

A Needs Assessment for Outreach on the Muskegon Lake Area of Concern's Former Zephyr Refinery

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SUMMARY

The researchers conducted a needs assessment with stakeholders of the former Zephyr Oil Refinery site situated next to the Muskegon River and within the Muskegon Lake Area of Concern. Findings of the needs assessment will help us better understand perceptions of the waterway and the Zephyr site, as well as attitudes toward a proposed cleanup plan. Interviews were conducted with 27 individuals representing various groups, identified by the Zephyr Outreach Team as significant. Local stakeholders represented government, non-governmental organizations, residential neighbors, and businesses. Using conventional qualitative content analysis, five main themes emerged from interviewee responses. This report summarizes the following five findings and outreach implications derived directly from coded themes. 1) An industrial past stigmatizes Muskegon and is exacerbated by the presence of remaining contaminated sites like the former Zephyr oil refinery. 2) Although threats to the river remain, environmental improvements have led a portion of the community to start embracing a water town identity. 3) The Muskegon River is a tremendous recreational resource, but limited access in areas like the Zephyr site minimizes the use and potential of certain river sections. 4) The benefits of the cleanup and restoration at the Zephyr site focus largely on redevelopment. 5) Knowledge of the Zephyr site is low due to its secluded location, but interest in learning about the cleanup is high. Findings have been shared with the Zephyr Outreach Team and will be used to inform outreach efforts on the proposed Great Lakes Legacy Act remediation and restoration plan. Broad findings may also be applied within the AOC for wider outreach efforts.

INTRODUCTION

The Great Lakes are the largest freshwater system in the world. Lakeside communities reap the economic and socio-cultural benefits of this vital resource (Deweese & Schaefer, 2001). Unfortunately in many Great Lakes tributaries, the sediment is contaminated from former municipal and industrial practices. Large quantities of chemicals, petroleum products, and heavy metals remain in near shore sediment and riverbeds, diminishing ecosystem health and inhibiting community prosperity. As such, the International Joint Commission established a list of the most degraded areas, designating them Great Lakes Areas of Concern (AOCs). In an effort to restore habitat and remediate contamination in AOCs, the U.S. Environmental Protection Agency (EPA) teams up with states, industries, non-governmental organizations, and municipalities. Under the Great Lakes Legacy Act (GLLA), EPA shares the cost of the work with non-federal sponsors that volunteer to pay at least 35 percent. Since 2002, the GLLA program has completed 19 cleanups throughout the region, remediating 4.0 million cubic yards of contaminated sediment.

The Muskegon Lake Area of Concern is situated along Lake Michigan's eastern shoreline and includes Muskegon Lake, Bear Lake, and Muskegon River. It was designated an AOC in 1985 due to the poor quality of water, sediment, and habitat. Contamination from decades of discharges from foundries, pulp and paper mills, chemical and petrochemical companies, and municipal sewage has resulted in degradation of benthos, restrictions to fish and wildlife consumption, and habitat degradation (EPA, 2013). EPA has completed two GLLA sediment cleanups in the Muskegon Lake AOC, including Ruddiman Creek and Division Street Outfall. Many other sites must be cleaned up and restored for the AOC to be delisted.

This includes the Zephyr site on Holton Rd, formerly the location of a refinery that experienced many oil spills in the 1900s. The contaminated property includes a large tract of

land atop a bluff and wetlands situated below the bluff, next to Muskegon River. Remediation planning of the upland by the Michigan Department of Environmental Quality (DEQ) and U.S. Army Corps of Engineers is underway. Michigan DEQ has designed a plan with EPA under the GLLA to remediate 36,000-45,000 cubic yards of contaminated sediment and restore about 15 acres of habitat in the wetlands. GLLA work is expected to start in 2016. The Muskegon Lake Watershed Partnership has been instrumental in facilitating community engagement with work at the Zephyr site. Outreach with State Senator Geoff Hanson about the community's desire for sediment cleanup helped Zephyr stand out as a funding priority.

Previous Research

The benefits of stakeholder involvement in environmental management are well documented in improving decision-making (Beierle & Konisky, 1999; Connelly & Knuth, 2002). Early involvement helps managers incorporate community needs from the start. This situates the cleanup within a local context that increases community support, reduces post-hoc challenges, and produces sediment-related solutions for residents and decision makers alike (Oen et al. 2010; Gerrits & Edelenbos, 2004). An economic study within the Muskegon Lake AOC illustrates the community's interest in environmental improvement (Isely, Isely, & Hause, 2011). The study indicates that community members are willing to pay for cleanup projects and that habitat restoration will produce value six times the initial investment. This study, among others conducted within AOCs, highlights the community benefits of sediment cleanup, such as improvements to fish and wildlife, recreation, tourism, and quality of life (Deweese & Schaefer, 2001; Lichtkoppler & Blaine, 1999). Involving stakeholders in cleanup at the Zephyr site can lead to a more informed constituency, ready to help facilitate remediation and restoration.

Purpose

This paper reports on phase one of an investigative effort to enhance stakeholder involvement through audience characterization. Because the Zephyr Outreach Team has limited capacity, a (phase one) needs assessment will channel resources toward the local needs and interests of target audiences. The qualitative assessment was conducted to discover how locals relate to Zephyr and the Muskegon River, perceive the sediment cleanup plan, and engage with past and current outreach efforts. The findings will validate or disprove the team's assumptions about the target audiences and will allow for new audiences and interests to emerge. Additional interviews will take place in the second phase, post-remediation, to analyze if perceptions have changed as a result of the sediment work. Findings will shape outreach efforts for the Zephyr site GLLA project and the broader Muskegon Lake AOC.

METHODS

Sampling and Data Collection

This study uses methods tested in previous stakeholder research accompanying sediment cleanup projects within Great Lakes AOCs (Bishop, R. C., 2001; McCoy, Krupa, & Lower, 2014). The researchers conducted the study with stakeholders of the site that represent target audiences of the Zephyr Outreach Team: local residents and businesses, municipalities, and environmental organizations. Sixty stakeholders were contacted to participate, and 27 individuals were interviewed (45 percent response rate). Although the study sample represents a variety of stakeholder views, results of this study are not generalizable to the entire Muskegon community. A number of stakeholders from the larger Muskegon community are not represented in this study. Instead, this study offers valuable, detailed insight into the perceptions of the target audiences of the Zephyr Outreach Team.

Interviews were semi-structured with 13 open-ended questions (Table 1) aimed at guiding stakeholders to speak freely about Muskegon River and the Zephyr site. Flexibility within the interviews allowed the researchers to successfully gauge knowledge levels about the cleanup and elicit personal anecdotes about the waterways. Interviewees were encouraged to elaborate on topics that resonated with them regardless of the relevance to the interview question. Questions were designed based on effective past studies (Braden, Patunru, Chattopadhyay, & Mays, 2004; McCoy & Morgan, 2012) and allowed interviewees the freedom to speak about the remediation site a larger context, including the Muskegon Lake AOC. In-person interviews lasted about 30 minutes in a place selected by the interviewee. Phone interviews of a similar length were performed with stakeholders that could not meet in person. Researchers recorded audio with permission for later transcription and took notes during the interviews.

Data Analysis

Researchers performed conventional content analysis (Hsieh & Shannon, 2005), which allows for a more organic coding process. Codes were derived directly from the transcribed interviews. Each researcher thoroughly read the transcripts, going back to highlight and make notes on relevant portions. They then created codes based on interview trends and organized the codes into major themes. Researchers then compared codes and themes, concluding that separate analyses produced similar findings.

Data Validity

Established verification strategies helped produce reliable and valid qualitative study results (Morse, Barrett, Mayan, Olson, & Spiers, 2002). An adequate sample size of 27 interviewees produced replication and information saturation. Researchers used six of nine

methodological strategies (italicized below) outlined by Guba and Lincoln for maintaining qualitative rigor (1982, 1989). Although the process was iterative, general methodological organization was set a priori allowing for *audit trailing*. Before interviews were conducted *adequate referential materials* were studied, including MLive articles, stakeholder-created material and websites, and attendance at stakeholder meetings. *Negative case analysis* helped eliminate researcher bias by breaking down data through code editing and reorganization to intentionally analyze outliers within the data set. The two researchers conducted analyses separately then employed *peer debriefing* to confer derived themes together. Participants credited findings as representative and accurate via email, using *participant confirmation*. Overall, researchers established rapport and trust with interviewees during *prolonged engagement*, participating in informal activities within the community.

FINDINGS AND IMPLICATIONS

Finding # 1: An industrial past stigmatizes Muskegon and is exacerbated by the presence of remaining contaminated sites like the former Zephyr oil refinery.

Access to natural resources like Muskegon Lake, Muskegon River, and seemingly endless forestland, led Muskegon to develop as a timber town. Prior to modern environmental laws, saw mills, foundries, and oil companies exploited the natural resources of the area, causing extensive pollution of aquatic resources as well as habitat degradation. The industrial legacy lingers and affects the local identity. Citizens are accustomed to driving by contaminated sites, and older buildings remain with their backs turned to the water.

I₁: My history, I was raised right here. My memory dates back to 1965-66. Now at that time the refinery was gone. The big tanks you see over there used to be right here next to the fence. As far as me growing up here, it was just common... No one thought much about it with the open sludge pit.

I₂: Back then they didn't know any better. When Zephyr started it was 50 years ago. We have Occidental Chemical in Montague. We have a tannery in Whitehall. We have a lot of bad ones... No one knew until it started killing people and making them sick that they realized, "Oh this probably wasn't a good idea."

For some, years of industrial abuse foster feelings of doubt that Muskegon can overcome its polluted past. When asked about the impact that a sediment cleanup would make, a couple interviewees had a general mistrust of whether improvement projects in the area would follow through.

I₃: I was disappointed in the Cobb plant when they informed the community. They needed somewhere to put their potash. They said, "We will go across the street. When that is all taken care of, we will put in soccer fields." Do you see anything over there? That was ten years ago. Nothing.

One of the former industrial sites that continues to plague the area is the land where the former Zephyr oil refinery was located. Most interviewees acknowledged the cleanup efforts there, yet expressed concerns about the lack of vegetative growth and uncertainty about the risks posed by contamination. Many interviewees described the site as a wasteland, unfit for use in its current condition.

I₄: It was a wasteland. It was just an old oil refinery. It was a contaminated piece of property. Ten years ago there wasn't even grass growing on the property.

Although oil refining and storage is no longer performed on-site, the current property owner has repurposed the old oil tanks for fertilizer storage. The Michigan DEQ also uses an old tank for the environmental cleanup of the upland. This, along with the recent expansion of Marathon Oil Co. holding tanks west of the Zephyr property, has created a misunderstanding about sources of contamination and contributes to the industrial image of the area. Interviewees described the tanks as a reminder of unsafe industrial practices from the past. Some were unsure if the tanks were a source of contamination, and a few even considered the cleanup to be pointless because of the continued industrial use of the area.

I₅: It is definitely a blighted area through that Holton Rd. corridor. We are still going to have the Marathon tank farm there... the area around them is considered no man's lands. Hopefully those neighborhoods there will get renewed interest. When you drive past it right now it does look like Love Canal.

I₆: They even think that the pollution started and grows from the tank farms. That is where I thought the pollution was, right there at the tank farms originally until I got involved with this [the Zephyr cleanup].

Outreach and Management Implications

- Outreach should clear up misconceptions about the tanks as a source of pollution for the site. Explaining how modern environmental regulations on industry help protect human health and the environment creates a more informed perception of the risk of recontamination.
- A reimagining of Muskegon's industrial heritage, including tank appearance, could remove the stigma associated with the tanks, former spills in the area, and the site in general.
- Outreach materials should address safety concerns, stating exactly how the cleanup will successfully remove contaminants.
- Distinction between the Zephyr site and the adjacent Marathon Oil property needs to be made as well as the exact location of contamination and the cleanup project.

Finding # 2: Although threats to the river remain, environmental improvements have led a portion of the community to start embracing a water town identity.

The community is concerned about threats to the river beyond the industrial contamination found at sites like Zephyr. Recent agricultural development in the area, which has the potential to elevate nutrient loading to the river, is a community concern for one third of the interviewees. Community members also referred to future development as a possible threat to river health, citing inadequate resource protection, erosion, and wetland infill as undesirable

results. Lastly, stakeholders brought up invasive species, stormwater runoff, dams, climate change, and insufficient funding to address these as future pressures to the river system.

I₇: I am concerned about the price of corn and what we are seeing in some of our other watersheds that have been over fertilized, manure application, and irresponsible farming practices: not leaving buffers [and] farming right up to the roadside ditches.

While threats remain, environmental progress in the watershed has led many to take on a renewed interest in the water and view it as a valuable asset to the community. The influx of habitat restoration and sediment remediation, such as the work at Zephyr, and their positive impacts on nature, shape an identity as a water town for many community members. A majority of interviewees described the importance of being able to commune with nature in water-based settings. Interviewees described the intrinsic value, high water quality, and opportunities for education and economic gain as attributes of Muskegon's rivers and lakes. Many leaders talk about the importance of water resources and waterfronts in establishing a new vision for Muskegon.

I₈: The backs were turned to the water. In the last decade that has really gone the other direction. People have started to embrace the water. It is a really good thing.

I₉: It flows right in the middle of everything we do, practically the middle of our downtown. Everything we do revolves around that river.... We are water. Muskegon is water.

Although the value of water as a resource is changing from one of exploitation to conservation, everyone has not yet assumed a water town identity. Interviewees described how the community takes the abundance of water resources for granted. Because the presence of contaminated sites is something people have always lived with, people do not possess an urgency to clean up the remaining sites. If one section of the river is contaminated, people can enjoy another section of river or one of the many lakes nearby. Environmental leaders are worried the

community will forget how much effort it has taken to get the health of the river to where it is now, and become complacent in planning and decision-making.

I₁₀: I put my kayak in there, and I can boat or kayak. Not being an environmentalist person, I usually don't worry about being in contact with the water or anything like that.... For me it is like if you want to clean it up, that is your profession that is what you do, and that is great. For me, I am not going to tell you I don't care; this is way low on my list of priorities.

I₁₁: We see beautiful sunsets every day. We see kids playing on water. We are so used to the water resources around us that we take them for granted. ...People who see it every day are so used to what we consider pollution and invasive species, all the things that we are trying to remedy, they just see as part of everyday life. It is difficult.

Nevertheless, many community leaders hope to incorporate water into community life more sustainably, sharing this new vision for Muskegon with a wider public audience, going beyond leaders and planners.

Outreach and Management Implications

- A cleanup at the Zephyr site could help shape Muskegon as a water town and provide an opportunity to shine a light on environmental improvements occurring within the community.
- Cleanup benefits should be promoted, but it is important to keep expected results clear and reasonable. If locals believe this project can address additional perceived threats that are not within the scope of the Zephyr cleanup, support may diminish or perpetuate a disbelief in the potential for change.

Finding # 3: The Muskegon River is a tremendous recreational resource, but limited access in areas like the Zephyr site minimizes the use and potential of certain river sections.

As perceptions of the water resources throughout Muskegon improve, recreational use is increasing. People regularly get out on the water to enjoy kayaking, tubing, fishing, hunting, and

motorized boating. The river flats are a more shallow water body that allow residents to kayak and tube, while motorized boating is a popular pastime on Muskegon Lake. The lake also hosts fishing tournaments, while ice fishing extends the tourist season into the winter.

Interviewees mentioned a diversity of fishing and hunting opportunities including the salmon run and duck hunting in the fall. The ability to recreate locally is considered a huge asset for the community and increases tourism potential.

I₁₂: It [the Muskegon River] really helps quality of life in our area because we have such an affordable recreational opportunity.... There are so many little places to access whether you are in a small motorized boat or whether you are in a canoe or kayak. It is very serene... Whether you are hunting or swimming or fishing or kayaking or just birding, watching the wildlife, photographing it, it gives you something to do at very low cost.

I₁₃: You can go down there now and see eagles and deer, and so many different kinds of wildlife. That is always neat to see. I think leaving it to those kinds of things is a trademark of the area.

However, access is limited in some areas, and the stigma created by contaminated sites makes certain portions of the river less user-friendly. The river is mostly used farther upstream, with a limited number of interviewees reporting passage through the river section near the Zephyr site. This creates some disconnect between locals and the river below.

I₁₄: Around Zephyr-people generally go tubing further north of Zephyr because you didn't want to float through that section. It was scary.

I₁₅: I have never actually seen it. I have just heard about it since this came about. That was the first I knew that there was a bluff and the river is down there. I haven't really visually got the connection of the river.

I₁₆: More people can't take advantage of it [the river]. It should be published a bit more. A lot of people do not know what they are missing. Unless you have done it a time or two, you really don't know.

The Zephyr site is on private property. Trespassing teenagers were described by a few as the most frequent visitors of the river in this area. Occasionally, an adult will navigate around a fence to reach the river below to fish. Interviewees expressed concern for the teenagers accessing

the river via the trestle bridge, describing the current at this portion of the river as abnormally fast.

I₁₇: I think the disconnect with the river, part of that is no one has ever been allowed down there. I don't think people know what is going on. Number one you had Zephyr, and then you had the celery flats. They didn't want people down there. More than anything there has just been kids down there fooling around.

I₁₈: We have had a few drownings off of the trestle bridge.... Kids do use that bridge for jumping in the water, but that is about the only access we have had down there

Outreach and Management Implications

- Possible short-term disturbances and any safety concerns to river users near Zephyr, although few, should be articulated.
- The benefits of recreational river use can be promoted through outreach material, which can share information about alternative access points. Since the area is currently private property, increased access is not possible at this time.

Finding # 4: The benefits of the cleanup and restoration at the Zephyr site focus largely on redevelopment.

The changing relationship between the community and its water resources is also manifesting itself in thoughts of redevelopment. This is especially the case at Zephyr, where almost everyone acknowledged redevelopment as a benefit of the cleanup and restoration of the site. More than half spoke of it as the biggest change resulting from remediation and restoration. There is general agreement in the redevelopment vision among the municipalities interviewed. Many think the beautiful view of the wetlands below creates an opportunity for mixed-use redevelopment that embraces economic, environmental, and social potential. Community leaders see Zephyr as a prime step toward successfully realizing sustainable practices and a new vision for Muskegon.

I₁₉: I would like to see more mixed use. You saw how far we had to drive to get to an outdoor café with some sort of waterfront view, which is bizarre because we have all of these lakes... most of it is industrial or not readily accessible. So some sort of campground or commercial venue that opens that area up...

I₂₀: It is a beautiful scenic view. I think there should definitely be some green space, recreational public access there. Now how we combine that with the potential industrial uses is what is going to be key. How do you have a factory and public access?

I₂₁: I think it would be a good balance between keeping the natural environment, but also be able to bring businesses or industry or attract some tourism to the area... Like in Grand Haven, everyone likes being by the pier and everything there. I think Muskegon could benefit from the same type of atmosphere.

Other respondents, including local businesses and residents, shared an assortment of ideas for redevelopment including parkland, mixed use, residential housing, and commercial development. A commonality that seemed to cut across most interviews was a complementary dichotomy of the upland and the wetland. The value of the wetland can primarily be realized as a non-developed area managed for nature, wildlife, and fish, which in turn provides a stunning view from atop the bluff for future development. The general public is most likely unaware that a beautiful view is an asset to the property.

I₂₂: For me the river is one of the areas that is still natural.... The river way is still pretty natural most of the way down. You get to see all of the nature in its true form.

I₂₃: The view shed is the gold on the site. Maximize the view shed, and you have maximized the value.

I₂₄: The views are underappreciated. If it was not deemed a contaminated site anymore people would look at it a lot differently. Developers would probably be all over that site.

That this asset is hidden and inaccessible to the general public frustrated some. Many described a desire for better public access to recreation on the river below, especially as a result of the planned cleanup work. However, some mentioned that creating parkland has startup and maintenance costs, and they were unsure if that would be the wisest approach. Regardless of the enthusiasm toward redevelopment, there was ultimately an emphasis on the fact that the property

to be cleaned up is private land. The current landowner is not liable for the contamination left behind by old industry, and redevelopment of – and access to – the site is the landowner’s prerogative.

I₂₅: I would hope accessibility. If there was accessibility to the public, somehow communication to the public that there is this, from what I have heard, beautiful view that no one really knows about.

I₂₆: You would have a hard time putting anything down there other than grass and a park, and the township has seven parks already.

I₂₇: One of the designs would be walkways and paths in front of the property.... all that work and planning was put in without the blessing of the landowner.... this is private land.

Outreach and Management Implications

- The emerging paradigm for GLLA projects includes revitalization as a benefit of remediation and restoration. However, anyone working on the Zephyr site should strongly consider land ownership when addressing redevelopment opportunities. The landowner should be a primary stakeholder in future planning efforts.
- With the landowner’s approval, outreach can communicate that the site can provide a diverse array of environmental, economic, and social benefits as a result of the cleanup work.
- If public access is granted and developed, planners should reach out to neighbors and provide them an easy way to be involved in the planning process to include their interest in the site.

Finding # 5: Knowledge of the Zephyr site is low due to its secluded location, but interest in learning about the cleanup is high.

While the Zephyr site is on a popular transportation corridor, the upland appears barren and the wetlands are set far back on the property – off of a hidden bluff. Along with the private

ownership of the land, the location leads most community members to drive by the site without giving it much thought. Local business owners interviewed do not live nearby and are not active locally. Most interviewees stated that the average person knows very little about the site or the cleanup plans. Interviewees with the most knowledge of the site's history and the cleanup plans rely on information from the Muskegon Lake Watershed Partnership, whereas less-informed people receive information mostly through word of mouth.

I₂₈: One neighbor I talked to last week, they don't have knowledge of this. So if you were to go ask them a question, they would say, "I don't know what you are talking about."

I₂₉: ...go through the [Muskegon Lake Watershed] Partnership. The community needs to know where they can plug in.

Although awareness of the Zephyr site is fairly limited, interviewees expressed an interest in learning more about the cleanup and staying informed. Some expressed keen interest in being involved in the planning process. Almost all recommended that outreach efforts target impacted citizens, primarily neighbors of the site along Wood Street and Celery Lane.

I₃₀: The Wood Street residents! They are going to be impacted the most by the cleanup. There is some concern for short-term disturbances. Neighbors would like to see the trees on the northeastern portion of the property remain to help block the view of the construction activity and act as a noise buffer. Truck traffic may be disruptive locally for a few neighbors on Wood Street, but Holton Road (M120) is already a busy truck corridor. Odor is a major concern because the site's history is steeped in oil. Petroleum fumes waft off the site, especially in summer, and can be smelled by river users and neighbors. Past construction projects have exacerbated the problem, and community members have requested at past meetings for the wetland cleanup to take place in winter.

I₃₁: The trees will protect all visibility. The only difference is more trucks are going to come out onto M120, but that is a busy truck corridor now anyway.

I₃₂: This [a preference for cleanup in winter] was brought up by us in a meeting. We know what rotten oil smells like in the heat of the summer. We had a neighbor almost not buy the house. When you get a lot of rain out here, you will smell it. They did take that input. I hope they follow through with that.... We will take the brunt of it here because of the prevailing winds.

The other primary interests in the Zephyr cleanup include improvements to nature, removing the stigma of contamination, the potential for improved recreational access, and redevelopment opportunities. Interviewees also voiced a number of concerns when asked to provide questions for a set of FAQs for the site (Table 2).

Twenty-three interviewees provided input on the best way to communicate about the Zephyr project, as well as recommendations for outreach partnerships. About half of them proposed social media, making it the top suggestion. Social media includes websites, Twitter, Facebook, and the MLive online forum. About a third recommended local media, such as newspapers and radio. Ideas for outreach also included public meetings, door-to-door, a sign or flyer in a public place, and mailings, with a few interviewees recommending each.

I₃₃: Social media, website, twitter all seem to be working for other people.

I₃₄: The neighbors are the most important to know what is going on. That could be as simple as leaving a flyer. I think that direct contact is good for Wood Street and the next one over.

A number of environmental and outdoor organizations were recognized as potential partners for sharing information (Table 3). Some of the organizations fit within a larger classification of the Zephyr Outreach Team's target audiences, while others do not. Quite a few acknowledged the Muskegon Lake Watershed Partnership, the West Michigan Shoreline Regional Development Commission, and the municipalities as important purveyors of information.

I₃₅: Get it out to all the municipalities. Ask them to put it on their websites, put it on their Facebook. We all have access to those things.

Outreach and Management Implications

- Outreach should aim to keep neighbors of the Zephyr site informed about the project time line and short-term disturbances and provide opportunities for involvement in the planning process. The project team should make an effort to mitigate any disruptions and publicize those efforts to nearby residences.
- Because capacity is limited, outreach efforts will be unable to reach out to all the organizations that interviewees deemed important.
- Partnerships with local, trusted organizations and outreach through social and local media may be the most effective way to keep stakeholders informed.

CONCLUSION

Qualitative content analysis of the Muskegon area interviews produced five key findings. These findings provide unique insight into local attitudes toward the Zephyr site, the cleanup, and the Muskegon River. History of the Muskegon area has shaped perceptions of the river and Zephyr. While many residents use the river recreationally, lack of public access limits use near the Zephyr site. Furthermore, contamination still paints a blighted picture for the Zephyr site and surrounding area. As Muskegon looks to shape a future as a water town, many stakeholders are thinking about sustainable redevelopment of the site that takes advantage of the elevated scenic view of the river and lake, and increased river access. The health of natural areas holds great value to the community, which generally supports the promotion of river use, conservation, and a cleanup of the Zephyr site.

Interviewees were interested in learning and staying informed about the cleanup and progress at the Zephyr site. To that end, outreach and management implications were provided for each finding, encompassing suggestions for outreach and community engagement. For

example, outreach efforts should promote the cleanup's contribution to a more sustainable Muskegon, while making it clear that the property is privately owned and future use will be left to the property owner. Outreach must also address short-term disturbances for residents on Wood Street and long-term benefits to the community. Information from this report will be used to improve outreach and communication about the cleanup at the Zephyr site, as well as to inform future outreach efforts on the Muskegon River and other Great Lakes AOCs.

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APPENDIX

Table 1. Interview Questions

1. Tell me about Muskegon River and Muskegon Lake.
2. What do you use the river and lake for? How often?
3. What do you value the most about the Muskegon River and Muskegon Lake?
4. What are the biggest problems/threats currently facing the river and lake?
5. Tell me what you know about the plans to restore and clean up the former Zephyr oil refinery on Holton Road.
6. How would you describe the connection between the properties on the bluff like the Zephyr site to the wetlands and river below?
7. Imagine that a restoration and cleanup took place at the Zephyr site. What do you think would change the most as a result?
8. Now I'd like for us to talk about certain aspects of the river and lake. I'd like to get your thoughts on each of these in their current state. (After they respond, prompt with the question – and do you think [said aspect] could be affected by a cleanup and restoration? How?)
 - a. Aesthetics (or beauty) of the river and lake
 - b. River or lake's effect on quality of life
 - c. River or lake's effect on property values
 - d. A place for fish and wildlife to live and grow
 - e. River or lake's effect on the local economy and likeliness of new development
9. Imagine you're on a team that's exploring redevelopment opportunities at the Zephyr site. What types of future uses would you like to see at the site after it is cleaned up and restored?
10. Have you received any information regarding the cleanup or habitat plans of the Zephyr site? Where did you receive it? Was it easy to understand?
11. What is the best way for the community to be informed about plans to restore and clean up the Zephyr site?
12. If we were to design a set of FAQs about the Zephyr cleanup, what questions would you like to include?
13. Is there anything else you'd like to say about the Zephyr site, the Muskegon River, the lake or the cleanup or restoration plans?

Table 2. Questions posed by interviewees and the number of people who posed them

<u>Questions from the interviewees</u>	<u># People</u>
What are the goals of the project? To what level will the contamination be cleaned up?	6
What is the potential or the plans for future use?	5
How do you know the area is contaminated? How will I know it is cleaned up?	4
What does the cleanup process look like?	4
What is the project timeline?	4
What will the truck routes be? How many trucks will there be?	3
Should I be concerned about drinking water quality and my safety?	3
Can I swim in the river?	3
What is the property of the Zephyr cleanup and the property next door currently used for?	3
Can I eat fish from the river?	2
Where will the cleanup be located?	2
What is the history of the site?	2
Where is the funding coming from?	2
What has already been done for cleanup in the area?	2
What is the contamination?	2
How will the cleanup improve the area? What is the economic impact of the cleanup?	2
How is the cleanup going to impact me? Is it going to disrupt my life in anyway?	2
Will the cleanup area be recontaminated?	1
Who is involved?	1
How much sediment or soil will be taken out and where will it go?	1
What are the long-term effects of exposure to polluted sediment or soil?	1
Are they going to keep the wells running?	1

Table 3. Organizations identified by interviewees as important outreach audiences or partners

National Oceanic and Atmospheric Association
Army Corps of Engineers
Michigan Department of Environmental Quality
Michigan Department of Natural Resources
Michigan Department of Community Health
Muskegon Conservation District
Muskegon Township
Laketon Township
Muskegon County
Muskegon Lake Watershed Partnership
West Michigan Shoreline Regional Development Commission
Muskegon River Watershed Assembly
Annis Water Resource Institute
Muskegon County Water Safety Task Force
Muskegon Conservation Club
Ducks Unlimited – Michigan Chapter
Safari Club International – Lakeshore Sportsman’s Chapter
Pheasants Forever – Muskegon County Chapter
Michigan Duck Hunters – Lake Effect Chapter
Timberland Resource Conservation & Development
Muskegon Family YMCA
Muskegon Rotary Club