



# Mining The Past

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# Mining the Past

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By

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# Table Of Contents:

<b>Abstract</b> .....	1
<b>Problem Statement</b> .....	2
<b>Statement of Intent</b> .....	3
<b>Proposal</b> .....	5
Narrative .....	6
Users/Clients .....	7
Project Elements .....	8
Site Information .....	9
Emphasis/Plan for Proceeding .....	11
<b>Previous Studio Experience</b> .....	13
<b>Project Schedule</b> .....	14
<b>Program Document</b> .....	15
Theoretical Research .....	17
Case Studies .....	25
Historical Context .....	34
Project Goals .....	41
Site Analysis .....	42
Programmatic Requirements .....	59
Design Themes .....	60
<b>Design Proposal</b> .....	61
Master Plan .....	63
Gateway to the Range .....	64
Site Clean-Up .....	72
A Living Museum .....	76
<b>Reference List</b> .....	83
<b>Personal Information</b> .....	84

# Project **Abstract:**

This project examines how the development of brownfields can benefit local communities and ecologies. Reclamation-based design principles are used to propose remediation of contaminated soils and the adaptive reuse of existing structures and landscapes.

The focus lies in the creation of a space that exemplifies history and culture while enriching the lives of local residents and attracting future visitors. By strengthening the bond between the past and present, a stronger sense of identity will be formed along with cultural pride.

Key Words: **brownfields, reclamation, culture, history, phytoremediation, mining**

# Problem **Statement:**

How can landscape architecture be used to **reclaim and repurpose** former iron mining sites in order to **preserve** cultural identities?

# Statement of **Intent:** **Typology**

An iron mine brownfield.

## The Claim

Landscape architecture is capable of reclaiming and repurposing former iron mining sites to not only revitalize the land and facilities, but also create new social amenities based in regional history and culture.

Designers, community members, local and state government agencies and landscape architects will work together to redevelop a former iron mining site through remediation, historical preservation and the repurposing of facilities and land.

## The Premise

Landscape architects have the ability to analyze and solve problems within our environment through design. This ability can be directly applied to former iron mining sites by basing design decisions on quantitative and qualitative evaluations.

By reclaiming these unused iron mining sites, degraded land can be remediated, facilities can be given new purpose, and social, cultural, and historical amenities can be developed.

## Conclusion

With the combination of careful analysis and planning, landscape architecture can enhance a place by redefining its purpose with a focus on restoration, cultural awareness and historical celebration.

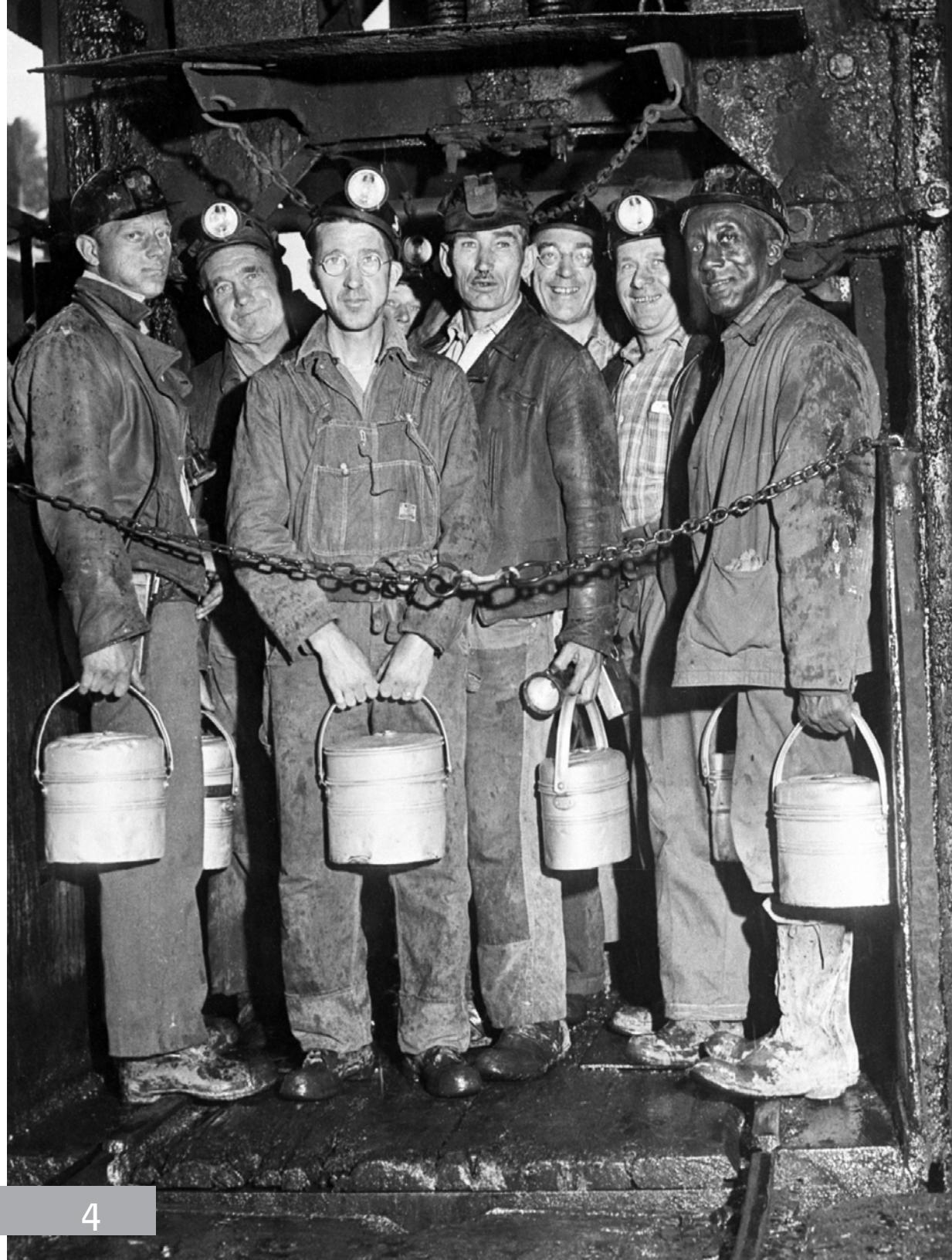


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## Project Justification

The importance of the mining industry on the Iron Range of Minnesota and its communities, both economically and socially, is something to be remembered and celebrated. Iron mining was the driving force for development within the region. The industry's effects can be seen in the multitude of cultural backgrounds immigrant workers brought to the area as well as the numerous open and closed mines dotting the landscape.

However, as some of the mining sites become unused, a disconnect is created not only with history but also the land itself. These former sources of livelihood and culture can be used to not only exemplify the regional qualities of history and culture but also to educate local people and visiting tourists.

# The Proposal



## Narrative

The Iron Range region of northern Minnesota has long been looked at as a place of beauty. The region has many lovely characteristics ranging from lakes, streams and rivers, to open grassland and old growth forests, to a multitude of small and large communities with rich cultures and histories. That history has been shaped for more than a century by the iron mining industry.

The mining of iron ore within the Iron Range developed both the economy of and the cultural fabric. By 1900, more than 70% of those working for the mining companies were new immigrants from countries such as Finland, Sweden, Slovenia and Croatia. These immigrants blended with the locals and others to create the cultural melting pot the Iron Range came to be (Minnesota Historical Society, 2011).

This great mix of cultural and industrial history is something to be remembered and celebrated. The opportunity to create a place where this celebration of the past can come to life is both an exciting and daunting challenge. Harnessing the cultural and historic elements of the Iron Range allows for the creation of a truly dynamic and inspiring destination for not only the local communities but also visiting tourists.

# Users/Clients

At its final stage, this project will be enjoyed by local community members, state and local government agencies, business owners and tourists. Each of these groups will benefit from the design and may interact with the place in different ways.

## Community

Local community members will have a new public recreation area that reflects their regional heritage while offering numerous opportunities for activities and education. Tourists will be drawn to the site for the same reasons. As the project creates a unique destination, these tourists will bring new capital to the area and leave with a greater knowledge of the region's history and culture.

## Government and Business

The local and state governments will play key roles in the development of the project itself. As the project moves forward, various agencies will be called upon for information and approval with regard to developmental ordinances and ecological impact. In the long term, the local government will be responsible for the maintenance and promotion of the project to the locals and potential tourists.

The local economy will further benefit from the increase in tourism revenue, which will flow directly into hotels, restaurants and shops as well as the government through sales taxes. This will serve as a catalyst for future development within the region.

# Major Project Elements

The elements within this projects development all focus on the creation of a culturally and historically relevant sense of place. With that as the theme of the project, there are many other elements that support it.

## Structures and Landscape

The evaluation and analysis of existing structures and landscape will be integral to the final result of *Mining the Past*. The structures need to be made safe and given new purpose wherever possible. The potential outcome for these structures includes educational facilities focused on not only iron mining processes and its history but also regional and cultural history. Other potential uses include various physical activities such as wall climbing and the exploration of the structures themselves.

Beyond the structures, the landscape may need remediation due to the invasive nature of iron mining. This may include specific plantings to remove toxins, the creation of wetlands and the removal of existing soils. All of these methods will be done with the utmost consideration of local ecologies and groundwater while creating a pleasant aesthetic for the area.

## Tourism

In the process of creating a cultural and historic sense of place, the design will incorporate elements to draw in greater tourism to the region. Designing the place as a unique destination is integral to the success of the project. Beyond the elements already discussed, creating close connections to local towns will strengthen the the tourism industry by providing visitors with a new destination, activities and access to hotels, restaurants and shops. All of this serves to strengthen the goals of the design itself as well as bolster local economies, promote cultural awareness and preserve regional history.

# Site Context

## Regional

The site for *Mining the Past* is located in the Iron Range region of Minnesota. This area is rich in culture and history formed over 150 years and driven by a specific industry: iron mining. The iron mining industry drew multitudes of immigrant workers who traveled to the area in search of prosperity within the mines (Minnesota Historical Society, 2011).

There is an abundance of natural beauty in the area including lakes, rivers, forests and rock formations. This makes it ideal for the development of attractive outdoor spaces that engage visitors and locals alike.



image: <http://chokeonwords.com/wordpress/wp-content/gallery/minnesota/lake-bronson.jpg>

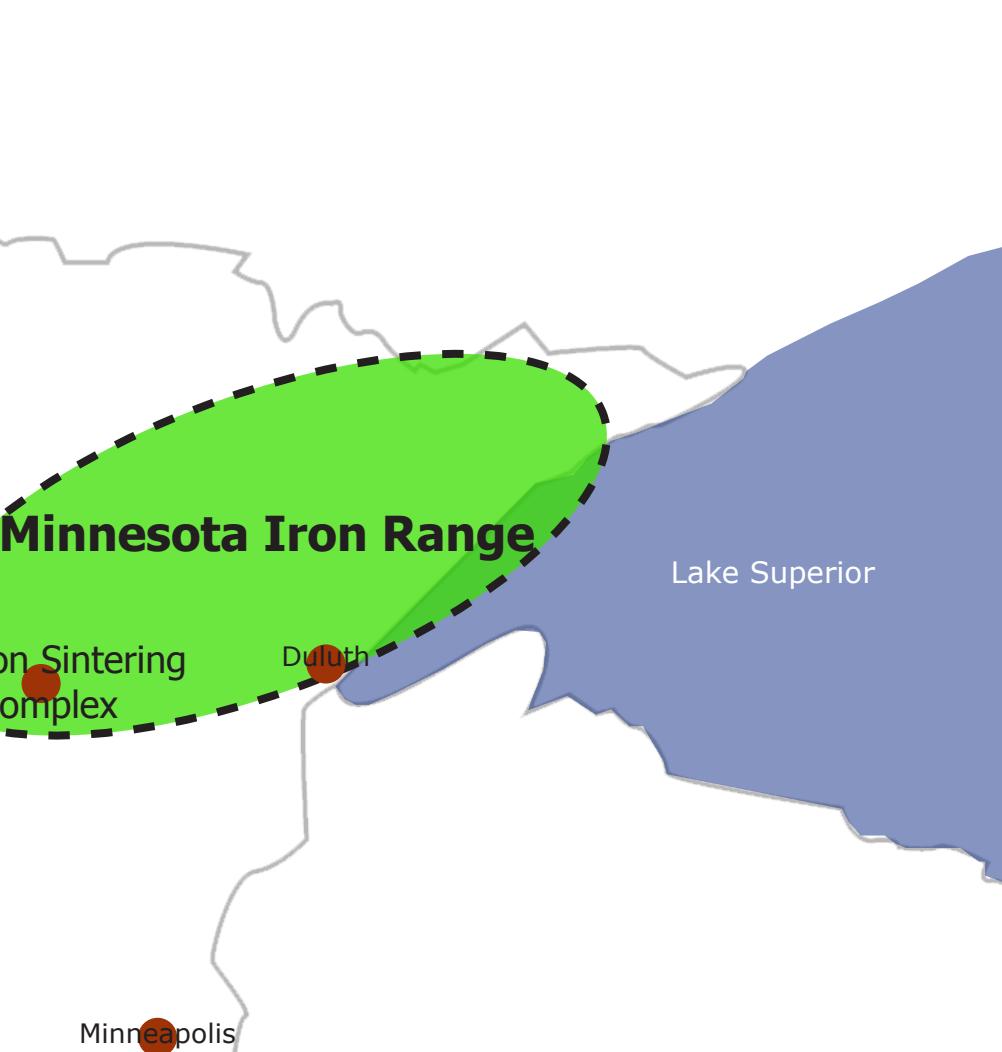


image: [http://salsacycles.com/files/blog/Cuyuna\\_Salsa\\_8.jpg](http://salsacycles.com/files/blog/Cuyuna_Salsa_8.jpg)



image: Bing Maps

## Site Information

The Ironton Sintering Complex occupies a roughly 35 acre area just north of the town of Ironton, Minnesota. Ironton, located in Crow Wing County, has a population of 572. Ironton's twin city, Crosby, Minnesota, is located just to the east and has a population of 2,386. Both towns were founded in response to the prominent mining industry in the Iron Range of northeastern Minnesota, but their current economies have shifted to a focus on retail, health and social services.

The Ironton Sintering Complex is on the National Register of Historic Places and was in operation until the middle of the 20th century. It was chosen for use in this thesis for numerous reasons. First, the site's location in the Iron Range, a region with a rich history and culture, provides the perfect backdrop for the premise behind *Mining the Past*. Second, the site is close to the towns of Ironton and Crosby, providing the social and cultural capital as well as the necessary infrastructure needed to make the design successful. Third, the Iron Range area has a growing tourism industry that focuses on the mining industry and how it shaped the region's culture and history.

# Project Emphasis

## Goals

The primary goal behind this project is to create a destination in the Iron Range of Minnesota that preserves and emphasizes the areas culture and history. There will be a strong focus on historical and cultural elements to ensure a fixed connection to the region and local communities while also maintaining a high level of sensitivity to those elements.

With those elements in mind, the first step will be securing and repurposing the existing structures and landscape. Both the structures and landscape will be heavily analyzed for form, function and existing conditions with relation to reusability and remediation. Structures will need to be made safe while the landscape may need various remediation techniques to improve the site's ecology. This will all be done to make way for other project elements such as trails, plantings and water features as well as educational and activity centers.

Because this project seeks to create a cultural and historic destination, emphasis will be placed on how the various elements will work together to draw in tourists. While this project will serve the region and local communities, expanded tourism will lead to a greater public awareness of the region as well as an increase in revenue for local businesses as well the government.

# Plan for Proceeding

## Research Direction

The research done to support this project will be integral to its success. While there is definitely a loose concept in mind for the design, further research into what makes historic and cultural destinations successful and meaningful will be needed. The hope is to find case studies as well as qualitative and quantitative data that support the direction the project is heading. The case studies that will be used are those of similar post-industrial typology.

Examination of the reclamation and remediation processes will help to inform and direct the design development. Obviously, history and culture will be very important elements to this project and will require vast amounts of research. This research will focus on the mining industry in the Iron Range, the various people involved, from company executives to those who worked the mines as well as the iron mining process and cultural elements within the region such as traditions, backgrounds and activities.

Building size, form, condition and previous uses will need to be researched to determine how best to repurpose them. The existing conditions of the landscape, including vegetative cover, soil typology, water table, water and soil conditions, sun patterns, and micro/macro climates, will all need close examination before any design determinations can be made.

## Design Methodology

The design process for this project will take many forms. Initial analysis will include both qualitative and quantitative research. The use of statistics, locations, demographics, as well as the actual effects of these statistics on the region will all come into use throughout the design process.

Digital analysis of 3D models, collages and maps will further inform the design's arrangement and composition. In addition, interviews with prominent community members, developers and government officials may occur to better grasp the opinions of the population.

The actual development of the design will happen in a variety of media. Hand sketches and mappings will lead to digital representations of potential plans, details and hand drawn and 3D renderings of various interventions. All of these methodologies will be utilized and guided within the scope of the theoretical premise of the project.

## Project Documentation

As this project develops it will be documented and compiled digitally. All relevant hand drawings and sketches will be scanned and compiled with all digital data and stored on multiple hard drives to ensure secure backups.

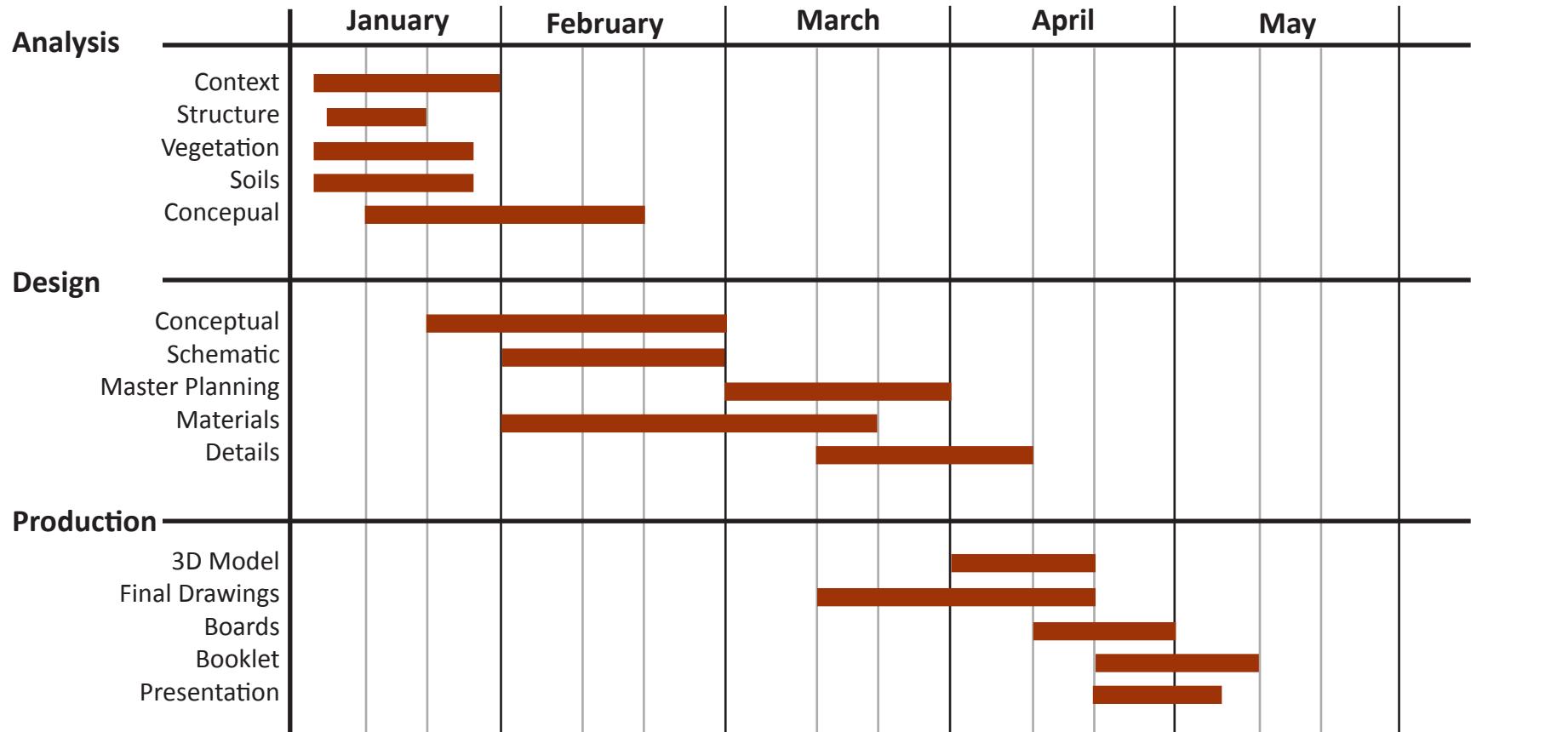
A biweekly record will be made of the most prominent thoughts and ideas and saved as a separate document for later review. Once completed and organized, this project and its research will be preserved in the digital repository for future scholars to review and utilize for their benefit.

The schedule for this project will be maintained and updated regularly to ensure tasks are completed in a timely manner. The processes for the project include, but are not limited to:

- Inventory and Research
- Analysis and Synthesis
- Conceptual Design
- Master Planning
- Detail Design
- Finalizing Graphics
- Presentation Preparations

Each process of the project will be documented digitally and presented within the final project documents.

# Project Schedule



## Previous Studio Experience:

### Second Year:

**LA 271:** Landscape Architecture I - Kathleen Pepple  
-Tea Garden  
-Halvorson Park Design

**LA 272:** Landscape Architecture II - Mark Lindquist  
-Cold Smoke  
-Fargo Corridors  
-Winnipeg, Canada Design

### Third Year:

**LA 371:** Site Planning and Design - Stevie Famulari  
-Defiant Gardens  
-Regent, North Dakota Community Design

**LA 372:** Community Planning and Design - Kathleen Pepple  
-United Tribes Technical College Campus  
-Roosevelt Neighborhood

### Fourth Year:

**LA 471:** Urban Design - Jay Kost  
-Duluth, Minnesota Urban Design

**ARCH 474:** International Design - Paul Gleye  
-Blois, France Design School Campus  
-Lille, France Plaza Re-Design

### Fifth Year:

**LA 571:** Environmental Planning - Catherine Wiley  
-Red River Valley Flooding

# The **Program**



# Theoretical Research

## Brownfields

"Two issues dominate current discussion of these blighted landscapes. First, the remaining pervasive pattern of hazardous substances found in the soils, groundwater and within the fabric of buildings and infrastructure left standing on site. Second, the motivation to return these manufactured sites to productive use and the physical means by which this can be carried out."

(Kirkwood, 2001)

*Mining the Past*, at its core, is a brownfield development. So it is important to know what a brownfield development is and what it entails. Chances are that most people have seen or in some way experienced a brownfield without knowing it. This is completely understandable as most brownfields are not interesting enough to garner much more than the occasional glance.

So, what is a brownfield? As described by the United States Environmental Protection Agency, brownfields are "abandoned or underused industrial and commercial sites where redevelopment is complicated by real or perceived contamination" (Kirkwood, 2001).

## Benefits of Brownfield Development

There are approximately 500,000 sites that fall under this definition in the United States alone (Kirkwood, 2001). These former locations of economic and social development can be found in numerous settings, ranging from the densest urban environments to agricultural regions to the quaintest of neighborhoods. There is no size limit either; brownfields can encompass hundreds of acres or be the size of an average corner gas station, however the effects these sites have are grand in scale.

In 1996, the mayors of thirty-nine cities in the United States determined that between them, brownfield sites accounted for 43,000 acres of land and caused an estimated annual loss of between \$121 million and \$386 million in potential tax revenue (Russ, 2000). This begs the question: why is nothing being done to develop these sites that provides value? The answer lies predominantly with issues of liability.

Until the 1970s it was considered very risky for private-sector investors and developers to work on brownfield sites due to federal liability laws. Essentially the problem was that if a piece of land was purchased and later found to be contaminated in some way, the current owner would be liable for the cleanup. After the 1970s, state-level legislation began to loosen up the liability laws and allow for easier development of brownfield sites (Russ, 2000).

The government continues to have a heavy hand at the state and federal level. During his 1997 State of the Union address former President Bill Clinton said:

We should restore contaminated land and urban buildings to productive use...in the last four years, we cleaned up 250 toxic waste sites, as many as the previous twelve years. Now, we should clean up 500 more, so our children grow up next to parks, not poison.

These developments not only add purpose to formerly unused or underused sites but also add real economic gains. A study funded by the Environmental Protection Agency concluded that overall property values within a one-mile radius of a redeveloped brownfield were raised by up to \$1.5 million, with an average individual property value increase of two to three percent (EPA, 2011). Additionally, every dollar invested by the federal government leverages \$18.29 of additional capital and for each \$100,000 of federal investment, 7.43 jobs are leveraged (EPA, 2011). This type of development produces real, quantifiable growth.

This growth leads to an easier project completion as well as long term economic benefits for local communities and an increase in tax revenue for municipalities (EPA, 2011). Furthermore, a national survey concluded that if all the brownfields within the 187 surveyed cities were developed, 550,000 jobs could be created (Russ, 2000). Considering the current economic condition, these are numbers that should be seriously considered and used as support for real investment opportunities.

The potential benefits of brownfield development go far beyond increases in land value. There are serious benefits to the public as well. By developing brownfields, the community gains recreational and educational opportunities. A recreational space that is grounded in some level of history or culture can be used by local groups such as Boy Scouts, Girl Scouts or other programs to hold educational events detailing the development process as well as the historic use of the site and its importance to the community (ITRC, 2006).



Photo: <http://www.via-ferrata.de/data/media/21/P1000495.jpg>

As mentioned earlier, the average brownfield is not much to look at. Therefore it makes sense that by developing these sites, a community's image can be improved. From an aesthetic standpoint, a well developed design serves to replace something that was once regarded as blight with something the community can be proud of. It also translates to an increase in community pride while fostering an increase in the community's reputation within the region (ITRC, 2006). A study conducted in 1999 by the Conference Board, an international business organization, concluded that consumers felt the most important factor in developing an impression of a company was that company's reputation (ITRC, 2006). This is easily translated to how people form impressions of a city or community. A community known for its cleanliness and friendly demeanor is going to draw more visitors and future residents than one viewed as dirty or dilapidated.

There are ecological benefits to developing brownfields as well. Development projects can produce habitat, reduce stormwater runoff and clean the air, water and the soil. The EPA (2011) noted that, on average, a redeveloped brownfield produces between 47 and 62 percent less stormwater runoff. One of the greatest ecological benefits to brownfield development is that it reduces the consumption of currently undeveloped land often referred to as "greenfields". By redeveloping land instead of seeking new property, environmental impacts such as habitat loss, stormwater runoff and urban sprawl can be avoided while strengthening a city's core (ITRC, 2006).



Photo: Michael Aasen

## Remediation of Brownfields

Nearly all brownfield sites will require some form of remediation to reduce contamination by toxins within soils, water and the air. There are many potential methods for remediation but one that is growing in popularity is phytoremediation (Russ, 2000). This process involves the use of specific plant species to uptake or aide in the degradation of hazardous materials.

Phytoremediation is much less invasive than traditional cut and fill methods, which remove the toxic soil and place it in remote locations such as landfills, causing potential contamination of soils and water elsewhere. The use of vegetation to clean degraded land is additionally beneficial with regard to aesthetics and habitat creation (Russ, 2000). This makes phytoremediation a great multi-layered method for cleaning these sites.

Specific plants can be used to uptake and remove or render harmless numerous chemicals and even heavy metals. For example "a typical plant may accumulate about 100 parts per million (ppm) zinc and 1 ppm cadmium. *Thlaspi* (alpine pennycress) can accumulate up to 30,000 ppm zinc and 1,500 ppm cadmium in its shoots, while exhibiting few or no toxicity symptoms" (Becker, 2000). Furthermore, the metals within these plants can potentially be extracted and reused (Becker, 2000). These findings are both impressive and important because they support the effectiveness of phytoremediation in cleaning contaminated sites and show that a future commodity is produced through that cleaning.

Different remediation techniques come with their own benefits and downfalls. Cost and time are the two major factors involved in selecting a potential technique. Generally speaking, phytoremediation techniques take significantly more time than their non-vegetative counterparts. This increased time-cost is offset by the benefits of limited future contamination liability, minuscule long-term maintenance, lowered financial cost and the openness of future site use possibilities (Russ, 2000). Other remediation techniques, including excavation or site-capping may be more time-efficient but place heavy limitations of future site uses and pose threats of further contamination while adding little to no value to the local community or ecology.



Photo: Michael Aasen



## Historical and Cultural Interpretation

"Cultures in transition are pulled in two directions, enthusiastically toward the future and nostalgically toward the past." (Rogers, 2001)

The interpretation of culture and history is becoming a more conscious focus within environmental design. That is to say, designers are increasingly trying to connect culture and history in the layers of their work. Looking back through history, the cultures of the past are easily recognized in architecture, landscape and art. The famous Baroque-styled gardens of Versailles are a perfect example of this. The rigidly groomed hedges, symmetrical design and prevailing formality symbolizes the social, economic and cultural dominance of the French monarchy (Francis & Hester, 1990).

Spaces that reflect a frame of time, an important event, person or group of people serve to honor and preserve the memory of that which is being reflected. These spaces can take many forms, including monuments such as the memorial of the terrorist attacks on 9/11, historic towns like Colonial Williamsburg, Virginia or Japanese-styled gardens. Whatever the form, the purpose remains relatively the same; to immerse people within a memory.

Architectural preservationists have been garnering support for their efforts to preserve historic buildings and put them to new use. The preservation of the character of materials, structure, and form of these symbols of architectural history is appreciated by not just architectural scholars but the public as well (Alanen & Melnick, 2000). An iconic building can set a tone within a particular area and hark back to an earlier time.

Photo: [http://i.dailymail.co.uk/i/pix/2011/09/11/article-2036119-0DD4594D00000578-908\\_964x1301.jpg](http://i.dailymail.co.uk/i/pix/2011/09/11/article-2036119-0DD4594D00000578-908_964x1301.jpg)

The same enthusiasm for architectural preservation is beginning to appear in landscape preservation (Alanen & Melnick, 2000). The recognition that entire towns, cities and parks are representative of a particular place, time and culture is creating a new movement within landscape architecture that will change the way people look at the environment that surrounds them.

The Magic Kingdom at Disney World in Orlando, Florida is a fantastic example of a place that immerses visitors in an idealistic representation of culture. Specifically, the design of Main Street within the Magic Kingdom blends the themes of colonial America with that of cliché 1950s American style in a way that transports visitors to those frames of time. As Elizabeth Barlow Rogers describes in her book *Landscape design: A cultural and architectural history*, "The treatment of history as narrative capable of stage-set explication is a theme park strategy that has been carried over into the preservation of historic towns and old urban centers".

Nearly any design can be successful in its aim. A park can serve as a recreational area while a plaza can be a place of welcome but it is the designs that incorporate more than just physical context that truly generate a deep sense of place. The representation of culture and history within a design is what grounds it in the social and cultural fabric of its surroundings. This type of design mentality is a growing force in environmental design and serves as an important base for the development of *Mining the Past*, my design proposal in Ironton, Minnesota.



Photo: <http://aytch.mnsu.edu/Disneyworld/Magic%20Kingdom--Main%20Street%202.JPG>

## Research Summary

The research for this document was divided into three area of focus: the benefits of brownfield development, the remediation of brownfields and the expression of culture and history within environmental design. Through the synthesis of the research it is apparent that the ecological, social and economic benefits of remediating and developing brownfields are numerous and meaningful.

The benefits of brownfield development include positive change in social, ecological and economic sectors. From a social standpoint, redeveloped brownfields can be sources of community pride and beautification. The creation of parks, recreation areas and cultural centers from formerly distressed sites provides people with a place to interact with each other and the outdoors and allows for a growing sense of connectedness.

Economically, developing brownfields provides an opportunity for increased tax revenue and job creation. As stated in the research, property values around redeveloped brownfields can generate a 2%-3% increase in property values and generate an increase in job creation within that development (EPA, 2011). Additionally, there is strong support from the government to redevelop these sites. The EPA reported in 2011 that for every federal dollar spent, an additional \$18.29 is generated from other sources and the EPA has specific programs aimed at dealing with brownfields.

The ecological benefits of brownfields are numerous as well. Developed sites can generate an average of between 47and 62 percent less stormwater runoff (EPA, 2011). These sites also have the potential to generate habitat and restore damaged ecologies to a more natural and healthy state.

The research discussed the benefits of phytoremediation, the use of vegetation to clean soils, water and air, within brownfield development as well. Phytoremediation techniques have become ecologically and economically better suited for cleanup than traditional cut and fill methods. Phytoremediation requires little to no long-term maintenance and offers significantly more opportunities for future site uses post-remediation.

Cultural and historical representation within a design was a major research emphasis for this project. There is a growing interest in landscape preservation due to the historic and cultural significance of so many towns, parks and other locations (Alanen & Melnick, 2000). This interest, as well as a growing population of culturally and historically based designs, is bringing about an enhanced awareness of this typology and its potential. Places like Disney's Magic Kingdom, Colonial Williamsburg and the case studies outlined in this document are all effective examples of design with a cultural and historic focus because they immerse people within the memory of the place.

The process of collecting this research helped in cementing my interest in the post-industrial, culturally focused premise of *Mining the Past*, my proposal in the Iron Range of Minnesota. The research shows strong economic, social and ecological evidence to support the concept behind the *Mining the Past*. By synthesizing and incorporating the information gathered from the research, the design of *Mining the Past* will be guided along a well-supported path, ensuring its success.

# Case Studies

## Shanghai Houtan Park

Shanghai, China

The Shanghai Houtan Park is a 34-acre restorative development of a former industrial site on the Huangpu riverfront in Shanghai, China. The site was originally used as a shipyard and for the manufacturing of steel, but has most recently been used as a landfill and industrial material dump site.

The purpose of the design, produced by the Beijing-based design firm Turenscape, was to create a green expo site that would demonstrate green technologies and eventually transition into a permanent waterfront park for public use (Turenscape, 2007). With that purpose in mind, Turenscape had numerous challenges to overcome considering the degraded nature of the site itself. The site contains an abundance of industrial debris and waste both within the soil and on the surface, while the Huangpu River has the lowest possible water quality rating given by the Chinese government (Turenscape, 2007).



Considering the challenges of such a degraded site, Turenscape utilized the development of a mile-long, 100-foot wide constructed wetland to aid in the purification of the Huangpu River while also creating a riparian habitat along the river's edge. This wetland is capable of improving the water quality rating of more than 500,000 gallons of water per day (Turenscape, 2007).

The wetland does this through a series of terraces that utilize specific plantings to uptake toxins, reduce sedimentation and boost oxygen levels within the nutrient-rich water. It does this while also acting as a flood protection buffer and allowing people to easily and safely connect with the Huangpu River, something that was impossible before the designs completion.

The deeper beauty of the project comes from the way Shanghai Houtan Park blends aspects of Chinese culture and the site's industrial heritage within the design. Terraces, meant to slow runoff rates from a nearby expressway, were designed to be reminiscent of the traditional Shanghai agricultural practices that were used prior to the industrialization of the area.

The terraces create an urban farm consisting of crops and wetland plants that allow urban people to revisit the seasonal changes of the rural environment while also reconnecting with the regions agricultural past. Traditional plantings of bamboo and Chinese Redwood are abundant throughout the site and further connect the design to its context.



The existing structures that remain on the site have been repurposed and given new life. The former factory and dock have been transformed into hanging gardens and viewing platforms offering visitors grand views of Shanghai Houtan Park and the Huangpu River. Existing steel panels that were found throughout the site now serve a variety of purposes. Many of these panels have been transformed into a series of follies that arch over pathways offering shelter while framing views of the project and the city of Shanghai. The panels also serve as unique paving materials and as artistic shade covers (Turenscape, 2007).

While Shanghai Houtan Park is thousands of miles away from *Mining the Past*, there is a strong connection of the objectives of both designs. Shanghai Houtan Park's most effective element is the way it addresses ecological and cultural challenges by creating an accessible, functional and enjoyable space. This is the ultimate goal for *Mining the Past* as well. Like Shanghai Houtan Park, *Mining the Past* seeks to heal a degraded, poorly-used landscape while creating a strong connection to local culture.

Shanghai Houtan Park is inspirational because it exemplifies creative, functional design methodology that not only solves a problem but adds something substantial to its context. The utilization of cultural influences such as agriculture and industry within the design concept is truly effective. The agriculturally inspired terraces and repurposed industrial structures and materials anchor the design within the local vernacular while adding to the aesthetic and functional appeal of the space.

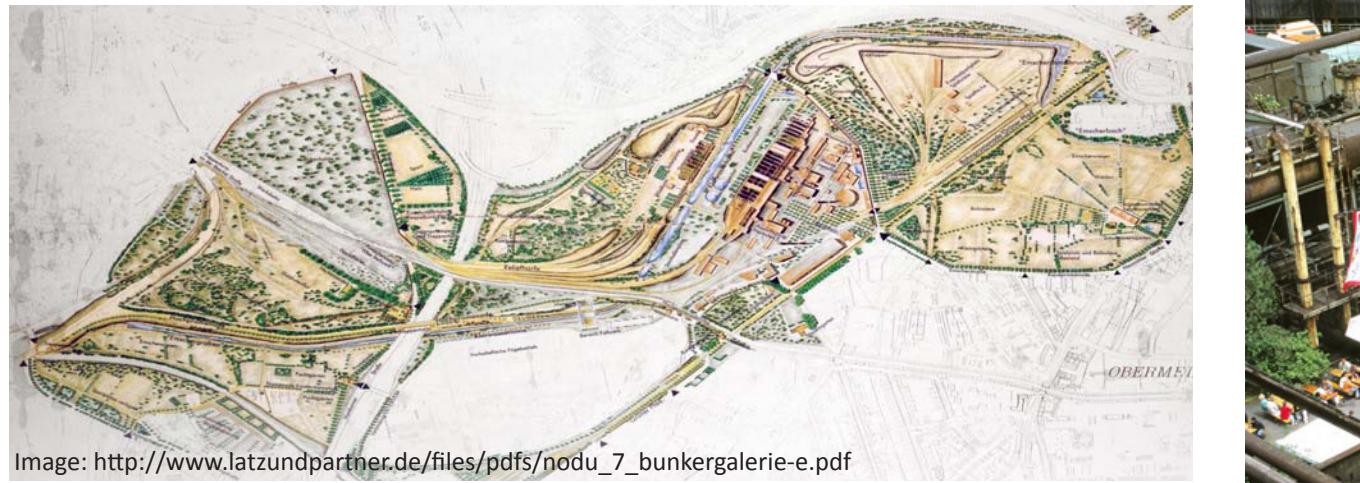
This is the type of design methodology to be used in *Mining the Past*. Connections to local culture will not just be hinted at, but will be exemplified through both form and function. Shanghai Houtan Park inspires this technique while reinforcing its success. Drawing from history and culture to inform the design process and thus the final product is the primary lesson learned from this case study. All this can be done while creating something that is not only beautiful but also enriches lives.



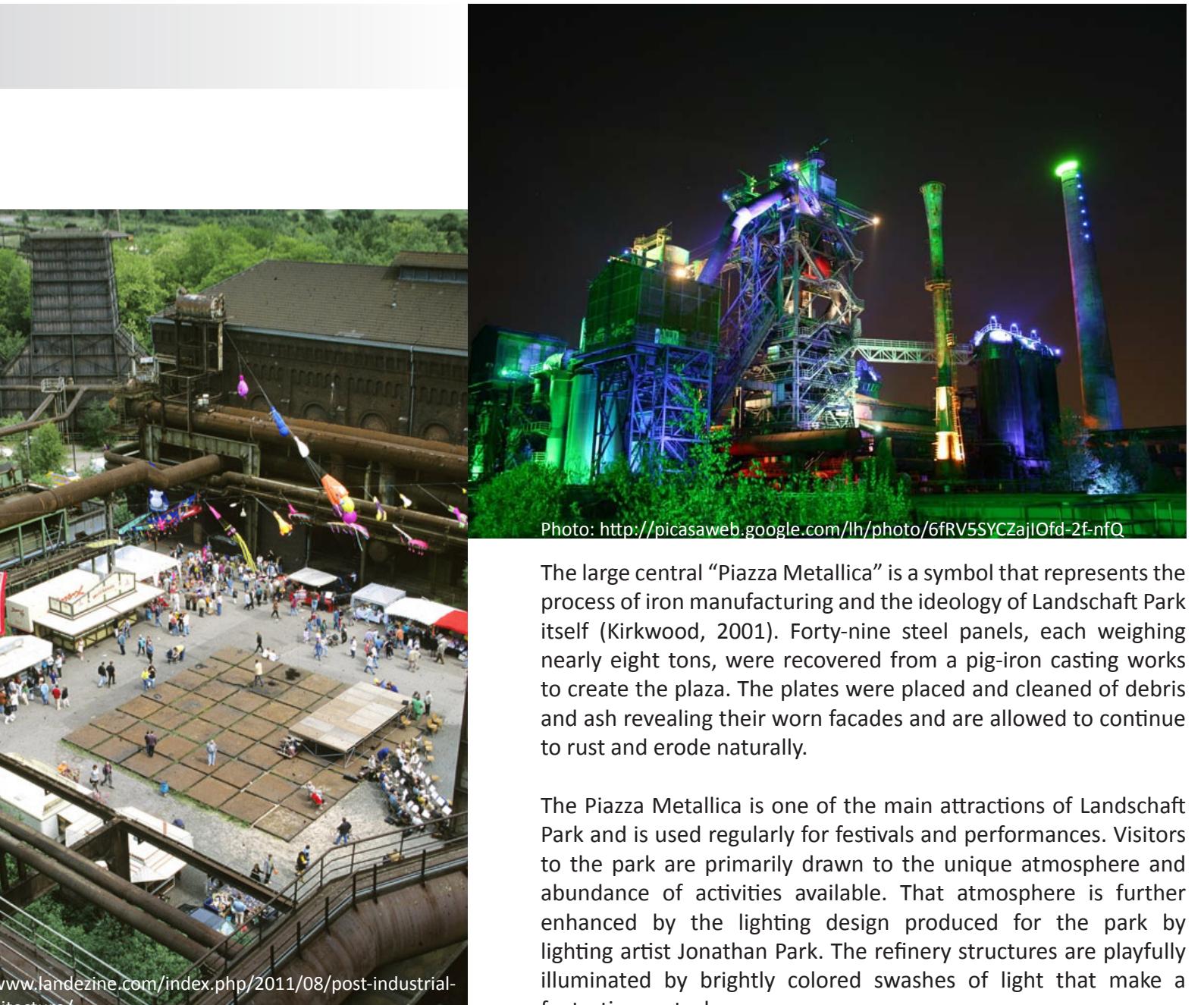
# Case Studies

## Landschaft Park Duisburg Nord, Germany

Landschaft Park, located in Duisburg Nord, Germany is a 568 acre brownfield development on the Emscher Canal. Developed as part of the International Building Exposition Emscher Park (IBA), the project includes the remediation of contaminated soils, adaptive reuse of steel refinery structures and facilities and strong connections to the site's industrial past. The park was designed by Latz+Partners in the late 1980s and fully constructed by 1999 (Kirkwood, 2001). The primary focal point within Landschaft Park is the steelworks facility that has been remediated and given many new purposes.



Landschaft Park was created from the recession of mining activity within the region and designed around the themes of "physical nature" and "utilization" (Kirkwood, 2001). To that end nearly every facility within Landschaft Park has been given a new purpose while retaining its original identity. For instance, the towering blast furnaces have been decommissioned and are now connected by a series of raised walkways that offer views of the surrounding landscape as well as the prominent steelworks. Former ore bunkers are now used as climbing walls with installed grips as well as existing cracks for use by free-climbers. The project also houses the largest human-made indoor diving facility in Europe, which was created through the reclamation of the refinery's former gasometer.



The metamorphosis from original function to new purpose with a retention of identity is what makes Landschaft Park so effective. While none of the site's original purposes are actually functioning, they are all on display. The acceptance and exemplification of the past is the inspiration to be gained from Landschaft Park. Typologically, the park holds numerous similarities to the concept of *Mining the Past*. The strong connection to industrial heritage and adaptation of existing structures with respect to original and innovative new uses play key roles in the success of Landschaft Park. That success supports the design to be implemented in *Mining the Past*.

The designers of Landschaft Park found ways to create new activities within the existing setting and will inspire an interesting challenge and add depth to *Mining the Past*. Connecting the design to current recreational activities such as fishing, hiking, birding and biking will provide a strong anchor within the community. Drawing inspiration from Landschaft Park, the existing structures within the Ironton Sintering Complex could easily be turned into climbing walls, viewpoints or educational centers for activity that celebrates the history of the site while adding social and cultural value to the region.



# Case Studies High Line New York

Located in the lower west side of Manhattan in New York City, High Line is a one mile linear, aerial greenway built upon a section of an unused former rail line. The project began after the formation of the non-profit group Friends of the High Line who sought to see the rail lines preserved and reused as open space (Friends of the High Line, 2010). The design for High Line was drafted by Corner Field Operations based in New York and was completed and fully open to the public in 2011 (Friends of the High Line, 2010).



w.thehighline.org/galleries/images/high-line-park-photos

development a marked increase in property development began (Friends of the High Line, 2010). This brought the park an increase in users and attention of developers and governments in the area. It is seen as a great example of a way to revitalize neighborhoods while finding use for brownfield sites (Friends of the High Line, 2010). Reports also state that the park has relatively low rates of crime, even compared to Central Park, due to the increases in use and development (Friends of the High Line, 2010).

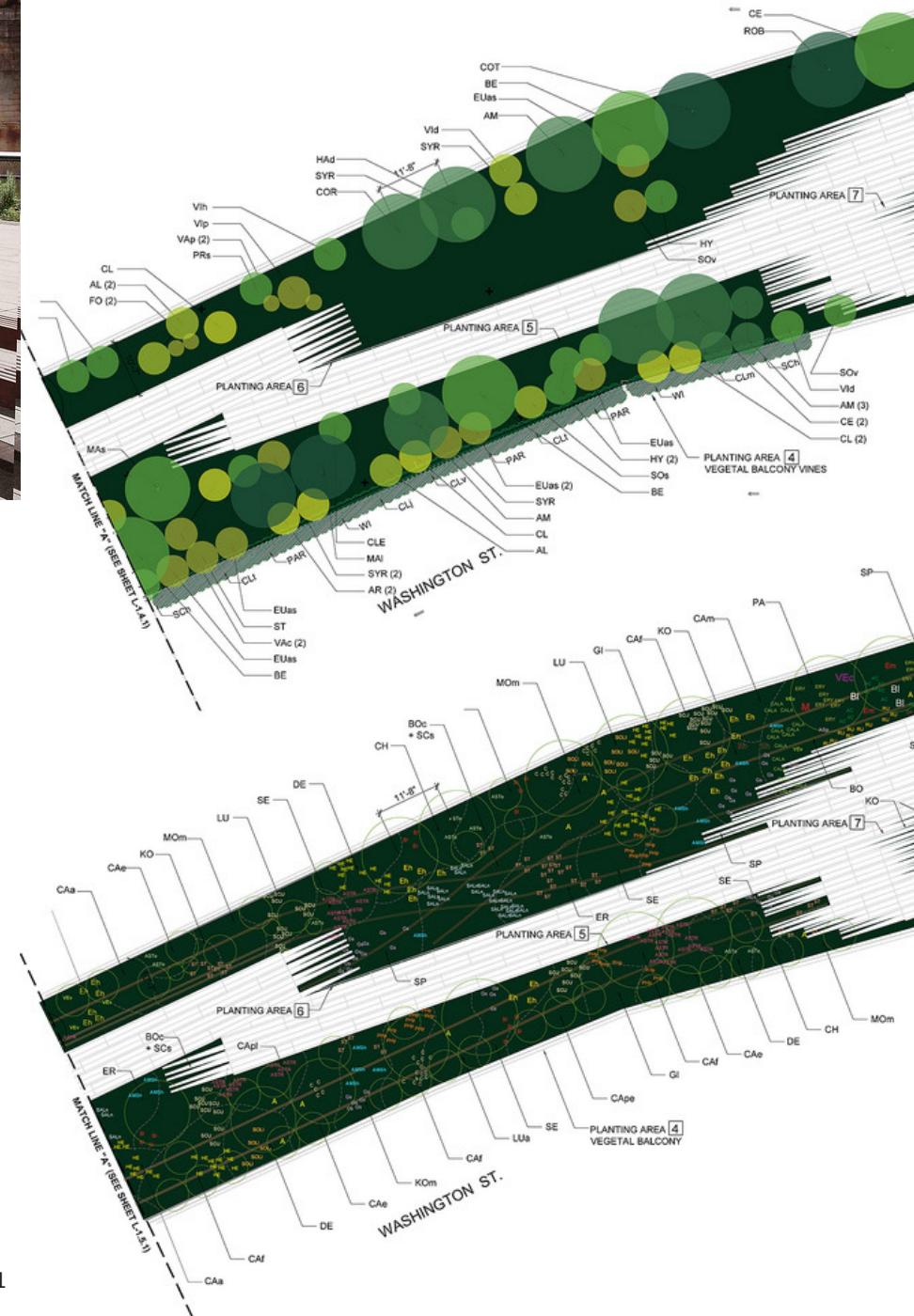
ures the reuse of the existing rail line structure of native plant species that had previously made the abandoned tracks as well as modern, but influenced materials (Friends of the High Line, 2017). The old rail tracks we removed for construction are buried within the planted areas to further remind visitors of the park's original use. The entrance to High Line is accessible via five stairways and elevators located along the park which allow the public to easily access



The use of the park varies slightly as one moves through it. Some areas are dominated by plantings and slimmer walking paths, while at other points, the hardscape widens and features lounging chairs ideal for sunbathing and taking in the grand vistas of the city and the Hudson River (Friends of the High Line, 2010). The park is also home to the works of various artists and performances helping to ground it into the culture and community of the area.

High Line is an effective design that utilizes existing structures and property to create a place that fosters community pride while spurring continued development. The lessons learned from High Line can be directly translated to *Mining the Past*. The primary reason behind the selection of High Line as a case study is the way the development of High Line garnered interest in further development within the neighborhoods traversed by the park. Obviously, the reuse of structures and history-based design decisions are notable factors in the park's success. However, there is more to developing brownfields like this than the creation of enjoyable spaces; there are serious economic benefits as well and High Line illustrates that.

oto (above): <http://www.thehighline.org/galleries/images/high-line-park-photos>  
oto (right): <http://www.thehighline.org/galleries/images/design-slideshow?page=1>



# Case Study Summary



The three case studies outlined within this document, Landschaft Park, Shanghai Houtan Park and High Line are very different projects but share some common themes. Each of these projects have a strong connection to history, are relevant within their cultural context and utilize some form of remediation and reclamation. After analyzing the three case studies, the theoretical premise behind *Mining the Past*, my proposal near Ironton, MN, has stayed relatively the same but has been further strengthened.

The commonalities between the case studies strongly supported *Mining the Past*'s premise of beneficial brownfield development and of the impact that culture and history have on a design. The case study of High Line in New York City had a large impact on the premise behind the economic benefits of brownfield development. After High Line's construction, property values around the park increased and a number of new developments began to start along the path of the aerial greenway. This is influential to the theoretical premise of this project because having strong evidence that brownfield development does more than create usable spaces increases the viability of the project.

Landschaft Park and Shanghai Houtan Park support the theoretical premise behind the utilization existing industrial structures and materials within a design. By incorporating existing structures the design becomes firmly grounded in the history of its site. Additionally utilizing found materials and materials of a similar site-related theme the designs historic character is further strengthened. Landschaft Park provided the design of *Mining the Past* with a multitude of potential future uses as well including community events, rock climbing and SCUBA diving.

Photo: <http://www.thehighline.org/galleries/images/high-line-park-photos>

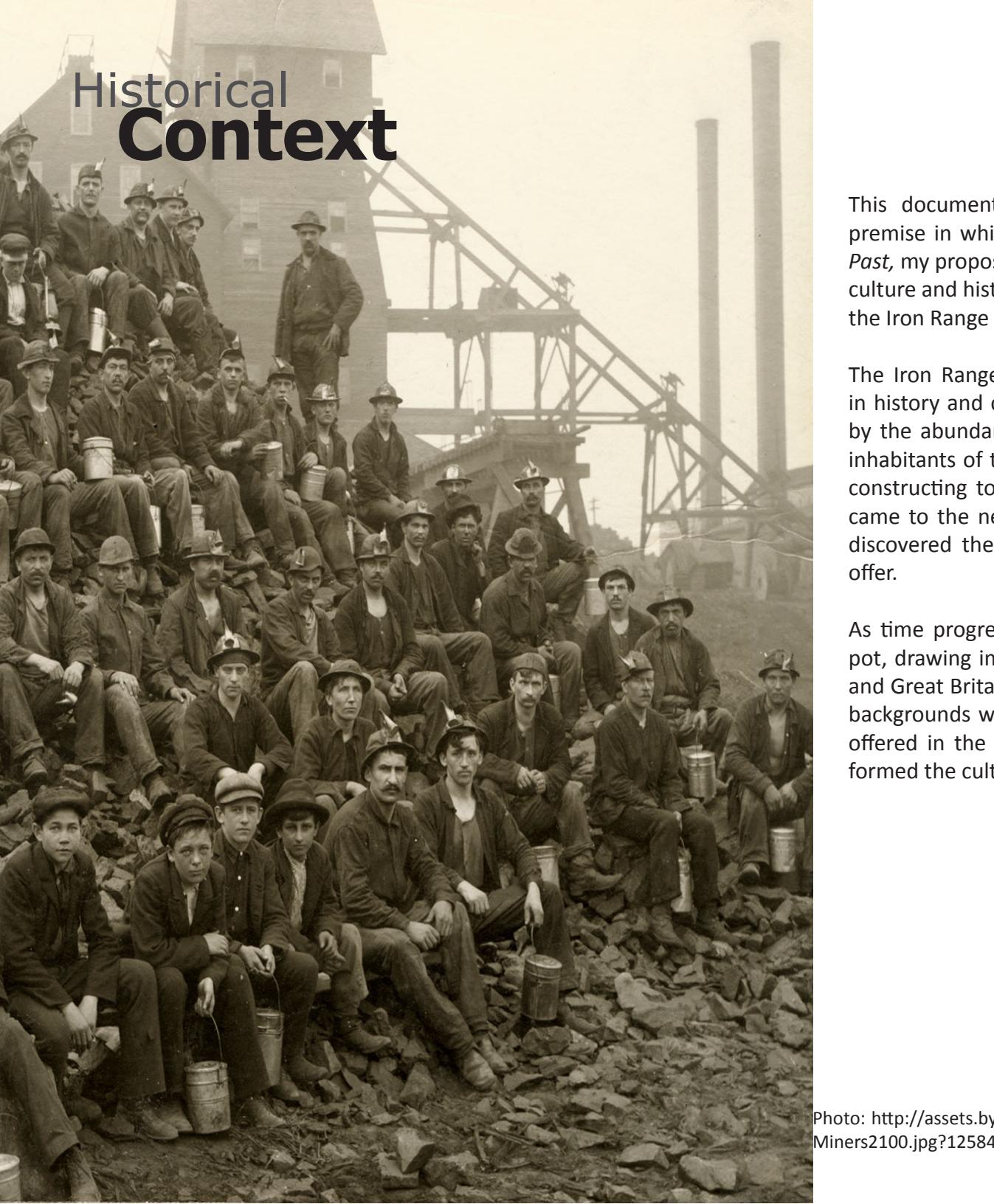
From the standpoint of remediation, Landschaft Park and Shanghai Houtan Park both show that remediation techniques can be functional as well as beautiful. The terraces in Shanghai Houtan Park are reminiscent of past Chinese agricultural techniques but serve the purpose of cleaning runoff water from busy highway before it enters the Huangpu river. The design of Landschaft park utilized phytoremediation in a number of beautiful ways including rows of poplar trees near the blast furnace and baroque-styled gardens in old ore bunkers. The combination of form and function within the remediation techniques of these two places has inspired potential within the premise of *Mining the Past*, the site for which will need some level of remediation.

It is of little surprise that these case studies were chosen to be included within this document. While there are numerous examples of brownfield developments throughout the world, the three examples examined here share close ties with the typology and premise of *Mining the Past*. The integration of history and culture, the remediation of contaminants and the creative use of existing structures and materials come together to produce designs that are both effective in their proposed function and stunning to look at.



Photo: <http://www.turenscape.com/english/projects/project.php?id=443>

# Historical Context



This document has examined the typological and theoretical premise in which *Mining the Past* is set. However, as *Mining the Past*, my proposal near Ironton, MN, is a project firmly grounded in culture and history, it is important to delve deeply into what makes the Iron Range of Minnesota the place it is today.

The Iron Range area of northern Minnesota is a region steeped in history and culture that has been driven for hundreds of years by the abundance of natural resources in the earth. The earliest inhabitants of the area mined copper, flint and other minerals for constructing tools and jewelry. As settlers from Europe and Asia came to the new world and eventually the Iron Range, they too discovered the vast opportunities the region's resources had to offer.

As time progressed, the Iron Range grew into a cultural melting pot, drawing immigrants from Germany, Finland, the Netherlands and Great Britain to name a few. These people of different cultural backgrounds were drawn together by the prospects of prosperity offered in the depths of the earth and through that connection formed the cultural tapestry of the Iron Range.

One of first prominent examples of subsurface mining were the salt caverns at St. Thomas, Nevada which extended over 100 yards into the mountain side and were worked nearly 1000 years ago (N. & Sloane, 1970). These mines, like many other subsurface operations, were extremely susceptible to cave-ins and many ancient miners lost their lives to the acquisition of salt, copper, iron and other minerals and metals (N. & Sloane, 1970).

Photo: [http://assets.byways.org/asset\\_files/000/004/446/CCT\\_nom\\_Tamarack\\_Miners2100.jpg?1258496019](http://assets.byways.org/asset_files/000/004/446/CCT_nom_Tamarack_Miners2100.jpg?1258496019)

## Mining in America

Before we can effectively represent the history of the Iron Range we must first examine America's mining history as a whole. Knowing where the mining industry gained its footings and the people involved in its progression is important within the context of not only the History of the United States but also the history of the Iron Range as well. The mining industry had a more substantial influence on the origins and development of the United States than many people realize.

## Early History

Some of the earliest evidence of mining in America is found around the upper Great Lakes region of Michigan and Wisconsin (N. & Sloane, 1970). Small copper pit mines have been discovered on the Isle Royal and Keweenaw Peninsula that date back roughly 5,600 years and were likely mined by heating the surrounding rock and suddenly cooling them with lake water. This method would crack the large rock, allowing these ancient Native American miners access to the raw copper ore (N. & Sloane, 1970). The raw ore was then heated in open fires and hammered into various tools such as spear heads, fishing hooks, knives and jewelry as well as being traded for other goods (N. & Sloane, 1970).

## The Arrival of Columbus

The Native Americans continued to extract resources from the earth relatively isolated from the rest of the world until the arrival of explorers from Europe. The most notable of these explorers, with regard to American history, was Christopher Columbus, who set out from Spain with the goal of landing on the Asian continent. Columbus obviously never landed in Asia, instead landing on the shores of Cuba and Central America. This accidental discovery set in motion the colonization of the Americas and an eventual, drastic change in American mining.



Due to Columbus's discoveries, other explorers ventured across the Atlantic in search of new wealth in the form of gold and silver. That desire for gold and silver was a driving force behind the first exploration of North America. Lured by fantastic tales of the Seven Cities of Cibola, whose streets were supposedly paved in gold, Spanish explorers, ordered by Francisco Vasques de Coronado in 1539, were the first to enter North America at what is now Arizona (N. & Sloane, 1970).

Photo: <http://www.latinamericanstudies.org/cuba/colon-desembarco.jpg>

These first endeavors were fraught with hardship and often death at the hands of Native Americans and disease. The “city with golden streets” was discovered by Coronado himself in 1540 and found to be seven Native American villages with no riches whatsoever (N. & Sloane, 1970). However, further imaginative tales of golden cities continued to drive continued exploration of North America for another three decades (N. & Sloane, 1970). At the same time, the British and French were beginning the exploration of northeastern America, where the original thirteen colonies of the United States would eventually be founded.



## Revolutionary Times

Like the Spanish, the British and French came to the Americas in search of precious metals like gold, silver and copper. However, they had significantly better success than their Spanish counterparts in the south. The French and British explored the land heavily throughout the 1600s, discovering iron, copper and lead deposits (N. & Sloane, 1970). The discovery of these valuable resources by the early British colonists eventually contributed in the creation of the Declaration of Independence and sparked the Revolutionary War as the British, in 1719, tried to make the construction of ore processing facilities within the colonies illegal. The British Parliament believed the construction of these facilities would reduce the colonies dependence on England (N. & Sloane, 1970).



After the Revolutionary War started in 1775, mining operations within the colonies increased dramatically to meet the needs of the colonial American military forces (N. & Sloane, 1970). The colonists mined iron ore, to make rifles, bullets and cannonballs as well as niter, a key component in gunpowder, consistently throughout the Revolutionary War (N. & Sloane, 1970). Mining continued at a rapid pace throughout the war and shifted focus afterward back to the search for gold.

## Gold Rush

In 1799 the first authenticated discovery of gold was made in North Carolina, completely by accident, as a boy was fishing in a cave (N. & Sloane, 1970). This led to a greater desire for gold and eventually, with the discovery of gold in California, the Gold Rush of 1849. The massive influx of settlers seeking to strike it rich in California helped pave the way for western expansion in the United States. San Francisco, California, for instance grew, from a population of 300 in 1846 to 36,000 in 1852 (N. & Sloane, 1970).

Photo(Left):<http://www.ushistory.org/declaration/images/trumbull-large1.jpg>  
Photo(Above):[http://www.ng.mil/resources/photo\\_gallery/heritage/hires/Stand\\_Your\\_Ground.jpg](http://www.ng.mil/resources/photo_gallery/heritage/hires/Stand_Your_Ground.jpg)

People traveled in the thousands by land and sea in search of work and wealth in the mines and eventually earned themselves the nickname “forty-niners” (N. & Sloane, 1970). The effects of this westward rush went far beyond the discovery and acquisition of gold. By 1850 California was made a state and there was a boom in agricultural production to meet the demands of the mine workers. Furthermore, imported goods from China, England and South America were in high demand by the miners, stimulating those economies. The Gold Rush also spurred the construction of the American Transcontinental Railroad, which would be known as one of the most astounding American technological achievements of the 19th century (N. & Sloane, 1970).

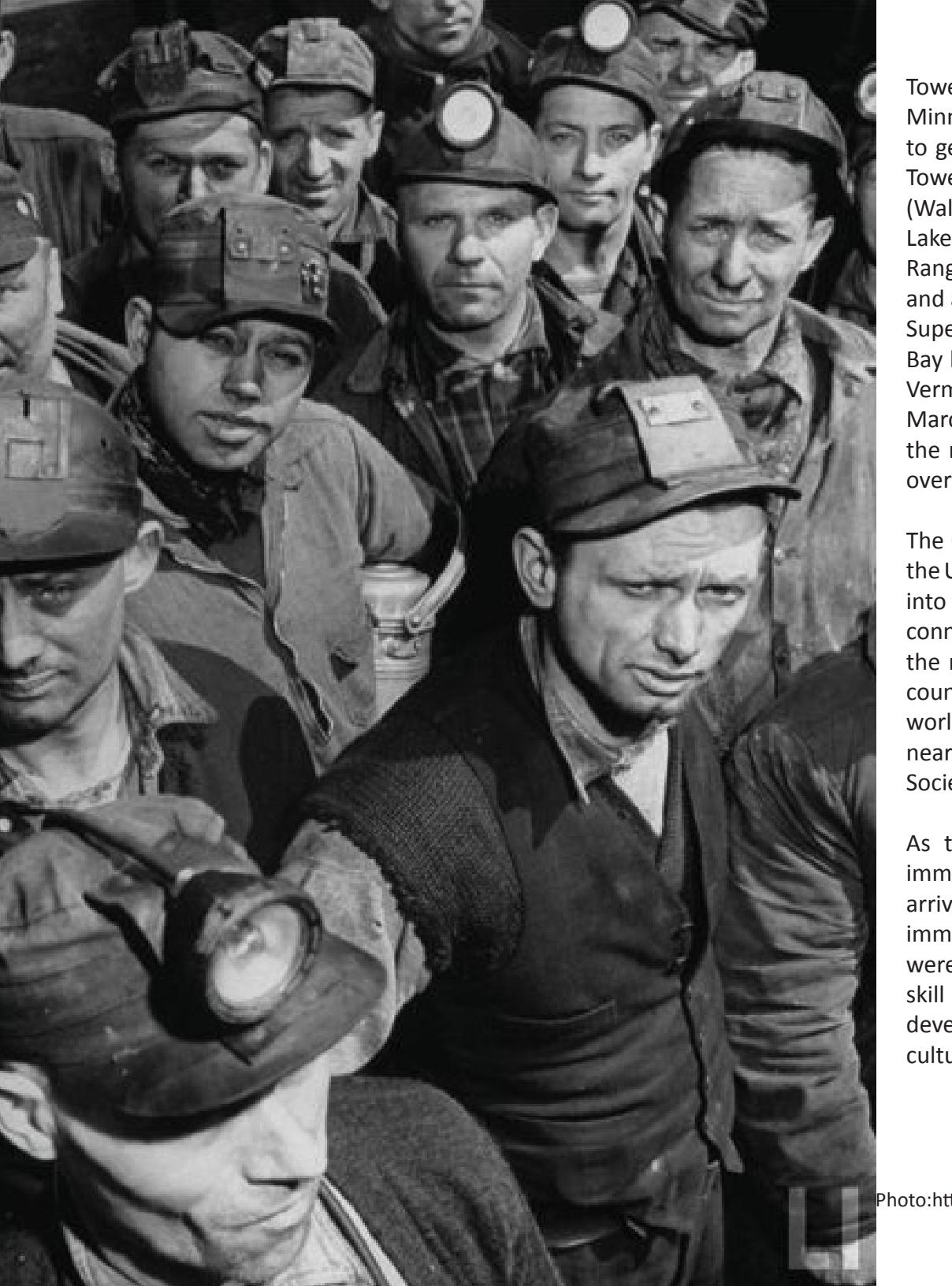


## Minnesota's Iron Range

With the American Industrial Revolution and the American Civil War came a great increase in demand for coal and iron ore. While Pennsylvania held the market on coal mining, it was the American Midwest that dominated the iron mining industry (N. & Sloane, 1970). Laid down by thousands of years beneath a great inland sea, iron deposits, some of the largest in the world, are located within the Lake Superior region of North America. Specifically, there are six major iron ranges; the Marquette and Menominee in Michigan, the Gogebic in Wisconsin and the Mesabi, Vermillion and Cuyuna ranges in Minnesota.

Human activity in the Lake Superior region dates back thousands of years, with ancient Native Americans being the first to occupy the area. As European settlers, starting predominantly with the French, began exploring the area, the discovery of the regions bountiful mineral deposits was made prominent. Copper was the first ore to be excavated from the area, though iron would eventually dominate the mining industry (Minnesota Historical Society, 2011).

The presence of ore within northern Minnesota had been reported as early as the 1700s, but a more full scale exploration of the regions ore deposits wouldn't happen until the last half of the 19th century (Walker, 1979). The true abundance of ore was discovered when prospectors came to the Iron Range region in search of gold. The first ore to be commercially mined from the region came from the Soudan Mine, opened by the Minnesota Iron Company in 1884 (Minnesota Historical Society, 2011). The Minnesota Iron Company was started by the industrialist Charlemagne Tower.



Tower's investment in the Vermillion Range of northeastern Minnesota caused the area to develop at an incredible pace. In order to get the iron ore from the mines to the ports on Lake Superior, Tower built railroads lines, roads and small town infrastructure (Walker, 1979). Tower constructed a town on the edge of Vermillion Lake that drew hundreds of miners formerly working in the Michigan Ranges. The journey from Michigan to Vermillion Lake was long and arduous. Miners had to travel from their homes in Michigan to Superior, Wisconsin by train and then cross the frozen Lake Superior Bay by sleigh to Duluth and finally travel 80 miles by sleigh ride to Vermillion Lake. All of this was done during a single winter and by March the experienced miners and their families were at work in the mines (Walker, 1979). They joined scores of laborers from all over Europe and other parts of the world.

The Great Lakes that traverse between the borders of Canada and the United States provided a convenient route for immigrants to flow into the area and for the valuable minerals to flow out. This natural connection to the Atlantic Ocean helped spur the development of the region into one of the fastest growing economic areas in the country at the time. Iron mining drew immigrants from all over the world including Finland, Sweden, Slovenia and Croatia and by 1900 nearly 70% of mine workers were immigrants (Minnesota Historical Society, 2011).

As the region's iron mining operations grew, more and more immigrants from nearly every corner of the European continent arrived. By the 1900s, the Iron Range contained the largest variety of immigrants outside the Twin Cities (Alanen, 1989). The immigrants were easily put to work as most jobs in the mines required little skill or the ability to speak English. The history these immigrants developed within the region is what shaped the Iron Range into the cultural tapestry it is today.

Photo:<http://scrapetv.com/News/News%20Pages/Business/images-5/miners.jpg>

The preserved culture of the various ethnic groups would continue for decades. This was in part due to the level of isolation many foreign-born workers felt. American-born workers often looked down upon immigrants, using racial slurs and keeping their distance both physically and socially. The language barriers did not help either. However, many foreign-born miners of different backgrounds were able to communicate using various "mixtures" of their own languages and English that would become known as "mine-English" (Alanen, 1989). Religion was another way culture was preserved. The Finnish immigrants established numerous Lutheran churches of varying sub-denominations including Unitarian and Pentecostal, while the Irish, Polish, Croatians and Italians established numerous Catholic churches throughout the Iron Range, thus establishing the foundation for the religious culture within the Iron Range (Alanen, 1989).

The immigrants shared with each other numerous traditions and practices from their homeland. The Italians impressed the other immigrant groups with their superiority in growing tomatoes, a practice that would be adopted by Finnish gardeners as part of their regular crops. The Finnish immigrants built large community halls and invited other groups to their celebratory dances, which helped develop a sense of connectedness among the ever-growing immigrant populations.

The Iron Range possesses a cultural fabric woven from the strings of many backgrounds. Immigrants from nearly every corner of Europe were drawn to the area in search of work. This common desire for prosperity developed the economy, the landscape, the culture and the history of one of the most unique areas within Minnesota.

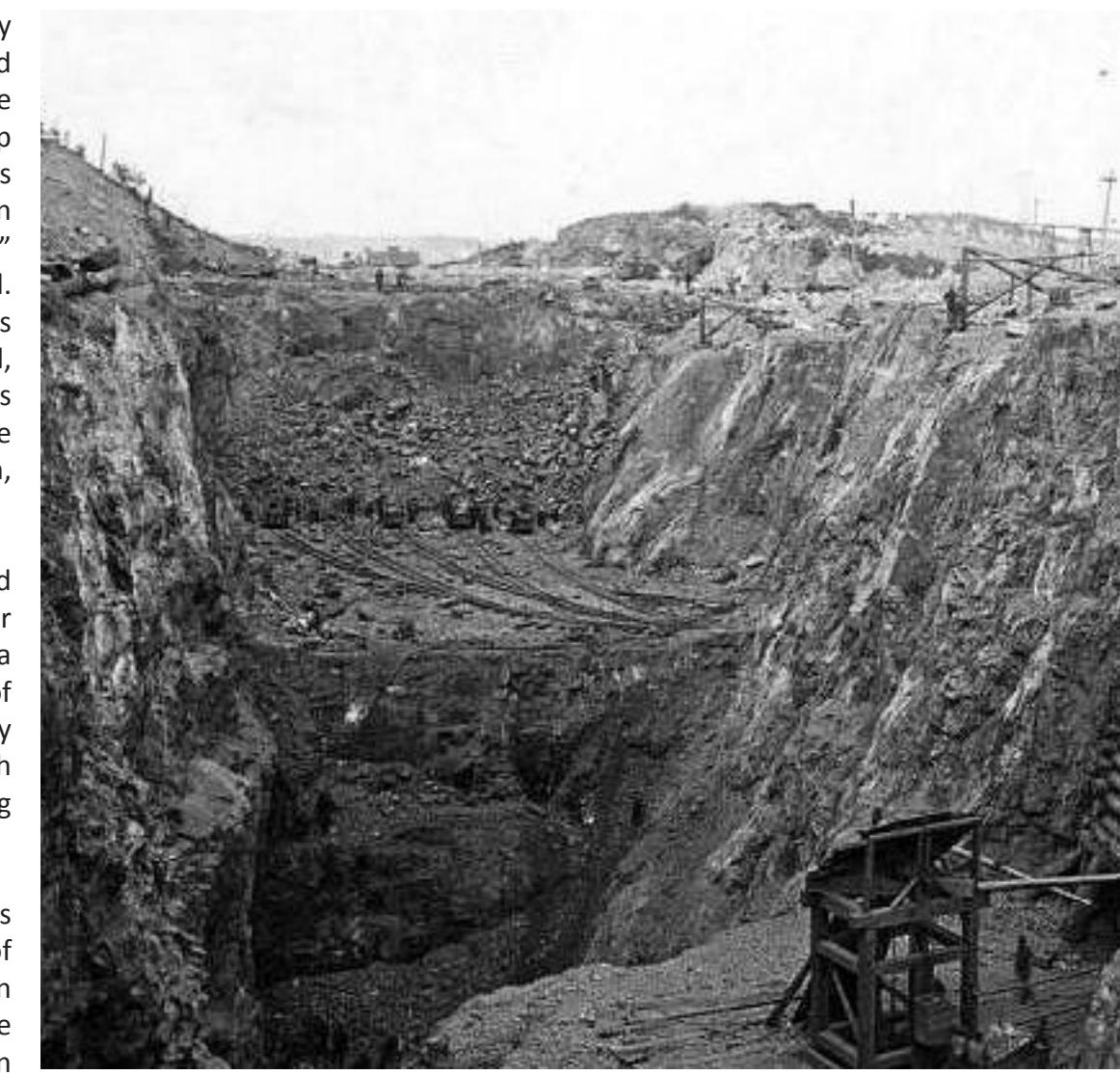


Photo: <http://www.miningartifacts.org/mnopenpitmining.html>

## Ironton and Crosby, Minnesota

Both located within the Cuyuna Range, the smallest and most recently mined of the three Iron Range region ranges, these towns were born for the sole purpose of supporting the mining industry. These “twin-cities” share the historical background of the rest of the Iron Range, having been founded in the early 1900s near the peak of the iron mining industry. Ironton and Crosby were developed so close together that a visitor today could easily drive through one and into the other without noticing the transition.

Crosby was the site of the greatest mining tragedy the Iron Range ever experienced. In 1924, the Millford mine, just outside town, flooded with water after a new tunnel was blasted and broke into Foley Lake. Forty-one miners lost their lives. The accident was the largest single loss of life in the Minnesota mining industry.

The Portsmouth Mine Pit Lake, located just north of Ironton and Crosby, was once a fully operational pit mine that produced hundreds of thousands of tons of iron ore. After it filled with water, the lake was used for one of the first space exploration experiments in American history. Project Manhigh, launched in 1957, sent Air Force Major David Simmons nearly 102,000 ft above the Earth in a small gondola carried by a balloon.

Currently, both towns are suffering from slow population loss but continue to hold onto their industrial past and diverse cultural history. Efforts to draw tourism to the two cities have increased in recent years and Crosby has created plans for a city beautification project as well as an expansion of local hiking and biking trails. These cities are in a prime location, at the southern edge of the Iron Range, to act as a welcoming point and first-stop for visitors to “the range,” as the locals call it.

Photo(right): [http://www.miningartifacts.org/Croft\\_Mine\\_-\\_Crosby\\_MN.jpg](http://www.miningartifacts.org/Croft_Mine_-_Crosby_MN.jpg)  
Photo(far-right): <http://www.miningartifacts.org/Minnesota-Mines.html>



# Project Goals

I am generally not the type of person to heavily plan the direction my life is heading, but setting meaningful goals is a way for me to get the metaphorical “carrot on a stick” out in front of me. The goals for this project are threefold: academic, professional and personal.

## Academic

From an academic standpoint I look at this project as the culmination of five years of education in landscape architecture. With that in mind, I want to produce something that not only provides a learning experience for myself but also for future students. I look forward to the challenges I will put upon myself to produce something great and meaningful. I want future students to be able to look upon what I have done for inspiration just as I have with past thesis projects.

I chose a design typology that I have had little experience with but have copious interest. I feel this combination will provide educational challenges that I will be excited to meet head on. These challenges will educate me in the importance of designing with culture and history in mind and the strength those factors can have upon a design.

## Professional

I am keeping my options open for what will happen after graduation. My education has opened my eyes to many possibilities and I am not sure what direction I want to take. I see graduate school in my future as a pathway to a teaching position, as I love interacting with people and teaching them new things. Teaching can be more of a learning experience than most realize. The opportunity to educate young people going into a design profession is something I would truly enjoy.

This project will be a valuable tool in educating myself on producing a clear and professional design and project document. It will prepare me to take on the challenges of the professional world in numerous ways, such as managing my time and resources while adhering to professional standards.

## Personal

To put it simply, my personal goals for this thesis are multifaceted. I hope to sharpen the technical and design skills I have learned over the last five years and I would love to be nominated for the Dennis Colliton Memorial Thesis Award. Being nominated would be a great honor and winning would be absolutely amazing. Furthermore, this thesis is going to educate me in many ways. Just as I stated earlier, I want this thesis to teach me how to produce a professional level document and design.

# Site Analysis

# Site Narrative

On a cool November day in 2011 I approached the town of Ironton, Minnesota on a winding road surrounded by a wall of leafless maples, elms and oaks. Their leaves now scattered to the ground were occasionally cast across the road by a faint gust of wind or the passing of another car. The sun was bright and warm while the air had the chilly scent of fall hinting at winter. The trees began to open up and give way to sod-grass and structure. What began to sprawl out in front of me was very close to my personal vision of a small rural town. A few stoplights, some old buildings, including quaint little shops, restaurants and the obligatory bar, church and post office.

Ironton looked to be fairly typical on the surface but there was a notable sense of history about the place. I think it was the mixture of historic architecture, the iron-range setting and the overall quietness of it. Ironton seemed humble, honest, and I liked that. As I moved through the town I could not help but notice the abundance of trees. Thinking back, I suppose it makes sense that there would so much foliage given the context of the region. However, as I have become accustomed to the landscape of Fargo, the presence of so many trees appealed to me.

As I drove out of town and towards the Ironton Sintering Complex, I gained an even better understanding of why so many people enjoy visiting this area. The natural beauty presented to me was more than abundant. Former pit-mines have filled with water and their hilly edges are painted with an array of mature maples, oaks, elms and pine trees. It is a beautiful scene. The road to the site snaked around the edges of these former pit-mines and I eventually stumbled upon the Sintering Complex. I could have easily missed it as there is no signage whatsoever. This had me a little confused, as the site is on the National Register of Historic Places.

As I pulled my car off the main road and onto the scoria driveway I was met by a half-opened gate that my car could barely sneak through. Just beyond the gate was a discerning sign reading "Stop! No trespassing. Range employees and customers only". I, of course, ignored the sign and bravely forged ahead. I had come this far and was not going to be turned away by petty signage. The scoria driveway weaved through scrubby grasses and trees and opened up to what could only be described as a scrap yard. It was perfect.



Photo: Michael Aasen

There were piles of pallets, old cars, a strange metal dragon sculpture and a couple of corrugated metal buildings that came together and painted a scene from "Texas Chainsaw Massacre". That imagery was enhanced by the sounds of people working within one of the buildings who, to this day, have no idea I was ever there. Aside from the fear-inducing first impressions, the site has a lot of potential. The corrugated metal buildings left me a bit lost for inspiration; however, after wading through the overgrown vegetation I was able to explore the historic sintering structures. The old buildings had not been well preserved. To be honest, I was not even sure what each one was used for, but they were interesting to say the least. I think that in their current state they are far more interesting than in their former, functional condition.

The most captivating visual of the visit was looking up to the sky from inside the largest of the two original structures; named "Fort Clatsop" by a local hooligan. There was no ceiling to block the skyward view, and the interior of the structure had been taken over by vegetation. Twenty to thirty foot tall trees were growing straight out of the concrete. Both structures were like this. Vegetation had taken hold in nearly all available cracks and crevices. The juxtaposition of greenery against the rust-colored concrete was beautiful.



Photo: Michael Aasen

I made my way toward what appeared to be the oldest corrugated metal building on the site. The building's metal skin had been rusted from years of exposure and painted a very distinct and heavy character. The building is large, red, old and captivating. Its use was a mystery to me but its weight on the site was so prominent, especially against the background of the still, reflective Portsmouth Mine Pit Lake. I found the only unlocked door and let curiosity guide me to open it. I was greeted by a scared orange tabby cat and a lot of junk. After the cat, whom I later referred to as "Whiskers," ran off I took a visual inventory of the mass of plastic children's pools, old windows, lumber and tarps. Whatever this building's use was in the past it has since been delegated to the role of storage locker.

Something disappointing about the site was the lack of access to the pit-mine lake at its edge. The area around the lake is labeled a state recreation area, but water access is blocked by tall grasses. An opportunity? Most definitely. I continued to explore the site, finding more and more random piles of scrap metal, lumber and junk. The site will need extensive cleanup before any serious changes can be made but I tried to look past all the junk and see the site for the potential it held.

This was the recurring theme of my site visit: potential. After thoroughly exploring the Ironton Sintering Complex and taking a couple hundred photos I got back in my car and drove off. As I made my way back through Ironton my head was full of ideas. I kept thinking about what I was going to transform my site into, what needed to be done to make it safe and make it successful. As I left Ironton I stopped to take a photo of a sign I had passed on arrival. The sign read, "Ironton, Solid Outdoor Heritage" and featured a mountain bike perched above a lake rimmed with trees bursting with fall colors. The message behind that imagery was inspiring.



Photo: Michael Aasen

# Site Recon

Photo: Bing Maps



45

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Photos: Michael Aasen

## Existing Site In Plan

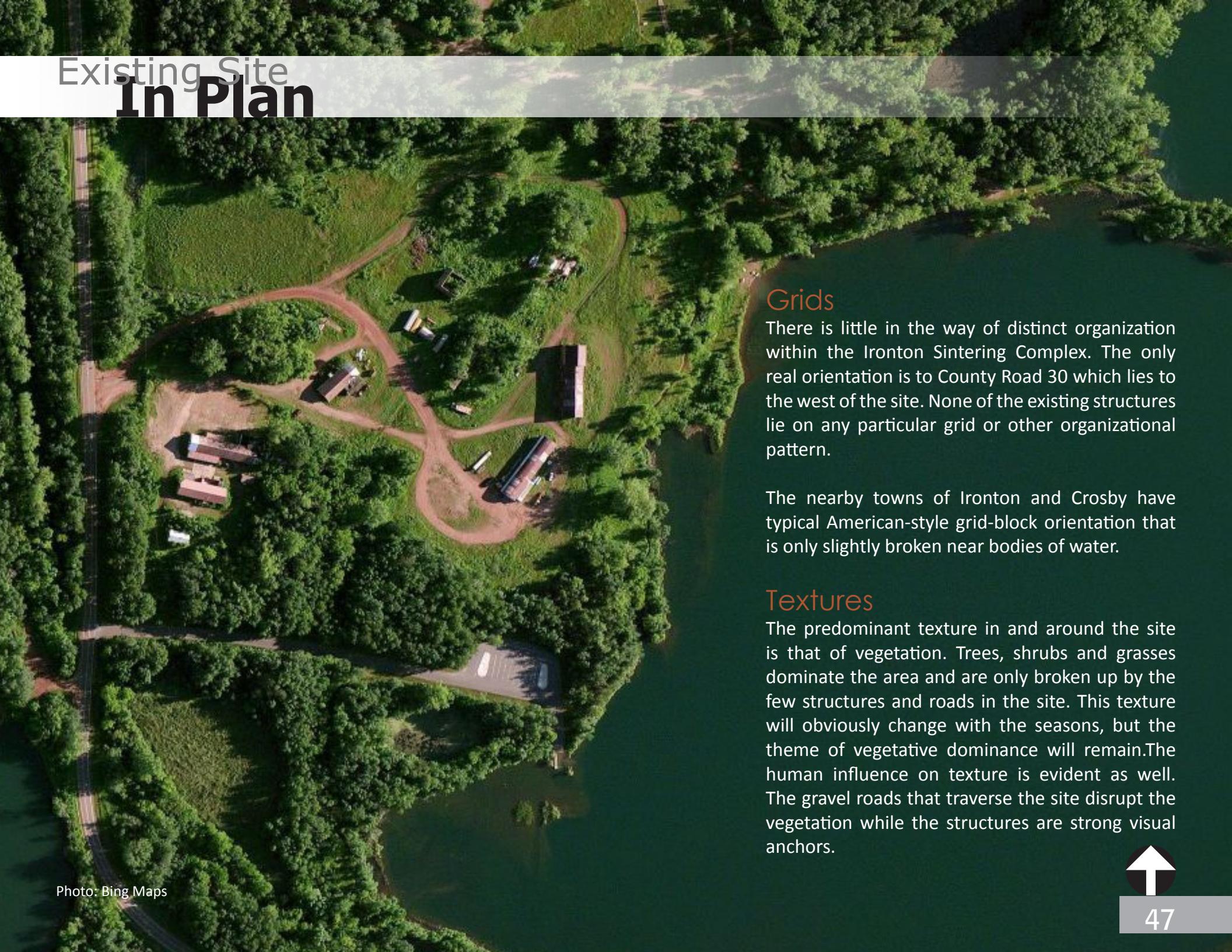
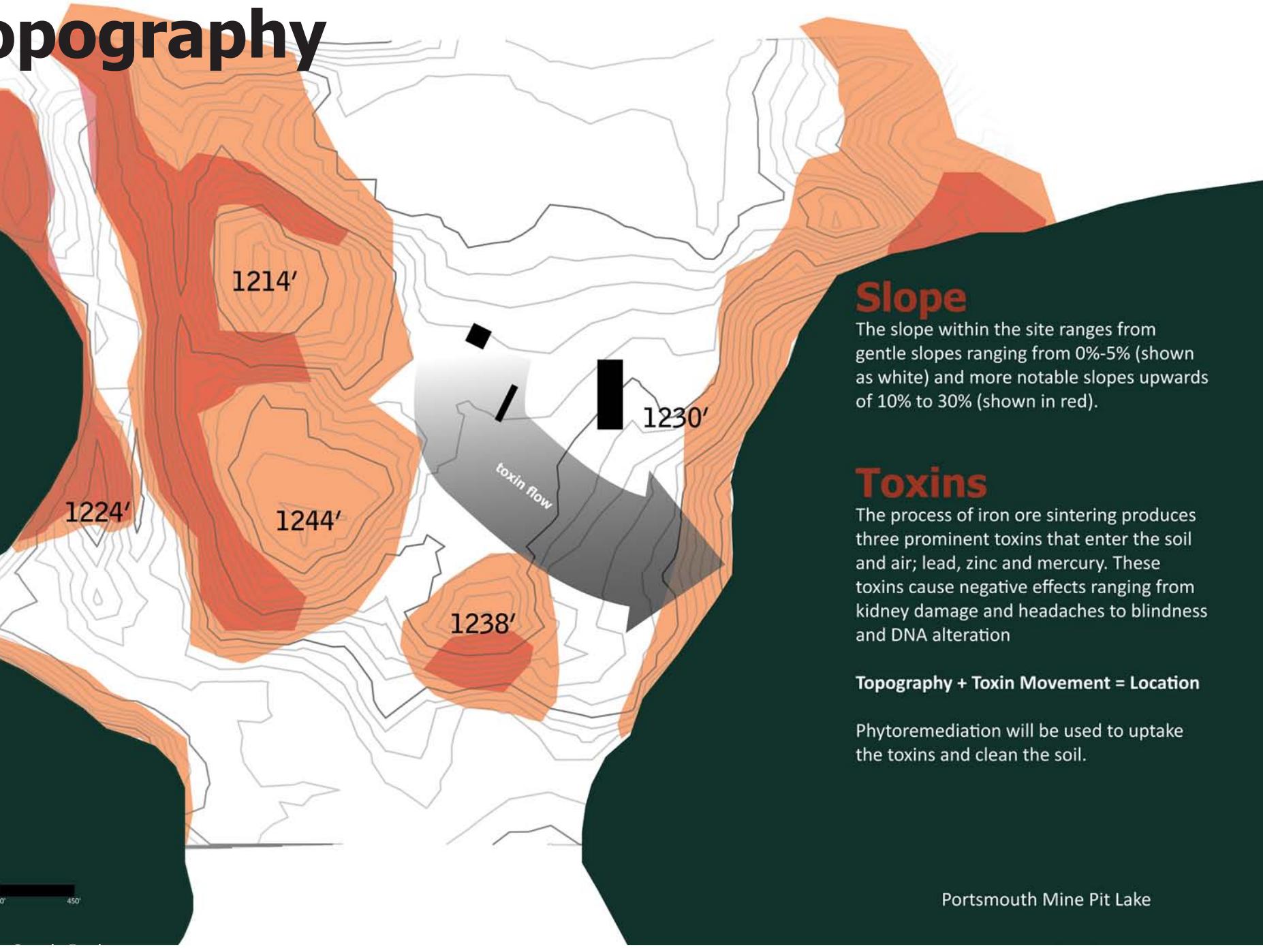


Photo: Bing Maps

## Site Topography



Portsmouth Mine Pit Lake

# Existing Structures

## Condition

The structures within the Ironton Sintering Complex are, in general, poorly maintained. The original sintering structures, dating back to 1924, have been allowed to be overgrown by trees, shrubs and grasses. The newer, corrugated metal buildings are rusting and in various states of disrepair. They all do, however, serve as a reminder of the industrial heritage of the site.

The juxtaposition of the rigid, heavy building materials against the softness of the vegetation creates an interesting contrast. The interior of one of the sintering structures has been made home to numerous 20'-30' birch trees and the atmosphere created is very unique.

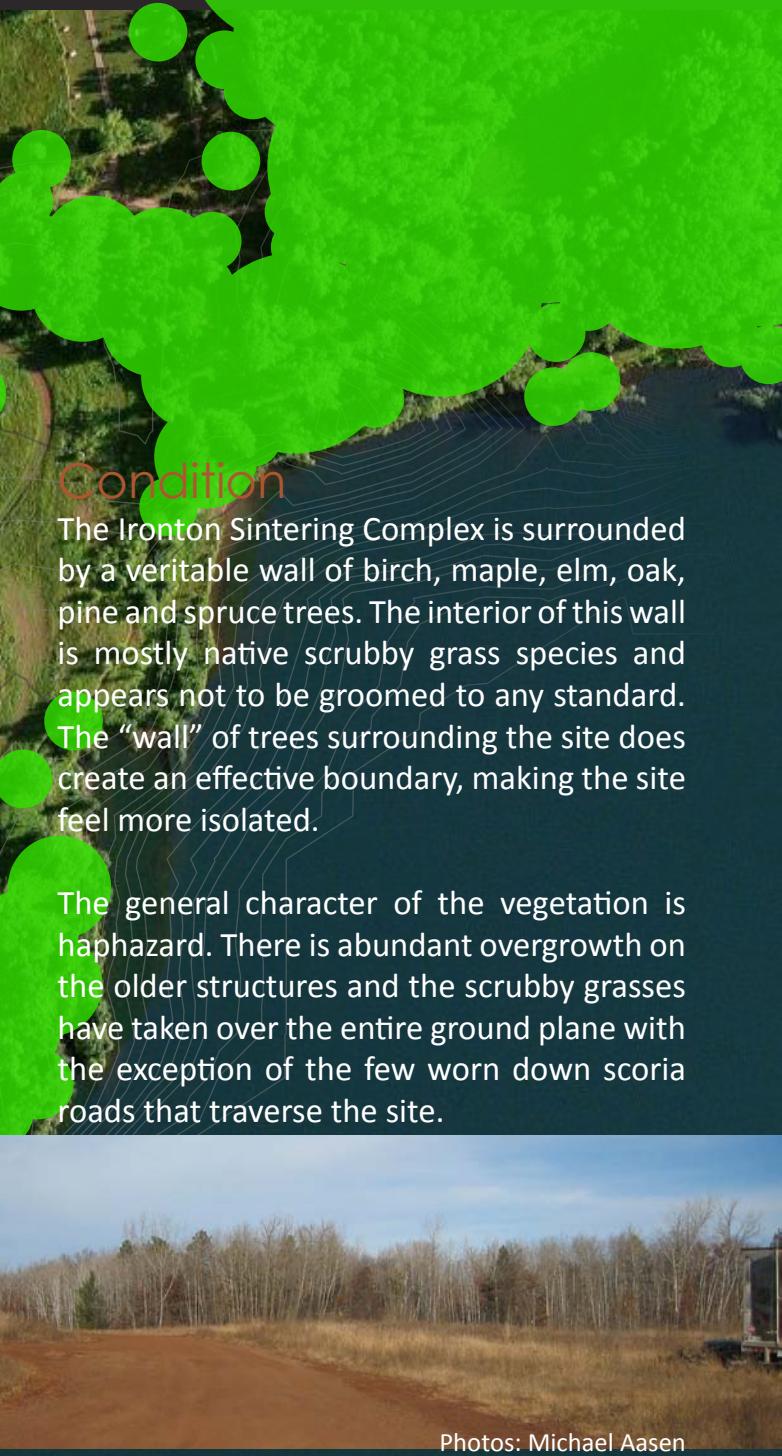
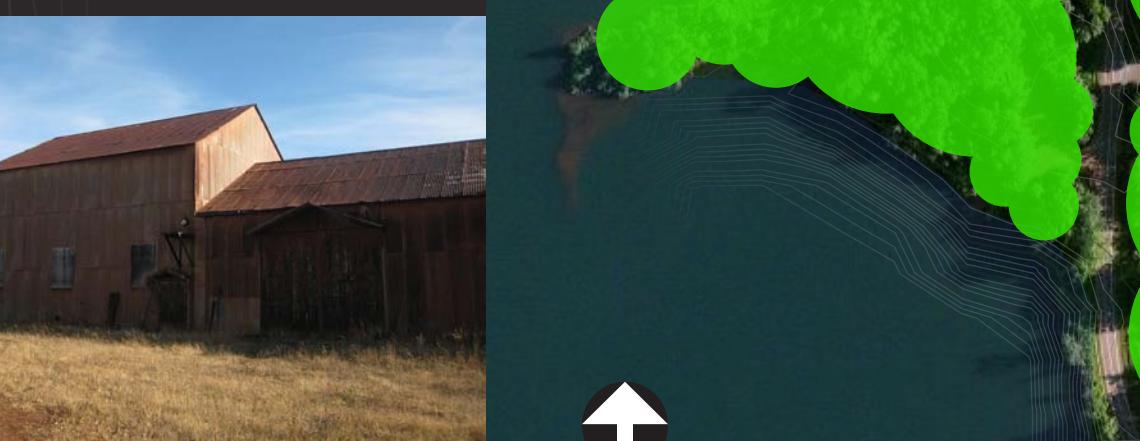
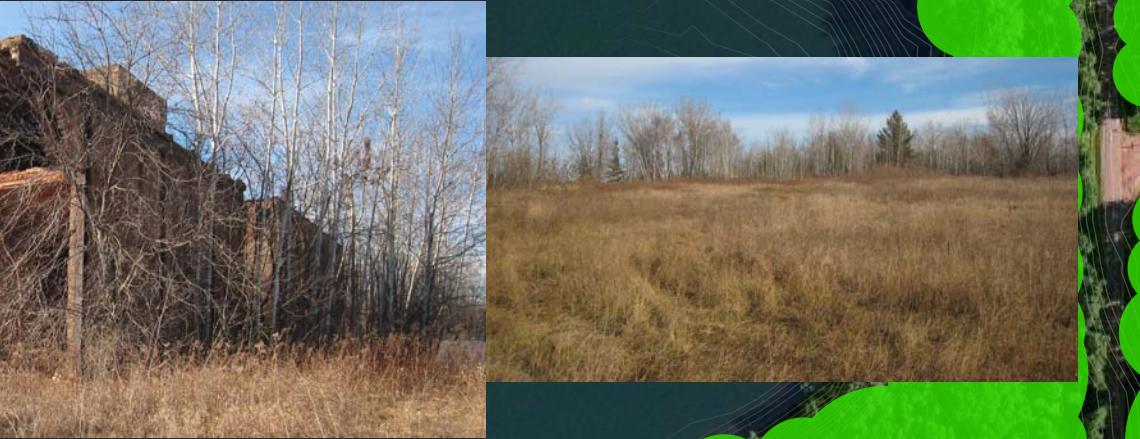
A further examination of the structural condition of these buildings will need to be conducted in order to determine their potential future use within the design.



Photos: Michael Aasen



## Vegetative Cover



## Condition

The Ironton Sintering Complex is surrounded by a veritable wall of birch, maple, elm, oak, pine and spruce trees. The interior of this wall is mostly native scrubby grass species and appears not to be groomed to any standard. The "wall" of trees surrounding the site does create an effective boundary, making the site feel more isolated.

The general character of the vegetation is haphazard. There is abundant overgrowth on the older structures and the scrubby grasses have taken over the entire ground plane with the exception of the few worn down scoria roads that traverse the site.

# Site Qualities



## Water

The closest body of water to the Ironton Sintering Complex is Portsmouth Mine Lake. The lake is a former pit mine and is part of a recreational area with a boat launch located just south of the complex. The lake is a permanent source of water and is the deepest lake in Minnesota, with a maximum depth of nearly 400 ft (MN DNR, 1992).

The water quality is relatively non-polluted and has a water clarity of up to 21 ft. The lake is used for recreational purposes such as boating, swimming and fishing. However, there are high enough levels of mercury, dioxins and perfluorochemicals to limit the level of safe fish consumption (MN DNR, 1992).

Photo: Michael Aasen

## Light Quality

The character and quality of lighting within the Ironton Sintering Complex is something that will change depending on the time of day and season. While there is an abundance of vegetation in and around the site, the sunlight is easily able to dominate the area. The site is relatively open and bright during the day and heavily washed in moonlight at night. There is very little artificial lighting on the site with the exception of a few lamps connected to the still operational structures.

## Human Activity

As the site used to be a fully operational iron ore sintering facility, the imprint of human activity is highly prevalent and one of the primary reasons for the site's selection.

The site is currently used by the company Northern Machining for storage of materials and fabrication of various mechanical components. There are also gravel roads traversing the site that lead to a number of various structures, both new and old. During a visit to the site there were employees working within one of the corrugated metal structures.

The site is littered with debris, old cars and other abandoned objects including pallets, generators, trailers and lumber scraps. This debris seems to be a mixture of new and old and is of widely varying use. A distinct image of history, both recent and long past, is easily drawn from all the clutter.

## Distress

The Ironton Sintering Complex can easily be described as distressed. Between the condition of the structures, the overgrowth of vegetation and the abundance of debris a picture far from pristine is painted. However, the distress seems highly superficial and only serves to better support the industrial heritage of the site.

There is both specific and general distress to the site. Generally, the site is in a state of disarray and haphazardness. There is little to no organization to the location of anything. Even the structures seem random in their positioning. The debris on site is sometimes gathered in piles or simply scattered about the ground.

The structures on site range in condition from being slightly worn down to dilapidated. This condition is mostly superficial but the older structures have become overgrown with vegetation and show obvious signs of weather erosion.



Photo: Michael Aasen

## Utilities

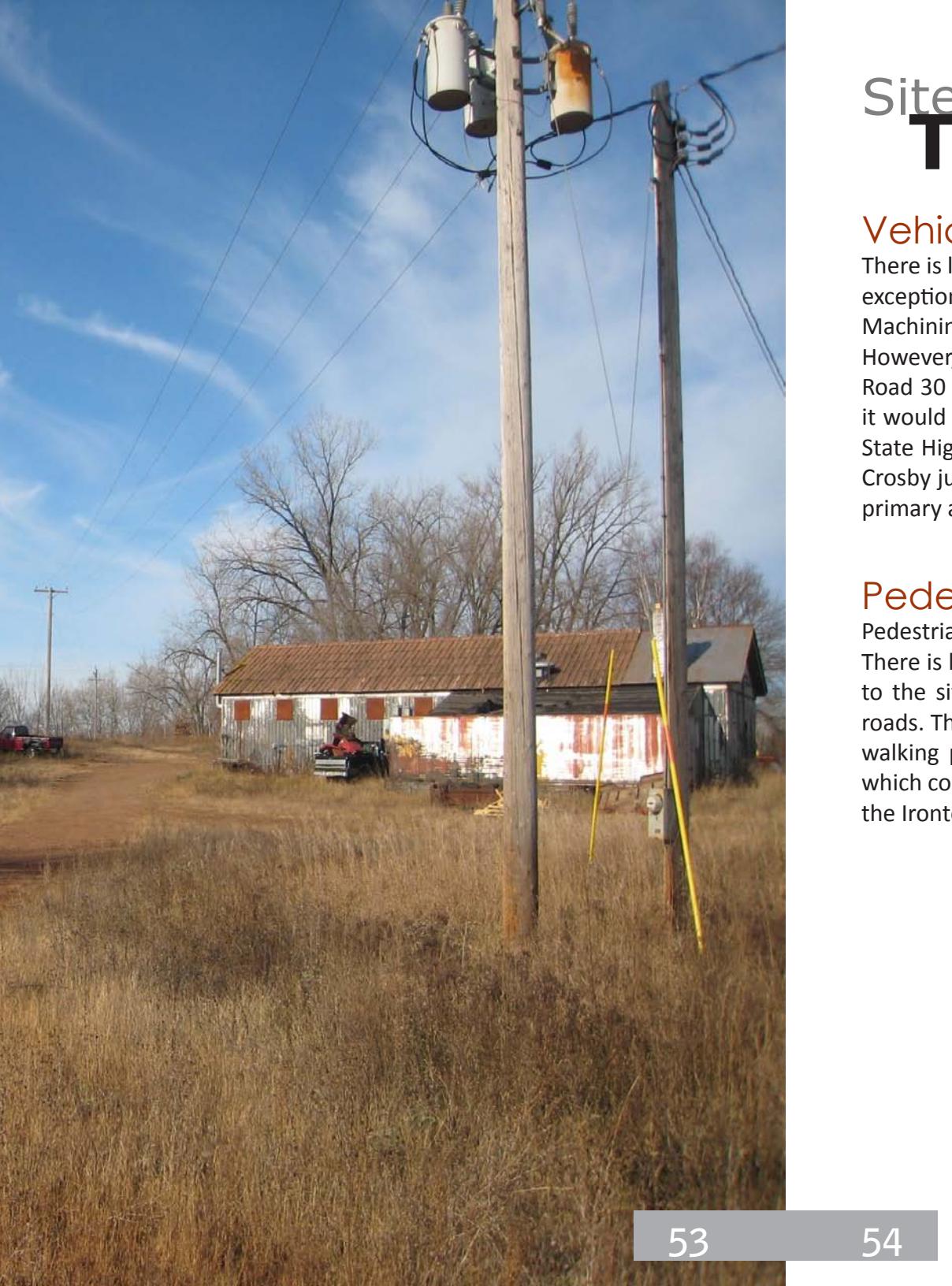
There is little evidence of major utility structures in the Ironton Sintering Complex. However, the site is still in use by a local machining company and therefore must have electricity and water service. There is a single, overhead power line running through the site and connecting to a few of the newer structures. The town of Ironton is just south of the site and could easily supply future utility services.

## Wind

The wind on site can be somewhat variable. The site is relatively open in terms of wind blockage. The majority of the trees are located at the perimeter of the site, leaving the interior relatively exposed. The Portsmouth Mine Lake also adds a level of wind exposure to the site. However, wind on the site is not particularly offensive in nature. The predominant wind comes out of the northwest and averages a speed of roughly 12 mph (City-Data, 2011).

## Water Table

The average depth of the water table within Crow Wing County is roughly 25 feet below ground. The implications for this are that potential on-site contaminants such as mercury, zinc and lead will likely have penetrated deep enough into the soil to contaminate the groundwater. Mercury has been found present in the surrounding bodies of water but not at levels above those found in the majority of Minnesota's lakes.



## Site Traffic

### Vehicular

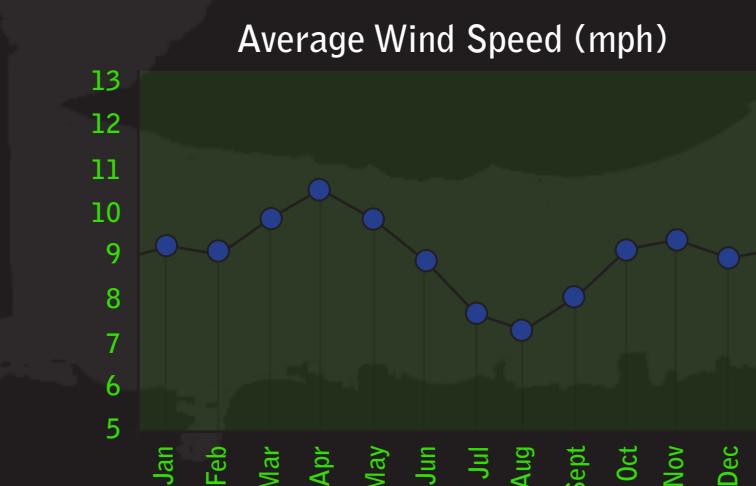
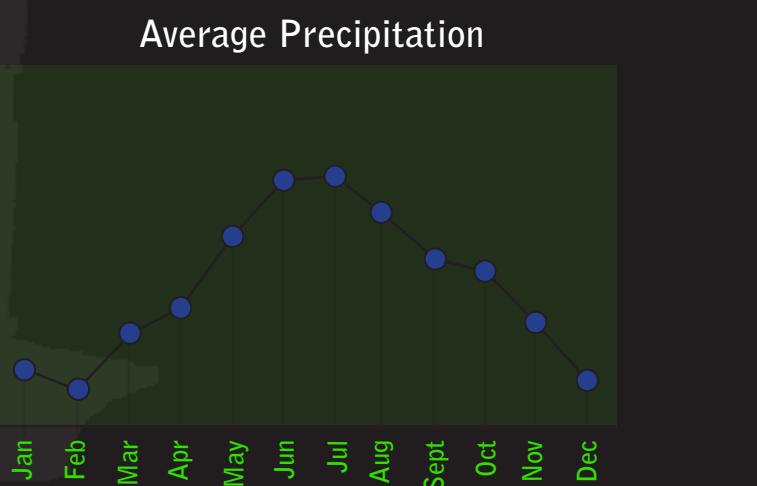
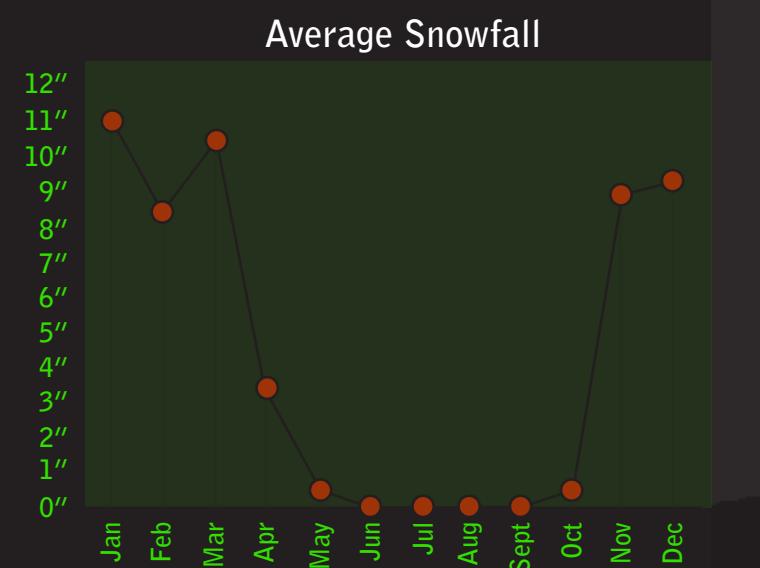
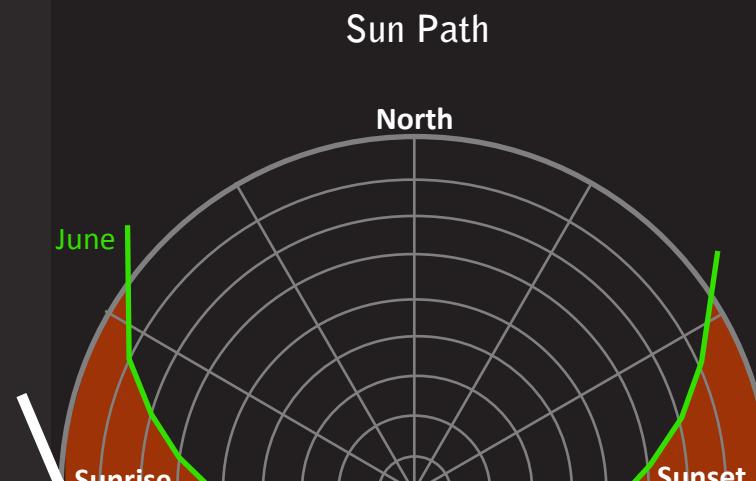
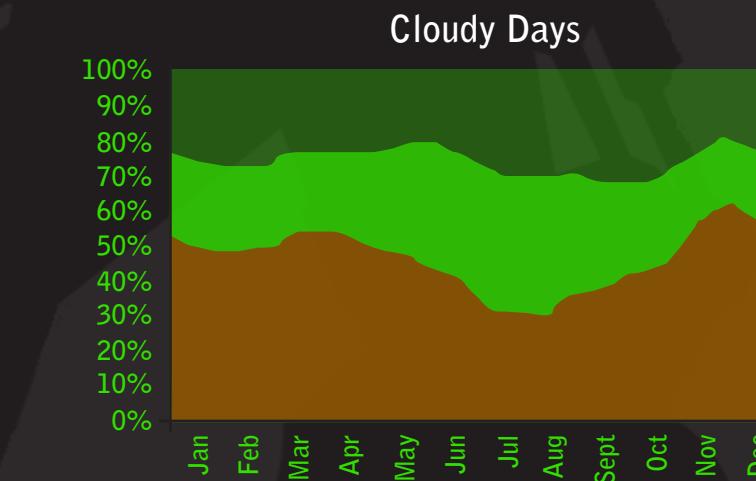
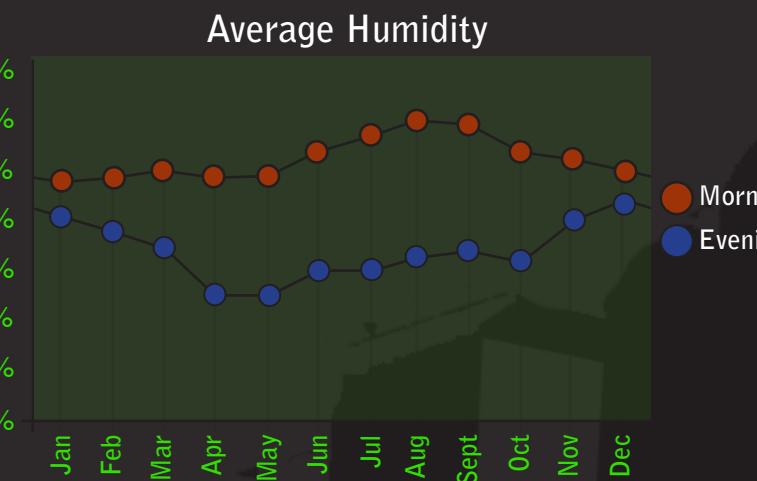
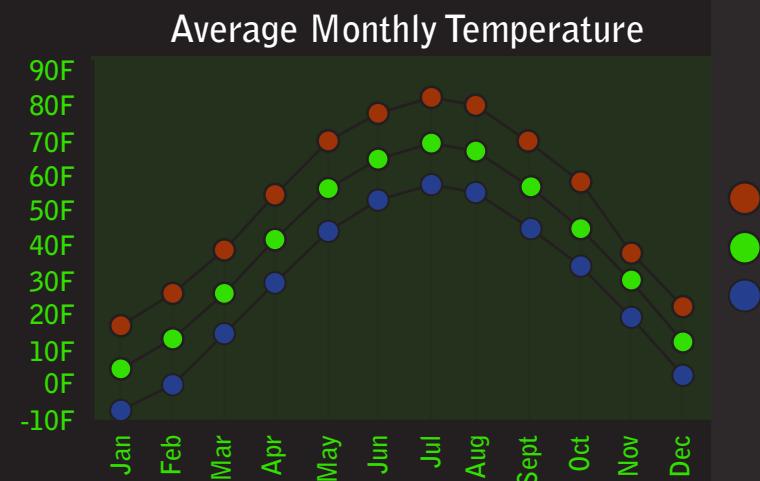
There is little vehicular traffic on-site with the exception of the few employees of Northern Machining coming and going to work. However, the site is located just off of County Road 30 which does get some use. However, it would be a stretch to say the road is busy. State Highway 210 runs through Ironton and Crosby just to the south of the site and is the primary artery within the area.

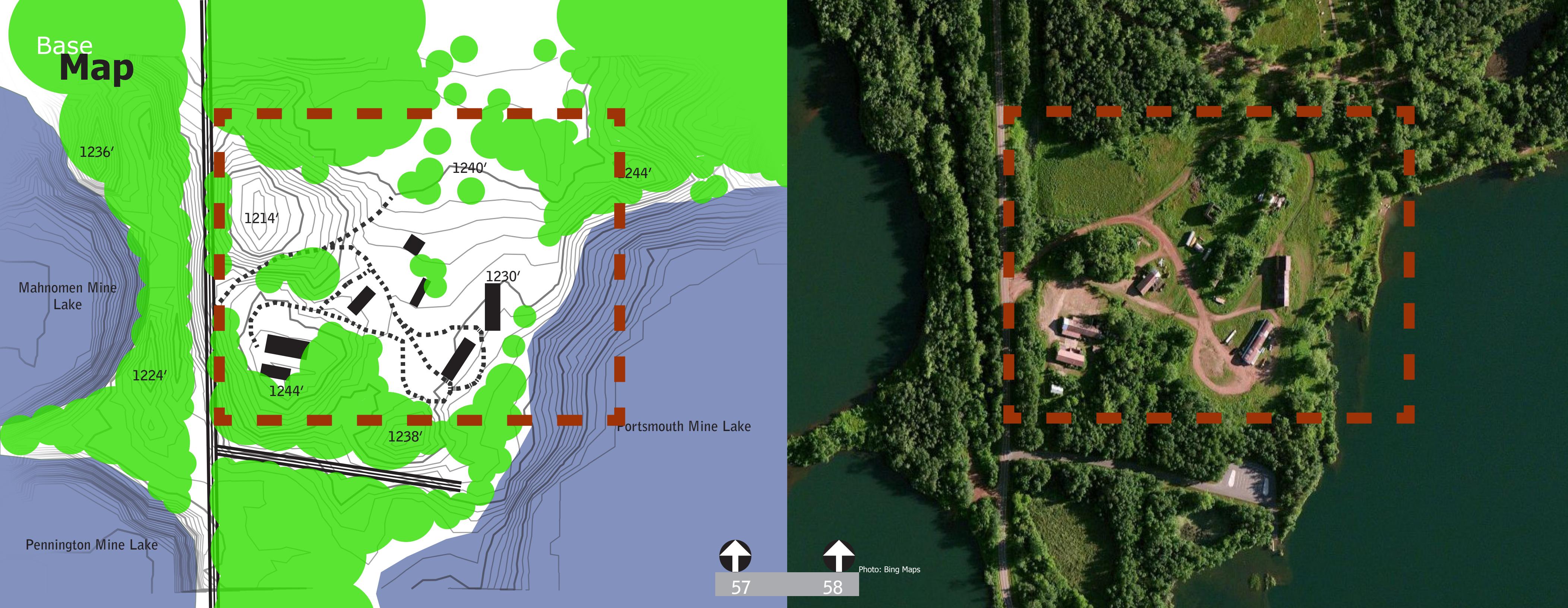


### Pedestrian

Pedestrian traffic on site is nearly non-existent. There is little to no current pedestrian access to the site with the exception of the gravel roads. There are, however, several biking and walking paths in close proximity to the site which could be potentially expanded to enter the Ironton Sintering Complex.

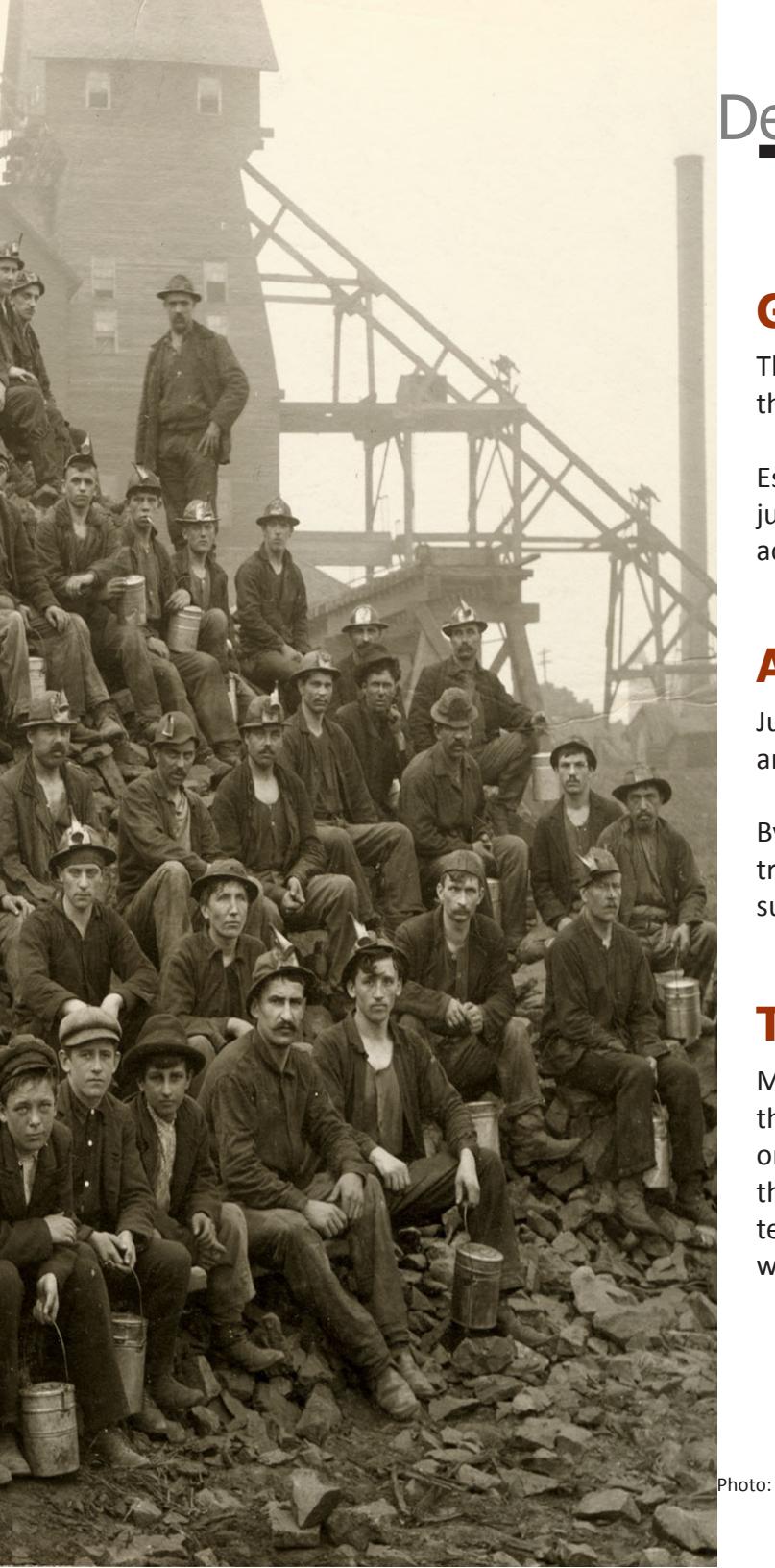
# Inventory of the **Climate:**





# Programmatic Requirements

- The creation of an educational experience through the expression of regional history and culture.
- Repurposing existing structures for recreational and educational use. Potential uses include climbing walls and viewpoints.
- Creating a gathering/event space for the towns of Ironton and Crosby, MN
- Expansion of current trail systems to draw hikers and bikers into the site.
- Remediation of potentially contaminated soils. Methods could include phytoremediation, cut and fill and/or a water wall system.



# Design Themes

## Gateway to the Range

The aim of this project is to create a meaningful place within the community that celebrates the history of the Iron Range while enhancing the local economy by drawing in tourists.

Essentially, the goal is to create a multifaceted “Gateway to The Range” that can act as a jump off point for visitors and a source of pride for locals. This will be done by providing activities, itineraries, gathering spaces and programs.

## A Living Museum

Just as the history of the Iron Range has gone through ups, downs and numerous changes any representation of that history needs to be fluid as well.

By using the existing landscape, a living, interaction-based museum will be created. New trails will offer discovery points where visitors can find artifacts through new methods such as geocaching and traditional way finding.

## Toxin Clean-Up

Mining at its core is an invasive practice. Mining carves the land, clears forests and poisons the soil and water. Therefor the restoration of the sites soil will play a key role in not only the site-specific clean up but also the education of the community and visitors of the impact mining has on the environment and how to deal with it. Phytoremediation techniques will be used to stabilize and neutralize the toxins wherever possible.

Photo: [http://assets.byways.org/asset\\_files/000/004/446/CCT\\_nom\\_Tamarack\\_Miners2100.jpg?1258496019](http://assets.byways.org/asset_files/000/004/446/CCT_nom_Tamarack_Miners2100.jpg?1258496019)

# Design **Proposal**



# Cohesive **Design** master plan

Portsmouth Mine  
Discovery Park



Discovery Trail  
(Primary)



Discovery Trail  
(Secondary)



## Design

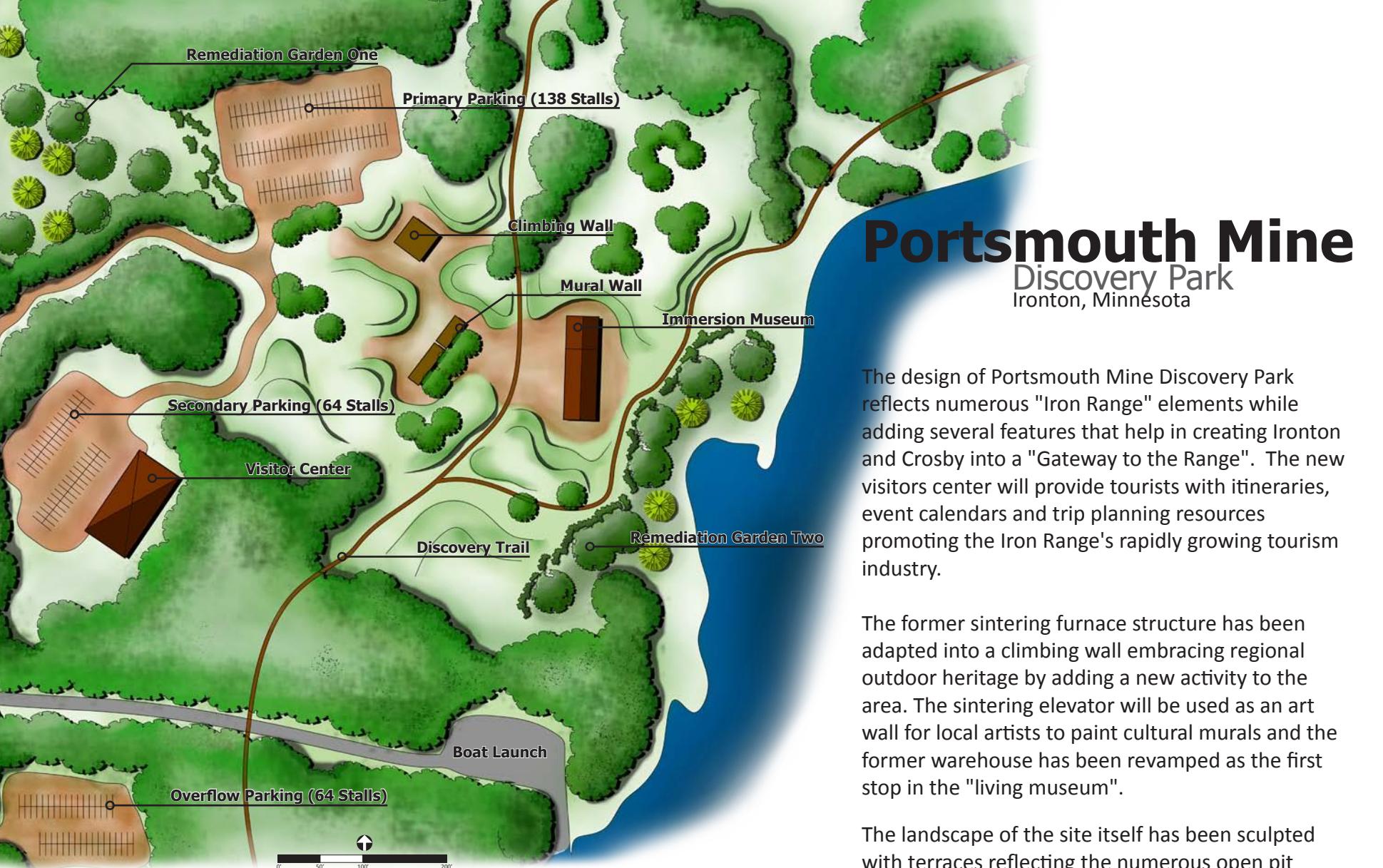
The master plan of Mining the Past embraces the three concepts of "Gateway to the Range", "Living Museum" and "Site Cleanup". The plan connects to both Ironton and Crosby while taking advantage of the natural landscape with the Discovery Trail system. Portsmouth Mine Discovery Park is located on the west bank of Portsmouth Mine Pit Lake and serves as a community gathering and event space.

## A **Gateway** to the **Range**



### Entry

A defined entrance greets visitors as they enter Portsmouth Mine Discovery Park. The theme of the entrance, like that of the park as a whole, reflects the industrial heritage of the region in both material and form. The added vegetation symbolizes the regrowth of damaged ecologies while adding further aesthetic appeal and definition.



## Portsmouth Mine Discovery Park Ironton, Minnesota

The design of Portsmouth Mine Discovery Park reflects numerous "Iron Range" elements while adding several features that help in creating Ironton and Crosby into a "Gateway to the Range". The new visitors center will provide tourists with itineraries, event calendars and trip planning resources promoting the Iron Range's rapidly growing tourism industry.

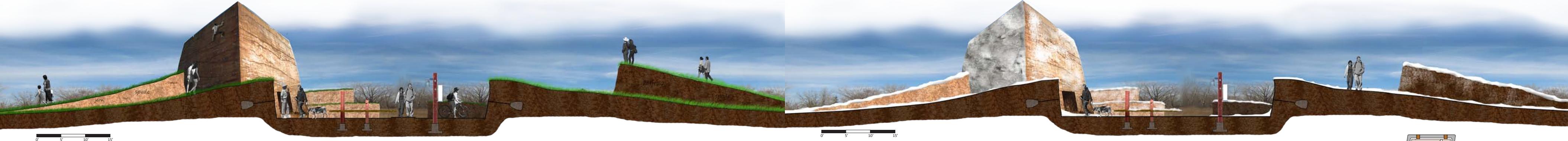
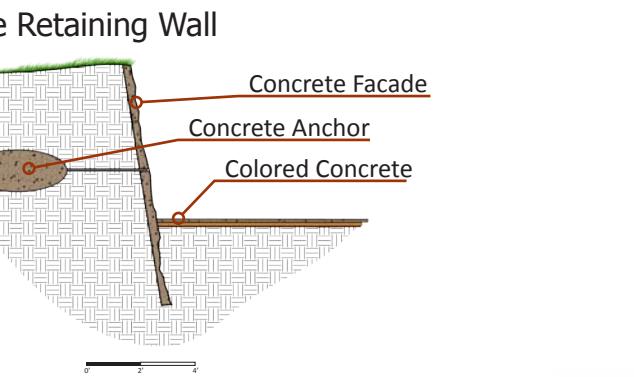
The former sintering furnace structure has been adapted into a climbing wall embracing regional outdoor heritage by adding a new activity to the area. The sintering elevator will be used as an art wall for local artists to paint cultural murals and the former warehouse has been revamped as the first stop in the "living museum".

The landscape of the site itself has been sculpted with terraces reflecting the numerous open pit mines within the Iron Range as well as adding visual definition to the central gathering space.

Two remediation gardens have been added. Each with its own focus. One for the new, ample parking lot and one for the uptake of the toxins produced by the sintering process.

# Gateway to the Range

sculpted landscape

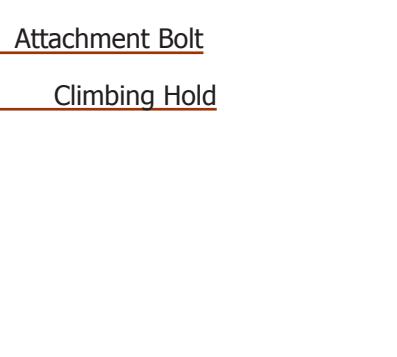


## Design

Portsmouth Mine Discovery Park includes a sculpted landscape. The terraces, built using a sheet piling wall system seen in this detail, range from 4 to 6 feet in height and gently slope back to the site's natural grade.

In this image you can also see the new climbing wall and how the exterior wall of the sintering furnace has been adapted to attach the climbing holds.

### >Climbing Wall Holds



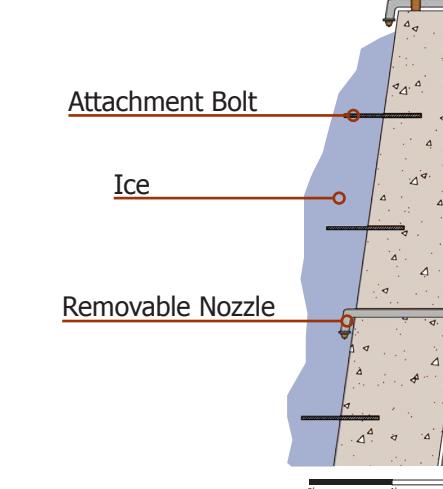
# Gateway to the Range

sculpted landscape



## Winter

In winter, the sculpted landscape can be used by children, with supervision of course, for sledding or skiing. The Climbing wall is also adaptable to the cold, as you can see from these details, transforming to allow for ice climbing and associated competitions.



# Gateway to the Range

defining place



## Theme

When designing Portsmouth Mine Discovery Park, I focused on creating a unique sense of place that reflected the industrial heritage of the Iron Range. Everything from benches and light poles to bike racks and market stalls are designed in both form and material to instill that heritage.

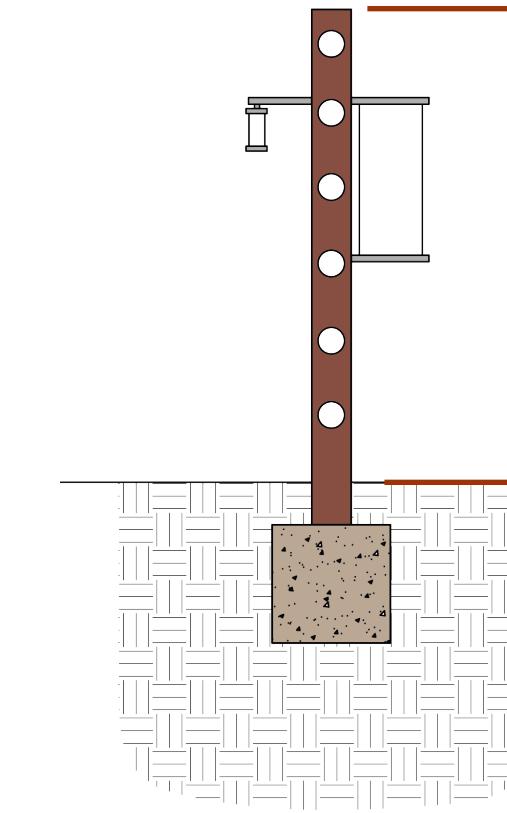
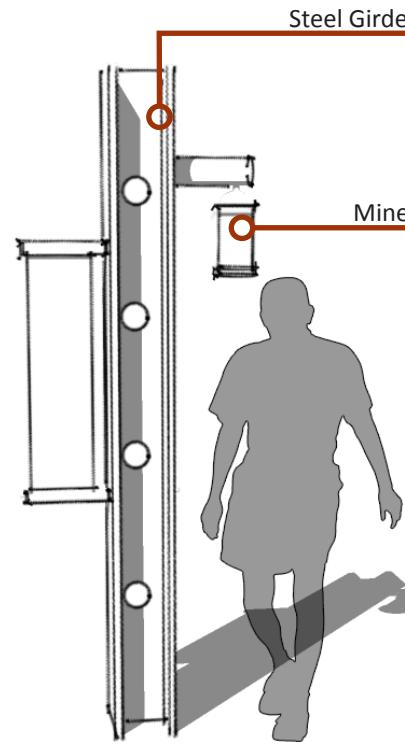
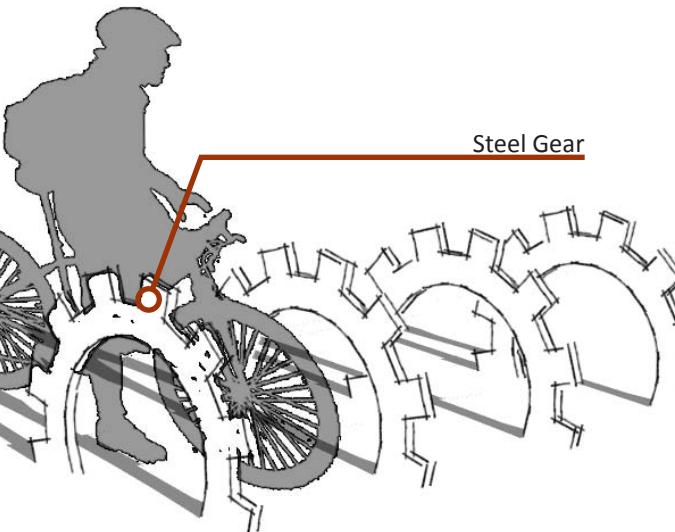
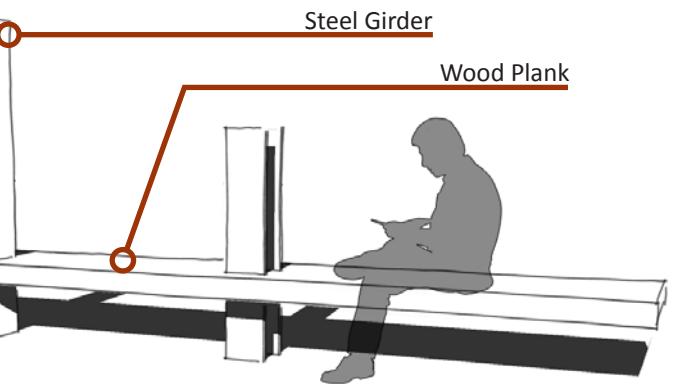
While Red maples have been sparsely planted throughout the central gathering space bearing vibrant red fall color expressing the redness of iron ore.

Additionally, within the concrete on the ground as well as the terraces, words such as "iron", "shovel" and "ore" have been imprinted in the native languages of the numerous immigrant groups represented throughout The Range.



# Gateway to the Range

defining place

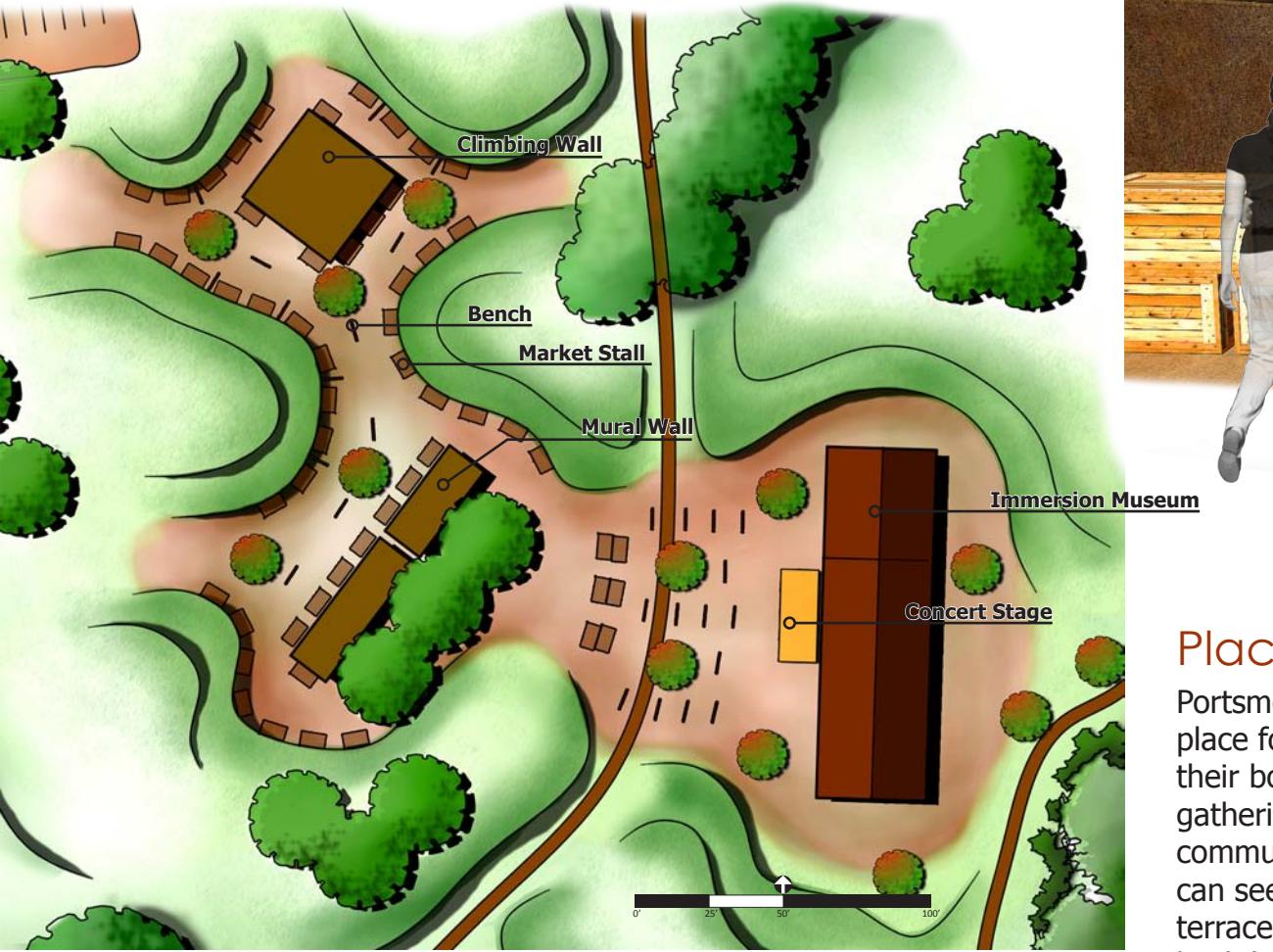


## Form

The form of the site furniture is that of a heavy industrial vernacular. Steel girders and wood planks create benches and light poles while large, partially embedded steel gears become bike racks with most being constructed upon typical concrete footings.

# Gateway to the Range

event space

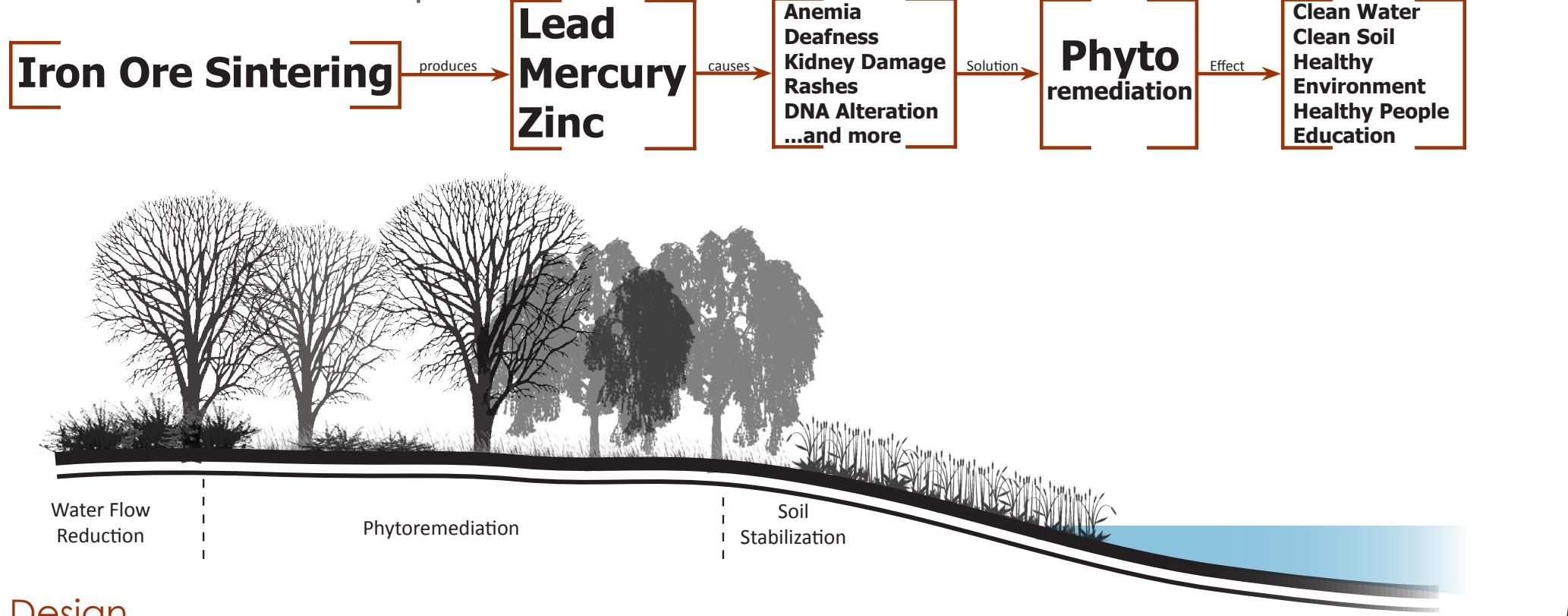


## Toxin Clean-Up

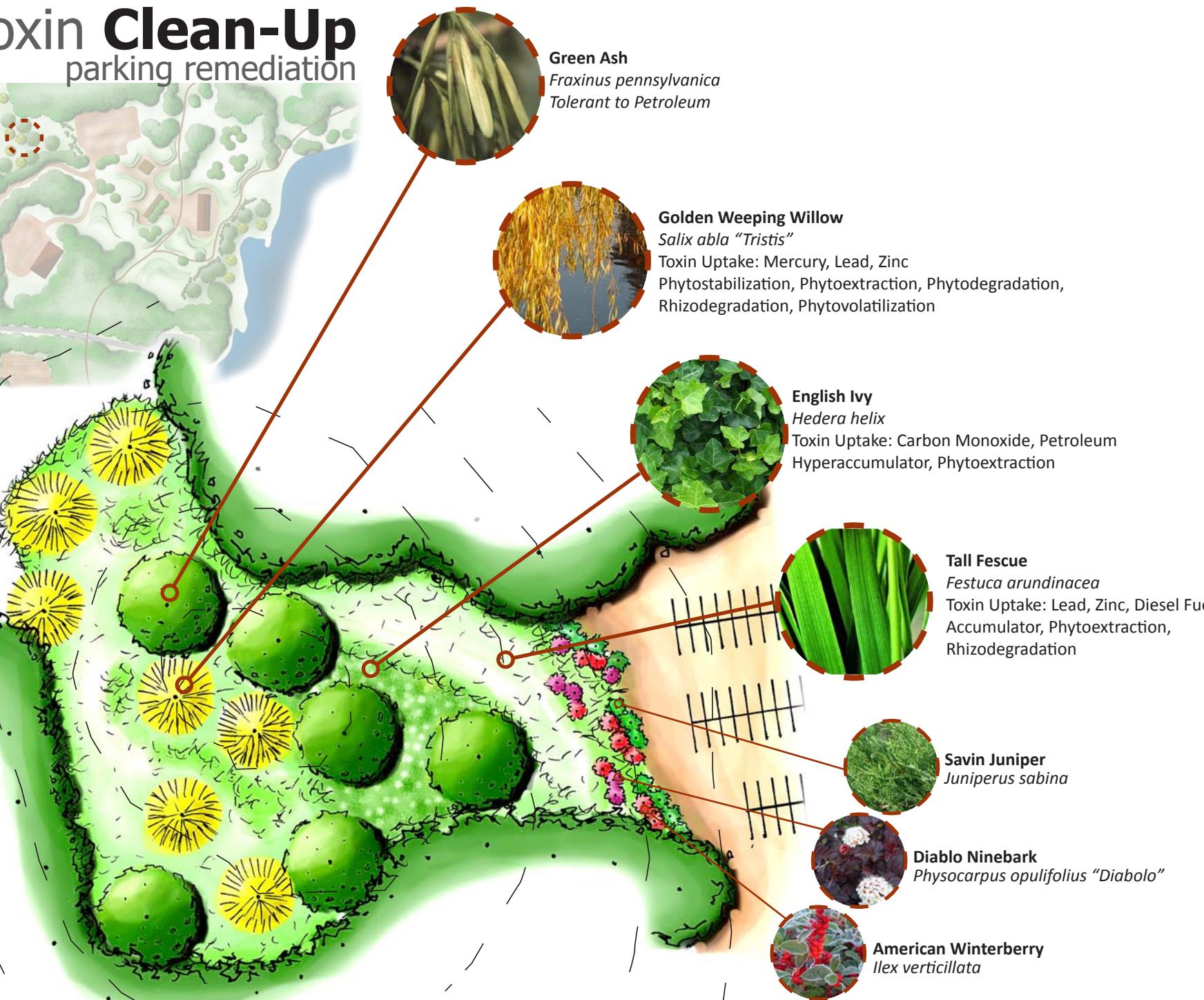
### Place

Portsmouth Mine Discovery Park is meant to serve as a place for the people of Ironton and Crosby to strengthen their bond of community. The terraces of the central gathering space were designed in a way that will define community markets, festivals and other events. As you can see the industrial themed market stalls hug the terraces while the existing warehouse structure plays backdrop to a concert stage used by local and national musical acts.

# Toxin Clean-Up concept

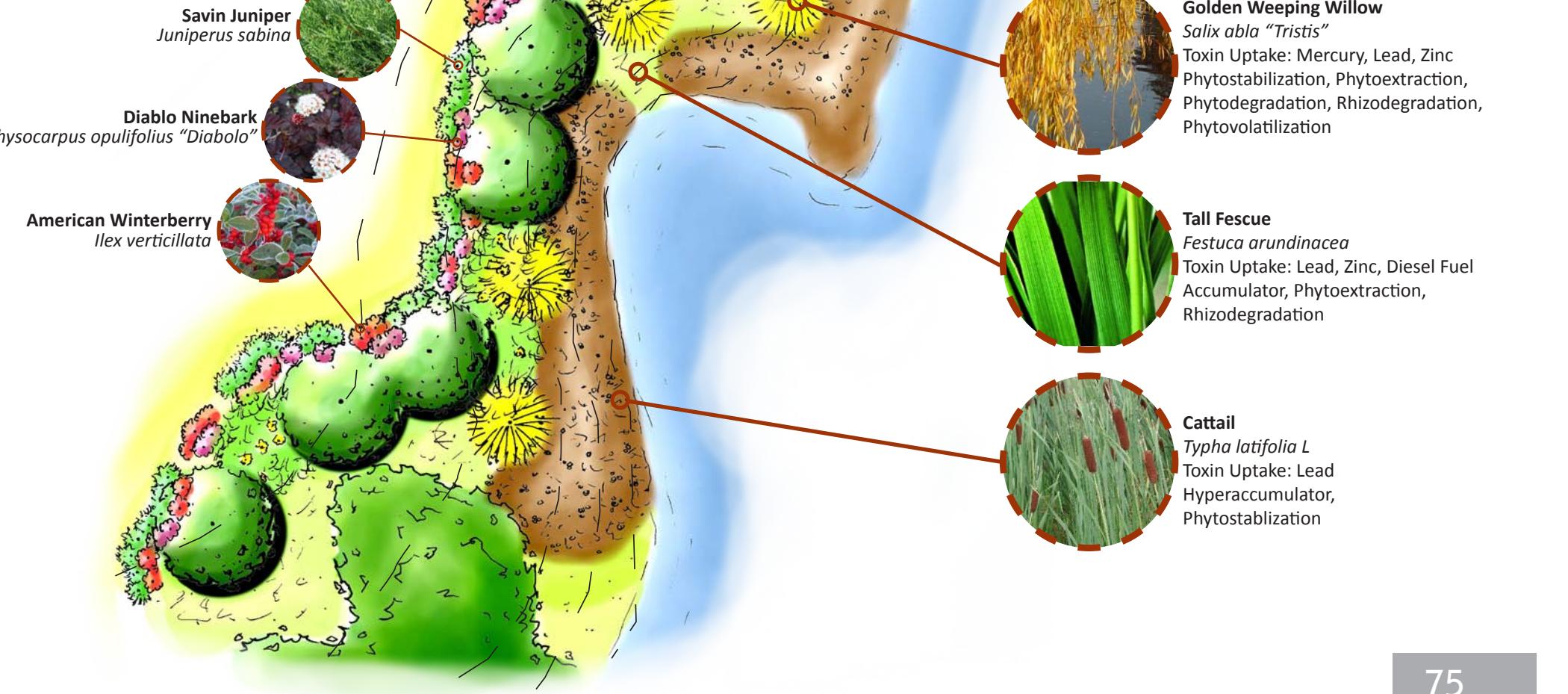


# Toxin Clean-Up parking remediation



# Toxin Clean-Up

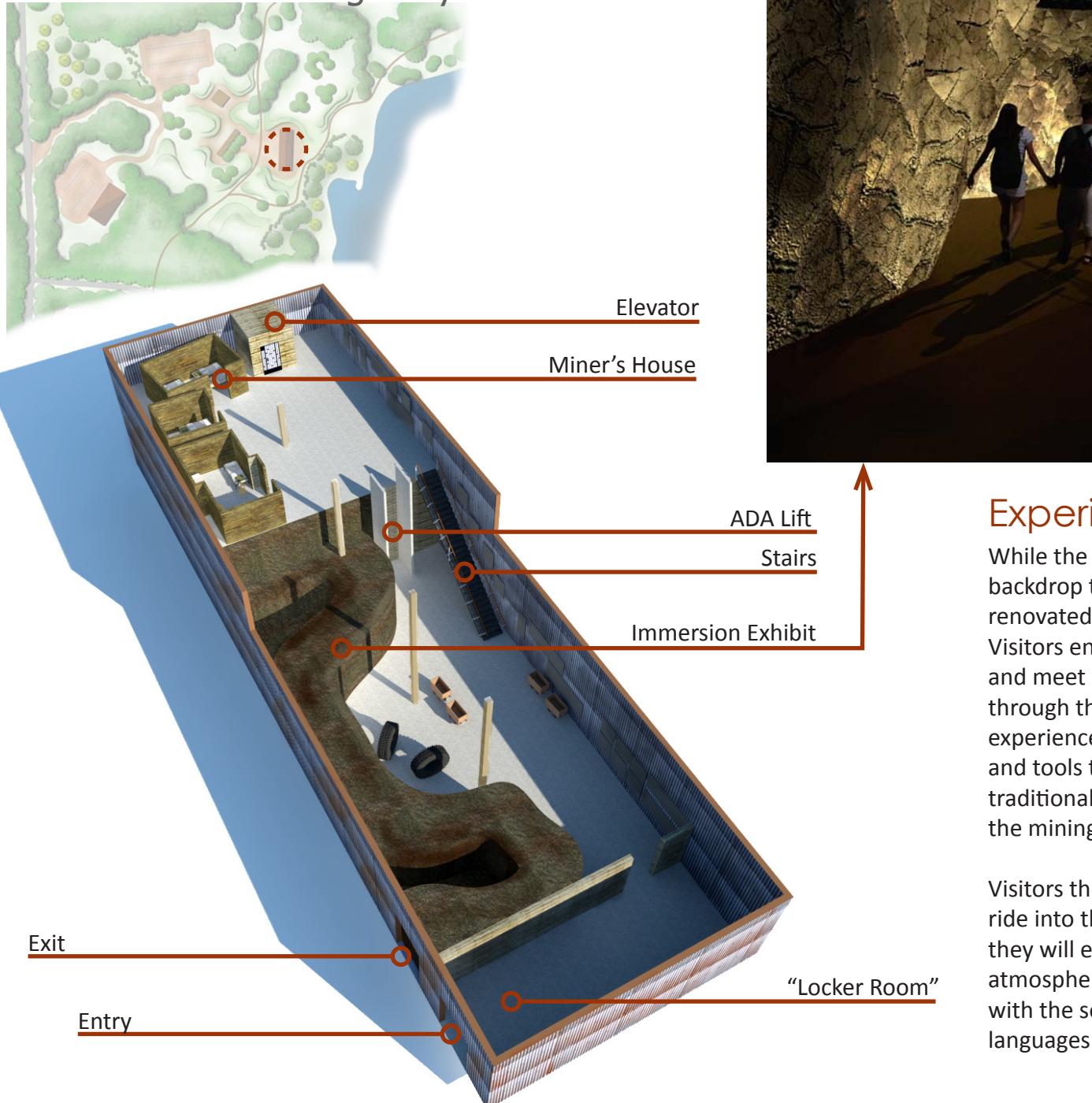
toxin remediation



A Living Museum

# Living Museum

immersion gallery



## Experience

While the exterior of the sintering warehouse plays backdrop to concerts, the interior has been entirely renovated as an interactive museum experience. Visitors enter into a traditional "miner's locker room" and meet with a tour guide who will guide them through the gallery space, a more traditional museum experience with exhibits ranging from historic pictures and tools to local art and finally three examples of the traditional shack-like housing provided to workers by the mining companies in the early 1900s.

Visitors then take a brief, nearly pitch black elevator ride into the "full immersion" mine exhibit where they will experience the authentically cold, dirty atmosphere of an underground iron mine complete with the sounds of steel hitting stone and the spoken languages of the many immigrant miners.



# Living Museum

discovery trail



## Concept

Surrounding Portsmouth Mine Pit Lake is the 2.5 mile Discovery Trail meant for everything from walking and biking to snowshoeing and skiing. While taking advantage of the existing landscape for views of the lake and forests, the trail is dotted with 24 outdoor exhibits or "discoverables" as I call them, each separated by a short walk.

# Living Museum

discoverables

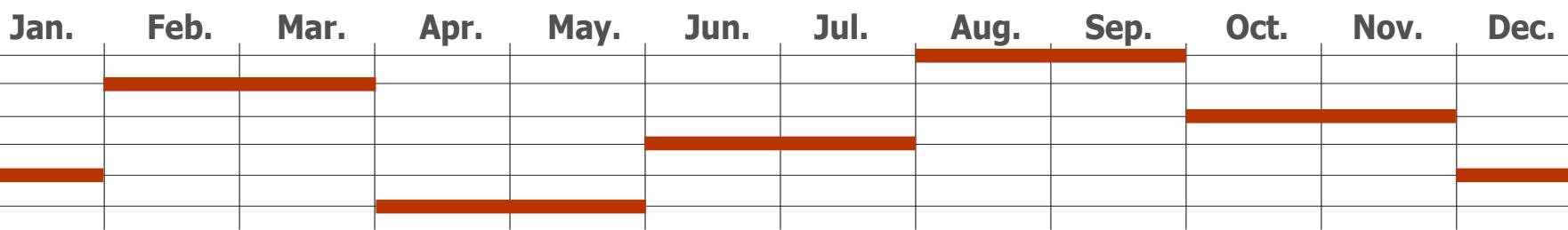


## Theme

The "discoverables" along the trail range in theme from cultural, including Norwegian wood carvings to historic items such as mining carts and traditional gardens to modern themes like the retired, donated mining equipment seen in these images. The "discoverables" will change in theme according to a cultural calendar and all feature signage informing visitors about each exhibit and guiding them to the next one.

# Living Museum

cultural calendar



## Concept

Several things within this design are meant to change through time. They do so under the guidance of a "cultural calendar". That calendar is designed to focus on the immigrant groups that created the social cosmos of the Iron Range. Each major group is allotted a two-month period during which activities, festivals and other events are themed.

# Living Museum

cultural calendar

DECEMBER/  
JANUARY

Dog Sledding



SnowShoeing



Swedish

FEBRUARY/  
MARCH

Cross Country Skiing



Ice Hockey



Finnish

APRIL/MAY

Chinese Celebration



German Festival



Other

JUNE/JULY

Traditional Dance



Food Festival



Croatian

AUGUST/  
SEPTEMBER

Trail Riding



Spaghetti Cookoff



Italian

OCTOBER/  
NOVEMBER

Viking Festival



Climbing Competition



Norwegian

# Tourist Information

itineraries and culture camps



## Tourism

To help support these activities I developed a sample itinerary that provides visitors an entire days worth of entertainment within Ironton and Crosby that includes an overnight stay at the Viking -themed Nordic Inn bed and breakfast.

Additionally themed camping events or "culture camps" as I call them immerse visitors into the lives of a late 1800s mining family by teaching traditional activities and cooking methods.

# Reference List:

- Alanen, A. R., & Melnick, R. Z. (2000). *Preserving cultural landscapes in america*. Baltimore, Maryland: The Johns Hopkins University Press.
- Alanen, A. R. (1989). Years of change on the iron range. In C. Clark (Ed.), Minnesota in a Century of Change (pp. 155-194). St. Paul, MN: Minnesota Historical Society.
- Becker, H. United States Department of Agriculture, Agricultural Research Service. (2000). *Phytoremediation: Using plants to clean up soils*. Retrieved from website: <http://www.ars.usda.gov/is/AR/archive/jun00/soil0600.htm>
- City-Data. (2011). *Ironton, mn*. Retrieved from <http://www.city-data.com/city/Ironton-Minnesota.html>
- EPA. Environmental Protection Agency, (2011). *The epa brownfields program produces widespread environmental and economic benefits*. Retrieved from website: <http://epa.gov/brownfields/overview/Brownfields-Benefits-postcard.pdf>
- Francis, M., & Hester, Jr, R. T. (1990). *The meaning of gardens*. London, England: The MIT Press.
- Kirkwood, N. (2001). *Manufactured sites: Rethinking the post-industrial landscape*. New York, NY: Taylor and Francis.
- Liebherr. (2008). New 800-ton mining excavator. [Web Photo]. Retrieved from [http://www.liebherr.us/CMS/images/Liebherr-R9800\\_layout.jpg](http://www.liebherr.us/CMS/images/Liebherr-R9800_layout.jpg)
- Friends of the High Line. (2010). High line history. Retrieved from <http://www.thehighline.org/>
- Minnesota Historical Society. (2011). Iron range region: Historical overview. Retrieved from [http://nrhp.mnhs.org/iron\\_range\\_overview.html](http://nrhp.mnhs.org/iron_range_overview.html)
- MN DNR. Minnesota Department of Natural Resources, (1992). *Lake information report: Portsmouth mine lake*. Retrieved from website: <http://www.dnr.state.mn.us/lakefind/showreport.html?downum=18043700>
- N., H., & Sloane, L. L. (1970). *A pictoral history of american mining*. New York, NY: Crown Publishing, Inc.
- Rogers, E. B. (2001). *Landscape design: A cultural and architectural history*. New York, NY: Harry N. Abrams, Incorporated.
- Russ, T. H. (2000). *Redeveloping brownfields*. New York, NY: McGraw-Hill.
- Siciliano, P. C. (2005). *Landscape interpretations: History, techniques and design inspiration*. Canada: Thomson Delmar Learning.
- Turenscape. (2007). Shanghai houtan park. Retrieved from <http://www.turenscape.com/english/projects/project.php?id=443>
- Walker, D. A. (1979). Iron frontier: The discovery and early development of minnesota's three iron ranges. Minnesota Historical Society
- Wong, M. H., & Bradshaw, A. D. (2002). *The restoration and management of derelict land: Modern approaches*. Singapore: World Scientific Publishing Co. Pte. Ltd.



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