Iron Range Resources & Rehabilitation (Ida Rukavina)

Attached please reference Iron Range Resources & Rehabilitation's public comments and corresponding attachments as it relates to U.S. Steel Corp. NPDES/SDS Permit for Keetac Mining Area (MN0031879), U.S. Steel Corp. NPDES/SDS Permit for Keetac Tailings Basin (MN0055948) and U.S. Steel Corp. Application for Variance from Wild Rice Sulfate Standard.

DEPARTMENT OF IRON RANGE
RESOURCES & REHABILITATION

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mn.gov/irrrb

September 22, 2025

Stephanie Handeland
Minnesota Pollution Control Agency (MPCA)
520 Lafayette Road North
St. Paul, MN 55155

RE: U.S. Steel Corp. NPDES/SDS Permit for Keetac Mining Area (MN0031879), U.S. Steel Corp. NPDES/SDS Permit for Keetac Tailings Basin (MN0055948), U.S. Steel Corp. Application for Variance from Wild Rice Sulfate Standard

Dear Ms. Handeland,

Iron Range Resources & Rehabilitation submits this public comment to the Minnesota Pollution Control Agency (MPCA) as part of the U.S. Steel Keetac variance review. I want to be clear: denying this variance would have devastating consequences—not only for the mining industry, but for the communities and people of northeastern Minnesota. This variance would provide security and opportunity for the communities throughout northeastern Minnesota that deserve a dependable, responsible and robust mining industry.

Our agency's work is made possible through the Taconite Production Tax, ensuring that mining revenue is reinvested back into the region. Every dollar we invest into schools, local governments, infrastructure, housing, healthcare and economic development is tied directly to mining. That funding also supports responsible environmental practices—through mineland reclamation, brownfield redevelopment and programs that help both industry and local businesses reduce impacts and strengthen sustainability. Keetac alone contributed over $16 million last year. Over the next 20 years, more than $400 million in local tax revenue is at stake.

For schools already laying off teachers and towns currently cutting services, the consequences are immediate and personal—larger class sizes, fewer healthcare options, reduced public safety and higher property taxes on working families and seniors. These are not abstract numbers; they are the everyday realities of life in our rural communities. When mine idles, jobs, families and tax revenue rarely return, leaving behind permanent gaps in our economy and population.

We are a rural region with an aging population, already stretched to provide the basics. We do not have another tax base or industry of this magnitude waiting in the wings to replace what would be lost. To weaken the foundation of mining revenue now would place our communities and people in an even more vulnerable position.

We respect MPCA's responsibility to protect the waters of northern Minnesota, which are central to our cultural and ecological identity. We share that responsibility as stewards of the land, and our investments reflect that commitment. But we also must ensure the decisions made here are workable, sustainable and do not irreparably harm the people who call this region home. The stakes could not be higher. We must get this right.

Sincerely,

Ida Rukavina
Commissioner
Iron Range Resources & Rehabiliation

Introduction

Iron Range Resources & Rehabilitation (IRRR) is a state economic development agency with a mission to strengthen and diversify the economy of northeastern Minnesota. For more than 80 years, IRRR has invested in communities, businesses, infrastructure and workforce initiatives across the Taconite Assistance Area (TAA), a 13,000-square-mile region encompassing 53 cities, 134 townships, 15 school districts and portions of four Tribal Nations (Minn. Stat. §273.1341). Unlike other state agencies, IRRR is funded by a portion of the Taconite Production Tax—paid by mining companies in lieu of property taxes—ensuring that mining revenue is reinvested directly into schools, local governments and economic development opportunities.

As the Minnesota Pollution Control Agency (MPCA) considers information from a range of perspectives in its review process, IRRR submits this comment to provide data and context. This information is offered to support MPCA's broader evaluation of the environmental, cultural and economic factors involved in this decision.

The waters of northern Minnesota, including wild rice waters, hold cultural, ecological and economic importance for all people of northern Minnesota. They are integral to the region's identity and heritage, and IRRR recognizes MPCA's responsibility to protect them through science-based environmental regulation.

Because of this dual importance—environmental protection on the one hand, and community and economic stability on the other—decisions benefit from a complete understanding of both. Mining operations on the Iron Range generate employment, household income and production taxes that directly fund schools, cities, counties, townships and regional development. The region supplies more than 80% of the nation's iron used in first-pour domestic steel, underscoring its critical importance not only to northeastern Minnesota, but to the United States as a whole. The ripple effects of changes in mining production extend into classroom resources, healthcare access and the long-term capacity of local governments to provide essential services.

These dynamics are particularly significant given the scale of production tax revenues: in 2023, more than $122 million was distributed to support education, property tax relief and local government services across the TAA. U.S. Steel Keetac alone contributed over $16 million in 2024. The continuation of these revenues depends directly on mining activity.

Background Information

Current Iron Ore Market

This permit renewal comes at a particularly uncertain time for the Iron Range. In March, Cleveland-Cliffs announced the idling of the Minorca Mine and a reduction in production at Hibbing Taconite. By June, over 600 miners were out of work and a vast majority are unemployed to this day. Temporary closures and production cuts at taconite mines are not new and are a cyclical occurrence in the globally competitive, commodity-driven iron and steel markets. A fair question to consider when comparing the current economic conditions to potential impacts of regulation over a longer timeframe is whether these conditions are part of a normal economic downturn from which they will likely recover, or if they signal a more permanent structural change. While the official company stance is that these reductions are temporary and indefinite leaving open the possibility of a return to production, a closer look at the market suggests something different.

Minnesota's iron ore taconite pellets generally supply blast furnace ironmaking at steel mills around the Great Lakes. Over the past six years, Cleveland-Cliffs, U.S. Steel and other steel producers have permanently shut down or idled many blast furnaces that, when operational, would have consumed millions of tons of Minnesota taconite pellets. Meanwhile, significant new capacity for electric arc furnaces (EAF) steelmaking has been established in the United States. EAF's use a mixture of scrap steel and pig iron instead of taconite pellets to produce steel. On a per ton of finished steel basis, blast

furnace steel making uses approximately 1.3 tons of taconite pellets, while EAF steel making uses, on average, only 0.2 tons of pellets. The shift to EAF steelmaking is driven by multiple factors, including lower capital costs, more flexible production and lower emissions.

A detailed analysis of Cleveland-Cliffs' sources of iron, including taconite pellets from Minnesota mines, compared to its iron utilization at steel-making facilities, further supports concerns of the eroding use of Minnesota produced taconite pellets in steelmaking. The analysis suggests that Cleveland-Cliffs currently has an excess pellet capacity of six million tons annually. If this excess cannot be sold to a limited and shrinking number of third-party blast furnace customers, producing these pellets is not economical. Because iron ore is traded worldwide, there's always the option of selling pellets to the global market. Global sales are highly competitive, and deals can hinge on a few of dollars per ton. Minnesota miners' inland location relative to the bulk of global trade on the Atlantic basin is both a positive and a negative. To access the global market, Minnesota's most efficient shipping path is by freighter through the Great Lakes and the Saint Lawrence Seaway to Quebec, Canada, where the iron ore pellets can be loaded onto Panamax ocean freighters for delivery to global customers. Shipping iron ore through the Great Lakes costs about $30 to $35 per ton. For perspective, Cleveland-Cliffs reported in 2021, in Security and Exchange Commission filings, that it cost $85.47 per ton to produce pellets at Minorca and $75.29 per ton at Hibbing Taconite, with Tilden Mine being the lowest-cost producer at $66 per ton. Adding $35 in shipping raises those costs to roughly $115 at Minorca and $105 at Hibbing, with freight making up about 30% of the delivered price at the Port of Quebec. These added costs often make Minnesota's pellets too expensive to compete in global markets. At the same time the high shipping costs protect Minnesota's iron mines from outside competition at blast furnaces located on the Great Lakes. This creates a co-dependent relationship between Minnesota's iron mines and the Great Lakes steel mills. As those mills have idled or shut down, it is not surprising that demand for Minnesota pellets has dropped. And since many of the blast furnace closures appear permanent, the cutbacks at Minorca and Hibbing Taconite may also be long-term.

A similar analysis of U.S. Steel's iron sources and uses reveals information that may be especially useful in assessing the likelihood of Keetac being idled or permanently closed in response to new sulfate limits in the NPDES permit. U.S. Steel has a total taconite pellet capacity of approximately 22 million tons per year, with the ability to produce six million tons at Keetac and 16 million tons at Minntac. Of this total, roughly 12 million tons per year are used to support U.S. Steel operations at the Gary Works and Mon Valley blast furnaces. At the same time, the remaining 10 million are sold on domestic and international markets. U.S. Steel's Minntac facility produces enough pellets to meet U.S. Steel's internal needs. To keep both facilities running, U.S. Steel must compete to sell its pellets against other domestic iron ore producers and global suppliers.

An independent analysis by CRU Consulting (CRU), an expert in global iron and steel markets is helpful in determining if Keetac's pellets can be competitive in sales to third-party customers. CRU assessed the impact of a potential $17/ton increase in Keetac's pellet cost for blast furnace pellets and a $26/ton rise for Direct Reduction (DR)-grade pellets on U.S. Steel's competitiveness in the iron and steel market. These costs per ton are calculated by dividing the annual pollution control costs reported in U.S. Steel's variance application of $105 million by a yearly production capacity of six million tons for blast furnace pellets and four million tons for DR-grade pellets. The analysis found that a $17/ton increase would shift Keetac's blast furnace pellets from being in the top 25% of most competitive pellets within the region to the bottom 25%, potentially limiting Keetac's ability to secure future pellet sales to third-party steel producers. Additionally, for pellets U.S. Steel would use in its internal steel-making operations, the higher cost from Keetac would raise steelmaking expenses by $20/ton, significantly weakening U.S. Steel's finished-steel cost position compared to other domestic producers. The CRU analysis shows that the US steelmaking industry is highly competitive, where the average cost difference between a low-cost steel mill and a high-cost steel mill is only $30/ton. Regarding the potential $26 per ton increase in DR-grade pellet cost at Keetac, CRU determined that this would likely make Keetac the highest-cost DR-grade pellet producer in the region, push Keetac's costs above the current seaborne pellet price level and pose a serious threat to the future of its export sales.

Given the increase in costs associated with meeting the standard as detailed in the variance request, and the ability of U.S. Steel to meet 100% of its internal pellet needs from Minntac, it is reasonable to assume U.S. Steel would idle all or part of the Keetac plant if profitable operation becomes impossible. On worksheet N of U.S. Steel's variance request, it detailed the possibility of 453 additional people eligible for unemployment if the variance is not granted. Based on an analysis of current market conditions, this is a very possible outcome.

The future of Minnesota's taconite industry will depend in part on adapting to the growing role of EAF's, which require an increasing supply of virgin iron units such as pig iron and hot-briquetted iron. Today, most of these units are imported to the United States from Brazil, Canada and Sweden. Producing them domestically requires significant capital investments to manufacture lower-silica, higher-iron content (DR)-grade pellets, as well as to construct greenfield direct reduced iron (DRI) plants that convert DR-grade pellets into metallic iron for use in electric arc furnaces. These technology shifts are also a critical step in decarbonizing the steel value chain, with the potential to reduce emissions from roughly 2 tons CO2 emissions per ton of steel to less than 0.5. Recent capital investments have been made at Keetac and Northshore Mine to produce DR-grade pellets, and once operational, Mesabi Metallics will also produce DR-grade pellets. What remains missing in the United States is sufficient DRI plant capacity to process these pellets into metallic iron. Until such facilities are constructed, DR-grade producers must sell into a limited domestic market or compete in the global market to remain operational. Iron and steel market analysts see potential for new DRI facilities in the Midwest that could utilize Minnesota's DR-grade pellets, but these plants require substantial investment—estimated at $1.5 billion for a two-million-ton-per-year facility. Without additional investment in DRI capacity near the Great Lakes or within economically feasible transport distance of Minnesota's mines, overall pellet production in the state is likely to continue to decline.

Further analyses indicate that substantial investments in water treatment will compete with the same capital needed for long-term modernization, including DR-grade pellet production and new DRI facilities. If capital is redirected away from modernization, the transition to serve EAF markets may be slowed, which in turn could increase the risk of scaling back or idling production at facilities such as Keetac if they are unable to remain cost-competitive in future markets.

Direct, Indirect, and Induced Employment / Spending

While the Iron Range economy is somewhat diversified, taconite plants continue to play a significant role. A 2020 study by the University of Minnesota Duluth's Bureau of Business and Economic Research (BBER) estimated that taconite mining contributes approximately $3.9 billion annually to the regional economy, including $1.0 billion in labor income.

Table 10. Economic Impacts from Ferrous Mining Operations on the State of Minnesota (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	3,982	$537.1	$1,190.7	$2,294.8
Indirect Effect	2,640	$247.3	$428.9	$888.8
Induced Effect	4,841	$259.1	$433.9	$756.6
Total Effect	11,464	$1,043.5	$2,053.5	$3,940.2
Multiplier	2.88	1.94	1.72	1.72

*Totals may not sum due to rounding

SOURCE: IMPLAN

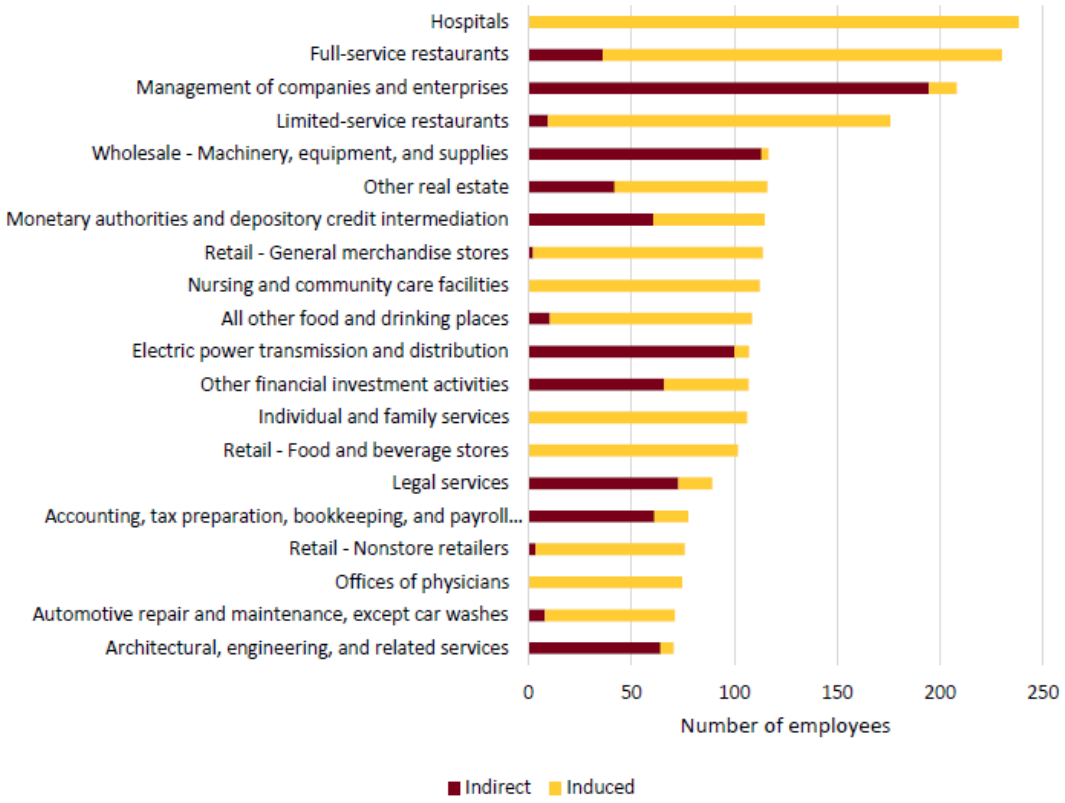
Source: Haynes, et.al - Economic Impact of Ferrous and Nonferrous Mining on Minnesota and the Arrowhead Region with Douglas County, Wisconsin.

The same study estimated that each direct job in taconite mining supports an additional 1.25 jobs in the regional economy. This multiplier effect means that the influence of mining extends beyond the plants themselves and into the broader community. Household income data underscores this point: according to the U.S. Census Bureau's 2023

American Community Survey, median household incomes in the Taconite Assistance Area range between $60,000 and $74,999, compared to Minnesota's statewide median of $87,556. This disparity highlights the region's economic vulnerability and demonstrates how reductions in mining employment would not only affect direct and indirect jobs but also further strain households that already earn below the state average.

Furthermore, the table below identifies the industries most affected by iron mining.

Figure 8. Top 20 Industries Impacted by Ferrous Mining Operations on the Arrowhead Region, by Employment (2019)

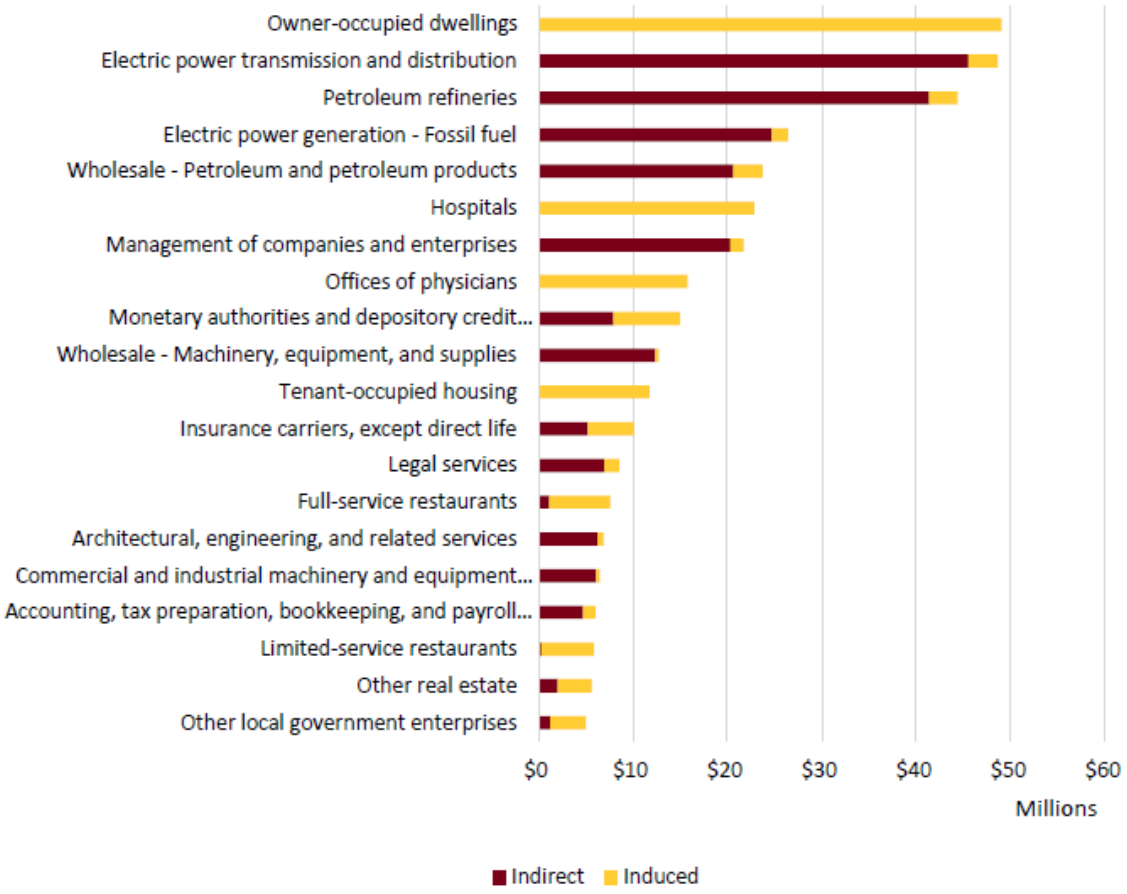


Source: Haynes, et.al - Economic Impact of Ferrous and Nonferrous Mining on Minnesota and the Arrowhead Region with Douglas County, Wisconsin.

From an employment perspective, the number one industry supported by iron mining is healthcare. The mining industry supports over 350 regional jobs in hospitals, clinics and nursing facilities. The second most supported industry is restaurants, where the mining industry supports over 230 jobs. Both of these industries have yet to feel the full impact of the layoffs at Minorca and Hibbing Taconite, in large part due to unemployment insurance and union sub-pay. A fuller effect is likely to be felt when these supports are no longer available. The timing of these layoffs, and any additional potential layoffs related to Keetac, is particularly devastating for our rural healthcare network as it lands at the same time the Federal government is withdrawing financial support. Losing additional patients with private insurance, as opposed to Federal Medicaid, would only add to the economic challenges of the healthcare system in northeast Minnesota.

From a spending perspective, the mining industry supports millions of dollars in regional expenditure annually. As shown in the chart below, the BBER study identifies the top affected industries in terms of spending as housing (~$49 million), electric power generation and distribution (~$48 million). Hospitals and clinics are the 6th and 8th most impacted industries with annual induced spending of over $35 million.

Figure 9. Top 20 Industries Impacted by Ferrous Mining Operations on the Arrowhead Region, by Value Added (2019), Millions of Dollars



Source: Haynes, et.al - Economic Impact of Ferrous and Nonferrous Mining on Minnesota and the Arrowhead Region with Douglas County, Wisconsin.

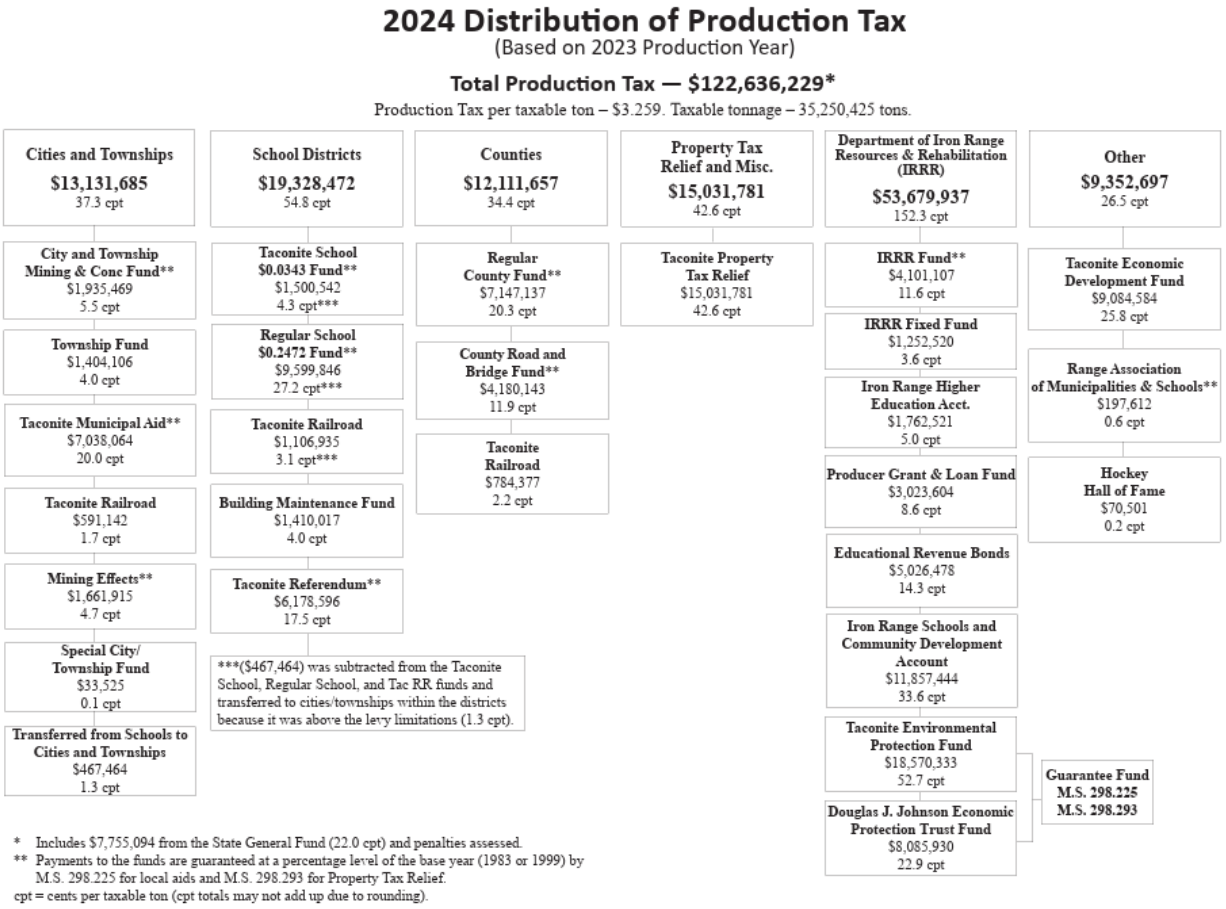
Currently, Minnesota Power, a regional utility with a unique customer profile, supplies electric power to the taconite plants. This uniqueness stems from the fact that approximately 70% of Minnesota Power's load is generated by heavy industrial users, primarily taconite plants, with the remaining load being divided between residential and commercial customers. State regulators have assigned Minnesota Power's industrial customers a larger share of the utility's costs relative to their actual cost of service. In other words, industrial users are subsidizing lower rates for residential and commercial customers. If large industrial users, such as Keetac, cease operations. These fixed costs will likely be passed on to and raise electric rates for the remaining industrial, residential and commercial customers. Most of Minnesota Power's residential and commercial users are not located near the taconite plants, but rather in the Duluth area and other municipalities throughout northern Minnesota. These potential increases come at a time when electric rates are already rising nationwide and under increased pressure in Minnesota due to investments in transforming the electrical system. These investments include costs related to ceasing operations at coal-powered generating facilities, building replacement generation and storage, upgrading and strengthening transmission and distribution infrastructure to adapt to climate change and new sources of distributed power generation, and replacing aging components at the end of their useful life. The impact of losing Keetac's electric load, coupled with the loss of the Minorca load and reduction in Hibbing Taconite's load, would likely have negative economic consequences across all of Minnesota Power's widespread service area.

Production Tax

Factor 6 of the variance criteria also requires consideration of impacts on local government revenues and community services. Production tax distributions are a primary source of funding for schools, cities, townships and counties in the Taconite Assistance Area. The following data provide context for how reduced Keetac production would affect these revenue streams.

Another unique aspect of northeast Minnesota's economy is that a significant portion of the land is exempt from property taxes. This includes state parks, tax-foreclosed lands, and other designated areas. Included in this category are taconite plants, such as Minorca, Hibbing Taconite, and Keetac, which pay a production tax on each ton of pellets produced, rather than property taxes. If Keetac is not producing or operates at limited capacity, its contribution to the production tax decreases or disappears entirely. This has widespread and significant consequences for the region in general and the IRRR directly.

As outlined in the 2024 Mining Production Tax guide published by the Minnesota Department of Revenue, and shown in the chart below, the tax revenue from taconite production is shared across a broad and diverse regional economy. In 2023, $122.6 million in production taxes paid by iron mines was distributed. The production tax is directly allocated to counties, cities, towns and school districts throughout the Taconite Assistance Area. Funds from the production tax, dedicated to specific accounts, are used to support property tax relief for eligible homeowners, as well as to fund school consolidation, community development, business recruitment and regional tourism and recreation initiatives.



Source: Minnesota Department of Revenue, 2024 Mining Tax Guide

In 2024, Keetac contributed over $16 million in production taxes in addition to occupancy tax and other fees. Over the next twenty years, with a typical production rate of 5 million tons per year, Keetac is expected to contribute

approximately $400 million in production taxes to the local economy. It goes without saying that these future tax revenues will not be generated if Keetac idles a portion or all production.

Schools

Schools across the Taconite Assistance Area are among the largest beneficiaries of the production tax. In 2024, over $19 million in direct funding was distributed across 14 school districts. Figure 6 below, from the 2024 Mining Tax Guide, shows the distribution of funds to each school district.

Figure 6

2024 Distributions by Fund to School Districts

(Based on 2023 production year tax revenues)

School Districts	Taconite School Fund $0.0343	Regular School Fund $0.2472	Taconite Railroad Aid	School Bldg. Maintenance Fund $0.04	Taconite Referendum $0.213	Less Excess Money Transferred to Cities and Townships	Total by School District
001 Aitkin	–	$221,464	–	–	$62,694	$0	$284,158
166 Cook County	$21,087	$74,697	$264,977	–	$91,498	($16,219)	$436,040
182 Crosby-Ironton	–	$230,625	–	–	$222,602	$0	$453,227
316 Greenway	$33,373	$923,088	–	$142,803	$372,009	($1,945)	$1,469,328
318 Grand Rapids	$0	$1,257,630	–	–	$428,400	($80,391)	$1,605,639
319 Nashwauk-Keewatin	$51,555	$365,925	–	$62,898	$268,675	($743)	$748,310
381 Lake Superior	$68,377	$416,035	$342,720	$52,626	$244,417	($19,774)	$1,104,401
695 Chisholm	–	$861,740	–	$67,930	$469,527	($36,867)	$1,362,330
696 Ely	–	$118,787	–	–	$213,624	($7,109)	$325,302
701 Hibbing	$365,579	$1,824,451	–	$196,023	$1,219,547	($127,777)	$3,477,823
712 Mtn. Iron-Buhl	$438,246	$430,288	–	$97,327	$349,776	($67,281)	$1,248,356
2142 St. Louis County	$152,093	$552,354	$284,841	$160,156	$429,452	($26,854)	$1,552,042
2711 Mesabi East	$183,337	$542,632	$214,397	$146,549	$425,333	($15,902)	$1,496,346
2909 Rock Ridge	$186,895	$1,780,130	$0	$483,705	$1,381,042	($66,602)	$3,765,170
Total	**$1,500,542**	**$9,599,846**	**$1,106,935**	**$1,410,017**	**$6,178,596**	**($467,464)**	**$19,328,472**

Dashes indicate not eligible. $0 indicates eligible, but no payment at current valuation and production.

Source: Minnesota Department of Revenue, 2024 Mining Tax Guide

Regionally, school districts are already financially stretched and managing significant budget shortfalls. This spring, many teachers and support staff were laid off across northeast Minnesota. Rock Ridge school district laid off more than 12 FTE and Hibbing School district more than 20 FTE as each contended with budget shortfalls in excess of $2.5 million. Idling of taconite plants hit schools particularly hard. As laid-off workers and their families leave the area to find employment, local enrollment drops and with it, per-pupil state funding. As production is curtailed, both production tax proceeds are reduced, creating an even more challenging fiscal situation.

Cities, Townships, and Counties

Local governments, including cities, townships, and counties, are also important beneficiaries of taconite production taxes. In 2024, more than $25 million was directly allocated to these entities. As production tax distributions decrease, local governments face the challenge of finding new ways to cover funding gaps. Often, these costs are passed on to residents through higher property taxes and fewer services.

The potential idling of Keetac, combined with the current idling of Minorca and Hibbing Taconite, which could reduce taconite production by nearly 30% from 2024 production levels, presents a significant and widespread negative economic impact on the region.

Conclusion

The information in this comment provides data on the economic aspects of Keetac's operations, including employment levels, household income, school funding, local government revenues and regional energy costs. These findings are supported by independent market analyses, state revenue data, University of Minnesota research and IRRR's direct experience working with communities across the Taconite Assistance Area.

This information is offered as an expert resource on the iron ore industry, iron ore markets and the regional economy and is intended to support MPCA's broader evaluation of the economic factors involved in this decision.

IRRR appreciates the opportunity to submit this comment and remains available to provide further data or context that may assist MPCA as this process moves forward.

Attachments:

1. 2024 Mining Tax Guide
2. BBER STUDY
3. CRU Keetac Analysis

References:

CRU Consulting. (2024). *Independent market analysis of pellet competitiveness*. [As cited in U.S. Steel variance application].

Duluth Seaway Port Authority. (2025). *Tonnage report, August 2025*. https://duluthport.com/wp-content/uploads/2025/09/Tonnage-2025-Season-August.pdf

Haynes, M., Chiodi Grensing, G., Badger, M., Brand, N., Hockert, M., & Thorsgard, H. (2020). *Economic impact of ferrous and nonferrous mining on Minnesota and the Arrowhead Region with Douglas County, Wisconsin*. University of Minnesota Digital Conservancy. https://hdl.handle.net/11299/216463

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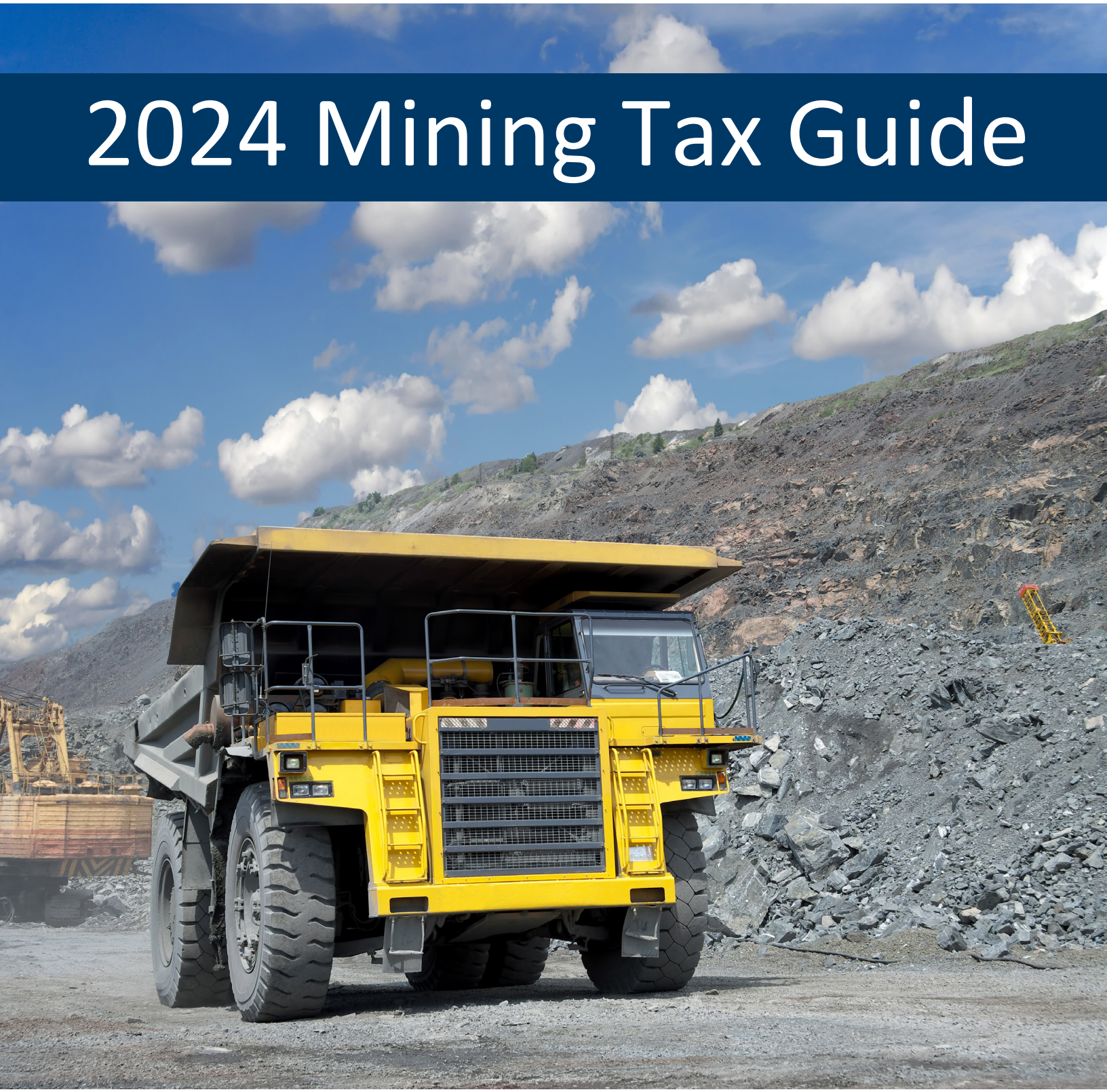
U.S. Census Bureau. (2023a). *American Community Survey 5-year estimates, Table S1901: Income in the past 12 months (in 2023 inflation-adjusted dollars)* [Counties in the Taconite Assistance Area: Itasca, St. Louis, Lake, Cook, Koochiching, Crow Wing]. https://data.census.gov

U.S. Census Bureau. (2023b). *American Community Survey 1-year estimates, Table S1901: Income in the past 12 months (in 2023 inflation-adjusted dollars)* [State of Minnesota]. https://data.census.gov

2024 Mining Tax Guide



DEPARTMENT OF REVENUE

2024 Distribution of Production Tax

(Based on 2023 Production Year)

Total Production Tax — $122,636,229*

Production Tax per taxable ton – $3.259. Taxable tonnage – 35,250,425 tons.

Cities and Townships
$13,131,685
37.3 cpt

- **City and Township Mining & Conc Fund****
  $1,935,469
  5.5 cpt
- **Township Fund**
  $1,404,106
  4.0 cpt
- **Taconite Municipal Aid****
  $7,038,064
  20.0 cpt
- **Taconite Railroad**
  $591,142
  1.7 cpt
- **Mining Effects****
  $1,661,915
  4.7 cpt
- **Special City/ Township Fund**
  $33,525
  0.1 cpt
- **Transferred from Schools to Cities and Townships**
  $467,464
  1.3 cpt

School Districts
$19,328,472
54.8 cpt

- **Taconite School $0.0343 Fund****
  $1,500,542
  4.3 cpt***
- **Regular School $0.2472 Fund****
  $9,599,846
  27.2 cpt***
- **Taconite Railroad**
  $1,106,935
  3.1 cpt***
- **Building Maintenance Fund**
  $1,410,017
  4.0 cpt
- **Taconite Referendum****
  $6,178,596
  17.5 cpt

***($467,464) was subtracted from the Taconite School, Regular School, and Tac RR funds and transferred to cities/townships within the districts because it was above the levy limitations (1.3 cpt).

Counties
$12,111,657
34.4 cpt

- **Regular County Fund****
  $7,147,137
  20.3 cpt
- **County Road and Bridge Fund****
  $4,180,143
  11.9 cpt
- **Taconite Railroad**
  $784,377
  2.2 cpt

Property Tax Relief and Misc.
$15,031,781
42.6 cpt

- **Taconite Property Tax Relief**
  $15,031,781
  42.6 cpt

Department of Iron Range Resources & Rehabilitation (IRRR)
$53,679,937
152.3 cpt

- **IRRR Fund****
  $4,101,107
  11.6 cpt
- **IRRR Fixed Fund**
  $1,252,520
  3.6 cpt
- **Iron Range Higher Education Acct.**
  $1,762,521
  5.0 cpt
- **Producer Grant & Loan Fund**
  $3,023,604
  8.6 cpt
- **Educational Revenue Bonds**
  $5,026,478
  14.3 cpt
- **Iron Range Schools and Community Development Account**
  $11,857,444
  33.6 cpt
- **Taconite Environmental Protection Fund**
  $18,570,333
  52.7 cpt
- **Douglas J. Johnson Economic Protection Trust Fund**
  $8,085,930
  22.9 cpt

Guarantee Fund
M.S. 298.225
M.S. 298.293

Other
$9,352,697
26.5 cpt

- **Taconite Economic Development Fund**
  $9,084,584
  25.8 cpt
- **Range Association of Municipalities & Schools****
  $197,612
  0.6 cpt
- **Hockey Hall of Fame**
  $70,501
  0.2 cpt

* Includes $7,755,094 from the State General Fund (22.0 cpt) and penalties assessed.

** Payments to the funds are guaranteed at a percentage level of the base year (1983 or 1999) by M.S. 298.225 for local aids and M.S. 298.293 for Property Tax Relief.

cpt = cents per taxable ton (cpt totals may not add up due to rounding).

Table of Contents

Data Charts

Figures are available in Excel format on our website. Go to www.revenue.state.mn.us and type **Mining Statistics** in the Search Box.

Mineral and Mining Agencies

Minnesota Department of Revenue

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Overview

The *Minnesota Mining Tax Guide* is published to identify all Minnesota mining-related taxes paid by the mining industry.

Production Tax

The Production Tax is the largest tax paid by the ferrous mining industry. It is a major source of revenue to the counties, municipalities, and school districts within the Taconite Assistance Area. The Production Tax distributed in 2024 is the tax due for the 2023 production year. The tax rate for concentrates and pellets produced in 2023 was $3.259 per taxable ton. An additional tax of 3 cents per ton is imposed for each 1% that the iron content exceeds 72%. The taxable tonnage for 2023 is the average tonnage produced in 2021, 2022, and 2023. If this tax is imposed on other iron-bearing material, it is applied to the current-year production.

The first page illustrates how the Production Tax is distributed. It shows both the cents per ton (cpt) distribution and the total amount distributed to various funds. The funds to which the Production Tax are distributed are explained on pages 4–9.

Occupation Taxes

Minnesota's Occupation Tax applies to mining and producing both ferrous minerals, such as taconite and iron ore, and nonferrous minerals, such as silver and copper. To date, only mining of ferrous minerals has occurred in Minnesota. More information relating to the Occupation Tax attributable to iron ore and taconite mining is available on pages 23–26.

State Taxes Incidental to Mining

Other state taxes impacted by mining include Sales and Use Tax and withholding on royalties. Go to www.revenue.state.mn.us and type **Mining** in the Search box. Follow the links to Sales Tax Fact Sheet 147 (Taconite and Iron Mining) or Withholding on Mining and Exploration Royalties.

Aggregate Material Tax

This tax is administered at the county level. For more information, go to www.revenue.state.mn.us and type **Aggregate** in the Search box.

County Taxes

Other Taconite and Iron Ore Ad Valorem (Property) taxes are paid directly to the counties. These are Property taxes assessed on auxiliary mining lands, unmined taconite, unmined natural iron ore, taconite railroads and severed mineral interests. These taxes are explained on pages 28-33.

Taxes on Nonferrous Minerals

While not subject to the Production Tax, nonferrous mining operations are subject to Occupation Tax, Gross Proceeds Tax, and Ad Valorem Tax. These taxes are explained on page 33.

Figure 1

Iron Ore Production Comparison

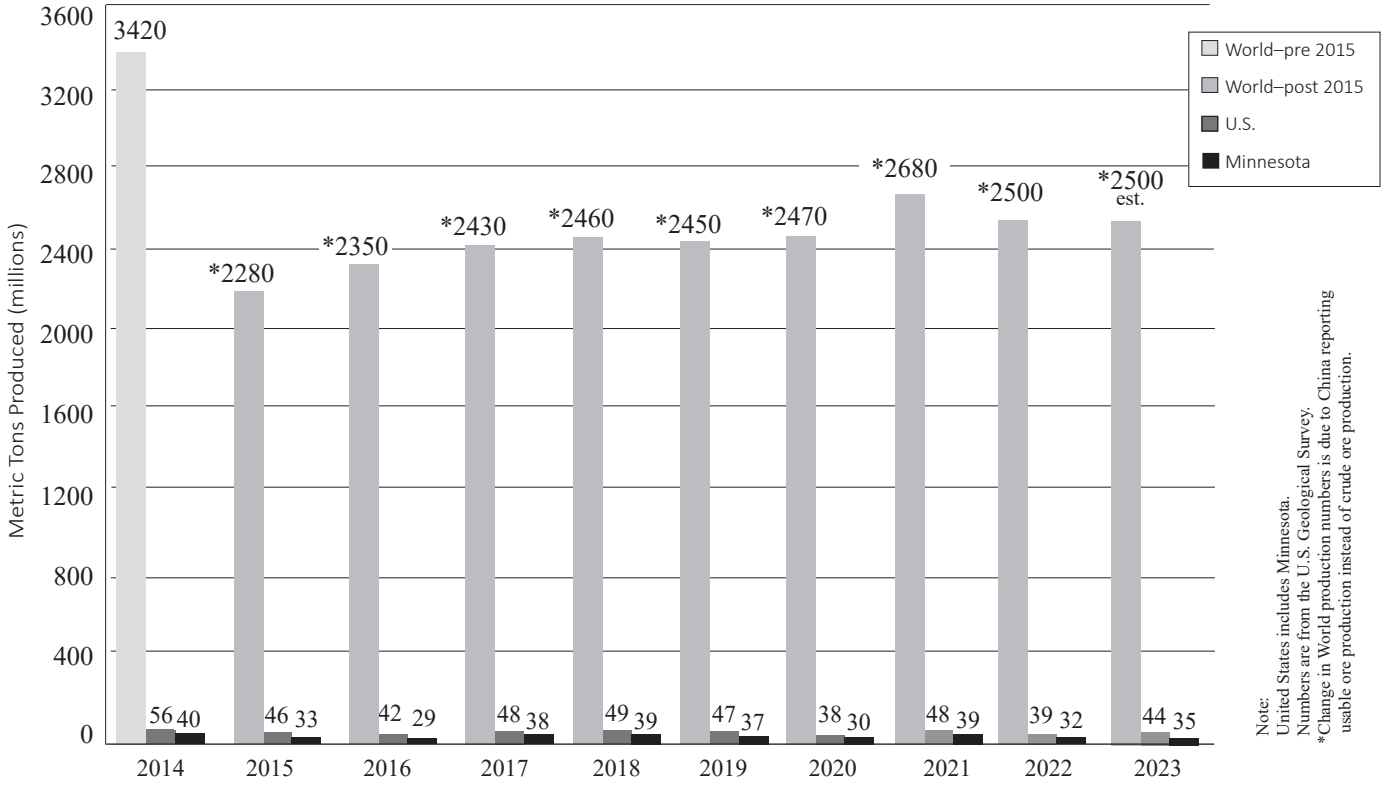


Figure 2
Minnesota Taconite Production Summary (2014–2023)

Year	Minorca	Hibbing Taconite	Northshore	U.S. Steel–Keewatin Taconite	U.S. Steel–Minntac	United Taconite	Total
2014	2,508,625	7,338,620	5,123,277	5,153,784	13,705,811	4,823,478	**38,653,595**
2015	2,490,099	7,760,305	4,168,373	1,702,877	11,491,695	3,011,800	**30,625,149**
2016	2,585,337	7,928,200	3,153,811	85,899	12,695,781	1,535,192	**27,984,220**
2017	2,592,807	7,456,883	5,162,815	4,466,520	13,418,112	4,622,710	**37,719,847**
2018	2,607,494	7,481,616	5,480,542	5,180,427	13,365,538	4,983,259	**39,098,876**
2019	2,556,397	7,180,256	5,024,544	5,120,108	12,128,617	5,079,821	**37,089,743**
2020	2,616,481	5,262,948	3,657,229	1,790,257	11,820,671	5,005,071	**30,152,657**
2021	2,670,167	7,329,934	4,839,777	5,300,999	13,460,057	5,091,052	**38,691,986**
2022	2,349,282	5,931,535	1,171,255	5,251,515	12,650,042	4,542,463	**31,896,092**
2023	**2,693,251**	**6,534,997**	**3,071,376**	**4,875,060**	**13,010,421**	**4,978,094**	**35,163,199**

Note:
- Historical data is available on our website.
- All weights are dry without flux.
- Production Tax report tonnages are used.

Figure 3
Minnesota Taxes Levied on Mining-Related Activity

Production Years	Unmined Taconite Tax	Use Tax (net)	Production Tax	Occupation Tax[1]	Railroad Gross Earnings Tax[2]	Total Taxes	Total Tons Produced[3]	Total Taxes per Ton
2014	291,298	10,873,758	102,369,609	16,401,555	30,352	129,966,572	39,835,029	3.26
2015	299,722	(11,104,636)*	98,728,605	6,370,000	26,466	94,320,157	32,664,481	2.89
2016	296,597	(13,958,786)*	89,141,361	4,599,000	20,600	80,558,968	29,087,625	2.77
2017	281,460	4,857,150	86,728,401	13,051,000	15,394	104,933,405	37,719,847	2.78
2018	288,758	8,664,249	96,104,298	19,082,000	11,000	124,150,305	39,098,876	3.18
2019	270,737	9,333,167	106,732,232	15,436,000	10,970	131,783,106	37,089,743	3.55
2020	284,833	5,212,784	101,286,895	6,631,451	9,762	113,375,725	30,152,657	3.76
2021	290,453	10,437,197	102,184,372	53,405,901	20,735	166,338,658	38,711,986	4.30
2022	271,205	8,833,191	102,856,294	42,599,798	17,336	154,577,824	31,896,092	4.85
2023	**248,703**	**13,099,928**	**114,881,135**	**22,958,260**	**21,934**	**151,209,960**	**35,163,199**	**4.30**

Note:
Historical data is available on our website.
Taxes often levied (assessed) for one year and paid in the following year.
1 Amount paid (unaudited). Does not include adjustments.
2 Taconite railroads are taxed on an ad valorem basis.
3 Tons are dry without flux .
* The Use Tax law changed mid 2015. Manufacturers no longer pay Use Tax on equipment used in the production process. As a result, more tax was refunded than collected.

Production Tax

(M.S. 298.24, 298.27 and 298.28)

Definition

The Production Tax is a severance tax paid on iron concentrates or pellets produced by the companies. It is paid in lieu of Ad Valorem (Property) taxes on taconite and lands containing taconite. Land and structures used in the production of the products are also excluded from Property Tax, with some exceptions. Electric power plants principally devoted to the generation of power for taconite mining and concentrating are considered to be used in the production of taconite (or direct reduced ore) and are covered by the *in lieu exemption* for property taxes. If part of the power is used for other purposes, that proportion of the power plant is subject to the general Property Tax. The power plant must be owned by a company subject to Production Tax to qualify for the exemptions.

Tax Rate

The Production Tax rate for any given year is determined by multiplying the prior year's rate by the percentage change in the Gross Domestic Product Implicit Price Deflator (GDPIPD) from the fourth quarter of the second preceding year to the fourth quarter of the preceding year. The U.S. Department of Commerce publishes the GDPIPD monthly in *Survey of Current Business*. This escalator takes effect each year unless the rate is frozen or changed by the Minnesota State Legislature. The tax rate for the 2023 production year was $3.259 per taxable ton. For concentrates produced in 2024, the rate escalated to $3.345 per taxable ton.The tax for a producer of other iron bearing material is based on the current year production. There is an additional tax of three cents per ton for each 1% the dry iron content is above 72%.

Taxable Tons

The Production Tax is levied on taxable tons, which are the average tons produced during the current year and the previous two production years. This eliminates the peaks and valleys of tax payments by the taconite producers and distribution to the tax recipients. The result is a more stable tax base resembling a Property Tax.

Distribution

Under Minnesota law, Production Tax revenues are distributed to various cities, townships, counties, and school districts within the Taconite Assistance Area. This is an area comprising the present taconite mining areas plus areas where natural ore was formerly mined.

Funds are also allocated to the Minnesota Department of Iron Range Resources and Rehabilitation (IRRR), which administers the Taconite Environmental Protection Fund (TEPF), the Douglas J. Johnson Economic Protection Trust Fund (DJJ) and the Taconite Economic Development Fund (TEDF) and other programs for the range cities, townships, schools, and the taconite industry. You can find more information at **mn.gov/irrrb**.

Payment Dates and Method

Fifty percent of the tax is due on or before February 24 and the remaining 50% is due on or before August 24. The Minnesota Department of Revenue must notify each producer of its tax obligation for the year before February 15.

Each producer must make payments to six counties and Iron Range Resources and Rehabilitation on or before the due date. Payments are made to Aitkin, Cook, Crow Wing, Itasca, Lake and St. Louis Counties, and to IRRR. The county auditors then make payments to cities, townships, school districts, and other recipients.

Taconite Economic Development Fund (M.S. 298.227)

The Taconite Economic Development Fund (TEDF) was first created for production year 1992 at a rate of 10.4 cents per taxable ton.

The rate and qualifications have changed several times since the fund was created and is available only to Minnesota taconite pellet producers.

Currently, each pellet producer has two potential sources of TEDF money:

1. **Taxable production** — The Production Tax amount credited to each producer's share of the TEDF is 25.1 cpt provided they make a matching investment of at least equal size. (No distribution is made under this clause if the total industry production for the year is less than 30 million tons.)
2. **Chips, fines, and concentrate** — An additional amount equal to 50% of the tax for chips, fines, or concentrate sold not exceeding 5/16-inch, is allocated to each company's share of the TEDF. The total amount may not exceed $700,000 for all companies. If the total claimed exceeds $700,000, each company's share will be prorated. The determination of this allocation is based on current production year **sales** of chips, fines, and concentrate—not the three-year average of production. Sales of crushed pellets *do not* qualify for this credit. [M.S. 298.28, subd. 9a(b).]

Therefore, each pellet producer is eligible to receive 25.1 cents per taxable ton plus an additional amount based on current year tons of chips and fines sold.

Fluxed Pellets

Fluxed pellets have limestone or other basic flux additives combined with the iron concentrates before pelletizing. Some facilities produce fluxed pellets while others produce a partially fluxed pellet containing a low percentage of limestone additives.

A flux credit is allowed against Production Tax. M.S. 298.24, subd. 1 (f) allows the weight of flux added to be subtracted from

A flux credit is allowed against Production Tax. M.S. 298.24, subd. 1 (f) allows the weight of flux added to be subtracted from the pellet weight for Production Tax purposes. The taxable weight is the dry weight, less the weight of the flux. The weight of the flux is determined by a metallurgical calculation based on the analyses of the finished pellet, the concentrate and the flux stone. All tables in the *Minnesota Mining Tax Guide* with production statistics use an equivalent or calculated weight for fluxed pellets.

Occupation Tax is based on iron units and uses the full dry weight including flux.

Pellet Weighing

Pellet and concentrate tonnages are reported on a dry weight basis after the flux credit has been applied.

Definition of Taconite Tax Relief Area

One common prerequisite exists for all taconite aids and grants; the recipient must be within the geographic confines of the Taconite Tax Relief Area or the Taconite Assistance Area. This is defined by state laws (M.S. 273.134 and M.S. 273.1341) as follows:

"Taconite Tax Relief Area" means the geographic area contained within the boundaries of a school district that meets the following qualifications:

(1) It is a school district in which the assessed valuation of unmined iron ore on May 1, 1941, was not less than 40% of the assessed valuation of all real property and whose boundaries are within 20 miles of a taconite mine or plant; or

(2) It is a school district in which, on January 1, 1977, or the applicable assessment date, there is a taconite concentrating plant or where taconite is mined or quarried or where there is located an electric generating plant which qualifies as a taconite facility.

Definition of Taconite Assistance Area

A "Taconite Assistance Area" means the geographic area that falls within the boundaries of a school district that contains a municipality in which the assessed valuation of unmined iron ore on May 1, 1941, was not less than 40% of the assessed valuation of all real property, or contains a municipality in which there was a taconite facility or taconite power plant on January 1, 1977, or the applicable assessment date. Any area within the Taconite Tax Relief Area is also considered to be within the Taconite Assistance Area. The 2023 legislature expanded the definition of the Taconite Assistance Area to include any school district which contains a municipality in which there is a mine subject to the Gross Proceeds Tax and such school district is located in a county that already contains a school in the assistance area.

State Appropriation (M.S. 298.285)

The Department of Revenue determines a state aid amount equal to a tax of 22 cents per taxable ton of iron ore concentrates. It is distributed under M.S. 298.28 as if the aid were Production Tax revenues. The aid is appropriated from the state's General Fund.

The tonnage of other iron-bearing material defined in M.S. 298.001, subd. 9, is not to be included in the appropriation calculation for distribution years 2022 and 2023.

2024 Legislation

The 2024 legislature made the following changes to the Production Tax.

(1) It renamed the Iron Range School Consolidation and Cooperatively Operated School Account to the Iron Range Schools and Community Development Account. It increased this account from 10 cents per taxable ton to 24 cents per taxable ton for distributions in 2024 through 2032.

(2) It increased the maximum reduction of tax to $515 on all property that qualifies under the Taconite Property Tax Relief Account.

(3) It increased the Range Association of Municipalities and Schools from 0.30 cent per taxable ton to 0.50 cent per taxable ton beginning with distributions in 2024.

(4) It increased the amount Breitung Township will receive from the Taconite Municipal Aid Account from $15,000 annually to $25,000 annually.

Other new legislation:

(1) It authorized the Department of Iron Range Resources and Rehabilitation (IRRR) to issue up to $49,000,000 in revenue bonds in 2024 for grants to numerous counties, cities, school districts, and other entities. The revenue bonds are paid from the Iron Range Schools and Community Development Account. If in any year the amount available in this account is insufficient, an additional amount is appropriated from the Douglas J. Johnson economic protection trust fund to make up the deficiency.

(2) It authorized the IRRR to issue up to $31,000,000 in revenue bonds in 2025 for grants to numerous counties, cities, school districts, and other entities. The revenue bonds are paid from the Iron Range Schools and Community Development Account. If in any year the amount available in this account is insufficient, an additional amount is appropriated from the Douglas J. Johnson economic protection trust fund to make up the deficiency.

(3) It authorized the transfer of $300,000 from the Taconite Economic Development Fund to the city of Chisholm for the Senator David Tomassoni Bridge of Peace. The transfer must be made within ten days of the August 2024 payment.

2023 Distribution of Funds (M.S. 298.28)

Subd. 2 – Cities and Towns Where Mining and Production is Located

(a) The Taconite Cities and Towns Fund allocates 4.5 cents per ton to cities and towns where mining and concentrating occur. Fifty percent goes to cities and townships in which mining activity occurs. The remaining 50% goes to cities and townships in which concentrating occurs. *Note: This is done on a company-by-company basis.*

If both mining and concentrating take place in a single taxing district, the entire 4.5 cents is allocated there. If mining occurs in more than one city or town, the revenue (2.25 cpt) is divided based on either a percentage of taconite reserves or a four-year production average. Most taconite mines have mining in two or more areas.

If concentrating is split between two or more cities or towns, the revenue (2.25 cpt) is divided by the percentage of hours worked in each. The primary crusher is considered the first stage of concentration. Distribution detail is shown in *Figure 5*.

(b) Mining Effects — Four cents per taxable ton is allocated to cities and organized townships affected by mining because their boundaries are within three miles of a taconite mine pit that was actively mined in at least one of the prior three years. If a city or town is located near more than one mine meeting the criteria, it is eligible to receive aid calculated from only the mine producing the largest taxable tonnage. When more than one municipality qualifies for aid based on one company's production, the aid must be apportioned among the municipalities in proportion to their populations. The money must be used for infrastructure improvement projects.

(c) If there are excess distributions from the 3.43 cent, 24.72 cent, and taconite railroad school funds after covering the levy reduction in M.S. 126C.48, subd. 8, then the excess money must be distributed to the cities and townships within the school district in the proportion that their taxable net tax capacity within the school district bears to the net tax capacity of the school district for Property taxes payable in the year prior to distribution.

Subd. 3 – Taconite Municipal Aid Account

(a) The Taconite Municipal Aid is funded at 12.5 cents per taxable ton. Beginning with distributions in 2020 and subsequent years, the 12.5 cents per ton is escalated in the same proportion as the Implicit Price Deflator as provided in M.S. 298.24, subd. 1. The Kinney-White allocation (par. b and c) and the 0.3 cent Range Association of Municipalities and Schools (RAMS) allocation in subd. 8 are subtracted from it. The payment is made on September 15. Each city or township first receives the amount it was entitled to receive in 1975 from the Occupation Tax. The remainder of the aid is distributed according to a complex formula using levies, valuation, population and fiscal need factors.

The first step in this formula is to determine the fiscal need factor (FNF). The FNF is a three-year average of the sum of the local government aid (LGA), local levy and Production Tax revenues received by the community. Next, the local effort tax capacity rate equals the fiscal need factor per capita (FNFPC) divided by 17. If the FNFPC is greater than 350, the local effort tax capacity rate (LETCR) is 350 divided by 17 plus the excess over 350 divided by 15. The minimum allowable LETCR is 8.16. The final step in this formula is to compute the distribution index (DI). The DI for a community equals its FNF minus LETCR times the adjusted net tax capacity divided by 100.

$$\text{If FNFPC} \leq 350,\ \text{LETCR} = \frac{\text{FNFPC}}{17}$$

$$\text{If FNFPC} > 350,\ \text{LETCR*} = \frac{350}{17} + \frac{(\text{FNFPC} - 350)}{15}$$

$$\text{DI} = (\text{FNF minus LETCR*}) \times \frac{\text{Adjusted Net Tax capacity}}{100}$$

* Minimum allowable LETCR = 8.16

A DI is determined for all eligible communities. A percentage is determined by comparing the DI of a particular community to the total of distribution indexes for all eligible communities. This percentage is then multiplied by the amount of available municipal aid to determine an amount for each community. Prior to this calculation, the Occupation Tax grandfather amounts and special aid for the city of Kinney and township of White are subtracted from the total available to the Taconite Municipal Aid Fund.

The conditions necessary for a municipality to qualify for this aid are identical to the qualifications for the 66% Taconite Property Tax Relief listed under subd. 6 (see page 7). The state laws governing Taconite Municipal Aid are M.S. 273.134, 298.28, subd. 1, Clause 2, and 298.282. Distribution detail is shown in *Figure 5*.

(b) and (c) - Additional money is allocated to cities and townships if more than 75% of the city's assessed valuation consisted of iron ore as of January 2, 1980, or if more than 75% of the township's assessed valuation consisted of iron ore on January 2, 1982. The distribution is calculated using certified levies, net tax capacities and population. Currently, only White Township and the city of Kinney qualify.

(d) The Township Fund was funded at 3 cents per ton for townships located entirely within the Taconite Tax Relief Area for 2009 distributions. For distributions in 2010 and subsequent years, the 3 cents is escalated in the same proportion as the Implicit Price Deflator as provided in

M.S. 298.24, subd. 1. However, the escalation was frozen for distributions made in 2015 through 2017. The money is distributed to the townships on a per capita basis with a maximum of $50,000 per township. If a township would receive more than $50,000, the portion that exceeds $50,000 is redistributed among the townships under $50,000.

Subd. 4 – School Districts

(a) A total of 32.15 cents per taxable ton is allocated under (b) and (c), plus the amount in paragraph (d).

(b) (i) Taconite School Fund (3.43 cents)

A total of 3.43 cents per taxable ton for each producer is allocated to school districts in which mining and concentrating occurs. If the mining and concentrating take place in separate districts, 50% is allocated to the location of mining and 50% to concentrating. In addition, if the mining occurs in more than one school district, the 50% portion is further split based on either a four-year average of production or a percentage of taconite reserves. If the concentrating function of a company takes place in more than one school district, the 50% portion is further split according to hours worked in each district. The primary crusher, tailings basin and power plant owned by a taconite company are considered part of concentrating. When these are in different school districts from the plant, the hours-worked split is used. Distribution detail is shown in *Figure 6*.

(b) (ii) School Building Maintenance Fund (4 cents)

Four cents per taxable ton is allocated to specified school districts, based on proximity to a taconite facility, to be used for building maintenance and repairs. The money allocated from each taconite facility shall be apportioned between its recipient school districts based on pupil units.

a. Keewatin Taconite proceeds are allocated to the Greenway and Nashwauk-Keewatin districts.

b. Hibbing Taconite proceeds are allocated to the Chisholm and Hibbing districts.

c. Minorca and Minntac proceeds are allocated to the Mountain Iron-Buhl, Mesabi East, and Rock Ridge districts.

d. Northshore Mining proceeds are allocated to the St. Louis County and Lake Superior districts.

e. United Taconite proceeds are allocated to the St. Louis County and Rock Ridge districts.

This additional money is not subject to the 95% levy limitations in M.S. 126C.48, subd. 8.

(c) Regular School Fund (24.72 cents)

A total of 24.72 cents per taxable ton is split among the 14 school districts in the Taconite Assistance Area. Each school district receives the amount it was entitled to receive in 1975 from the taconite Occupation Tax (under M.S. 298.32). This amount may be increased or reduced by the percentage aid guarantee provisions of M.S. 298.225. The remaining amount in the fund is distributed using an index based on pupil units and tax capacities. Generally, districts with larger tax capacities per pupil unit tend to receive a proportionately smaller amount of this fund. Eleven cents per ton of this distribution is not subject to the 95% levy limitation in M.S. 126C.48, subd. 8. Distribution detail is shown in *Figure 6*.

The index is calculated as follows: The pupil units for the prior school year are multiplied by the ratio of the average net tax capacity per pupil unit of all taconite districts to the adjusted net tax capacity per pupil unit of the district. Each district receives the portion of the distribution that its index bears to the sum of the indexes for all taconite school districts.

(d) Taconite Referendum Fund (21.3 cents)

The Taconite Referendum Fund (TRF) receives an allocation of 21.3 cents per taxable ton. Taconite school districts receive money from the fund on July 15 based on two calculations: (1) an additional $175 per pupil unit over and above state aids by passing a special levy referendum equal to 1.8% of net tax capacity. The pupil units used in the computation are the greater of the previous year or the 1983-84 school year units. The fund pays the difference between the local levy and $175 per pupil unit. (2) A second calculation equal to 22.5% of the amount obtained by subtracting 1.8% of the district's net tax capacity from the district's 2012 weighted average daily membership times the sum of (A) $415, plus (B) the district's fiscal year 2013 referendum allowance. If any money remains in the fund, it is distributed to the Taconite Environmental Protection Fund (two-thirds) and the Douglas J. Johnson Economic Protection Trust Fund (one-third). *Note: A district receiving money from the TRF must reserve the lesser of $25 or the amount received per pupil unit (of the $175 authorized) for early childhood programs or outcome-based learning programs. Distribution detail is shown in* Figure 6.

(e) Each school district is entitled to receive the amount it received in 1975 under M.S. 298.32 (Occupation Tax Grandfather).

Subd. 5 – Counties

(a) The allocation of 21.05 cents per taxable ton to counties (subject to adjustment by M.S. 298.225) is to be distributed under subd. 5(b) through (d). The amounts listed in (b) and (d) are the statutory amounts prior to any adjustment by M.S. 298.225. Distribution detail is shown in *Figure 8*.

(b) Taconite Counties with Mining or Concentrating

An amount of 10.525 cents per taxable ton is distributed to the county in which the taconite is mined or quarried or in which the concentrate is produced (split in the same manner as taconite cities and towns), less any amount distributed in subd. 5(c). Distribution detail is shown in *Figure 8*.

(c) Counties - Electric Power Plant

If an electric power plant owned by and providing the primary source of power for a taconite plant is located in a county other than the county in which the mining and concentrating processes are conducted, 1 cent per ton (for that company) is distributed to the county in which the power plant is located. *This 1 cent is not escalated but is subject to M.S. 298.225 adjustment with variable guarantee*.

Cook County continues to receive aid based on Minnesota Power's power plant, located in Taconite Harbor, due to the guarantee provided by M.S. 298.225. For the 2023 production year, this amounted to $84,716. The 1 cent per ton distribution for the 1983 base year was figured on 9,793,639 tons. The current year M.S. 298.225 guarantee percentage is always applied.

$0.01 x 9,793,639 x 86.500850% = $84,716

There is also a transfer of $19,487 (1983 base of $22,528 x 86.500850%) to the county fund covered in subd. 6(b). Therefore, Cook County receives a total of $104,203 due to the power plant.

(d) Taconite County Road and Bridge

Each county receives a portion of the aid that is deposited in the County Road and Bridge Fund in the same manner as taconite cities and towns. The basic allocation is 10.525 cents per taxable ton. It is subject to adjustment as in M.S. 298.225. Distribution detail is shown in *Figure 8*.

Subd. 6 – Taconite Property Tax Relief

(a) Taconite Property Tax Relief

The amount sent to this fund was rebased by the 2013 legislature at 34.8 cents per taxable ton for the 2013 production year. The fund resumed indexing by using the Gross Domestic Product Implicit Price Deflator beginning with the 2017 production year. The qualifications and distribution of Taconite Property Tax Relief are described in the following paragraphs.

The *Taconite Homestead Credit* reduces the tax paid by owners of certain properties located on the Mesabi and Vermillion ranges located within the Taconite Tax Relief Area. The properties receiving this credit are owner-occupied homes and owner-occupied farms.

If an owner-occupied home or farm is located in a city or town that contained at least 40% of its valuation as iron ore on May 1, 1941, or which had a taconite mine, processing plant, or electric generating facility on January 1, 1977, or currently has a taconite mine, processing plant, or electric generating facility, the taconite credit is 66% of the tax, up to a maximum credit of $515 for taxes payable beginning in 2025.

If the property is not located in such a city or town, but is located in a school district containing such a city or town, the taconite credit is 57% of the tax, up to a maximum credit of $515 for taxes payable beginning in 2025.

The total amount of Taconite Property Tax Relief paid in each county and school district and an example of the calculation are available on our website.

State laws governing Taconite Property Tax Relief are contained in M.S. 273.134 to M.S. 273.136 and M.S. 298.28, subd. 6. This is guaranteed by the Douglas J. Johnson Economic Protection Trust Fund as stated in M.S. 298.293.

(b) Electric Power Plant Aid from Property Tax Relief

For any electric power plant located in another county, as described in 5(c), 0.1875 cent per taxable ton (cpt) from the Taconite Property Tax Relief Account is paid to the county. The distribution is subject to the M.S. 298.225 variable guarantee. For the 2023 production year, $19,487 was distributed, with the entire amount coming from the M.S. 298.225 guarantee (calculation details under (c) Counties).

(c) Electric Power Plant Aid from Property Tax Relief

This subdivision allocates 0.4541 cent per LTV's taxable tonnage to the Cook County school district due to LTV's power plant in Cook County. The distribution is subject to the M.S. 298.225 guarantee at 31.2% or the variable rate, whichever is less. For the 2023 production year, $21,087 was distributed. This is calculated by multiplying the 1983 base of $67,586 x .312 = $21,087.

Subd. 7 – Iron Range Resources and Rehabilitation

An amount of 6.5 cents per taxable ton escalated by the Gross Domestic Product Implicit Price Deflator is allocated to Iron Range Resources and Rehabilitation (subject to M.S. 298.225 guarantee). However, the escalation was frozen for distributions made in 2015 through 2017. The funds are used by Iron Range Resources and Rehabilitation for general operating expenses and community development grants.

Subd. 7a – Iron Range Schools and Community Development Account

This account was created by the 2014 legislature and is managed by Iron Range Resources and Rehabilitation. It will receive distributions from the following:

(a) For distributions in 2024 through 2032 it receives 24 cents per taxable ton. For distributions beginning in 2033 it will receive 10 cents per taxable ton.

(b) Also, beginning the distribution year after a taconite school bond receives its last taconite payment, an amount equal to what the bond received from the 2012 pay 2013 production year distributions will be added to the fund with the money being deducted from the same sources as the original bond.

Subd. 8 – Range Association of Municipalities and Schools (RAMS)

An amount equal to 0.5 cent per taxable ton (subject to M.S. 298.225 guarantee) is paid to the RAMS to provide an area-wide approach to problems that demand coordinated and cooperative actions. All cities, towns, and schools in the taconite and iron ore mining area are included. This amount is subtracted from the Taconite Municipal Aid distribution in subd. 3.

Subd. 9 – Douglas J. Johnson Economic Protection Trust Fund (DJJ)

In addition to the amount provided in the remainder after all other distributions are completed, 3.35 cents per taxable ton is allocated to the DJJ. The cents per ton is normally increased in the same proportion as the implicit price deflator as provided in M.S. 294.24, subd 1. However, the escalation for this fund was frozen for distributions in 2015 through 2017.

In addition to the above, for distributions in 2015 through 2017, the DJJ received one-third of the cumulative tax generated due to the increase in the tax rate. The amount received in 2017 was also distributed in 2018 and 2019.

Subd. 9a – Taconite Economic Development Fund

This subdivision is explained on page 3.

Subd. 9b – Producer Grants

Five cents per taxable ton must be paid to the Taconite Environmental Protection Fund (TEPF) for use under M.S. 298.2961, subd. 4. The fund also receives a fixed amount equal to the increased tax proceeds due to the tax rate change for 2005 distributions, as stated in subd. 10 (b).

Subd. 9c – City of Eveleth

The City of Eveleth shall receive 0.20 cents per taxable ton for support of the Hockey Hall of Fame provided that an equal amount of donations have been received. Any amount of the 0.20 cents per ton that exceeds the donations shall be distributed to Iron Range Resources and Rehabilitation.

Subd. 9d – Iron Range Higher Education Account

Five cents per taxable ton must be allocated to Iron Range Resources and Rehabilitation (IRRR) to be deposited in the Iron Range Higher Education Account to be used for higher education programs conducted at educational institutions in the Taconite Assistance Area defined in M.S. 273.1341. The Iron Range Higher Education committee under M.S. 298.2214 and IRRR must approve all expenditures from the account.

Subd. 10 – Indexing

Beginning with distribution in 2000 (1999 production year), the amounts determined under subd. 6, paragraph (a), and subd. 9 are increased in the same proportion as the increase in the implicit price deflator as provided in M.S. 298.24, subd. 1.

Subd. 11 – Remainder

(a) After calculating the initial distributions to the various funds and grandfathered amounts including (b) and (c) below, the remainder is distributed two-thirds to the TEPF and one-third to the DJJ. Any interest earned on money on deposit by the counties is sent to IRRR to be split into the two funds using the same two-thirds/one-third apportionment.

(b) Taconite Railroad
Until 1978, the taconite railroad gross earnings tax was distributed to local units of government based on a formula of 50% to school districts, 22% city or town, 22% county, and 6% to the state. The respective shares were further split based on miles of track in each government unit. Beginning in 1978, the distributions were frozen at the 1977 level and funded from Production Tax revenues. The total amount distributed in 2018 was $2,482,454. Taconite railroad aids are not subject to the percentage reduction mandated for other aids by M.S. 298.225 and so remain constant from year to year. Beginning with the 2002 production year, the taconite railroad distribution to schools was reduced to 62% of the 1977 amount.

(c) Occupation Tax Grandfather Amount to Iron Range Resources and Rehabilitation
In 1978 and each year thereafter, the amount distributed to Iron Range Resources and Rehabilitation was the same as it received in 1977 from the distribution of the taconite and iron ore Occupation taxes: $1,252,520.

Additional Payments

In Minnesota Laws 2013, Chapter 143, Article 11, Section 11, the legislature authorized the commissioner of Iron Range Resources and Rehabilitation (IRRR) to issue $38,000,000 in revenue bonds to make grants to school districts within the Taconite Assistance Area. The grants are to be used for various building projects with the exception of ISD 2142 which must use the grant for debt service reduction for a bond passed in 2009. The revenue bonds are paid from Production Tax revenues prior to the calculation of the remainder under M.S. 298.28, subd. 11, with a maximum of 10 cents per ton. Any amount above 10 cents per ton will be paid by the DJJ fund.

Although the following payments are not included in M.S. 298.28 or its subdivisions, they are subtracted after dividing the remainder described in subd. 11.

These payments consist of school bond payments to school districts within the Taconite Tax Relief Area and Taconite Assistance Area. Most are funded 80% taconite and 20% local efforts.

In Minnesota Laws 2005, Chapter 152, Article 1, Section 39 the legislature authorized the commissioner of IRRR to issue $15,000,000 in revenue bonds to make grants to school districts in the Taconite Tax Relief Area or Taconite Assistance Area. The bonds are to be used by the school districts to pay for health,

safety and maintenance improvements. The bonds are funded in equal shares from the TEPF and the DJJ. Minor amendments were made by the 2006 legislature.

Aid Guarantee (M.S. 298.225)

The recipients of the Production Tax, provided in M.S. 298.28, subds. 2 to 5, subd. 6, paragraphs (b) and (c) and subds. 7 and 8, are guaranteed to receive distributions equal to the amount distributed to them with respect to the 1983 production year, provided that production is not less than 42 million taxable tons. If the production is less, the amount distributed from the fund is reduced proportionately by 2% per each 1,000,000 tons by which the taxable tons are less than 42 million tons. For example, if the taxable tonnage (three-year average) is 39.8 million then the proportionate reduction is 4.4%. This is calculated by multiplying 2% times 2.2 million tons.

This aid guarantee is funded equally from the initial current year distributions to the TEPF and the DJJ. If the initial distributions are insufficient to fund the difference, the commissioner of Iron Range Resources and Rehabilitation makes the payments of any remaining difference from the existing balance of the TEPF and the DJJ in equal proportions.

The commissioner of the Department of Revenue determines the amounts. The 12.5 cent Taconite Municipal Aid Account is covered at 100%.

The aid payments covered by this variable guarantee are listed as follows:

1. 4.5 cents—Taconite Cities and Towns Fund (uses 1999 production year as base year)
2. 21.3 cents— Taconite Referendum Fund
3. 6.5 cents—escalated to Iron Range Resources and Rehabilitation
4. 0.5 cent—RAMS
5. 0.1875 cent—Electric Power Plant Aid is transferred from Taconite Property Tax Relief Account to Cook County
6. 4 cents - Mining Effects Fund (uses 1999 production year as base year)

The following funds are guaranteed at 75% or the variable guarantee, whichever is less:

1. 10.525 cents—Taconite County Fund (For this fund, the 75% guarantee is further reduced by 5 cents per taxable ton)
2. 10.525 cents—Taconite County Road and Bridge Fund

The following funds are guaranteed at 31.2% or the variable guarantee, whichever is less:

1. 24.72 cents—Regular School Fund
2. 3.43 cents—Taconite School Fund
3. 0.4541 cent—Electric Power Plant Aid is transferred from Taconite Property Tax Relief Account to School District 166, Cook County

The Taconite Property Tax Relief Account is not covered by M.S. 298.225, but is separately guaranteed by the DJJ, as stated in M.S. 298.293.

Production Tax Distribution Calculation (M.S. 298.28)

The producers make the Production Tax payments directly to six counties (Aitkin, Cook, Crow Wing, Itasca, Lake, and St. Louis) and Iron Range Resources and Rehabilitation (IRRR). Each county auditor is responsible for making the taconite aid payments to the various jurisdictions within the county. St. Louis County was designated as fiscal agent for the Taconite Property Tax Relief Account and issues Taconite Property Tax Relief checks to the other counties. The state of Minnesota also makes a payment of 22 cents per taxable ton (payable 2024). This money was added to the amount available for distribution.

The Department of Revenue makes all computations regarding the amount paid by the companies, state and the aid payments due to cities, schools, townships, counties and Iron Range Resources and Rehabilitation. Interest earnings on undistributed funds are remitted by the counties to IRRR.

The proceeds of the 2023 Production Tax (payable 2024) were distributed as follows:

M.S. 298.28	Payment Recipients	Cents per Taxable Ton
Subd. 2a	Taconite cities and towns	4.5
Subd. 2b	Taconite cities and towns (mining effects)	4.0
Subd. 3	Taconite Municipal Aid Account	12.2*
Subd. 3(d)	Township Fund	3.0*
Subd. 4	School districts	
	(b)(i) Taconite schools (mining and/or concentrating in the district)	3.43
	(b)(ii) School Building Maintenance Fund	4.0
	(c) Regular School Fund (distributed by formula)	24.72
	(d) Taconite Referendum Fund	(formula amount–see page 6)
Subd. 5	Counties	
	(b and c) Taconite counties (includes electric power plant)	10.525
	(d) Taconite county Road and Bridge	10.525
	Counties total	21.05
Subd. 6	Taconite Property Tax Relief	
	(includes .6416 cents for Cook County and Cook County Schools)	34.8*
Subd. 7	Iron Range Resources and Rehabilitation	6.5*
Subd. 7a	Iron Range Schools and Community Development Account	24.0
Subd. 8	Range Association of Municipalities and Schools	0.5
Subd. 9	Douglas J. Johnson Economic Protection Trust Fund	3.35*
Subd. 9a	Taconite Economic Development Fund	25.1
Subd. 9b	Taconite Environmental Fund for use in Producer Grants	5.0**
Subd. 9c	City of Eveleth (Hockey Hall of Fame)	0.2
Subd. 9d	Iron Range Higher Education Account	5.0
Subd. 10	Indexing provisions	-
Subd. 11	Distribution of remainder	-

* These funds are escalated using the Gross Domestic Product Implicit Price Deflator. After escalation, the cents per ton for the Taconite Municipal Aid Account was 14.45 cents, Township fund was 3.98 cents, Taconite Property Tax Relief was 42.64 cents, Iron Range Resources and Rehabilitation was 10.73 cents, and the Douglas J. Johnson Economic Protection Trust Fund was 5.43 cents.

** Plus amount of revenue due to tax increase generated in pay 2005.

The full amount distributed, including escalation and M.S. 298.225 guarantees, is available in *Figure 4*.

Taconite Environmental Protection Fund (TEPF) and Douglas J. Johnson Economic Protection Trust Fund (DJJ) (M.S. 298.223 and 298.291)

The TEPF and the DJJ were established by the 1977 Legislature. These two funds receive the remainder of the Production Tax revenues after all distributions are made according to M.S. 298.28. The remainder is split with one-third to the DJJ and two-thirds going to the TEPF.

The TEPF was created for the purpose of reclaiming, restoring and enhancing those areas of Minnesota that are adversely affected by environmentally damaging operations involved in mining and producing taconite and iron ore concentrate. The scope of activities includes local economic development projects. The Iron Range Resources and Rehabilitation (IRRR) commissioner administers the fund.

The DJJ is somewhat different in that only interest and dividends earned by the fund may be spent before January 1, 2028. Expenditures from the principal may be made with approval from IRRR for economic development projects.

Taconite Property Tax Relief

The taconite homestead credits described on page 7 are administered by the county auditors. The amounts do not equal the total Production Tax allocated for Property Tax Relief shown in the tables as collections or payments. The difference is carried in the Taconite Property Tax Relief Fund balance with St. Louis County as fiscal agent. If the fund balance and Production Tax collections are not sufficient to make the payments, the deficit is made up from the Douglas J. Johnson Economic Protection Trust Fund. The last time this occurred was in 1989.

Note: The Taconite Property Tax Relief Fund Balance, Taconite Property Tax Relief Fund Distribution, and Taconite Residential Homestead Credit Examples tables are available on our website as Excel files. Go to www.revenue.state.mn.us and type **Mining Statistics** in the Search box.

Figure 4

Distribution by Fund/Recipient*

Production Year	2019	2020	2021	2022	2023
City and Township (Mining/Concentrating)	$2,048,889	$1,938,607	$1,930,198	$1,842,159	$1,935,469
Cities and Towns (Mining Effects)	$1,769,090	$1,673,923	$1,665,780	$1,581,233	$1,661,915
Taconite Municipal Aid Account	$6,750,694	$6,743,652	$6,754,186	$6,770,368	$7,038,064
Taconite Municipal Aid — Special City/ Township Fund	$157,055	$157,055	$139,920	$33,525	$33,525
Township Fund	$1,304,574	$1,237,470	$1,248,919	$1,257,018	$1,404,106
County Fund	$6,981,868	$7,108,076	$7,120,152	$7,193,102	$7,147,137
County Road and Bridge Fund	$4,450,683	$4,185,199	$4,173,031	$3,988,715	$4,180,143
Regular School Fund	$10,271,999	$9,648,464	$9,619,880	$9,186,979	$9,599,846
Taconite School Fund (Mining/Concentrating)	$1,554,556	$1,468,037	$1,464,072	$1,436,556	$1,500,542
School Building Maintenance Fund	$1,518,780	$1,417,884	$1,412,458	$1,343,209	$1,410,017
Taconite Levy Shortfall Payment	$0	$137,699	$1,381,367	$0	$0
Taconite Referendum Fund	$6,178,596	$6,178,596	$6,178,596	$6,178,596	$6,178,596
School Bond Payments	$775,829	$631,705	$355,032	$177,339	$0
Taconite Railroad Aid (total for cities, towns, counties, schools)	$2,482,454	$2,482,454	$2,482,454	$2,482,454	$2,482,454
Taconite Property Tax Relief Fund	$13,966,233	$13,110,149	$11,989,040	$13,457,130	$15,031,781
Iron Range Resources & Rehabilitation (IRRR) (Indexed)	$3,853,249	$3,653,879	$3,683,847	$3,692,686	$4,101,107
IRRR (Fixed)	$1,252,520	$1,252,520	$1,252,520	$1,252,520	$1,252,520
Taconite Economic Development Fund (TEDF)	$10,147,628	$8,940,170	$9,365,582	$8,620,416	$9,084,584
Taconite Environmental Protection Fund (TEPF)	$17,095,863	$15,790,434	$16,670,677	$18,227,837	$18,570,333
TEPF Producer Grants and Loans	$3,159,558	$3,033,438	$3,027,655	$2,940,096	$3,023,604
Douglas J. Johnson Economic Protection Trust Fund (DJJ)	$7,030,321	$6,141,588	$6,916,039	$7,727,575	$8,085,930
Iron Range Higher Education Account	$1,898,475	$1,772,355	$1,766,572	$1,679,013	$1,762,521
IRRR Educational Revenue Bonds	$3,990,234	$3,993,884	$2,730,834	$2,733,034	$5,026,478
Iron Range Schools and Community Dev Account	$6,233,822	$6,139,325	$6,426,027	$6,250.905	$11,857,444
Hockey Hall of Fame	$75,940	$70,895	$70,663	$67,162	$70,501
Range Association of Municipalities and Schools (RAMS)	$136,610	$127,797	$127,393	$124,321	$197,612
Excess School Levy Replacement Money**	($1,438,718)	$0	$0	($217,068)	($467,464)
Levy Replacement Money to Cities/Townships**	$1,438,718	$0	$0	$217,068	$467,464
Unallocated School Levy Replacement Money***	$0	$0	$0	$0	$0
School Money to Cities and Towns for Pay 2018 Levy Reduction***	$0	$0	$0	$0	$0
Total	**$115,085,520**	**$109,035,225**	**$109,952,894**	**$110,243,948**	**$122,636,229**

Dash indicates not eligible.

* The Production Tax is collected and distributed in the year following production. For example, the amount distributed in 2024 was based on the 2023 Production Tax.

** If the combined total of the School District Fund, Regular School Fund and Taconite Railroad exceeds the levy replacement amount, the excess is transferred to cities and townships within the district.

*** If a school district does not allocate all of its eligible levy replacement amount, the unallocated amount is used to reduce the following year's levy for cities and towns within the district.

Figure 5

2024 Distributions by Fund to Cities and Townships

(Based on 2023 production year tax revenues)

	Mining and Concentrating 4.5 cents	Mining Effects 4.0 cents	M.S. 298.28, subd. 3(b)	Township Fund 3.0 cents	Taconite Railroad Aid	Taconite Municipal Aid	Transferred from Schools*	Total
Aitkin County								
Aitkin	–	–	–	–	–	–	–	$0
Aitkin Township	–	–	–	–	–	–	–	$0
Farm Island Township	–	–	–	–	–	–	–	$0
Fleming Township	–	–	–	–	–	–	–	$0
Glen Township	–	–	–	–	–	–	–	$0
Hazelton Township	–	–	–	–	–	–	–	$0
Kimberly Township	–	–	–	–	–	–	–	$0
Lakeside Township	–	–	–	–	–	–	–	$0
Lee Township	–	–	–	–	–	–	–	$0
Libby Township	–	–	–	–	–	–	–	$0
Logan Township	–	–	–	–	–	–	–	$0
Malmo Township	–	–	–	–	–	–	–	$0
Morrison Township	–	–	–	–	–	–	–	$0
Nordland Township	–	–	–	–	–	–	–	$0
Palisade	–	–	–	–	–	–	–	$0
Spencer Township	–	–	–	–	–	–	–	$0
Verdon Township	–	–	–	–	–	–	–	$0
Waukenabo Township	–	–	–	–	–	–	–	$0
Wealthwood Township	–	–	–	–	–	–	–	$0
Workman Township	–	–	–	–	–	–	–	$0
Cook County								
Grand Marais	–	–	–	–	–	–	$4,116	$4,116
Lutsen Township	–	–	–	$26,350	–	–	$6,579	$32,929
Schroeder Township	$7,683	–	–	$9,053	$47,297	$0	$2,626	$66,659
Tofte Township	–	–	–	$12,695	–	–	$2,898	$15,593
Crow Wing County								
Bay Lake Township	–	–	–	–	–	–	–	$0
Center Township	–	–	–	–	–	–	–	$0
Crosby	–	–	–	–	–	$136,592	–	$136,592
Crosslake	–	–	–	–	–	–	–	$0
Cuyuna	–	–	–	–	–	–	–	$0
Deerwood	–	–	–	–	–	–	–	$0
Deerwood Township	–	–	–	–	–	–	–	$0
Emily	–	–	–	–	–	–	–	$0
Fairfield Township	–	–	–	–	–	–	–	$0
Irondale Township	–	–	–	–	–	$0	–	$0
Ironton	–	–	–	–	–	$40,308	–	$40,308
Lake Edward Township	–	–	–	–	–	–	–	$0
Little Pine Township	–	–	–	–	–	–	–	$0
Mission Township	–	–	–	–	–	–	–	$0
Nokay Township	–	–	–	–	–	–	–	$0
Oak Lawn Township	–	–	–	–	–	–	–	$0
Pelican Township	–	–	–	–	–	–	–	$0

*Excess school levy replacement money transferred to cities/townships.

Figure 5 *(cont.)*
2024 Distributions by Fund to Cities and Townships

	Mining and Concentrating 4.5 cents	Mining Effects 4.0 cents	M.S. 298.28, subd. 3(b)	Township Fund 3.0 cents	Taconite Railroad Aid	Taconite Municipal Aid	Transferred from Schools*	Total
Perry Township	–	–	–	–	–	–	–	$0
Rabbitt Lake Township	–	–	–	–	–	–	–	$0
Riverton	–	–	–	–	–	$2,835	–	$2,835
Ross Lake Township	–	–	–	–	–	–	–	$0
Trommald	–	–	–	–	–	$2,077	–	$2,077
Wolford Township	–	–	–	–	–	–	–	$0
Itasca County								
Alvwood Township	–	–	–	–	–	–	$183	$183
Arbo Township	–	–	–	–	–	–	$2,960	$2,960
Ardenhurst Township	–	–	–	–	–	–	$946	$946
Balsam Township	–	–	–	–	–	–	$3,716	$3,716
Bearville Township	–	–	–	–	–	–	$1,334	$1,334
Big Fork	–	–	–	–	–	–	$451	$451
Big Fork Township	–	–	–	–	–	–	$870	$870
Blackberry Township	–	–	–	–	–	–	$2,971	$2,971
Bovey	–	–	–	–	–	$94,883	$94	$94,977
Calumet	–	–	–	–	–	$40,745	$35	$40,780
Carpenter Township	–	–	–	–	–	–	$1,329	$1,329
Cohasset	–	–	–	–	–	–	$21,661	$21,661
Coleraine	–	–	–	–	–	$79,181	$419	$79,600
Effie	–	–	–	–	–	–	$153	$153
Feeley Township	–	–	–	–	–	–	$1,671	$1,671
Good Hope Township	–	–	–	–	–	–	$452	$452
Goodland Township	–	–	–	$24,782	–	–	$200	$24,982
Grand Rapids	–	–	–	–	–	–	$20,676	$20,676
Grattan Township	–	–	–	–	–	–	$117	$117
Greenway Township	$17,587	–	–	$42,382	–	$17,659	$211	$77,839
Harris Township	–	–	–	–	–	–	$10,474	$10,474
Keewatin	$12,744	$65,833	–	–	–	$129,593	$105	$208,275
Kinghurst Township	–	–	–	–	–	–	$382	$382
LaPrairie	–	–	–	–	–	–	$318	$318
Lawrence Township	–	–	–	$25,237	–	–	$166	$25,403
Lone Pine Township	$6,349	$28,848	–	$21,697	–	$2,820	$223	$59,937
Marble	–	–	–	–	–	$60,941	$72	$61,013
Max Township	–	–	–	–	–	–	$386	$386
Moose Township	–	–	–	–	–	–	$250	$250
Nashwauk	$12,509	$65,294	–	–	–	$73,975	$197	$151,975
Nashwauk Township	$9,590	$45,726	–	$34,391	–	$8,370	$253	$98,330
Nore Township	–	–	–	–	–	–	$202	$202
Pomroy Township	–	–	–	–	–	–	$125	$125
Sago Township	–	–	–	–	–	–	$919	$919
Spang Township	–	–	–	–	–	–	$671	$671
Splithand Township	–	–	–	–	–	–	$696	$696

*Excess school levy replacement money transferred to cities/townships.

Figure 5 *(cont.)*
2024 Distributions by Fund to Cities and Townships

	Mining and Concentrating 4.5 cents	Mining Effects 4.0 cents	M.S. 298.28, subd. 3(b)	Township Fund 3.0 cents	Taconite Railroad Aid	Taconite Municipal Aid	Transferred from Schools*	Total
Squaw Lake	–	–	–	–	–	–	$120	$120
Stokes Township	–	–	–	–	–	–	$557	$557
Taconite	–	–	–	–	–	$0	$195	$195
Third River Township	–	–	–	–	–	–	$273	$273
Trout Lake Township	–	–	–	–	–	–	$1,117	$1,117
Wabana Township	–	–	–	–	–	–	$2,950	$2,950
Warba	–	–	–	–	–	–	$325	$325
Wawina Township	–	–	–	–	–	–	$938	$938
Wildwood Township	–	–	–	–	–	–	$716	$716
Lake County								
Beaver Bay	–	–	–	–	–	–	$457	$457
Beaver Bay Township	$2,276	–	–	$27,007	$12,459	–	$1,592	$43,334
Crystal Bay Township	–	–	–	$23,164	$6,892	–	$656	$30,712
Fall Lake Township	–	–	–	$35,453	–	–	$3,665	$39,118
Silver Bay	$76,712	–	–	–	$151,414	$162,095	$1,517	$391,738
Silver Creek Township	–	–	–	$50,000	$20,438	–	$4,056	$74,494
Stony River Township	–	–	–	$10,064	$19,774	–	$870	$30,708
Two Harbors	–	–	–	–	–	–	$3,118	$3,118
St. Louis County								
Alango Township	–	–	–	$14,616	–	–	$204	$14,820
Alborn Township	–	–	–	$21,393	–	–	$543	$21,936
Alden Township	–	–	–	$10,115	–	–	$185	$10,300
Angora Township	–	–	–	$10,975	–	–	$343	$11,318
Arrowhead Township	–	–	–	–	–	–	$1,292	$1,292
Ault Township	–	–	–	$6,878	–	–	$327	$7,205
Aurora	$15,102	$71,029	–	–	–	$234,671	$2,076	$322,878
Babbitt	$86,311	$133,085	–	–	$165,356	$203,296	$829	$588,877
Balkan Township	$4,932	$9,517	–	$39,499	–	$7,940	$10,453	$72,341
Bassett Township	–	$4,407	–	$2,326	$11,646	–	$292	$18,671
Beatty Township	–	–	–	$21,545	–	–	$2,443	$23,988
Biwabik	$29,915	$27,861	–	–	–	$32,261	$2,508	$92,545
Biwabik Township	$12,842	$23,815	–	$41,977	–	$0	$4,126	$82,760
Breitung Township	–	–	–	$26,552	–	$25,000	$1,339	$52,891
Brevator Township	–	–	–	–	–	–	$265	$265
Brookston	–	–	–	–	–	–	$62	$62
Buhl	–	$37,603	–	–	–	$95,028	$7,171	$139,802
Camp 5 Township	–	–	–	$1,011	–	---	$176	$1,187
Cedar Valley Township	–	–	–	–	–	---	$1,342	$1,342
Cherry Township	–	–	–	$41,825	–	---	$980	$42,805
Chisholm	–	$57,855	–	–	–	$662,722	$26,605	$747,182
Clinton Township	–	$29,907	–	$49,462	–	–	$2,093	$81,462
Colvin Township	–	–	–	$13,908	–	–	$1,249	$15,157
Cook	–	–	–	–	–	–	$284	$284
Cotton Township	–	–	–	$23,365	–	–	$706	$24,071

*Excess school levy replacement money transferred to cities/townships.

Figure 5 *(cont.)*

2024 Distributions by Fund to Cities and Townships

	Mining and Concentrating 4.5 cents	Mining Effects 4.0 cents	M.S. 298.28, subd. 3(b)	Township Fund 3.0 cents	Taconite Railroad Aid	Taconite Municipal Aid	Transferred from Schools*	Total
Crane Lake Township	–	–	–	$4,704	–	–	$724	$5,428
Culver Township	–	–	–	$15,628	–	–	$306	$15,934
Duluth Township	–	–	–	$50,000	–	–	$2,420	$52,420
Eagle's Nest Township	–	–	–	$11,279	–	–	$1,118	$12,397
Ellsburg Township	–	–	–	$9,660	–	–	$528	$10,188
Elmer Township	–	–	–	$6,525	–	–	$91	$6,616
Ely	–	–	–	–	–	$326,730	$2,163	$328,893
Embarrass Township	–	–	–	$31,306	–	–	$404	$31,710
Eveleth	$63,193	$107,486	–	–	–	$605,845	$9,357	$785,881
Fairbanks Township	–	–	–	$3,591	–	–	$242	$3,833
Fayal Township	$3,616	$55,807	–	$50,000	–	$0	$14,882	$124,305
Field Township	–	–	–	$18,511	–	–	$443	$18,954
French Township	–	–	–	$29,182	–	–	$16,517	$45,699
Gilbert	$15,089	$48,233	–	–	–	$227,242	$5,112	$295,676
Great Scott Township	$20,245	$17,241	–	$22,354	–	$11,910	$11,213	$82,963
Greenwood Township	–	–	–	$50,000	–	–	$5,292	$55,292
Hibbing	$519,843	$196,581	–	–	–	$1,775,113	$109,090	$2,600,627
Hoyt Lakes	$216,914	$87,246	–	–	$150,866	$245,050	$4,190	$704,266
Industrial Township	–	–	–	$40,966	–	–	$801	$41,767
Iron Junction	–	–	–	–	$5,000	–	$443	$5,443
Kabetogama Township	–	–	–	$6,979	–	–	$664	$7,643
Kelsey Township	–	–	–	$7,890	–	–	$199	$8,089
Kinney	$12,323	$6,007	$33,525	–	–	$33,543	$1,155	$86,553
Kugler Township	–	–	–	$7,333	–	–	$159	$7,492
Lavell Township	–	–	–	$14,515	–	–	$1,314	$15,829
Leiding Township	–	–	–	$20,584	–	–	$837	$21,421
Leonidas	$6,246	$1,621	–	–	–	$4,092	$245	$12,204
Linden Grove Township	–	–	–	$5,664	–	–	$134	$5,798
McDavitt Township	$101,517	–	–	$21,596	–	$8,048	$573	$131,734
McKinley	–	$2,927	–	–	–	$11,231	$340	$14,498
Meadowlands	–	–	–	–	–	–	$50	$50
Meadowlands Township	–	–	–	$15,880	–	–	$269	$16,149
Morcom Township	–	–	–	$4,198	–	–	$97	$4,295
Morse Township	–	–	–	$50,000	–	–	$4,871	$54,871
Mountain Iron	$555,336	$112,341	–	–	–	$265,560	$46,729	$979,966
Ness Township	–	–	–	$3,389	–	–	$100	$3,489
New Independence TS	–	–	–	$18,460	–	–	$356	$18,816
Northland Township	–	–	–	$7,688	–	–	$274	$7,962
Orr	–	–	–	–	–	–	$144	$144
Owens Township	–	–	–	$12,340	–	–	$226	$12,566
Pequaywan Township	–	–	–	$7,181	–	–	$502	$7,683
Pike Township	–	–	–	$20,482	–	–	$2,072	$22,554
Portage Township	–	–	–	$8,749	–	–	$471	$9,220
Sandy Township	–	–	–	$17,196	–	–	$1,682	$18,878

*Excess school levy replacement money transferred to cities/townships.

Figure 5 *(cont.)*
2024 Distributions by Fund to Cities and Townships

	Mining and Concentrating 4.5 cents	Mining Effects 4.0 cents	M.S. 298.28, subd. 3(b)	Township Fund 3.0 cents	Taconite Railroad Aid	Taconite Municipal Aid	Transferred from Schools*	Total
Stoney Brook Township	–	–	–	$16,842	–	---	$218	$17,060
Sturgeon Township	–	–	–	$7,839	–	---	$142	$7,981
Toivola Township	–	–	–	$8,851	–	---	$187	$9,038
Tower	–	–	–	–	–	$32,057	$269	$32,326
Vermillion Lake TS	–	–	–	$13,605	–	---	$500	$14,105
Virginia	$43,506	$326,142	–	–	–	$1,330,297	$26,679	$1,726,624
Waasa Township	–	$9,627	–	$11,228	–	---	$238	$21,093
White Township	$25,244	$67,603	$0	$50,000	–	$42,448	$3,989	$189,284
Willow Valley Township	–	–	–	$5,310	–	---	$119	$5,429
Winton	–	–	–	–	–	---	$75	$75
Wuori Township	$57,845	$22,273	–	$28,879	–	$5,906	$3,127	$118,030
Total	**$1,935,469**	**$ 1,661,915**	**$33,525**	**$1,404,106**	**$591,142**	**$7,038,064**	**$467,464**	**$13,131,685**

Dash indicates not eligible. $0 indicates eligible, but no payment at current valuation and production.

*Excess school levy replacement money transferred to cities/townships.

Figure 6
2024 Distributions by Fund to School Districts
(Based on 2023 production year tax revenues)

School Districts	Taconite School Fund $0.0343	Regular School Fund $0.2472	Taconite Railroad Aid	School Bldg. Maintenance Fund $0.04	Taconite Referendum $0.213	Less Excess Money Transferred to Cities and Townships	Total by School District
001 Aitkin	–	$221,464	–	–	$62,694	$0	$284,158
166 Cook County	$21,087	$74,697	$264,977	–	$91,498	($16,219)	$436,040
182 Crosby-Ironton	–	$230,625	–	–	$222,602	$0	$453,227
316 Greenway	$33,373	$923,088	–	$142,803	$372,009	($1,945)	$1,469,328
318 Grand Rapids	$0	$1,257,630	–	–	$428,400	($80,391)	$1,605,639
319 Nashwauk-Keewatin	$51,555	$365,925	–	$62,898	$268,675	($743)	$748,310
381 Lake Superior	$68,377	$416,035	$342,720	$52,626	$244,417	($19,774)	$1,104,401
695 Chisholm	–	$861,740	–	$67,930	$469,527	($36,867)	$1,362,330
696 Ely	–	$118,787	–	–	$213,624	($7,109)	$325,302
701 Hibbing	$365,579	$1,824,451	–	$196,023	$1,219,547	($127,777)	$3,477,823
712 Mtn. Iron-Buhl	$438,246	$430,288	–	$97,327	$349,776	($67,281)	$1,248,356
2142 St. Louis County	$152,093	$552,354	$284,841	$160,156	$429,452	($26,854)	$1,552,042
2711 Mesabi East	$183,337	$542,632	$214,397	$146,549	$425,333	($15,902)	$1,496,346
2909 Rock Ridge	$186,895	$1,780,130	$0	$483,705	$1,381,042	($66,602)	$3,765,170
Total	**$1,500,542**	**$9,599,846**	**$1,106,935**	**$1,410,017**	**$6,178,596**	**($467,464)**	**$19,328,472**

Dashes indicate not eligible. $0 indicates eligible, but no payment at current valuation and production.

Figure 7
School Bond Payments

School Districts	Year Authorized[1]	Final Payment Year[2]	Payment[3]	Outstanding Balance[4]
			$0	$0

1 Legislative year in which taconite funding was enacted.
2 Production year from which final bond payment will be deducted.
3 Payments made from 2023 pay 2024 tax distribution.
4 Estimated portion of outstanding bond balance to be paid by taconite funds (not including interest).

Figure 8
2024 Distribution by Fund to Counties
(Based on 2023 production year tax revenues)

County	Regular County 10.525 cents	Road and Bridge 10.525 cents	Taconite Railroad	Total by County
Cook	$104,203	–	$187,190	$291,393
Itasca	$372,393	$102,325	–	$474,718
Lake	$546,647	$159,737	$243,034	$949,418
St. Louis	$6,123,894	$3,918,081	$354,153	$10,396,128
Total	**$7,147,137**	**$4,180,143**	**$784,377**	**$12,111,657**

Dash indicates not eligible.

Figure 9

2023 Taxable Production and Tax by Mine

(Includes taconite, DRI/iron nuggets, concentrate, and other iron-bearing material)

Producer	Production Tonnage	Taxable Tonnage*	Production Tax Rate per Ton	Tax Assessed
Hibbing Taconite	6,534,997	6,598,822	$3.259	$21,505,561
Keewatin Taconite	4,875,060	5,142,525	$3.259	$16,759,489
Minntac	13,010,421	13,040,173	$3.259	$42,497,924
Minorca	2,693,251	2,570,900	$3.259	$8,378,563
Northshore	3,071,376	3,027,469	$3.259	$9,866,521
United Taconite	4,978,094	4,870,536	$3.259	$15,873,077
Total	**35,163,199**	**35,250,425**	**$3.259**	**$114,881,135**

* Taxable tonnage is the average production of the current year and previous two years for taconite producers. Other iron-bearing is the production of the current year.

Mesabi Nugget, Mining Resources, and ERP Iron Ore remained idled throughout 2023.

Figure 10

2023 Production Tonnage by Product Type

Producer	Pellets			Chips and Fines			DRI/Iron Nuggets	Total Tons by Mine
	Acid	Fluxed	Partial Fluxed	Acid	Fluxed/ Partial Fluxed	Concentrate	Nuggets	
Hibbing Taconite	–	–	6,534,997	–	–	–	–	6,534,997
Keewatin Taconite	–	–	4,827,785	–	42,824	4,451	–	4,875,060
Northshore	–	–	2,995,596	–	75,780	0	–	3,071,376
Minntac	690,566	12,196,884	122,971	–	0	–	–	13,010,421
Minorca	0	2,646,170	0	–	47,081	–	–	2,693,251
United Taconite	–	1,478,394	3,499,700	–	0	0	–	4,978,094
Total Tons	**690,566**	**16,321,448**	**17,981,049**	**0**	**165,685**	**4,451**	**0**	**35,163,199**

Dash indicates not produced.

* Partially fluxed pellets contain less than 2% flux.

Figure 11

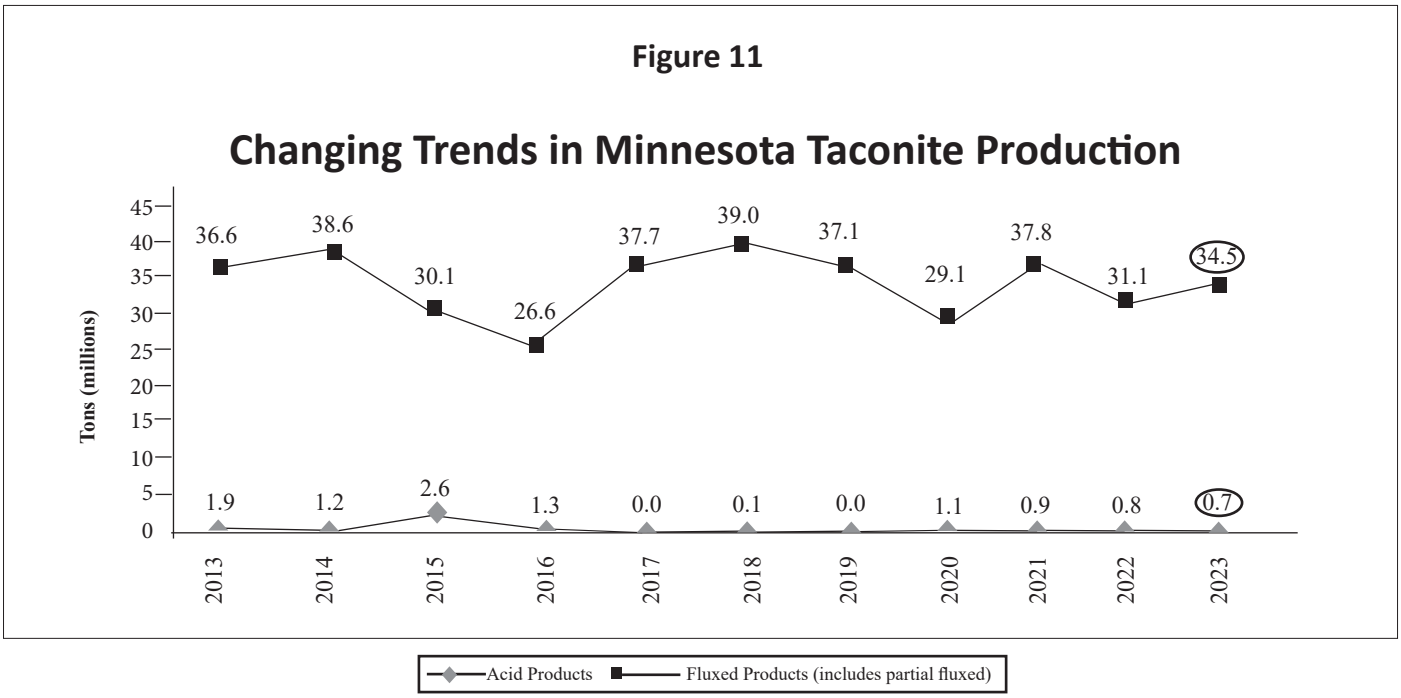

Changing Trends in Minnesota Taconite Production
Tons (millions)
45
40
35
30
25
20
15
10
5
0
36.6
38.6
30.1
26.6
37.7
39.0
37.1
29.1
37.8
31.1
34.5
1.9
1.2
2.6
1.3
0.0
0.1
0.0
1.1
0.9
0.8
0.7
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Acid Products
Fluxed Products (includes partial fluxed)

Figure 12

Production Tax Rate History and Index Summary

Production Year	Statutory	Fe (iron)	Inflation	Total	TEDF
2014	256.0 cents	0	3.7 (IPD) cents	259.7 cents	25.1 cents
2015	256.0 cents	0	7.0 (IPD) cents	263.0 cents	25.1 cents
2016	256.0 cents	0	9.9 (IPD) cents	265.9 cents	25.1 cents
2017	256.0 cents	0	14.1 (IPD) cents	270.1 cents	25.1 cents
2018	256.0 cents	0	19.1 (IPD) cents	275.1 cents	25.1 cents
2019	256.0 cents	0	25.1 (IPD) cents	281.1 cents	25.1 cents
2020	256.0 cents	0	29.6 (IPD) cents	285.6 cents	25.1 cents
2021	256.0 cents	0	33.2 (IPD) cents	289.2 cents	25.1 cents
2022	256.0 cents	0	50.3 (IPD) cents	306.3 cents	25.1 cents
2023	256.0 cents	0	69.9 (IPD) cents	325.9 cents	25.1 cents
2024	**256.0 cents**	**0**	**78.5 (IPD) cents**	**334.5 cents**	**25.1 cents**

Historical data available on website.

Figure 13

Production and Production Tax Assessed

Year	Production Tons (000s)	Production Tax (000s)	Collected Rate Per Production Ton	Taxable Tons (000s)	Tax Rate Per Taxable Ton
2013	38,481	101,214	2.630	39,608	2.560
2014	39,835	102,370	2.570	39,437	2.597
2015	32,664	98,729	3.023	37,539	2.630
2016	29,088	89,146	3.065	33,524	2.659
2017	37,720	86,728	2.299	32,110	2.701
2018	39,099	96,104	2.458	34,934	2.751
2019	37,090	106,732	2.878	37,969	2.811
2020	30,153	101,237	3.357	35,447	2.856
2021	38,712	102,184	2.640	35,331	2.892
2022	31,896	102,856	3.225	33,580	3.063
2023	**35,163**	**114,881**	**3.267**	**35,250**	**3.259**

Historical data is available on our website.

A three-year average is used, except for other iron-bearing material which uses the current year.

Direct Reduced Iron (DRI)

Because it is subject to the Production Tax, a DRI production plant and facilities is exempt from regular ad valorem (Property) taxes. The taxable tonnage is based on a three-year production average. Pig iron is considered DRI for the purpose of Production Tax and incentives.

A steel plant would be subject to Ad Valorem (Property) taxes as would any other business. If a steel plant were in conjunction with a DRI plant, the DRI portion would be subject to the Production Tax, thus exempt from Ad Valorem (Property) taxes.

Reduced Production Tax Rate for DRI

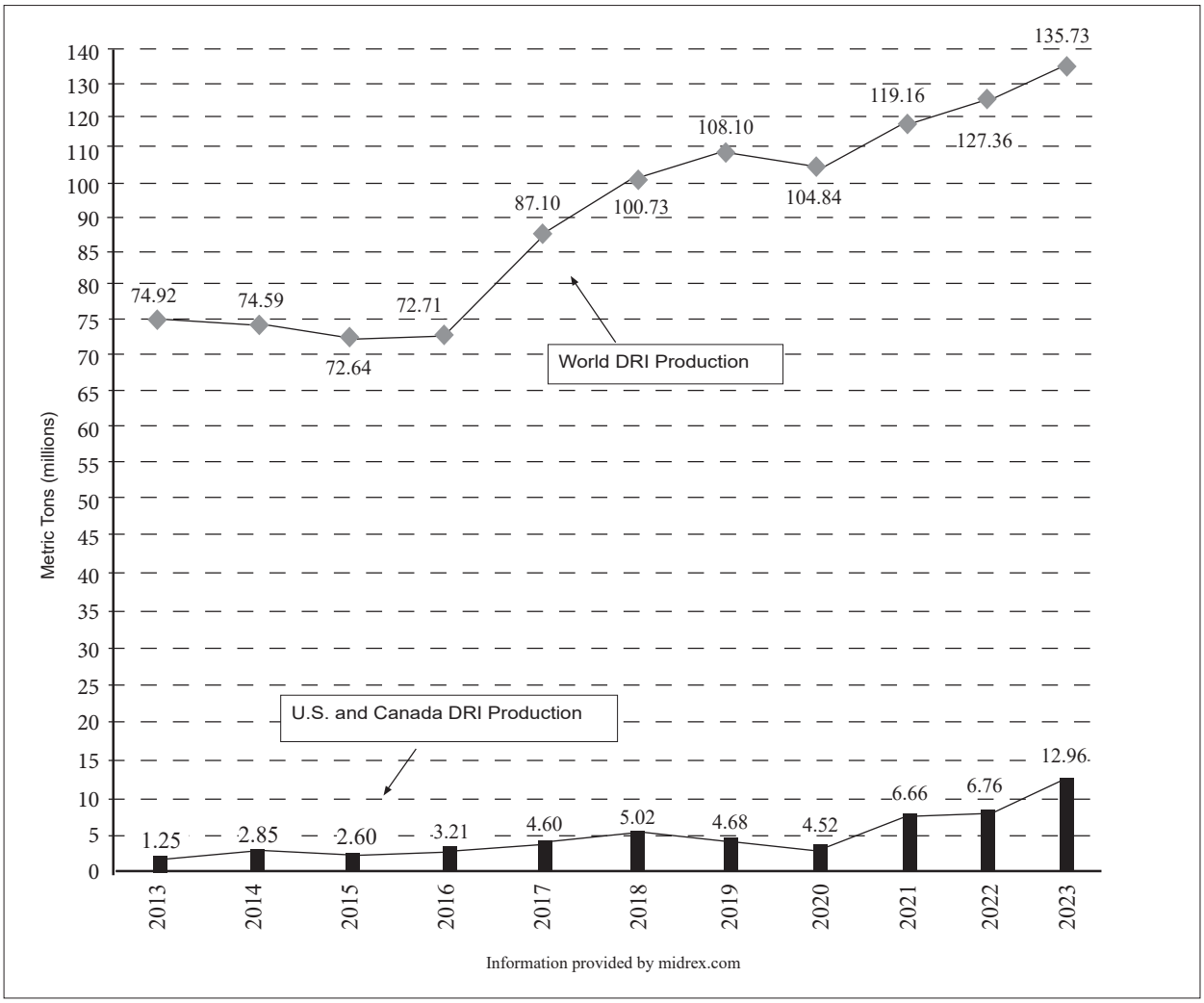
The first five years of a DRI plant's commercial production are subject to reduced tax rates if all environmental permits have been obtained and construction has begun before July 2, 2008. Commercial production is defined as more than 50,000 tons.

Years of operation	% of regular rate	Years of operation	% of regular rate
1	0%	4	50%
2	0%	5	75%
3	25%	6	100%

The Production Tax rate for DRI is the regular rate plus an additional 3 cents per gross ton for each 1% that the iron content exceeds 72% when dried at 212 degrees Fahrenheit. Thus, at a base Production Tax rate for 2023 of $3.259 per ton, the tax rate for 90% iron DRI would be $3.799. The rate for 95% DRI would be $3.949.

Figure 14

World Direct Reduced Iron Production



Occupation Tax

(M.S. 298.01, 298.16 – 298.18)

Minnesota's Occupation Tax applies to mining and producing both ferrous and nonferrous minerals, including taconite and iron ore, and other minerals such as gold, silver, copper, nickel, and titanium.

The Occupation Tax is paid in lieu of the Corporate Franchise Tax on mining activities. Generally, it is determined in the same manner as Minnesota's Corporate Franchise Tax under M.S. 290.02 but there are a few exceptions:

- The unitary provisions of the Corporate Franchise Tax law do not apply to Occupation Tax.
- Mining companies may use percentage depletion.
- The Alternative Minimum Tax (AMT) does not apply.
- All sales are Minnesota sales, so 100% of net income is assigned to Minnesota.
- The tax rate is 2.45%.

Ferrous Minerals

Gross income from mining or producing ferrous minerals is based on "mine value;" i.e., the value of the products produced *after* beneficiation or processing, but *prior* to any stockpiling, transportation, marketing, and marine insurance, loading or unloading costs.

The procedure for determining a company's mine value was developed by the Department of Revenue and representatives from the taconite industry in 1990. The department sets product values each year, which are generally based on the following:

(1) Seventy-five percent of the change in the product value is based on the change in the Steel Mill Products Index (SMPI) from June of the previous year to June of the current year; and

(2) Twenty-five percent of the change in product value is based on actual transaction prices of products sold in nonequity sales as reported by the mining companies.

When ferrous minerals, such as taconite pellets, chips or concentrate, are used by the producer or disposed of or sold in a **non-arms-length transaction**, the company must use the product values set by the department to determine the mine value for Occupation Tax.

Non-arms-length transactions include, but are not limited to, any sales or shipments to: 1) any steel producer having any ownership interest in the selling or shipping company, or 2) any steel producer affiliated or associated with any firm having any ownership or other financial interest in the selling or shipping company.

For **nonequity or arms-length transactions**, a company may choose to determine the mine value by using either 1) actual sales prices (f.o.b. mine) or 2) the product values set by the department. It must select one of these options the first time a nonequity sale is made. *Once it selects an option, however, it must continue to use that option for all nonequity sales in the future*. Requests to change the selected option must receive approval from the department.

Product Values

Acid Pellets: The value of acid pellets is based on the change in the SMPI from June of the previous year to June of the current year (75%), and actual sales prices of nonequity sales (25%).

Flux Pellets: The value of flux pellets is based on the acid pellet value, adjusted based on the amount of flux in the finished pellets.

- *Partial Flux (less than 2% flux)*: Pellets with 1.99% or less flux are valued at $0.015 per Fe (iron) unit higher than the acid pellet value.
- *Flux*: Pellets with 2% or more flux are valued at $0.015 per Fe (iron) unit higher than the acid pellet value *per each 1% of flux* in the finished pellet.

Chips, Fines, and Concentrate: Acid chips (fines) and concentrate are valued at 75% of the acid pellet value. Flux chips and concentrate are valued at 75% of the flux pellet value.

Direct Reduced Iron (DRI): The value of DRI is based on the change in the SMPI from June of the previous year to June of the current year (100%). There are currently insufficient nonequity sales reported to determine a nonequity sales factor.

2023 Product Values per Iron Unit

Value per Fe (iron) unit (per dry gross ton) for the period January 1 – December 31, 2023:

	Value
Acid pellets	$1.805 per iron unit
Pellet chips (fines) and concentrate	75% of acid or fluxed pellet price
Flux pellets – partial flux (.1% – 1.99% flux)	$1.805 + $0.015 = $1.820
Flux (2.00% and higher flux) *	$1.805 + $0.015 per iron unit for each 1% flux
Direct reduced iron (DRI)	$8.306 per iron unit

***Example:** Pellet with 4.8% flux in finished pellet: 4.0 × $0.015 = $0.060
Mine value: $1.805 + $0.060 = $1.865

Acid Pellet and DRI Values 2019–2023		
	Acid Pellets (per iron unit)	**DRI** (per iron unit)
2019	1.351	4.956
2020	1.222	4.360
2021	2.118	8.249
2022	2.348	10.093
2023	1.805	8.306

Nonferrous Minerals

Gross income from mining or producing nonferrous minerals, such as copper, nickel, gold, etc., is calculated differently from the method used for ferrous minerals.

For **nonequity or arms-length transactions**, gross income is based on actual sales. Generally, for **non-arms-length transaction**s, gross income is based on the average annual market price as published in the *Engineering and Mining Journal*.

Occupation Tax Distribution

All Occupation Tax revenue is deposited in the state's General Fund. Ten percent is used for the general support of the University of Minnesota and 40% for elementary and secondary schools. Fifty percent remains in the General Fund.

Of the amount remaining in the General Fund, the following appropriations are made based on taxable tonnage used to calculate the Production Tax. For the 2023 pay 2024 distributions, the taxable tonnage was 35,250,425 tons.

Region 3 Counties: An amount equal to 1.5 cents per taxable ton is appropriated to the Iron Range Resources and Rehabilitation for counties in Region 3 not qualifying for Taconite Property Tax Relief. Only Carlton and Koochiching counties qualify. These funds must be used to provide economic or environmental loans or grants.

Region 3 Distributions			
2019	$524,015	2022	$529,972
2020	$569,542	2023	$503,704
2021	$531,706	2024	$528,756

Department of Natural Resources. An amount equal to 2.5 cents per taxable ton is appropriated to the Mining Environmental and Regulatory Account managed by the Department of Natural Resources. These funds must be used for work on environmental issues and to provide regulatory services for ferrous and nonferrous mining operations in the state. The distribution is made by July 1 annually. The amount distributed in 2024 was $881,261.

Iron Range Resources and Rehabilitation. An amount equal to 6 cents per taxable ton is appropriated to the Iron Range School Consolidation and Cooperatively Operated School Account managed by IRRR The distribution is made on May 15 annually starting in 2015. The amount distributed in 2024 was $2,115,026.

Figure 15
Employment and Mine Value by Mine
Production Year 2023

Company	Employment	Tons Produced	Mine Value*
Minorca	380	2,855,256	$333,348,614
Hibbing Taconite	690	6,566,848	788,809,782
Northshore	491	3,089,014	370,438,437
U.S. Steel-Keewatin Taconite	429	4,918,822	585,522,141
U.S. Steel-Minntac	1,448	13,515,162	1,589,692,935
United Taconite	536	5,113,077	603,687,494
Total – Taconite	**3,974**	**36,058,179**	**$4,271,499,403**
Mesabi Nugget	0	0	0
Total – DRI	**0**	**0**	**0**
Magnetation	**	**	**
Mining Resources	0	0	0
Total – Natural Ore	**0**	**0**	**$0**
Total – All	**3,974**	**36,058,179**	**$4,271,499,403**

* The mine value is based on product values set by the Department of Revenue. It does not represent actual sales by companies.
** Information not provided.

Figure 16
Occupation Tax by Company*

	2016 (000s)	2017 (000s)	2018 (000s)	2019 (000s)	2020 (000s)	2021 (000s)	2022 (000s)	2023 (000s)
Minorca	$0	$0	$500	$150	$200	$3,750	$2,900	$1,660
Hibbing Taconite	2,170	2,030	3,400	3,500	1,500	10,550	7,700	5,750
Northshore	600	1,260	1,770	1,140	0	3,900	0	980
U.S. Steel	1,829	9,186	11,732	9,096	4,101	29,506	27,099	11,558
United Taconite	0	575	1,680	1,550	830	5,700	4,900	3,010
Total – Taconite	**$4,599**	**$13,501**	**$19,082**	**$15,436**	**$6,631**	**$53,406**	**$42,599**	**$22,958**
Mesabi Nugget	$0	$0	$0	$0	$0	$0	$0	$0
Total – DRI	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Magnetation	$0	$0	$0	$0	$0	$0	$0	$0
Mining Resources	0	0	0	0	0	0	0	0
Total – Natural Ore	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$4,599**	**$13,501**	**$19,082**	**$15,436**	**$6,631**	**$53,406**	**$42,599**	**$22,958**

* Amount paid by May 1 each year. Does not include adjustments.
** The Occupation Tax by Company total shown for 2016 in the 2017 Mining Tax Guide was incorrect. See breakdown above for correct totals.

Figure 17
Occupation Tax by Product Type*
(Iron Ore, Direct Reduced Ore, Taconite)

	Iron Ore		Direct Reduced Iron		Taconite		Total	
Year	Tons Produced (000s)	Occupation Tax (000s)	Tons Produced (000s)	Occupation Tax (000s)	Tons Produced (000s)	Occupation Tax (000s)	Tons Produced (000s)	Occupation Tax (000s)
2016	**	$0	0	$0	28,849	$4,599	28,849	$4,599
2017	0	$0	0	$0	38,680	$13,051	38,680	$13,051
2018	0	$0	0	$0	40,244	$19,082	40,244	$19,082
2019	0	$0	0	$0	38,053	$15,436	38,053	$15,436
2020	0	$0	0	$0	31,026	$6,631	31,026	$6,631
2021	0	$0	0	$0	39,475	$53,406	39,475	$53,406
2022	0	$0	0	$0	32,735	$42,599	32,735	$42,599
2023	0	$0	0	$0	36,058	$22,958	36,058	$22,958

Dash indicates not applicable. $0 indicates eligible, but no payment at current valuation and production.

* Amount paid by May 1 each year. Does not include adjustments.
** Information not provided.

Figure 18

Occupation Tax Averages – Taconite Only

Year	Tons Produced (000s)	Average Value	Cost of Beneficiation	Cost of Mining	Development	Production & Property Tax Paid	Sales and Use Tax Paid	Admin. and Misc. Expense	Royalty	Taxable Value of Production	Occupation Tax Paid
2019	38,053	89.19	32.71	13.09	2.55	2.69	0.18	10.87	3.53	23.57	0.41
2020	31,026	80.95	35.06	13.99	3.11	3.22	0.23	12.01	3.48	9.85	0.21
2021	39,475	139.54	32.06	14.15	2.43	2.51	0.21	12.20	5.35	70.63	1.35
2022	32,735	153.95	42.91	17.10	2.98	3.05	0.28	17.33	5.05	65.25	1.30
2023	**36,058**	**118.46**	**41.91**	**16.56**	**2.82**	**3.02**	**0.27**	**12.96**	**4.09**	**36.82**	**0.64**

Cost of Beneficiation

Year	Tons Produced (000s)	Beneficiation Labor (000s)	Per Ton	Beneficiation Supplies (000s)	Per Ton	Beneficiation Depr. and Int. (000s)	Per Ton	Beneficiation Misc. Per Ton	Total Beneficiation Per Ton
2019	38,053	155,361	4.08	697,561	18.33	113,014	2.97	7.33	32.71
2020	31,026	119,103	3.84	619,096	19.95	124,691	4.02	7.25	35.06
2021	39,475	150,374	3.81	725,859	18.39	84,326	2.14	7.73	32.06
2022	32,735	155,656	4.76	746,620	22.81	106,789	3.26	12.08	42.91
2023	**36,058**	**170,739**	**4.74**	**828,038**	**22.96**	**117,278**	**3.25**	**10.96**	**41.91**

Cost of Mining

Year	Tons Produced (000s)	Mining Labor (000s)	Per Ton	Mining Supplies (000s)	Per Ton	Cost of Mining	Mining Depreciation (per ton)	Total Mining Costs Per Ton
2019	38,053	145,244	3.82	293,395	7.71	11.53	1.57	13.09
2020	31,026	122,835	3.96	246,021	7.93	11.89	2.10	13.99
2021	39,475	155,663	3.94	330,787	8.38	12.32	1.83	14.15
2022	32,735	150,761	4.60	335,479	10.25	14.85	2.25	17.10
2023	**36,058**	**161,293**	**4.47**	**352,143**	**9.77**	**14.24**	**2.33**	**16.57**

This information is provided by Minnesota mining companies and is not audited by the Department of Revenue.

Ad Valorem Tax on Auxiliary Mining Lands for Taconite Operations

(M.S. 272.01)

Lands and structures actively used for taconite production are exempt from the Ad Valorem Tax and are subject to the Production Tax *in lieu* of Property Tax. Actively used lands include the plant site, mining pit, stockpiles, tailings pond, and water reservoirs. Also included are lands stripped and ready for mining, but not lands merely cleared of trees. It is important to note that this exemption applies only to the Ad Valorem Tax on the land and buildings and *not to the Unmined Taconite Tax* described on the following page. Lands adjacent to these facilities, commonly referred to as auxiliary mining lands, are subject to assessment of Ad Valorem Tax administered by the county.

The county assessor is responsible for estimating the market value of auxiliary mining lands and classifying them into one of several property classifications established by Minnesota law. The two most common property classifications used on auxiliary mining lands are industrial and rural vacant land. In general, lands in close proximity to active taconite operations are assigned the industrial classification while those further away are classified as rural vacant land. The classification of property is covered in M.S. 273.13.

Each property classification has a legislatively set percentage called the class rate that is multiplied by the property's taxable market value (TMV) to calculate tax capacity. For taxes payable 2023, the class rate for rural vacant land is 1.00% of the estimated market value. For the industrial classification, there are two class rates: 1.50% for the first $150,000 of the TMV and 2.0% for the value over $150,000.

Property taxes are calculated by multiplying a property's tax capacity times the tax extension rate for the jurisdiction where it is located. Tax extension rates are determined by county, local government and school district spending. In St. Louis County within the mining area for taxes payable in 2024, they range from a low of approximately 87% to a high of approximately 304%. In addition, the market value times the referendum rate must be added to the tax determined above if there is a referendum in the taxing district. For industrial class property, the state general tax rate of 29.294% applies in addition to the local tax rate.

The following schedule provides for adjustments in both the valuations and classifications of auxiliary mining lands located on the iron formation versus off-formation lands as well as further refinements based on the proximity of these lands to active mining operations. It outlines valuation adjustments to be made on excess lands where they are located as market conditions and/or Minnesota statutes dictate (see below). This schedule was updated based on market conditions for the 2023 assessment.

St. Louis County Mining Land Assessment Schedule

1. Iron formation land	**Value ($/acre)**	**Classification**
A. Land within ¼ mile of active pit	$1,340	Industrial
B. Excess land (more than ¼ mile from mining activity or outside 15-year pit limit).		
1. Undisturbed	$804	Rural Vacant Land or current use
2. Disturbed		
a. Stockpiles	$603	Rural Vacant Land or current use
b. Abandoned Pits	$402	Rural Vacant Land or current use
2. Off-formation land		
A. Land within ¼ mile of mining activity	$938	Industrial
B. Excess Land		
1. Undisturbed	$804	Rural Vacant Land or current use
2. Tailings Ponds		
a. Stockpiles	$603	Rural Vacant Land or current use
b. Tailings Ponds	$402	Rural Vacant Land or current use

Ad Valorem Tax on Unmined Taconite

(M.S. 298.26)

A tax not exceeding $15 per acre may be assessed on the taconite or iron sulfides in any 40-acre tract from which the production of iron ore concentrate is less than 1,000 tons.

The heading in the statute is somewhat misleading since it refers to a *Tax on Unmined Iron Ore or Iron Sulfides*. The tax clearly applies to unmined taconite and has been administered in that manner. The term "iron ore" does not refer to high-grade natural ore in this instance.

The tax, as presently administered, applies to all iron formation lands on the Mesabi Range. The statutory exemption administered by the county assessor provides that in any year in which at least 1,000 tons of iron ore concentrates are produced from a 40-acre tract or government lot, the tract or lot are exempt from the Unmined Taconite Tax. The county assessors have also exempted actual platted townsites that are occupied.

The iron formation lands on the Mesabi Range are divided into two categories by the Department of Revenue. This is done through the evaluation of exploration drill hole data submitted by the mining companies.

The categories are:

1) Lands that are underlain by magnetic taconite of sufficient quantity and grade to be currently economic: They are considered to be economic taconite and are given a market value of $500 per acre.

2) Lands either not believed or not known to be underlain by magnetic taconite of current economic quantity, quality and grade: They are considered to be uneconomic taconite and are given a market value of $25 per acre.

To be classified as economic taconite, category 1, the taconite must pass the following criteria:

— contain more than 16% magnetic iron with the Davis tube test;

— contain less than 10% concentrate silica (SiO_2) with the Davis tube test;

— have a 15- to 25-foot minimum mining thickness; and

— have a stripping ratio of less than four-to-one (waste/concentrate), calculated as follows:

A) Surface (ft.) x 1.5= Equiv. Ft. Surface

B) Rock (ft.) x 2.25 = Equiv. Ft. Waste

C) $\frac{\text{Ore (ft.) x 2.5}}{3}$ = Equiv. Ft. Concentrate

Stripping Ratio = $\frac{A + B}{C}$

If the material fails any of the above criteria, then it is considered to be *uneconomic* taconite and classified as category 2. Some lands may also be considered as uneconomic due to environmental restrictions.

For taxes payable in 2024, the tax is calculated by multiplying the market value for the parcel of land by the 2.00% class rate to obtain the tax capacity. The special rate on the first $150,000 of market value that applies to class 3 commercial/industrial property does not apply to class 5 unmined taconite. This is then multiplied by the local tax rate. *Note: Call your county auditor for more information.*

Figure 19

Ad Valorem Tax on Unmined Taconite

(Year payable)

County	2017	2018	2019	2020	2021	2022	2023	2024
Itasca	$ 41,697	$ 45,283	$ 41,465	$ 31,876	$ 30,858	$ 30,662	$ 28,827	$ 28,724
St. Louis	254,900	236,177	247,293	238,861	253,975	259,791	242,378	219,979
Total	**$296,597**	**$281,460**	**$288,758**	**$270,737**	**$284,833**	**$290,453**	**$271,205**	**$248,703**

Ad Valorem Tax on Unmined Natural Iron Ore

(M.S. 272.03, 273.02, 273.12, 273.13, 273.165, 273.1104)

Since 1909, Minnesota's natural iron ore reserves have been estimated and assessed by the state for Ad Valorem Tax purposes. The actual Ad Valorem Tax levy is set by the county, the school district, and the local township or municipality. The county auditor collects the tax levy.

A Minnesota Supreme Court decision in 1936 established the present worth of future profits method for valuing the iron ore reserves. This is accomplished through the use of a complex formula known as the Hoskold Formula. The formula takes into account ore prices and all the various cost factors in determining the value of the unmined ore.

Each year, the Department of Revenue uses a five-year average for allowable costs taken from the Occupation Tax report. A five-year average of the Lake Erie iron ore market value is also used. These averages are used to help reduce fluctuation of value due to sudden cost/price changes.

The following expenses are allowed as deductions from the Lake Erie market value on the computation of present worth, which is known as the Hoskold Formula:

1a. Mining, normal costs
1b. Mining, special costs
2. Beneficiation
3. Miscellaneous (Property Tax, medical ins., etc.)
4. Development (future)
5. Plant and equipment (future)
6. Freight and marine insurance
7. Marketing expense
8. Social Security tax*
9. Ad Valorem Tax (by formula)
10. Occupation Tax
11. Federal income tax
12. Interest on development and working capital

* Since 1987, Social Security tax has been included under miscellaneous.

These 12 allowable expense items are deducted from the Lake Erie market value to give the estimated future income (per ton). Note that although royalty is allowable as an Occupation Tax deduction, it is not allowable on the Ad Valorem Tax.

The present worth is then determined by multiplying the estimated future income (per ton) by the Hoskold Factor. The Department of Revenue presently allows a 12% risk rate and 6% safe rate that yields the .33971 Hoskold factor when used with a 20-year life. A 20-year life has been used since 1968 as representative of the remaining life of Minnesota's natural iron ore reserves. The resulting value is considered the market value by the Department of Revenue.

The term "class rate" was introduced for taxes payable in 1990. For 2002 and thereafter, this rate is reduced to 2.0%.

The tax capacity is the product of the class rate and the market value. The product of the market value and class rate must then be multiplied by the local tax rate plus the state general Property Tax rate to determine the tax. In addition, the market value times the referendum rate must be added if there is a referendum in the taxing district.

Local tax rates are a function of county, local government, and school district spending. In addition, a statewide general Property Tax levy applies to most types of property with the exception of agricultural and homestead properties. For example, for taxes payable in 2024, tax rates ranged from a low of approximately 87% to a high of approximately 304% (not including the state general Property Tax rate of 29.294%) in St. Louis County. The class rate from 2002–2024 has been 2%.

The special rate on the first $150,000 of market value that applies to class 3 commercial/industrial property does not apply to unmined iron ore that are class 5 properties.

The Department of Revenue has tried to maintain all ores on the tax rolls, including the uneconomic, underground, and unavailable classifications. A schedule of minimum rates was established in 1963 and revised in 1974, 1986, 1988, 1992 and 1999. The market values for iron ores that do not show a value with the Hoskold Formula are determined from the schedule of minimum rates. The table on the following page *(Figure 20)* lists the current schedule of minimum rates. Most of the iron ore value remaining today was determined using the schedule of minimum rates.

Open pit ores with too high of a cost to show a value with the Hoskold Formula are assigned minimum values from the open pit classification. Underground and uneconomic ores with stripping ratios exceeding five-to-one are assigned minimum values from underground uneconomic classification.

Beginning with the 1999 assessment, the minimum rates for determining market values in Crow Wing County were reduced by 50%. This simply recognizes that the potential for mining iron ore is substantially less in Crow Wing County than on the Mesabi Range in St. Louis or Itasca counties *(Figure 19)*.

A notice of the market value of unmined ore is sent to each person subject to the tax and to each taxing district affected on or before May 1 (M.S. 273.1104).

According to the provisions of M.S. 273.1104, a public hearing to review the valuations of unmined iron ore must be held on the first secular day following May 20. This hearing provides an opportunity for mining company and taxing district representatives to formally protest any of the ore estimates or valuation procedures they believe to be incorrect.

In addition, current conditions and future trends in the iron ore industry are discussed. Iron ore Ad Valorem taxes are expected to continue their long decline as remaining economic deposits are mined or allowed to go tax forfeit. Reserves in old flooded pits converted to recreational use are classified as underground, low-grade recreational.

Figure 20
Minimum Valuation Rates on Unmined Natural Iron Ore

Ore Classification	Market value/ton (cents)	
	Itasca and St. Louis Counties	Crow Wing County
Wash Ore Concentrate (OPC)	12.0	6.0
Heavy Media Concentrate (HMC)	9.0	4.5
Low Grade (OPPRC)	3.0	1.5
Underground Uneconomic (stripping ratio greater than 5 to 1)		
Underground Concentrate > 60% Fe (UGC)	2.4	1.2
Underground Concentrate < 60% Fe (UGC)	1.8	0.9
Underground Heavy Media (UGHM)	1.5	0.75
Low grade (UGPRC)	0.9	0.45
Low grade (UGR)	0.9	0.45

Figure 21
Ad Valorem Tax Payable on Unmined Natural Iron Ore

Year Assessed	Market Value	Payable Year	Estimated Tax Payable			Total
			Crow Wing	Itasca	St. Louis	
2014	2,501,400	2015	2,800	14,100	95,200	112,100
2015	2,490,700	2016	2,600	14,200	96,600	113,400
2016	2,476,700	2017	2,500	14,300	86,500	103,300
2017	2,495,100	2018	2,500	14,400	92,600	109,500
2018	2,504,900	2019	2,500	14,800	90,600	107,900
2019	2,530,900	2020	2,400	14,600	96,700	113,700
2020	2,554,100	2021	2,300	14,200	93,300	109,800
2021	2,576,400	2022	2,200	13,900	97,800	113,900
2022	2,610,800	2023	1,800	12,500	95,600	109,900
2023	2,664,200	2024	1,700	12,200	84,600	98,500

Ad Valorem Tax on Taconite Railroads

(M.S. 270.80 - 270.88)

Beginning with the January 2, 1989 assessment, taconite railroads have been included in the definitions of common carrier railroads and were assessed and taxed on an ad valorem basis according to Minnesota law. LTV and Northshore were the only railroads classified as taconite railroads. Since the 2003 assessment, Northshore Mining is the only operating railroad.

The Department of Revenue developed rules governing the valuation of railroad operating property. The rules have been in effect since 1979 when common carrier railroads went off the gross earnings tax. Each railroad is required to file an annual report containing the necessary information.

The valuation process utilizes the unit value concept of appraisal. For taconite railroads, this involves calculating a weighted cost indicator of value allowing for depreciation and obsolescence. Personal property is then deducted from the net cost indicator to yield a Minnesota taxable value.

This value is then apportioned to the various taxing districts where the taconite railroad owns property. The amount of value each taxing district receives is based on an apportionment formula involving three factors: land, miles of track, and the cost of buildings over $10,000.

After the market value is apportioned to each taxing district, the value is equalized with the other commercial and industrial property on a county-wide basis using an estimated median commercial and industrial sales ratio. A commercial and industrial ratio is developed for each county and applied to that county's taconite railroad market values.

Figure 22

Ad Valorem Tax Assessed on Taconite Railroads

Year Payable	Assessed	St. Louis County	Lake County	Total Tax
2014	2013	7,286	26,796	34,082
2015	2014	6,462	23,890	30,352
2016	2015	5,770	20,696	26,466
2017	2016	4,376	16,224	20,600
2018	2017	3,086	12,308	15,394
2019	2018	2,436	8,564	11,000
2020	2019	2,276	8,694	10,970
2021	2020	2,414	7,348	9,762
2022	2021	3,734	17,001	20,735
2023	2022	3,716	13,620	17,336
2024	**2023**	**4,950**	**16,984**	**21,934**

Ad Valorem Tax on Severed Mineral Interests

(M.S. 272.039, 272.04, 273.165)

Definition

Severed mineral interests are those separately owned from the title to surface interests in real estate. Each year, severed mineral interests are taxed under Minnesota law at 40 cents per acre times the fractional interest owned. The minimum tax on any mineral interest (usually 40-acre tracts or government lots) regardless of the fractional interest owned, is $3.20 per tract. No tax is due on mineral interests taxed under other laws relating to the taxation of minerals, such as unmined taconite or iron ore, or mineral interests exempt from taxation under constitutional or related statutory provisions.

Ownership of a specific mineral or group of minerals, such as energy minerals or precious metals rather than an actual *fractional interest* of all the minerals, does not constitute a fractional interest. Thus, if one individual reserved all minerals except gas, oil. and hydrocarbons, and a second entity reserved the hydrocarbons, each owner would be subject to the full 40 cents per acre tax.

The Severed Mineral Interest Tax is a Property Tax that is levied by local taxing authorities in the same manner as other local Property taxes. Proceeds from the tax are distributed in this manner: 80% is returned by the county to local taxing districts where the property is located in the same proportion that the local tax rate of each taxing district bears to the total surface tax rate in the area; and 20% to the Indian Business Loan Account in the state treasury for business loans made to Indians by the Department of Employment and Economic Development.

The registration and taxation of severed mineral interests is a county function. Severed mineral interests are registered with the county recorder in the county where the interest is located. The county auditor sends a tax statement similar to any other real estate interest. The tax is normally collected in two increments payable in May and October. If the tax is less than $50, the taxpayer is required to pay in full with the May payment.

Nonpayment Penalty: Forfeiture

The eventual penalty for not paying the tax is forfeiture. Policies vary somewhat among counties. Specific questions about the tax, interest, or penalties should be directed to the county recorder and auditor in the county where the minerals are located.

Tax Imposed

The tax on severed mineral interests was enacted in 1973 as part of an act that required owners to file a document with the county recorder where the interests were located describing the mineral interest and asserting an ownership claim to the minerals. The purpose of this requirement was to identify and clarify the obscure and divided ownership conditions of severed mineral interests in the state (M.S. 93.52). Failure to record severed mineral interests within time limits established by the law results in forfeiture to the state (M.S. 93.55).

History of Litigation

In 1979, the Minnesota Supreme Court ruled that the tax, the recording requirements, and the penalty of forfeiture for failing to timely record were constitutional, but also ruled that forfeiture procedures were unconstitutional for lack of sufficient notice and opportunity for hearing. This decision is cited as *Contos, Burlington Northern, Inc. U.S. Steel, et al. v. Herbst, Commissioner of Natural Resources, Korda, St. Louis County Auditor, Roemer, Commissioner of Revenue, and the Minnesota Chippewa Tribe, et al., 278 N.W. 2d 732 (*1979). The U.S. Supreme Court refused to hear an appeal requested by the plaintiffs. Shortly after this decision, the legislature amended the law to require notice to the last owner of record and a court hearing before a forfeiture for failure to timely record becomes complete. Under these requirements, court orders have been obtained by the state in several counties declaring the forfeiture of particular severed mineral interests to be complete and giving title to the state.

Figure 23

Ad Valorem Tax on Severed Mineral Interests: Collection and Distribution

Period ending	80% retained by local government	20% payment to Indian Business Loan Account	Total collections of affected counties
Dec. 31, 2016	$417,991	$104,498	$522,489
Dec. 31, 2017	513,528	128,382	641,910
Dec. 31, 2018	386,876	96,719	483,595
Dec. 31, 2019	449,044	112,261	561,305
Dec. 31, 2020	433,576	108,394	541,970
Dec. 31, 2021	387,926	96,982	484,908
Dec. 31, 2022	416,316	104,079	520,395
Dec. 31, 2023	**193,904**	**48,476**	**242,380**

In 1988, the legislature amended the law to allow the commissioner of the Minnesota Department of Natural Resources (DNR) to lease unregistered severed mineral interests before entry of the court order determining the forfeiture to be complete. However, mining may not commence under such a lease until the court determines that the forfeiture is complete.

In a 1983 case, the Minnesota Supreme Court ruled that severed mineral interests owned by the Federal Land Bank of St. Paul were exempt from the state Severed Mineral Interest Tax under a federal law exempting Land Bank real estate from local Property taxes. The U.S. Supreme Court denied a petition by the State of Minnesota to review the case.

DNR Lease

If someone buys a DNR mining lease of three or more years duration, the Severed Mineral Interest Tax of 40 cents per acre applies. Contact the DNR, Minerals Division, to determine the status of activities under any state metallic minerals lease.

Indian Business Loan Account

The 20% portion of the Severed Mineral Interest Tax that is allocated to the Indian Loan Program is reported by the county auditors on *Form SMI1, Severed Mineral Interest Return*. Normally, the form is submitted twice each year to correspond with payment of Property taxes.

The money deposited in the Severed Mineral Interest Account is distributed to the Indian Loan Program at the end of each month.

Department of Revenue

Processing and payment of the Severed Mineral Interest Tax is handled by the Special Taxes Division of the Department of Revenue, Mail Station 3331, St. Paul, MN 55146-3331. Phone 651-556-4721.

Loan Program

The Indian Business Loan Program is administered by the Department of Employment and Economic Development, 1st National Bank Building, 332 Minnesota Street, Suite E-200, St. Paul, MN 55101-1351. Phone: 651-259-7424.

Taxes on Nonferrous Minerals

Companies mining or exploring for nonferrous minerals or energy resources are also subject to Minnesota taxes. This includes mining or exploring for:

- Base metals, such as copper, nickel, lead, zinc, titanium, etc.
- Precious metals, such as gold, silver and platinum
- Energy resources, such as coal, oil, gas and uranium

Companies that are in the exploration stage, and not actually mining, are NOT subject to Occupation Tax or Gross Proceeds Tax, however, they are subject to income taxes (e.g., regular Corporate Franchise Tax, S Corporate Tax, etc.).

Companies that are mining nonferrous minerals are subject to the same taxes as companies that mine ferrous minerals:

- Occupation Tax (see page 23)
- Sales and Use Tax (see page 1)
- Ad Valorem Tax on severed mineral interests (see page 32)

In addition, they are subject to Ad Valorem Tax (Property Tax) in certain situations and a Gross Proceeds Tax.

Ad Valorem Tax (M.S. 272–273)

Companies mining or exploring for nonferrous minerals or energy resources are subject to Property Tax the same as other businesses.

For commercial and industrial property, the assessor's estimated market value is multiplied by a class rate to obtain gross tax capacity. The first $150,000 of market value is taxed at 1.5%, while a 2% rate applies to market value over $150,000. To determine the tax, the product of the market value and class rate must be multiplied by the local tax rate plus the 33.003% state general Property Tax rate for taxes payable in 2023. In St. Louis County, where the majority of Minnesota's mining industry is located, the local tax rates payable in 2023 varied from a low of 88% to a high of approximately 304%. If a referendum tax is passed, the referendum rate times the full market value must be added.

If a company is mining minerals or energy resources subject to the Gross Proceeds Tax under M.S. 298.015, then the following property is exempt:

- Deposits of ores, metals, and minerals and the lands in which they are contained
- All real and personal property used in mining, quarrying, producing, or refining ores, minerals, or metals, including lands occupied by or used in connection with the mining, quarrying, production, or ore refining facilities
- Concentrate

Gross Proceeds Tax (M.S. 298.015–298.018)

The Gross Proceeds Tax applies to the mining or producing of nonferrous minerals and energy resources, i.e., all ores, metals, and minerals mined, extracted, produced or refined within Minnesota, except for sand, silica sand, gravel, building stone, crushed rock, limestone, granite, dimension granite, dimension stone, horticultural peat, clay, soil, iron ore, and taconite concentrates.

Taxes on Nonferrous Minerals

The tax is equal to 0.4% of the gross proceeds from mining in Minnesota. Gross income from mining or producing nonferrous minerals or energy resources is calculated differently from the method used for ferrous minerals.

If you have all required permits to mine and are subject to the Gross Proceeds Tax, there is a $2,000,000 annual minimum payment until mining starts, unless:

- The gross proceeds tax due in a given year is greater than zero.
- The person demonstrates to the Department of Revenue that it is legally prohibited from engaging in the business of mining under a permit it has obtained, or
- The mine is in the process of closure

If subject to the minimum payment:

- The $2,000,000 minimum payment is prorated based on the number of months the mine is considered operational (has all required permits).

For **non-equity or arms-length transactions**, gross income is based on actual sales. Generally, for **non-arms-length transactions**, gross income is based on the average annual market price as published in the *Engineering and Mining Journal*.

The Gross Proceeds Tax was designed to apply to mining and beneficiation, generally to the point of a saleable product. In the case of some hydrometallurgical processes, the saleable product may be a refined metal.

Distribution of the tax. If the minerals or energy resources are mined *outside* the Taconite Assistance Area, the tax is deposited in the state's General Fund. If they are mined or extracted *within* the Taconite Assistance Area, the tax is distributed to:

- Cities and towns (5%), counties (10%), and school districts (10%) where the minerals or energy resources are mined or extracted, or where the concentrate is produced. If concentrating occurs in a different taxing district from where the mining occurs, 50% is distributed to the taxing districts where mined and the remainder to those districts where processed. In addition, counties must pay 1% of their proceeds to the Range Association of Municipalities and Schools. If the materials or energy resources are mined, extracted, or concentrated in School District 2711 (Mesabi East) then the 5% to cities and towns is subdivided as follows: Aurora, Babbitt, Ely, and Hoyt Lakes must each receive 20%, and the city of Biwabik and Embarrass Township must each receive 10%.
- Regular School Fund (20%)
- Taconite Municipal Aid Account (10%).
- Taconite Property Tax Relief (5%), using St. Louis County as fiscal agent.
- Iron Range Resources and Rehabilitation (20%).
- Douglas J. Johnson Economic Protection Trust Fund (3%).
- Taconite Environmental Protection Fund (7%).
- Iron Range Resources and Rehabilitation for Giant Ridge Recreation Area (10%).

For the first five years that the Gross Proceeds Tax is paid, the first 10% of the tax is subdivided to Aurora, Babbitt, Ely, and Hoyt Lakes at 20% each, and to the city of Biwabik and Embarrass Township at 10% each. The remaining 90% of the total proceeds distributed in each of those years must be distributed as normally under the gross proceeds distribution. Distributions are made annually on December 15; however, there are currently no companies subject to the Gross Proceeds Tax.

Glossary of Terms

Acid pellets — Taconite pellets comprised of iron, oxygen and silica held together by a binder such as bentonite (clay) or peridor (organic).

Agglomeration — The term describing the preparation and heat treatment used to prepare iron ore pellets or other iron ore products for shipment and use in a blast furnace.

Arms-length transaction — A sale of iron ore or pellets representing a true free market transaction when the buyer normally does not have an ownership or other special relationship with the seller.

Basic oxygen furnace (BOF) — A steel-making furnace invented in Austria. It replaced open hearth furnaces in the 1960s. It is currently the standard furnace used by the integrated steel producers in the United States.

Beneficiation — The process of improving the grade by removing impurities through concentrating or other preparation for smelting, such as drying, gravity, flotation, or magnetic separation. In taconite operations, this includes the first stage of magnetic separation and converting the concentrate into taconite pellets for use in making steel.

Concentrate — The finely ground iron-bearing particles that remain after separation from silica and other impurities.

Douglas J. Johnson Economic Protection Trust Fund (DJJ) — A portion of Production Tax revenues is allocated to this fund with the intent to use the funds to diversify and stabilize the long-range economy of the Iron Range.

Direct reduced iron (DRI) — A relatively pure form of iron (usually 90% + Fe), which is produced by heating iron ore in a furnace or kiln with a reducing agent such as certain gases or coal.

Dry weight — The weight of iron ore or pellets excluding moisture. For pellets, the dry weight is normally 1 to 2% less than the natural weight.

Electric Arc Furnace (EF or EAF) — A furnace in which an electric current is passed through the charge. These furnaces are much smaller than the conventional BOFs used by the integrated steel producers.

Fe unit — Commonly referred to as an iron unit. An iron unit is a term of measurement denoting one ton containing 1% iron. Iron ore and taconite produced in the United States is measured in long tons (see definition). One long ton of taconite containing 65% iron also contains 65 long ton iron units.

Historically, this measurement was and is used for the selling price quoted in cents per iron unit. One example is a currently published price of acid pellets FOB mine at 37.344 cents per dry gross ton iron unit *or* $.37344 per iron unit.

Fluxed pellets — Taconite pellets containing limestone or another basic flux additive. Fluxed pellets eliminate the need to add limestone in the blast furnace, improving productivity and quality. Adding flux reduces the iron content of a pellet. Fluxed pellets, as used in this guide, mean pellets containing 2% or more limestone or other flux.

Partially fluxed pellets — Fluxed pellets containing 1.99% or less limestone or other flux additive.

Gross Domestic Product Implicit Price Deflator (GDPIPD) — An index maintained by the U.S. Department of Commerce measuring inflation in the overall economy. The Production Tax rate is adjusted annually based on the change in this index.

Gross Proceeds Tax — A tax equal to 0.4% of gross proceeds from mining.

Integrated steel producer — Term used to describe steel companies that produce steel by starting with raw iron ore, reducing it to molten iron in a blast furnace, and producing steel with a BOF, open hearth, or electric furnace.

Lake Erie value — The traditional and quoted price of iron ore from the earliest days of iron ore mining in Minnesota and Michigan. This price per iron unit included delivery, mainly rail and lake transportation, from the mine to a Lake Erie port.

This was the starting point for Occupation Tax since its 1921 beginning. It was the standard method of pricing domestic iron ore and taconite for Occupation Tax until the mid-1980s (see Mine Value).

Long ton — The standard unit for weighing iron ore and taconite in the United States. A long ton equals 2,240 pounds.

M.S. 298.225 — A Minnesota statute (law) guaranteeing the Production Tax aids received by municipalities, counties, schools and the Iron Range Resources and Rehabilitation. The aid levels are adjusted according to a sliding scale based on production levels.

Metric ton — Standard unit for weighing iron ore and taconite in most areas of the world. A metric ton equals 1,000 kilograms or 2,204.62 pounds.

Mine value — The value of iron or pellets at the mine. This became the starting point for Occupation Tax in 1987. This value per iron unit does not include any rail or lake transportation beyond the mine.

Mini mill — A small steel mill using an electric furnace that produces steel from scrap iron.

Natural ore — Iron ore that can be fed to a blast furnace with less complicated processing than taconite requires. Natural ore typically contains 50% + Fe (iron) in its natural state.

Natural weight — The weight of iron ore or pellets including moisture.

Non-equity sales — See Arms-length transaction.

Pellet chip — Broken pellets often cannot be sold as pellets and instead are sold at a reduced price for sinter plants and other uses. For Occupation Tax purposes, chips are defined as individual shipments or stockpiles containing at least 85% of pellet chips smaller than one-fourth inch. Such chips cannot be shipped or commingled with regular pellets.

For Occupation Tax purposes, pellet chips are valued at 75% of the value of the unbroken pellets.

Percentage depletion — A taxable income deduction in the form of an allowance representing a return on capital investment on a wasting asset subject to a gradual reduction in reserves. This deduction applies to income derived from various mining or oil and gas properties.

Range Association of Municipalities and Schools (RAMS) — An association representing Iron Range cities, towns, and schools receiving any funding from the Production Tax.

Region 3 — Koochiching, Itasca, Aitkin, Carlton, St. Louis, Lake, and Cook counties.

Royalty — A share of the product or profit reserved by the owner for permitting another to use the property. A lease by which the owner or lessor grants to the lessee the privilege of exploring, mining and operating the land in consideration of the payment of a certain stipulated royalty on the mineral produced.

Short ton — Standard for weighing many commodities in the United States. It equals 2,000 pounds.

Steel Mill Products Index (SMPI) — A United States government index tracking the actual selling price of all steel products in the United States. This index is published monthly by the U.S. Department of Labor. It is part of the formula used to determine a product value for Occupation Tax purposes each year.

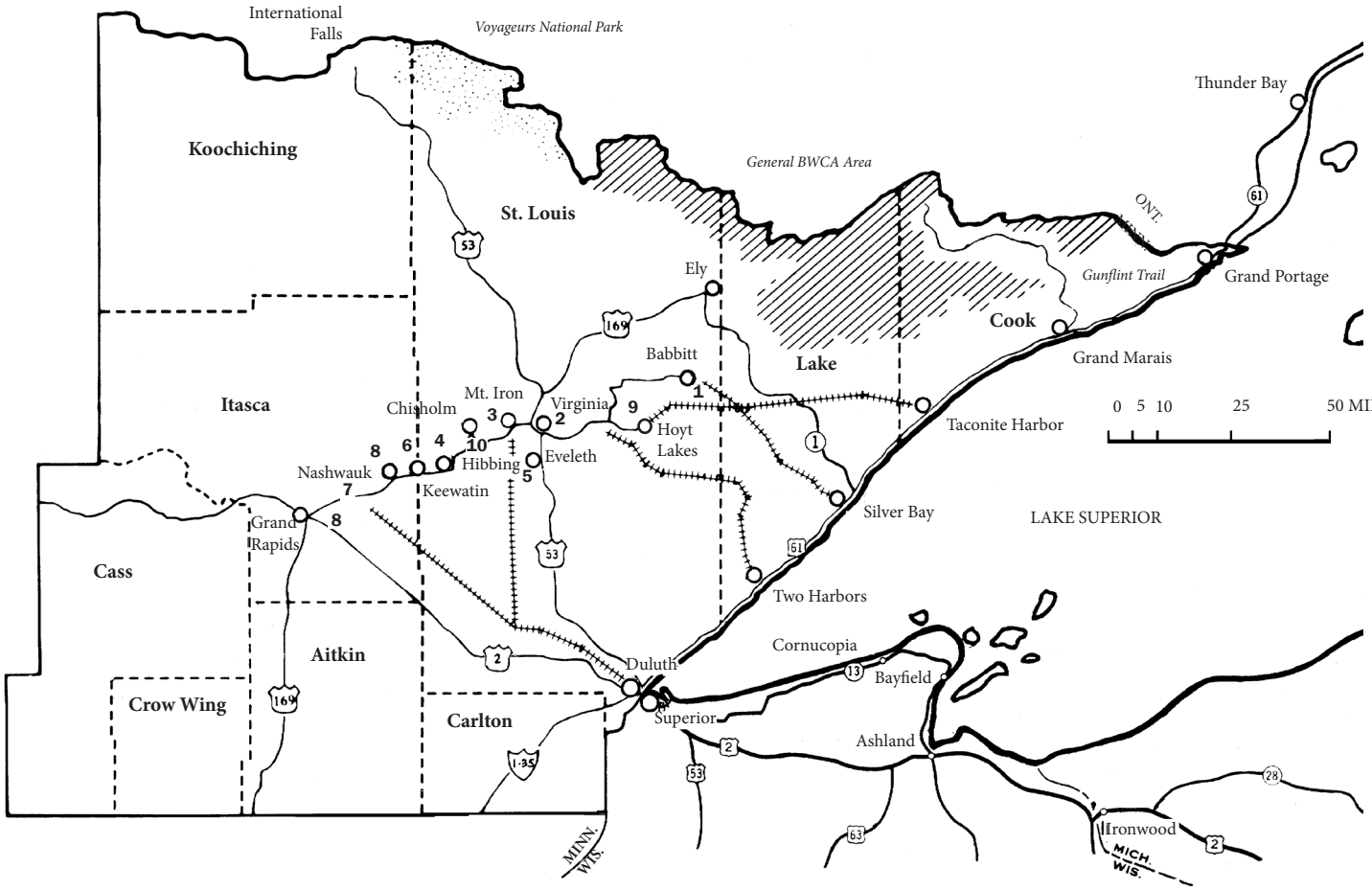
Taconite — Ferruginous chert or ferruginous slate in the form of compact, siliceous rock in which the iron oxide is so finely disseminated that substantially all of the iron-bearing particles are smaller than 20 mesh.

It is not merchantable in its natural state, and it cannot be made merchantable by simple methods of beneficiation involving only crushing, screening, jigging, washing and drying, or any combination thereof. (MS 298.001, subd. 4)

Tailing — Small rock particles containing little or no iron, which are separated during various stages of crushing, grinding, and concentration. Most of the separation is done with magnetic separators. Silica is the main mineral constituent of tailings.

Taxable tons — The three-year average of the current and prior two years production. The Production Tax is based on taxable tons. The weight is on a dry basis without any flux additives. For other iron bearing material subject to the Production Tax, only the current year is used.

Mine Locations and Production Capacity



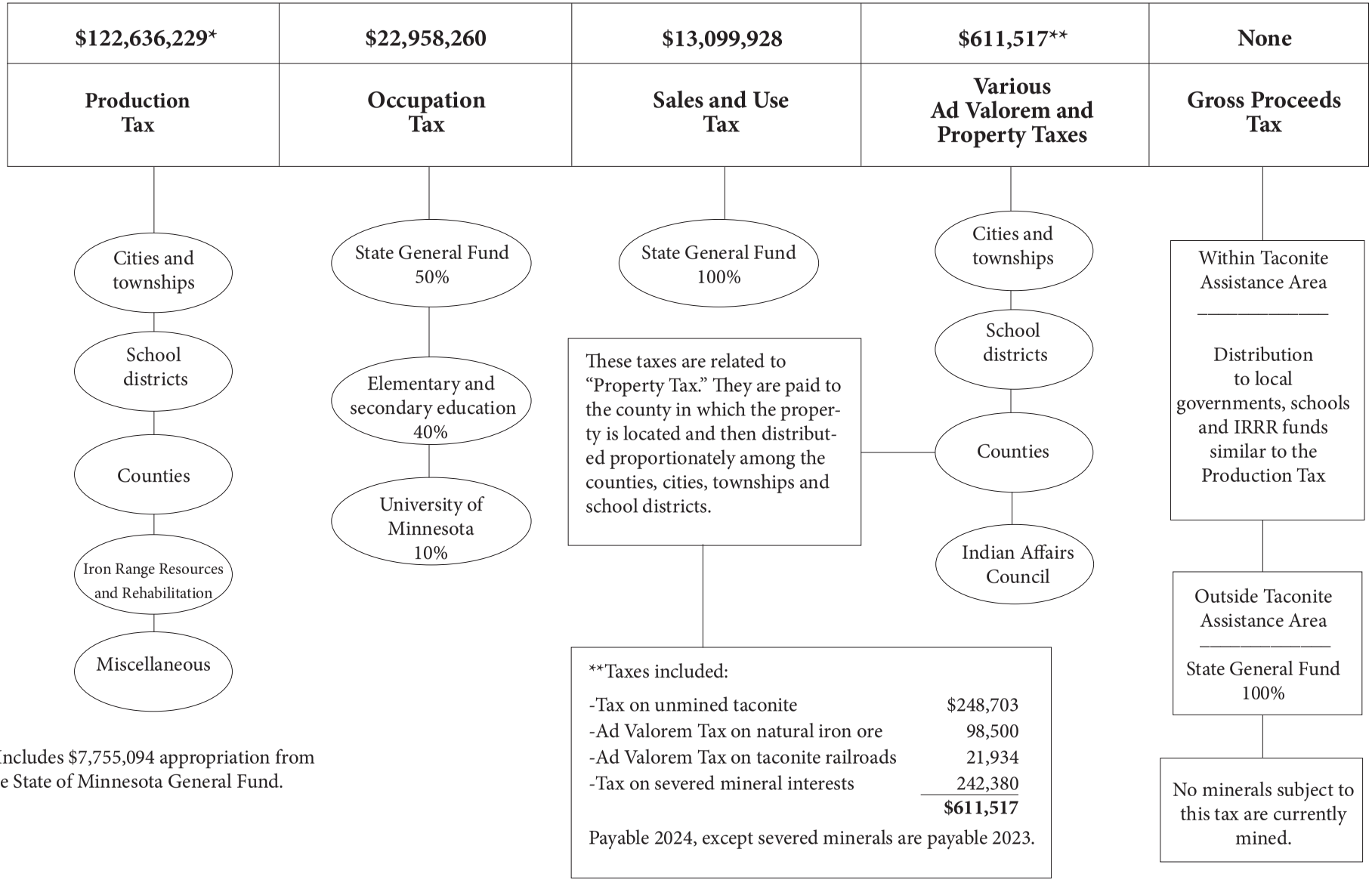
		Effective Capacity* (million tons)
1.	**Northshore Mining** Owner: Cleveland-Cliffs, Inc. (100%)	6.2
2.	**Minorca Mine** Owner: Cleveland-Cliffs, Inc. (100%)	2.8
3.	**U. S. Steel–Minntac** Owner: USS Corporation (100%)	16.0
4.	**Hibbing Taconite** Cleveland-Cliffs, Inc. Managing Agent Owners: Cleveland-Cliffs, Inc. Cleveland-Cliffs, Inc. (85.3%) U. S. Steel (14.7%)	8.0
5.	**United Taconite LLC** Owner: Cleveland-Cliffs, Inc.(100%)	5.4
6.	**U. S. Steel–Keewatin Taconite** Owner: USS Corporation (100%)	6.0
7.	**Mesabi Metallics**	Unknown
8.	**Formerly ERP Iron Ore**	3.0
9.	**Mesabi Nugget LLC** Owners: Steel Dynamics, Inc (81%) Kobe Steel, Ltd (19%)	0.5
10.	**Mining Resources LLC** Owner: Steel Dynamics, Inc. (100%)	1.0

* Effective capacity is the annual production capacity in natural long tons (including flux) that can be sustained under normal operating conditions.

The ownership percentages shown are the ultimate percentages controlled by parent steel and mining companies.
In some instances, various other partnerships and subsidiaries are listed on legal corporate documents.

Distribution of Mining Taxes

Production Year 2023 Tax Obligations - $159,305,934

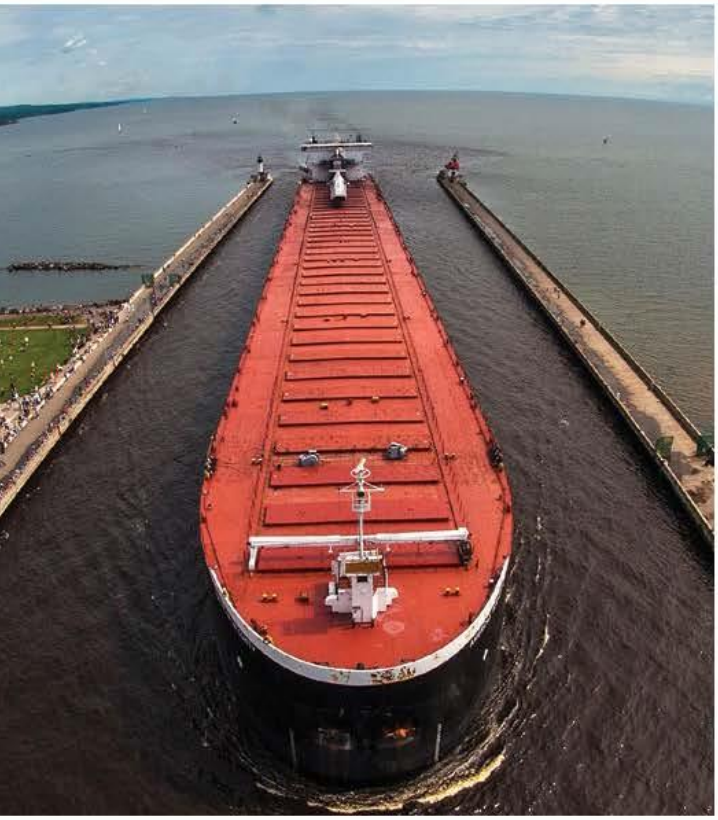


* Includes $7,755,094 appropriation from the State of Minnesota General Fund.

ECONOMIC IMPACT OF FERROUS AND NONFERROUS MINING

on Minnesota and the Arrowhead Region including Douglas County, Wisconsin

June 3, 2020



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DISCLAIMER –The Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth's (UMD) Labovitz School was contacted by the Iron Mining Association (IMA) and Mining Minnesota as an unbiased research entity. Publication and dissemination of this report, or any of its data, is not an endorsement by the BBER/UMD of the IMA/Mining Minnesota or their projects. The BBER was asked to supply an economic impact analysis only. This analysis does not consider the social or environmental impacts of the project and should not be viewed as a cost benefit analysis or environmental impact assessment.

Executive Summary

The northeast region of Minnesota, often referred to as the Iron Range, has a history of iron ore mining dating back to the 1880s. While the focus of mining to date has been iron deposits (known as ferrous mining), the ores also contain a variety of base and precious metals including copper and nickel. Minnesota currently has six operating taconite plants, all located on the Mesabi Range. In addition, a number of companies are pursuing copper-nickel mining in the same area.

The UMD Labovitz School of Business and Economics' research bureau, the Bureau of Business and Economic Research (BBER), was contacted by the Iron Mining Association of Minnesota and Mining Minnesota to study and estimate the economic impacts of construction and operations for ferrous and nonferrous mining on Minnesota and the Arrowhead Region including Douglas County, Wisconsin.

The objectives of the study include:

- To study the recent economic trends of the ferrous and nonferrous mining industries and describe the size of the mining industry relative to the economic base of the study area.
- To model the economic impacts of the ferrous and nonferrous mining industry, including the current and projected impacts of the industry's operations and projected capital expenditures.
- To report on Minnesota mining-related taxes paid by the mining industry.
- To report on the business confidence of mining-related firms in the study area.

According to 2018 data from the Quarterly Census of Employment and Wages (QCEW), the mining industry grew by 37% between 2009 and 2018, adding 1,138 jobs. This growth rate was significantly higher than any of the other top 20 industries in the Arrowhead Region. Relative to the size of the area's economy, mining also employs a significant number of workers. In the past ten years, the industry has seen a significant growth in production and GDP levels, with much of that growth during the most recent three-year period. In 2018, the mining industry directly contributed more than $2.0 billion to the economy of the Arrowhead Region.

To estimate the current and projected economic impacts of the ferrous and nonferrous mining industry, the research team developed a survey that asked representatives from each of the mines in the study area to estimate the current and projected number of employees, wages/benefits, annual operation expenditures, and investment projections at their location. Of the 13 existing and planned mine locations in the study area (eight ferrous and five nonferrous), 12 mines participated in the survey, for a 92% response rate.

According to company expectations, the number of employees at the ferrous mines is not expected to increase, but annual operating expenses are expected to increase at a rate of 1% annually.

In 2019, there were 46 people directly employed by the nonferrous mining companies within the study area and operating expenses for the industry were more than $63 million. By the year 2024, one of the four nonferrous mines is expected to be operational, and an additional one to two will have proposed mine projects in environmental review. By that time, the nonferrous mines are expecting to have employed 436 workers, an increase of roughly 950% over the 2019 baseline. Similarly, by 2024, operating expenses are projected to quadruple in size in comparison to the baseline year. The nonferrous mines predict sizable construction and capital projects as they become operational, with construction spending expected to peak in 2022.

According to the results of modeling, in 2019 ferrous mining contributed nearly 8,800 jobs in the Arrowhead Region. Nearly 4,000 of those were

employed directly in the mining industry, while an additional 4,960 were created in other parts of the regional economy through indirect and induced effects. The employment multiplier of 2.25 suggests that for every individual job created within the mining industry an additional 1.25 jobs were created in other industries within the region. It is projected that in 2024 the ferrous mining industry will support more than 8,350 jobs in the Arrowhead Region and contribute nearly $790 million in labor income (wages), $1.5 billion in value added, and $3.29 billion in output to the region's economy.

In 2019, 46 jobs were supported directly by nonferrous mining and 71 additional jobs were indirectly supported by the nonferrous mining industry in the region for a total employment effect of 117 jobs in 2019 (2.55 multiplier). In total, the nonferrous mining industry added more than $10 million in labor income, $62 million in value added spending, and more than $77 million in output to the Arrowhead Region's economy in 2019. By 2024, it is projected that the nonferrous mining industry could contribute $45 million in labor income, $210 million in value added, and $307 million in output to the study area's economy.

Economic impacts from ferrous and nonferrous mining are even greater when using the state of Minnesota as the study area, as the initial round of spending from the mines' operations has a larger ripple effect in a larger study area.

For example, when the mines purchase goods and services from companies that are located beyond the Arrowhead Region but within the state, those purchases are included in the economic impacts for the state.

In 2019, ferrous and nonferrous mining combined contributed more than 11,600 jobs, $1.0 billion labor income, $2.1 billion in value added spending, and more than $4.0 billion to the state's economy. By 2024, the ferrous and nonferrous mining industry combined is expected to support roughly 11,200 jobs, $1.1 billion in labor income, and $4.1 billion in output statewide.

Impacts from the mines' capital and construction spending are projected to peak in 2022. In that year alone, construction and capital spending on the part of the ferrous and nonferrous mines is expected to add more than 12,000 jobs, $815 million in labor income, $776 million in value added spending, and $1.5 billion in total output to the state of Minnesota.

In addition, Minnesota's iron mines paid $158.7 million in production tax, occupation tax, sales and use tax, income tax, various Ad Valorem and property taxes and royalties and rentals on state minerals in 2018. Nearly $53 million of that total went directly to fund the state's education system, $7 million to university-related expenses and $46 million to public schools.

Finally, a survey of mining-related businesses found that businesses that depend upon and support the mining industry tend to have higher-than-average wages than the average for the state. In addition, nearly 40% of occupations at mining-related firms required only a high school diploma as a final degree completed. Surveyed businesses were very positive about recent business performance but cautious about the future. The most common reason given for factors limiting companies' ability to increase business activity included lack of demand, competition, and uncertainty about the performance of the mining industry.

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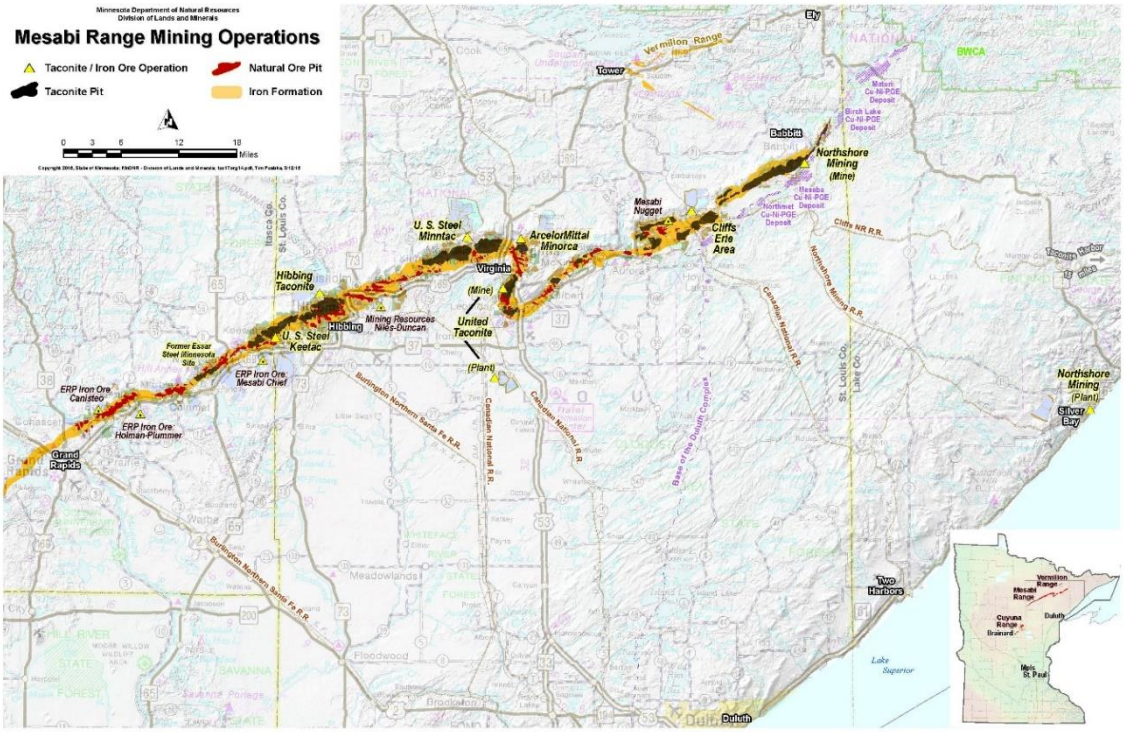
Economic Impact of Ferrous and Nonferrous Mining on Minnesota and the Arrowhead Region with Douglas County, Wisconsin

I. Project Description

The northeast region of Minnesota, often referred to as the "Iron Range," has a history of iron ore mining dating back to the 1880s. While the focus of mining to date has been iron deposits (known as ferrous mining), the ores also contain a variety of base and precious metals including copper, nickel, platinum, palladium, cobalt, and gold.[1] Minnesota currently has six operating taconite plants, all located on the Mesabi Range. In addition, a number of companies are pursuing copper-nickel mining in the same area.[2] The locations of current mines are shown in Figure 1.

The mining industry is an integral part of the state's economy, especially in Northern Minnesota. According to Minnesota's Department of Employment and Economic Development (DEED), the industry paid more than $500 million in wages to nearly 6,000 workers in 2018; nearly all of those workers were employed in Minnesota's Arrowhead Region.

Figure 1. Location of Mines on the Iron Range in the Arrowhead Region



SOURCE: IRON MINING ASSOCIATION OF MINNESOTA

[1] https://www.leg.state.mn.us/lrl/guides/guides?issue=coppernickel
[2] https://www.dnr.state.mn.us/education/geology/digging/mining.html

The UMD Labovitz School of Business and Economics' research bureau, the Bureau of Business and Economic Research (BBER), was contacted by the Iron Mining Association of Minnesota and Mining Minnesota to study and estimate the economic impacts[3] of construction and operations for ferrous and nonferrous mining on Minnesota and the Arrowhead Region including Douglas County, Wisconsin. The BBER completed a similar study in 2012.

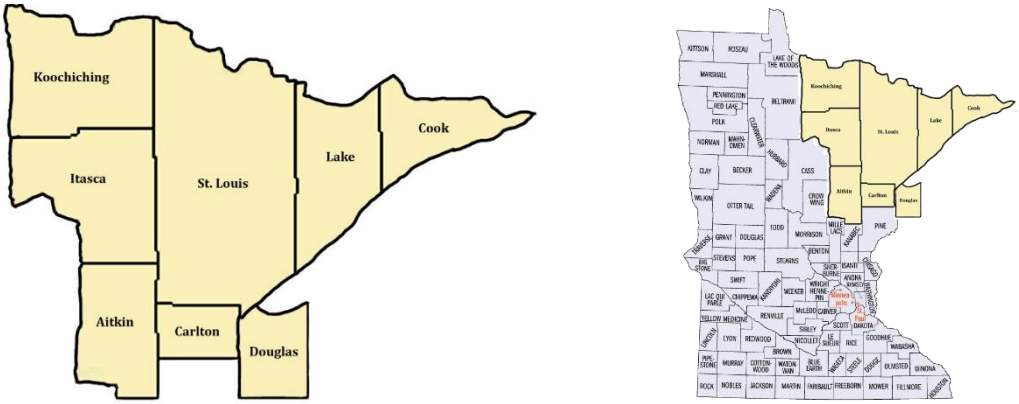
The objectives of the study are:

- To study the recent economic trends of the ferrous and nonferrous mining industries and describe the size of the mining industry relative to the economic base of the study area.
- To model the economic impacts of the ferrous and nonferrous mining industry, including the current and projected impacts of the industry's operations and projected capital expenditures.
- To report on Minnesota mining-related taxes paid by the mining industry.
- To report on the business confidence of mining-related firms in the study area.

Study Area

There are two geographic scopes for this economic impact analysis. The first study area is the Arrowhead Region of Minnesota— Aitkin, Cook, Itasca, Koochiching, Lake, St. Louis, and Carlton Counties along with Douglas County in Wisconsin. The second study area includes the state of Minnesota. The figures below and on the following page provide insight on the regional economy of both study areas as background information for the results of the report.

Figure 2. Counties of Minnesota's Arrowhead Region and Douglas County, Wisconsin

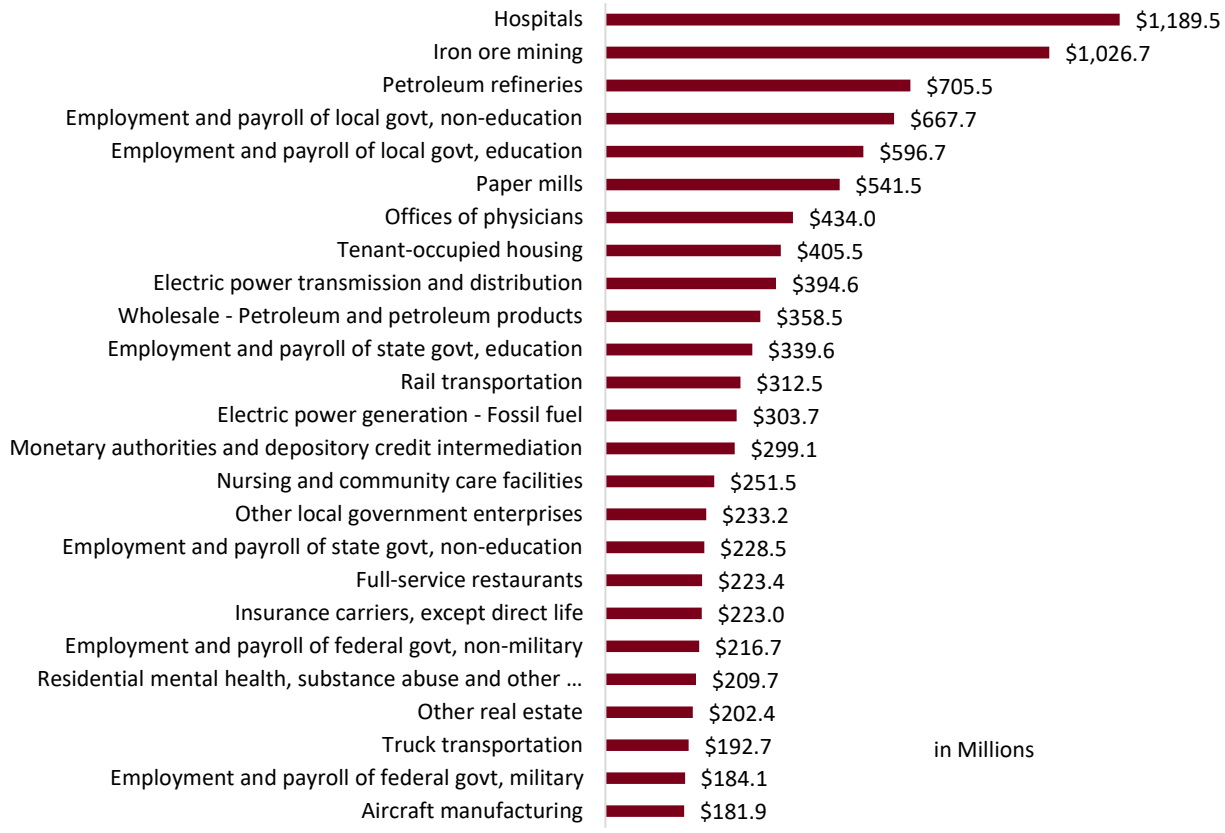


SOURCE:WIKIPEDIA

[3] For a full list of definitions, please see Appendix A.

Figure 3 provides the top 25 industries in the Arrowhead/Douglas County study area ranked by value added. The figure shows the amount of value added each industry directly contributes to the gross regional product of the study area.[4] The graph includes a mix of public and not-for-profit industries. The iron ore mining industry was the second largest contributor to value added in the study area's economy, and the largest contributor among the private industries. In 2018, iron ore mining contributed over $1 billion in value added to the study area, behind hospitals at nearly $1.2 billion. The third largest contributing industry was petroleum refineries, which contributed $705 million to the study area's GRP in 2018.

Figure 3. Top 25 Industries in Study Area by Value Added on the Arrowhead Region (2018)



SOURCE: IMPLAN

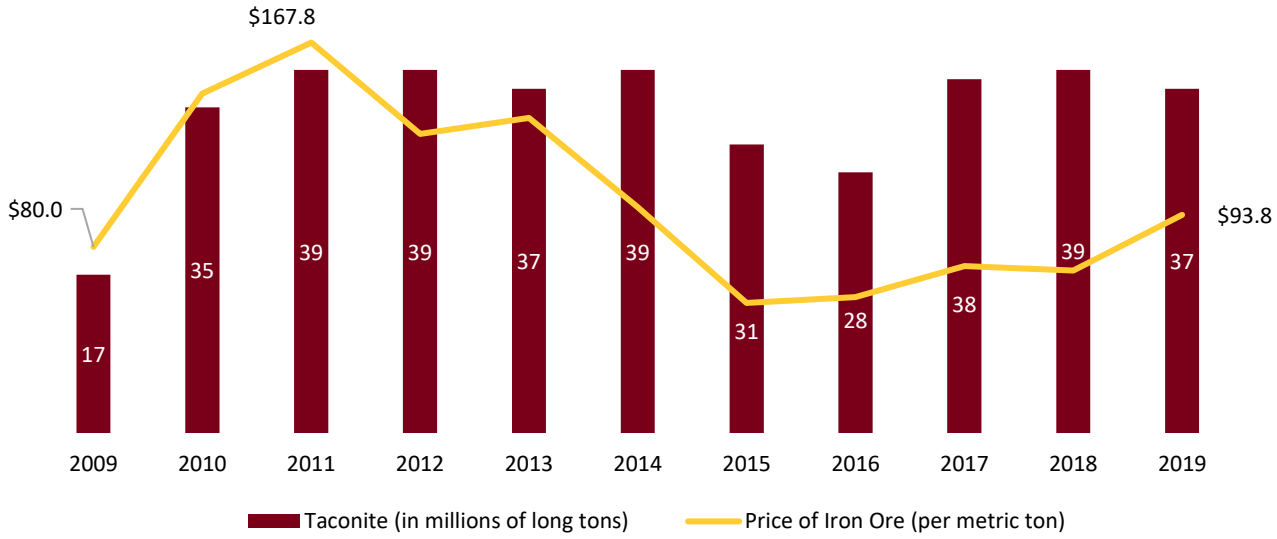
[4] Values shown reflect each industry's direct contribution and do not include indirect or induced effects.

II. Ferrous and Nonferrous Mining Industry Trends

This chapter examines recent economic trends of the ferrous and nonferrous mining industry, including the industry's contribution to gross regional product (GRP), taconite production estimates, and iron ore prices.

Figure 4 shows the taconite production estimates compared to the price of iron ore[5] (measured by U.S. dollars per metric ton).[6] Production values are for all operational taconite mines in the state of Minnesota, which include ArcelorMittal Minorca, Hibbing Taconite, Northshore Mining, U.S. Steel–Keewatin Taconite, U.S. Steel–Minntac, and United Taconite. The price of iron ore represents the average annual commodity price as estimated by Index Mundi.

Figure 4. Production Estimates of Taconite on the Arrowhead Region



SOURCE: MINNESOTA MINING TAX GUIDE, INDEX MUNDI

The graph shows that the mining sector went from producing roughly 17 million long tons in 2009 to nearly 40 million in 2019. However, most of the growth in production happened immediately following the Great Recession and coincided with significant increases in the price of iron ore. In the two years following the Great Recession, the price of iron ore doubled (from $80 to $168 per metric ton) then fell to less than $60 per metric ton in 2015, before gradually recovering to $93.8 per metric ton in 2019.

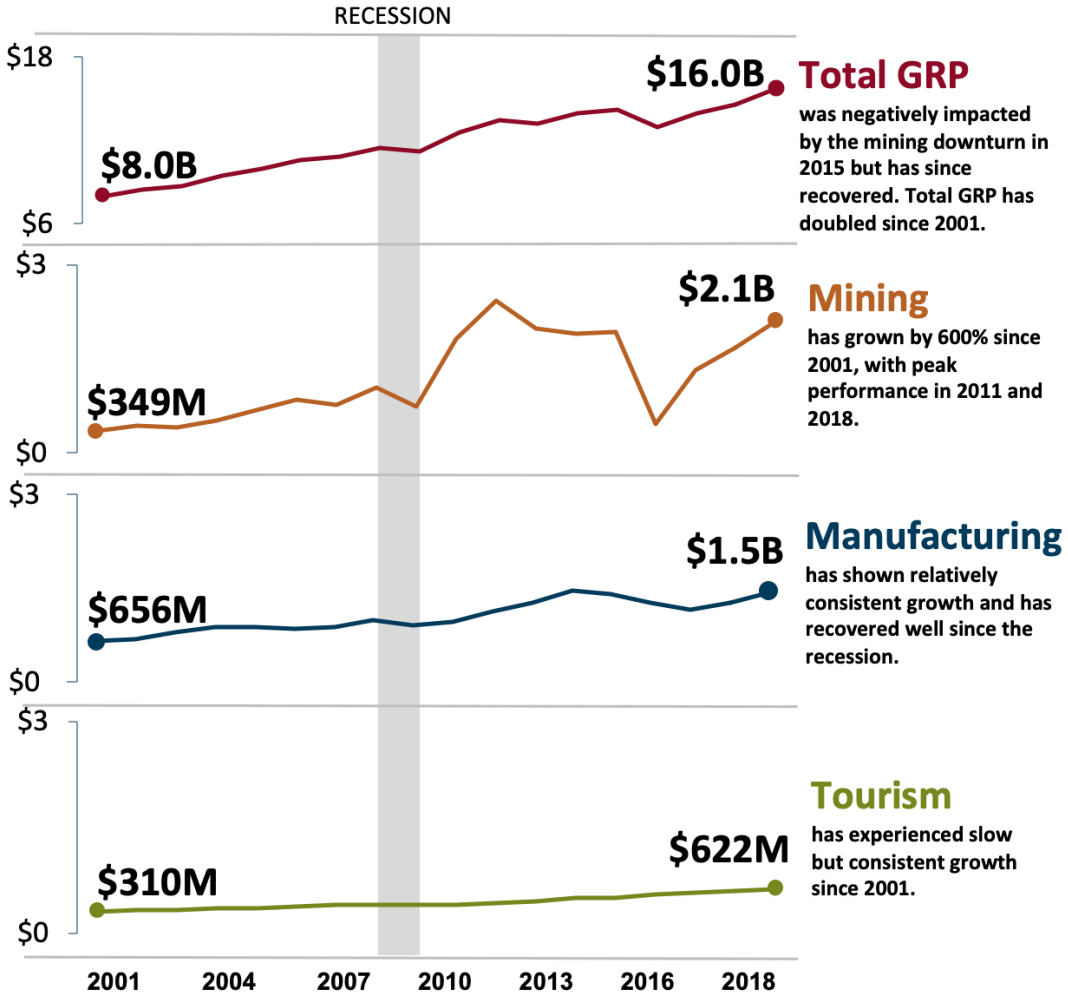
Since 2010, taconite production levels have been stable, with the exception of a two-year dip in 2015-2016. The decrease in production between 2015 and 2016 was due partially to the decrease in the price of iron ore but also to illegal steel dumping by China. In response, the U.S. Commerce Department imposed duties on Chinese and Mexican structural steel in 2019 after determining that producers in both countries had dumped

[5] In Minnesota, nearly all high-grade iron ore has been mined, but advancements in technology have made usage of taconite feasible. Taconite is a low-grade iron ore that can be processed into hard, marble-sized pellets that are melted in blast furnaces and blown with oxygen to make steel.

[6] The price of iron ore is measured in metric tons, and taconite production is measured in long tons. A metric ton is 2,205 pounds, whereas a long ton is 2,240 pounds.

fabricated structural steel on the U.S. market at prices below fair market value.[7] After 2016, the price of iron ore remained low, but taconite production rebounded to pre-2015 production.

Figure 5. Comparison of Duluth-Superior MSA GRP to Local Industries' GRPs



SOURCE: BEA, STORYTELLING WITH DATA, BBER

Figure 5 shows total GRP growth for the Duluth-Superior MSA[8] from 2001-2018 along with the GRP contribution of three local industries of mining (both ferrous and nonferrous), manufacturing, and tourism. The longer time period allows us to see the impacts of the Great Recession on the economy of the region and each of the three industries. These three industries were selected as they are all relatively similar in size and

[7] Beech, Eric and David Lawder, "U.S. imposes duties on structural steel from China, Mexico" Reuters https://www.reuters.com/article/us-usa-trade-steel/us-imposes-duties-on-structural-steel-from-china-mexico-idUSKCN1VP2R7

[8] GRP for the MSA is shown rather than for the eight-county study area as GRP estimates are not available by county. The Duluth/Superior MSA is comprised of St. Louis and Carlton Counties in Minnesota and Douglas County in Wisconsin. However, based on IMPLAN estimates for GRP in 2018, the GRP for the Duluth-Superior MSA represented nearly 90% of the GRP for the eight-county study area.

have both economic and cultural significance to the Arrowhead Region. Each graph inside the figure has its own vertical axis, while all graphs share a horizontal axis. This allows us to compare fluctuations in industry trends with trends in the broader economy.

As shown in the figure, the total GRP of the Duluth-Superior MSA has doubled since 2001, from $8 billion to $16 billion (200% growth). Of the industries shown, mining experienced the largest amount of growth over the past two decades. In 2001, the mining industry's contribution to the region's GRP was roughly $349 million. By 2018 that value had increased to $2.1 billion, a growth rate of roughly 600%. The mining industry's contribution to GRP peaked in 2011 at $2.4 billion, but it has been able to recover well after a decline in output in 2015. Notably, the mining sector represents 13% of the total GRP in the MSA, the largest percentage of the three sectors shown in the figure.

By comparison, the manufacturing industry saw consistent but relatively slower growth during the same time period. In 2001, the manufacturing industry contributed roughly $656 million to the region's GRP, and in 2018, it produced roughly $1.5 billion in output, a 228% increase. Of the three industries shown, the tourism industry experienced the slowest level of growth during the time period consistently, increasing from $310 million in 2001 to $622 million in 2018.

The Great Recession, which strongly affected the global economy, is shown in Figure 5 as a vertical bar. Total GRP, mining, and manufacturing all declined during the Great Recession but were able to recover. The mining industry went on to increase production rapidly with a peak in 2011, contributing roughly $2.4 billion to the region's GRP. Meanwhile, the tourism industry maintained stable but slow growth during the recession and subsequent several years.

Finally, Table 1 shows the percentage change in employment between 2009 and 2018 and location quotients for the 20 economic super sectors that are defined by the North American Industry Classification System (NAICS). The 20 super sectors (or sectors) are the main categories identified by NAICS. They are then broken down into sub-sectors and then industries. The percentage change in employment measures the growth in each sector's employment between 2009 and 2018. A location quotient is used as a way to quantify a region's industrial specialization relative to a larger geographic area (e.g. the respective state or nation). In this case, the table compares the level of employment in Minnesota's Arrowhead Region in 2018 to the state of Minnesota as a whole. A location quotient of 1.0 means that the specialization of the industry in the Arrowhead Region is equal to the state's. A location quotient greater than 1.0 suggests that the Arrowhead Region has a higher concentration in that industry than the state. And a location quotient less than 1.0 indicates that the Arrowhead Region has a lower concentration in that industry than the state.

Table 1. Percentage Change in Employment on the Arrowhead Region (2009-2018) and Location Quotient by Super Sector

NAICS Sector	*% Change in Employment (2009-2018)*	*Employment Location Quotient***
Mining	37%	14.28
Utilities	-6%	2.27
Public administration	6%	1.65
Arts, entertainment, and recreation	3%	1.42
Health care and social assistance	8%	1.39
Accommodation and food services	7%	1.30
Retail trade	1%	1.17
Other services	20%	1.15
Educational services	4%	1.05
Construction	12%	1.04
Real estate and rental and leasing	14%	0.75
Transportation and warehousing	15%	0.74
Finance and insurance	-9%	0.63
Agriculture, forestry, fishing and hunting	0%	0.55
Manufacturing	1%	0.54
Information***	-19%	0.54
Waste management and remediation services	-7%	0.52
Professional, scientific, and technical services	12%	0.52
Wholesale trade	-1%	0.46
Management of companies and enterprises	-19%	0.18
Total, all industries	5%	

* Northeast Minnesota considers seven counties including Cook, Lake, St. Louis, Koochiching, Itasca, Aitkin, and Carlton.
**Location Quotient = (NE MN Sector Employment / NE MN Total Employment) / (MN Sector Employment / MN Total Employment).
*** Information sector data for 2009 was unavailable, so percentage change in employment for that sector is 2013-2018, the first year in which data was available for the sector.

SOURCE: QWEC

As shown in Table 1, the mining sector has a location quotient of 14.28, considerably larger than all of the other sector's location quotients. This demonstrates that mining has a higher concentration in northeastern Minnesota than in the State of Minnesota, and that within Northeast Minnesota mining is the dominant

sector relative to the size of the local economy. Also, according to 2018 quarterly census of employment and wages, the mining sector grew by 37% between 2009 and 2018, adding 1,138 jobs. This growth rate was significantly higher than any of the other top 20 sectors in the region.

As shown in this chapter, Minnesota's Arrowhead Region is heavily dependent on the mining sector. Relative to the size of the region's economy, mining employs a significant number of workers and has shown significant employment growth. The industry also saw significant growth in production and GDP levels over the past ten years, with much of that growth during the most recent three-year period. In 2018, the mining sector contributed more than $2.0 billion to the region's economy.

III. Economic Impacts

The second objective of the research project is the modeling of the economic impacts of the ferrous and nonferrous mining industry, including the current and projected impacts of the industry's operations and projected construction and capital expenditures. This chapter includes a description of inputs used for modeling and the estimated economic impacts of the ferrous and nonferrous mining industries, shown in terms of employment, labor income, value added, and output. The research team used IMPLAN software version 3.1 to estimate economic impacts. All operational scenarios were modeled using IMPLAN's 2018 dataset, the most recent data available. All operations and capital expenditures were modeled in the year of the incurred expenses. All results are adjusted for inflation, so dollar amounts reflect the year in which the activities were modeled.

Inputs Used for Modeling

Inputs required for modeling included the current and projected number of employees, employee compensation, proprietor income, and industry sales for both the ferrous and nonferrous mining industries. These inputs were used to create a baseline model for mining operations. Further models were built to estimate the predicted impact over the next five years and the additional impact of proposed capital and construction investment over the next five years (2020-2024).

The research team developed a survey that asked representatives from each of the study area mines to estimate the current and projected number of employees, wages/benefits, annual operation expenditures, and investment estimates at their location. The survey was distributed to 11 representatives at 13 existing and planned mine locations. Of the 13 mine locations in the study area (eight ferrous and five nonferrous), 12 mines participated in the survey, for a 92% response rate. Table 2 shows the mines that participated in the survey.

Table 2. Participating Ferrous and Nonferrous Mines

	Participating Mines	***Owner***	***Mine Location in MN***	***Headquarters***
Ferrous	ArcelorMittal Minorca	ArcelorMittal USA	Virginia	Chicago, IL
	Hibbing Taconite Company*	ArcelorMittal USA	Hibbing	Chicago, IL
	Keewatin Taconite	U.S. Steel Corp.	Keewatin	Pittsburgh, PA
	Mesabi Nugget Delaware, LLC**	Steel Dynamics, Inc.†	Aurora	Fort Wayne, IN
	Mining Resources, LLC	Steel Dynamics, Inc.†	Chisholm	Fort Wayne, IN
	Minntac	U.S. Steel Corp.	Mountain Iron	Pittsburgh, PA
	Northshore Mining	Cleveland Cliffs, Inc.	Silver Bay	Cleveland, OH
	United Taconite, LLC	Cleveland Cliffs, Inc.	Eveleth	Cleveland, OH
Nonferrous	PolyMet Mining, Inc.	PolyMet Mining Corp.	Hoyt Lakes	St. Paul, MN
	Teck American, Inc.	Teck Resources Limited	Babbitt	Spokane, WA
	Twin Metals, LLC	Antofagasta, PLC	Ely	St. Paul, MN
	Vermillion Gold, Inc.	Vermillion Gold, Inc.	Vermillion Greenstone Belt	Minneapolis, MN

*According to the Mining Tax Guide 2019, Hibbing Taconite Company is owned by ArcelorMittal USA (62.3%), Cleveland Cliffs, Inc. (23%), and U.S. Steel (14.7%).

**Mesabi Nugget Delaware, LLC is owned by Steel Dynamics, Inc. (81%) and Kobe Steel, Ltd (19%).

†Mesabi Nugget Delaware, LLC and Mining Resources, LLC, both owned by Steel Dynamics, Inc., are not currently operational.

SOURCE BBER MINING IMPACT SURVEY

The data provided by the mines' representatives was used to model the current and projected operation impacts as well as impacts from proposed construction and capital investment. The research team assumed that each company provided good-faith estimates. In instances where data was not provided by the client and the mines, the research team relied on IMPLAN estimates and secondary data sources[9] as inputs.

Table 3 shows the estimated number of employees, wages and benefits, and annual operating expenses for each year for the ferrous mines that participated in the survey. These values are based on the previous year's employment and spending as well as the companies' projected operation activity for the next five years.

Table 3. Inputs Used in Modeling Ferrous Mining Impacts (Total Effects) on the Arrowhead Region (2019-2024), Millions of Dollars

	# of Employees	*Wages/Benefits*	*Annual Operating Budget*
Current (2019 Baseline)	3,982	$543.4	$2,294.8
2020 (Projected)	3,982	$548.7	$2,296.4
2021	3,982	$554.1	$2,297.9
2022	3,982	$559.7	$2,299.4
2023	3,982	$565.4	$2,301.0
2024	3,982	$571.3	$2,302.6

SOURCE: BBER MINING IMPACT SURVEY

According to company expectations, the number of employees is not expected to increase, but wages and benefits are expected to grow by roughly 1% annually, from $543 million in 2019 to over $570 million in 2024. Annual operating expenses are expected to increase at a rate of 1% annually as well.

Table 4 shows the same estimates for the nonferrous mines that participated in the survey. In 2019, there were 46 people employed by the nonferrous mining industry within the study area and operating expenses for the industry were more than $63 million. By the year 2024, one of the four non-ferrous mines are expected to be operational, and an additional one to two more will have proposed mine projects in the environmental review phase. By that time, employment is expected to grow to more than 400 employees, an increase of 800% over the baseline. Similarly, by 2024, operating expenses are projected to quadruple in size in comparison to the baseline year.

Table 4. Inputs Used in Modeling Nonferrous Mining Impacts (Total effects) on the Arrowhead Region (2019-2024), Millions of Dollars

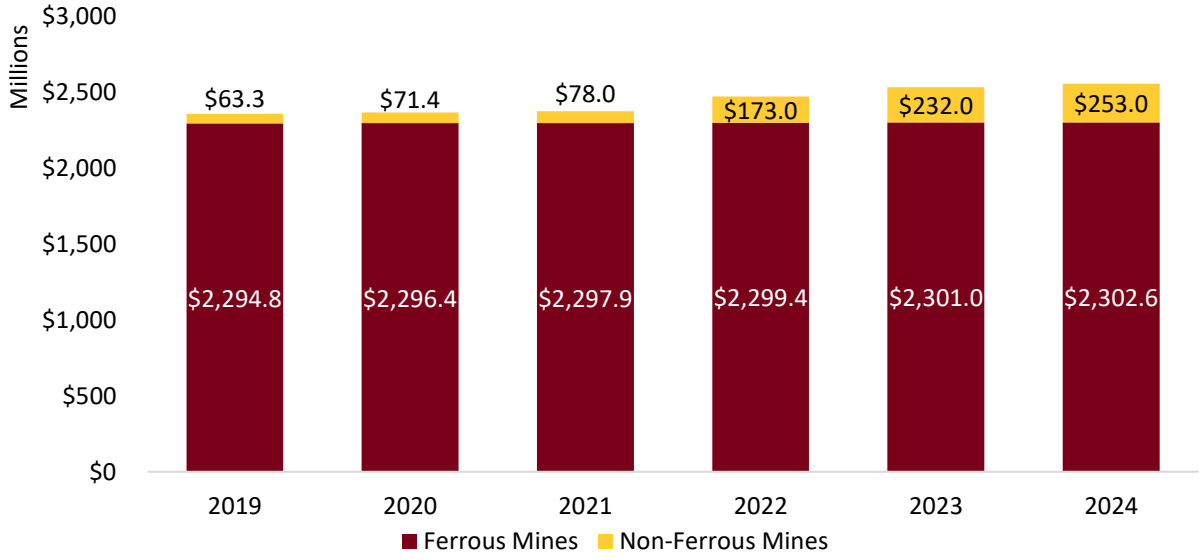
	# of Employees	*Wages/Benefits*	*Annual Operating Expenses*
Current (2019 Baseline)	46	$8.5	$63.3
2020 (Projected)	47	$9.3	$71.4
2021	76	$10.4	$78.0
2022	133	$16.7	$173.0
2023	336	$34.4	$232.0
2024	436	$38.7	$253.0

SOURCE: BBER MINING IMPACT SURVEY

[9] Secondary data sources included company 10-K reports in which some companies included predicted capital expenditures.

Figure 6 below shows the current and projected annual operating expenses for both the ferrous and nonferrous mines in the study area. The purpose of the figure is to compare the size and anticipated growth for both types of mines in the study area over the coming years. In 2019, the eight ferrous mines had operating expenses of nearly $2.3 billion combined. Meanwhile, the four nonferrous mines had combined operating budgets of roughly $63 million. Based on the survey data received, there is expected growth for both the ferrous and nonferrous mining industries within the study area. However, the nonferrous mines are anticipating growth of nearly 400%, compared with 5% for the ferrous mines. Therefore, by 2024, nonferrous mines in the study area estimate that they could see operating expenses of roughly $253 million or nearly 10% of the region's mining industry overall.

Figure 6. Ferrous and Nonferrous Annual Operating Budget (2019-2024), Millions of Dollars

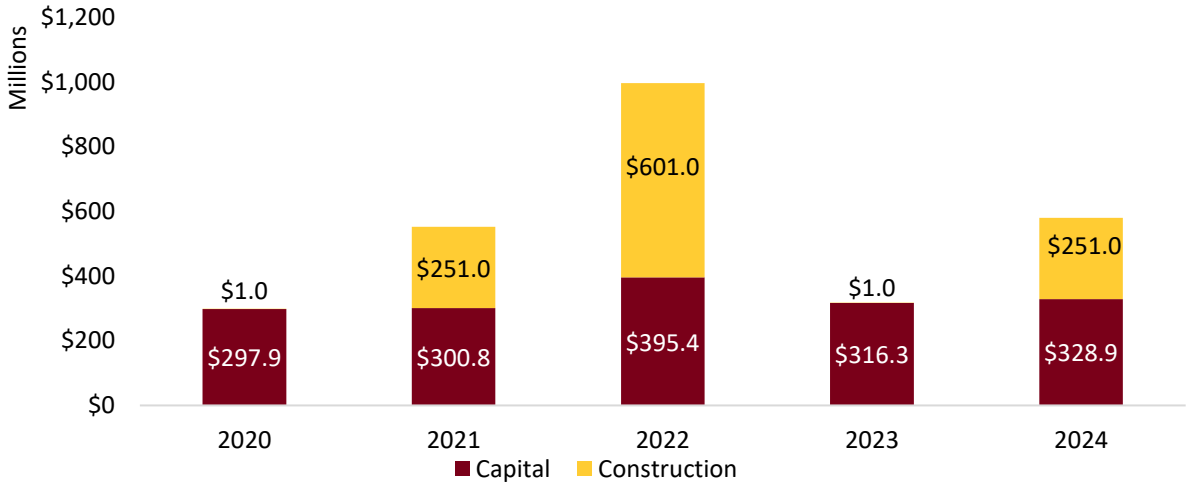


SOURCE: BBER MINING IMPACT SURVEY

Figure 7 on the following page illustrates the breakout of capital and construction expenditures for the ferrous and nonferrous mines.[10] The data was self-reported by each mining company and aggregated by year. The year 2022 is projected to be the peak spending year with $996 million projected ($601 million in construction spending and $395 million in other capital expenditures). Over the five-year span of 2020-2024, construction spending is projected to total $1.11 billion overall, and other capital expenditures are projected to total $1.64 billion, resulting in $2.74 billion of investments overall. The nonferrous mines in particular are predicting sizable construction and capital projects as the mines become operational.

[10] Capital and construction spending was aggregated for all ferrous and nonferrous mines to preserve confidentiality of individual mines' responses.

Figure 7: Proposed Ferrous and Nonferrous Capital and Construction Spending (2020-2024), Millions of Dollars



SOURCE: BBER MINING IMPACT SURVEY

Table 5 shows the IMPLAN sectors used in modeling the current and projected operations of the ferrous and nonferrous mines in the study area. The two sectors included iron ore mining and copper, nickel, lead, and zinc mining.

Table 5. Sectors Used in Modeling Ferrous and Nonferrous Mining Operations in the Arrowhead Region (2019-2024)

Sector
Iron ore mining
Copper, nickel, lead, and zinc mining

SOURCE: IMPLAN

Table 6 below shows the IMPLAN sectors used in modeling all capital and construction expenditures for the ferrous and nonferrous mines in the study area.

Table 6. Sectors Used in Modeling Capital and Construction Expenditures in the Arrowhead Region (2020-2024)

Sector
Construction of other new nonresidential structures
Maintenance and repair construction of nonresidential structures
Construction machinery manufacturing
Mining machinery and equipment manufacturing
Industrial process variable instruments manufacturing
Wholesale - Machinery, equipment, and supplies
Wholesale - Grocery and related product wholesalers
Wholesale - Petroleum and petroleum products
Retail - Gasoline stores
Retail - Clothing and clothing accessories stores
Retail - General merchandise stores

SOURCE: IMPLAN

In cases where the mine provided a description of the capital spending, the research team selected the IMPLAN sector that most closely aligned with the description and then distributed the specified spending amount based on IMPLAN margins.[11] In cases where there was no specific description of the item, the research team distributed funds to the mining machinery and manufacturing sector, again using IMPLAN margins. All construction spending was attributed to the sector of construction of other new nonresidential structures. Capital and construction spending was modeled for ferrous and nonferrous mines combined with the proposed construction spending and modeled by year for years 2020 through 2024.

Ferrous Mining Impacts

Arrowhead Region and Douglas County, Wisconsin

This section provides the direct, indirect, and induced economic impacts[12] for the ferrous mining industry on the Arrowhead Region and Douglas County, Wisconsin.[13] Results first highlight the baseline impacts of the industry's operations. Baseline results are based on the industry's annual sales and production estimates for the most recent year available (2019). Next, the results show projected operational impacts based on estimates provided by the mines, looking forward over the next five years (2020-2024). For all projected impacts, a range of estimates (i.e. sensitivity analysis) is provided to show the possible range of impacts that could occur given the uncertainty surrounding the projections.

Table 7 shows the detailed economic impacts of the ferrous mines in the study area for the most recent year (2019). Each row in the table shows the direct, indirect, induced, and total effects of the mining operations. The columns in the table represent employment,[14] labor income, value added, and output. All results are shown in 2019 dollars.

Table 7. Economic Impacts from Ferrous Mining Operations on the Arrowhead Region (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	3,982	$537.1	$1,190.7	$2,294.8
Indirect Effect	1,637	$104.8	$251.0	$623.7
Induced Effect	3,323	$138.8	$253.0	$467.5
Total Effect	8,942	$780.7	$1,694.7	$3,386.0
Multiplier	2.25	1.45	1.42	1.48

*Totals may not sum due to rounding

SOURCE: IMPLAN

The first row of Table 7, labeled direct effects, represents the employment and spending coming from the mines themselves on wages, equipment, and supplies. These estimates are based on the estimates from the BBER Mining Impact Survey. Indirect effects measure increased inter-industry spending on the part of regional businesses and suppliers as a result of the mines' direct spending. Induced effects reflect an increase

[11] Margins allow for business and consumer expenditures to be traced though retail, wholesale, and transportation industries back to the industries that manufactured the product, allowing the appropriate allocation to the producing industries (IMPLAN, 2020).
[12] For data sources and assumptions used in accepting IMPLAN's input-output model, please see Appendix B.
[13] When describing the results of modeling, the eight-county study area is referred to throughout the report simply as the Arrowhead Region.
[14] Employment is measured in terms of headcount, not full-time equivalent.

in household spending by mining employees as well as the employees of businesses that support the mines. Total effects are the sum of direct, indirect, and induced. The last row in the table is the impact multiplier associated with each effect and is calculated by dividing the total effect by the direct effect. A multiplier indicates how much additional spending is added to the study area's economy for each dollar generated by the direct spending of the industry.

According to the results of modeling, nearly 4,000 jobs were directly supported by the mining industry in 2019. Employment estimates are in terms of jobs, not in terms of full-time equivalent employees. In addition to the 4,000 direct jobs, an additional 1,637 jobs were created in other industries as a result of the mines' operational spending, and more than 3,300 jobs were created as a result of mining employees' spending on goods and services. The employment multiplier of 2.25 suggests that for every individual job created within the mining industry, an additional 1.25 jobs were created elsewhere in the economy. In total, the ferrous mining industry supported over 8,900 jobs in 2019 through the direct, indirect, and induced spending.

The second column, labor income, is an estimate of all employee compensation, including wages, benefits, and proprietor income. The mining industry pays roughly $537 million in wages and benefits to its employees, generating an additional $243 million in income to individuals employed by businesses supported by the mining industry (through indirect and induced impacts). The value added column represents the contribution to the GDP made by an individual producer, industry, or sector. In 2019, mining had a total effect of nearly $1.7 billion in value added to the local economy through direct, indirect, and induced effects. The last column, output, is the value of all local production required to sustain activities. In 2019, it is estimated that operational spending (roughly $2.3 billion in the study area) led to a total output impact of roughly $3.4 billion in the study area.

Table 8 shows the total effects of the ferrous mining industry on the region in terms of employment, labor income, value added, and output from 2019 to 2024. The total effects represent the sum of the direct, indirect, and induced effects.

Table 8. Projected Economic Impacts (Total Effects) from Ferrous Mining Operations on the Arrowhead Region (2019-2024), Millions of Dollars

Impact Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	8,942	$780.7	$1,694.7	$3,386.0
2020	8,809	$781.3	$1,659.2	$3,365.1
2021	8,684	$782.4	$1,625.8	$3,345.5
2022	8,566	$783.9	$1,594.5	$3,327.1
2023	8,455	$785.8	$1,565.2	$3,309.8
2024	8,351	$788.2	$1,537.8	$3,293.6

SOURCE: IMPLAN

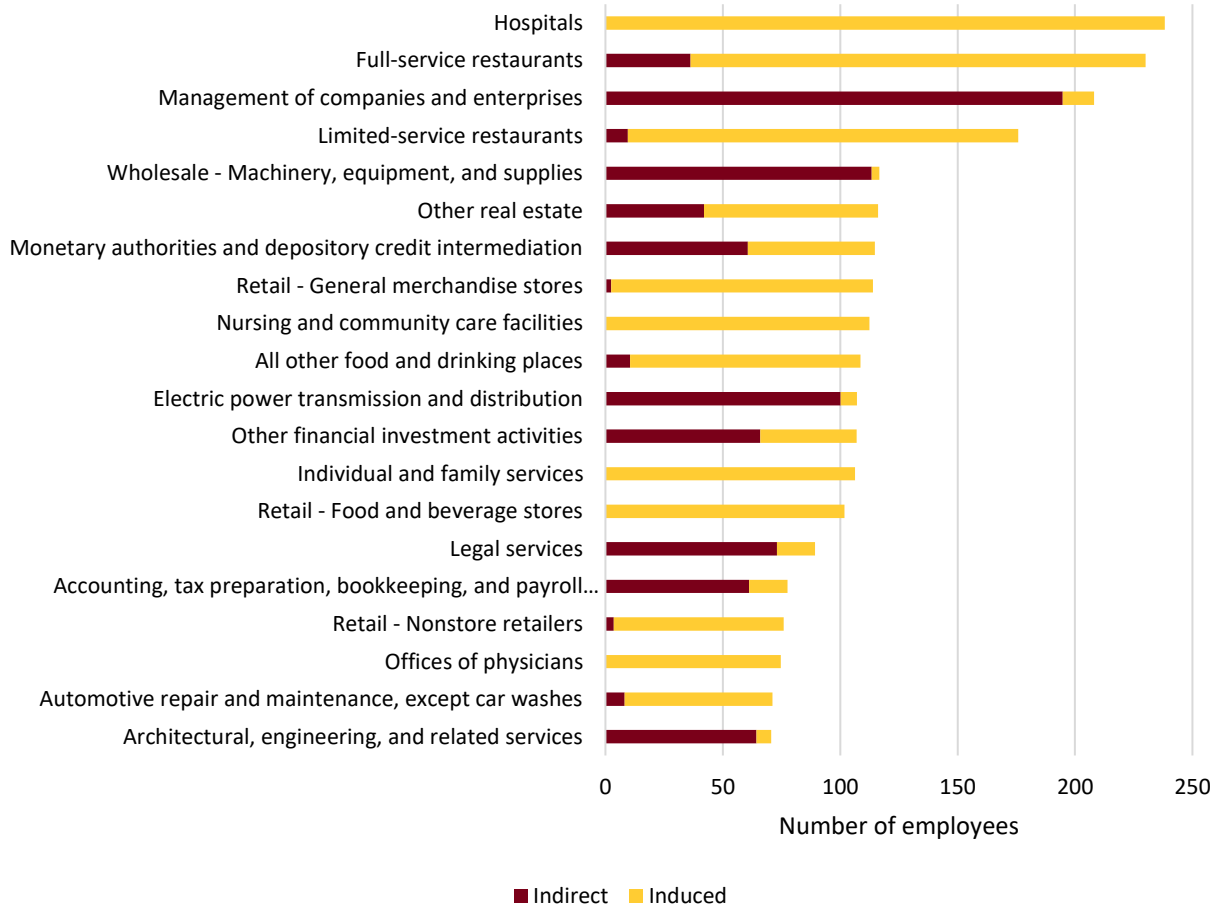
In 2019, ferrous mining resulted in more than 8,900 jobs, $780 million in labor income, nearly $1.7 billion in value added, and nearly $3.4 billion in output to the eight-county study area. Over the next five years, total employment effects of ferrous mining operations are projected to decrease slightly,[15] while labor income will increase by 0.9% and value added by 9.3%. It is projected that in 2024 the ferrous mining industry will support 8,351 jobsin the study area (through direct, indirect, and induced effects), contributing nearly $800

[15] In its projections, the IMPLAN database assumes increases in worker productivity, and therefore predicts a small reduction in the number of workers required for every unit of output. This is why, for all models, projected employment is slightly lower than in the baseline.

million in labor income (wages) to the region, $1.5 billion in value added, and $3.33 billion in output.

Figure 8 shows the estimated employment impacts in the top twenty most impacted industries as measured by number of employees. Only indirect and induced impacts are shown in the chart as all direct effects are felt only within the iron mining industry. Heavily impacted industries include hospitals (n=238), full-service restaurants (n=230), management of companies and enterprises (n=208) and limited-service restaurants (n=176). Industries that are affected by ferrous mining's indirect effects (through business to business spending) include management of companies and enterprises, monetary authorities and depository credit intermediation, and machinery, equipment, and supplies wholesale industries. Industries affected by the induced effects (from employee household spending) include hospitals, full and limited service restaurants, real estate, and general retail industries.

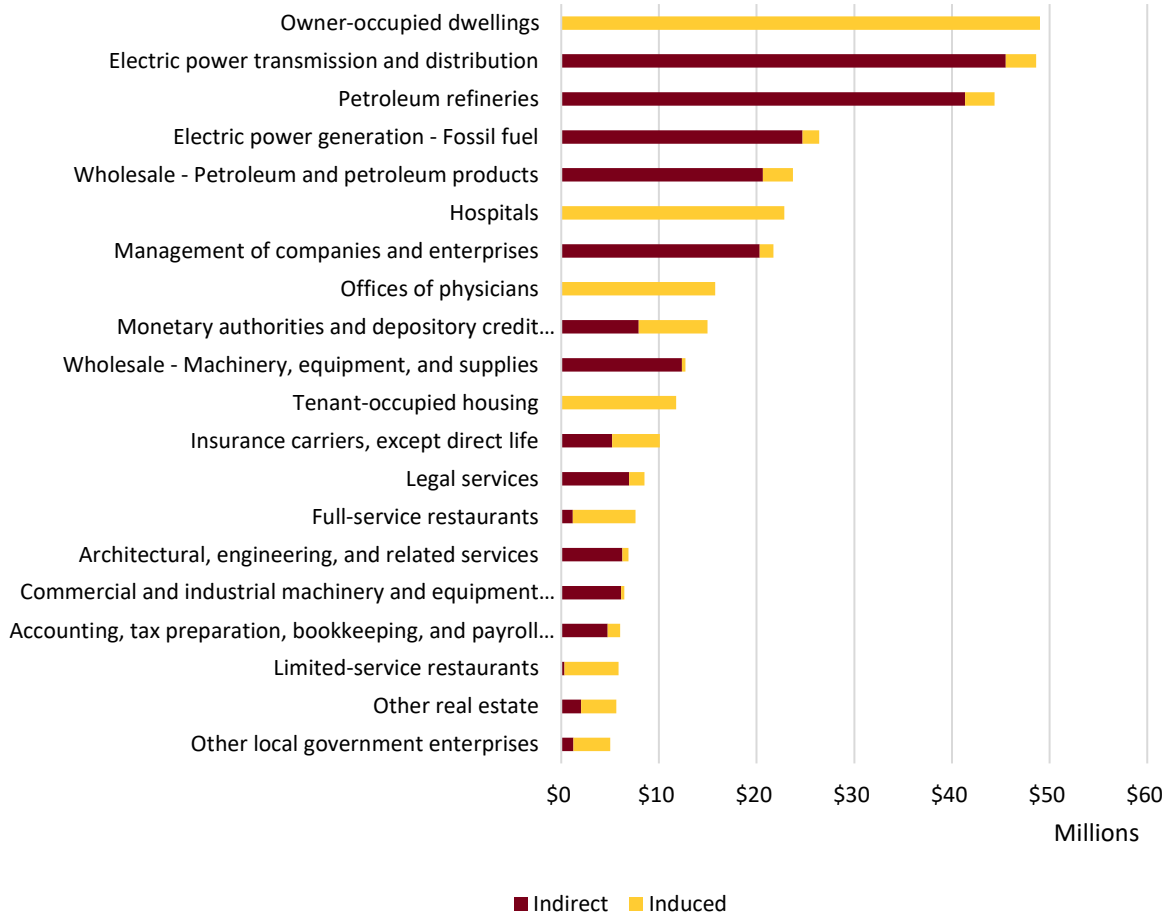
Figure 8. Top 20 Industries Impacted by Ferrous Mining Operations on the Arrowhead Region, by Employment (2019)



SOURCE: IMPLAN

Figure 9 shows the top 20 industries impacted by the ferrous mining industry in terms of value-added spending within the study area. Owner-occupied dwellings is a sector that is unique to IMPLAN's accounting model and represents the amount homeowners would pay if they rented rather than owned their homes. Industries impacted by indirect effects include electric power transmission and distribution, petroleum refineries, petroleum and petroleum products wholesale, management of companies and enterprises, and more. The induced effects of value added to the economy from the ferrous mining operations are seen in many industries including owner occupied dwellings, hospitals, offices of physicians, and tenant-occupied housing. In fact, the region's hospitals benefitted from more than $22 million in value added spending from mining's induced effects (i.e. household spending).

Figure 9. Top 20 Industries Impacted by Ferrous Mining Operations on the Arrowhead Region, by Value Added (2019), Millions of Dollars



SOURCE: IMPLAN

The research team used survey responses provided by representatives of the participating mines as inputs in IMPLAN to model the projected economic impacts of the mining industry on the study area. Due to the uncertainty surrounding the projected impacts, the research team created a sensitivity analysis to depict how varying levels of operations could impact the results. The research team modeled 100% (full impacts), 75% (partial), and 50% (half) impacts for the ferrous and nonferrous mines.

Table 9 shows the results of the sensitivity analysis. By 2024, it is projected that the ferrous mining industry could contribute $788 million in labor income, $1.54 billion in value added, and $3.29 billion in output to the economy at the full impact level. By comparison, a 75% impact would result in nearly $600 million in labor income, $1.15 billion in value added, and nearly $2.5 billion in output to the economy. A 50% impact would result in $394 million in labor income, $769 million in value added spending, and $1.65 billion in output.

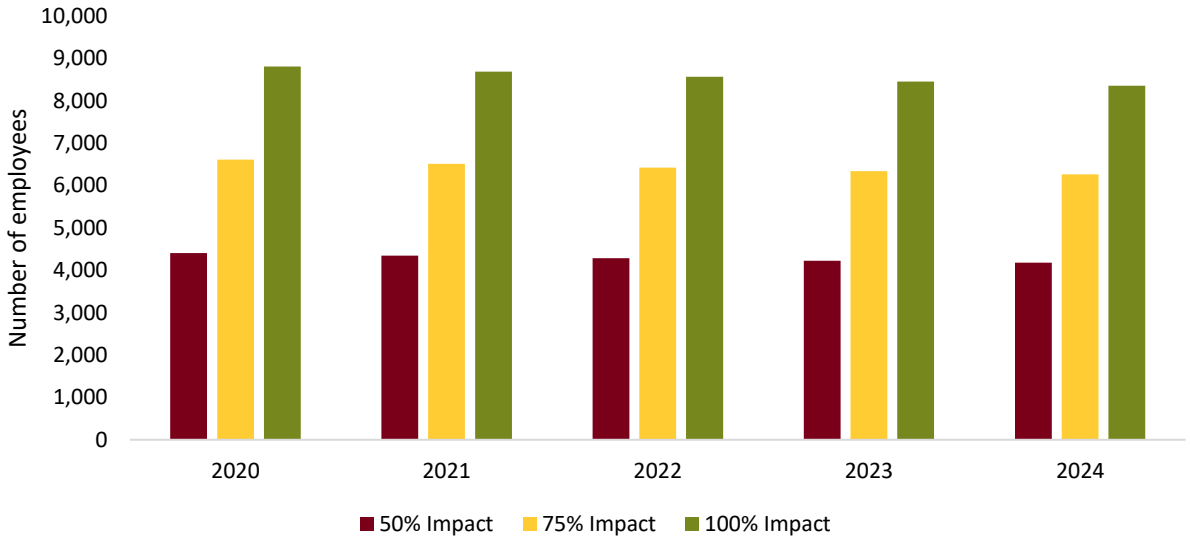
Table 9. Projected Ferrous Mining Sensitivity Analysis on the Arrowhead Region (2024), Millions of Dollars

Total Effect Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	8,351	$788.2	$1,537.8	$3,293.6
75%	6,263	$591.1	$1,153.3	$2,470.2
50%	4,175	$394.1	$768.9	$1,646.8

SOURCE: IMPLAN

Figure 10 below visually depicts the results of the sensitivity analysis on projected employment for the years 2020 through 2024. In 2020, the ferrous mining industry operations are projected to have a full impact of 8,809 jobs within the study area. By comparison, a 75% impact would result in 6,607 jobs to the economy and a 50% impact would result in 4,405 jobs. In five years, the projected impact of ferrous mining operations on employment within the study area is 8,351 jobs for the full impact, 6,263 jobs for a 75% impact, and 4,175 jobs for a 50% impact.

Figure 10. Ferrous Mining Sensitivity Analysis of Projected Employment on the Arrowhead Region



SOURCE: IMPLAN

State of Minnesota

This section provides the direct, indirect, and induced economic impacts for the ferrous mining industry on the state of Minnesota. Results first highlight the baseline (2019) impacts of the industry's operations. Next, the results show projected operational impacts based on estimates provided by the mines, looking forward over the next five years (2020-2024). For all projected impacts, a range of estimates (i.e. sensitivity analysis) show the possible range of impacts that could occur given the uncertainty surrounding the projections.

Table 10 shows the detailed economic impacts of the ferrous mines in the study area for the most recent year (2019). All results are shown in the dollar amount that they occur. As shown in the table, the direct effects from ferrous mining are nearly identical when modeled statewide as compared to the study area of the Arrowhead Region and Douglas County, Wisconsin. However, indirect and induced effects are larger than those for the eight-county study area, since the initial round of spending from the mines' operations has a larger ripple effect when using a larger study area. For example, when mines purchase goods and services from companies that are located beyond the Arrowhead Region but within the state, those purchases would be included in the effects shown in Table 10. In total, ferrous mines contributed more than 11,000 jobs, $1.0 billion in labor income, over $2.0 billion in value added, and $3.9 billion in output to the state's economy in 2019. Also, the jobs multiplier for ferrous mining at the state level is 2.88, meaning that, for every job added in the mining industry, another 1.88 jobs are created elsewhere in the state, in other related industries.

Table 10. Economic Impacts from Ferrous Mining Operations on the State of Minnesota (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	3,982	$537.1	$1,190.7	$2,294.8
Indirect Effect	2,640	$247.3	$428.9	$888.8
Induced Effect	4,841	$259.1	$433.9	$756.6
Total Effect	11,464	$1,043.5	$2,053.5	$3,940.2
Multiplier	2.88	1.94	1.72	1.72

*Totals may not sum due to rounding

SOURCE: IMPLAN

Table 11 shows the total effects from ferrous mining operations for each year in the study (2019-2024). The total employment effects from ferrous mining are expected to see a slight decline over the six-year period from 11,464 jobs in 2019 to 10,357 jobs in 2024. Total effects from labor income, value added, and output on the state's economy are expected to see slight growth over the time period.

Table 11. Projected Economic Impacts (Total Effects) from Ferrous Mining Operations on the State of Minnesota (2019-2024), Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	11,464	$1,043.5	$2,053.5	$3,940.2
2020	11,215	$1,035.6	$2,006.4	$3,900.8
2021	10,981	$1,028.5	$1,962.1	$3,863.5
2022	10,761	$1,022.4	$1,920.3	$3,828.4
2023	10,553	$1,017.0	$1,881.1	$3,795.3
2024	10,357	$1,012.4	$1,844.4	$3,764.2

SOURCE: IMPLAN

Table 12 below shows the results of the sensitivity analysis. By 2024, it is projected that ferrous mines could contribute over $1.0 billion in labor income, $1.84 billion in value added, and nearly $3.76 billion in output to the state's economy at the full impact level. By comparison, a 50% impact would result in roughly $506 million in labor income, $922 million in value added spending, and $1.88 billion in output.

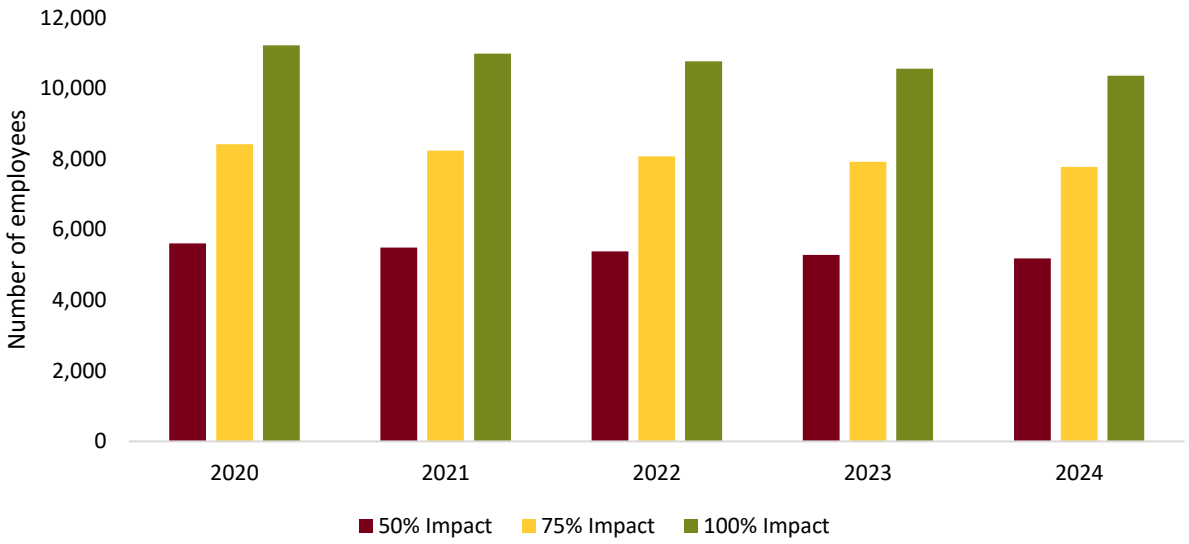
Table 12. Projected Ferrous Mining Sensitivity Analysis for the State of Minnesota (2024), Millions of Dollars

Total Effects Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	10,357	$1,012.4	$1,844.4	$3,764.2
75%	7,768	$759.3	$1,383.3	$2,823.1
50%	5,179	$506.2	$922.2	$1,882.1

SOURCE: IMPLAN

Figure 11 below shows the results of the sensitivity analysis for employment for each year included in the analysis. The anticipated operations for the ferrous mining industry are expected to be relatively steady over the coming years, and that is reflected in the results of the sensitivity analysis. The true employment impacts of the ferrous mining industry on the state's economy are likely to fall somewhere between the maroon (50%) and green bars (100%).

Figure 11. Ferrous Mining Sensitivity Analysis of Projected Employment on the State of Minnesota



SOURCE: IMPLAN

Nonferrous Mining Impacts

Arrowhead Region and Douglas County, Wisconsin

This section provides the direct, indirect, and induced economic impacts for the nonferrous mining industry on the Arrowhead Region and Douglas County, Wisconsin. Results first highlight the baseline (2019) impacts of the industry's operations. Next, the results show projected operational impacts over the next five years (2020-2024). For all projected impacts, a range of estimates (i.e. sensitivity analysis) is provided to show the possible range of impacts that could occur, given the uncertainty surrounding the projections.

Table 13 shows the detailed economic impacts of the nonferrous mining industry in terms of employment,

labor income, value added, and output. Results are based on 2019 operations estimates and are shown in 2019 dollars.

Table 13. Economic Impacts from Nonferrous Mines Operations on the Arrowhead Region (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	46	$6.8	$54.9	$63.2
Indirect Effect	28	$1.6	$3.9	$8.2
Induced Effect	43	$1.8	$3.3	$6.1
Total Effect	117	$10.2	$62.0	$77.5
Multiplier	2.55	1.50	1.13	1.23

*Totals may not sum due to rounding

SOURCE: IMPLAN

In 2019, 46 jobs were supported directly by nonferrous mining, and 71 additional jobs were indirectly supported by the nonferrous mining industry in the region for a total employment effect of 117 jobs in 2019 (2.55 multiplier). In total, the nonferrous mining industry added more than $10 million in labor income, $62 million in value added spending, and more than $77 million in output to the study area's economy in 2019.

Table 14 shows the total effect of the nonferrous mining industry on the region in terms of employment, labor income, value added, and output from 2019 to 2024. Over the next five years, employment is expected to increase by almost 500%, and value added is anticipated to increase by over 200% to just over $210 million. Total output is expected to grow to more than $300 million by 2024.

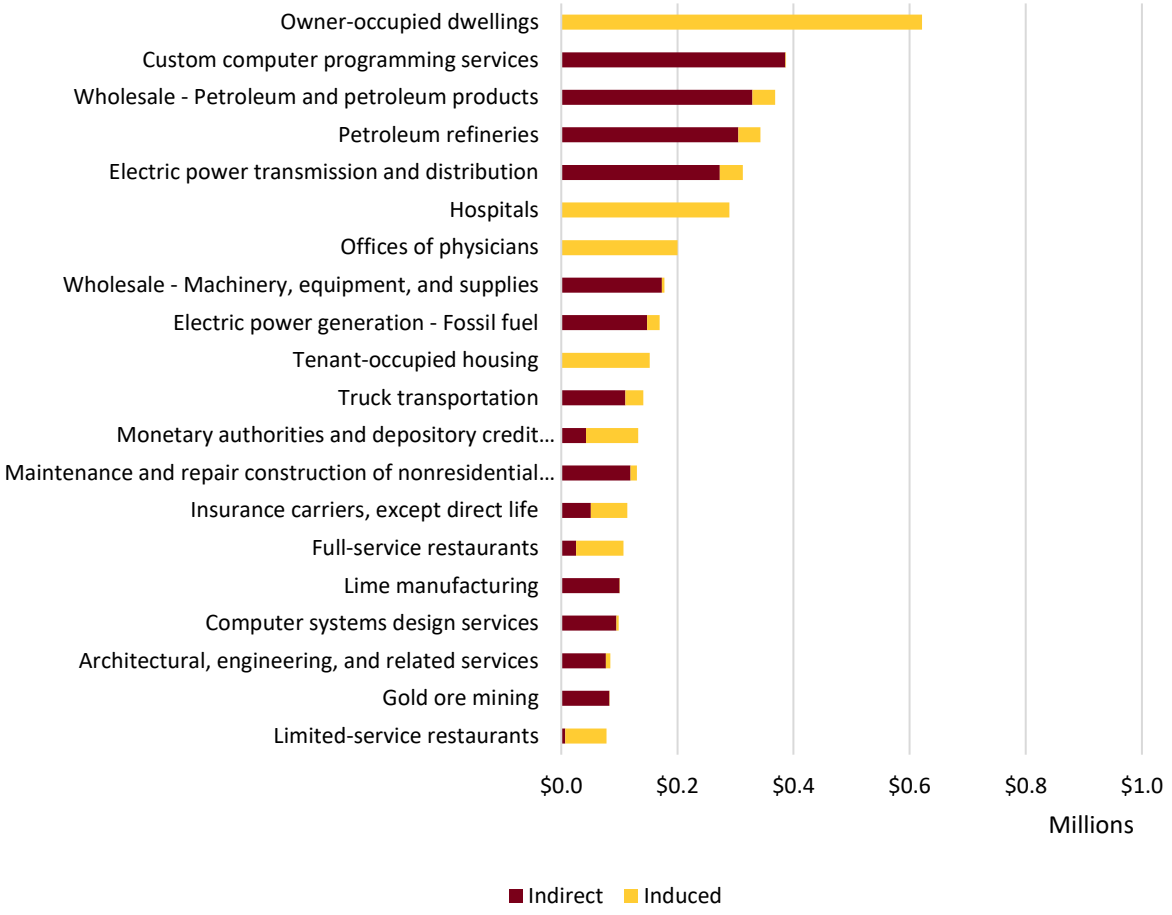
Table 14. Projected Economic Impacts (Total Effects) from Nonferrous Mining Operations on the Arrowhead Region (2019-2024), Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	117	$10.2	$62.0	$77.5
2020	123	$11.1	$66.9	$86.9
2021	164	$13.8	$72.4	$95.7
2022	290	$22.7	$145.6	$206.8
2023	598	$44.8	$204.3	$285.0
2024	698	$45.0	$210.6	$307.4

SOURCE: IMPLAN

Figure 12, on the following page, shows the top 20 industries impacted by nonferrous mining operations in 2019. Only indirect and induced impacts are shown in the chart as all direct effects are felt only within the nonferrous mining industry. After owner-occupied dwellings, the most impacted industries in the study area are custom computer programming services ($387,000 in value added impacts), wholesale – petroleum and petroleum products ($369,000), and petroleum refineries ($343,000).

Figure 12. Top 20 Industries Impacted by Nonferrous Mining Operations, by Value Added (2019), Millions of Dollars on the Arrowhead Region



SOURCE: IMPLAN

Table 15 below shows the results of the sensitivity analysis. By 2024, it is projected that the nonferrous mining industry could contribute almost $45 million in labor income, $211 million in value added, and $307 million in output to the economy at the full impact level. By comparison, a 75% impact would result in over $34 million in labor income, $158 million in value added, and $231 million in output to the economy. Additionally, a 50% impact would result in roughly $23 million in labor income, $105 million in value added spending, and $154 million in output.

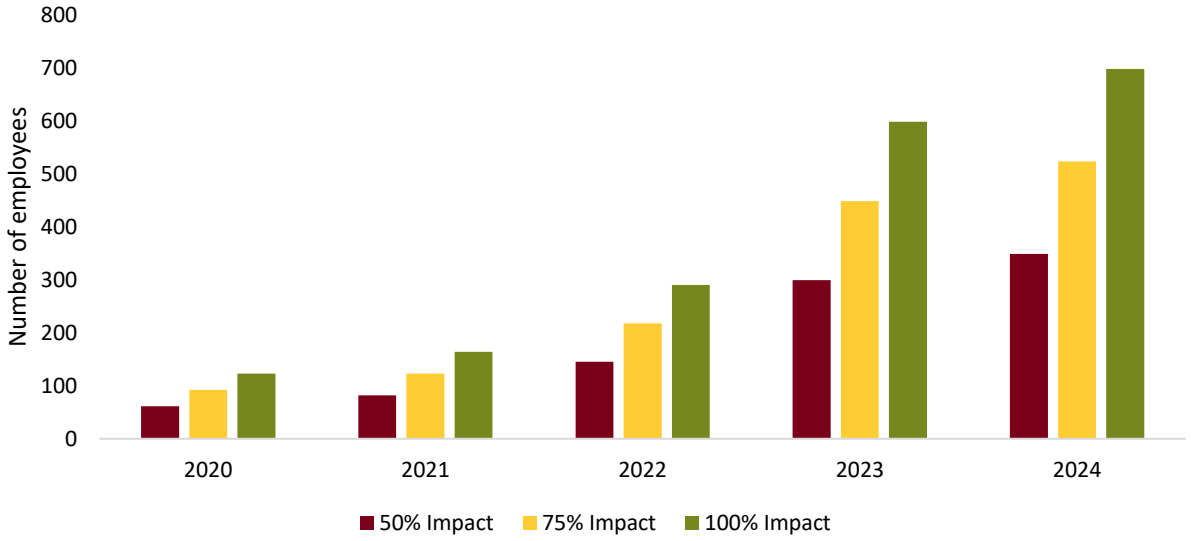
Table 15. Projected Nonferrous Mining Sensitivity Analysis on the Arrowhead Region (2024), Millions of Dollars

Total Effects Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	698	$45.0	$210.6	$307.4
75%	524	$33.7	$158.0	$230.6
50%	349	$22.5	$105.3	$153.7

SOURCE: IMPLAN

Figure 13 below shows the sensitivity analysis of projected employment within the study area as a result of the nonferrous mines for the years 2020 through 2024. In 2020, the full impact of nonferrous mining operations on employment is projected to be 123 jobs within the study area. By comparison, a 50% impact would result in 62 jobs, and a 75% impact would result in 92 jobs to the economy. In five years, the projected impact of nonferrous mining operations on employment within the study area is anticipated to be 698 jobs for the full impact, 349 jobs for a 50% impact, and 524 jobs for a 75% impact.

Figure 13. Nonferrous Mining Sensitivity Analysis of Projected Employment on the Arrowhead Region



SOURCE: IMPLAN

State of Minnesota

Table 16 on the next page shows the economic impacts from nonferrous mining on the state of Minnesota. As shown in the table, the direct effects from nonferrous mining are nearly identical when modeled statewide as compared to the study area. However, indirect and induced effects are quite a bit larger since the initial round of spending from the mines' operations has a larger ripple effect when using a larger study area. For example, if the mines are purchasing goods and services from companies that are located beyond the Arrowhead Region and Douglas County, Wisconsin, but within the state, those purchases would be included in the effects shown in Table 16. In total, nonferrous mining operations contributed nearly 174 jobs, $15.6 million in labor income, $64.7 million in value added, [16] and $89.2 million in output to the state's economy in 2019.

[16] Value added is a measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and proprietor income (i.e. profits). In most cases, value added is larger when modeled in a larger study area. However, it is possible for value added to be smaller if one of the components is negative. In this case, proprietor income was negative for the nonferrous mining industry for the state. For this reason, the value added direct effects shown in Table 16 are actually smaller than those for the Arrowhead Region.

Table 16. Economic Impacts from Nonferrous Mining Operations on the State of Minnesota (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	46	$6.8	$50.1	$63.2
Indirect Effect	56	$5.0	$8.1	$14.7
Induced Effect	72	$3.9	$6.5	$11.3
Total Effect	174	$15.6	$64.7	$89.2
Multiplier	3.79	2.30	1.29	1.41

*Totals may not sum due to rounding

SOURCE: IMPLAN

Table 17 shows the total effects from nonferrous mining operations for each year in the study (2019-2024). The surveyed mines predict growth over the coming years, and the economic effects reflect that growth. The total employment effects from nonferrous mining, for example, are expected to grow from 174 jobs in 2019 to more than 877 jobs in 2024. Similarly, total output is expected to increase from $89.2 million in 2019 to almost than $350 million in 2024.

Table 17. Projected Economic Impacts (Total Effects) from Nonferrous Mining Operations on the State of Minnesota (2019-2024), Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	174	$15.6	$64.7	$89.2
2020	184	$16.9	$69.8	$99.5
2021	228	$20.1	$75.7	$109.2
2022	420	$35.4	$151.7	$234.1
2023	774	$62.5	$214.2	$322.9
2024	877	$63.2	$220.7	$346.4

SOURCE: IMPLAN

Table 18 below shows the results of the sensitivity analysis. By 2024, it is projected that the nonferrous mining industry could contribute over $63.0 million in labor income, $220.7 million in value added, and $346 million in output to the state's economy at the full impact level. By comparison, a 50% impact would result in roughly $32 million in labor income, $110 million in value added spending, and $173 million in output.

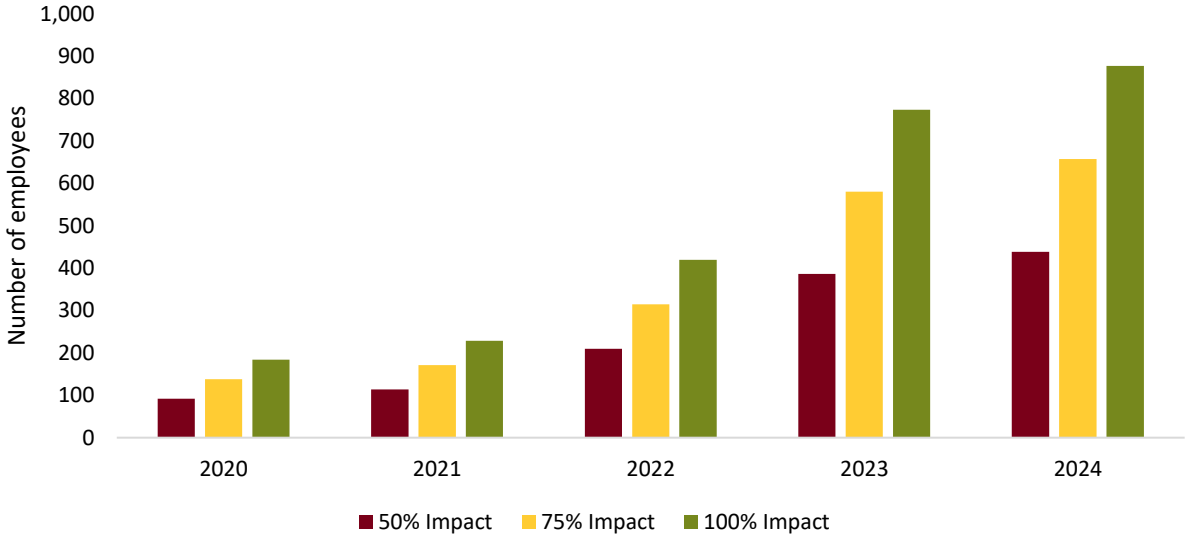
Table 18. Projected Nonferrous Mining Sensitivity Analysis on the State of Minnesota (2024), Millions of Dollars

Total Effects Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	877	$63.2	$220.7	$346.4
75%	658	$47.4	$165.5	$259.8
50%	438	$31.6	$110.4	$173.2

SOURCE: IMPLAN

Figure 14 on the next page shows the results of the sensitivity analysis on employment (2020-2024) for the state of Minnesota. The results show not only the predicted growth based on surveyed mines' projections (green bars) but also what employment would be if true impacts were 75% (gold) or 50% (maroon) of the companies' projections. Even by conservative estimates (i.e. 50% level), it is estimated that the nonferrous mines will contribute roughly 430 new jobs to the state's economy by 2024.

Figure 14. Nonferrous Mining Sensitivity Analysis of Projected Employment on the State of Minnesota



SOURCE: IMPLAN

Ferrous and Nonferrous Mining Impacts

Arrowhead Region and Douglas County, Wisconsin

This section provides the direct, indirect, and induced economic impacts for the combined ferrous and nonferrous mining industry on the Arrowhead Region and Douglas County, Wisconsin. Results first highlight the baseline impacts of the industry's operations, followed by projected operational impacts for the next five years (2020-2024). For all projected impacts, a range of estimates (i.e. sensitivity analysis) is provided to show the possible range of impacts that could occur, given the uncertainty surrounding the projections. Finally, this section also includes projected impacts for capital and construction spending in the coming years.

Table 19 shows the combined impacts of the ferrous and nonferrous industry for the baseline (2019) year. As shown in the table, the ferrous and nonferrous industry combined added more than 9,000 jobs, nearly $791 million in labor income, over $1.75 billion in value added spending, and over $3.46 billion in output to the Arrowhead Region in 2019. The industry had an employment multiplier of 2.25, meaning that for every one job created directly by the industry, another 1.25 jobs were added in other parts of the economy.

Table 19. Economic Impacts from Ferrous and Nonferrous Mining Operations on the Arrowhead Region (2019), Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	4,028	$543.9	$1,245.6	$2,358.1
Indirect Effect	1,665	$106.5	$254.8	$631.9
Induced Effect	3,367	$140.6	$256.3	$473.6
Total Effect	9,060	$790.9	$1,756.7	$3,463.6
Multiplier	2.25	1.45	1.41	1.47

*Totals may not sum due to rounding

SOURCE: IMPLAN

Table 20 shows the projected impacts over the coming five years. Employment effects from ferrous and nonferrous mining are projected to be relatively stable from 2019-2024, as are the projected value added effects. Total output and labor income effects are projected to increase slightly over the period, with output predicted to exceed $3.6 billion by 2024.

Table 20. Projected Economic Impacts (Total Effects) from Ferrous and Nonferrous Mining Operations on the Arrowhead Region (2020-2024), Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	9,060	$790.9	$1,756.7	$3,463.6
2020	8,932	$792.4	$1,726.0	$3,452.1
2021	8,848	$796.2	$1,698.1	$3,441.2
2022	8,857	$806.6	$1,740.0	$3,533.8
2023	9,054	$830.6	$1,769.4	$3,594.8
2024	9,049	$833.2	$1,748.4	$3,601.1

SOURCE: IMPLAN

Table 21 shows the sensitivity analysis for ferrous and nonferrous mining. Three levels of impacts (100%, 75%, and 50%) are provided to show the possible range of impacts that could occur given the uncertainty surrounding the mine's projections.

Table 21. Projected Ferrous and Nonferrous Mining Sensitivity Analysis on the Arrowhead Region (2024), Millions of Dollars

Total Effects Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	9,049	$833.2	$1,748.4	$3,601.1
75%	6,787	$624.9	$1,311.3	$2,700.8
50%	4,524	$416.6	$874.2	$1,800.5

SOURCE: IMPLAN

Further models were developed to estimate the predicted economic impacts of proposed capital and construction investment over the next five years. These results are shown in Table 22 on the following page. The year 2022 is projected to be the highest level of investment and, therefore, have the highest economic impacts. In that year alone, construction and capital spending on the part of the ferrous and nonferrous mines is expected to add roughly 11,500 jobs to the study area, more than $640 million in labor income, $545 million in value added spending, and $1.24 billion in total output.[17] Over the course of the five-year period, it is predicted that the combined capital and construction spending for the ferrous and nonferrous mines will contribute more than $1.2 billion in labor income, $1.1 billion in value added spending, and $2.4 billion in total output. It is important to note that the employment effects from the construction and capital spending are temporary and will only be felt in the study area for the year in question. Therefore, employment cannot be summed.

[17] In most cases, value added is larger than labor income. However, it is possible for value added to be smaller than labor income. This can occur if "other property type income" (OPTI) is negative. Negative OPTI means that the sector spent more than in brought in as revenues (i.e., ran a deficit) that year. This was the case for the construction of other nonresidential structures sector in the study area in 2018, which is the reason why labor income effects are larger than value added in 2020, 2021, and 2023.

Table 22. Projected Economic Impacts (Total Effects) from Ferrous and Nonferrous Capital and Construction Expenditures on the Arrowhead Region (2020-2024), Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2020	194	$11.8	$22.0	$42.6
2021	4,990	$276.8	$241.0	$540.8
2022	11,487	$643.7	$544.6	$1,237.3
2023	189	$11.9	$22.3	$43.6
2024	4,713	$268.1	$233.9	$529.3
Total	--	$1,212.3	$1,063.8	$2,393.7

SOURCE: IMPLAN

Table 23 shows the sensitivity analysis for the capital and construction impacts for the year 2022. If the nonferrous mines' projections are accurate, impacts from the proposed construction projects could reach nearly 11,500 jobs, $644 million in labor income, and over $1.2 billion in output in 2022. By comparison, a 75% impact would result in over 8,600 jobs and $928 million in output to the economy, while a 50% impact would result in roughly 5,700 jobs and $619 million in output. The impacts shown, however, represent the peak year for spending, and impacts would be temporary, ending once the construction project is complete.

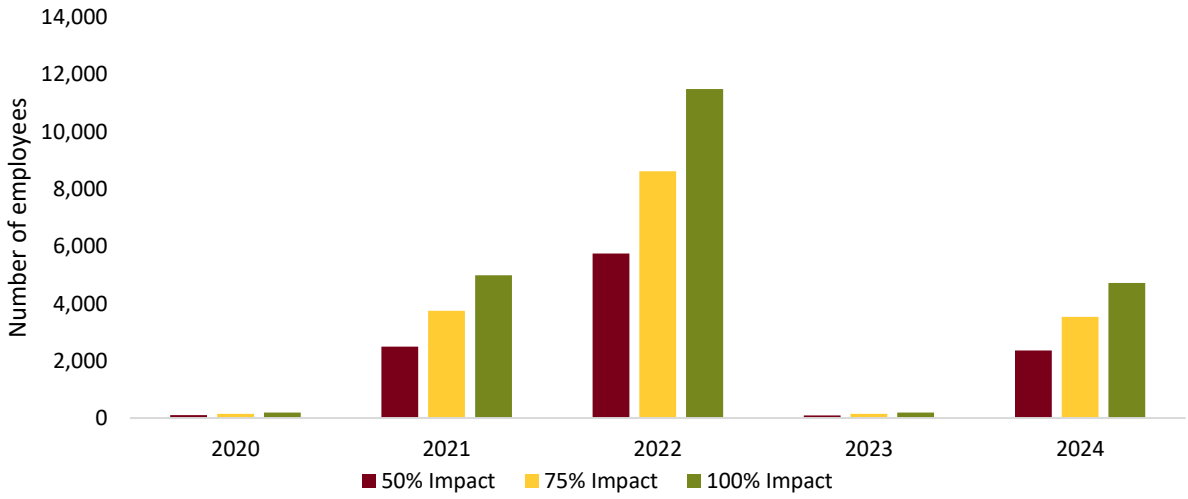
Table 23. Projected Construction and Capital Expenditure Sensitivity Analysis on the Arrowhead Region (2022), Millions of Dollars

Total Effects Level	*Employment*	*Labor Income*	*Value Added*	*Output*
100%	11,487	$643.7	$544.6	$1,237.3
75%	8,615	$482.8	$408.5	$928.0
50%	5,743	$321.9	$272.3	$618.7

SOURCE: IMPLAN

Figure 15 shows further details of the sensitivity analysis. In the figure, the full employment impacts, along with the 75% and 50% levels are shown for each year.

Figure 15. Capital Expenditure and Construction Spending's Sensitivity Analysis of Projected Employment on the Arrowhead Region



SOURCE: IMPLAN

Table 24 depicts the 25 most impacted sectors by mining capital and construction expenditures forecasted for 2022 (the peak year for spending). Construction of other new nonresidential structures, owner-occupied dwellings, and hospitals are the three most impacted industries. These industries could see $212 million, $40 million, and $18 million of value added spending respectively as a result of capital and construction spending from ferrous and nonferrous mines. Impacts to the construction of other new nonresidential structures industry would be due to direct spending on the part of the mines, while most of the other top impacted industries would see large indirect and induced effects from increased wages and inter-industry spending.

Table 24. Top 25 Industries Impacted by Ferrous and Nonferrous Mining Capital and Construction Expenditures on the Arrowhead Region (2022), Millions of Dollars

Sector	*Direct*	*Indirect*	*Induced*	*Total*
Construction of other new nonresidential structures	$211.8	$0.0	$0.0	$211.8
Owner-occupied dwellings	$0.0	$0.0	$39.5	$39.5
Hospitals	$0.0	$0.0	$18.4	$18.4
Retail - Building material and supplies stores	$0.0	$13.5	$1.3	$14.8
Wholesale - Petroleum and petroleum products	$4.4	$6.2	$2.5	$13.0
Offices of physicians	$0.0	$0.0	$12.6	$12.6
Architectural, engineering, and related services	$0.0	$9.4	$0.5	$9.9
Tenant-occupied housing	$0.0	$0.0	$9.2	$9.2
Truck transportation	$0.0	$7.0	$1.9	$8.9
Wholesale - Machinery, equipment, and supplies	$4.3	$4.2	$0.3	$8.8
Monetary authorities and depository credit intermediation	$0.0	$2.5	$5.7	$8.2
Petroleum refineries	$0.0	$5.5	$2.4	$7.9
Full-service restaurants	$0.0	$0.5	$5.1	$5.6
Wholesale - Other durable goods merchant wholesalers	$0.0	$4.9	$0.6	$5.5
Other real estate	$0.0	$2.4	$2.9	$5.2
Mining machinery and equipment manufacturing	$5.1	$0.0	$0.0	$5.1
Retail - General merchandise stores	$0.6	$0.4	$3.9	$4.9
Limited-service restaurants	$0.0	$0.1	$4.4	$4.5
Insurance carriers, except direct life	$0.0	$0.5	$3.9	$4.4
Automotive repair and maintenance, except car washes	$0.0	$1.2	$3.1	$4.3
Ready-mix concrete manufacturing	$0.0	$3.9	$0.1	$4.0
Nursing and community care facilities	$0.0	$0.0	$3.8	$3.8
Electric power transmission and distribution	$0.0	$1.3	$2.5	$3.8
Retail - Food and beverage stores	$0.0	$0.0	$3.7	$3.7
Other local government enterprises	$0.0	$0.7	$3.0	$3.7

SOURCE: IMPLAN

State of Minnesota

This section provides the direct, indirect, and induced economic impacts for the combined ferrous and nonferrous mining industry on the state of Minnesota. Table 25 on the following page shows the combined economic impacts of the ferrous and nonferrous industry for baseline (2019) year. As shown in the table, the ferrous and nonferrous industry combined added over 11,600 jobs, almost $1.1 billion in labor income, more than $2.1 billion in value added spending, and over $4.0 billion in output to the state's economy in 2019. The

industry had an employment multiplier of 2.89, meaning that for every one job created directly by the industry, another 1.89 jobs were added in other parts of the economy.

Table 25. Economic Impact Modelling for Combined Mining Operations on the State of Minnesota (2019 Baseline), in Millions of Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	4,028	$543.9	$1,240.8	$2,358.1
Indirect Effect	2,697	$252.3	$437.1	$903.5
Induced Effect	4,914	$263.0	$440.4	$767.9
Total Effect	11,638	$1,059.1	$2,118.3	$4,029.4
Multiplier	2.89	1.95	1.71	1.71

*Totals may not sum due to rounding

SOURCE: IMPLAN

Table 26 shows the total effects of the ferrous and nonferrous mines for the years 2019-2024. Total effects are expected to remain stable over the period, while employment effects will reach almost 11,250 by 2024.

Table 26. Total Projected Economic Impacts (Total Effects) from Combined Mining Operations on the State of Minnesota (2019-2024), in Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2019 (Baseline)	11,638	$1,059.1	$2,118.3	$4,029.4
2020	11,399	$1,052.5	$2,076.2	$4,000.3
2021	11,210	$1,048.7	$2,037.7	$3,972.7
2022	11,180	$1,057.8	$2,072.1	$4,062.4
2023	11,327	$1,079.5	$2,095.3	$4,118.2
2024	11,234	$1,075.7	$2,065.1	$4,110.6

SOURCE: IMPLAN

Table 27 outlines the economic impacts that capital expenditure and construction projects will have on the state of Minnesota in terms of employment, labor income, value added, and output (total economic impacts) for the years 2020-2024. The wide range in estimated outputs comes from the wide range of construction and capital expenditure estimates reported by the mining companies. The most impactful year is 2022 with an estimated $1.55 billion of total economic impact and 12,018 jobs. The $1.55 billion of impact on the state of Minnesota in the year 2021 is $308.7 million larger than the impacts specific to the Arrowhead Region.

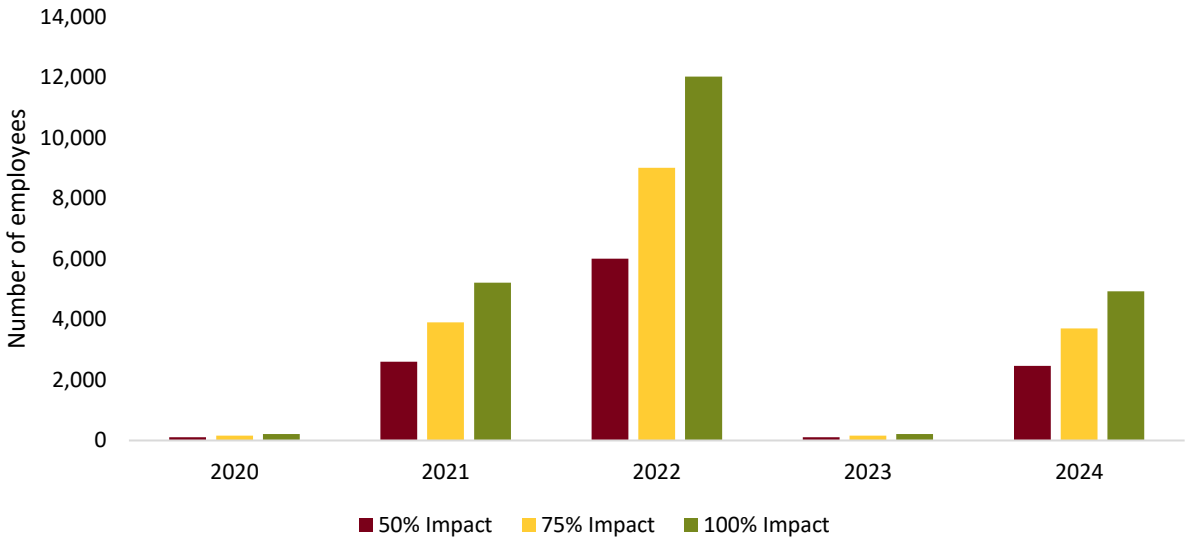
Table 27. Total Projected Impacts (Total Effects) from Capital Expenditure and Construction on the State of Minnesota (2020-2024), in Millions of Dollars

Year	*Employment*	*Labor Income*	*Value Added*	*Output*
2020	212	$15.5	$26.2	$46.8
2021	5,209	$349.7	$338.5	$667.2
2022	12,018	$815.5	$776.4	$1,546.0
2023	213	$16.2	$27.4	$49.9
2024	213	$16.5	$27.8	$50.6
Total		$1,213.4	$1,196.1	$2,360.4

SOURCE: IMPLAN

Finally, Figure 16 shows the sensitivity analysis for the employment impacts from capital and construction spending for the ferrous and nonferrous mines. Employment is expected to peak in 2022, with moderate activity predicted for 2021 and 2024 and very little occurring in 2020 or 2023. In 2022, employment could reach more than 12,000 jobs due to large construction spending. However, these impacts would be temporary and would cease to be felt after the construction was completed. Even at 50% level (maroon), employment in 2021 could reach more than 6,000 statewide as a result of mining construction projects and capital spending.

Figure 16. Capital Expenditure and Construction Spending's Sensitivity Analysis of Projected Employment on the State of Minnesota



SOURCE: IMPLAN

IV. Tax Impacts

The third objective of the study is to describe Minnesota mining-related taxes paid by the mining industry. In order to interpret tax tables in this report, readers should note that taxes are distributed between the State of Minnesota's General Fund, local units of government, and education. Taxes employed by the government come in the forms of production taxes, occupation taxes, state and county taxes, and other various taxes.

Ferrous Mining Tax Impacts

During 2018 (calendar year) Minnesota's iron mines paid $158.7 million in production tax, occupation tax, sales and use tax, income tax, various Ad Valorem and property taxes and royalties and rentals on state minerals.

The 2018 taconite production tax of more than $103 million is payable the following year. As we note below, and in order to reconcile totals for subsequent tax impacts, readers must note that $113.3 million in production, sales and use, income and various Ad Valorem taxes were accrued in 2018. These taxes are spread between the State of Minnesota's General Fund, local units of government and schools. Approximately $8.7 million of this was support to local school districts. (See Table 28.) A further detail on interpreting the occupation tax is to note that the occupation tax is split according to 10% for the University of Minnesota, 40% to elementary and secondary education, and 50% to the State of Minnesota's General Fund. A further breakdown of this $79 million is found in Appendix C.

Table 28. Minnesota's Iron Mines Direct Support for the State of Minnesota, 2019

Tax	***Mining Industry Contribution***
Taconite Production Tax**	$103,789,847
Occupation Tax*	$19,082,000
Sales and Use Tax	$8,664,249
Various Ad Valorem and Property taxes	$890,644
Royalties and Rentals on State Iron Ore	
School Trust Lands	$15,276,000
University Trust Lands	$4,411,000
Tax Forfeit	$6,177,000
Other state accounts	$371,000
Total	$158,661,740

*All taxes are according to the Department of Revenue's *Minnesota Mining Tax Guide, 2019* (based on 2018 production year).
**Production and other taxes: $113.3 million in production, sales and use, and various Ad Valorem and property taxes were paid in 2018. Approximately $19.7 million of the $113.3 million was used to support the local school districts.

SOURCE: MN DEPARTMENT OF REVENUE, MN DNR

Table 29 shows Minnesota's iron mining industry's support for the state's education. During 2018, iron mining paid nearly $53 million towards education, with over $7 million on university-related expenses and almost $46 million on public schooling.

Table 29. Minnesota's Iron Mining Industry Support for Education, 2018, in Millions

Account	*School*	*University*	*Total Education*
School district component of production tax*	$19.7		$19.7
State iron ore royalties and rent**	$18.3	$5.3	$23.6
Occupation tax***	$7.6	$1.9	$9.5
Totals	$45.7	$7.2	$52.9

*School district component of production tax is according to the Department of Revenue's *Minnesota Mining Tax Guide*, 2019.
**School trust and university royalties are from Department of Natural Resources Mineral receipts by account for calendar year 2011. Iron ore and taconite income is 97% of the state's total mineral receipts.
*** Occupation tax is according to the Department of Revenue's *Minnesota Mining Tax Guide, November 2011*. Total tax is $12,617,000 of which 40% went to elementary and secondary education and 10% went to the University of Minnesota.

SOURCE: MN DEPARTMENT OF REVENUE, MN DNR

Table 30 shows royalties and rental receipts to the state from ferrous mining as reported from the Department of Natural Resources mineral receipts by account for calendar years 2017 and 2018. Royalties and rental receipts are payments by the mining companies for the use of the state's non-renewable mineral resources.

Table 30. Minnesota Ferrous Mineral Royalties and Rentals Receipts, 2017 and 2018, in Millions of Dollars

Account	*2017 Iron-Ore Taconite*	*2018 Iron Ore Taconite*
School trust fund	$12.3	$15.3
School trust fund (minerals mgmt)	$2.4	$3.0
University trust fund	$0.3	$4.4
University trust fund (minerals mgmt)	$0.0	$0.9
Tax forfeit	$3.8	$6.2
Tax forfeit (minerals mgmt)	$0.8	$1.2
Advanced royalty account	$0.2	$0.2
Totals	$19.8	$31.2

SOURCE: MN DEPARTMENT OF REVENUE

Nonferrous Mining Tax Impacts

In order to estimate nonferrous tax impacts on Minnesota, the BBER followed the Minnesota DNR's mineral receipts by account for 2017 and 2018. A more detailed table on the royalties and rental receipts can be found in Appendix C. Compared to ferrous mining, nonferrous mining contributes much less to the state. Table 31 shows that the nonferrous sector contributed over $1.64 million in 2017 and almost $1.97 million in 2018.

Table 31. Minnesota Nonferrous Mineral Royalties and Rentals Receipts, 2017 and 2018, in Thousands of Dollars

Account	*2017 Nonferrous Metallic Minerals*	*2018 Nonferrous Metallic Minerals*
School trust fund	$528.2	$592.7
School trust fund (minerals mgmt)	$105.7	$118.5
Tax forfeit	$602.3	$719.7
Tax forfeit (minerals mgmt)	$120.5	$143.9
Consolidated conservation	$238.1	$302.0
Consolidated conservation (minerals mgmt)	$47.6	$60.4
Other land classes	$1.7	$32.2
Other land classes (minerals mgmt)	$0.3	$0.3
Totals	$1,644.4	$1,969.7

SOURCE: MN DEPARTMENT OF REVENUE, MN DNR

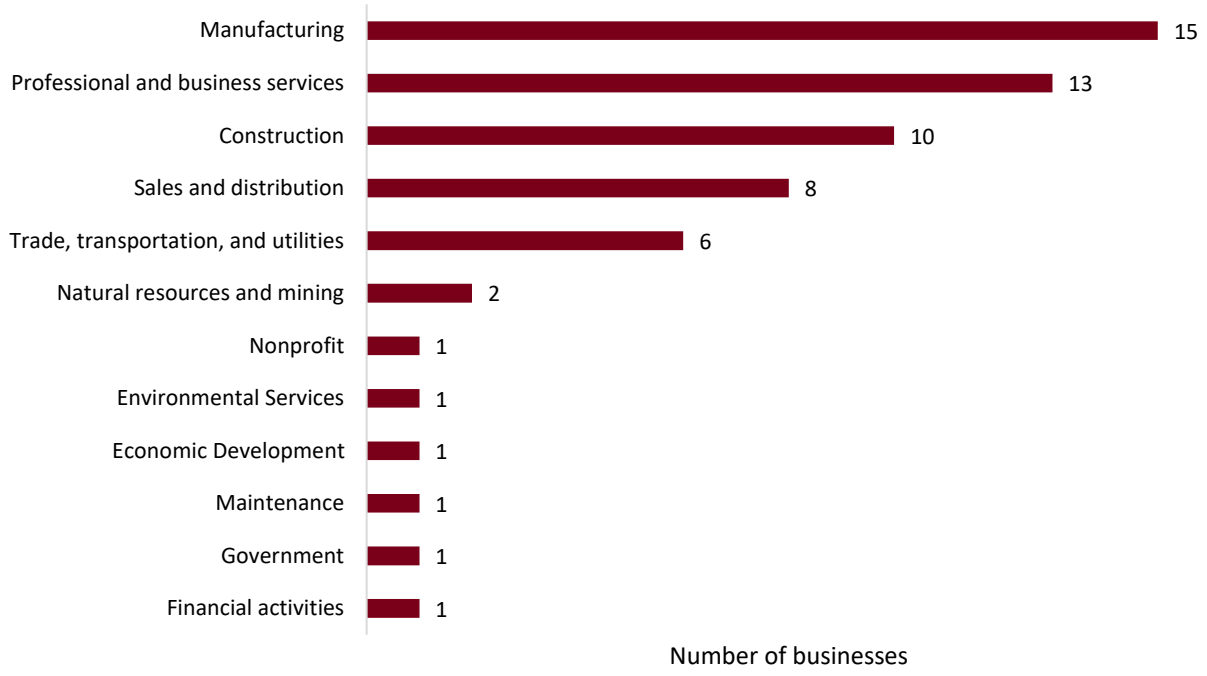
V. Survey of Mining Related Firms

The results of a survey distributed to mining-related businesses are provided in this section. The BBER produced the survey to understand how the mining industry has impacted the economic performance of mining-related firms in the region and to gauge the confidence of businesses that support the industry locally.

In total, 82 businesses responded to the survey. However, not all businesses completed each question. Any respondent who answered at least one question related to their business performance was included in the analysis, which in total includes 60 businesses. For each question shown, the number of respondents is provided in parentheses following the caption. (These are not always 60.)

Respondents were asked to identify the sector in which their business was classified (Figure 17). Manufacturing (n=15), professional and business services (n=13), and construction (n=10) were the most common responses. It is interesting to note that many sectors which aren't normally associated with the mining industry were represented among survey respondents, including government, nonprofit, and financial activities.

Figure 17. What sector is your business in? (n=60)

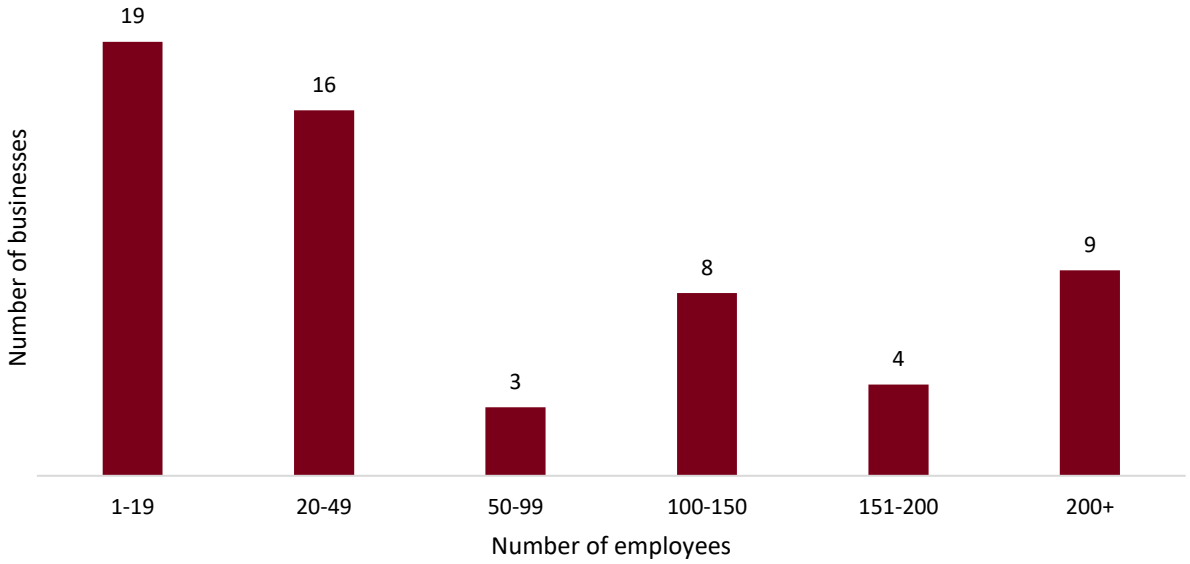


SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Respondents were then asked if their company was the headquarters or a branch location. Of the 59 respondents, 63% (n=38) indicated that their location was the headquarters, while 37% (n=22) stated it was a branch location. For those who stated that their business was a branch location, they were asked to specify the location of their headquarters. Some of the most common locations were in the Twin Cities metro area (n=9) or in the Twin Ports (n=3). Another five businesses indicated their headquarters was located somewhere on the Iron Range (Virginia, Eveleth, Chisolm, or Hibbing). And nine businesses had a headquarters located in another state or country.

Businesses were also asked how many employees they currently have at their specific location. Figure 18 shows that more than half of all surveyed businesses have fewer than 50 employees, with 19 businesses reporting fewer than 20 employees at their specific location, and 16 businesses reporting 20-49 employees. The third most common response was 200+ employees, with nine businesses selecting that option.

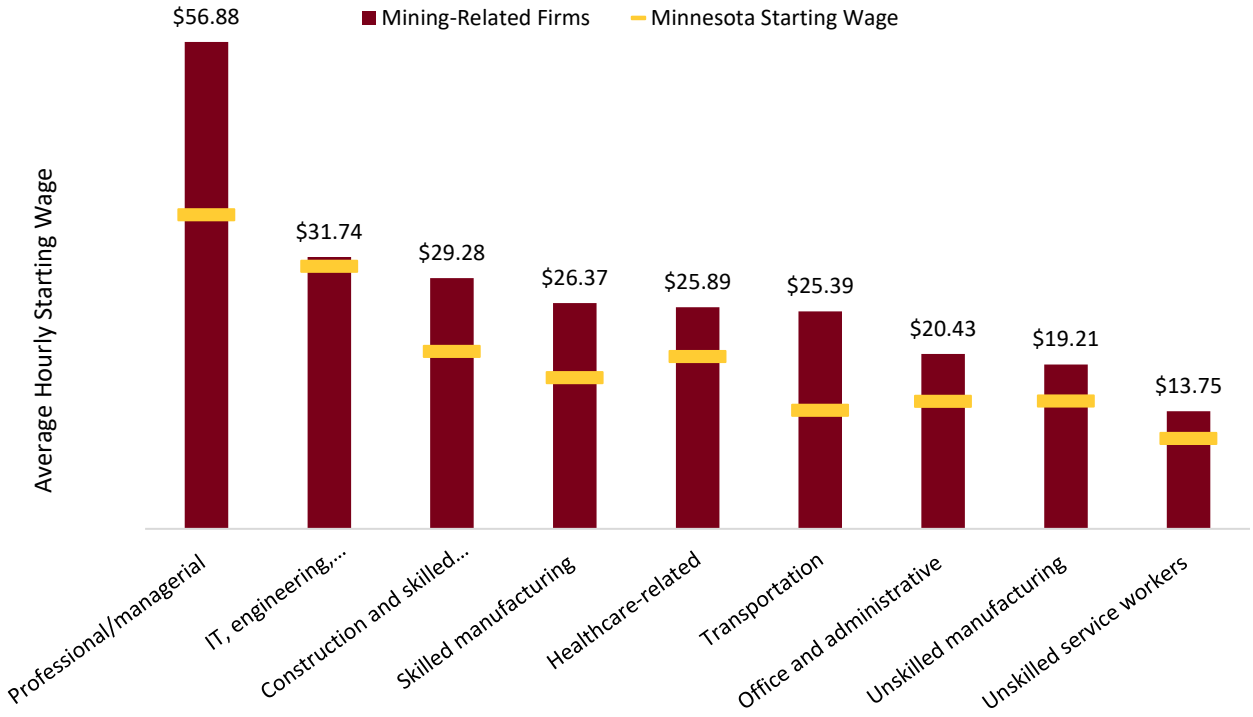
Figure 18. How many employees does your business have at your specific location? (n=59)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Next, the survey asked businesses to provide the average hourly starting wage they pay to employees by specific type of occupation. Figure 19 below shows the average wage for each occupation for all businesses that provided a response. In addition, the graph shows the average hourly wage for the equivalent occupation statewide, taken from the Occupational Employment Statistics (OES) database.[18] The average wage for the 25th percentile of workers was used to represent a typical starting wage in that occupation. Among surveyed businesses, the highest paid occupations are professional/managerial ($57/hour); IT, engineering, scientists, and technicians ($32); and construction and skilled maintenance ($29).[19] It is notable that, for every occupation, the average hourly starting wage reported by survey respondents was higher than the 25th percentile hourly wage for the same position statewide. In many cases, the difference was significant. For example, the average hourly starting wage for transportation workers employed by surveyed businesses was $25.39, while the average wage for the 25th percentile of workers statewide in that occupation was only $13.85.

Figure 19. What is the average hourly starting wage paid to employees in each category? (n=48)



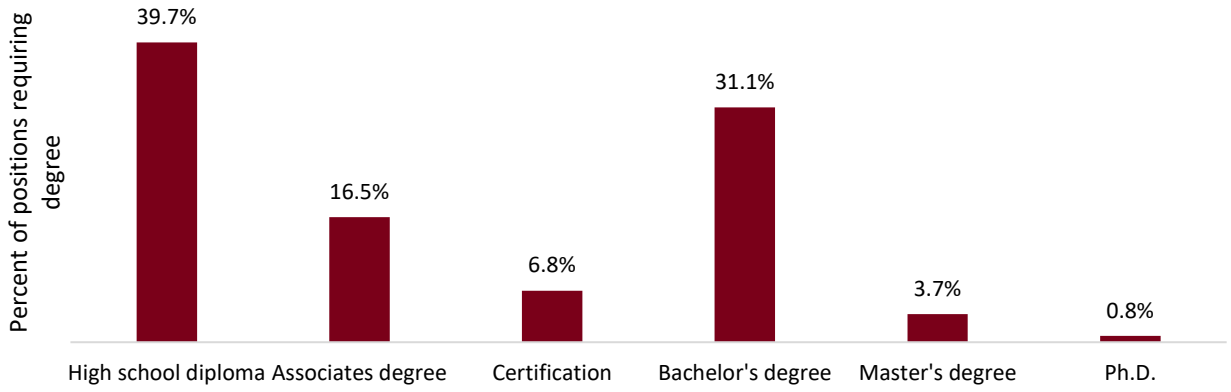
SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

[18] https://mn.gov/deed/data/data-tools/oes/

[19] Equivalent positions used for comparison are as follows: Management Occupations (used as equivalent position for Professional/managerial); Computer and Mathematical Occupations (IT, engineering, scientists, and technicians); Construction and Extraction Occupations (Construction and skilled maintenance); Installation, Maintenance, and Repair Occupations (Skilled manufacturing); Healthcare Practitioners and technical Occupations/Healthcare Service Occupations (Healthcare-related); Transportation and Material Moving Occupations (Transportation); Office and Administrative Support Occupations (Office and administrative); Production Occupations (Unskilled manufacturing); Food Preparation and Serving Related Occupations (Unskilled service workers)

Respondents were then asked to provide a percentage of the positions that require a specific degree as a final degree completed (see Figure 20). To avoid double counting, the survey provided an example for respondents: "If half of the positions at your company have a minimum education requirement of a high school diploma, while the other half requires a minimum of a bachelor's degree, you would type '50' in both of those categories."

Figure 20. Of all positions at your company, what percentage of positions requires the following degrees (as a final degree completed)? Total should sum to 100% (n=47)

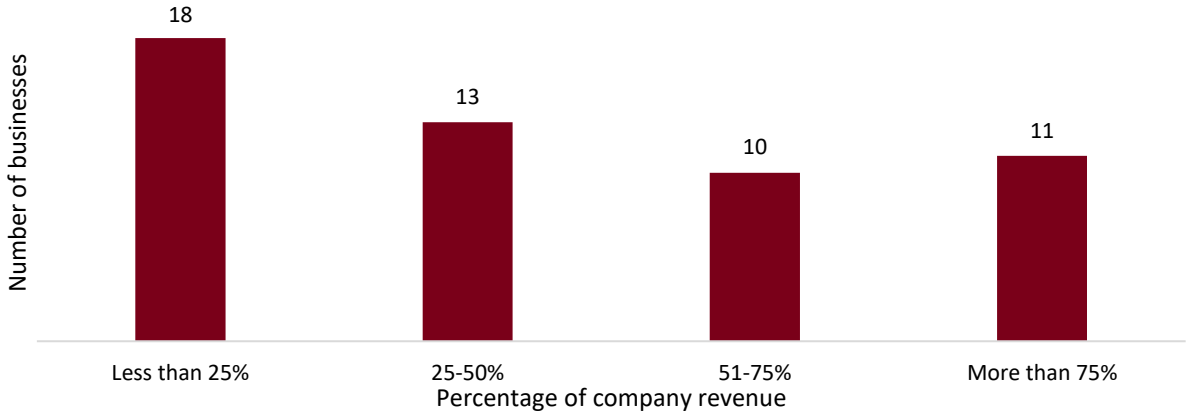


SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Figure 20 shows the percentage of positions requiring each degree. As shown in the figure, roughly 40% of all the positions at the surveyed businesses require a high school diploma/GED as a final degree completed. Just over 30% of all positions require a bachelor's degree. Less than 5% of all positions require a master's or Ph.D.

Respondents were also asked what portion of their company's annual revenue can be attributed to the mining industry (see Figure 21). While the largest number of respondents (n=18) stated that less than 25% of their annual revenue could be attributed to the mining industry, it is notable that more than 40% of respondents (21 of 52) stated that more than half of their annual revenue was directly attributable to the mining industry. These companies were categorized as having "more than 50% revenue from mining." Later in the chapter, results for this group are compared with those having less than 50% revenue from mining to see if there are significant differences in company outlook and business confidence.

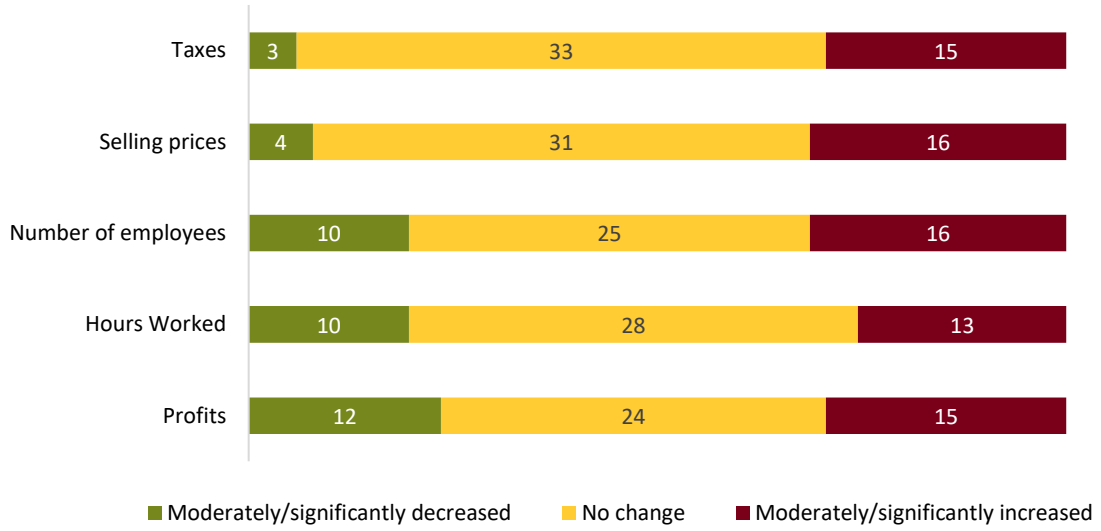
Figure 21. What portion of your company's annual revenue can be attributed to the mining industry? (n=52)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Next, respondents were asked a series of questions relating to how certain factors were affected in the past six months and how those same factors will be affected in the next six months. The factors include average hours worked, number of employees, selling prices, profits, and taxes. The level at which these factors were affected was scaled from "significantly decreased," "moderately decreased," "no change," "moderately" "increased," and "significantly increased." Each respondent was asked to state the level at which the factor changed.

Figure 22. How did the following factors change, if at all, for your business in the past six months? (n=52)

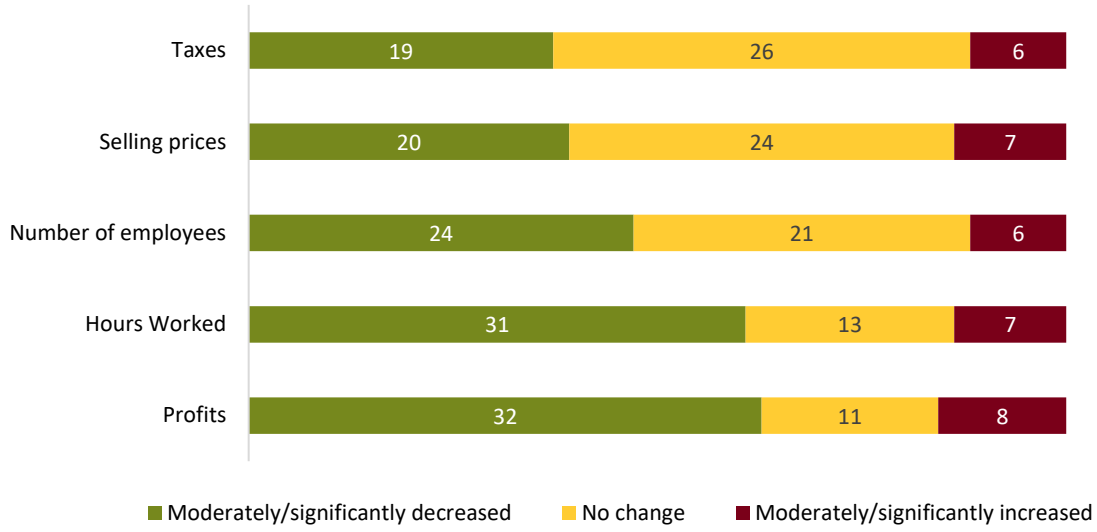


SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Figure 22 shows how those factors have changed for businesses over the past six months. For ease of interpretation, "moderately increased" and "significantly increased" responses were grouped, as were "moderately decreased" and "significantly decreased." According to the results, the majority of respondents reported no change for all of the factors over the past six months. For example, 33 respondents stated that taxes had not changed in the past six months, while 24 respondents stated that their profits had not changed. For those who reported some type of change in their businesses, most indicated that the factors had moderately or significantly increased over the past six months, with selling prices (n=16) and number of employees (n=16) having the highest number of positive responses. Fewer businesses reported negative changes over the past six months, although 12 businesses did report a moderate or significant decrease in profits.

Figure 23 on the following page provides the responses for how those factors are expected to change over the next six months. As shown in the figure, many businesses are feeling pessimistic about the coming business conditions. The majority of respondents are expecting moderate or significant decreases in profits (n=32), hours worked (n=31), and number of employees (n=24) in the coming months. Fewer than ten businesses expect moderate or significant increases in any of the five business factors listed.

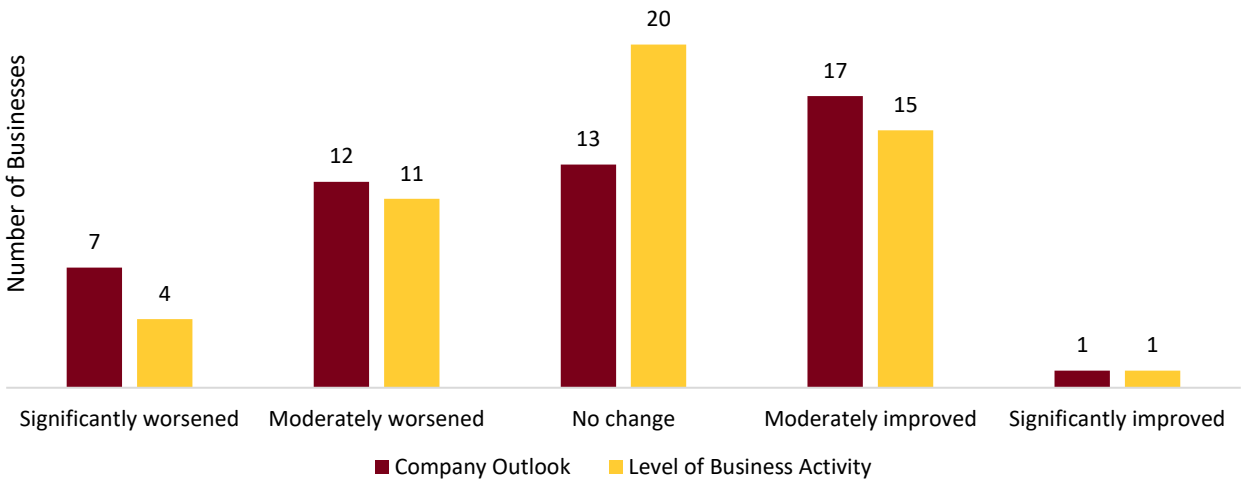
Figure 23. How will the following factors change, if at all, for your business in the next six months? (n=51)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Respondents were then asked how general business conditions had changed in the last six months pertaining to company outlook and level of business activity. Figure 24 has a total of 50 responses. In terms of company outlook, 17 businesses stated that their company outlook had moderately improved over the past six months, 13 indicated no change, and 12 reported a moderate decrease in their company outlook. In terms of the level of business activity over the past six months, 20 businesses indicated no change, while 15 stated that their business activity had moderately improved, and 11 reported that it had moderately worsened.

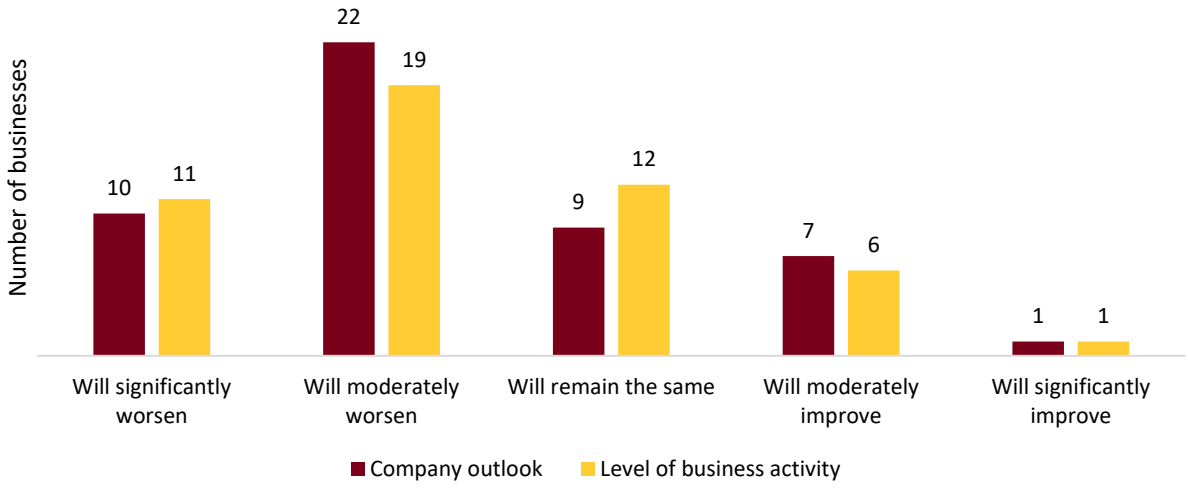
Figure 24. How did the general business conditions change, if at all, for your business in the last six months? (n=50)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Respondents were also asked to predict changes in their company's general business conditions over the coming six months (Figure 25). Again, many businesses reported feeling pessimistic about future conditions. Of the 50 businesses who responded to the question, 22 respondents predicted their company outlook would moderately worsen, while 10 businesses predicted it would significantly worsen. When asked about their level of business activity, 19 respondents predicted it would moderately worsen, 11 said significantly worsen, and 12 predicted no change. For both questions, only one business predicts a "significant improvement" in business conditions and company outlook.

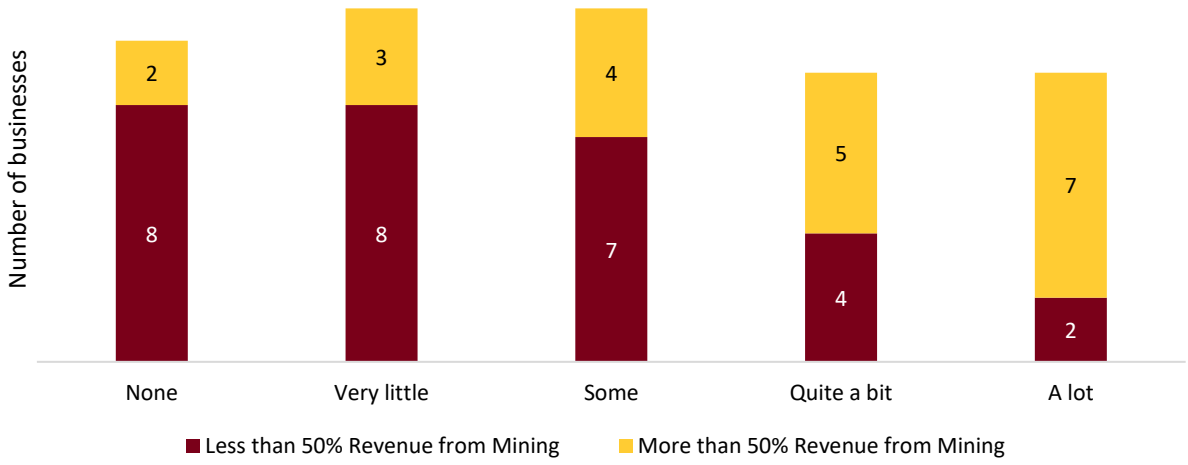
Figure 25. How will the general business conditions change, if at all, for your business in the next six months? (n=50)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Respondents were then asked how much of the change in their business activity in the past six months was the result of region's mining industry. Figure 26 shows the results of that question with responses broken out by whether the businesses receive more than 50% of their annual revenue from the mining industry. In general, responses were distributed fairly evenly among the possible choices. However, it is not surprising that businesses that are more heavily dependent on the mining industry were more likely to report that "quite a bit" or "a lot" of the change in their business activity was due to the region's mining industry.

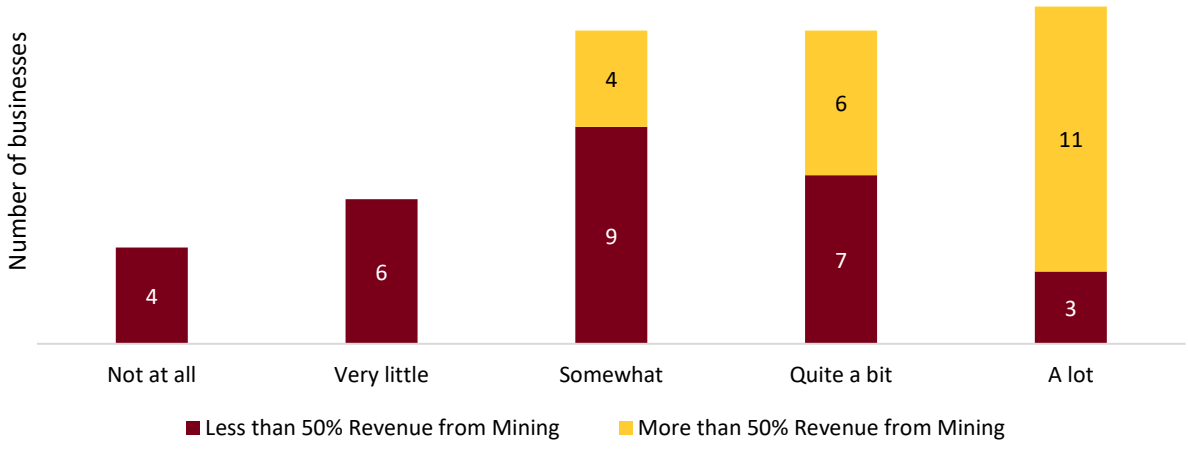
Figure 26. How much of the change in business activity over the past six months was the result of the region's mining industry? (n=50)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Next, respondents were asked to evaluate how much of their business outlook depends on their expectations for the region's mining industry. Figure 27 shows that, not surprisingly, businesses that receive more than 50% of their annual revenue from the region's mining industry were much more likely to base their future business outlook on their expectations for the region's mining industry.

Figure 27. How much does your general business outlook for the next six months depend on your expectations for the region's mining industry? (n=50)



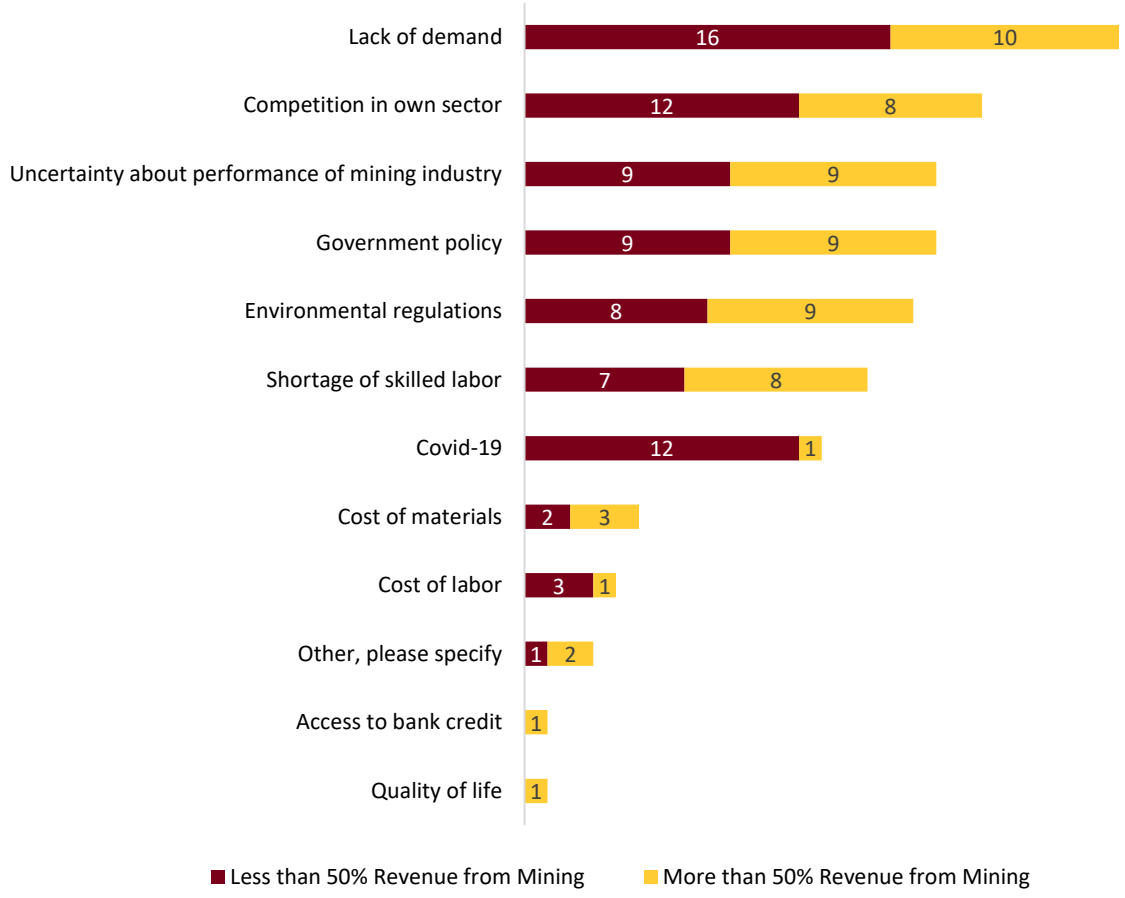
SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

Lastly, respondents were asked what factors may be limiting their ability to increase business activity. Businesses were allowed to select multiple factors. Figure 28 shows that a "lack of demand" (n=26), "competition" (n=20), "uncertainty about the performance of the mining industry" (n=18), and "government policy" (n=18) were top concerns among surveyed businesses. Businesses were also given the option to write

in other concerns in the survey. Of those that wrote in a specific concern, 13 mentioned the covid-19 pandemic as a factor they felt was limiting their ability to increase business activity. Since there were a significant amount of those answers, covid-19 was added to the chart as an additional category.

The figure also shows the differences in responses between businesses that receive more than 50% of their revenue from the mining industry versus those that do not. Interestingly, businesses that are heavily dependent on the mining industry were less likely to mention covid-19 as a factor in their response. This could be due to the timing of the survey, which was distributed during the early stages of the outbreak, when news was still just emerging on the impacts of the virus. Or, it could be that businesses that are heavily dependent on mining were deemed "essential" and are therefore less concerned about the long-term effects of the virus on that industry in particular.

Figure 28. What factors, if any, are limiting your ability to increase business activity? Select all that apply (n=59)



SOURCE: BBER SURVEY OF MINING-RELATED BUSINESSES

VI. Conclusions

The ferrous and nonferrous mining firms have provided significant economic growth for the study areas of the Arrowhead Region with Douglas County, Wisconsin, and the state of Minnesota.

For this study, representatives from 12 of the 13 surveyed mines provided data. The year 2019 was used as the baseline with the study estimating outcomes of the next five years (2020-2024).

FERROUS: In 2019, nearly 4,000 jobs were directly attributable to ferrous mining, while an additional 4,960 were created in other parts of the regional economy through indirect and induced effects in the Arrowhead Region. Over the five-year study period, ferrous mines report that the number of jobs is expected to remain stable.

The study shows that these mines should experience a 1% annual increase in capital and construction spending, progressing from $113 million to $119 million, as well as an annual increase in operating expenses of 1%. It is projected that in 2024, the ferrous mining industry will contribute $788 million in labor income (wages and benefits), roughly $1.5 billion in value added, and $3.29 billion in output to the region's economy.

NONFERROUS: Nonferrous mining operations employed 46 people directly in 2019, with 71 additional jobs indirectly supported. Operating expenses for the industry were more than $63 million. In total, the non-ferrous mining industry added more than $10 million in labor income, $62 million in value added spending, and $77.5 million in output to the study area's economy in 2019.

By the year 2024, one of the four non-ferrous mines is expected to be operational, and one to two more will have proposed projects in the environmental review phase. This growth is anticipated to produce a 950% increase in direct employment (436 jobs) by 2024, $253 million in operating expenses, and $38 million in wages and benefits. By 2024, it is projected that the nonferrous mining industry could contribute $45 million in labor income, $210 million in value added, and more than $300 million in output to the eight-county study area's economy.

MINNESOTA: Economic impacts from ferrous and nonferrous mining are greater when using the state of Minnesota as the study area

In 2019, the baseline year, ferrous and nonferrous mining combined contributed more than 11,600 jobs, $1.0 billion labor income, $2.1 billion in value added spending, and nearly $4.0 billion to the state's economy. By 2024, this study shows that the impacts from the ferrous and nonferrous mining industry are anticipated to support 11,200 jobs, $1.1 billion in labor income, and $4.1 billion in output statewide.

Additionally, this study included a survey of businesses that depend upon and support the mining industry. Results show that these businesses tend to have higher-than-average wages as compared to the state's average wage. Surveyed businesses were very positive about recent business performance but cautious about the future.

Appendix A. Definitions Used in this Report

Ferrous: Of, relating to, or containing iron.

Nonferrous: Not containing, including, or relating to iron.

Capital expenditures: An amount paid out that creates a long-term benefit (as one lasting beyond the taxable year).

Proprietor income: The current-production income of sole proprietorships, partnerships, and tax -exempt cooperatives. Excludes dividends, monetary interest received by nonfinancial business, and rental income received by persons not primarily engaged in the real estate business.

Taconite: A flint-like rock high enough in iron content to constitute a low-grade iron ore.

Ore: A naturally occurring mineral containing a valuable constituent (such as metal) for which it is mined and worked.

Long ton: A unit of weight equal to 2,240 pounds.

Ad Valorem: Imposed at a rate percentage of value.

Royalties: A share of the product or profit reserved by the grantor especially of an oil or mining lease.

Metric ton: A unit of mass equal to 1,000 kilograms or 2,205 pounds.

Economic super sectors: One of the 20 major areas of economic activity in North American Industry Classification System (NAICS).

Sensitivity analysis: This model is also referred to as "what-if" or simulation analysis. It is a way to predict the outcome of a decision given a certain range of variables.

Employee compensation: Total payroll cost of the employee including wages and salaries, all benefits (e.g., health, retirement) and payroll taxes.

Labor income: All forms of employment income, including employee compensation (wages and benefits) and proprietor income.

Direct effect: Initial new spending in the study area resulting from the project.

Economic impact: The effect of an event on the economy in a specified area, ranging from a single neighborhood to the entire globe. It usually measures changes in business revenue, business profits, personal wages, and/or jobs.

Employment: Estimates (from U.S. Department of Commerce secondary data) are in terms of jobs, or headcount, not in terms of full-time equivalent employees. Therefore, these jobs may be temporary, part-time, or short-term.

Gross Domestic Product (GDP): The market value of all goods and services produced in a nation in a certain time frame (typically a year)

Gross output: The value of local production required to sustain activities.

Gross Regional Product (GRP): The market value of all goods and services produced in a region in a certain time frame (typically a year)

Growth rates: The change in the measure of a variable, over time, compared to a previous measure of the variable

Indirect effect: The additional inter-industry spending from the direct impact. For example, increased sales in linen supply firms resulting from more motel sales would be an indirect effect of visitor spending.

Induced effect: The impact of additional household expenditures resulting from the direct and indirect impact. For example, motel employees spend the income they earn from increased tourism on housing, utilities, groceries, and other consumer goods.

Industry: A group of businesses based on their related primary business activities

Labor income: All forms of employment income, including employee compensation (wages and benefits) and proprietor income.

Leakages: Any payments made to imports or value added sectors that do not in turn re-spend the dollars within the region.

Location Quotient (LQ): A measure industry concentration compared to another geographic location (e.g. the nation). A LQ of less than 1 indicates that the industry is less concentrated in a region as compared to the national economy, and a LQ higher than 1 means that it is more concentrated

Margins: The value of wholesale and retail trade services provided in delivering commodities from producers' establishments to purchasers. Margin is calculated as sales receipts less the cost of the goods sold. It consists of the trade margin plus sales taxes and excise taxes that are collected by the trade establishment. (BEA)

Metropolitan Statistical Area (MSA): A geographical region with a relatively high population density at its core and close economic ties throughout the area. MSAs are defined by the U.S. Census Bureau

Multipliers: Total production requirements within the Study Area for every unit of production sold to Final Demand. Total production will vary depending on whether Induced Effects are included and the method of inclusion. Multipliers may be constructed for output, employment, and every component of value added.

Owner-occupied dwellings: An IMPLAN industry that represents imputed rental activity by homeowners. In this case, market rents are used to estimate the value to the property owner.

Value added: A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.

Appendix B. Input-Output Modeling

Data Sources

This study uses the IMPLAN Group's input-output modeling data and software (IMPLAN version 3.1). The IMPLAN database contains county, state, zip code, and federal economic statistics, which are specialized by region, not estimated from national averages. Using classic input-output analysis in combination with region-specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. IMPLAN data files use the following federal government data sources:

- U.S. Bureau of Economic Analysis Benchmark Input-Output Accounts of the U.S.
- U.S. Bureau of Economic Analysis Output Estimates
- U.S. Bureau of Economic Analysis Regional Economic Information Systems (REIS) Program
- U.S. Bureau of Labor Statistics Covered Employment and Wages (CEW) Program
- U.S. Bureau of Labor Statistics Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture Census

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices, and inter-institutional transfers. Economic impacts are made up of direct, indirect, and induced impacts. The data used was the most recent IMPLAN data available, which is for the year 2017. All data are reported in 2018 dollars.

Economic impacts are made up of direct, indirect, and induced impacts. The following are suggested assumptions for accepting the impact model: IMPLAN input/output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

Regional data for the impact models for value added, employment, and output are supplied by IMPLAN for this impact. Employment assumptions were provided to the model to enable construction of the impact model. From these data, social accounts, production, absorption, and byproducts information were generated from the national level data and were incorporated into the model. All region study definitions and impact model assumptions were agreed on before work with the models began.

Modeling Assumptions

The following are suggested assumptions for accepting the impact model:[20]

Backward-Linkages: IMPLAN is a backward-linkage model, meaning that it measures the increased demand on industries that produce intermediate inputs as a result of increases in production. However, if an industry increases production, there will also be an increased supply of output for other industries to use in their production. Models that measure this type of relationship are called forward-linkage models. To highlight this

[20] Bureau of Economic Analysis https://www.bea.gov/papers/pdf/WP_IOMIA_RIMSII_020612.pdf

concept, consider the example of a new sawmill beginning its operations in a state. The increased production as a result of the sawmill's operations will increase the demand for lumber, creating an increase in activity in the logging industry, as well as other supporting industries such as electric transmission and distribution. IMPLAN's results will include those impacts, but will exclude effects on any wood product manufacturers located nearby that might be impacted by the newly available supply of lumber.

Employment: IMPLAN input-output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

Fixed prices and no supply constraints: IMPLAN is a fixed-price model. This means that the modeling software assumes no price adjustment in response to supply constraints or other factors. In other words, the model assumes that firms can increase their production as needed and are not limited by availability of labor or inputs and that firms in the local economy are not operating at full capacity.

Fixed production patterns: Input-output (I-O) models assume inputs are used in fixed proportion, without any substitution of inputs, across a wide range of production levels. This assumption assumes that an industry must double its inputs (including both purchases and employment) to double its output. In many instances, an industry will increase output by offering overtime, improving productivity, or improvements in technology.

Industry homogeneity: I-O models typically assume that all firms within an industry have similar production processes. Any industries that fall outside the typical spending pattern for an industry should be adjusted using IMPLAN's Analysis-by-Parts technique.

Leakages: A small area can have a high level of leakage. Leakages are any payments made to imports or value added sectors, which do not in turn re-spend the dollars within the region. What's more, a study area that is actually part of a larger functional economic region will likely miss some important linkages. For example, workers who live and spend outside the study area may actually hold local jobs.

Appendix C. Taxes, School Support, and Minnesota's Mineral Revenue

This appendix reproduces secondary data sources for tax impact findings presented in the report, including sources for:

1. Taconite Production Tax
   A severance tax paid on concentrates or pellets produced by the taconite companies. The rate is determined by multiplying the prior year's rate by the percent change in the Gross Domestic Product Implicit Price Deflator from the fourth quarter of the second preceding year to the fourth quarter of the preceding year. The rate for 2018 production was $2.751 per taxable ton. The tax revenue is distributed to various cities, townships, counties, and school districts within taconite mining areas.
2. Occupation Tax
   All mining companies, ferrous or nonferrous, are subject to the Minnesota Occupation tax. This is similar to a corporate income tax. The tax revenue is credited to the general fund.
3. Minnesota taxes levied on mining related activity
4. School district component of production tax
5. Various Ad Valorem and property taxes
   Lands that include un-mined taconite and iron ore are subject to the ad valorem and property taxes. Lands and structures actively used for taconite production are exempt from the ad valorem tax and are subject to the production tax instead of the property tax.

1. Taconite Production Tax

Distribution by Fund/Recipient*

Production Year	2014	2015	2016	2017	2018
City and Township (Mining/Concentrating)	$2,125,786	$2,062,198	$1,940,927	$1,867,524	$1,958,947
Cities and Towns (Mining Effects)	1,789,718	1,699,835	1,634,030	1,614,524	1,692,584
Taconite Municipal Aid Account	6,589,995	6,475,364	5,952,563	5,707,956	5,997,930
Taconite Municipal Aid — Special City/ Township Fund	157,055	157,055	157,055	157,055	157,055
Township Fund	1,281,952	1,220,270	1,089,757	1,060,065	1,174,750
County Fund	7,114,672	7,313,951	7,364,487	7,267,637	7,133,755
County Road and Bridge Fund	4,605,134	4,405,415	3,982,835	3,833,944	4,131,231
Regular School Fund	10,634,759	10,165,680	9,173,173	8,823,468	9,521,706
Taconite School Fund (Mining/Concentrating)	1,604,891	1,539,803	1,423,998	1,382,880	1,450,450
School Building Maintenance Fund	1,531,417	1,420,003	1,296,839	1,284,390	1,397,372
Taconite Levy Shortfall Payment	–	–	369,785	284,267	0
Taconite Referendum Fund	6,178,596	6,178,596	6,178,596	6,178,596	6,178,596
School Bond Payments	2,608,285	2,606,617	2,513,481	1,379,870	773,388
Taconite Railroad Aid (total for cities, towns, counties, schools)	2,482,454	2,482,454	2,482,454	2,482,454	2,482,454
Taconite Property Tax Relief Fund	13,724,064	13,063,708	11,296,703	11,064,355	12,576,381
Iron Range Resources & Rehabilitation (IRRR) (Indexed)	3,803,209	3,623,063	3,241,899	3,151,470	3,481,195
IRRR (Fixed)	1,252,520	1,252,520	1,252,520	1,252,520	1,252,520
Taconite Economic Development Fund (TEDF)	10,598,678	10,122,388	700,000	8,430,530	9,224,587
Taconite Environmental Protection Fund (TEPF)	12,993,550	11,392,335	13,619,534	7,508,487	10,937,237
TEPF Producer Grants and Loans	3,232,931	3,138,053	2,937,302	2,866,569	3,007,800
Douglas J. Johnson Economic Protection Trust Fund (DJJ)	5,633,213	5,036,933	6,189,981	2,962,180	4,949,847
Iron Range Higher Education Account	1,971,848	1,876,970	1,676,219	1,605,486	1,746,717
IRRR Educational Revenue Bonds	3,993,464	3,990,434	3,992,134	3,990,034	3,990,384
Iron Range School Consolidation...Acct–	4,916,476	5,552,584	5,860,104	7,453,570	8,377,087
Hockey Hall of Fame	78,874	75,079	67,048	64,218	69,868
Range Association of Municipalities and Schools (RAMS)	142,200	135,963	123,303	118,494	126,006
Excess School Levy Replacement Money**	(633,976)	(97,157)	0	0	(681,480)
Levy Replacement Money to Cities/Townships**	633,976	97,157	0	0	681,480
Unallocated School Levy Replacement Money***	–	–	(255,023)	0	0
School Money to Cities and Towns for Pay 2018 Levy Reduction***	–	–	255,023	0	0
Total	**$111,045,741**	**$106,987,271**	**$96,516,727**	**$93,792,543**	**$103,789,847**

Dash indicates not eligible.

* The Production Tax is collected and distributed in the year following production. For example, the 2018 Production Tax was collected and distributed during 2019.

** If the combined total of the School District Fund, Regular School Fund and Taconite Railroad exceeds the levy replacement amount, the excess is transferred to cities and townships within the district.

*** If a school district does not allocate all of its eligible levy replacement amount, the unallocated amount is used to reduce the following year's levy for cities and towns within the district.

SOURCE: MINNESOTA MINING TAX GUIDE, 2019, PG 12

2. Occupation Tax

Occupation Tax by Company*

	2011 (000s)	2012 (000s)	2013 (000s)	2014 (000s)	2015 (000s)	2016 (000s)	2017 (000s)	2018 (000s)
ArcelorMittal	$50	$700	$250	$460	$0	$0	$0	$500
Hibbing Taconite	4,550	4,360	3,165	2,320	2,300	2,170	2,030	3,400
Northshore	2,015	1,545	360	1,350	490	600	1,260	1,770
U.S. Steel	13,400	12,187	9,320	10,622	3,150	1,829	9,186	11,732
United Taconite	2,040	3,000	2,000	1,650	430	0	575	1,680
Total – Taconite	**$22,055**	**$21,792**	**$15,095**	**$16,402**	**$6,370**	**$4,599**	**$13,051**	**$19,082**
Mesabi Nugget	$0	$0	$0	$0	$0	$0	$0	$0
Total – DRI	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Magnetation	$0	$25	$682	$0	$0	$0	$0	$0
Mining Resources	0	0	0	0	0	0	0	0
Total – Natural Ore	**$0**	**$25**	**$682**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$22,055**	**$21,817**	**$15,777**	**$16,402**	**$6,370**	**$4,599**	**$13,051**	**$19,082**

* Amount paid by May 1 each year. Does not include adjustments.
** The Occupation Tax by Company total shown for 2016 in the 2017 Mining Tax Guide was incorrect. See breakdown above for correct totals.

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 25

3. Minnesota taxes levied on mining related activity

Minnesota Taxes Levied on Mining-Related Activity

Production Years	Unmined Taconite Tax	Use Tax (net)	Production Tax	Occupation Tax[1]	Railroad Gross Earnings Tax[2]	Total Taxes	Total Tons Produced[3]	Total Taxes per Ton
2009	238,274	(2,835,766)	74,255,473	340,000	9,612	72,007,593	17,079,106	4.22
2010	239,518	17,101,895	72,441,708	12,617,000	10,137	102,410,258	35,122,570*	2.92
2011	228,517	24,673,718	73,287,396	22,055,000	10,725	120,255,356	39,120,810*	3.07
2012	297,390	2,579,876	94,204,746	21,817,000	13,632	118,912,644	39,680,723	3.00
2013	279,594	24,636,760	101,214,301	15,776,560	34,082	141,941,297	38,481,228	3.69
2014	291,298	10,873,758	102,369,609	16,401,555	30,352	129,966,572	39,835,029	3.26
2015	299,722	(11,104,636)**	98,728,605	6,370,000	26,466	94,320,157	32,664,481	2.89
2016	296,597	(13,958,786)**	89,141,361	4,599,000	20,600	80,558,968	29,087,625	2.77
2017	281,460	4,857,150	86,728,401	13,051,000	15,394	104,933,405	37,719,847	2.78
2018	**288,758**	**8,664,249**	**96,104,298**	**19,082,000**	**11,000**	**124,150,305**	**39,098,876**	**3.18**

Note:
Historical data is available on our website.
Taxes often levied (assessed) for one year and paid in the following year.
1 Amount paid (unaudited). Does not include adjustments.
2 Taconite railroads are taxed on an ad valorem basis.
3 Tons are dry without flux .
* Includes tonnage produced by Mesabi Nugget but not taxed under Production Tax.
** The Use Tax law changed mid 2015. Manufacturers no longer pay Use Tax on equipment used in the production process. As a result, more tax was refunded than collected.

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 26

4. School district component of production tax

2019 Distributions by Fund to School Districts

(Based on 2018 production year tax revenues)

School Districts	Taconite School Fund $0.0343	Regular School Fund $0.2472	Taconite Railroad Aid	School Bldg. Maintenance Fund $0.04	Taconite Referendum $0.213	Less Excess Money Transferred to Cities and Townships	Total by School District
001 Aitkin	---	$265,570	---	---	$62,694	($8,226)	$320,038
166 Cook County	$21,087	$71,708	$264,977	---	$91,498	($38,751)	$410,519
182 Crosby-Ironton	---	$278,307	---	---	$222,602	$0	$500,909
316 Greenway	$33,373	$972,786	---	$91,640	$372,009	($45,283)	$1,424,525
318 Grand Rapids	$0	$1,090,251	---	---	$428,400	($26,340)	$1,492,311
319 Nashwauk-Keewatin	$84,208	$330,786	---	$38,131	$268,675	($17,682)	$704,118
381 Lake Superior	$75,510	$433,968	$342,720	$81,983	$244,417	($46,701)	$1,131,897
695 Chisholm	---	$913,866	---	$79,500	$469,527	($67,438)	$1,395,455
696 Ely	---	$107,046	---	---	$213,624	($11,915)	$308,755
701 Hibbing	$302,919	$1,826,867	---	$225,389	$1,219,547	($140,133)	$3,434,589
706 Virginia	$74,754	$1,046,174	---	$212,878	$728,472	($135,063)	$1,927,215
712 Mtn. Iron-Buhl	$447,057	$390,608	---	$91,638	$349,776	($31,372)	$1,247,707
2142 St. Louis County	$141,307	$558,468	$284,841	$200,655	$429,452	($73,418)	$1,541,305
2154 Eveleth-Gilbert	$86,898	$664,562	---	$219,905	$652,570	($2,619)	$1,621,316
2711 Mesabi East	$183,337	$570,739	$214,397	$155,653	$425,333	($36,539)	$1,512,920
Total	**$1,450,450**	**$9,521,706**	**$1,106,935**	**$1,397,372**	**$6,178,596**	**($681,480)**	**$18,973,579**

Dashes indicate not eligible. $0 indicates eligible, but no payment at current valuation and production.

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 17

School Bond Payments

School Districts	Year Authorized[1]	Final Payment Year[2]	Payment[3]	Outstanding Balance[4]
316 Greenway	2000	2019	$144,280	$175,000
381 Lake Superior	2000	2022	355,147	1,126,839
695 Chisholm	2000	2020	273,961	533,400
Total			**$773,388**	**$1,855,239**

1 Legislative year in which taconite funding was enacted.
2 Production year from which final bond payment will be deducted.
3 Payments made from 2018 pay 2019 tax distribution.
4 Estimated portion of outstanding bond balance to be paid by taconite funds (not including interest).

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 18

5. Various Ad Valorem and property taxes

Ad Valorem Tax Payable on Unmined Natural Iron Ore

Year Assessed	Market Value	Payable Year	Estimated Tax Payable			Total
			Crow Wing	Itasca	St. Louis	
2009	2,347,000	2010	2,200	12,200	71,500	85,900
2010	2,345,500	2011	2,400	12,700	76,400	91,500
2011	2,341,600	2012	2,600	14,300	87,400	104,300
2012	2,485,800	2013	2,700	13,900	93,200	109,800
2013	2,492,600	2014	2,800	14,100	93,900	110,800
2014	2,501,400	2015	2,800	14,100	95,200	112,100
2015	2,490,700	2016	2,600	14,200	96,600	113,400
2016	2,476,700	2017	2,500	14,300	86,500	103,300
2017	2,495,100	2018	2,500	14,400	92,600	109,500
2018	2,495,100	2019	2,500	14,800	90,900	107,300

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 30

Ad Valorem Tax Assessed on Taconite Railroads

Year Payable	Assessed	St. Louis County	Lake County	Total Tax
2009	2008	2,562	6,415	8,977
2010	2009	2,319	7,293	9,612
2011	2010	2,514	7,623	10,137
2012	2011	2,460	8,265	10,725
2013	2012	2,981	10,651	13,632
2014	2013	7,286	26,796	34,082
2015	2014	6,462	23,890	30,352
2016	2015	5,770	20,696	26,466
2017	2016	4,376	16,224	20,600
2018	2017	3,086	12,308	15,394
2019	**2018**	**2,436**	**8,564**	**11,000**

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 31

Ad Valorem Tax on Severed Mineral Interests: Collection and Distribution

Period ending	80% retained by local government	20% payment to Indian Business Loan Account	Total collections of affected counties
Dec. 31, 2011	$444,016	$111,004	$555,020
Dec. 31, 2012	487,096	121,774	608,870
Dec. 31, 2013	452,376	113,094	565,470
Dec. 31, 2014	436,704	109,176	545,880
Dec. 31, 2015	427,756	106,939	534,695
Dec. 31, 2016	417,991	104,498	522,489
Dec. 31, 2017	513,528	128,382	641,910
Dec. 31, 2018	**386,876**	**96,719**	**483,595**

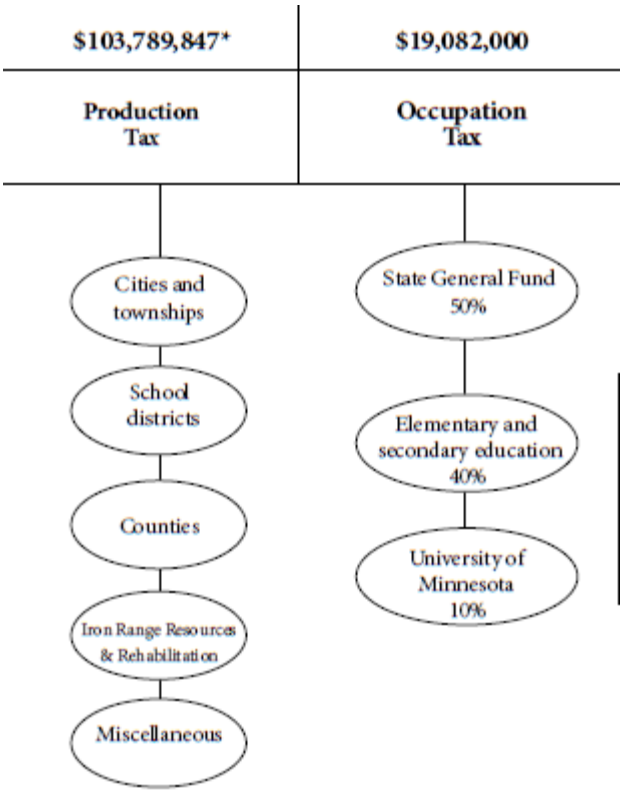
SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 32

Ad Valorem Tax on Unmined Taconite

(Year payable)

County	2012	2013	2014	2015	2016	2017	2018	2019
Itasca	$ 0	$ 32,283	$ 32,468	$ 31,498	$ 43,838	$ 41,697	$ 45,283	$ 41,465
St. Louis	228,517	265,107	247,126	259,800	255,884	254,900	236,177	247,293
Total	**$228,517**	**$297,390**	**$279,594**	**$291,298**	**$299,722**	**$296,597**	**$281,460**	**$288,758**

SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 28



SOURCE: MINNESOTA MINING TAX GUIDE, MINNESOTA DEPARTMENT OF REVENUE, 2019, PG. 42

Mineral Revenue (in thousands), FY 2007-2018 (with bar chart).

FY	School Trust Lands	University Trust Lands	Tax-Forfeited Lands and Minerals	Other Land Classes	Special Advance Royalties	Total Revenue
2009	$16,792	$8,268	$760	$128	$324	$26,272
2010	$10,487	$2,270	$729	$252	$389	$14,127
2011	$21,448	$12,526	$859	$286	$389	$35,508
2012	$33,383	$12,496	$4,481	$245	$389	$50,994
2013	$32,176	$12,063	$4,763	$198	-$109	$49,090
2014	$53,578	$15,379	$4,418	$287	$366	$74,028
2015	$30,515	$5,937	$4,640	$228	$206	$41,526
2016	$16,429	$678	$4,862	$273	$258	$22,499
2017	$12,339	$291	$3,822	$318	$186	$16,956
2018	$15,276	$4,411	$6,177	$371	$190	$26,426
Total	$242,423	$74,319	$35,512	$2,585	$2,587	$357,426

Notes: These values include all revenue from iron ore/taconite, metallic minerals, peat, industrial minerals, M-Leases, stockpile leases, and interest. "Other land classes" include Game & Fish Fund, Volstead Lands, General Fund, Consolidated Conservation (Con-Con) lands, and Professional Services Account.

Minerals Management Account Revenue, FY2006-2018.

FY	School Trust Lands	University Trust Lands	Tax-Forfeited Lands and Minerals	Consolidated Conservation	Other	Total Revenue
2006	$2,165,778	$1,417,795	$255,107	$10,130	$1,211	$3,850,021
2007	$3,254,288	$1,991,639	$314,992	$12,562	$2,641	$5,576,122
2008	$4,154,194	$1,876,064	$104,359	$9,874	$4,495	$6,148,985
2009	$3,254,808	$1,648,862	$145,909	$13,895	$6,698	$5,070,172
2010	$2,071,993	$451,195	$136,194	$30,241	$10,124	$2,699,747
2011	$4,248,263	$2,503,345	$162,737	$23,971	$18,578	$6,956,894
2012	$6,639,050	$2,494,469	$889,380	$25,620	$19,150	$10,067,669
2013	$6,381,052	$2,408,773	$941,740	$24,896	$25	$9,756,486
2014	$10,672,739	$3,074,198	$872,350	$38,375	$10,161	$14,667,823
2015	$6,097,488	$1,186,652	$927,400	$41,685	$734	$8,253,958
2016	$3,261,192	$134,401	$966,184	$44,701	$331	$4,406,809
2017	$2,371,814	$53,885	$756,641	$54,725	$299	$3,237,364
2018	$3,028,637	$881,952	$1,231,268	$67,496	$354	$5,209,707
	$57,601,296	$20,123,230	$7,704,261	$398,171	$74,801	$85,901,757

(*)MS 93.2236: Balance above $3,000,000 in the account at FY2007 closing is returned to Trust Funds.

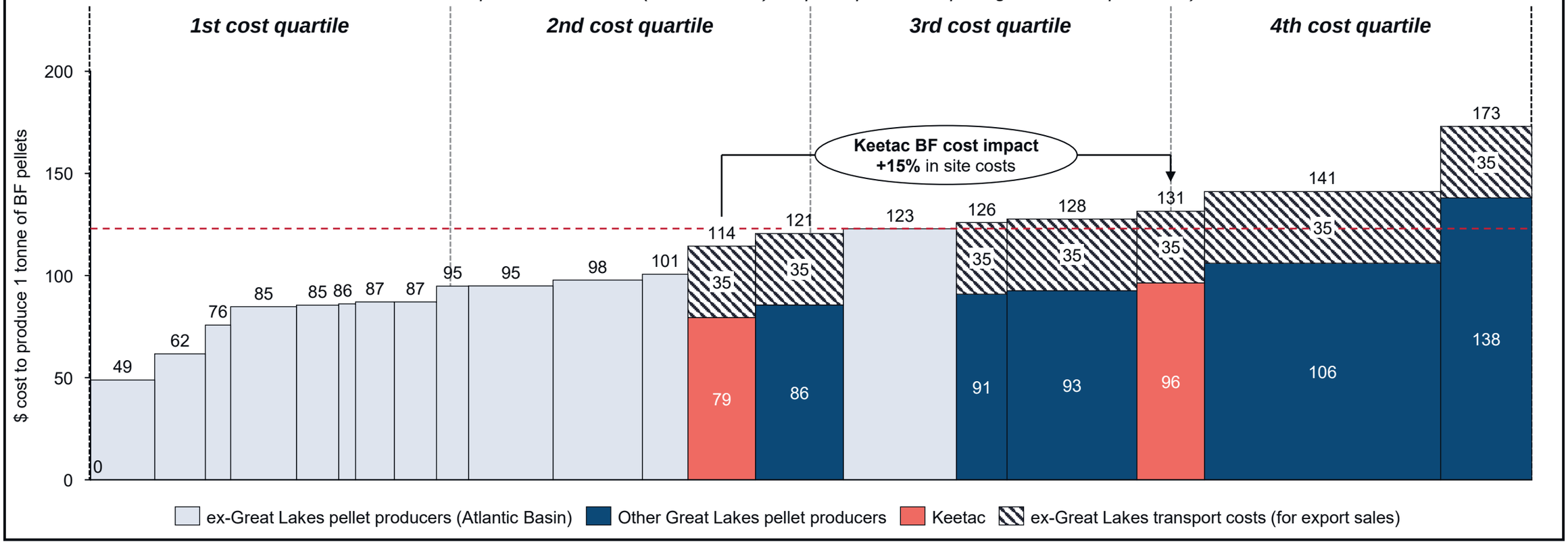
CRU's summary of key findings

- CRU was requested to provide a brief analysis of cost & competitiveness impacts if Keetac was to incur an additional operating cost increase of $/17/ton and $26/ton, respectively for Blast Furnace (BF) grade and Direct Reduction (DR) grade pellet production.
- CRU has found that in the current baseline market (2025), Keetac is a highly competitive producer of pellets, both within the immediate Great Lakes region, but also when compared to potential international / seaborne peers in the Atlantic Basin. This cost position has allowed Keetac to export pellets to international buyers competitively in recent historical years despite the otherwise high logistics costs associated with transporting pellets from Minnesota international non-Great-Lakes customers.
- Based on CRU's independent cost analysis, an estimated $17/ton increase in BF-grade pellet production costs would shift Keetac's cost position from the first quartile into the fourth quartile and raise overall site costs by 15%, compared to the base-case.
- If Keetac's existing blast-furnace customers (e.g. US Steel's integrated BF-based steel mills in the US) were to continue using Keetac pellets after this cost increase, it would in turn increase these steel mill's crude steelmaking cost basis by $20/ton or 4%, compared to the base case.
- While this 4% cost change seems small in percentage terms, a $20/ton steelmaking cost impact would significantly impact these mill's competitiveness relative to other domestic blast furnace or EAF-based steelmakers and likely put all of US Steel's BF operations above the total US steelmaking cost average.
- CRU estimates that Keetac is currently among the lowest-cost DR pellet producers in the entire Americas region. Despite the ~$35/ton logistics costs associated with moving pellets out of the Great Lakes, Keetac can still execute meaningful export sales profitably in the current seaborne international iron ore pricing environment, because of its otherwise low site-cost advantage.
- A $26/ton increase in DR pellet production costs would significantly harm Keetac's cost competitiveness, likely 1) making it the highest-cost DR pellet producer within the region; 2) raising costs above the current seaborne pellet price level; and therefore, 3) effectively negating any previous cost advantage in the ex-Great Lakes export market.

Compared to other BF pellet producing peers within the Great Lakes and within the broader Atlantic Basin seaborne pellet market, Keetac is currently a relatively low-cost producer. An additional $17/t cost increase would push Keetac into the highest cost quartile and likely make future ex-Great Lakes export sales less competitive

BF pellet production site costs for Great Lakes and select Atlantic Basin BF-grade pellet producers (relevant international peers) in 2025

Each bar in the chart represents an individual mine/pelletizing plant. Y-axis measures facility-specific site costs in 2025. X-axis extent measures total BF pellet production volume. Dotted line represents seaborne (Atlantic Basin) BF pellet price – the pricing basis for export sales)

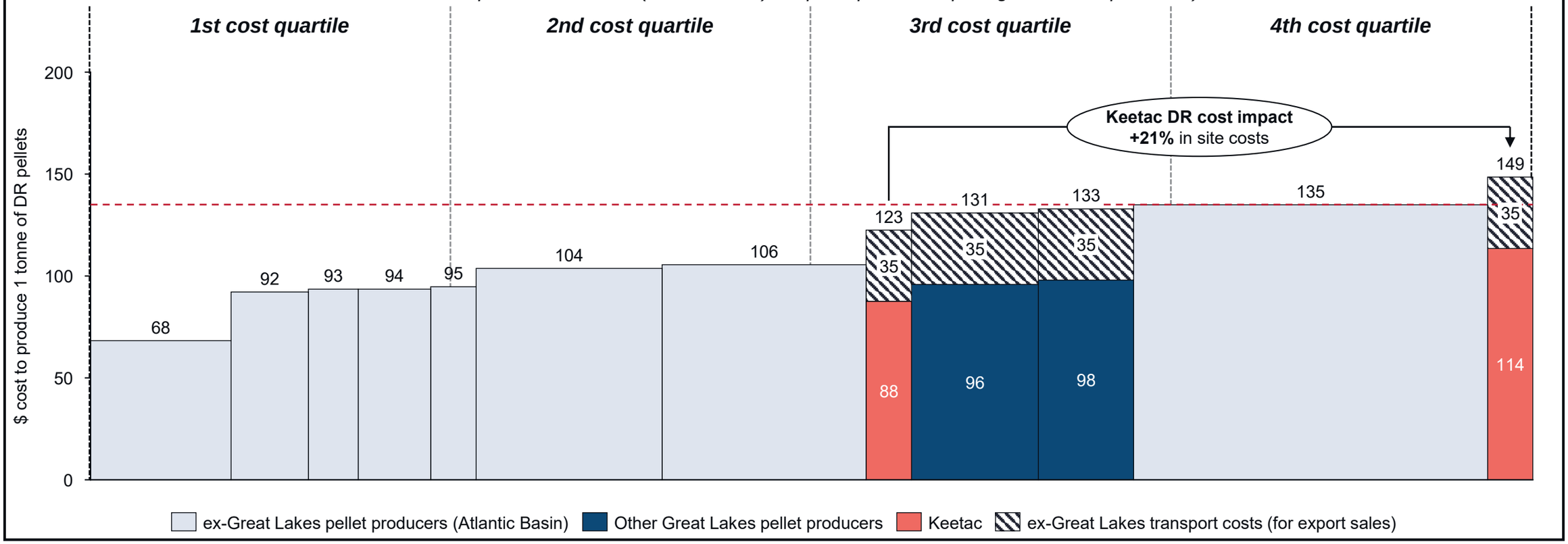


Source: CRU team analysis and CRU's Iron Ore Model. Note that the costs provided in this chart represent CRU's independent estimates of site costs for relevant facilities.

For DR-grade pellet production, an additional $26/t cost increase would push Keetac from a relatively competitive 1st-quartile cost position into the highest fourth quartile cost position. Under these higher cost conditions, future ex-Great Lakes export sales of DR pellets would become significantly less viable

DR pellet production site costs for Great Lakes and select Atlantic Basin DR-grade pellet producers (implied international peers) in 2025

Each bar in the chart represents an individual mine/pelletizing plant. Y-axis measures facility-specific site costs in 2025. X-axis extent measures total DR pellet production volume. Dotted line represents seaborne (Atlantic Basin) DR pellet price – the pricing basis for export sales)

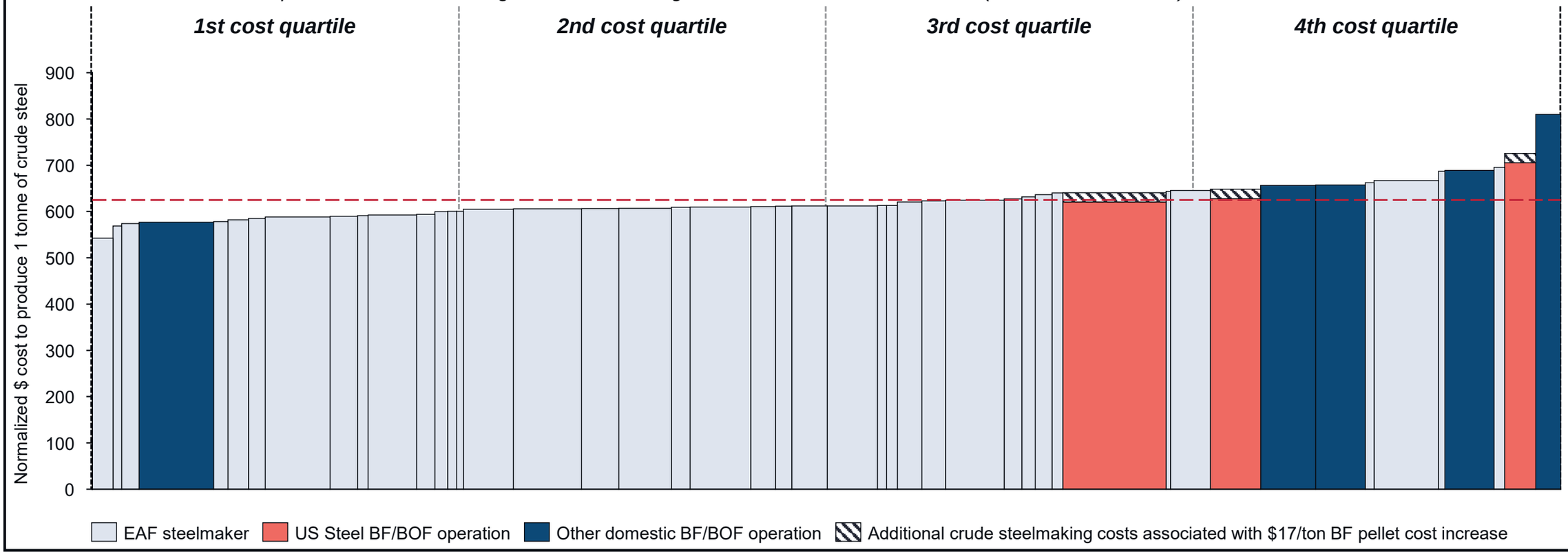


Source: CRU team analysis and CRU's Iron Ore Model. Note that the costs provided in this chart represent CRU's independent estimates of site costs for relevant facilities.

US Steel consumes Keetac's BF-grade pellets in its domestic blast furnace operations. A $17/ton mining cost increase for BF pellets would amount to a ~$20/ton (roughly 4%) increase in crude steelmaking costs for those facilities, thereby further reducing BF-based cost competitiveness compared to other domestic US steelmakers

Crude steelmaking production site costs for steelmakers in the United States in 2025, split by production process

Each bar in the chart represents an individual steel mill. Y-axis measures facility-specific crude steel site costs in 2025. X-axis extent measures total crude steel production volume. Dotted line represents estimated average crude steelmaking costs for all domestic steelmakers (BF and/or EAF-based) in the United States in 2025



Source: CRU team analysis and CRU's Steel Cost Model. Note that the costs provided in this chart represent CRU's independent estimates of site costs for relevant facilities.