberry Ridge (WLEHP, 2018b). This investigation of Hooker/OxyChem in 1981 resulted in the chemical company being required to clean contaminated soil as well as alerting officials to the contamination of groundwater on the site (WLEHP, 2018b).

In 1982, shortly after Hooker/OxyChem begun to clean up contaminated groundwater, the company closed its doors. Three years later, White Lake was declared an Area of Concern by the Environmental Protection Agency (WLEHP, 2018b).

Historically, there have been 43 EPA designated Areas of Concern throughout the Great Lakes, 14 located in or on the border of Michigan. AOCs are defined as sites that have been highly degraded due to contaminated surface water, sediments, groundwater, wastewater, or sewage (United States Environmental, 2017). The EPA designated White Lake as an Area of Concern in 1987 under the Great Lakes Water Quality Agreement (United States Environmental, 2018b).

In White Lake, the designation encompasses 2,571 acres along the eastern shore of Lake Michigan, incorporating areas of the communities of Montague and Whitehall, and the White Lake watershed. White Lake was designated as an Area of Concern because of severe pollution harming fish and wildlife, and preventing residents from

using water for drinking, recreation, or other purposes (WLPAC, 2002).

The White Lake community relies on their local groundwater as a main source of drinking water. Groundwater is also the source for almost half of all stream flows in Michigan (United States Environmental, 2005). According to the EPA, “ground water can move hundreds of feet per year, especially in sand soils common to the White River Watershed. Contamination is not easily contained” (United States Environmental, 2005, p. 17).

The required clean up under the Resources Conservation and Recovery Act identified eight Beneficial Use Impairments (BUI's) to be addressed in the restoration work, although a total of fourteen Impairments were listed as ecological health concerns for the Great Lakes area (United States Environmental, 2017).

These eight high-priority BUI's included:

1. Restrictions on Dredging Activities
2. Eutrophication or Undesirable Algae
3. Degradation of Benthos
4. Restrictions on Fish and Wildlife Consumption
5. Degradation of Fish and Wildlife Populations
6. Loss of Fish and Wildlife Habitat
7. Restrictions on Drinking Water Consumption and Taste or Odor Problems
8. Degradation of Aesthetics

In order for White Lake to be removed from the RCRA list, each one of these BUIs had to be addressed and 'corrected' to ensure the safety of human and wildlife health (United States Environmental, 2016).

Once White Lake was designated as an Area of Concern (AOC), residents began alerting officials to additional concerns they had. In 1992, DuPont conducted investigations of landfills on their own site (WLHEP, 2018).

At the same time, the (then) Lake Michigan Federation obtained a grant to help establish a citizen advisory group for White Lake's Area of Concern. This group came to be known as the White Lake Public Advisory Council (PAC). Accordingly, this formal council's goal was to "ensure that White Lake area community members can provide input on activities undertaken as part of the lake's restoration" (WLEHP, 2018). Another goal was to promote environmental stewardship throughout the area to help progress and protect White Lake for future generations (WLEHP, 2018).

The White Lake PAC, and their community advocates, became instrumental in the clean-up of White Lake. In 1993, the EPA ordered Hooker/OxyChem to conduct a second site investigation that led Occidental Chemical to sign an Administrative Order which "legally bound the company to investigate the nature and extent of hazardous waste releases to the environment, determine what measures to take to address releases, and implement corrective measures" (United States Environmental, 2017b).

However, Hooker Chemical was not the only polluter responsible for White Lake's AOC designation. Whitehall Leather Company and DuPont were also targeted by the White Lake PAC and local activists. In 1995, the Whitehall Leather Company site and Tannery Bay (the body of water adjacent to it), went under investigation by state officials. The following year E.I. DuPont de Nemours (DuPont) officially closed its doors and demolished their facilities. Five years later, in 2000, the Tannery shut down and with the guidance of the state, began removal of contaminated soils.

> The 21st century brought a lot of change to the White Lake area. Occidental Chemical removed the contaminated sediments from the lake (2003), the State's investigation into DuPont began (2010), and Whitehall Leather Company's cleanup was completed. In 2014, White Lake was finally delisted as an Area of Concern and activists felt a sense of accomplishment and were hopeful for the future (G. Marks, personal interview, June 2017).

The following timeline, *Environmental History of White Lake, MI* (Figure 4) is summarized from Cabala, 2013b and shares the history of the area regarding the three major chemical companies: Hooker/OxyChem, Whitehall Leather Company, and DuPont, and their legacies of contamination.

In the following chapters, I will discuss in further details the history of each of these three plants and how residents and activists of White Lake have reacted over the years. The following narratives are taken from interviews conducted with participants from the area and share concerns and accolades regarding the history and cleanup of these three plants as well as their views for the future.

Environmental History Timeline of White Lake

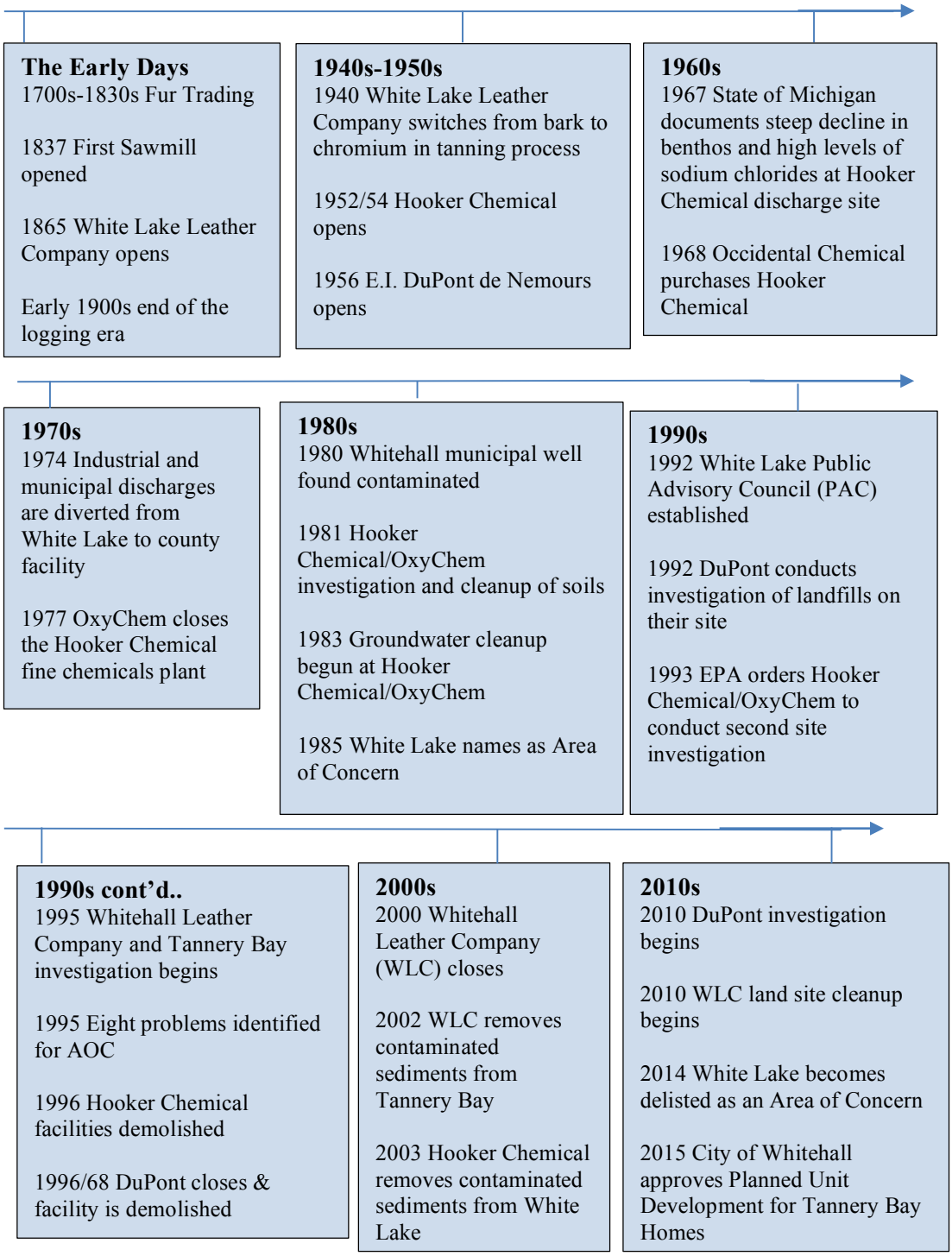


Figure 4 Environmental History Timeline (Revord, 2018)

Behind the Gates

"*Polite people get poisoned." –Lois Gibbs*

I wouldn't call it trespassing, per se. The large sliding gate was still open, but it was shortly after 5pm on a sunny Friday afternoon. I could see work trucks in the parking lot, their windows were still rolled down and retired for the night, but other than that, the place looked desolate. *How quaint it is to be home- no one bothers to lock their doors here*. *Not me*, as I clicked the key fob to my rental minivan and walked up to the front door. After all, I lived in California now, and wasn't so trusting. Before my knuckles could rap on the door, a white pick-up truck hauled down the road and whipped into the facility, breezing through the security gate like I had a few moments earlier. Two large retrievers hung their slobbery heads out the back of the window. "Hey! Can I help you?"

"Yeah, I hope so," I replied, a little upset that I didn't have the place to myself to poke around. "I'm looking for Randy, your Health and Safety Coordinator?"
"There's nobody that goes by Randy that works here, ma'am. What is it that you're looking for?"

I could tell that he was irritated by my presence. He was probably on his way to the pier or to take his dogs swimming down at White Lake. They just stared at me with their big old doe eyes, impatient that I was stopping them from possibly having the time of their lives.

"My name is Liz and I was hoping to speak to someone about what you are

doing here on this property."

"Are you with the newspapers?" he asked while staring at my Nissan Quest. I guess it did kind of look like a news vehicle. Damn you, National. This was the upgrade they had so generously provided to me after a rock from a semi-truck cracked the windshield of my zippy little Corolla.

"No, not in the slightest. I'm a graduate student doing my thesis research on the chemical companies of White Lake and I was hoping to learn more about Hooker and what Glenn Springs Holdings is doing on this property."

He handed me his card and told me to contact the office on Monday. "Everyone's out for the weekend," he stated as he pointed to the empty building. "I'll have Charles* get at you next week."

His pleasantries were cut short when the larger of the retrievers started to bark, "I guess it's time to get back on the road," he said as he attempted to hush them both.

He waited for me to pull out of driveway first and ensured the large gate closed entirely behind him before taking off. I drove off down the road towards DuPont and watched through my rear view as he did his last round of security checks. Here's hoping it won't be the last time I get on the other side of that gate, I remember thinking.

Cleanup of White Lake & Community Involvement

When I interviewed one of the original members of the White Lake PAC, George Marks[3], he recalled his twenty plus years on the board with passion and vigor. The strong sense of community helped pave the way to the delisting of White Lake, and without the local community, it may have not been so successful.

Marks recalled the push for the clean-up at Tannery Bay and the leverage the PAC had with the community behind them. In the 2017 interview, Marks stated that

> [t]he greatest key to getting something done- the more partners at the table to help pushing that third party to do something, in a non-legal aspect. The local community is there pounding the table saying, 'Come on, you made this mess, you need to clean it up.' That's the partnership that made the difference especially with the Tannery (G.Marks, personal interview, July 2017).

The WLPAC was not only a powerhouse in the fight for cleanup efforts, it was also a community-based organization, that helped to disseminate information to the public and include them in the cleanup process. By hosting open meetings, the council was able to solicit membership from local businesses, industries, environmental organizations, and various local partnerships to help aid in decision-making opportunities (WLHEP, 2018). Decisions that the WLPAC made were instrumental in the removal of the Beneficial Use Impairments (BUI).

Starting in September of 2011, the U.S. Army Corps of Engineers began remediation efforts and they finished work in April of 2014 (United States Environmental, 2016).

The first project was on the "Restrictions on Dredging Activities". Dredging of White

[3] Names have been changed to protect interviewees and activists.

Lake was necessary due to chemical contamination in the soil throughout the lake (United States Environmental, 2014c, p. 13). During the cleanup, it was discovered that no special handling was required. As a result, the spoils were removed from the BUI list and used in the federal beach nourishment program for Lake Michigan (United States Environmental, 2014c, p. 13).

In April of 2012, the second BUI, "Eutrophication or Undesirable Algae," was addressed. With consistent monitoring and treatment, the elevated levels of Chlorophyll were reduced to an acceptable level within the target range (United States Environmental, 2014c, p. 14). At this point, the water quality had been significantly improved and Eutrophication was removed from the list.

The "Degradation of Benthos" was analyzed and the previous impairment at White Lake was delisted in June of 2012. As part of the benthic community analysis, species' diversity was analyzed before and after the contaminated sediment dredging and remediation (United States Environmental, 2014c, p.15). Species' population densities increased and were three times higher than in 2001 when initial sampling was done (United States Environmental, 2014c, p. 15).

Nine months later, the "Restrictions on Fish Consumption" BUI followed and was removed from the list in February 2013. Large-mouth bass and carp from Pentwater Lake, an unimpaired control watershed located roughly 30 miles north of Montague were compared with fish from White Lake. Restrictions were lifted once levels of contaminants in both fish species were equal in the two lakes (United States Environmental, 2014c, p. 18).

In March of 2014, the "Degradation of Aesthetics" was finally removed from the BUIs list. Five sites were assessed from shore, prior to and upon completion of restoration efforts (United States Environmental, 2014c, p. 21). After remediation, unsightly debris was less visible in low and high tides, and signs of recreational usage were apparent. These were both large factors in the delisting of the fifth BUI.

The seventh BUI, "Restrictions on Drinking Water Consumption", was removed during the same time as the aesthetics removal. Both Montague and Whitehall drinking sources are groundwater from municipal well fields (United States Environmental, 2014c, p. 24). In order to be considered for removal, the public water supplies needed to be monitored for two years and indicate that they "met the current and most stringent human health standards... and treatment needed to make raw water potable and palatable does not exceed standard methods in those supplies" (United States Environmental, 2014c, p. 24). Each drinking water supply employs conventional treatment methods (including filtration and disinfection of the water).

In April of 2014, the fifth and sixth BUIs, "Degradation of Fish and Wildlife Populations" and "Loss of Fish and Wildlife Habitats," were removed concurrently. Although these were two separate BUIs, they were closely related and restoration priorities for both were done simultaneously on both privately and publicly owned lands (United States Environmental, 2014c, p. 29). The Index of Biological Integrity (IBI) is a scoring system used to measure strong responses to human disturbance, or pollution in wetlands (United States Environmental, 2014c, p. 30). A score of >33 is indicative of a "healthier" ecosystem, while scores under a 33 represent a degraded one (United States Environmental, 2014c, p.30). The goal of staying consistent at a 43+, a number that signified the mean and

standard deviation IBI score for White Lake during 2004-2006, was met three years in a row when the BUIs were finally removed (United States Environmental, 2014c, p. 30).

Meanwhile, the wildlife habitat also increased as the lake became cleaner. The total habitat restoration sites originally proposed for public land had been 30.9 acres, but in the end 40.9 acres were completed with the 10 additional acres restored on private land (United States Environmental, 2014c). All private sites are now protected (or are in the process of becoming protected) through conservation easements, deed restrictions, or long-term management agreements. Below, Figure 5 shows the White Lake watershed and the location of OxyChem, Tannery Bay, and the DuPont property.

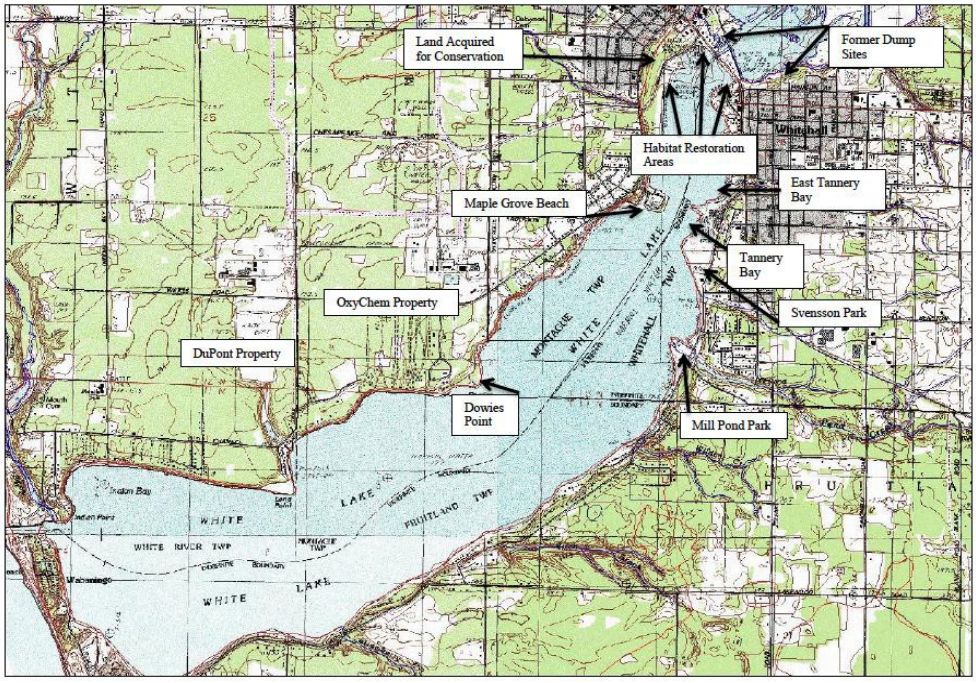


Figure 5 Map of chemical plants on White Lake (United States Environmental, 2014c)

The cleanup of White Lake has met the federal and state standards for cleanup, giving the community hope for further growth and prosperity in the area. With the lake

no longer listed as an Area of Concern, residents hope to see tourism return to the area and the return of the ecosystem services White Lake offered prior to the devastating industrial pollution. The delisting offers residents a way to reconnect to their local ecosystem; reestablishing a sense of stewardship, and place, back into their own community.

Luxury Homes on Hide Island

He didn't mean to become an activist. He was, after all, raised on a farm. How many farmers-turned-activists do you know? But when you live downstream, you learn quickly what you are willing to do for your lake, your community. At least, that's what George Marks learned. He explained, "[l]iving in the White Lake area, my farm is located in the White Lake Watershed. So, I'm *connected* as a resident," [emphasis added].

George sat on the White Lake Participatory Action Council for twenty plus years, helping define and shape the future of White Lake and the watershed as a whole. "Early on, there was maybe just five of us [on the WPAC] and we'd be looking at our shoe ties thinking, 'Should we still be doing this?' And the answer was always, 'Of course.'"

"Community is the greatest key to getting something done," he said, adding,

> The more partners at the table helping push that third party to do something, in a non-legal aspect. The local community is there pounding the table saying, 'Come on, you made this mess, you need to clean it up.' *That's the partnership that made the difference, especially with the Tannery.*

He continued,

> I don't think it's ever going to come back to 'White Lake the Beautiful.' That was our motto before Hooker and DuPont [arrived]. I hope a larger portion of the community wakes up to the resources they have. History repeats itself all the time. Different issues, but same regards to the resources being degraded. Whether it's bottling water or huge swathes of lands being clear-cut without the full understanding of what's going on downstream.

Whitehall Leather Company

The former Whitehall Leather Company operated a tannery from 1865 until the mid-1970s. In the mid-1940s, chromic sulfate (chromium) was used as a tanning agent to keep up with the high demand for military boots during WWII. Arsenic and mercury were added to the process as biocides to speed up the dyeing process (Lata-Kemron, 2013). Tannery wastewater was reportedly discharged into White Lake prior to 1940.

After 1940, wastewater was discharged into six lagoons on the tannery's site, and it remained there until the land was included in the White Lake toxic hot-spot and listed as an Area of Concern in 1987 (United States Environmental, 2016).

Figure 6 Whitehall Leather Company, Whitehall, MI (WLEHP, 2018b).

The state's investigation of Whitehall Leather Company and Tannery Bay began in 1995, after the designation as an Area of Concern, but five years passed before the company finally closed its doors (Hausman, 2014a). Removal of Tannery Bay's contaminated sediments commenced two years later, in 2002 (Hausman, 2014a). Sludge was dredged from the lagoons and disposed of on the property (Lata-Kemron, 2013).

Bales of tanned leather straps were found in Tannery Bay being used as filler to control erosion, thus bringing the current reference to the area as "Hide Island." Between 2002 and 2003, approximately 91,000 cubic yards of sediment were removed, containing tannery waste including hide, hair, and a purple shoe polish-like dye, all which were contaminated with chromium, arsenic, and mercury. These materials were later disposed of off-site (Lata-Kemron, 2013).

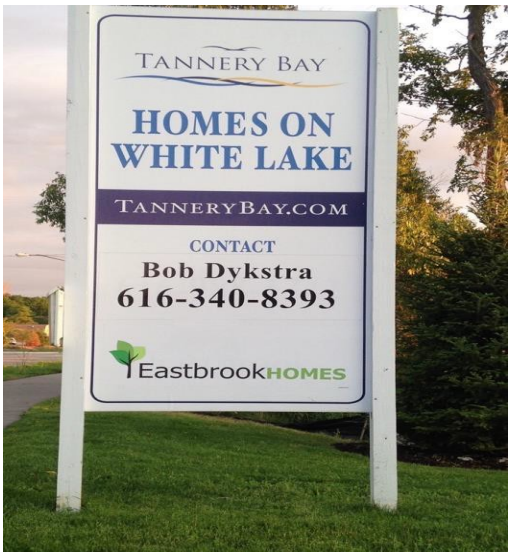


Figure 7 Tannery Bay Homes Sign White Lake, MI (Revord, 2017).

Under Michigan law, the Whitehall Leather Company and Tannery Bay falls under Part 201- Liable Party sites, according to Harriet Harpster[3], an Environmental Quality

[3] Names have been changed to protect interviewees and activists.

Analyst for the State of Michigan whom I interviewed. Michigan Law Part 201 stems from the Natural Resources and Environmental Protection Act of 1994 (NREPA), which regulates facilities of environmental contamination in Michigan. This law addresses many issues but the two main programs cover Environmental Remediation (Part 201) and Leaking Underground Storage Tanks (Part 213) (MDEQ, 2016). Harpster recalled her time working as the Project Manager on the Tannery Bay and Whitehall Leather Company remediation:

> We generally look at groundwater contamination as a higher priority that can move offsite and if you have people on drinking water wells. At this point, there was some contamination in the groundwater and also soil contamination, historic contamination. We had requested a remedial investigation to GENESCO, the parent company of Whitehall Leather. Once you find something at the location, you have to find the extent of it and step out and look into boundaries. We found things to property boundaries and the water's edge. Monitoring wells were installed, surface soils were collected, and there's a lot of negotiations because there were attorneys involved in this work (H. Harpster, personal interview, July 2017).

Funding sources

While there are several types of competitive grant funding through the Environmental Protection Agency to help with Brownfield assessment, cleanup, revolving loans, and environmental job training (United States Environmental, 2017), the Whitehall Tannery Remediation Project was paid for through the Great Lakes Restoration Initiative and through a consent judgment against General Shoe Company (GENESCO), the previous owner of the tannery site. In a 2002 Muskegon County Circuit Court Consent Judgement, Judge Timothy G. Hicks ordered GENESCO to pay $3,350,000 to the Michigan Department of Environmental Quality (MDEQ) for contribution to the cost of removal of contaminated soil (Granholm, 2002).

According to the EPA, the Great Lakes Restoration Initiative (GLRI) ultimately

financed $4.6 million towards remediation and restoration of White Lake as an AOC, the largest investment in the Great Lakes in the last two decades. The money was divided between Tannery Bay and other projects along the lake.

There were several funding sources for this program, but the main source of funding came from the direct implementation of the Great Lakes Legacy Act (United States Environmental, 2017c). The Legacy Act was established to provide federal funding to "accelerate contaminated sediment remediation in Areas of Concern" (United States Environmental, 2017c). Since funding to implement the GLLA was first appropriated in 2004, the EPA has invested over $338 million, complementing the $227 million in non-federal sponsors (United States Environmental, 2017c). Federal funds like the GLAA support cleanup efforts in communities to spur economic revitalization, increase property values, and improve quality of life the communities that are most affected by the devastating effects of industrial contamination and pollution.

The Great Lakes National Program Office (GLNPO) coordinated with Canada, under the Great Lakes Water Quality Agreement, to "restore and maintain chemical, physical and biological integrity of the Great Lakes Basin Ecosystem, which includes Lakes Superior, Michigan, Huron, Erie, and Ontario," (United States Environmental, 2017c). The U.S. and Canada first signed the Agreement in 1972, and it was amended twice, once in 1983 and again in 1987. In 2012, it was further updated to enhance water quality programs that ensured the "chemical, physical, and biological integrity" of the Great Lakes (United States Environmental, 2017c).

Under the Great Lakes Restoration Initiative framework, GLNPO pulled from federal, state, tribal, local, and industry partners to achieve their objectives. One such

objective was to provide assistance for 'community-based Remedial Action Plans' for Areas of Concern and to use their funding to assist in these projects, (United States Environmental, 2017c).

Another source of funding came from a watershed management program called the Clean Michigan Initiative (CMI). Run by the Michigan Department of Environmental Quality, the goal of CMI was to "restore waters impaired by nonpoint source pollution and protect high quality waters from degradation" (MDEQ, 2017). Counties and local government entities, as well as non-profit agencies, were able to apply for CMI grants under a required 25% match. The White River Watershed Planning Project received $154,823,and matched $24,195 to assist in reducing the negative impacts that nonpoint source pollutants were having on the 344,166-acre watershed (Carlson, S., Dey, S., Evans, K., Genson, R., Kolbe, E., Ryneberg, J., 2008).

Harriet Harpster recalled a bit more regarding the local clean up funding and the financial burden that lay with GENESCO:

> I think that's why the Great Lakes Restoration Initiative and GLNPO [Great Lakes National Program Office] has been successful in assisting with cleaning up things. They kind of help match. A lot of these companies say that they were only doing what they were told to do at the time. They see that some of this was historic and I think that's how to get clean ups. 187,000 tons [of contaminated soil was] removed from the site that GENESCO paid for, they paid for my time out there. Costs were recovered by GENSCO for my time. Some CMI [Clean Michigan Initiative] funds were used in 2006, they were rewarded some Brownfield money, that came from the state. That money goes statewide to different Brownfield sites.

Remediation Work

Field crews mobilized on August 19, 2013 to start clean-up at the former White Lake Tannery site. A number of permits were obtained and sampling of the soil was done prior to the September 19th dredging. Monitoring of the dredging ensured that all

discolored materials (assumed to be toxic) were removed down to the clean sand. Water and air quality were measured throughout this time to ensure water turbidity control and that fugitive dust would not become an issue on the work site or become sources of additional contamination. The dredging project carried out by Emergency and Rapid Response Services wrapped up on November 8, 2013, removing 8,629 cubic yards of sediment, disposing of 12,669 tons of amended materials, treating and discharging more than 126,000 gallons of water, and placing 7,863 cubic yards of sand backfill (Lata-Kemron, 2013). The cost of this remediation was $3,560,799, according to Lata-Kemron, a member of the Emergency and Rapid Response Services team that wrote the final site report for White Lake Tannery Bay (2013).

Remediation of the former Whitehall Leather Company property was completed in 2011. Although pleased with the progress made at Tannery Bay, Harpster empathized with the community and the property by stating, “When I say clean-up, I don’t think it’s ever a full, true cleanup, we don’t ever get it back as it was pre-conditioned. As much as we’d love to, it just doesn’t ever happen.”

Tannery Bay Homes

> *"Tannery Bay where spectacular vistas, stunning lakeshore beaches, and the clear, sparkling waters of majestic Lake Michigan combine to create a haven unlike any other. This private lakeside community offers newly built single-family homes and condominium living,"*
>
> – Community Details, Trulia.com (Trulia, 2017).

On May 26, 2015, the Whitehall City Council approved a Planned Unit Development (PUD) for Tannery Bay Homes by developer Eastbrook Homes, which is based in Grand Rapids, Michigan (Hausman, 2015). This included the development of approximately 160 housing units in a lakefront residential complex, complete with a clubhouse, restaurant, and marina (Hausman, 2015b). When asked about the Council's thought process and city's efforts to ensure security and safety for Tannery Bay homeowners in the summer of 2017, Whitehall City Manager Scott Huebler declined to be interviewed. However, in a 2015 news media interview, Huebler remarked, "I'm confident it's been cleaned up to the highest degree possible, so there are no 'what ifs'" (Hausman, 2015).

Local residents of White Lake voiced their concerns over the building of Tannery Bay Homes from the initial proposal onward, their main concern being that clean-up efforts should not be compromised in order to fast track the development timeline. Based on the interviews I conducted with local activists and analysis of local literature, many residents were happy to see the land at Tannery Bay being developed, but wanted to ensure that the safety of the community continued to be held above the profits of the developer. "We want a high-quality project here," said Catherine Ellis, a resident who called for removal of contaminated sludge from the lagoons. "We want

high standards, not limited standards" (Means, 2009).

USDA Natural Resources Conservation Services employee, member of the White Lake Public Advisory Council, and concerned member of the community, George Marks, had this to say about Tannery Bay Homes in an interview:

> Tannery Bay, I wouldn't buy there. There's no way that the cleanup and the sediment removal captured 100% of what still lays there and downstream, down lake. It was a money issue. The state and the company agreed on a $7 million cleanup, the state did about $2.3 million into it. And this was just prior to the Federal Legacy Act with USEPA coming on board. GENESCO was the responsible party for it. The State wanted to get that site cleaned up, but it was pretty much limited based on available dollars. Instead of the 200,000-300,000 yards [of potentially contaminated waste that was identified during the initial cleanup estimate] they did about 85,000 yards that ended up getting removed. US Army Corp estimated 300,000. They probably got the worst. *The bar of cleanup was lowered to fit the dollar amount.* Lead, arsenic, mercury, and chromium. It all goes back to the dollar [emphasis added].

Trulia, the online and mobile real estate platform, estimates prices of new Tannery Bay Homes at anywhere from $243,400-$461,900 (Trulia, 2017). The real estate website provides no information about remediation efforts or the parcel's dirty history, leaving interested new homeowners in the dark, and worse, the potential to expose unknowing children and families to decades worth of contaminants deeply buried in their own backyards.

Although Tannery Bay Homes has met the criteria for brownfield development, many residents are still hesitant about the cleanup efforts on the site. Some, like George Means, wonder if the 'bar was lowered' due to financial barriers, preventing the state and GENESCO from doing a thorough job. Other residents see the reuse of the site as a positive step forward, but question how the development of homes will benefit the community at large. According to the inital article written on *MLive*, a Michigan-based

online news source, the principal plans for Tannery Bay homes included a restaurant and storefronts along the Eastbrook Homes site (Hausman, 2015) and invites the land to be used for public access, but left as private home lots, the reuse of the site offers little for White Lake residents, as many interviewees had voiced.

This is Not a Chocolate Factory

"Can you just talk to me about the purge wells- there's about 16 purge wells on the site [at Hooker], that they are pumping water through activated carbon, and then that carbon is going to an incinerator down in Chicago. What does the carbon do when it filters out C-56 and the other PCBs?"

Dr. Robert Radcliff[4] was sitting across from me in his office; papers, rocks, and books scattered throughout the room. He was every sort of nutty professor I was hoping for. I came to him because he was supposed to be "the guy" to talk to. A research professor at my alma mater, Radcliff was an environmental chemist and studied the fate and transport of chemicals in the environment. He was also a key player in the cleanup of White Lake, the Area of Concern delisting, and seemed to know a thing or two about Hooker Chemical Company and the current operation being run by Occidental Chemical. He replied,

> The first thing they have to do, the groundwater is very caustic, very basic. They have to inject carbon dioxide into the groundwater. They have to treat the pH issue of the groundwater. That's something that a lot of people aren't aware of. They made chlorine gas and sodium hydroxide, so there's a lot of sodium hydroxide left (R. Radcliff, personal interview, July 2017).

He looked around the room, as through searching for a visual aid or something to help me better understand the science he was spewing at me. I'm guessing there was a blank look in my eyes. Without finding what he was looking for, Dr. Radcliff continued, "The carbon absorbs the C-56 and the other soluble materials in the ground water. So

[4] Names have been changed to protect the interviewees and activists.

they have to change the Ph of it. They have back up filters and monitoring- they have an onsite lab that does all the monitoring."

He hadn't heard that it was now estimated that it would take 10,000 years (Hausman, 2014b) for the purge wells at the previous Hooker Chemical Company site to completely clean up the contaminants, but he didn't flinch when I threw the number out. "I hadn't heard that one. I was under the impression that it would take 300 years, but I believe it. It will take a long, long time."

> The C-56 outfall was in one of the deeper spots [in White Lake], nobody was exposed to that sediment. There was actually a dead zone at the bottom of that area, there were no invertebrates that lived there. They dug out to 1 ppm there, capped the sediment, placed charcoal on it, [and after] seven years of monitoring and they tested the fish and invertebrates on it... Chromium is going to be there [White Lake] forever- Occidental for hundreds of years. Chromium will always be there, but it will get buried now that there's no more discharge. You've got very large tracts of land, i.e. DuPont and Occidental that can't be used, they are totally taken away from the public.

He seemed bothered by this last part, that these lands were taken from the community, as though he was invested into the community himself. I wondered if there were a lot of external pressures that he was worried about, specifically funding. I asked him about the Great Lakes Restoration Initiative (GLRI), the $300 million in federal funding and 3,500 jobs that were on the chopping block [at the time of the interview] under the current Trump administration (Ellison, 2017). The administration was set to reallocate the GLRI funding to help pay for the wall between the United States and Mexico border. Radcliff noted,

> I'm very concerned about the funding of GLRI. Those funds were instrumental in getting White Lake cleaned up. If those funds evaporate, we're going to have trouble cleaning up Muskegon Lake. They pay for a lot of other important aspects like Beach Monitoring. All of the Lake Michigan beaches are monitored for bacteria, and that money comes from the GRLI.

It seemed that the health and well-being of White Lake and the rest of West Michigan still weighed heavily on his mind. It has not been disclosed whether or not Occidental Chemical Corporation (OxyChem) knew the exact details of what they were inheriting with the purchase of Hooker Chemical Corporation but Radcliff and I discussed our speculations. Regardless, Glenn Springs Holdings, the subsidiary of OxyChem, has worked diligently on enforcing cleanup efforts and has allowed the public to weigh in, giving a sense of transparency and respect to the local community.

Hooker & Occidental Chemicals

Hooker Chemical has a history of disposing of hazardous chemicals in ecosystems surrounding its plants. The Love Canal, EPA Superfund site in Niagara Falls, New York, is a well-known example in which Hooker Chemical was found to be a negligent contaminator. The United States sued Hooker Chemical for disposing 199,900 tons of chemical waste at four of their plant sites, and another 66,000 tons of waste at a local landfill (United States Environmental, 1979). EPA scientists found 82 toxic chemicals in the air, water, and soil near the dumping grounds, and at least a dozen of those were carcinogenic. This blatant disregard for health and human safety triggered several health problems among local residents. Sixteen years later, in December of 1995, the Corporation settled the suit for $129 million dollars (Gerstenzang, 1995).

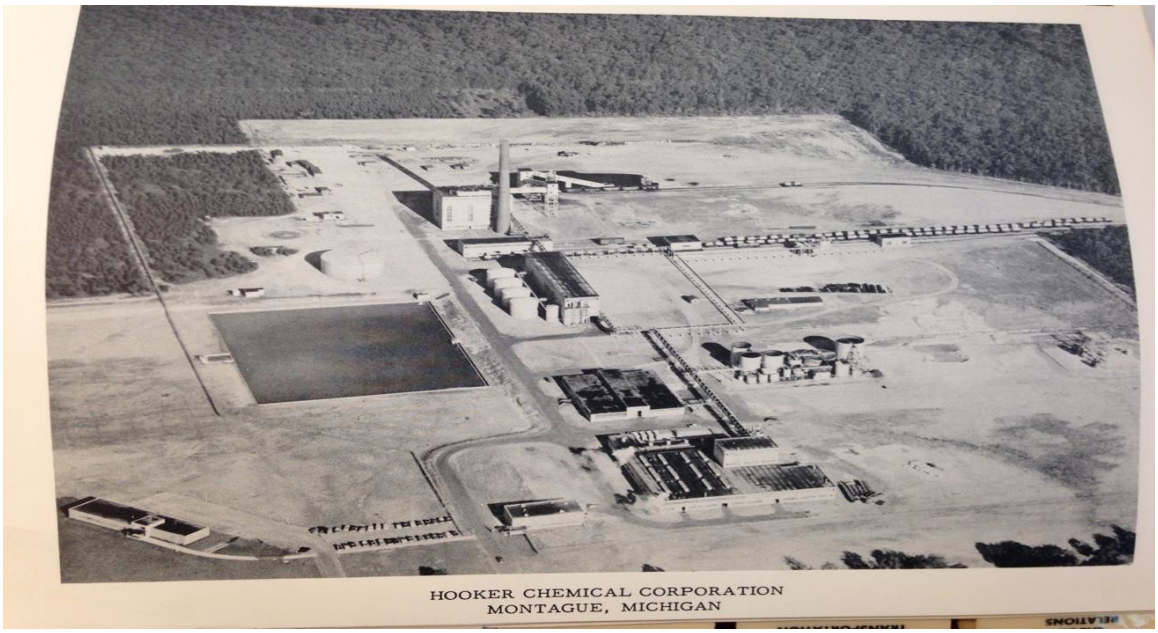


Figure 8 Hooker Chemical Corporation, Montague, MI (WLEHP, 2018b).

Hooker Chemicals established a new factory in Montague, Michigan in 1954, manufacturing chlorine, caustic soda, and C-56 (hexachlorocyclopentadiene), a precursor to several cancer-causing pesticides (Richards, 1979). At its peak, Hooker Chemical employed roughly 300 people and was once the largest employer in the area. Around that time, Montague had a population of around 2,400 people. In Whitehall, the population was around 2,500 (Population, 2016).

In 1966, residents began to notice a change in White Lake near Hooker's discharge pipe (WLEHP, 2018b). A year later, the State of Michigan documented a drop in benthos in that same area, as well as high levels of sodium chloride (WLEHP, 2018b). In 1968, Occidental Chemical Corporation (OxyChem) bought Hooker Chemicals, viewing the purchase as an opportunity to expand their production of pesticide pre-cursors. Three years after industrial and municipal discharges were redirected from White Lake to the county's new wastewater treatment plant, OxyChem closed a portion of the facility, the fine chemicals plant.

In December of 1976, Hooker was fined $176,000 for its alleged toxic chemical damage to the fish population of White Lake (Muskegon, 1976). Assistant Attorney Stuart Freeman supported this fine by stating that Hooker "has made a hell of a lot of money by not having its pollution under control. Now we are going to try and get some of it back" (Muskegon, 1976). This payment would not reverse any long-term effects of Hooker's negligence, of course, but there was hope that it would "send a message," as it were, by not allowing the polluter to profit by their misconduct and erroneous ways (Muskegon, 1976).

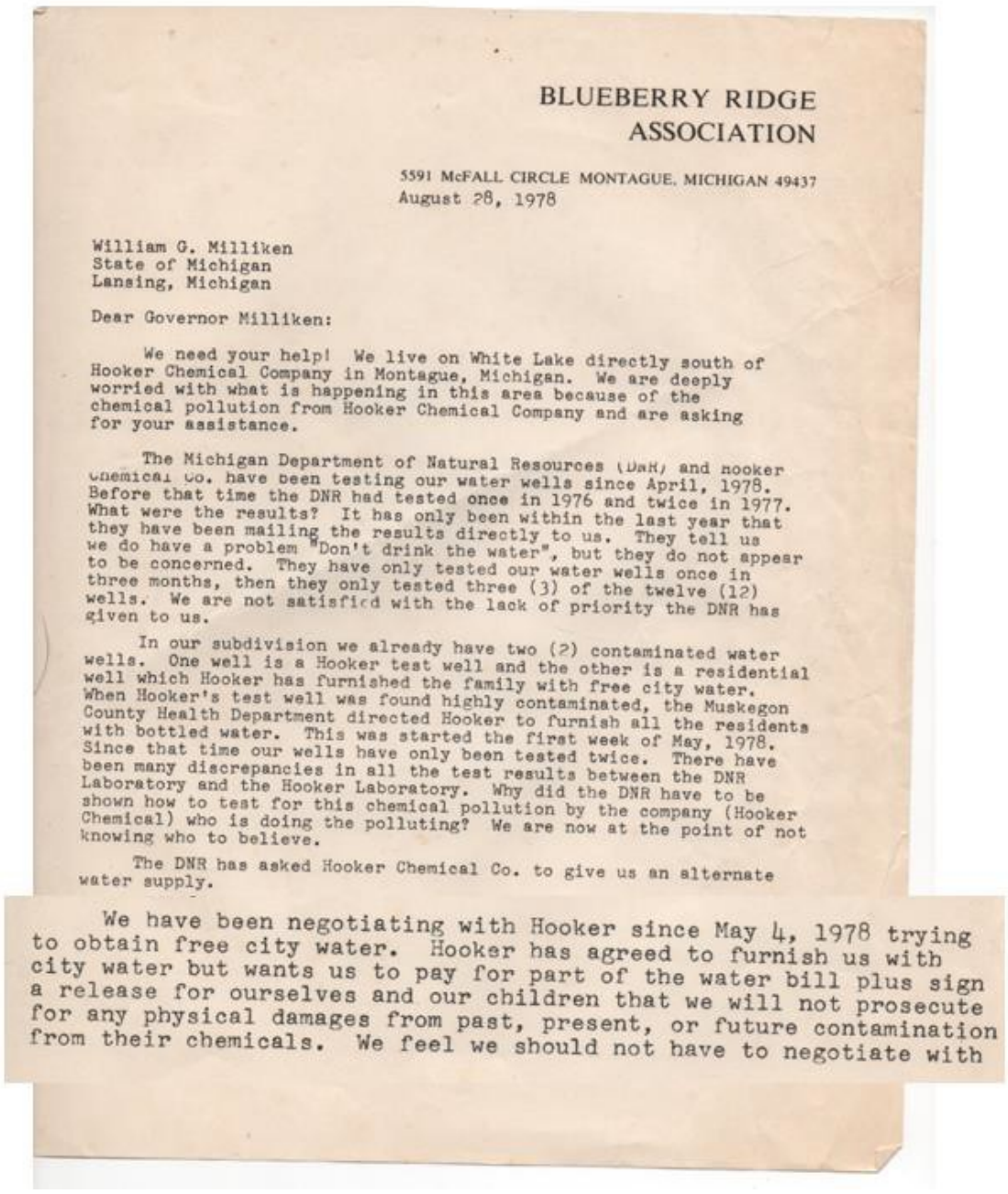
It wasn't much later when the residents of Blueberry Ridge noticed a funny taste in

their well water. As one resident recalled, “You began to know what C-56 smelled like” (Mahoney, 2013). Located directly between OxyChem and White Lake, Blueberry Ridge residents had beautiful views of the lake and the Hooker Chemical discharge pipe. This same discharge pipe was pumping C-56 into White Lake (Sims, 1978).

The DNR confirmed that Blueberry Ridge wells were contaminated. The residents of the subdivision decided they were not going to take Hooker’s contamination without a fight. Beverly Hunt, a Blueberry Ridge homeowner, was furious when she found out her water was contaminated. She vented her frustrations, saying,

> Hooker tells us to use the bottled water for drinking and cooking, but they say our water isn’t contaminated… They’d give us city water from Montague if we sign a release that we and our children won’t prosecute them for any health problems later. We refuse to sign. (Sims, 1978).

In a letter to Michigan Governor William Milliken, the Blueberry Ridge Association pleaded their case against Hooker Chemical, hoping for the state’s support in the fight against the chemical plant (Figure 8).



BLUEBERRY RIDGE
ASSOCIATION

5591 McFALL CIRCLE MONTAGUE, MICHIGAN 49437
August 28, 1978

William G. Milliken
State of Michigan
Lansing, Michigan

Dear Governor Milliken:

We need your help! We live on White Lake directly south of Hooker Chemical Company in Montague, Michigan. We are deeply worried with what is happening in this area because of the chemical pollution from Hooker Chemical Company and are asking for your assistance.

The Michigan Department of Natural Resources (DNR) and Hooker Chemical Co. have been testing our water wells since April, 1978. Before that time the DNR had tested once in 1976 and twice in 1977. What were the results? It has only been within the last year that they have been mailing the results directly to us. They tell us we do have a problem "Don't drink the water", but they do not appear to be concerned. They have only tested our water wells once in three months, then they only tested three (3) of the twelve (12) wells. We are not satisfied with the lack of priority the DNR has given to us.

In our subdivision we already have two (2) contaminated water wells. One well is a Hooker test well and the other is a residential well which Hooker has furnished the family with free city water. When Hooker's test well was found highly contaminated, the Muskegon County Health Department directed Hooker to furnish all the residents with bottled water. This was started the first week of May, 1978. Since that time our wells have only been tested twice. There have been many discrepancies in all the test results between the DNR Laboratory and the Hooker Laboratory. Why did the DNR have to be shown how to test for this chemical pollution by the company (Hooker Chemical) who is doing the polluting? We are now at the point of not knowing who to believe.

The DNR has asked Hooker Chemical Co. to give us an alternate water supply.

We have been negotiating with Hooker since May 4, 1978 trying to obtain free city water. Hooker has agreed to furnish us with city water but wants us to pay for part of the water bill plus sign a release for ourselves and our children that we will not prosecute for any physical damages from past, present, or future contamination from their chemicals. We feel we should not have to negotiate with

Figure 9 Letter from Blueberry Ridge Association (Sims, 1978).

The company stopped making C-56 in 1977. According to Andrew Hogarth, Chief of Groundwater Compliance for Michigan's Department of Natural Resources, C- 56 is the major component of insecticides like Mirex and Kepone, and Hooker could not afford the required treatment of the chemical to keep it from polluting the environment (Sims, 1978).

During this time, residents beyond Blueberry Ridge began to get involved. The once beloved Hooker Chemical was now being shunned by activists in the community due to its devastating impacts on the local environment, including groundwater and air contamination. Worried about their children, the quality of the lake, and the local economy, many residents turned into activists and started to protest. The community was divided. There were people, resort owners, for example, who wanted the cleanup to happen but keep it hidden from public view, as their livelihoods relied on tourists visiting White Lake. Then there were the activists who just wanted to get it done (Mahoney, 2013).

Challenges of the Superfund Site

Because of the outcry from residents at Blueberry Ridge, Occidental Chemical was the first known groundwater contaminator on White Lake (United States Environmental, 2017b). Over 50 acres of the Hooker Chemical plant site hosted unlined "settling" ponds where 506,000 cubic yards of organic waste was disposed of (United States Environmental, 2016²). Chlorinated organic chemicals trichloromethane, carbon tetrachloride, trichloroethylene, hexachlorobutadiene, hexachlorocyclopentadiene, and hexachlorobenzene were all still found at the site contaminating both the surface and

ground water in 2016 (United States Environmental, 2016[2]) (Appendix III).

As part of the cleanup efforts, officials decided that the safest way to dispose of the chemical waste was to capture and contain it on site. Starting in 1980, contaminated soil located throughout the Hooker site was placed in a large, pyramid-shaped containment vault. The technology was considered "advanced" for the time (Hausman, 2014b). Nearly one million tons of toxic soil was placed inside the 10-acre (United States Environmental, 2017b)[,] clay-lined vault. Locals called this containment "The Vault" or the "Temple of Doom" (Hausman, 2014b).

In a settlement between the State of Michigan and OxyChem, residents were assured that no additional waste would be brought in to be placed in the vault. Shortly after this verbal commitment, the DNR brought "caravans of trucks were bringing in waste to put in the vault" with contaminants from a dump site located in the central part of the state (Mahoney, 2013). In an interview for the local White Lake History archives, Mary Mahoney recalled her role in the protests,

> When the first trucks came, we decided to do a peaceful march. We wanted one person to get arrested and I was prepared to do it. Well then Ralph Rose said, 'Mary, do you mind if I get arrested?' (Mahoney, 2013

Figure 10 Left: Hooker Chemical Workers during the creation of the Vault; Right: Mother and child protesting (WLCL, 2017)

When the Hooker/OxyChem plant finally came under investigation for contaminated soils and groundwater in 1981, they responded by closing their doors the following year, and in 1985, White Lake became a designated Area of Concern. There is far more research and data on Love Canal than on the comparatively smaller White Lake contamination site, because the former proved to be the costlier and more visible incident. The incident at Love Canal has been research extensively, and provides a cautionary tale for discussing corporate malfeasance, environmental catastrophe, and the short and long-term social and economic costs associated with both. However, by contrast, Hooker Chemical's misconduct in White Lake has flown under the radar of both the press and the academic community. James Truchan, an environmental specialist for the Department of Natural Resources stated that, "The only

difference between Montague and the Love Canal is that we don't have people living on the site" (Sims, 1978, para. 8).

Hooker managed to exploit one community, only to commit a strikingly similar transgression in a smaller, more remote area and have it go largely ignored. As such, there is not only a need within academic literature to understand the long-term effects of chemicals in White Lake on the surrounding community; there also exists a moral imperative to expose and hold Hooker and other corporations responsible for the reoccurring and lasting impacts they have on communities.

Figure 11 Vault at Oxy Chemical (Revord, 2017).

Hooker continued to clean up the property. In 2010, the EPA issued its final verdict on the site, estimating that the contaminated groundwater could remain for another 10,000 years as there were more than 500 toxic chemicals still seeping into it (Hausman, 2014b). The EPA then placed a permanent conservation easement on the shoreline portion of the property (Hausman, 2014b) and left. The cleanup efforts for White Lake cost roughly $4.6 million through the Great Lakes Restoration Initiative, funded by the EPA (United States Environmental, 2017) as part of their National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act (United States Environmental, 2016b).

During a tour of the facility in August of 2017, I witnessed the scale of the groundwater collection and treatment system currently operating on the property. The system was designed to contain a contaminated plume of water (Figure 11) and keep it from travelling off site. Since 1982, the system has continuously pumped and filtered close to one million gallons of water per day (United States Environmental, 2016²). After treatment, the water is discharged into White Lake.

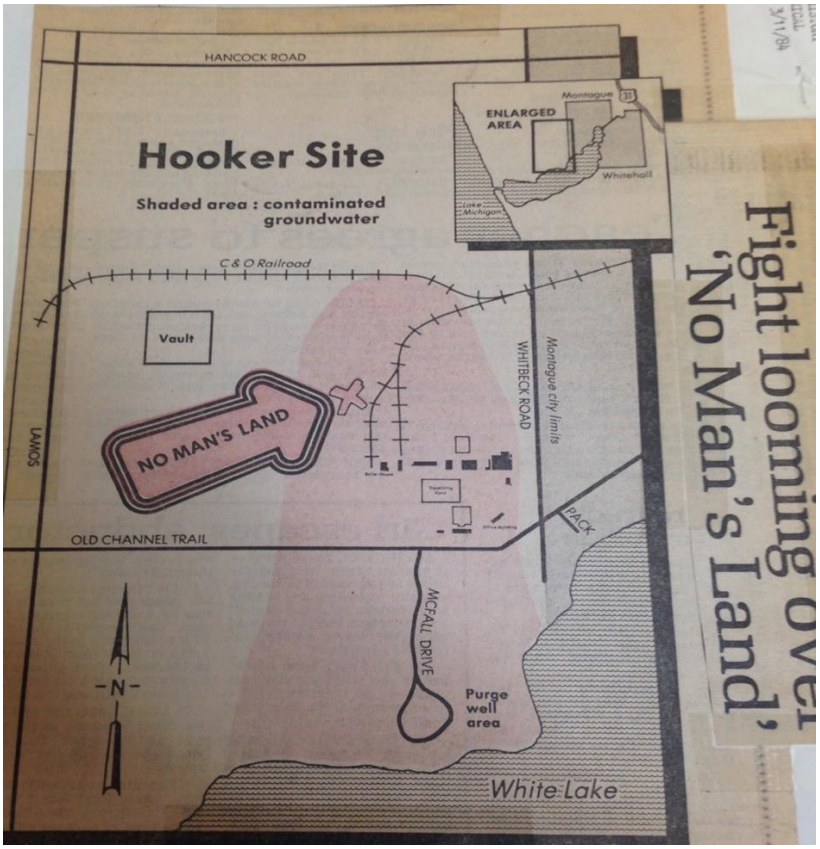


Figure 12 No Man's Land, Contaminated Groundwater at Hooker Chemical site (WLCLb, 2017).

The former Hooker Chemical site, now managed by Glenn Springs Holdings, Inc. an Occidental Chemical subsidiary, helped turn the old property into a non-public nature sanctuary. Although now a visually beautiful restored habitat, in 2017, the property still contained close to a million tons of chemical waste and toxic materials.

Glenn Springs Holdings' cleanup efforts regarding Hooker's industrial contamination were addressed in two separate parts: the impacts on White Lake and the pollution that occurred in the area surrounding their site boundaries.

Funding for White Lake remediation came from the Area of Concern, the Clean Michigan Initiative (CMI) funds, and included state, federal and local sources. In a questionnaire sent to Eric Moses, Director of Communications and Public Affairs for

Occidental Petroleum Company, I asked how much Hooker Chemical, Occidental, and Glenn Springs Holdings spent on clean-up efforts, and Moses simply replied that they do not disclose that amount.

Remediation Work

As Moses noted, Glenn Springs Holdings now manages the site to "ensure the long-term maintenance of the EPA-approved groundwater containment remedy as well as nurture the habitat for the native wildlife."

The onsite landfill contains the contaminated soils excavated from the remediation activities in 1981 and 1982. As Moses described the landfill, "It was constructed with a 10-foot-thick clay base liner, with a network of perforated piping that carries liquids – mostly rain and snow – to the water treatment plant." The landfill was covered with topsoil and vegetation to prevent erosion, allowing the towering vault to blend in better with its surroundings. Glenn Springs Holdings conducted semiannual groundwater monitoring to certify that the cap, liner and leachate collection was functioning as designed. Wells were placed around the entire landfill and monitored to ensure the landfill continued to function as designed. The Michigan Department of Environmental Quality (MDEQ) conducted annual cap inspections to monitor for defects in the cap's integrity and vegetative cover. Regarding the vault, Moses stated that the landfill will be maintained and monitored for the "foreseeable future." (Appendix II).

According to Moses, on-site eight purge wells helped ensure that no impacted groundwater reached White Lake. The eight purge wells collectively produced about 700 gallons per minute, and were monitored 24 hours a day via a fiber optic telemetry

system that sent notifications related to flow, pressure or pumping issue. Water is processed and treated by carbon filters in large vats (Figure 12) before being released into White Lake. Once the carbon filters have reached the end of their lifespan, they were sent to an incinerator in Chicago for disposal.

Figure 13 Carbon filter, managed by Glenn Springs Holdings (Revord, 2017)

Glenn Springs Holdings provided supervision and ongoing maintenance to ensure the system was performing as designed. In 2012, the underground piping and electrical network was replaced. The wells were replaced as needed, and only two wells have been replaced in thirty-five years. As with the vault, the wells were expected to continue to operate for the 'foreseeable future.'

In an attempt to move beyond their historical legacy as contributors of pollutants, Glenn Springs Holdings and OxyChem continued to work on their relationship with community residents. As Moses stated,

> [We] are proud to be members in good standing of the White Lake Community and will continue to run an operation that is protective of human health and the environment. We are committed to maintaining the property as greenspace and wildlife habitat, both of which were requested by the community.

Moses made it clear that the relationship with all stakeholders, including the City of Montague, the White Lake Public Advisory Council, and the Muskegon County Soil Conservation District, was critical to the success of restoring the previous Hooker site. Glenn Springs Holdings' restoration work at the site has received accolades from Pheasants Forever and was certified by the Wildlife Habitat Council.

As I gathered from my conversations with activists in the area, the general sentiment towards the parcel of land once owned by Hooker Chemicals had changed from one of fear to one of hope for the site. "As far as the cleanup themselves, I think Hooker [Glenn Springs Holdings] has done a fairly good job. I think they have done a good job with the groundwater," George Marks commented on Hooker. To clarify, Marks was referring to the cleanup that Glenn Springs Holdings did on the previous Hooker site. The parcel, which was once viewed with fear, had now become a "poster child" for future reuse sites.

Figure 14 OxyChem/Glenn Springs Holding Wildlife Designation (Revord, 2017).

Harriet Harpster concluded on the topic of Hooker that,

> I think with Hooker [Glenn Springs Holdings] being a wildlife preserve, I like to see more wild spaces that are being reused naturally. The tannery redevelopment, seeing Brownfield and industrial sites being reused is advantageous, instead of being barricaded off without any future use. It does make it challenging when you do redevelop for whatever use they are. You want to make sure you manage the risks appropriately when you do that. Across the state we've gotten some good brownfield reuses. I like the uses of green space.

Overall, the White Lake community activists I spoke with applauded the efforts by Glenn Springs Subsidiary, but still had concerns regarding the longevity of the cleanup on the site. Glenn Springs and OxyChem did a commendable job with the transparency and communication with the community, answering questions, providing insight into remediation efforts, and held public meetings to share updates and address concerns. I noticed during my time with activists and community members that their perceptions towards OxyChem had shifted over the years due to their relationship with the community.

Secrets the size of the town

When I sat down with Debbie Jacobson[5], I knew that we were going to be friends. I didn't know her before setting up our interview, and I still don't know her entire story. I knew her kids, but only because we were on the same bus route. She was calm and collected, but there was a fire in her eyes. My first question to her was, "What makes you care about the environment in White Lake?" She responded, "What makes me care about the environment anywhere? There is one planet, one earth. That's it" (D. Jacobson, personal interview, July 2017).

It was in that moment I knew we were going to get along. She was passionate, and thoughtful, and wasn't going to let anyone stop her. "Polite people get poisoned, that's sorta been my mantra; you have to make noise to get change."

Debbie continued to tell me about her change from mom-to-activist -to- community organizer: "It wasn't until someone convinced me in 1989 to go to a conference in Clare, MI and I came back the next year a different person." After that initial conference, Debbie knew she had to help make change in her own community. She joined Citizen's Group in Muskegon, just fifteen minutes north of the White Lake Community. It was more of an information group, focusing attention on a few Muskegon entities and DuPont, located right on White Lake.

She knew she had to get involved with DuPont after an incident she experienced as a bus driver left her shaking. She recalled:

> I was a school bus driver at the time and I remember driving a bus down Old

[5] Names of have been changed to protect interviewees and activists.

> Channel [the main road near DuPont]. Through the trees, it was just white. I had abus full of kids at the time. I know what HC [hydrocarbon] is now. To this day, I remember seeing that leak or release at DuPont while driving the kids. I stopped and called by boss to tell him I couldn't go any further, that I wouldn't go through.

Debbie remembered getting a lot of pushback for her decision at the time.

While diving more into the history of DuPont and the chemicals they were

manufacturing, Debbie hit a wall.

> First of all, they refused to meet with us, then they met with us and their environmental person, at DuPont, [and he] took me for a tour and showed me the facility where the CFCs [chlorofluorocarbons] were produced. I told him about a study I had just read and I talked to him about prostate cancer in men and he said 'we don't worry- we open up the windows at the top. If the levels in the plant are too high, that's what they do.' And I told a reporter who was doing research on CFCs about what the guy said, but it was illegal at that point, to knowingly put CFCs into the air. After that, DuPont stopped speaking to me. I couldn't be trusted. I just thought that people had the right to know. It's all about business with corporations. That's the bottom line: Profits first. It's this short sighted, linear thinking. It shocked me. They didn't see things holistically at all. It was all about profit.

She sighed in frustration, a sigh that weighed heavy in the room.

Her work continued for years. Jacobson spent much of her free time researching and going to lectures and conferences. "It was all consuming. My kids remember seeing mom on the floor, with papers scattered everywhere, wondering, 'Are we going to eat?' and me being like, 'Hold on, this is Washington on the phone!'"

Debbie isn't just one woman with a vengeance. She is one of the many White Lake residents who wanted to know more about the happenings in her own backyard. She invested time and energy into her community. She spent time away from her kids for this. She exhausted herself every night reading reports, gathering data, making phone calls. She was someone who thought people had the right to know.

DuPont

DuPont sits across from Occidental Chemical Corporation just off a long dirt road. Their lime piles are visible from the road, but that's about as transparent as the company gets.

E.I. DuPont de Nemours (DuPont) opened a 1,330-acre site in Montague in 1956, less than two years after Hooker Chemical. Situated less than one mile down the road from the old Hooker plant, DuPont produced chemical products for food preservation, air conditioning, and medical devices (Gaertner, 2008). In 1992, DuPont's landfills came under investigation by the State of Michigan. When the company closed its doors three years later, there were eleven chemical dumps on the property, two of which were considered "significant" by state officials (Gaertner, 2008).

In a 2004 meeting with the White Lake PAC, Michigan DEQ representative Ronda Blayer told residents that the main focus at DuPont was the plume of groundwater contamination that had impacted residential wells. This water was contaminated with volatile organic compounds including PERC, carbon tetrachloride, and Freon 113, chemicals typically found in degreasers and refrigerants (Beacon, 2004). Similar to the old Hooker site, DuPont also installed pumping wells onsite to treat contaminated groundwater plume (Figure 14). DuPont executive, Thomas Stilley stated that there were over 200 wells on the site, pumping 625 gallons per minute from the property and reinjecting the treated water back into the ground (Beacon, 2004).

Figure 15 Map of Contaminated DuPont Site (Gaertner, 2010).

During the White Lake AOC delisting process, DuPont entered into a 'voluntary cleanup' before any legal action could ensue. This decision ultimately allowed DuPont to remain out of the press and resulted in a very private clean up. Little was recorded or shared with the public during this time, resulting in a confused and frustrated community. Blayer told White Lake residents that DuPont was "voluntarily providing information about its correction actions and the state prefers keeping a working relationship rather than entering an enforcement posture" (Beacon, 2004).

George Marks seemed very skeptical when I asked him his thoughts on the cleanup. He told me,

> DuPont is questionable. They are doing a voluntary remedial action plan with the state. But since the delisting, I don't know if anything's moved forward. It's a voluntary program. Since the delisting though, I think the DuPont facility and the clean-up with them has fallen off the radar. There's a number of items out there in regards to groundwater contamination. Pierson Drain and Pierson landfill, we could never get them resolved prior to the delisting. And the Sadony Bayou. That was one thing that we couldn't get resolved.

Some credit DuPont's ability to "fly under the radar" to their marketing and PR budgets. DuPont was able to control the media attention because they had acquired more financial stability. As Charlotte Schultz explained,

> I wanted to hear about DuPont. Norm Ullman would always make sure we were looking at DuPont. Hooker always had the most headlines. DuPont- theirs is a voluntary clean up so there's not much oversight. Hooker was a forced clean up. DuPont is just sneaky and still going on.

The future of DuPont's site is important to the people of White Lake, not only because of the contamination and its impact on the environment, but because the site is only 462 acres smaller than the City of Montague (Gaertner, 2010). Potential land use for this property could be tremendous for economic growth and/or environmental stewardship projects surrounding both White Lake and Lake Michigan. DuPont has left the community worrying and wondering about its future.

Chairman of the PAC and former Whitehall Mayor, Norm Ullman expressed his concerns with DuPont as "taking too long." Ullman commented. "We've worked our way through the tannery issue and kept track of Hooker. And DuPont ... has kind of been sliding under the radar. It's taking too long. There's been very little done."

Ullman's sentiments were shared in several of the interviews I conducted with White Lake activists. These individuals felt as though cleanup efforts at DuPont have halted due to the removal of funding and government oversight after the AOC delisting. They have continued to use their social and political capital to encourage DuPont to share updates, but shared feelings of defeat in the process.

Legacies of Resistance

Author and researcher Paul Steinberg stated that he has spent the past twenty years trying to find the answer to one question: What does it take to bring about social change to protect the environment? (Steinberg, 2015). This question might be hard to answer for some, but for the activists of White Lake, Michigan, the answer is simple: Resist.

Tanya Cabala, a White Lake environmentalist and WLPAC member, said she believes that

> [i]t didn't take huge numbers of people in our community to raise the alarm about White Lake's pollution and eventually get the attention of state environmental regulators. What it did take, however, was a few people who were not afraid to speak up, put time into researching the issues, and pursue answers and action persistently and doggedly (Cabala, 2013).

The story of the White Lake resistance started with two individuals: Winton [Wint] Dahlstrom and Warren Dobson. These two men were the beginning voices of resistance that helped pave the way for other residents (mothers-businessmen-teachers-fill in the blank)-turned-activists in the community.

Wint Dahlstrom was an attorney and citizen advocate in the White Lake community. His boat sat in the White Lake marina where he loved to fish and enjoy the water, but his desire for a bigger boat was trumped by his concern for the ecosystem. In 1966, people started noticing fish dying off in the lake and looked to Wint for a solution.

In the local documentary, *The Tragedy of White Lake,* Wint shares his story of activism from the beginning, stating:

> I was contacted by the people around here to take a look. Up until that time I was just waiting to get a bigger boat…When I saw that stuff coming out of that pipe, down there chunks of stuff, that's when I was galvanized. I've been fighting about it ever since (Beaman & Nelson, 1978).

In 1970, Dahlstrom challenged the statewide water pollution policies. His defense hit newspapers statewide and helped bring attention to the key issues in White Lake. His argument was based on a provision in the state's constitution, which provided:

> The conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety, and general welfare of the people. The Legislature shall provide for protection of the air, water, and other natural resources of the state from pollution, impairment, and destruction (Chisholm, 1970, para.11).

Figure 16 Chemical waste barrels and train depot, Hooker Chemical (WLCL, 2017c)

In 1977 Warren Dobson blew the whistle on Hooker Chemical. In the documentary,

This is Not a Chocolate Factory, Dobson recalled,

> I cut the holes in the top of the drums- 35 barrels a week we buried on the north side [of the Hooker Property], Dobson recalled, It's the poison in Kepone, it's the toxin in pesticides. It's measured in parts per billions, you can't imagine how bad it is. I thought I was going to die out there (Figure 15) (Cabala, 2013).

In that same film, he remembered,

> three days prior to when I left, they had let an 8" line just spew hydrogen chloride, chlorine, and C-56 gas. It was estimated at that time that 150,000 gallons per day were being pumped into those lines. I told him [the supervisor] it wasn't right what they were doing. I wasn't going to be a part of it anymore. On my resignation form they said "too much pollution". They didn't want to write it all out (Cabala, 2013).

When Dobson asked supervisors about their conduct, the response, overwhelmingly, was always, *"What do you think we make here? This is not a chocolate factory"* [emphasis added] (Cabala, 2013).

In another film, *The Tragedy of White Lake,* Dobson expressed concern for his community, stating:

> People have got to wake up. There's an illness in the community and it has to be taken care of before it becomes terminal. That's all. I don't believe that everyone should get radical, although in some instances that is the only way (Beaman & Nelson, 1978).

Dobson, afraid for himself and his family, resigned and fled the area.

Dobson wasn't the only one living in fear for doing what he thought was right. Robert Wesley remembered when the Federal Water Pollution Control Administration was established. It was a turning point in his crusade against Whitehall Leather Company and their continuous polluting of White Lake. Three days after Senator Robert Kennedy was assassinated, Wesley received his own death threat, a letter that stated, "Watch out! Your name is Bob too" (Woodbury, 1968, p. 46). Wesley believed

the letter came from a tannery employee who was fearful of losing his job if environmental restrictions became too burdensome on the company. Wesley hoped that after the FWPCA started to make headway, more people would follow his lead (Woodbury, 1968, p.46).

Dahlstrom went on to become the town's advocate and legal voice. This was met with its own resistance as the town stood divided. As Rand Barfoot, a Whitehall resident and City Council member remembers in a recorded interview with the White Lake Environmental History Project, "It separated us into two camps. The first were the environmentalists, the second was those who thought it was best to leave it all alone and not stir things up" (Barfoot, 2013).

This tension continued well into the next decade as the companies around White Lake started being investigated and eventually shut down. Pointing to the opposite camp, some residents began to blame the activists for losing their jobs and pushing out the few economic boosters in the community.

Wint and Warren's fights did not go unnoticed. Almost five decades after Dahlstrom became "galvanized" in the fight against pollution, and some forty-one years after Dobson's resignation, people are still applauding their monumental efforts in White Lake history.

When I sat down with Harriet Harpster, the Environmental Quality Analyst for the State of Michigan, who worked on the Tannery Bay cleanup as a representative for the state (then the Michigan Department of Natural Resources & Environment), she fondly remembered the role the two gentlemen had in the cleanup efforts:

> I think this community has a great environmental awareness. It started early and it has been continually going. It started in the 70s with the Dahlstroms, and then

> there were other crusaders, which really kept it a forefront in my district. We don't see that really anywhere else, at least in the district that I work in with the other counties that I have. I think now environmental awareness is much more on the forefront than what it was historically. A lot of it was how Hooker was discovered. With the whistleblower [Dobson].

Harpster had admired the role of the activists in White Lake. Their ability to pull together their political capital helped ignite change in their own community. Without this organization and resistance, the outcome of White Lake may have looked very different.

Discussion: Lessons Learned in White Lake, Michigan

The first sawmill was established in 1837, followed by the opening of the Tannery in 1865, Hooker Chemical in 1952, DuPont de Nemours in 1956, and Muskegon Chemicals in 1975. It was 50 years of 'lumbering' followed by another 50 years of 'slumbering' before White Lake opened their arms to businesses like Hooker Chemicals, DuPont, and the Whitehall Leather Company; the logging companies had come and gone and the area needed a new boost to the economy. These companies brought with them the promise to increase the economy and the livelihood of the community. Money came into the community and the people, jobs, and infrastructure followed. Unfortunately, they also brought contamination and devastation to the area.

Through the stories, semi-structured interviews, and historical documents, I was able to learn more about the community that I had called home, more than was ever discussed in our history classes in school. From these findings I was able to reveal the connection between industrial contamination, environmental and social justice, a sense of place (or community), and socio-ecological resilience. These themes became dominant in the discourse and reinforced the resistance and resilience of the activists in the White Lake Community. The following discussion ties interviews and historical analysis back to themes identified in the literature.

Throughout history, as confirmed by Fagin, chemical corporations' focus on profits trumped concerns for the environment, resulting in ecosystems around the world becoming easily accessible dumping grounds for toxic waste. The story of White Lake is similar to Toms River and Love Canal, however there is hope that their hard work

and organization of social and political capital will help create a vigilant community that won't allow history to repeat itself. Concerned residents utilized the resources around them to start making 'noise' in the community - they had people like Wint Dalhstrom and Warren Dobson to draw attention to the issues while organizing their resistance at the same time.

Based on the interviews and communication with activists in the area, many residents identified that the contamination of White Lake was the result of corporate greed and their heavy focus on profit over natural resources. This linear, short sighted thinking didn't incorporate the well-being of the residents at all, leaving them to take matters into their own hands. This resistance divided the community into two camps: those who argued that the jobs and the boost to the economy were vital to the success of the area, and those who saw the devastation to the ecosystem as a direct correlation to the community's health and well-being. By organizing and creating a voice for themselves, the activists in the White Lake community were able to help direct the change needed to clean up the devastation these contaminated sites had on the community.

The idea to reuse brownfield, Superfund, and other contaminated sites can be unnerving for communities. However, by incorporating public inclusion, disseminating information, and allowing co-decision making (much like in the creation and delegation of the PAC), community perceptions can be altered. Although Hooker Chemical seemed to have the most negative impact on the White Lake community at large, Glenn Springs Holdings' fought for the community's support through an attempt at transparency, encouraging people to visit the facility and become educated about their cleanup efforts.

Glenn Springs Holdings' has disseminated information to the public, created a conservation land trust on their waterfront property, and sponsored other restoration projects in the area. They attempted to become a better neighbor than their predecessors and the feedback has been positive.

However, the site has not been fully cleaned up. Hooker Chemical, was able to come into communities and use them as backyard dumping grounds and pay minimal fines for their destruction. As Moses pointed out in my interview with him, there is no long term, final solution for "The Vault" as it will continue to be on the site for the 'foreseeable future' and there is no current plan in place to change that. The water pumps perpetually clean groundwater on the site and will continue to do so for the 'foreseeable future'. Of course, Glenn Springs Holdings has done its due diligence on keeping an active clean up on the site and have done their best to preserve and protect the site and the surrounding communities. They have taken a progressive approach to conserving land and creating wildlife habitat on the areas of the site that can be used for such purposes.

The Whitehall Leather Company site is now owned by a private land developer, Eastbrook Homes, and the homes on that property will add to the many other hundreds of private homes around White Lake. When it comes to the cleanup of these areas, the people I interviewed in the White Lake community do not believe that all of the industrial contamination is completely gone. Cleanup efforts were publicized, but people are still concerned about future issues that may arise because 'the bar of cleanup was lowered to fit the dollar amount'. Residents that I spoke to would not be willing to buy land at Tannery Bay- not only because of the price, but because of the land's history.

Activists are concerned that Tannery Bay's cleanup efforts were minimized due to financial constraints and the remediation leaves little for the community as a whole.

Unlike Glenn Springs Holdings' conservation easement on the old Hooker site, Tannery Bay Homes only offers White Lake residents more over-priced waterfront homes that they cannot afford. Nor would they have any interest in owning because of the site's history. These homes are now being marketed to out-of-town vacationers and lake- front, second home buyers, without much additional information on the site's history or cleanup efforts.

The community's perceptions towards DuPont is the least hopeful out of the three main chemical plants in the area. A secretive 'voluntary' cleanup has left residents I spoke with worried about contaminants making their way into nearby Lake Michigan, which White Lake feeds into. More than anything, these residents are most disgruntled about the general lack of information. Since the Area of Concern delisting of White Lake, DuPont has remained quiet, and doesn't appear to be sharing any more information than needed. This has left the local activists community concerned about their health and well- being.

The health and well-being of the community and White Lake was a vital concern for these activists. Their stewardship for the environment they called home was stronger than the outside force of contamination; their social and political capital grew as Hooker, DuPont, and the Tannery focused on cleanup efforts that would keep them out of the news. Unfortunately for these large corporations, the residents of White Lake sought justice for the devastation these companies caused, fighting their way from city, to state, and finally to the federal government. Although a 'stain' on the name of White Lake, the

Area of Concern listing was one of the most beneficial declarations that could have happened to the area. By involving state and federal agencies as well as funding, White Lake was able to receive remediation efforts that it so desperately needed.

Frustration fueled the social and environmental justice activism in White Lake, leading the resistance against the large polluters in the area. Jacobson, and others, knew that if they didn't expose the conditions of White Lake there wouldn't be much of a future for the community. Some activists connected what was occurring in White Lake to the Lois Gibbs' quote that "Polite people get poisoned" and they weren't about to let that happen to them. By utilizing their social and political capital, the force of these activists helped galvanize many in the community, making people reconsider whether they were willing to stay 'polite'. The efforts of a few became the efforts of many, establishing a foundation of resistance in White Lake.

Charlotte Schultz remembers the years after her son died as her 'crash course' to community and social justice activism. As consumers, people are led to believe that if a product is available at the store, then it must be safe for us to use. Schultz recalled her reaction when the Agency for Toxic Substances & Disease Registry came out with a final report about living in contaminated sites and the White Lake area had made the list. This awareness of environmental issues soon drove many activists to start inquiring more and more about their surroundings, educating themselves on their own environment; becoming stewards of their own backyards. This newfound inquisitiveness rapidly turned into activism, which became organized and provided a strong foundation to the community's political capital.

After the delisting of White Lake, activists, PAC members, and fellow residents

shared their pride on what the community was able to accomplish. This was the beginning of a new era for White Lake, one that allowed them to move past their 25 years of contamination and cleanup efforts and move forward with a clean slate. The overwhelming sense of pride came across in the interviews and throughout much of my document analysis.

This sense of pride is a key factor in the socio-ecological resilience of the White Lake community. Socio-ecological resilience is the ability of an ecosystem, and community, to absorb disturbance, or outside pressure, and still retain its natural function and structure (Walker & Salt, 2006). Due to human influences on the environment, the White Lake watershed and ecosystem have suffered since the logging era. Like in Folke's "human-in-the-environment" perspective, the White Lake watershed did not become contaminated on its own, nor could it repair itself on its own.

The people of White Lake knew that without their own persistence, the outcome of their community, and ecosystem, might have looked very differently. Their ability to create waves and bring attention to the ill-managed corporations is what eventually saved the community from crossing over the threshold. Instead they called upon the socio-ecological system's policy process to apply regulations and force the corporations to clean up their waste. Jacobson really drove home the Lois Gibb's quote that "Polite people get poisoned", but what happened in White Lake turned out to be the opposite of this. The chemical plants of White Lake turned a quiet community into modern day activists, altering their sense of place forever. What could have very well been the end of the White Lake community instead brought together a force of resistance and hope for the future. There is a new sense of pride in White Lake due to the efforts made by activists to protect their community and

pave a different, more vibrant path for its future.

Concerns for the area have changed from battling large chemical companies to empowering neighbors to make better, more sustainable decisions with their lawn care and farming practices. Each activist and subject matter expert I spoke to expressed their concerns with over-manicured lawns, pesticide use, and water contamination from non- point pollution sources like cattle and celery farms that line the White Lake Watershed.

It seems that no matter how vigilant the residents of White Lake remain, corporate interests continue to seek out the area for personal gains. The protection of water and natural resources continues to be a fight for Michigan residents. As several of the interviewees brought up during conversation, the next concern activists have on their radar in the White Lake watershed is against Nestlé. In April of 2018, the state of Michigan granted Nestlé Corporation more access to water rights and water extraction for corporate production. Evart, Michigan hosts the headwaters where this extraction will occur, just ninety miles up the White River watershed. Nestlé's plan brought a record number of public comments from Michiganders. State Senator Rebekah Warren stated that,

> Michiganders know that no private company should be able to generate profits by undermining our state's precious natural resources, which is why an unprecedented number of people spoke up to oppose this permit. Out of 81,862 comments filed by the people of our state, only 75 of them were in favor of the permit (Gray, 2018, para. 9).

Nestlé's $36-million dollar expansion will increase their groundwater withdrawal from 250 gallons to 400 gallons per minute. The cost of the Michigan Department of Quality permit for water extraction is $200 per year (Gray, 2018, para. 14), a small price to pay

for a large corporation like Nestlé.

In an interview, Anna Parson[6], member of the White Lake Watershed Council, told me she was concerned about the exploitation of water resources in the state (A. Parson, personal interview, July 2017). Parson had concerns about Nestlé prior to this agreement, believing that there needed to be changes on America's outlook towards corporations. Evidence from this research and examples across the globe have shown us that the push for corporate profit often leads to the exploitation of natural resources. There is fear that history is bound to repeat itself, but the White Lake residents are trying to make sure that doesn't happen in their community.

White Lake residents and activists must remain vigilant in order to remain strong. Outside business interests and investors will continue to seek out communities that stay quiet, stay polite to host their plants and production sites. In order to maintain their socio-ecological resilience in the face of these pressures, communities like White Lake and throughout the world, need to remain alert and focus on their overall health and well-being. Their ability to do so may be the only way they can move past their legacies of contamination and onto a future that supports both economic growth and community sustainability.

[6] Names of have been changed to protect interviewees and activists.

Conclusion: A Resilient White Lake

> *Genesis 2:15: God put man in the garden and he was to keep it and care for it, our only other job was to multiply. We've done a really good job of multiplying- now it's our turn to be good stewards, of the environment, of the garden so to speak* -Marion Gunderson, community activist (Cabala, 2013).

Throughout this research, I have found one thing to be true: the people who make up this community are the reason it has been able to survive. Although they have become champions and resisters in their own community, there is still a lot of work to do.

Even though the efforts of OxyChem have been applauded, I believe there has to be a better conclusion for the cleanup on the site. The 'Vault' is approaching its 40th birthday and there are no signs of further remediation or upgrades to the containment site. Under current technology, the EPA expects the contaminated groundwater to remain for another 10,000 years (Hausman, 2016), which is devastating. I would encourage additional research into grant programs and outside funding sources to reassess the Vault and purge well systems on the site. The land has been conserved as a 'non-public wildlife sanctuary,' again taking property away from the community. While I was touring the OxyChem facility, the Glenn Springs Holdings' representative spoke of supporting a bike path around the perimeter of the property, allowing people to access a large stretch of land. If this idea were to come to fruition, I think the community would welcome the path as a win.

In the case of Tannery Bay, I would like to see some sort of public utility created near or adjoining to the private community. The residents of White Lake fought tooth and nail trying to get the area cleaned up and now the land has once again been

barricaded off, per se, to public use.

By learning from their neighbor, Glenn Springs Holdings, DuPont could change the perception of the community by allowing them access to information regarding the cleanup and future plans for the site. Keeping this information from the public doesn't bode well for the chemical plant as speculations arise and concerns are left unanswered. Additional research and time may allow for more information into DuPont, however I hope that the plant will take efforts into their own hands and help the residents of White Lake feel more confident in the cleanup efforts on the site.

I would encourage the local school systems to teach the history of White Lake in their curriculum. In order for the community to remain resilient, they need to continue the conversations of social and environmental justice and what that means for White Lake residents. By educating and disseminating information, the community can continue to be vigilant and understand their history so they can protect their future.

Further research into White Lake may also offer more insight on the longevity of these cleanup efforts and how they have held up over time. DuPont may reveal more answers to the public of their remediation and Tannery Bay Homes might provide a safe and beautiful living space for families and vacationers in West Michigan. Only time will tell what the future of White Lake brings.

Although it was a difficult battle, and one that may never truly be over, the willingness of White Lake residents to stand their ground, to be activists and whistleblowers, fighters of the good fight, is the very foundation of what the community is today.

If it weren't for the Dahlstroms, the Dobsons, the Mahoneys, Cabalas, and other

crusaders of the community, White Lake might have suffered a different fate. This country is rife with examples of communities that have not been able to win the good fight because they have been slighted by corporate interests. Often, when companies skip town, the jobs, profits, and people follow suit, changing once vibrant communities into ghost towns. Although this may be the dominant discourse, this is not the story of White Lake.

Maybe White Lake's successes have to do with the fact that they are a small community- everyone knows everyone. Maybe it's because they had a lawyer on their side, or perhaps it's because White Lake is a resource that the two small towns share- a resource that attracts hundreds of visitors every summer. But I think it's more than that. I think it's beyond the sailboats that sit in the marina, beyond the charm of the small town. I think the resilience of this town has become its charm and its livelihood.

I am proud to have come from a community of fighters, from a community whose people are willing to get dirty, to get messy, to resist. For they are the only people who can help make this world a better place.

To the people of White Lake- this is your story. I hope I have told it
well. Thank you for everything.

"To be a revolutionary is to love the world, to love life, to be happy.
So, he doesn't flee from life, he understands that it is his duty to live for the fight, and he enjoys life." -Hugo Blanco, "To My People" (Blanco, 1972).

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Appendix A Interview Questions

Interview Questions

For Environmentalists/Activists:

1. How long have you lived in White Lake?

2. What makes you care about the local environment and White Lake?

3. You've been identified as a local 'activists' for this community, how does that make you feel? Do you consider yourself an activist?

4. What issues have you worked on in the local area? What changes have you helped make?

5. Out of the main industrial companies of the White Lake Area, which one do think has done the most damage to our community? (Hooker, DuPont, Koch Chemicals, The Tannery)

6. What can you tell me about early efforts to draw attention to Hooker?
7. How familiar are you with White Lake as an AOC and the relatively recent delisting?

8. Have you had any interaction with the Great Lake Restoration Initiative or the work done on White Lake during the delisting

process?

9. What are some of the biggest issues to the local ecosystem that you are most worried about (in relation to the AOC, local chemical companies, etc.)?

10. What are some of the challenges or barriers you've come across when defending White Lake?

11. What are some concerns you have about the future of White Lake? Do you think the lake is safe for recreation? Fishing? Drinking?

12. What do you think the future holds for the White Lake area after hearing about the current administration's attempt to defund the GLRI, removing over 3,500 jobs from our state (and surrounding states)?

13. How do you feel the local/state/federal policies have affected our local community in regards to corporate pollution and cleanup efforts? What about the shift of the financial burden?

14. What are your thoughts on the current uses of the old industrial sites? Hooker is now a "non-public wildlife sanctuary", The Tannery is now Tannery Bay Homes, and Koch Chemicals has been gated off with designation contamination plaques surrounding the area.

15. What do you think our local ecosystem is going to look like in 10, 20, 50 years? Do you think we will still be struggling with the same issues that have been plaguing us for the last 10, 20, 50 years?

16. Did Hooker do everything it legally had to protect White Lake?

17. Did Hooker do everything it should have done to protect White Lake?

18. Are there any other corporations or industries on White Lake that you have concerns about? If so, who are they? What do they do? What are your concerns?

19. Are there any lasting environmental impressions you have regarding White Lake?

For County Officials:

1. How long have you lived and worked in White Lake?

2. What is your position with the county/local municipality/city/state/etc.?

3. How familiar are you with White Lake as an Area of Concern and the relatively recent delisting?

4. What are some concerns you have about the environment in White Lake?

5. Do you think the lake is safe for recreation? Fishing? Drinking?

6. Have you had any interaction with the Great Lake Restoration Initiative or the work done on White Lake during the delisting process?

7. What do you think the future holds for the White Lake area after hearing about the current administration's attempt to defund the GLRI, removing over 3,500 jobs from our state (and surrounding states)?

8. How do you feel the local/state/federal policies have affected our local community in regards to corporate pollution and cleanup efforts?

9. What about the shift of the financial burden from corporations to federal government?

10. Did Hooker do everything it legally had to protect White Lake?

11. Did Hooker do everything it should have done to protect White Lake?

12. Are there other corporations or industries located on the lake that you have more concerns about?

13. Are there any lasting environmental impressions you have

regarding White Lake?

Appendix B MDEQ National Pollutant Discharge Elimination System Letter Oxy Chemical

MDEQ National Pollutant Discharge Elimination System Letter

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
GRAND RAPIDS DISTRICT OFFICE

JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

May 22, 2008

Mr. Brent Bell, Process Supervisor
Glenn Springs Holdings, Incorporated
P.O. Box 146
Montague, Michigan 49437

Dear Mr. Bell:

SUBJECT: National Pollutant Discharge Elimination System (NPDES)
Permit No. MI0002631
Designated Name: Occidental Chem Corp-GWCU

On May 15, 2008, I conducted a Reconnaissance Inspection of the Occidental Chemical Corporation groundwater clean-up facility located at 7601 Old Channel Trail in Montague, Michigan. The purpose of the inspection was to determine compliance with the terms and conditions of your National Pollutant Discharge Elimination System (NPDES) Permit No. MI0002631.

No concerns were identified during the site inspection. I appreciate the time you spent explaining to staff your groundwater capture and treatment operations and your remarkable voluntary habitat restoration efforts. From year to year (and sometimes even from month-to-month) the transformation of this once blighted site into a sustainable habitat for wildlife remains an impressive feat. I hope you continue making progress for years to come.

Please feel free to contact me with any questions concerning this report at the telephone number listed below.

Sincerely,

Thomas P. Berdinski
Environmental Quality Analyst
Field Operations Division
Water Bureau
616-356-0212

TPB:JK

cc: Mr. Joe Branch, Site Manager, Glenn Springs Holdings
Mr. Clint Babcock, Glenn Springs Holdings
File

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www.michigan.gov • (616) 356-0500

Appendix C Chemicals found at Hooker Chemical site

Chemicals found at Hooker Chemical Site

Hooker Chemicals
The following provides a description of chemicals found on the Hooker Chemical site and their effects.

Trichloromethane (chloroform): **Found in the production of refrigerants.** According to the World Health Organization, trichloromethane has induced liver tumors in mice and kidney tumors in mice and rats, and with use as an anesthetic has been observed to coincide with liver necrosis and degeneration in humans (WHO, 2016).

Carbon tetrachloride: **Found in refrigerant and fire extinguishers**. Originally created by the reaction of chloroform and chlorine, but is now made from methane. It is a known to deplete the ozone and is one of the most potent hepatotoxins (toxic to the liver). It can affect the central nervous system, degenerate the live and kidneys, and chronic exposure could cause liver cancer (IARC, 2000).

Trichloroethylene: **Industrial solvent and degreaser.** Thought to be less hepatotoxic than tetrachloride. The National Cancer Institute has shown that exposure to trichloroethylene is carcinogenic.

Hexachlorobutadiene**: By-product of carbon tetrachloride, used as solvent.** It has been classified as a carcinogenic by the US EPA and is a banned chemical by the Stockholm Convention in 2015. Systemic toxic compound and exposure can lead to fatty liver degeneration, central nervous system depression and cyanosis (EPA, 1991).

Hexachlorocyclopentadiene**: Precursor to several pesticides.** Almost all derivatives of the chemical have been banned under the Stockholm Convention. It has also caused stomach liver, and kidney lesions in animals during testing as well as toxic nephrosis (EPA, 2014).

Hexachlorobenzene: F**ungicide used to treat fungal diseases on seeds, especially wheat.** It has since been banned globally under the Stockholm Convention and is known to be fatally poisonous if consumed, and cause skin and liver lesions (EPA, 2014).