

# Scrap Masters!

**NIKOLE BOUCHARD**

University of Wisconsin–Milwaukee

**For thousands of years humans have experimented with various methods of waste disposal; From burning, to burying, to simply packing up and moving in search of an unscathed environment. Habits of disposal are deeply ingrained in our daily lives; So casual and continual that we rarely ever stop to ponder the big picture effects on social, spatial and ecological orders. Rethinking the ways in which we produce, collect, discard and reuse our Waste, whether it's materials, spaces or places, is essential to ensure a more sustainable future.**

## **AN INTRODUCTION TO POST-INDUSTRIAL DETRITUS**

The Great Lakes Region was once the industrial core of the country. Unfortunately, the territory has suffered from the Post-Industrial Period, leaving these vast lakes lined with “Rust Belt” Cities which have been stigmatized by the shifting populations and industries that have migrated elsewhere. In many of these scarred cities, leaders are making impressive efforts to reinvigorate the urban core via programs that support the good food movement, adaptive reuse and urban revitalization projects.

The following paper presents three Graduate Thesis Projects, of varying scales, that propose to transform various types of Post-Industrial Waste into Wonder. Each design proposal carefully considers the architectural, cultural, economic and environmental issues that are tied to various forms of urban detritus. This thesis research and work was developed through interdisciplinary collaborations between Master of Architecture Students and stakeholders. These design proposals address specific Waste conditions of consumer by-products, urban vacancy, adaptive reuse and landscape remediation. Seen through an optimistic lens, these post-industrial environments present a tremendous set of opportunities. The following design proposals address local conditions with global applications for post-industrial cities around the World.

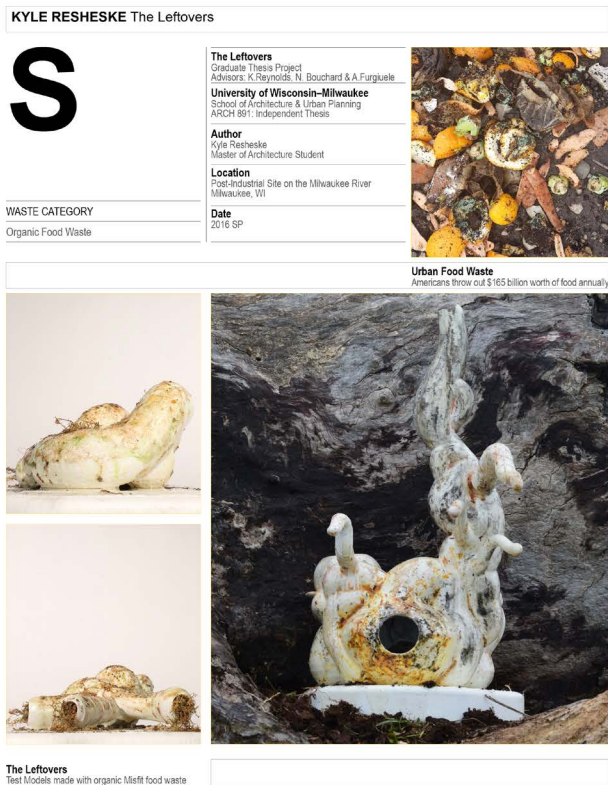
Landscape urbanism plays a major role in the way these projects understand and approach post-industrial debris. Each Graduate Student conducted intensive research at the start of their Thesis to produce a series of maps and infographics that visually explained the Waste-related

issues at hand. Simultaneously, a series of global and local precedents were analyzed to understand how other Designers have struggled with similar issues. Research and design focused on hydrology, infrastructure, ecology, landscape and urban form. Next Students synthesized the information they collected to develop imaginative post-industrial ecosystems at the intersection of art, architecture and landscape urbanism. The following Graduate Thesis Projects propose to transform our ripe Wastelands into productive urban environments that remediate the post-industrial landscape, provide educational opportunities and reinvigorate the “Rust Belt” City.

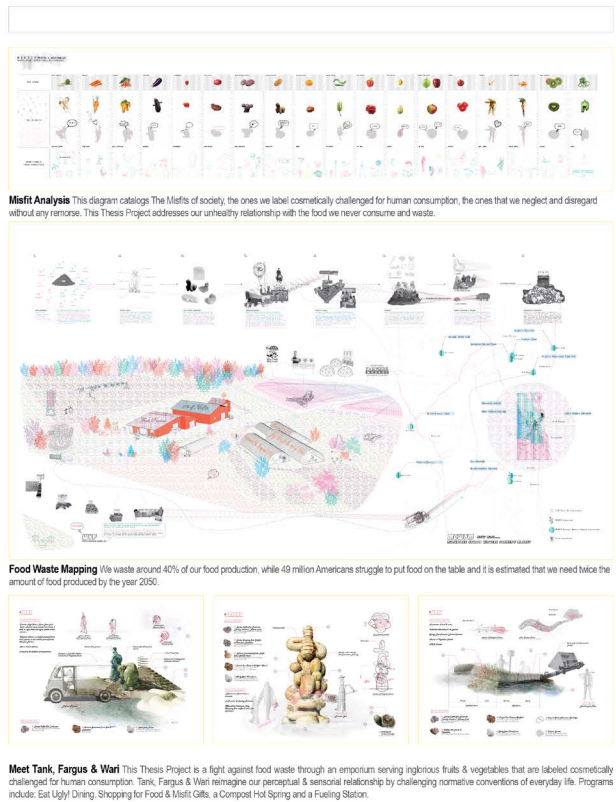
## **POST-INDUSTRIAL ECOSYSTEM (S-SCALE): THE LEFTOVERS BY KYLE RESHESKE**

In the spring of 2016, Master of Architecture Student Kyle Resheske embarked on his Graduate Thesis Project. His proposal, *The Leftovers*, is a reflection “upon the Misfits of society. The ones that we label cosmetically challenged for human consumption. The ones that we neglect and disregard without any remorse.”<sup>01</sup> *The Leftovers* confronts our unhealthy and irresponsible relationship with the food that we never consume, and instead waste, purely because of its disfigured appearance.

Superficial judgements based on “abnormal” deformities, scales, bruises and blemishes, compounded with our fear of “expired” sell-by dates, lead us to Waste obnoxious amounts of food every year. In the United States, we waste nearly 40% of our food production, while approximately 49-million Americans struggle to put food on the table. At the same time, it's projected that by the year 2050, food production will need to double in order to adequately feed humankind.<sup>2</sup> Resheske's Thesis argues that these unacceptable habits must be broken and dramatically transformed for Society to see the value of this good food that has a bad name. Resheske's design proposal is constructed with *Leftover Ingredients* that glorify the imperfections of what are otherwise considered, as he calls them, “cosmetically challenged” fruits and vegetables. *The Leftovers* aims to adjust consumer behavior in a way that makes society accept, appreciate and even celebrate our grotesque, but delicious, food sources. *The Leftovers* fights against food waste by proposing an Emporium that serves the inglorious fruits and vegetables which are labeled cosmetically challenged for human consumption. This Thesis reconstructs our perceptual and sensorial relationships with food by challenging our preconceived notions of “normal”.



THE FERTILITY OF URBAN RUINS From Waste to Wonder



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Figure 1: Selected documentation of The Leftovers, a 2016 Graduate Thesis by Kyle Resheske.

The Leftovers is strategically sited within the Milwaukee Rotary Centennial Arboretum. Situated in the heart of The City, this oasis sits on reclaimed post-industrial land to create a urban ecosystem that's thriving with native flora and fauna. The 40-acre arboretum connects people with nature and creates outdoor classrooms where visitors of all ages can learn more about the Urban Ecosystems that surround them. The Leftovers sits comfortably within the Arboretum and among the "ImagiNature Stations" that are scattered throughout the Site. These Stations "are intended for children to discover, be it a well-placed hollow log or a tree enhanced for safe climbing. Of the 22 designated Children's Forests in the country, the arboretum is the only one located within a major urban area."<sup>3</sup> This entire complex is part of The City's Urban Ecology Center.

Resheske's Thesis Project intentionally aligns with the Urban Ecology Center's mission to "foster ecological understanding as inspiration for change, neighborhood by neighborhood."<sup>3</sup> The Leftovers asks the question where and how is our food produced and proposes that eating foods which are grown locally is one way to be a more informed and conscientious consumer. Additionally, it goes without saying that buying local food means that more money remains within the regional economy and this, in turn, helps build and strengthen a healthy urban ecosystem. The Urban Ecology Center believes that "there is nothing like

getting your hands dirty in soil and watching a plant grow from a seedling to a mature, fruiting plant. The Urban Ecology Center provides many resources for people who are interested in growing their own food."<sup>3</sup> The Leftovers is intended to support the Urban Ecology Center's mission and supplement its existing facility.

The design of The Leftovers revolves around a cast of characters that Resheske developed. Each character has a distinct program: WARI / An Eat Ugly! Dining Space, FARGUS / A Misfit Food & Gift Market, RAMO / A Compost Hot Spring and TANK / A Fueling Station. The user interaction with each character is unique, for instance, in the Eat Ugly! Dining Space of WARI, "the smell seeps out of the 'Nose Cones'."<sup>01</sup> This series of sculpted wall extensions beckon visitors to lean into the garden sock structure to inhale the "Menu of the Day". Upon meal completion, all leftover food scraps are tossed into the compost pile that powers the Emporium and provides nutrients for the environment.

The primary construction technique riffs on traditional garden sock structures. Recycled burlap bags are wrapped around wire frame structures to create a variety of "abnormal" drooping and looping character forms. The organic shapes and materials engage all five sense to produce a new type of sensory experience that renegotiates the boundaries between the Architecture and the visitor, the natural and the man-made, the living and the dying.

Resheske believes that "as advancements in technology progress, our energy production will soon be fueled by the compost process, enabling

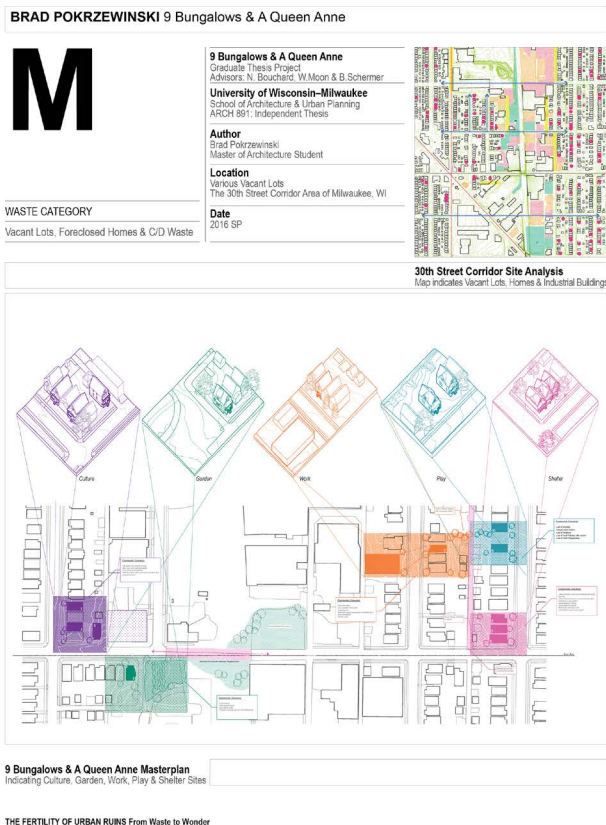


Figure 2: Selected documentation of 9 Bungalows & A Queen Anne, a 2016 Graduate Thesis by Brad Pokrzewinski.

us to home brew our very own energy source!”<sup>1</sup> During the winter months, the compost that fills the wire frame structures biodegrades. This process creates fuel to provide a source of heat, energy and illumination for the Emporium. The Leftovers creates a series of playful, mesmerizing spatial conditions that bring a sense of happiness, laughter, wonder, security, comfort and curiosity to visitors of all ages. This cyclical living, growing, decaying and dying urban ecosystem provides energy, education and enchantment to the larger urban ecosystem in which it exists.

**POST-INDUSTRIAL ECOSYSTEM (M-SCALE): 9 BUNGALOWS & A QUEEN ANNE BY BRAD POKRZEWSKI**

The same semester, Master of Architecture Student Brad Pokrzewinski “got real” with his Graduate Thesis Project, 9 Bungalows & A Queen Anne. This Thesis is a research and design proposal for what we could say is the quintessential Post-Industrial City Site - Milwaukee’s 30th Street Industrial Corridor. The entire Site is approximately four miles long and encompasses 880 acres of urban land. Nearly 100 acres of the Corridor are currently abandoned, blighted and some would say, filled with despair. But seen through an optimistic lens, there’s tremendous potential to revive what was previously the Heart of The City.



Milwaukee has a rich industrial past as it was once home to various machine makers, steel corporations and automotive parts plants. In 1915, populations began migrating to The City to take advantage of the burgeoning employment opportunities that these industries had created. Companies like A.O. Smith, Briggs & Stratton, Koehring Machine Company and Master Lock strategically situated themselves along the Canadian Pacific Railroad Line for easy access to this major transportation infrastructure. Throughout the 1950s, Briggs & Stratton produced over 200,000 engines per year and at its height, A.O. Smith had 7,800 employees, most of whom were residents in the adjacent neighborhoods. A large percentage of these employees were blue collar, middle class African Americans who had migrated to Milwaukee’s North Side at the start of the industrial boom. With them they brought a rich cultural history of art, music, dance and religion.

Like in most Post-Industrial Cities, de-industrialization began in the 1970s, resulting in an economic downturn that has left Milwaukee’s North Side ravaged with issues of unemployment, abandonment and crime. The 30th Street Industrial Corridor was once emblematic of opportunity, but today it represents the severe struggles that The City and its People have encountered since the industrial downturn. “The biggest problems with the corridor, stakeholders agree, is the perception of the area as a destitute and dangerous one; one blighted by the history of racial segregation and poverty.”<sup>4</sup> Today in Milwaukee there are nearly 1,600 city-owned and 1,400 bank-owned homes as a result of the foreclosure crisis. Additionally, The City owns approximately 2,700

vacant lots that are on the market for a whopping \$1. Pokrzewinski proposes that this post-industrial despair has the potential to transform into urban repair. His 9 Bungalows & A Queen Anne is a design proposal for a diverse and thriving urban ecosystem that's composed of re-imagined residences, education spaces & work/shops, garden plots, playscapes and performance platforms.

Pokrzewinski began by spending a significant amount of time on the ground, getting to know the place and the people that lived there. Through several site visits, he documented the foreclosed homes and vacant lots that surround the 30th Street Industrial Corridor and had discussions with local residents, organizations and city officials that have an invested interest in resuscitating this post-industrial artery of The City. Using this field work, Pokrzewinski created a thorough set of documents that cataloged the urban spaces, architectural typologies, material palettes and human activities that exist within the area. With these records, he designed a series of five interventions that transformed existing architectural typologies using salvaged materials that are native to the neighborhood. These spaces were programmed to address the specific needs and desires of the local residents.

The re-imagined residences consist of housing units for single mothers that are in need of shelter and support. This intervention takes inspiration from the Young Mothers Residency Program at Rick Lowe's Project Row Houses in Houston, Texas. Learning from projects like Ponyride in Detroit, the education spaces & work/shop component would provide an opportunity for local, unskilled labor of all ages to gain training in the deconstruction and reconstruction of spaces. Using this newfound knowledge, the now skilled labor would have access to work/shop space where entrepreneurial explorations can take place. Garden plot interventions would transform the abundance of vacant lots and wasted space into productive urban environments that provide healthy food options and economic opportunities for local residents. Playscapes create both indoor and outdoor environments where local youth can engage in physical activities that foster recreation and collaboration amongst residents. Lastly, the performance platforms provide an urban infrastructure that enables the rich cultural acts of art, dance, food and music to flourish within the community. Together, these five interventions create a healthy urban ecosystem that revives indigenous flora, fauna, individuals and industries and provides promise for the 30th Street Industrial Corridor Renaissance.

9 Bungalows & A Queen Anne employs a metabolic urban framework that co-locates all of the ingredients, not just Industry, that are necessary to sustain a successful urban ecosystem. Taking cues from a myriad of urban revitalization projects, like the work of Theaster Gates and the Rebuild Foundation, Pokrzewinski's Thesis attempts to instigate a discussion about "what undervalued communities could become and how art, architecture and urban planning can work together to elevate a space."<sup>5</sup> 9 Bungalows & A Queen Anne rejuvenates this region of The City and weaves together the broken pieces surrounding the 30th Street Industrial Corridor. When seen through an optimistic lens, there's tremendous opportunity for this region of The City to grow and thrive once again.

## POST-INDUSTRIAL ECOSYSTEM (L-SCALE): AFTER MINING BY RACHEL MOMENEE

In the spring of 2016, Master of Architecture Student Rachel MomenEE went deep into the World of Fracking with her Graduate Thesis Project, After Mining. Through in-depth research, numerous site visits, investigatory fly-overs and interviews with fracking specialists, Rachel gained an impressive understanding of the fracking "Boom" and "Bust" in western Wisconsin.

In conclusion of her pre-thesis research she states, "In the past decade there has been a boom in the industrial mining of Frac Sand within Wisconsin's landscape. Driven by the rise of domestic oil and gas extraction, the number of mines within the state has increased from under 10 to over 100. Due to its desirable properties, Wisconsin's White Gold is blasted from ridges, dredged from the plains and shipped by rail to hydraulic fracturing wells. Post-extraction, what will become of Wisconsin's unique landscape?"<sup>6</sup>

After Mining is a design proposal that rethinks the reclamation and re-inhabitation of Wisconsin's abandoned Frac Mines once the resources are depleted. The Thesis provides a strategy to rehabilitate the scarred landscapes that are created by the Frac Sand Mining Industry to create a network of productive landscapes that enable new ecosystems filled with economy, ecology, education and entertainment to thrive. Using the existing rail and trail infrastructure network, After Mining unites these newfound productive surfaces that reinvigorate the post-industrial ruins of Wisconsin.

Following the 2009 Financial Crisis, western Wisconsin experienced a "Fracking Boom". Specifically, the "Driftless" area of Wisconsin underwent major changes - A landscape that's characterized by its sculpted topography comprised of deeply carved river valleys, forested hillsides, prairies, wetlands and cold-water streams. The shortsighted Fracking Industry moved in and began pillaging the landscape to extract any and all amounts oil and natural gas from the subsurface rock units in the Hydrofrac Zone.

This Industry brought economic investments and employment opportunities to the region, but the "Boom" was short-lived. In 2014, western Wisconsin began to experience the "Fracking Bust". With falling oil prices, the Frac Sand demand plummeted. By 2016, a number of Frac Sand Mines had shut down and over 200 layoffs struck the facilities that remained in decreased operation. Rachel MomenEE's Graduate Thesis, After Mining, asks and provides answers to the following questions:

- 1) What happens to these ravaged landscapes in the post-industrial period?
- 2) What are the post-industrial effects on these ecosystems and how might these inevitable consequences be addressed?
- 3) How might adaptive reuse approaches be used to re-imagine decommissioned Frac Sand Processing Plants?
- 4) How can economic investments and employment opportunities be reintroduced upon de-industrialization?

# RACHEL MOMENEE After Mining



## After Mining

Graduate Thesis Project  
Advisors: N. Bouchard, K.Reynolds & A.Furguiele

**University of Wisconsin–Milwaukee**  
School of Architecture & Urban Planning  
ARCH 891: Independent Thesis

## Author

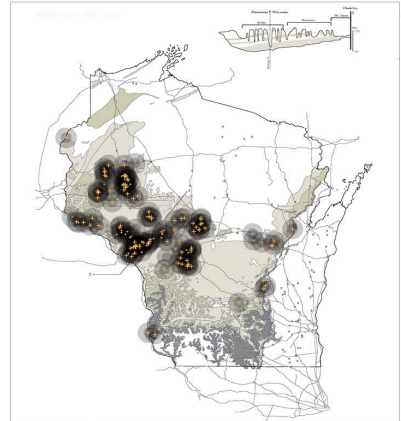
Rachel Momenee  
Master of Architecture Student

## Location

Various Decommissioned Frac Sand Mines  
The Driftless Area of Wisconsin

## Date

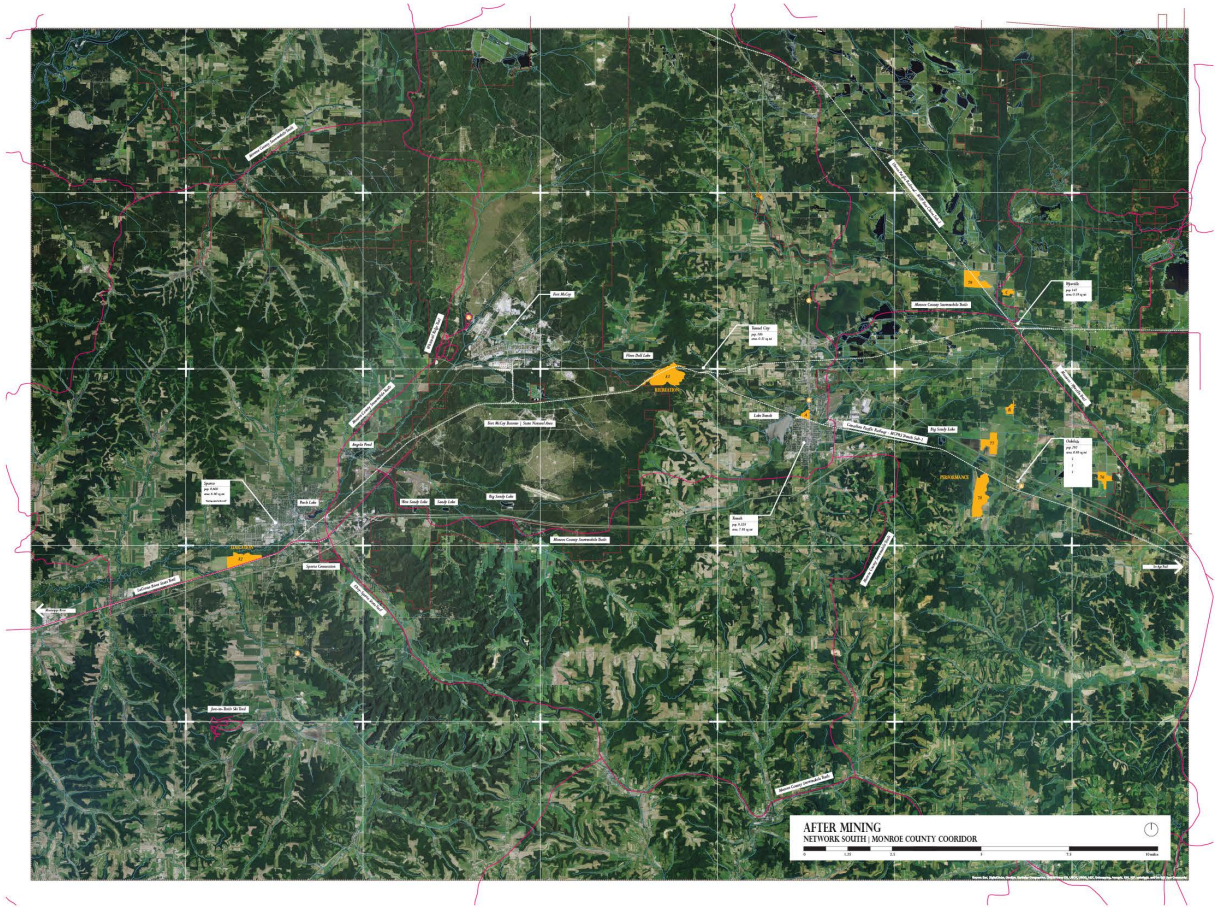
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## WASTE CATEGORY

Decommissioned Frac Sand Mines

## The Frac Sand Mine Boom and Bust The Driftless Area of Wisconsin



## Re-purposing 3 Frac Sand Mines

Linked by Wisconsin's "Rail-to-Trail" Network

Figure 3: Selected documentation of After Mining, a 2016 Graduate Thesis by Rachel Momenee.

To answer these questions, Momenee began by conducting extensive research on the Driftless Region, which included a Frac Mine Fly-Over with Ted Auch of the FracTracker Alliance. First she created an information-filled map that included existing Frac Sand Mines, cities/towns/villages, state/national parks, rail/trail networks and landscape typologies. Next, she zoomed in to focus on three selected Frac Sand Mines that were deemed ripe with potential - The Fairview Cranberry Mine in Oakdale, the U.S. Silica Company Mine in Sparta and the Unimin Corporation Mine in Tunnel City. From there, Momenee looked at the specific size, facility type and status, land use and ecological landscape of each Mine. This catalog of comprehensive research gave her the ingredients to produce a design proposal that would address the social, cultural, economic and environmental anxieties that the post-industrial period presents.

In the end, Rachel's design proposal consists of three unique After Mining typologies that operate both independently and as parts of a larger network system. The "Energy" typology works with the existing abundance of water on the abandoned mine site to create a series of energy producing algae ponds. The fuel that's created here is first used on site, then transported to the other After Mining locations using the existing rail network that threads the decommissioned mines together. This typology is coupled with education facilities that provided opportunities for visitors to learn about the past, present and future economic and environmental ecosystems of the region. The "Habitat" typology brings back the native Wisconsin flora and fauna that once thrived in the Central Sand Plains. This typology capitalizes on the natural beauty of the re-imagined landscape to promote outdoor activities and recreation for visitors from near and far. The "Wetland" typology works with the existing conditions of the Western Coulee and Ridges ecological landscape to create a soft, squishy and phytoremediative terrain that extracts toxic contaminants from the earth. This productive landscape also serves as an entertainment hub for the region, with several performance spaces that support the burgeoning arts and culture scene. Simultaneously, these Wetlands create, enlarge and connect important habitats to better support the areas sensitive species, like the Prairie Chicken.

Together, these three After Mining typologies reclaim and reinvigorate the post-industrial landscape as they provide increasingly important animal habitats, improve water quality and help local economies grow over the long term. This re-imagined ecosystem demonstrates how we might bring value and habitat back to a region that's been left behind in the "fugitive dust" of the "Fracking Boom".

#### **WHY WE SHOULD WORK WITH WASTE TO RESUSCITATE AND REINVIGORATE OUR URBAN ECOSYSTEMS**

We all know that the present global population expansion and the related increase in resource consumption poses a major threat to the future of our environment. According to the United States Environmental Protection Agency (EPA), Americans produced 254 million tons of Waste in 2013. Approximately 87 million tons of this refuse was recycled or composted.<sup>7</sup> The remaining 167 million tons of detritus ended up in America's 3,091<sup>8</sup> active landfills where the Waste continues to pollute our environment every day.

The Scrap Masters! Graduate Thesis Projects that are presented in this paper clearly demonstrate that working with what remains, at multiple scales, can be imaginative, innovative, inspiring and intellectually stimulating. As pedagogues and practitioners, it's our responsibility to face these issues head-on. We must question our preconceived notions of Waste and develop design ideas that strive to conserve resources and challenge the imagination. These design projects are not self-referential, but instead they engage a wide-range of audiences, including Artists, Architects, Industrial Designers, Landscape Architects, Ecologists, Environmentalists, Anthropologists and Garbologists. They are examples of responsible design that is rooted in reality but reaches for the radical.

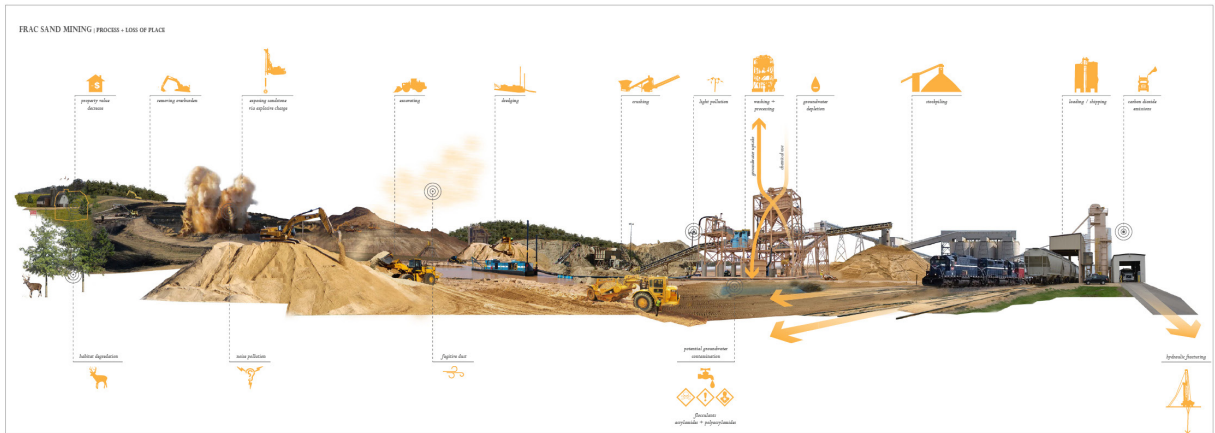
Scrap Masters! use the Post-Industrial City as a living laboratory and explore its numerous repositories where opportunities to revive our urban ecosystems are rich and plentiful. As Buckminster Fuller once said, "pollution is nothing but the resources we are not harvesting. We allow them to disperse because we've been ignorant of their value." Today's Post-Industrial Cities are overflowing with invaluable resources. The Scrap Masters! mentality challenges us to view post-industrial conditions not as abject environments, but as opportunities to revive our urban ecosystems with insightful and imaginative design interventions.

#### **ENDNOTES**

1. Kyle Resheske, "The Leftovers" (Masters Thesis, University of Wisconsin-Milwaukee, 2016).
2. Dana Gunders, *WASTED: How America is Losing up to 40 Percent of Its Food from Farm to Fork to Landfill* (New York: NRDC Issue Paper, 2012).
3. "The Urban Ecology Center," accessed February 10, 2016, <http://urbanecologycenter.org/>.
4. "Battling Foreclosure in Milwaukee: Foreclosures, Block by Block," Milwaukee Neighborhood News Service, accessed February 5, 2016, <http://milwaukeeenns.org/milwaukee-foreclosures/>.
5. Susan Nusser, "Corridor of Dreams: Can 30th Street Corridor Be Reclaimed?," Urban Milwaukee, September 9, 2014, accessed April 22, 2016, <http://urbanmilwaukee.com/2014/09/09/corridor-of-dreams-can-30th-street-corridor-be-reclaimed/>.
6. Rachel Momenee, "After Mining" (Masters Thesis, University of Wisconsin-Milwaukee, 2016).
7. "Advancing Sustainable Materials Management: Facts and Figures," EPA: United States Environmental Protection Agency, accessed October 10, 2015, <https://www.epa.gov/smm/advancing-sustainable-materials-management-facts-and-figures-report>.
8. "LANDFILLS: Hazardous to The Environment," ZERO WASTE America, accessed October 12, 2015, <http://www.zerowasteamerica.org/index.html>.



1 of 3 After Mining Sites. This Graduate Thesis Project proposes to reclaim these Wisconsin landscapes to reactivate the industrial ruins and reinvigorate surrounding towns



**The Loss of Place**  
The Frac Sand Mining industry extracts resources until the landscape is tapped dry. Once this happens, the mines are decommissioned and the landscape is scarred

Figure 4: Selected documentation of After Mining, a 2016 Graduate Thesis by Rachel Momenee.