



NI 43-101 Technical Report

Hibbing Taconite Property, Minnesota, USA

Cleveland-Cliffs Inc.

Prepared by:

SLR International Corporation

SLR Project No.: 123.020506.0000

Effective Date:

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Signature Date:

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1.0 Summary

SLR Consulting Ltd (SLR) was retained by Cleveland-Cliffs Inc. (Cliffs) to prepare an independent Technical Report (Technical Report) for the Hibbing Taconite Property (HibTac or the Property), located in Northeastern Minnesota, USA. The owner of the Property, Hibbing Taconite Company (Hibbing Taconite), is a joint venture (JV) between subsidiaries of Cliffs (85.3% ownership) and U.S. Steel Corporation (U.S. Steel) (14.7%). The Property is managed by Cleveland-Cliffs Hibbing Management LLC, a wholly owned subsidiary of Cliffs.

Cliffs is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of pelletized ore in the United States Securities and Exchange Commission's (SEC) filings. On July 14, 2024, Stelco Holdings Inc. (Stelco), 13421422 Canada Inc. (Purchaser), a wholly owned subsidiary of Cliffs, and Cliffs entered into an Arrangement Agreement, providing for, among other things, the acquisition by the Purchaser of all of the outstanding common shares of Stelco. In connection with a special meeting of Stelco shareholders to consider and approve the transactions contemplated by the Arrangement Agreement, Stelco is providing its shareholder with a management information circular (the Stelco Circular) that, given the consideration to be paid to Stelco shareholders pursuant to the terms of the Arrangement Agreement includes Cliffs' common stock, must include disclosure regarding Cliffs in the form of prospectus that Cliffs would be eligible to use immediately prior to the sending and filing of the Stelco Circular. The provision of disclosure related to Cliffs' mineral projects in the Stelco Circular requires Stelco to file this Technical Report.

This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). SLR Qualified Persons (QPs) visited the Property on April 28, 2021, and prepared an S-K 1300 Technical Report Summary (TRS) dated February 7, 2022. Cliffs has since been updating the Mineral Reserve estimate for the Property based on depletion due to mining, with the latest update at YE 2023. There has been no material change to the information contained in the 2022 TRS and Cliffs considers the TRS to be current. This Technical Report presents information from the 2022 TRS in compliance with NI 43-101.

The Property includes the Hibbing Taconite Mine (the Mine) and processing facility (the Plant) in Hibbing, Minnesota. The Mine is a large, operating open pit iron mine that produces pellets from a magnetite iron ore regionally known as taconite.

The Property commenced operations in 1976 as a JV between Bethlehem Steel Corporation (Bethlehem) (75%), Pickands Mather and Co. (Pickands Mather) (15%), and Steel Company of Canada (Stelco) (10%). Cliffs first became involved in the JV when it purchased Pickands Mather's 15% share of the JV in 1986 and another 8% share from Bethlehem in 2002. In 2003-2004, ArcelorMittal USA (AMUSA) acquired Bethlehem's 62% share and became the largest shareholder of the JV. Cliffs managed the JV through a subsidiary until 2019 when AMUSA assumed control of the operation. In 2020, Cliffs acquired the US assets of AMUSA and again became the operator of the Property.

The open pit operation has a mining rate of approximately 24 million long tons (MLT) of ore per year and produces 6.2 MLT of iron ore pellets, which are shipped by freighter via the Great Lakes to Cliffs' steel mill facilities in the Midwestern USA.

1.1.1 Conclusions

The Property has been a successful producer of iron pellets for over 45 years. The update to the Mineral Resource and Mineral Reserve does not materially change any of the assumptions from previous operations. An economic analysis was performed using the estimates presented



in this Technical Report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves for a remaining five-year mine life. There are no significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Mineral Resource or Mineral Reserve estimates or HibTac's continued economic viability.

The QPs offer the following conclusions by area.

1.1.1.1 Geology and Mineral Resources

- Above a crude magnetic iron (MagFe) cut-off grade of 13%, Measured and Indicated Mineral Resources exclusive of Mineral Reserves attributable to Cliffs' 85.3% ownership at HibTac are estimated to total 9.1 MLT at an average grade of 19.2% MagFe.
- The HibTac deposit is an example of Lake Superior-type banded iron formation (BIF) deposits. Both the site and corporate technical teams have a strong understanding of the HibTac geology and mineralization, as well as their processing characteristics.
- Exploration sampling, preparation, analyses, and security processes for both physical samples and digital data are appropriate for the style of mineralization and are sufficient to support the estimation of Mineral Resources.
- Quality assurance and quality control (QA/QC) results for the 2021 verification study are appropriate for the style of mineralization and are sufficient to generate a drill hole assay database that is adequate for Mineral Resource estimation in compliance with international reporting standards. In conjunction with good agreement between planned and actual product produced over more than 45 years, it is the QP's opinion that procedures are consistent with industry standards.
- The key economic variables (KEV) in the block models for HibTac compare well with the source data.
- The methodology used to prepare the block model is appropriate and consistent with industry standards.
- The block model represents an acceptable degree of smoothing at the block scale for prediction of quality variables at HibTac. Visually, blocks and composites in cross-section and plan view compare well.

1.1.1.2 Mining and Mineral Reserves

- The HibTac JV has been in production since 1976 and specifically under 100% Cliffs operating management of the JV since 2020. Cliffs conducts its own Mineral Reserve estimations.
- Total Proven and Probable Mineral Reserves are approximately 109.3 MLT of crude ore (at a 100% project basis) at an average grade of 18.7% MagFe.
- Mineral Reserve estimation practices follow industry standards.
- The life of mine (LOM) of HibTac is limited to the next five years, with mining operations ceasing in 2026.
- The geotechnical design parameters used for pit design are reasonable and supported by previous operations.
- The LOM production schedule is reasonable and incorporates large mining areas and open benches.



- An appropriate mining equipment fleet, maintenance facilities, and manpower are in place, with various options for additions and replacements estimated, to meet the LOM production schedule requirements.
- Sufficient storage capacity for waste stockpiles and tailings has been identified to support the production of the Mineral Reserve.

1.1.1.3 Mineral Processing

- Three ore types are processed at Hibbing and are referred to as blend components 1-7 (lean ore, <20%), 1-5/1-6 (high-grade ore, >60%), and 1-3/1-4 (low-grade ore, <30%).
- Routine plant samples are collected and analyzed in the HibTac onsite laboratory for process control, product quality monitoring, and reporting to comply with plant and cargo specifications.
- The crushing plant consists of two Allis Chalmers gyratory crushers that crush run of mine (ROM) ore to minus 10 in. The concentrator is based on nine lines of autogenous grinding (AG) mills with two stages (rougher and finisher) of magnetic separation, hydrocyclone classification to close the milling circuits, and hydro-separators for classification of non-magnetic tailings. Finisher magnetic concentrate is screened to obtain final product at 100% passing (P_{100}) 325 mesh. The magnetic concentrate reports to the concentrate thickener, and the non-magnetic fraction reports to the tailings.
- Concentrate is filtered using vacuum disc filters to approximately 9.25% moisture and blended with bentonite prior to pelletizing to produce standard compression pellets, and limestone is added to the mix when producing high-compression pellets.
- Each pelletizing line consists of four Sala balling drums, which discharge across roll screens, producing green (unfired) balls. Sized green balls are conveyed to three 13 -ft-wide by 243 -ft-long -long Dravo Traveling Grate indurating furnaces. Pellets discharged from the indurating furnaces are the final product and are conveyed to the pellet load-out bins or to the emergency stockpile.
- Final pellet production is determined by actual train shipments once per month and compared with operating plant measurements. Typical adjustments are in the range of 2,000 long tons (LT) to 3,000 LT over a total production of 700,000 LT (<0.5% adjustment).
- The ore delivered to the primary crusher from 2015 to 2020 averaged 28,083,000 wet long tons (WLT) per year (WLT/y) with an average crude magnetic iron grade of 19.2% and concentrate silica content of 4.9%. Weight recovery to concentrate averaged 26.4% over this period, and wet pellet production averaged 7,400,200 WLT/y. Pellet grades averaged 66.1% Fe, 4.5% SiO_2 , and 2.1% moisture for the period.

1.1.1.4 Infrastructure

- The Property is in a historically important, iron-producing region of Northeastern Minnesota. All the infrastructure necessary to mine and process significant commercial quantities of iron ore is in place.
- The HibTac tailings storage facility (TSF) has been operating since 1976 and is currently operating under the requirements of the Minnesota Department of Natural Resources (MDNR). The TSF is a paddock dam-type TSF consisting of five cells: West Area 1, 2, and 3 (WA-1, WA-2, and WA-3 with approximately 2,080 acres, 510 acres, and 1,000



acres of impoundment area, respectively), which are used for tailings deposition; SD-3 Reservoir (approximately 1,340 acres of impoundment area), which is used as a return water reservoir; and East Area (approximately 830 acres of impoundment area), which is currently not in use but will be brought into production at a later date.

1.1.1.5 Environment

Hibbing Taconite maintains the requisite state and federal permits and is in compliance with all permits. Environmental liabilities and permitting are further discussed in Section 17 of this Technical Report.

A mine closure plan is not required by the state of Minnesota until at least two years in advance of deactivation of the mining area. HibTac's current mine life is projected at five years; therefore, a detailed closure plan has not been prepared. Cliffs performs annual reviews of changes to HibTac's Asset Retirement Obligation (ARO) cost estimate and has calculated ARO legal obligations for closure and reclamation costs.

1.1.2 Recommendations

1.1.2.1 Geology and Mineral Resources

- 1 Continue to develop and expand the QA/QC program to ensure that the program includes defined limits where follow-up is required, and that results are reviewed and documented in a report including conclusions and recommendations regularly and in a timely manner.
- 2 Quality results documented in this report support an initial standard and duplicate submission rate of 5% each.
- 3 HibTac should submit a small number of "preparation duplicate" samples to a secondary accredited laboratory to document capability(ies), cost, and time efficiency of alternate provider(s) and confirm that results are comparable to those of the current provider.

1.1.2.2 Mining and Mineral Reserves

- 1 Complete additional permitting work at HibTac to finalize decision on conversion of on-strike Mineral Resources to Mineral Reserves and update mine planning accordingly.

1.1.2.3 Mineral Processing

- 1 While plant operational performance including concentrate and pellet production and pellet quality continue to be consistent year over year, continue to maintain diligence in process-oriented metallurgical testing and in plant maintenance going forward.

1.1.2.4 Infrastructure

- 1 The Operations, Maintenance, and Surveillance (OMS) Manual for the TSF should be updated with the Engineer of Record (EOR) in accordance with Mining Association of Canada (MAC) guidelines and other industry-recognized, standard guidance for tailings facilities.
- 2 The remediation, or resolution, of items of concern noted in TSF audits or inspection reports should be documented, prioritized, tracked, and closed out in a timely manner.



1.1.2.5 Environment

- 1 While it is acknowledged that a closure plan and other post-mining plans are not required to be prepared until two years prior to anticipated closure, the QP recommends that a closure plan including costing be completed to prepare the operation for eventual closure in approximately five years.

1.2 Economic Analysis

1.2.1 Economic Criteria

An un-escalated technical-economic model was prepared on an after-tax, discounted cash flow (DCF) basis, the results of which are presented in this subsection. Key criteria used in the analysis are discussed in detail throughout this Technical Report. General assumptions used are summarized in Table 1-1 with all physicals reported per WLT pellet.

Table 1-1: Technical-Economic Assumptions

Description	Value
Start Date	December 31, 2021
Mine Life	Five years
Three-Year Trailing Average Revenue	\$98/WLT pellet
Operating Costs	\$75.29/WLT pellet
Sustaining Capital	\$27 million
Discount Rate	10%
Discounting Basis	End of Period
Inflation	0%
Federal Income Tax	20%
State Income Tax	None – Sales made out of state

Table 1-2 presents a summary of the estimated mine production over the five year mine life.

Table 1-2: LOM Production Summary

Description	Units	Value
ROM Crude Ore	MLT	109.3
Total Material	MLT	220.8
Grade	% MagFe	18.7
Average Mining Rate	MLT/y	58

Table 1-3 presents a summary of the estimated plant production over the five year mine life.

Table 1-3: LOM Plant Production Summary

Description	Units	Value
ROM Material Milled	MLT	109.3



Description	Units	Value
Annual Processing Rate	MLT/y	24.7
Process Recovery	%	25.5
Total Pellet	MWLT	27.8
Annual Pellet Production Rate	MWLT/y	6.3

1.2.2 Cash Flow Analysis

The indicative economic analysis results presented in Table 1-4 indicate an after-tax Net Present Value (NPV), using a 10.0% discount rate, of \$269 million at an average blended wet pellet price of \$98/WLT. The QP notes that after-tax Internal Rate of Return (IRR) is not applicable, as the Plant has been in operation for a number of years. Capital identified in the economics is for sustaining operations and plant rebuilds as necessary.

The economic analysis was performed using the estimates presented in this Technical Report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

Table 1-4: LOM Indicative Economic Results

Description	\$ Millions	\$/WLT Pellet
Three-Year Trailing Revenue (\$/WLT Pellet)		98
Pellet Production (MWLT)	27.8	
Gross Revenue	2,726	
Mining	553	19.87
Processing	961	34.57
Site Administration	64	2.30
Pellet Transportation and Storage	288	10.35
General / Other Costs	228	8.20
Total Operating Costs	2,094	75.29
Operating Income (excl. D&A)	632	22.71
Federal Income Tax	(126)	(4.54)
Depreciation Tax Savings	13	0.46
Accretion Tax Savings	7	0.27
Net Income after Taxes	526	18.89
Sustaining + TSF Capital	(27)	(0.97)
Closure Costs	(172)	(6.20)
Cash Flow	327	11.72
NPV 10.0%	269	



1.2.3 Sensitivity Analysis

The HibTac operation is nominally most sensitive to market prices (revenues) followed by operating cost. For each dollar movement in sales price and operating cost, respectively, the after-tax NPV changes by approximately \$18 million.

1.3 Technical Summary

1.3.1 Property Description

The Property is located in St. Louis and Itasca Counties in Northeastern Minnesota, USA, on the Mesabi Iron Range, immediately north of the city of Hibbing, Minnesota. The open pit is also known historically as the Hull-Rust-Mahoning Mine and, based on its historical production, is the largest operating open pit mine in Minnesota. The mining and processing operation and TSF are located between latitude 47°25'48" N and 47°31'48" N and longitude 93°04'54" W and W 92°54'36" W. The Mine and Plant have the capacity to produce approximately 8.0 MWLT of iron ore pellets annually.

Hibbing Taconite is a joint venture between Cliffs (85.3%) and U.S. Steel (14.7%). Hibbing Taconite controls 36,280 acres in a combination of mineral and surface rights through ownership and lease and is the operator of the mine, process plant, and rail loading facility. The Property boundary comprises approximately 6,420 acres of mineral leases granted by private landowners and 220 acres granted by the State of Minnesota.

1.3.2 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

The Property is easily accessed via paved roads from Hibbing, Minnesota by Highway 169, four miles north toward Chisholm to County Highway 5, then 2.3 mi north on Highway 5 to the mine access road, and two miles west to the facilities on the Hibbing Taconite complex road. Duluth, a major port city on Lake Superior, is 76 mi southeast of the Property via US Highway 53 and MN Highway 37. Duluth has a regional airport with several flights daily to major hubs in Minneapolis and Chicago. A rail line operated by Burlington Northern Santa Fe Railway (BNSF) extends from the processing facility to the port in Superior, Wisconsin.

The climate in Northern Minnesota ranges from mild in the summer to winter extremes. The annual average temperature is 36.9°F. The annual average high temperature is 48.6°F, whereas the annual average low temperature is 25.1°F. By month, July is on average the hottest month (77°F), and January is the coldest (-4°F).

The HibTac operation employs 733 employees who live in the surrounding cities of Hibbing, Chisholm, Virginia, Mountain Iron, Eveleth, Buhl, Biwabik, Hoyt Lakes, and Aurora. Personnel also commute from Duluth and the Iron Range. St. Louis County has an estimated population of approximately 200,000 people.

The Property is located in a historically important, iron-producing region of Northeastern Minnesota. All the infrastructure necessary to mine and process significant commercial quantities of iron ore is currently in place. Infrastructure items include high-voltage electrical supplies, natural gas pipelines that connect to the North American distribution system, water sources, paved roads and highways, railroads for transporting finished products, port facilities that connect to the Great Lakes, and accommodations for employees. Local and State infrastructure also includes hospitals, schools, airports, equipment suppliers, fuel suppliers, commercial laboratories, and communication systems.



The Property is located at an elevation of approximately 1,400 ft above sea level (FASL), just east of the Itasca County line. The generally gentle topography in the area is punctuated by hummocky hills and long, gentle moraines, remnants of glacial ingress and egress. The landscape ranges from semi-rugged, lake-dotted terrain with thin glacial deposits over bedrock, to hummocky or undulating plains with deep glacial drift, to large, flat, poorly drained peatlands. The MDNR characterizes the area as being within the Laurentian Mixed Forest (LMF) Province. In Minnesota, the LMF is characterized by broad areas of conifer forest, mixed hardwood and conifer forests, and conifer bogs and swamps.

1.3.3 History

Exploration for high-grade, direct-shipping iron ore (DSO) deposits in the Hibbing area began in the 1890s. Focused exploration for beneficiation-grade magnetite deposits, regionally known as taconite deposits, however, did not begin until the 1940s. HibTac has operated as a joint venture among several companies since 1976.

1.3.4 Geological Setting, Mineralization, and Deposit

The HibTac deposit is an example of Lake Superior-type BIF deposits, specifically the Biwabik Iron Formation (Biwabik IF), which is interpreted to have been deposited in a shallow, tidal, marine setting and is characterized as having four main members (from bottom to top): Lower Cherty, Lower Slaty, Upper Cherty, and Upper Slaty. Cherty units generally have a sandy granular texture, are thickly bedded, and are predominantly composed of chert, magnetite, iron silicates (talc, stilpnomelane), and, in specific geologic units, carbonate (ankerite). Slaty units are fine grained, thinly bedded, and comprised of iron silicates and iron carbonate, with local chert beds, and they are typically uneconomic. The mineral targeted at HibTac is magnetite. Supergene weathering and oxidation has locally altered the primary assemblage to hematite, goethite, and chert, generally increasing in intensity with proximity to isolated occurrences of Cretaceous Coleraine Formation south of the mine and faults or fracture zones. Partial or complete oxidation of magnetite to hematite precludes recovery by magnetic separation, resulting in local degradation of potential ore intervals to waste rock. The nomenclature of the members is not indicative of metamorphic grade; instead, “slaty” and “cherty” are colloquial descriptive terms used regionally.

1.3.5 Exploration

Diamond drilling (DD) is the principal method of exploration utilized at HibTac. A combination of historical and current DD core drilled by Cliffs and its predecessors is used in mine planning. Near-mine exploration drilling is conducted on a 400 ft x 400 ft grid. Since drilling began in 1938, Cliffs and its predecessors have completed 3,665 DD drill holes totaling 620,670 ft.

1.3.6 Mineral Resource Estimates

Mineral Resource estimates for the HibTac deposit were prepared by Cliffs and audited and accepted by SLR using available data from 1938 to 2019.

The 2021 HibTac Mineral Resource estimate was completed using a conventional block modeling approach. The general workflow included the construction of a geological or stratigraphic model representing the Biwabik IF from mapping, drill hole logging, and sampling data, which were used to define discrete domains and surfaces representing the upper contact of each unit of non-iron formation and iron formation subunits. The geologic model was then imported into Maptek’s Vulcan™ (Vulcan) software by Cliffs for resource estimation. Sub-blocked model estimates used inverse distance squared (ID²) and length-weighted, 10 ft,



uncapped composites to estimate KEVs, including magnetic iron (determined by Saturation Magnetization Analyzer [Satmagan]), wtrec, and silica in concentrate in an omni-directional single search pass approach, using hard boundaries between subunits, ellipsoidal search ranges, and a search ellipse orientation informed by geology. Density for the iron formation is calculated in the block model as a function of Satmagan crude magnetic iron and total iron content.

Mineral Resources were classified in accordance with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM (2014) definitions). Blocks were classified as Measured, Indicated, or Inferred using distance-based and qualitative criterion. Cliffs classifies the Mineral Resources based primarily on drill hole spacing and influenced by geologic continuity, ranges of economic criteria, and reconciliation. Some post-processing is undertaken to ensure spatial consistency and to remove isolated and fringe blocks. The resource area is limited by a polygon and subsequent pit shell based on practical mining limits. A block of mineralized material is classified as Measured if the distance to the nearest drill hole is within 400 ft and estimated with interpolation pass 1. If the nearest drill hole is between 400 ft and 1,200 ft and estimated in pass 2, it is classified as Indicated. All remaining blocks are classified as Inferred; they are considered waste and excluded from the Mineral Resource estimate.

Estimates were validated using standard industry techniques including visual grade comparisons, reviews of block model coding, and statistical reviews of the global accuracy of the estimated variables and evaluation of the local accuracy through the preparation of comparative statistics.

To ensure that all Mineral Resource statements satisfy the “reasonable prospects for eventual economic extraction” requirement, the Mineral Resource estimate for HibTac considered factors significant to technical feasibility and potential economic viability. Mineral Resources were defined and constrained within LOM phase units prepared by Cliffs. Table 1-5 summarizes the estimates of Mineral Resources for the operating areas and developed projects of HibTac as of December 31, 2021.

Table 1-5: Summary of HibTac Mineral Resources – December 31, 2021

Class	Crude Ore Mineral Resources	Crude Ore MagFe	Process Recovery	Pellets	Cliffs Attributed Basis	Cliffs Crude Ore Mineral Resources	Cliffs Pellets
	(MLT)	(%)	(%)	(MWLT)	(%)	(MLT)	(MWLT)
Measured	10.1	19.2	25.4%	2.6	85.3	8.6	2.2
Indicated	0.6	18.7	25.0%	0.1	85.3	0.5	0.1
Measured + Indicated	10.7	19.2	25.4%	2.7	85.3	9.1	2.3

Notes:

1. Tonnage is reported in long tons equivalent to 2,240 lb.
2. Mineral Resources are reported exclusive of Mineral Reserves and have been rounded to the nearest 100,000.
3. Mineral Resource estimates are based on a cut-off grade formula dependent on a few variables and restricted to material greater than 13% MagFe.
4. Classification of Mineral Resources is in accordance with CIM (2014) definitions.
5. Bulk density is calculated based on magnetic iron and total iron content.
6. Mineral Resources are 85.3% attributable to Cliffs and 14.7% attributable to U.S. Steel.



7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Numbers may not add due to rounding.

Resource estimates take account of the minimum block size that can be selectively extracted. Mineral Resources are exclusive of Mineral Reserves and are reported at a 13% MagFe cut-off grade. Mining recovery is typically 100%, although the grade tends to be diluted by 1% MagFe due to geological conditions and mining practices.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

1.3.7 Mineral Reserve Estimates

Mineral Reserves in this Technical Report are derived from the current Mineral Resources. The Mineral Reserves are reported as crude ore and are based on open pit mining from the Hibbing Mine. Crude ore is the unconcentrated ore as it leaves the mine at its natural *in situ* moisture content. The Proven and Probable Mineral Reserves for HibTac were estimated as of December 31, 2021, and are reported in Table 1-6.

Table 1-6: Summary of HibTac Mineral Reserves – December 31, 2021

	Crude Ore Mineral Reserves (MLT)	Crude Ore MagFe (%)	Process Recovery (%)	Wet Pellets (MLT)	Cliffs Attributed Basis (%)	Cliffs Crude Ore Mineral Reserves (MLT)	Cliffs Wet Pellets (MLT)
Proven	100.1	18.7	25.4	25.5	85.3	85.4	21.7
Probable	9.1	18.7	25.6	2.3	85.3	7.8	2.0
Proven + Probable	109.3	18.7	25.5	27.8	85.3	93.2	23.7
Notes: 1. Tonnage is reported in long tons equivalent to 2,240 lb and has been rounded to the nearest 100,000. 2. Mineral Reserves are estimated based on a cut-off grade formula dependent on a number of variables and restricted to material greater than 13% MagFe. 3. The Mineral Reserve mining stripping ratio (waste units to crude ore units) is at 1.0. 4. Pellets are reported as a wet standard equivalent containing 65% Fe. 5. Tonnage estimate based on December 31, 2021, production depletion from surveyed topography on June 15, 2021. 6. Mineral Reserve tons are as delivered to the primary crusher; pellets are as loaded onto lake freighters in Superior, Wisconsin. 7. Classification of the Mineral Reserves is in accordance with CIM (2014) definitions. 8. Mineral Reserves are 85.3% attributable to Cliffs and 14.7% attributable to U.S. Steel. 9. Numbers may not add due to rounding.							

The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

1.3.8 Mining Methods

HibTac is mined using conventional surface mining methods. The Mine requires large 200-plus ton mining trucks, and some areas of the pit require long hauls. The surface operations include:

- Clearing and grubbing
- Overburden (glacial till) removal



- Drilling and blasting (excluding overburden)
- Loading and haulage

The Mineral Reserve is based on the ongoing annual average ore production of 21.9 MLT from the Group I, II, III, IV, and V pits, producing an average of 5.6 MLT/y of wet pellets for domestic consumption. The HibTac operations have no current expansion plans and are likely to cease operating once the reserves are depleted by 2026.

Mining and processing operations are scheduled 24 hours per day, and the mine production is scheduled to directly feed the processing operations.

The current LOM plan has mining scheduled for five years and mines the known Mineral Reserve. The average stripping ratio is 1.0 waste units to 1 crude ore unit (1.0 stripping ratio).

There are 20 mining pits/phases with varying dimensions, with a maximum depth of approximately 600 ft attained in two of the pits/phases.

Primary production for all mine pits includes drilling 16.00 -in.-diameter rotary blast holes. A production blast hole of 40 ft depth is drilled. Burden and spacing varies depending on the material being drilled. The holes are filled with explosive and blasted. A combination of front-end loaders (FEL) and electric shovels load the broken material into 240 ton-payload mining trucks for transport from the pit.

The Mine follows strict crude ore blending requirements to ensure that the Plant receives a uniform head grade. Generally, three groupings of geological subunits are mined at one time to obtain the best blend for the Plant. Operationally, blending is done on a shift-by-shift basis. Sixteen ore characteristics are tracked. Magnetic susceptibility probing of blast holes delineates zones of oxidized waste rock. Crude ore is hauled to the crushing facility and either direct tipped to the primary crusher or stockpiled in an area adjacent to the primary crusher. Haul trucks are alternated to blend delivery from the multiple crude ore loading points. The crude ore stockpiles are used as an additional source for blending and production efficiency.

The major pieces of pit equipment include electric shovels, FELs, haul trucks, drills, bulldozers, and graders. Extensive maintenance facilities are available at the mine site to service mine equipment and the rail fleet.

1.3.9 Processing and Recovery Methods

Three ore types are blended at HibTac and delivered to the crushing plant. Two Allis Chalmers gyratory crushers crush ROM ore to grinding mill feed size, which is conveyed to a 450,000 ton, crushed ore stockpile (COSP). Crushed ore is reclaimed from the COSP to the concentrator. The concentrator consists of nine autogenous grinding (AG) and magnetic separation process lines, beginning with 36 -ft-diameter x 15-ft EGL AG mills. The AG mills feed rougher magnetic separators, which produce a rougher magnetic concentrate and a non-magnetic tailing. The rougher magnetic concentrate is pumped to hydrocyclones for classification. The cyclone underflow slurry is returned to the AG mill for additional grinding, and the cyclone overflow slurry is pumped to finisher magnetic separators. The finisher magnetic separator product is pumped to the finisher product screens, and the screen undersize is final concentrate reporting to the concentrate thickener.

Concentrate is thickened and then pumped to agitated storage tanks in the pelletizing plant prior to filtration. Concentrate is filtered using vacuum disc filters and blended with bentonite prior to pelletizing to produce standard compression pellets. When high-compression pellets are required, limestone is added in addition to the bentonite.



The filter cake is transported by belt conveyors to the pellet plant concentrate bins. The concentrate is rolled in balling drums to produce green balls and sized using roll screens. Travelling grate furnaces are used for drying, preheating, and firing the pellets. Pellets discharged from the indurating furnaces are the final product and are conveyed to the pellet load-out bins or to the emergency stockpile.

1.3.10 Infrastructure

The Property is in a historically important, iron-producing region of Northeastern Minnesota. All the infrastructure necessary to mine and process significant commercial quantities of iron ore is in place.

Infrastructure items include:

- Mine and Plant concentrator facilities near Hibbing, Minnesota.
- Power is supplied to the site by Minnesota Power. The site load is approximately 167 MW.
- Natural gas supplied by Northern Natural Gas from pipelines that connect into the North American distribution system.
- The water for mining and processing operations is provided by makeup water from the Scranton and Morton pits and recycled water from the TSF. The makeup water is provided at approximately 5,000 gpm by pit pumps. The source of makeup water is adjusted based on the mine plan. The reclaim water from the tailings is used for process water at the Plant. The water supply is more than adequate, especially considering that the mine is in a net positive water situation requiring daily discharge of excess water from pit dewatering.
- Paved roads and highways.
- Finished taconite pellets are transported by BNSF Rail to its Allouez Taconite Facility in Superior, Wisconsin, approximately 90 mi from the Plant facilities.
- The port is controlled and operated by BNSF Rail and includes pellet screening, 72,000 LT of pellet storage, and ship loading either directly from rail cars to ship or from stockpiles to ship. The vessels are 25,000 LT- to 55,000 LT-capacity lakers that transport pellets to steel mills on the Great Lakes.
- Rail yards and workshops are operated by BNSF Rail.
- TSF.
- Accommodations for employees.
- Local and State infrastructure also includes hospitals, schools, airports, equipment suppliers, fuel suppliers, commercial laboratories, and communication systems.

1.3.11 Market Studies

Cliffs is the largest producer of iron ore pellets in North America. It is also the largest flat-rolled steel producer in North America. In 2020, Cliffs acquired two major steelmakers, AMUSA and AK Steel (AK), vertically integrating its legacy iron ore business with steel production and emphasis on the automotive end market.



Cliffs owns or co-owns five active iron ore mines in Minnesota and Michigan. Through the two acquisitions and transformation into a vertically integrated business, the iron ore mines are primarily now a critical source of feedstock for Cliffs' downstream primary steelmaking operations. Based on its ownership in these mines, Cliffs' share of annual rated iron ore production capacity is approximately 28.0 million tons, enough to supply its steelmaking operations and not have to rely on outside supply.

The importance of the steel industry in North America and specifically the USA is apparent by the actions of the US federal government by implementing and keeping import restrictions in place. It is important for middle-class job generation and the efficiency of the national supply chain. It is also an industry that supports the country's national security by providing products used for US military forces and national infrastructure. Cliffs expects the US government to continue recognizing the importance of this industry and does not see major declines in the production of steel in North America.

HibTac pellets are shipped to Cliffs' steelmaking facilities in the Midwestern USA. For cash flow projections, Cliffs uses a blended pellet revenue rate of \$98/WLT Free on Board (FOB) Mine based on a three-year trailing average for 2017 to 2019. Based on macroeconomic trends, the QP is of the opinion that Cliffs pellet prices will remain at least at the current three-year trailing average of \$98/WLT or above for the next five years.

1.3.12 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Hibbing Taconite indicated that it presently has the requisite operating permits for the operation of the Mine and Plant and estimates the mine life to be five years. These permits include county, state, and federal permits related to air quality, surface water quality, water appropriation, hazardous waste generation, and wetlands. Multiple permits are planned to support future operations including an amendment to the Permit to Mine. Environmental monitoring and reporting during operations primarily include water and air quality monitoring.

Closure plans and other post-mining plans are required to be prepared at least two years prior to the anticipated closure; however, Cliffs conducts an in-depth review every three years to ensure that the asset retirement obligation legal liabilities are accurately estimated based on current laws, regulations, facility conditions, and cost to perform services. These cost estimates are conducted in accordance with the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 410.

With respect to community agreements, HibTac is located in close proximity to the towns of Hibbing and Chisholm, Minnesota. Cliffs employs a public relations expert who is located in Forbes, Minnesota, only 30 mi away from HibTac, with the goal of responding to residents' complaints in a systematic manner. Hibbing Taconite has an ongoing lease agreement with the City of Hibbing's Public Utilities Department that provides access to Hibbing Taconite-owned property where the city operates a well. In 2017, Hibbing Taconite executed a land swap agreement with the City of Hibbing that was part of a plan to relocate the community's mine overlook and educational center so mining activities could commence at the former location (which was located on the HibTac Property) without significantly impacting the community.

1.3.13 Capital and Operating Cost Estimates

Sustaining capital expenditure estimates for the remaining LOM are presented in Table 1-7. Additional concurrent closure expenditures are associated with Hibbing Taconite's decision to



move to a more conservative method of TSF design with the addition of downstream fill to strengthen the dam cross-section.

Table 1-7: LOM Capital Costs

Type	Values	Total	2022	2023	2024	2025	2026
Sustaining	\$ millions	27.0	15.4	7.9	2.4	1.3	0.1
Concurrent Closure	\$ millions	29.4	18.8	10.7			
Total	\$ millions	56.5	34.2	18.6	2.4	1.3	0.1

Operating costs are based on a full run rate with a combination of both standard and flux production consistent with what is expected for the LOM. A LOM average operating cost of \$75.29/WLT pellet is estimated over the remaining five years of the LOM and is shown in Table 1-8.

Table 1-8: LOM Operating Costs

Description	LOM (\$/WLT Pellet)
Mining	19.87
Processing	34.57
Site Administration	2.30
Pellet Transportation and Storage	10.35
General / Other	8.20
Operating Cash Cost	75.29

Cliffs' forecasted capital and operating cost estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1, with an accuracy range of -3% to -10% to +3% to +15%.



2.0 Introduction

SLR Consulting Ltd (SLR) was retained by Cleveland-Cliffs Inc. (Cliffs) to prepare an independent Technical Report (Technical Report) for the Hibbing Taconite Property (HibTac or the Property), located in Northeastern Minnesota, USA. The owner of the Property, Hibbing Taconite Company (Hibbing Taconite), is a joint venture (JV) between subsidiaries of Cliffs (85.3% ownership) and U.S. Steel Corporation (U.S. Steel) (14.7%). The Property is managed by Cleveland-Cliffs Hibbing Management LLC, a wholly owned subsidiary of Cliffs.

Cliffs is listed on the New York Stock Exchange (NYSE) and currently reports Mineral Reserves of pelletized ore in the United States Securities and Exchange Commission's (SEC) filings. On July 14, 2024, Stelco Holdings Inc. (Stelco), 13421422 Canada Inc. (Purchaser), a wholly owned subsidiary of Cliffs, and Cliffs entered into an Arrangement Agreement, providing for, among other things, the acquisition by the Purchaser of all of the outstanding common shares of Stelco. In connection with a special meeting of Stelco shareholders to consider and approve the transactions contemplated by the Arrangement Agreement, Stelco is providing its shareholder with a management information circular (the Stelco Circular) that, given the consideration to be paid to Stelco shareholders pursuant to the terms of the Arrangement Agreement includes Cliffs' common stock, must include disclosure regarding Cliffs in the form of prospectus that Cliffs would be eligible to use immediately prior to the sending and filing of the Stelco Circular. The provision of disclosure related to Cliffs' mineral projects in the Stelco Circular requires Stelco to file this Technical Report.

This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). SLR Qualified Persons (QPs) visited the Property on April 28, 2021, and prepared an S-K 1300 Technical Report Summary (TRS) dated February 7, 2022. Cliffs has since been updating the Mineral Reserve estimate for the Property based on depletion due to mining, with the latest update at YE 2023. There has been no material change to the information contained in the 2022 TRS and Cliffs considers the TRS to be current.

This Technical Report presents information from the 2022 TRS in compliance with NI 43-101.

The Property includes the Hibbing Taconite Mine (the Mine) and processing facility (the Plant) in Hibbing, Minnesota. The Mine is a large, operating, open pit iron mine that produces pellets from a magnetite iron ore regionally known as taconite.

The Property commenced operations in 1976 as a JV between Bethlehem Steel Corporation (Bethlehem) (75%), Pickands Mather and Co. (Pickands Mather) (15%), and Steel Company of Canada (Stelco) (10%). Cliffs first became involved in the JV when it purchased Pickands Mather's 15% share of the JV in 1986 and another 8% share from Bethlehem in 2002. In 2003-2004, ArcelorMittal USA (AMUSA) acquired Bethlehem's 62% share and became the largest shareholder of the JV. Cliffs managed the JV through a subsidiary until 2019 when AMUSA assumed control of the operation. In 2020, Cliffs acquired the US assets of AMUSA and again became the operator of the Property.

The open-pit operation has a mining rate of approximately 24 million long tons (MLT) of ore per year and produces 6.2 MWLT of iron ore pellets.

2.1 Site Visits

SLR Qualified Persons (QPs), Mark B. Mathisen, C.P.G., Principal Geologist, Andrew P. Hampton, M.Sc., P.Eng., Principal Metallurgist, and Grant A. Malensek, M.Eng., P.Eng., Senior Principal Mining Engineer, visited the Property on April 28, 2021.



During the site visit, the SLR team toured the tailings basin, plant laboratory, concentrator, and pelletizing facilities, as well as rail pellet load-out site, and the mine offices and operational areas.

Mark B. Mathisen held discussions on drilling and sampling procedures, as well as reviewed Mineral Resource modeling procedures and parameters with the Cliffs mine geologist staff.

Andrew P. Hampton met with the metallurgical staff for general discussions and performed detailed tours of the primary crusher and coarse ore storage, rail transfer system, concentrator and plant laboratories, pellet plant, pellet storage and rail loading facility and tailings facilities. Discussions with operations on plant sampling for process control and quality control, metallurgical testing and quality control procedures.

Grant A. Malensek visited mine production, development, and infrastructure areas in the operating areas. Discussions were carried out on the mining cycle, productivities, dilution, and recovery and fleet maintenance procedures.

Dean K. Korri, P.E., MASCE, Director – Civil Engineering/Tailings Basin Engineering with Cliffs, visits the Property on a regular basis. During the site visits, the tailings storage facilities are viewed.

Brooke A. Lund, CPG, Project Manager of Environmental Permitting & Regulatory with Cliffs, visits the Property on a monthly basis. During the site visits, all environmental aspects on the Property are discussed and reviewed with the site team.

2.2 Sources of Information

This Technical Report was prepared by Mark B. Mathisen, C.P.G., Balaji Subrahmanyam, SME(RM), Principal Mining Engineer, Andrew P. Hampton, M.Sc., P.Eng., Grant A. Malensek, M.Eng., P.Eng., Dean K. Korri, P.E., MASCE, and Brooke A. Lund, C.P.G. The QP responsibilities are indicated in Table 2-1.

Table 2-1: Qualified Persons and Responsibilities

QP, Designation	Company	Responsible for
Mark B. Mathisen, C.P.G.	SLR	Sections 4 to 12, 14, and 23
Andrew P. Hampton, M.Sc., P.Eng.	SLR	Sections 13, 17, and 18 (except 18.4)
Balaji Subrahmanyam, SME(RM)	SLR	Sections 15 and 16
Dean K. Korri, P.E., MASCE	Cliffs	Section 18.4
Brooke A. Lund, C.P.G.	Cliffs	Section 20
Grant A. Malensek, M.Eng., P.Eng.	SLR	Sections 2, 3, 19 to 22, and 24
ALL QPs		Sections 1, 25, 26, and 27

Technical documents and reports on the Property were obtained from Cliffs' personnel. During the preparation of this Technical Report, discussions were held with personnel from Cliffs:

- Kurt Gitzlaff, Director – Mine Engineering, Cliffs Technical Group (CTG)
- Michael Orobona, Principal Geologist, CTG
- Adam Schaum, Lead Mine Engineer, CTG
- Scott Gischia, Director – Environmental Compliance



- Dean Korri, Director –Basin & Civil Engineering
- Tushar Mondhe, Senior Manager – Operations and Capital Operations Finance
- Ralland Hess – Area Manager, Mine
- Angela Schwenk – Section Manager, Mine Engineering
- Daniel Aagenes – Area Manager, Plant
- Corie Ekholm – Section Manager, Plant Technical Services
- Wade Hansen, Concentrator Operations
- Zachary Wheaton, Pellet Plant Operations
- Phillip Larson, Mine Geologist
- Tasha Niemi – Area Manager, Environmental

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 24, References.

2.3 List of Abbreviations

The U.S. System for weights and units has been used throughout this report. Tons are reported in long tons (LT) of 2,240 lb unless otherwise noted. All currency in this report is US dollars (US\$ or \$) unless otherwise noted.

Abbreviations and acronyms used in this Technical Report are listed below.

Unit Abbreviation	Definition	Unit Abbreviation	Definition
a	annum	LT/d	long tons per day
A	ampere	LT/h	long tons per hour
acfm	actual cubic feet per minute	M	mega (million); molar
bbl	barrels	Ma	one million years
Btu	British thermal units	MBtu	thousand British thermal units
d	day	MCF	million cubic feet
°F	degree Fahrenheit	MCF/h	million cubic feet per hour
fasl	feet above sea level	mi	mile
ft	foot	min	minute
ft ²	square foot	MLT/y	million long tons per year
ft ³	cubic foot	MPa	megapascal
ft/s	foot per second	mph	miles per hour
g	gram	MVA	megavolt-amperes
G	giga (billion)	MW	megawatt
Ga	one billion years	MWh	megawatt-hour
gal	gallon	MWLT	million wet long tons



Unit Abbreviation	Definition	Unit Abbreviation	Definition
gal/d	gallon per day	oz	Troy ounce (31.1035g)
g/cm ³	grams per cubic centimeter	oz/ton	ounce per short ton
g/L	gram per liter	ppb	part per billion
g/y	gallon per year	ppm	part per million
gpm	gallons per minute	psia	pound per square inch absolute
hp	horsepower	psig	pound per square inch gauge
h	hour	rpm	revolutions per minute
Hz	hertz	RL	relative elevation
in.	inch	s	second
in ²	square inch	ton	short ton
J	joule	stpa	short ton per year
k	kilo (thousand)	stpd	short ton per day
kg/m ³	Kilogram per cubic meter	t	metric tonne
kVA	kilovolt-amperes	US\$	United States dollar
kW	kilowatt	V	volt
kWh	kilowatt-hour	W	watt
kWLT	thousand wet long tons	wt%	weight percent
L	liter	WLT	wet long ton
lb	pound	y	year
LT	long or gross ton equivalent to 2,240 pounds	yd ³	cubic yard



Acronym	Definition
AA	atomic absorption
AACE	American Association of Cost Engineers
AG	autogenous grinding
AIST	Association for Iron & Steel Technology
AK	AK Steel
AMUSA	ArcelorMittal USA
ANFO	ammonium nitrate fuel oil
ANSI	American National Standards Institute
ARD	acid rock drainage
ARO	asset retirement obligation
ASC	Accounting Standards Codification
ASQ	American Society for Quality
ASTM	American Society for Testing and Materials
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
BF	blast furnace
BFA	bench face angle
BH	bench height
BIF	banded iron formation
BLS	United States Bureau of Labor Statistics
CBOD5	carbonaceous biochemical oxygen demand, 5 day test
CCD	counter-current decantation
CCP	Conceptual Closure Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Cost and Freight
COA	certificates of analysis
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
CSS	closed-side setting
CTW	calculated true width
D&A	depreciation and amortization
DCF	discounted cash flow
DD	diamond core drilling
DRI	direct reduced iron
DSO	direct-shipping iron ore
DT	Davis Tube



Acronym	Definition
EAF	electric arc furnace
EAP	Emergency Action Plan
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	environmental management system
EPA	United States Environmental Protection Agency
EPRT	External Peer Review Team
ESOP	Environmental Standard Operating Procedures
EOR	Engineer of Record
FASB	Financial Accounting Standards Board
FEL	front-end loader
FOB	Free on Board
FoS	factor of safety
GHG	greenhouse gas
GIM	Geoscientific Information Management
GPS	global positioning system
GSI	Geological Strength Index
GSSI	General Security Services Corporation
HBI	Hot briquetted iron
HRC	hot-rolled coil
HTW	horizontal true width
ID ²	Inverse distance squared
ID ³	Inverse distance cubed
IF	iron formation
ICFM	inlet air capacity
IIMA	International Iron Metallics Association
IRA	inter-ramp angle
IRR	Internal Rate of Return
ISO	International Standards Organization
KEV	key economic variables
LG	Lerchs-Grossmann
LiDAR	light imaging, detection, and ranging
LIS	Liberation Index Study
LLP	Lerch Laboratory Procedures



Acronym	Definition
LMF	Laurentian Mixed Forest
LOM	life of mine
MAC	Mining Association of Canada
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MLT	million long tons
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MR	moving range
MRCC	Midwestern Regional Climate Center
MTP	Main Tailing Pumphouse
MTW	measured true width
NAD	North American Datum
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGO	non-governmental organization
NGVD	National Geodetic Vertical Datum
NIST	National Institute of Standards and Technology
NNG	Northern Natural Gas
NOAA	National Oceanic and Atmospheric Administration
NOLA	Nuclear On-Line Analyzer
NPDES	National Pollution Discharge Elimination System
NPV	Net Present Value
NRRI	Natural Resources Research Institute
NSM	Northshore Mining Company
OBM	Ore Base Metalics
OMS	Operations, Maintenance and Surveillance
PLC	Programmable Logic Controller
PMF	probable maximum flood
POK	Pokegama Quartzite
PSD	Prevention of Significant Deterioration
QA/QC	quality assurance and quality control
QP	Qualified Person
RC	rotary circulation drilling
RCRA	Resource Conservation and Recovery Act



Acronym	Definition
RMA	reduced major axis
ROM	run of mine
RPD	relative percent difference
RQD	Rock Quality Designation
RTR	risk and technology review
SDS	State Disposal System
SEC	United States Securities and Exchange Commission
SG	specific gravity
SMU	selective mining unit
SQL	Structured Query Language
SPC	statistical process control
SPT	standard penetration testing
TMDL	Total Maximum Daily Load
TRS	Technical Report Summary
TSF	tailings storage facility
TSP	total suspended particulates
TRIR	total recordable incident rate
UCS	uniaxial compressive strength
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
XRF	x-ray fluorescence



3.0 Reliance on Other Experts

This report has been prepared by SLR for Cliffs. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this Technical Report.
- Assumptions, conditions, and qualifications as set forth in this Technical Report.

For the purpose of this report, SLR has relied on ownership information provided by Cliffs and verified in an email from Gabriel D. Johnson, Cliffs' Senior Manager – Land Administration, dated January 20, 2022 in the Executive Summary and Section 4.0. SLR has not researched property title or mineral rights for HibTac, as we consider it reasonable to rely on Cliffs' legal counsel, who is responsible for maintaining this information.

SLR has relied on Cliffs for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from HibTac in the Executive Summary and Section 22. As HibTac has been in operation for over 45 years, Cliffs has considerable experience in this area.

SLR has relied on information provided by Cliffs pertaining to environmental studies, management plans, permits, compliance documentation, and monitoring reports that were verified in an email from Scott A. Gischia, Cliffs' Director – Environmental Compliance, Mining and Pelletizing, dated January 21, 2022 in the Executive Summary and Section 20.0.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Cliffs is sound.

Except for the purposes legislated under provincial securities laws, any use of this Technical Report by any third party is at that party's sole risk.



4.0 Property Description and Location

4.1 Property Location

The Property is located in St. Louis and Itasca Counties in Northeastern Minnesota, USA, on the Mesabi Iron Range, immediately north of the town of Hibbing, Minnesota. The open pit is also known historically as the Hull-Rust-Mahoning Mine and, based on its historical production, is the largest operating open-pit mine in Minnesota. The mining and processing operation and tailings storage facility (TSF) are located in the center of the Mesabi Iron Range Mining District between longitude W 93°03' and W 92°54' 36" and latitude N 47°25' 48" and N 47°31' 48". Figure 4-1 shows the location of the Property. The Mine and Plant have the capacity to produce approximately 8.0 MWLT of iron ore pellets annually.

4.2 Land Tenure

Hibbing Taconite controls 36,280 acres in a combination of mineral leases, surface leases, and owned property and is the operator of the mine, process plant, and rail loading facility.

4.2.1 Mineral Rights

The Property Boundary comprises approximately 6,420 acres of mineral leases granted by private landowners and 220 acres granted by the State of Minnesota as illustrated in Figure 4-2. Mineral leases generally include surface rights. Where the mineral leases do not include surface mining rights, Hibbing Taconite controls the surface through ownership or surface leases with the owner of the surface. Approximately 1,150 acres of owned property is associated with the mineral lease acreage.

As shown in Table 4-1, Hibbing Taconite mineral leases expire between 2022 and 2056, with a number of leases that expire during the remaining five-year mine life. No scheduled mining activity on any of those leases will take place after their expiration date and all include time for proper reclamation.

In order to maintain the mineral leases until expiration, Hibbing Taconite must continue to make minimum prepaid royalty payments each quarter and pay property taxes. When mining occurs, a royalty is due per long ton of crude ore mined, or long ton of pellets produced from the crude ore mined; the royalty is payable to the respective lessors quarterly. Royalty rates per long ton fluctuate based on industry and economic indexes. Minimum prepaid royalty payments may be credited against royalties due when mining occurs. Specific terms and provisions of the mineral leases are confidential.

Table 4-1: Property Mineral Leases

Name	Expiration Date
Higgins (Red Cross)	Holdover
State of Minnesota #5075-N, Lamberton	3/18/2023
Day Lands	12/31/2023
State 2063	4/11/2025
Penobscot	12/30/2026
L&W Leetonia	12/31/2026



Name	Expiration Date
Bennett-Longyear / Great Northern 50% (Ontario 50%)	12/31/2026
Bennett-Longyear #3, Ontario # 3	12/31/2026
Great Northern 100%	12/31/2026
Morris-Burt	12/31/2026
Morris	12/31/2026
Mahoning	1/1/2027
McClintock-Crosby	12/31/2028
USSC Overriding	12/31/2028
USSC Direct	12/31/2028
Day Development	8/1/2034
Pillsbury-Alexandria	1/1/2037
Sargent #1	12/31/2037
Crosby, Wilson G. Trust	12/31/2040
Sheridan	12/31/2040
Winifred	12/31/2040
Laura	12/31/2040
Christine McClintock	9/2/2041
McClintock-Kirby	9/2/2041
Sargent #2	10/1/2041
Burt	12/31/2041
Cyprus Rust	12/31/2041
Rust Group I & Group II	12/31/2041
Hull Group I & Group II	1/1/2042
Galob	11/21/2042
Greene	4/12/2043
Wheeler	6/30/2049
Gray Annex	6/30/2049
Roy Mine	5/1/2056

4.2.2 Surface Rights

The Property consists of approximately 30,670 acres of owned property (1,150 acres associated with mineral leases) in and around HibTac as illustrated in Figure 4-2. To maintain ownership, the property taxes must be paid to St. Louis and Itasca Counties.



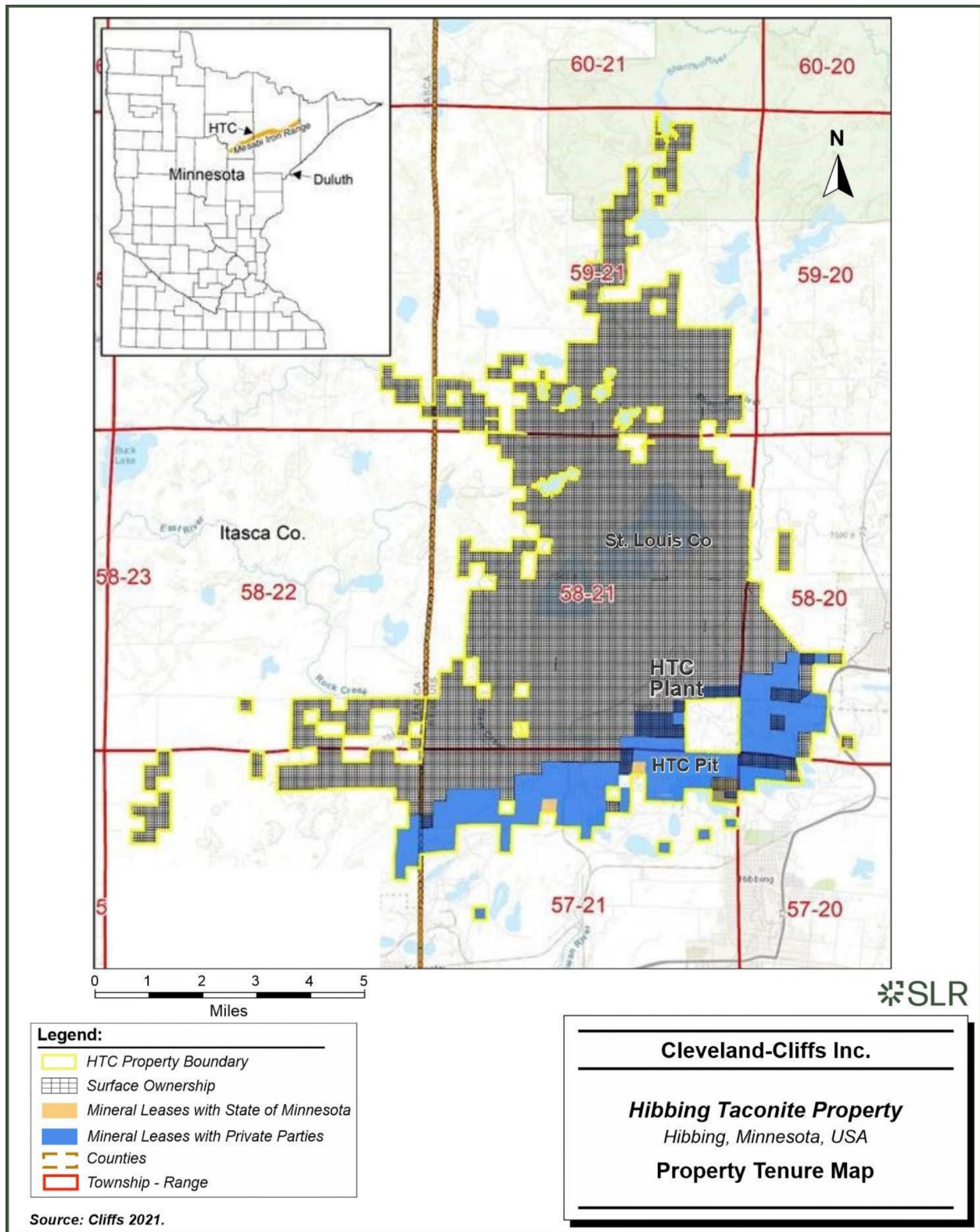
There are quarterly royalty payments made on the Hibbing Taconite mine mineral leases to multiple third parties. The details of the royalties are confidential between Hibbing Taconite and the lessors.



Figure 4-1: Property Location Map



Figure 4-2: Property Mineral Tenure Map



4.3 Encumbrances

Hibbing Taconite grants leases, licenses, and easements for various purposes including miscellaneous community land uses, utility infrastructure, and other third-party uses that encumber the Property but do not inhibit operations.

Cliffs has outstanding standby letters of credit, which were issued to back certain obligations of Hibbing Taconite, including certain permits and certain tailings basin projects. Additionally, Hibbing Taconite has and may continue to enter into lease agreements for necessary equipment used in the operations of the mine.

Hibbing Taconite has prepared an asset retirement obligation cost for the site of approximately US\$143 million, which covers monitoring and maintenance, reclamation and revegetation, remediation, structure removal, and watershed restoration. This amount does not include costs for long-term water management at the tailings basin, namely post-closure seepage control.

4.4 Royalties

Reference Section 4.2 of this Technical Report for royalty information. No overriding royalty agreements are in place.

4.5 Environmental Liabilities and Permitting

The QP is not aware of any environmental liabilities on the Property. Cliffs. has all required permits to conduct the proposed work on the Property (see Table 20-1 in Section 20 of this Technical Report).

4.6 Other Significant Factors and Risks

The QP is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the Property.



5.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The Property is easily accessed via paved roads from Hibbing, Minnesota by Highway 169, four miles north toward Chisholm to County Highway 5, then 2.3 mi north on Highway 5 to the mine access road, and two miles west to the facilities on the Hibbing Taconite complex road. Duluth, a major port city on Lake Superior, is 76 mi southeast of the Property via US Highway 53 and MN Highway 37. Duluth has a regional airport with several flights daily to major hubs in Minneapolis and Chicago. A rail line operated by Burlington Northern Santa Fe Railway (BNSF) extends from the Plant to the port in Superior, Wisconsin. Refer to Section 4.1 of this Technical Report and Figure 4-2 for the location of roads providing access to the Property.

5.2 Climate

The climate in Northern Minnesota ranges from mild in the summer to winter extremes. The annual average temperature is 37°F. The annual average high temperature is 49°F, whereas the annual average low temperature is 25°F. July is on average the hottest month (77°F), and January is the coldest (-4°F) (National Oceanic and Atmospheric Administration [NOAA], 1991-2020). Table 4-1 presents complete climate data for the area for 1991 to 2020.

Table 5-1: Northern Minnesota Climate Data (1991 to 2020)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high (°F)	16.9	22.5	35.4	49.5	63.4	72.2	76.7	74.9	65.7	50.8	34.3	21.4	48.6
Daily mean (°F)	6.2	10.5	23.8	37.1	49.5	58.9	63.5	61.6	53	40.2	25.6	12.3	36.9
Average low (°F)	-4.4	-1.4	12.2	24.8	35.7	45.7	50.3	48.3	40.3	29.7	16.9	3.1	25.1
Precipitation (in.)	0.51	0.53	0.91	1.61	2.76	4.36	3.85	3.09	3.06	2.35	1.09	0.64	24.76
Snowfall (in.)	15	7.1	7.8	3.7	0	0	0	0	0	1.2	13.2	12.3	60.3
Source: NOAA, 2021.													

Precipitation as rain in the Hibbing area ranges from less than one inch in December, January, and February, to approximately three to four inches per month during the summer, averaging approximately 25 in. annually. Annual snowfalls average 60 in. during November through March. Approximately half of the precipitation arrives during the summer months.

The Property is in production year-round.

5.3 Local Resources

Labor is readily available in the Property area. Medical facilities with trauma centers are located in the cities of Virginia, Hibbing, and Duluth, Minnesota. Table 4-2 presents a list of the major population centers and their distance by road to the Property.



Table 5-2: Nearby Population Centers

City/Town	Medical Center	Population 2010 Census	Mileage to Site
Hibbing, MN	Level III	16,361	10
Gilbert, MN	n/a	1,799	28
Eveleth, MN	n/a	3,718	26
Virginia, MN	Level IV	8,712	23
Duluth, MN	Level I and II	85,884	80
Source U.S. Census Bureau, Google Maps.			

As of Q4 2021, the HibTac operation employs 733 employees who live in the surrounding cities of Hibbing, Chisholm, Virginia, Mountain Iron, Eveleth, Buhl, Biwabik, Hoyt Lakes, and Aurora. Personnel also commute from Duluth and the Iron Range. St. Louis County has an estimated population of approximately 200,000 people.

5.4 Infrastructure

The Property is located in a historically important, iron-producing region of Northeastern Minnesota. All the infrastructure necessary to mine and process significant commercial quantities of iron ore is currently in place. Infrastructure items include high-voltage electrical supplies, natural gas pipelines that connect to the North American distribution system, water sources, paved roads and highways, railroads for transporting finished products, port facilities that connect to the Great Lakes, and accommodations for employees. Local and State infrastructure also includes hospitals, schools, airports, equipment suppliers, fuel suppliers, commercial laboratories, and communication systems. Additional information regarding HibTac supporting infrastructure can be found in Section 15 of this Technical Report.

5.5 Physiography

The Property is located at an elevation of approximately 1,400 feet above sea level (FASL), just east of the Itasca County line. The mine and mineral leases are located in both St. Louis and Itasca counties. The generally gentle topography in the area is punctuated by hummocky hills and long gentle moraines, remnants of glacial ingress and egress. The landscape ranges from semi-rugged, lake-dotted terrain with thin glacial deposits over bedrock, to hummocky or undulating plains with deep glacial drift, to large, flat, poorly drained peatlands. Topography includes rolling till plains, moraines, and flat outwash plains formed by the Rainy Lobe glacier. Most striking is the Giants Range, a narrow bedrock ridge rising 200 ft to 400 ft above the surrounding area. Bedrock is locally exposed near terminal moraines but is generally rare.

The Minnesota Department of Natural Resources (MDNR) characterizes the area as being within the Laurentian Mixed Forest (LMF) Province, which covers over 23 million acres of northeastern Minnesota. In Minnesota, the Province is characterized by broad areas of conifer forest, mixed hardwood and conifer forests, and conifer bogs and swamps. Vegetation is a mixture of deciduous and coniferous trees. White pine-red pine forest and jack pine barrens are common on outwash plains. Aspen-birch Forest and mixed hardwood-pine forest are present on moraines and till plains. Wetland vegetation includes conifer bogs, lowland grasses, and swamps. Prior to settlement, the area consisted of forest communities dominated by white pine, red pine, balsam fir, white spruce, and aspen-birch.



Brown glacial sediments form the parent material for much of the soils in the area. Soils are varied and range from medium to coarse textures. Soils are formed in sandy to fine-loamy glacial till and outwash sand. Soils on the Nashwauk Moraine have a loamy cap with dense basal till below at depths of 20 in. to 40 in. These soils are classified as boralfs (cold, well-drained soils developed under forest vegetation) (Minnesota Department of Natural Resources, 2011).



6.0 History

6.1 Prior Ownership

HibTac has operated as a joint venture among several companies since 1976. The ownership changes and effective percentages held by each company are described in Table 6-1.

Table 6-1: Ownership History

Ownership	%
1976 – Initial Start-Up	
Bethlehem Steel Corporation (Bethlehem)	75%
Pickands Mather & Co (Pickands Mather)	15%
Stelco (Steel Company of Canada)	10%
1978 – Phase II added	
Bethlehem	62%
Pickands Mather	15%
Stelco	7%
Republic	16%
1986 – Cliffs acquires Pickands Mather	
Bethlehem	70%
Cliffs	15%
Stelco	15%
2002 – Cliffs acquires an additional 8% ownership	
Bethlehem	62%
Cliffs	23%
Stelco	15%
2003 – International Steel Group (ISG) acquires Bethlehem assets	
ISG	62%
Cliffs	23%
Stelco	15%
2004 –AMUSA acquires ISG	
AMUSA	62%
Cliffs	23%
Stelco	15%
2007 –US Steel acquires Stelco	
AMUSA	62%
Cliffs	23%



Ownership	%
U.S. Steel	15%
2019 – AMUSA becomes operator of Hibbing Taconite	
AMUSA	62%
Cliffs	23%
U.S. Steel	15%
2020 – Cliffs acquires AMUSA’s assets and becomes operator of Hibbing Taconite	
Cliffs	85%
U.S. Steel	15%

6.2 Exploration and Development History

Initial observations of iron-bearing rocks in the Mesabi Iron Range are attributed to Henry H. Eames, the first state geologist of Minnesota, in 1866. Mr. Eames mentioned that “enormous bodies of iron ore occurred” in the northern part of the state (Eames, 1866).

Exploration for high-grade, direct-shipping iron ore (DSO) deposits in the Hibbing area began in the early 1890s. Test pitting, later diamond core and churn drilling, and dip-needle surveys were used to delineate DSO deposits. The understanding of this work in the immediate Property area is limited, with poor documentation of activities maintained on site. Coincident with early exploration activity, the aerial extent of the unenriched Biwabik Iron Formation (Biwabik IF) sub-crop was delineated, and the magnetite-bearing iron formation was documented. Between 1895 and 1976, thirty-four separate mines operated within the current Property limits, shipping more than 600 MLT of iron ore and iron ore concentrates. Focused exploration for beneficiation-grade magnetite deposits, regionally known as taconite, however, did not begin until the 1940s when Pickands Mather and its managed subsidiaries Erie Mining Company and Ontario Iron Company commenced evaluation activity that included geophysical surveys, metallurgical testing, and diamond core drilling on regular-spaced grids designed to delineate taconite and characterize its weight recovery and metallurgical properties. A brief history of the initial regional exploration can be found in the Field Trip 2 Guidebook (Severson et al., 2016) and references therein.

Drilling since the late 1960s has primarily consisted of infill diamond drilling for operational purposes and comprises the database currently used for resource estimation. Cliffs and Hibbing Taconite have not evaluated detailed records or results of early, non-drilling prospecting methods used during initial exploration activities such as geophysical surveys, mapping, trenching, and test pits conducted prior to taconite mining development in the 1970s.

In 2007, Hibbing Taconite contracted EDCON-PRJ to fly a high-resolution, ultralight aeromagnetic survey over and beyond the eastern portion of the Property, which included the area immediately east of Highway 169, with the purpose of understanding continuity of magnetic response, and large scale structural features and oxidation of the BIF. The exploration target area east of the highway was not subsequently developed.

Exploration at the Property by previous owners, consisting of primarily diamond drilling, is described in Section 10 of this Technical Report.



6.3 Historical Reserve Estimates

As Cliffs has had an interest in HibTac since 1986, historical reserves are not relevant and are not included here. A brief history of HibTac Mineral Reserves, as reported by Cliffs, is included in section 15.2 of this Technical Report.

6.4 Past Production

Production between 2010 and 2021 is listed in Table 6-2.

Table 6-2: Past Production

Year	Crude Ore ⁽¹⁾ MLT	Rock Stripping ⁽¹⁾ MLT	Surface Stripping ⁽¹⁾ MLT	Total Material MLT	Pellet Production (Wet) MLT
2010	22.4	15.2	12.1	49.6	5.9
2011	28.3	12.7	22.0	63.0	7.8
2012	29.5	13.1	23.8	66.3	8.1
2013	28.1	21.1	13.6	62.8	7.7
2014	27.3	24.3	12.0	63.7	7.7
2015	29.4	26.2	6.3	61.9	8.1
2016	30.3	28.5	5.0	63.9	8.2
2017	29.5	26.8	8.4	64.8	7.7
2018	28.8	31.1	4.8	64.7	7.8
2019	28.1	24.4	7.5	60.0	7.5
2020	21.5	17.7	6.1	45.2	5.5
2021	28.8	21.0	9.9	59.7	7.6
Note. 1. Values from Hibbing Taconite Met Balance form.					



7.0 Geological Setting and Mineralization

7.1 Regional Geology

Essential aspects of the regional geology in the Lake Superior region have been understood since the early 1900s, and the geologic understanding of the area has remained relatively unchanged over the years.

Iron ores produced within the region range from high-grade, structurally controlled ore bodies amenable to direct shipping to more disseminated, stratigraphically controlled, low-grade iron ores locally termed taconite. Taconite is observed in a sequence of Paleoproterozoic metasedimentary rocks overlying Archean granitic rocks in the Lake Superior region. A fold and thrust belt attributed to the Penokean orogeny (1,880 Ma to 1,830 Ma) developed a northward migrating foreland basin known as the Animikie Basin (Ojakangas, 1994, Figure 7-1). Sedimentary rocks within this basin include the basal Pokegama Quartzite (POK), the overlying Biwabik Iron Formation (Biwabik IF), and argillite and graywacke of the Virginia Formation (Jirsa and Morey, 2003).

The Mesabi Iron Range is a term used to designate the outcrop of the Animikie Group, defining a northeast-trending homocline dipping 5° to 15° to the southeast. The Biwabik IF is sectioned by a number of post-Penokean orogeny, high-angle normal and reverse faults associated with near-vertical, reactivated faults in the Archean basement (Morey, 1999). The most notable structural feature of the Biwabik IF is located east of Hibbing, between Virginia and Eveleth, where the paired Virginia syncline and Eveleth anticline result in an S-curve surface trace of the Biwabik IF (Jirsa and Morey, 2003, Figure 7-2).



Figure 7-1: Location of the Animikie Basin and Diagrammatic Cross-section Showing Development of the Basin

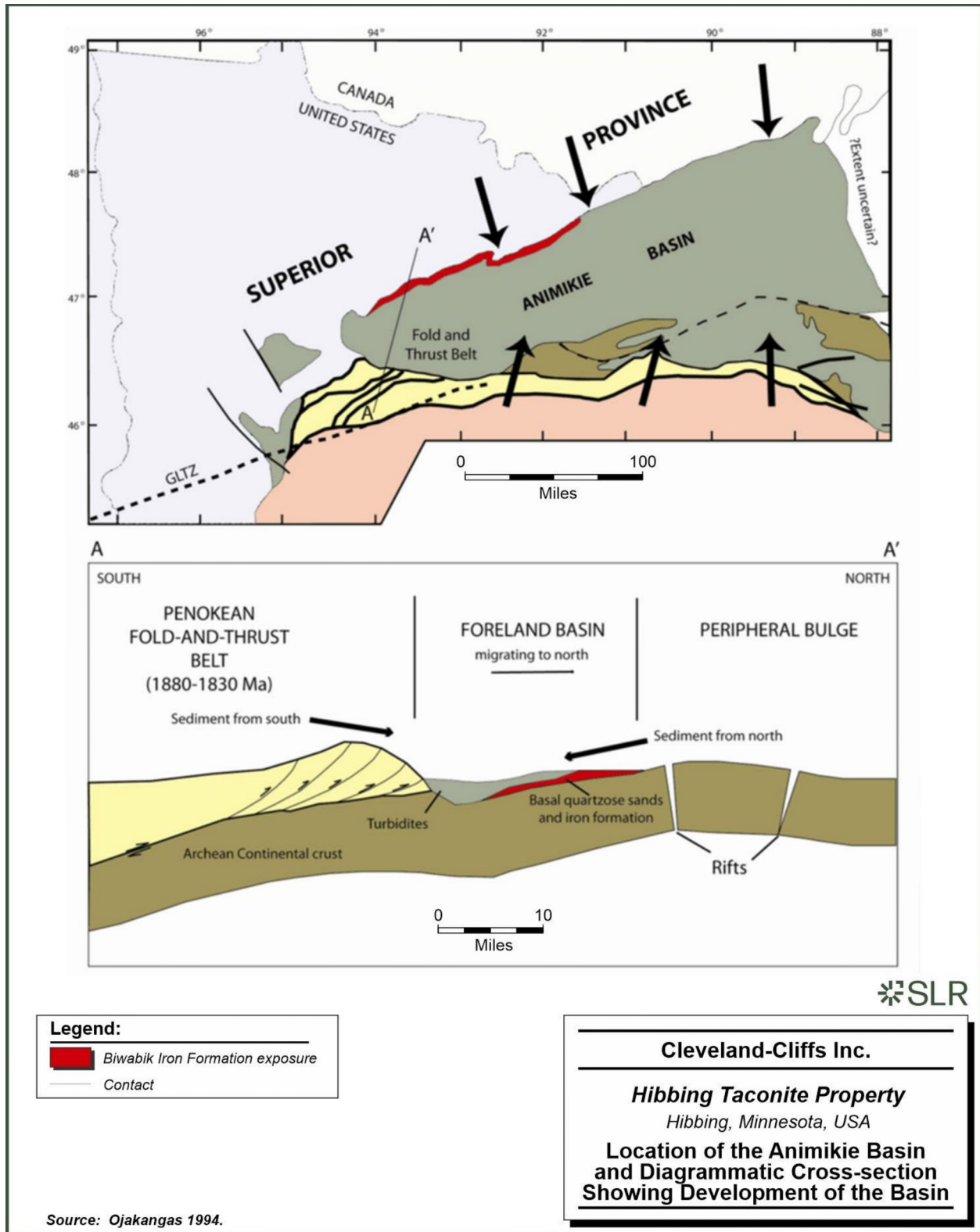
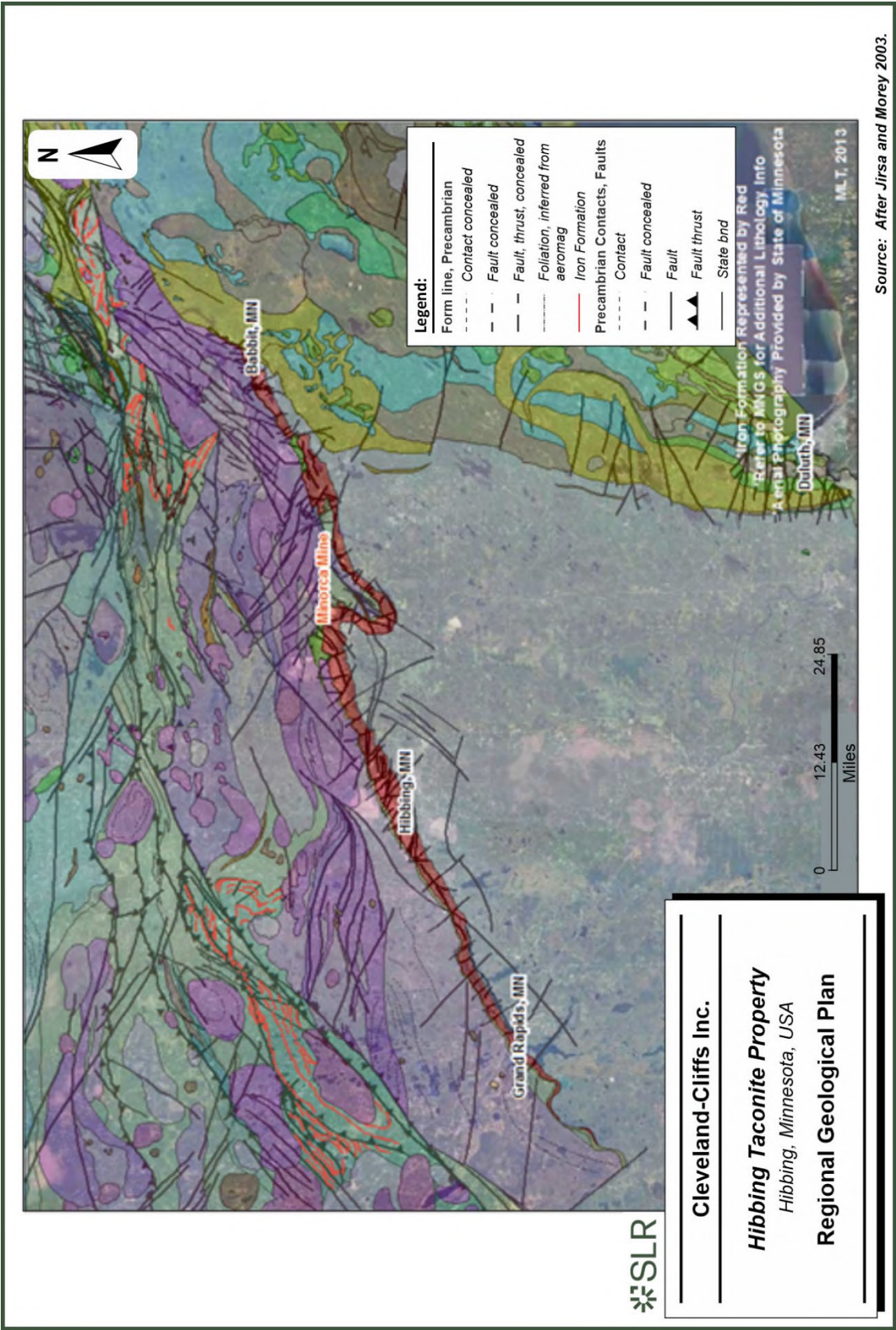


Figure 7-2: Regional Geological Plan



7.2 Local Geology

The Early Proterozoic Biwabik IF is a narrow belt of iron-rich strata varying in width from 1,300 ft to 3.2 mi and extending approximately 125 mi from Grand Rapids eastward past Babbitt, Minnesota. The true thickness varies from approximately 150 ft to 700 ft. The Biwabik IF is interpreted to have been deposited in a shallow, tidal marine setting and is characterized as having four separate lithostratigraphic members (from bottom to top: Lower Cherty, Lower Slaty, Upper Cherty, and Upper Slaty (Severson, Heine, and Patelke, 2009). “Cherty” members have a sandy, granular texture, are thickly bedded, and are composed of silica and iron oxide minerals. The “slaty” members are fine grained, thinly bedded, and comprise iron silicates and iron carbonates, with local chert beds. The cherty members are representative of deposition in a high-energy environment, whereas the slaty members were probably deposited in a muddy, lower-energy environment below the wave base. Interbedding is ubiquitous, and contacts are generally gradational. The iron content for the cherty members is approximately 31%, while the iron content of the slaty members is approximately 26%. It is important to note that nomenclature of the units is not indicative of metamorphic grade; instead “slaty” and “cherty” are colloquial descriptive terms used regionally.

The four members of the Biwabik IF are further subdivided into twelve locally recognized subunits within the HibTac area. Figure 7-3 illustrates the stratigraphy of these subunits and their general descriptions. Nomenclature for these subunits is based on their relative location within the four members. They are subdivided based on geologic characteristics observed in diamond drill core. Many of the contacts between subunits are gradational and do not provide a sharp geologic contact. Geologic contacts are occasionally adjusted to fit assay data once received.

The Biwabik IF is underlain by the basal, Early Proterozoic age POK, which unconformably overlies Archean igneous and metamorphic basement rocks. The Virginia Formation lies stratigraphically atop the Biwabik IF south of the current pit extents but is not exposed on the mine property. All Precambrian rocks are unconformably overlain by Pleistocene glacial deposits. A local geology cross-section is provided in Figure 7-4.

Isolated DSO material exists within the lower-grade taconite ores, the origins of which have been debated for many years. Some of the more recent publications suggest a genesis linked to crustal-scale groundwater convection related to igneous activity. Much of the evidence supporting this conclusion comes from the isotopic analysis of leached and replaced silicate and carbonate minerals (Morey, 1999). Within the Biwabik IF, metamorphic processes produced assemblages diagnostic of greenschist facies to the west, increasing in grade to the east. Mineralogy in unaltered taconite is dominated by quartz, magnetite, hematite, siderite, ankerite, talc, chamosite, greenalite, minnesotaite, and stilpnomelane (Perry et al. 1973).



Figure 7-3: Stratigraphic Column for the Hibbing Taconite Deposit

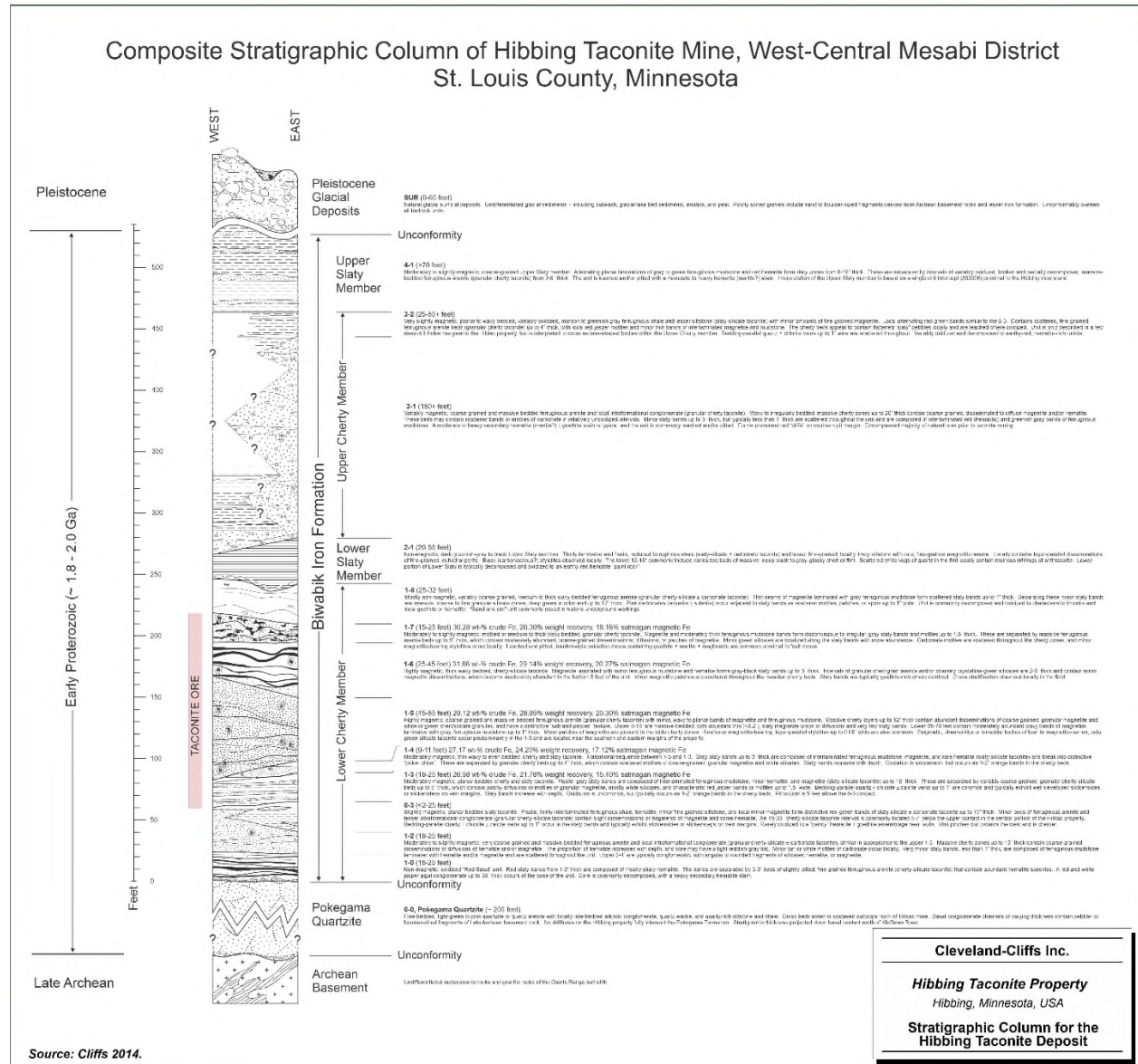
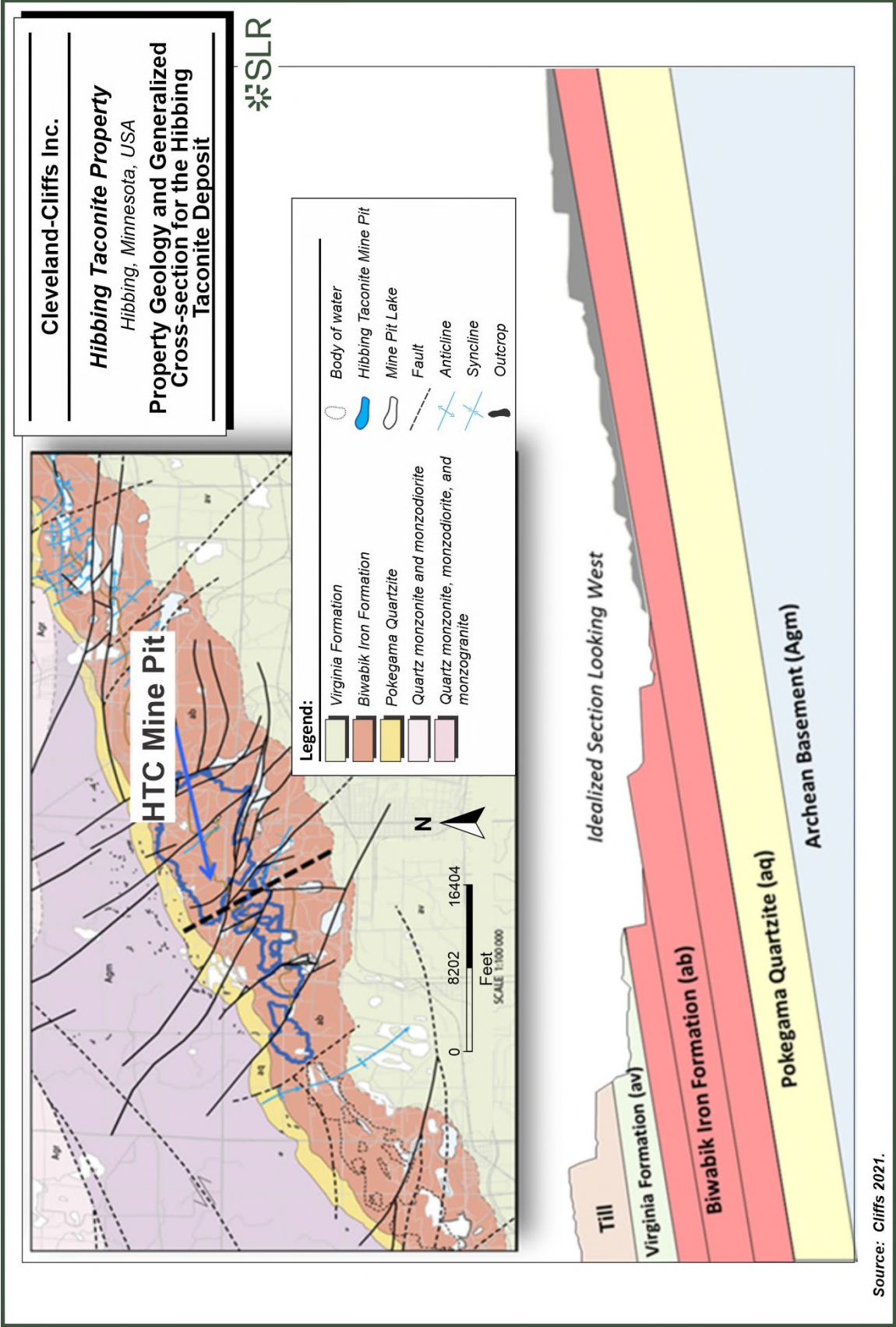


Figure 7-4: Property Geology and Generalized Cross-section for the Hibbing Taconite Deposit



7.3 Property Geology

The Biwabik IF at HibTac consists primarily of carbonates, iron silicates, fine-grained quartz, and iron oxides. These layers are visually distinct, locally separated into slaty beds and cherty beds. The ratio of slaty to cherty beds and distance between these beds are key indicators used during logging, as well as bedding style, texture, color, and magnetic strength. Slaty beds are dark gray in nature, consisting primarily of magnetite in mineralized zones, and range from 0.04 in. to upwards of one inch in thickness. Cherty beds range from gray to green in color depending on the ratio of fine-grained quartz (gray color) to iron silicates (green color). These beds vary in thickness to upwards of twelve inches and may or may not contain disseminated magnetite. Carbonates typically occur as granular, re-crystallized grains of varying size and commonly occur in late-stage quartz-carbonate-filled fractures, which run variably (orientation, length, width, continuity) throughout the iron formation. The Upper Slaty and Lower Slaty members are visually distinctive, as they are dominated by slaty beds; however, these beds rarely contain any notable iron oxide content.

The taconite ores mined at HibTac are from several locally recognized, informal subunits of the Lower Cherty member. Waste rock units (Lower Slaty and Upper Slaty members) cap the Lower Cherty and Upper Cherty members and are distinctively fissile and weakly magnetic as compared to the ore units. The POK, which underlies the Biwabik IF, is not exposed in the pit but is intersected at the base of the iron formation in diamond drilling. The Virginia Formation caps the Biwabik IF and is found predominantly in historical holes drilled south of the current pit extents. A brief description of the lithological units in the immediate Property area is listed below from youngest to oldest.

7.3.1 Pleistocene Glacial Deposits

Surficial deposits of 0 to 60 ft in thickness unconformably overlie all bedrock units. Undifferentiated glacial sediments include outwash, glacial lake bed sediments, glacial erratics, and peat. Poorly sorted gravels include sand- to boulder-sized fragments derived from Archean basement rocks and lesser iron formation.

7.3.2 Upper Slaty Member

Unit 4-1: This member is generally more than 70 ft thick. The Upper Slaty member is moderately to slightly magnetic and coarse grained. Alternating planar laminations of gray to green ferruginous mudstone and red hematite form slaty zones from six to ten inches thick. These are separated by intervals of variably oxidized, broken and partially decomposed, massive to bedded ferruginous arenite (granular cherty taconite) from two to six inches thick. The unit is leached and/or pitted with a moderate to heavy hematite stain.

7.3.3 Upper Cherty Member (Composite Subunit 3-1)

The Upper Cherty member comprised the majority of “natural” (DSO) ores in the Hibbing area prior to the era of taconite beneficiation. The remaining material is variably oxidized on the current Property and can be decomposed largely to earth-red, hematite-rich rubble in fault zones and near most current exposures, so there is little data from historical drilling (before 2005). Fresher intercepts in drill core occur south of the current HibTac pit and (predominantly) east of Highway 169, where the subunits are modeled. The Upper Cherty is modeled as a single rock package (3-1) over most of the Property.



7.3.3.1 Subunit UC4

This subunit ranges from 25 ft to 130 ft thick. It is comprised of moderately to strongly magnetic, gray (red-gray where weathered), thick- to massive-bedded (8 in. to 24 in. thick), medium-grained ferruginous arenite (cherty taconite) with abundant and distinct, fine-grained pink carbonate and magnetite mottling, as well as disseminated fine- to medium-grained magnetite. There are very minor bedded ooidal jasper beds 12 in. to 24 in. thick. Minor moderately magnetic, greenish-gray and red, thin and wavy ferruginous mudstone beds that are 0.1 in. to 1.0 in. thick occur near the western margins of the Property; however, such “slaty” beds can reach thickness greater than 3.0 in. in proximity to the upper and lower contacts. Along the eastern margin of the active property and beyond – in particular east of highway 169 – the unit becomes significantly thinner (25 ft to 55 ft) and contains green-gray and red, thin and wavy ferruginous shale beds, 0.5 in. to 3.0 in. thick, throughout. The subunit typically has a pitted appearance due to weathering of carbonate mottles.

7.3.3.2 Subunit UC3

This subunit ranges from 0 to 25 ft thick. It is moderately magnetic and consists of alternating bands of gray, medium- to thick-bedded (3 in. to 12 in. thick), fine- to medium-grained ferruginous arenite (cherty taconite) and olive to maroon, wavy and thickly laminated (one to eight inches thick) slaty taconite, with occasional hummocky cross-stratification. Magnetite occurs as disseminations and wavy-bedded, medium- to coarse-grained bands, and occasionally replaces rip up mud clasts. The unit contains diffuse ooidal jasper mottles, as well as yellow-gray carbonate stringers. The roof is a 4 in. to 24 in. thick, white and red-orange algal mat zone composed of stromatolites and oncolites that occasionally occurs as an algal breccia that has a strongly magnetic matrix of massive magnetite. UC3 is typically only observed east of the Albany Pit area, and pinches out further west.

7.3.3.3 Subunit UC2

This unit ranges from 0 to 50 ft thick. It is moderately to strongly magnetic. It comprises gray to beige-gray, medium- to thick-bedded and medium- to coarse-grained, granular and conglomeratic ferruginous arenite (granular cherty silicate taconite) with non-magnetic, wavy-bedded, green to red-green, thinly laminated ferruginous shale beds that range from one to four inches thick (slaty silicate ± carbonate taconite). Cherty beds contain abundant zones of course- to very coarse-grained pebble conglomerate that includes angular clasts of magnetite from $\frac{1}{16}$ in. to $\frac{1}{4}$ in. in width. Subrounded mudstone rip-up clasts are commonly observed in cherty beds immediately adjacent to the slaty beds. Abundant yellow-gray carbonate stringers are observed in and around the slaty beds. This unit is typically only observed east of the Albany Pit area and pinches out along the western margin of the Property.

7.3.3.4 Subunit UC1

This unit ranges from one foot to 25 ft thick. It is a non-magnetic, transitional unit between the Upper Cherty and Lower Slaty members of the Biwabik IF. It consists predominantly of green-gray to dark green, fine-grained, thinly laminated ferruginous shale and siltstone beds (slaty silicate taconite) ranging from six inches to 12 in. thick, interlaminated with gray, fine-grained and thin-bedded ferruginous arenite (cherty silicate taconite) that are typically one to two inches thick but can locally be up to six inches in thickness. The UC1 unit significantly thins out towards the western margin of the HibTac property, where it can be as little as one foot in thickness.



7.3.4 Lower Slaty Member

Modeled as LS_21, the Lower Slaty member is from 20 ft to 55 ft in thickness and is non-magnetic and dark greenish-gray to black in color. It is thinly laminated and fissile, containing reduced ferruginous shale (slaty-silicate $\pm$ carbonate taconite) and lesser fine-grained, locally limey siltstone with rare, fine-grained magnetite laminae. Locally it contains layer-parallel disseminations of fine-grained, euhedral pyrite. Black stylolites are observed locally. The lower 12 in. to 18 in. commonly include variably sized beds of massive, deep black to gray, glassy chert or flint. Scattered white vugs of quartz in the flint locally contain resinous infillings of anthraxolite. The lower portion of the Lower Slaty member is typically decomposed and oxidized to an earthy-red hematite “paint rock”.

7.3.5 Lower Cherty Member

The ore-grade intervals are contained within the Lower Cherty member, specifically, the 1-7 through the 1-3. The magnetic iron content ranges from approximately 15% to 18%, with the higher percentages found in the 1-5 and 1-6.

7.3.5.1 Subunit 1-8

Modeled as LC_18, subunit 1-8 is from 25 ft to 32 ft in thickness and is mostly non-magnetic. It is a variably coarse-grained, medium to thick wavy-bedded ferruginous arenite (granular cherty-silicate $\pm$ carbonate taconite). Thin seams of magnetite laminated with gray ferruginous mudstone form scattered slaty bands up to one inch thick. Separating these minor slaty bands are massive, coarse to fine, granular silicate mineral zones that are deep green in color and up to 12 in. thick. Pink carbonate minerals (ankerite $\pm$ siderite) occur adjacent to slaty bands as scattered mottles, patches, or spots up to one inch wide. The unit is commonly decomposed and oxidized to characteristic limonite and local goethite or hematite. The 1-8 is the “sand and ore” subunit commonly caved in historical underground workings.

7.3.5.2 Subunit 1-7

Modeled as LC_17, the 1-7 ranges from 15 ft to 25 ft in thickness and is moderately to slightly magnetic with medium to thick bedding. In this subunit, the taconite is granular and cherty. Magnetite and moderately thick ferruginous mudstone bands form discontinuous to irregular, gray slaty bands and mottles up to 1.5 in. thick. These are separated by massive ferruginous arenite beds up to eight inches thick that contain moderately abundant, coarse-grained disseminations, diffusions, or patches of magnetite. Minor green silicate minerals are localized along the slaty bands with more abundance. Carbonate mottles are scattered throughout the cherty zones, and minor magnetite-bearing stylolites occur locally. Leached and pitted, blanket-style oxidation zones containing goethite + martite $\pm$ maghemite are common proximal to fault zones.

7.3.5.3 Subunit 1-6

Modeled as LC_16, the 1-6 ranges between 25 ft and 45 ft in thickness and is highly magnetic. It has thick, wavy beds of cherty-silicate taconite. Magnetite laminated with minor ferruginous mudstone and hematite forms gray-black slaty bands up to three inches thick. Intervals of granular chert-grain arenite and/or coarsely crystalline green silicates are two to six inches thick and contain minor magnetite disseminations, which become moderately abundant in the bottom five feet of the unit. Minor magnetite patches are scattered throughout the massive cherty beds. Slaty bands are typically goethite rich where oxidized. Cross-stratification is observed locally in the field.



7.3.5.4 Subunit 1-5

Modeled as LC_15, subunit 1-5 ranges between 45 ft and 85 ft in thickness and is highly magnetic. The unit is a coarse-grained, massive to bedded ferruginous arenite (granular cherty taconite) with minor, wavy to planar bands of magnetite and ferruginous mudstone. Massive cherty layers up to 12 in. thick contain abundant disseminations of coarse-grained, granular magnetite and white or green chert/silicate mineral granules, resulting in a distinctive “salt-and-pepper” texture. The upper eight feet to 15 ft are massive to bedded, with abundant thin (<0.2 in.), slaty magnetite curls, wisps, or diffusions and very few slaty bands. The lower 35 ft to 70 ft contains moderately abundant wavy bands of magnetite laminated with gray, ferruginous mudstone up to one inch thick. Minor patches of magnetite are present in the wide cherty zones. Scattered magnetite-bearing, layer-parallel stylolites up to 0.05 in. wide are also common. Enigmatic, channel-like or lensoidal bodies of lean to magnetite-barren, pale-green silicate taconite occur predominantly in subunit 1-5 and are located near the southern and eastern margins of the Property.

7.3.5.5 Subunit 1-4

Modeled as LC_14, subunit 1-4 ranges between 9 ft and 11 ft in thickness and is a moderately magnetic, thin-bedded, cherty and slaty taconite that has wavy to even bedding. This is a transitional sequence between subunits 1-5 and 1-3. It is described as having gray slaty bands up to three inches thick, composed of interlaminated ferruginous mudstone, magnetite, and rare hematite (slaty-silicate taconite) that break into distinctive “poker chips.” These are separated by granular cherty beds up to four inches thick, which contain scattered mottles of coarse-grained, granular magnetite and white silicate minerals. Slaty bands increase with depth. Oxidation is uncommon but occurs as one- to two-inch orange bands in the cherty beds.

7.3.5.6 Subunit 1-3

Modeled as LC_13, subunit 1-3 ranges from 18 ft to 25 ft thick and is a moderately magnetic, planar-bedded, cherty and slaty taconite. Within the subunit, fissile, gray slaty bands are composed of interlaminated ferruginous mudstone, minor hematite, and magnetite (slaty-silicate taconite) up to 10 in. thick. These are separated by variably coarse-grained, granular cherty-silicate mineral beds up to five inches thick, which contain patchy diffusions or mottles of granular magnetite, mostly white silicate minerals, and characteristic bright red jasper bands or mottles up to 1.5 in. wide. Bedding-parallel quartz + chlorite ± calcite veins up to one inch wide are common and typically exhibit well-developed slickensides or slickensteps on vein margins. Slaty bands increase with depth. Oxidation is uncommon, but typically occurs as one- to two-inch orange bands in the cherty beds. Pit bottom is in Unit 1-3 and five feet above the subunit 8-3 contact.

7.3.5.7 Subunit 8-3

Modeled as LC_83, subunit 8-3 ranges from less than two feet up to 25 ft in thickness. It is a slightly magnetic, planar-bedded slaty taconite. Fissile, thinly interlaminated ferruginous shale, hematite, minor fine-grained siltstone and local minor magnetite form distinctive red-green bands of slaty-silicate ± carbonate taconite up to 15 in. thick. Minor beds of ferruginous arenite and lesser intraformational conglomerate (granular cherty-silicate taconite) contain slight disseminations or fragments of magnetite and some hematite. An 18 in. to 30 in. cherty-silicate taconite interval is commonly located five to seven feet below the upper contact in the central portion of the Property. Bedding-parallel quartz + chlorite ± calcite veins up to one inch occur in the slaty bands and typically exhibit slickensides or slickensteps on vein margins. Rarely



oxidized, the unit has a “painty” hematite + goethite assemblage near faults. Subunit 8-3 pinches out towards the west of the Property and is chertier.

7.3.5.8 Subunit 1-2

Modeled as LC_12, subunit 1-2 ranges from 18 ft to 25 ft thick. It is moderately to slightly magnetic, very coarse grained, and composed of massive to bedded ferruginous arenite and local intraformational conglomerate (granular cherty-silicate ± carbonate taconite). It is similar in appearance to the upper portion of subunit 1-5. Subunit 1-2 has massive cherty zones up to 12 in. thick that contain coarse-grained disseminations or diffusions of hematite and/or magnetite. The proportion of hematite increases with depth, and core may have a light reddish-gray tint. Minor tan or white mottles of carbonate minerals occur locally. Very minor slaty bands, less than one inch thick, are composed of ferruginous mudstone laminated with hematite and/or magnetite and are scattered throughout the subunit. The upper two to four feet are typically conglomeratic, with angular to rounded fragments of silicate minerals, hematite, or magnetite.

7.3.5.9 Subunit 1-0

Modeled as LC_10, subunit 1-0 ranges from 18 ft to 25 ft thick and is non-magnetic, oxidized, and is referred to as the “Red Basal” unit. In this subunit, red slaty bands from one to two inches thick are composed of mostly shaly hematite. The bands are separated by three- to five-inch beds of slightly pitted, fine-grained ferruginous arenite (cherty-silicate taconite) that contain abundant hematite speckles. A red and white jasper algal conglomerate up to 36 in. thick occurs at the base of subunit 1-0. Drill core is commonly decomposed, with a heavy secondary hematite stain.

In the Mine area, the four members of the Biwabik IF comprise a total thickness of approximately 580 ft. Average thicknesses of the four members of this formation are shown in Table 7-1.

Table 7-1: Relative Thickness of the Four Members of the Biwabik Iron Formation

Member	Thickness (ft)
Upper Slaty	70+
Upper Cherty – 4 subunits	205-265
Lower Slaty	20-55
Lower Cherty – 9 subunits	175-298

7.3.6 Pokegama Quartzite (0-0)

Drilling in the Pokegama Formation intersects fine-bedded, light-green to pink quartzite or quartz arenite with (locally) interbedded arkosic conglomerate, quartz wacke, and quartz-rich siltstone and shale. Cross-beds are noted in scattered outcrops north of HibTac. Basal conglomerate channels of varying thickness contain pebble- to boulder-sized fragments of Late Archean basement rock. No drill holes on HibTac fully intersect the Pokegama Formation. Stratigraphic thickness of approximately 200 ft is projected down the basal contact north of Kleffman road.



7.4 Mineralization

Mineralization consists predominantly of a primary assemblage of magnetite in a matrix of chert, iron silicate (talc, stilpnomelane), and carbonate (ankerite) formed by low-temperature diagenesis. Supergene weathering and oxidation has locally altered this primary assemblage to hematite, goethite, and chert, generally increasing in intensity with proximity to isolated occurrences of Cretaceous Coleraine Formation south of the Mine and faults or fracture zones. Partial or complete oxidation of magnetite to hematite precludes recovery by magnetic separation, resulting in local degradation of potential ore intervals to waste rock.

The mineral of economic interest at HibTac is magnetite, bound in rock referred to as taconite. The recoverable magnetic iron (MagFe) in ore generally ranges from 13% to 30%. Quartz, carbonates, and iron silicates are the common gangue minerals. The deposit is layered and consistent. HibTac targets the Lower Cherty member as the primary mineralized zone, in particular subunits 1-7 through 1-3, as shown below in Table 7-2.

Table 7-2: Relative Thicknesses and Magnetic Iron Content of Subunits of the Lower Cherty Member of the Biwabik Iron Formation

Subunits of Lower Cherty Member	Thickness (ft)	Average Magnetic Iron Content
1-8	25-32	
1-7	15-25	18% Magnetic Fe
1-6	25-45	20% Magnetic Fe
1-5	45-85	20% Magnetic Fe
1-4	9-11	17% Magnetic Fe
1-3	18-25	15% Magnetic Fe
8-3	0-25	
1-2	18-25	
1-0	18-25	



8.0 Deposit Types

The HibTac iron ore deposit is a classic example of a BIF deposit of the Lake Superior type. Lake Superior-type BIFs occur globally and are exclusively Precambrian in age, deposited from approximately 2,400 Ma to 1,800 Ma. Although the genesis of iron formations has been debated over the years, it is certain that they were deposited more or less contemporaneously and in similar marine depositional environments. Some of the most prolific iron districts in the world are hosted in these rocks, such as those found in the Pilbara district of Australia and the Animikie Group of Minnesota. Theories as to their formation center on the hypothesis that at stages in the Earth's history, the oceans were acidic and contained tremendous amounts of dissolved iron. The conventional explanation for the majority of these deposits is that oxygen-producing life forms such as stromatolites, found fossilized in BIFs, began to produce sufficient oxygen to oxidize the sulfide or free ion forms of iron within seawater. The iron content in seawater rose and fell for over a billion years, and the last of the Precambrian BIFs is thought to have been deposited around 1800 Ma (Guilbert and Park, 1986).

While there are some remaining high-grade iron deposits in the area, the majority of the iron ore is regionally referred to as taconite. Taconite is a type of BIF that is characterized as an iron-bearing sedimentary rock with greater than 15% Fe, where the iron minerals are interbedded with silicates or carbonates. Iron content ($\text{FeO} + \text{Fe}_2\text{O}_3$) in taconites is generally 25% to 30%. Higher-grade DSO ores are believed to have formed from the leaching and dissolution of silica found in the taconites, resulting in smaller zones that can contain greater than 60% iron (Morey, 1999). These high-grade deposits are predominantly related to the high-angle, steeply dipping faults common along the Mesabi Iron Range.

Geological classification of BIFs is made on the basis of mineralogy, tectonic setting, and depositional environment. The original facies concept provided for oxide-, silicate-, and carbonate-dominant iron formations that were thought to relate to the environment of deposition (James, 1954), as follows:

- Oxide-rich BIF typically consists of alternating bands of hematite [$\text{Fe}_2^{3+}\text{O}_3$] with or without magnetite [$\text{Fe}^{2+}\text{Fe}_2^{3+}\text{O}_4$]. Where the iron oxide is dominantly magnetite, siderite [$\text{Fe}^{2+}\text{CO}_3$] and iron silicate are usually also present.
- Silicate-rich BIF is usually dominated by the minerals greenalite, minnesotaite, and stilpnomelane. Greenalite [$(\text{Fe}^{2+}, \text{Mg})_6\text{Si}_4\text{O}_{10}(\text{OH})_8$] and minnesotaite [$(\text{Fe}^{2+}, \text{Mg})_3\text{Si}_4\text{O}_{10}(\text{OH})_2$] are ferrous analogues of antigorite and talc respectively, while stilpnomelane [$\text{K}_{0.6}(\text{Mg}, \text{Fe}^{2+}, \text{Fe}^{3+})_6\text{Si}_8\text{Al}(\text{O}, \text{OH})_{27} \cdot 2\text{-}4\text{H}_2\text{O}$] is a complex phyllosilicate.
- Carbonate-rich BIF is usually dominated by the minerals ankerite [$\text{Ca Fe}^{2+}(\text{CO}_3)_2$] and siderite, both of which display highly variable compositions. Similar proportions of chert and ankerite (and/or siderite) are typically expressed as thinly bedded or laminated alternating layers (James, 1966).

These classification schemes commonly overlap within Lake Superior-type deposits, defying classification by this method. Almost all of the minerals described in the three classifications can be found in many of the deposits of the Mesabi Iron Range. Lake Superior-type deposits are generally classified based on their size and depositional environments (Guilbert and Park, 1986). These deposits are typically large and are associated with other sedimentary rocks. Deposition of the Lake Superior-type deposits occurred in shallow marine conditions, with transgressive sequences commonly observed in the regional stratigraphy (Simonson and Hassler, 1996). It is common to observe shallow marine bedforms and sedimentary depositional textures in these deposits.



9.0 Exploration

Exploration for magnetic iron-formation resources at HibTac has relied predominantly on diamond core drilling (DD) and Liberation or Davis Tube (DT) analyses of recoverable magnetic concentrate for over four decades. Most exploration work by Cliffs has been and continues to be near-mine diamond core drilling conducted using a 400 ft x 400 ft grid. Limited ground magnetic surveying has been used locally in the past to define oxidized zones.

Details of drilling campaigns at HibTac are provided in Section 10.



10.0 Drilling

10.1 Type and Extent

DD is the principal method of exploration utilized at HibTac. A combination of historical and current DD core drilled by Cliffs and its predecessors is used in mine planning. Initial diamond drilling in the 1940s by Pickands Mather (Erie Mining Company) identified the potential for a magnetic iron formation-hosted iron resource. HibTac resource delineation drilling took place from 1967 to 1969, totaling 7,342 ft of drilling in 38 holes. In 1974, Hibbing Taconite commenced a program of systematic infill and step-out drilling; exploration has proceeded in conjunction with these development drilling activities. Between 1974 and 2019, Hibbing Taconite completed a total of 351,566 ft of drilling in 1,808 drill holes. Additional stratigraphic and assay data from beyond the limits of Hibbing Taconite drilling has been obtained through public records or exchange with other mining companies.

Exploration holes at HibTac are used to determine lithology, crude MagFe content, weight recovery, relative grinding power and grind size required to achieve silica targets, and concentrate SiO₂ content, and identify any offsetting or oxidized structures within the deposit and/or surrounding rock. These lead to factors for determining economic viability based on stripping ratio, cut-off grade, and ability for the plant site to process the ore. Exploration also helps identify areas that will need to be avoided or mined around due to geological or structural anomalies.

HibTac is a mature mine property that has been extensively drilled to the limits of the current mineral tenement. The last significant drilling outside the current Permit to Mine limits occurred in 2014. Drilling within the Permit to Mine limits during the period 2015-2019 has focused on definition and infill drilling of material included in the current life of mine (LOM) plan. Additional exploration and delineation drilling is contingent on acquisition of additional mineral leases.

No drilling has been conducted since Cliffs resumed management of Hibbing Taconite in December 2020.

As of the effective date of this Technical Report, Cliffs and its predecessors have compiled a drill hole database containing lithologic, geotechnical, and assay records for 3,665 diamond core and cuttings holes totaling 620,670 ft (Table 10-1 and Figure 10-1), of which 1,857 drill holes totaling 269,104 ft consist of DD holes drilled by Pickands Mather between 1942 and 1973, and DD and non-core holes drilled by predecessor and competitor companies within the limits of the Property and on adjacent parcels. Most of these 1,857 holes contain limited lithologic or assay data and are not used to directly support Mineral Resource estimation.

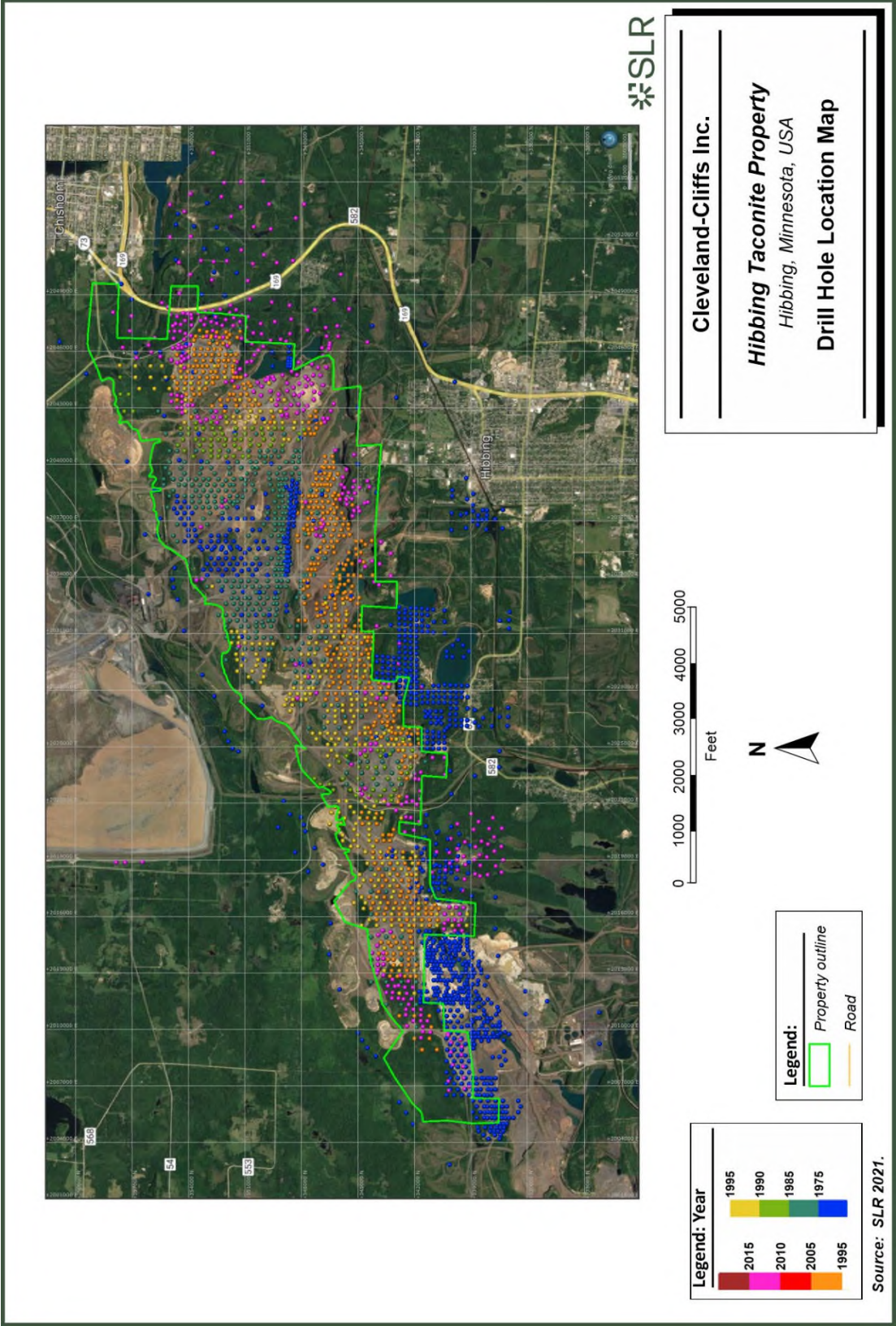


Table 10-1: Summary of Drilling Database

Company	No. Holes	Footage	Core	Cuttings	Period
Hibbing Taconite Company	1,808	351,566	x		1974-2019
Oliver Iron Mining Company	926	103,369		x	
National Steel Pellet Company	270	52,023	x		
Mahoning Ore & Steel Company	479	48,747		x	1895-1955
U.S. Steel Corporation	79	37,750	x		
Pickands, Mather & Co.	61	11,638	x		1947-1973
Hanna Ore Mining Co.	27	10,046		x	
Crete Mining Co.	12	4,336		x	
Burrall Reserve	1	791	x		
Donner Mining Co.	2	404			
	3,665	620,670			



Figure 10-1: Drill Hole Location Map



10.2 Procedures

10.2.1 Collar Coordinates and Surveying

Drill collars are planned using Maptek's Vulcan™ (Vulcan) software. Currently, the location of the drill hole is set by the geologist, with collars marked and surveyed using global positioning system (GPS). Drill hole locations are staked in the field and marked with a lath of unique properties and color to distinguish it from other posts or markers in the pit or surrounding area. Identifying marks (in permanent marker) indicate the hole number.

DD collar locations are recorded on the original drill logs created at the time of drilling, including easting and northing coordinates in local grid (modified Minnesota State Plane, NAD 27 datum) and elevation of collar in feet above sea level National Geodetic Datum of 1929 (NGVD29).

The collar of each completed drill hole is surveyed by Hibbing Taconite's contracted surveyor. The collar coordinates (XYZ – preferably Minnesota State Plane Coordinates) are verified by the project geologist. Final survey data are validated in the office by the project geologist and incorporated into the digital acQuire drill hole database.

Surveying methods have evolved over the years with advancements in technology, moving from optical methods to electronic distance measurement and to GPS, which is currently in use. The QP is of the opinion that, for the deposit type, all survey methods used for the collar locations would be expected to provide adequate accuracy for the drill hole locations. All drilling follows applicable Minnesota Department of Health (MDH) and MDNR regulations and requirements.

Due to the relatively shallow depth and vertical nature of most drill holes, downhole deviation survey are not typically conducted; however fourteen drill holes in the database that were drilled at an angle did receive a downhole deviation survey with a non-magnetic reflex gyro and were found to have minimal deviation. Drill holes pierce the generally flat lying Biwabik IF at near perpendicular angles.

10.2.2 Drill Site Reclamation

For exploratory borings outside the Permit to Mine, HibTac follows all applicable regulations concerning MDH and U.S. Environmental Protection Agency (EPA) regulations including: notification, drilling, abandonment, Storm Water Pollutant Prevention Plan (SWPPP) inspections, and site reclamation. As necessary, sites are re-graded and topsoil is replaced. Sites are re-seeded with an approved State of Minnesota reclamation mix when required.

10.2.3 Drill Core Sample Collection

All drilling follows MDH and MDNR regulations and requirements.

During drilling, core samples are boxed with depths marked in feet using wooden run blocks. The core is transported from the drill site by the mine geologist or by the drilling company and taken to an onsite core logging facility. The mine geologist confirms procedures for packaging and handling of core in the boxes, such as the inclusion of footage markers at the end of core runs and labeling core boxes with sequential numbering and footage of core included in the box.

Drilling footages are verified visually, as taconite is a very competent rock. Core recovery is generally very good. Core is sometimes lost in zones of intense oxidation, which is very rare in potential ore but common in waste rock.



10.2.4 Drill Core Logging

Logging includes rock types (lithologic member and subunit), magnetic characteristics, taconite type, degree of oxidation, mineralogy, textures, alteration, structural information, and a general geologic description. Boundaries of geological subunits are often gradational (e.g., more slaty than cherty versus more cherty than slaty, thin beds becoming more prevalent than thick beds) and may not provide a sharp geologic contact. As magnetite is the primary mineral of interest, a hand magnet is utilized during core logging and indicates relative magnetic iron content of a sample interval prior to assaying (e.g., slight, moderate, strong). Geotechnical core measurement includes core recovery and rock quality designation (RQD).

Core logging and photography is performed by geologic zones, which are separated by visual and physical characteristics, including relative magnetism, to determine subunit lithology. Drilling footages are verified visually by the mine engineer/geologist. Core was not photographed prior to 2003.

Logging records are entered into Microsoft (MS) Excel spreadsheets or manually on paper logs prior to import into an acQuire database and stored digitally onsite. Prior to 2014, MS Access was used for the database, and logs were uploaded from an MS Excel template. The logging records are sent with the samples to the laboratory, and hard copies of most of HibTac's drill logs are stored on site.

Drilling footages are verified visually, as taconite is a very competent rock. Core recovery is generally very good. The drill core data is stored digitally by drill hole ID.

10.2.5 Drill Core Sampling

In ore zones, samples for the laboratory are prepared in approximately 10 ft lengths but can range from five feet to 15 ft when intervals do not break evenly or within a defined geological unit. Core is split with a hydraulic splitter or rock saw. Samples are tagged and bagged for delivery to the contracted analytical laboratory. Sample tags reflect the operation, hole number, and from/to sample interval, with tags placed inside the sample bag and a second tag on the outside of the bag. Preserved half core is stored in original core boxes while the other half follows the normal assaying procedure. Half core, typically conserved for state-leased lands and property outside the mine operations area, is retained for future use. For holes internal to the mine operations area, whole core is sampled.

Drill core logging and sample interval selection are performed by the mine geologist. Digital core logs are stored on a common server. Digital assay information is stored in original MS Excel files delivered by the laboratory as well as in an acQuire drill hole database. Save samples are stored in core storage buildings leased from Cliffs by the contracted laboratory. Type drilling and sampling information is summarized in Table 10-2.

Table 10-2: Core vs. RC Drilling Summary

	Diamond Drilling	RC Drilling	Total Drilling
No. of Holes Drilled	2,219	1,444	3,663
Footage Drilled	453,768	166,498	620,266



10.2.6 Sample Storage and Data Security

Drill core is transported directly from the drill rig to the core logging facility at HibTac by either the drilling contractor or Cliffs' personnel. Core storage for unlogged and unsampled core is located at the HibTac logging facility.

Whole core is placed in labeled bags for submission to the assay laboratory. Some archived drill core or coarse reject is consumed during re-assaying programs conducted sporadically for specific local areas of the Mine.

Core samples are currently prepared and analyzed at the independently owned Lerch Brothers Inc. (Lerch) facilities in Hibbing, Minnesota, where they are transported by HibTac operations personnel or the laboratory. Lerch is accredited with ASQ/ANSI ISO-9001:2015 for its system of quality management. Each shipment of core samples is accompanied by a sample sheet with dispatch number recording all the sample information and required analyses. The data are stored digitally on HibTac's shared servers. Unused sample materials are saved and stored in barrels at Lerch's facilities in Hibbing, Minnesota.

Digital copies of drill core analyses received from Lerch are stored in a backed-up network drive with restricted permissions, as well as within an acQuire database, which retains daily, weekly, monthly, and yearly backups.

Electronic storage of an as-drilled collar location file for each annual drilling program is accomplished using the database management system acQuire. A hard copy printout of the collar file with other documents relevant to the drill holes is stored in file cabinets at the HibTac Mine Geology office.

It is the QP's opinion that there are no known drilling, sampling, or recovery factors that could materially affect the accuracy and reliability of the results and that the results are suitable for use in the Mineral Resource estimation.



11.0 Sample Preparation, Analyses, and Security

Lerch, which leases Cleveland-Cliffs' Hibbing Research laboratory facilities and equipment, provides contract analytical services that include all diamond drill core processing and analyses for HibTac. Lerch is accredited with ASQ/ANSI ISO-9001:2015 for its system of quality management. Core processing flowsheets, test procedures, and quality control procedures required for Lerch's ISO accreditation are used for HibTac drill core.

Only DD exploration holes are used for assaying and used in resources modeling. Magnetic susceptibility probing of blast holes is used to check ore contacts as well as confirm expected magnetic iron grade during production. Reconciliations between actual production and modeled production provide insight into the accuracy of the modeled assay data versus actual production.

11.1 Sample Preparation and Analysis

Sampling of iron formation is performed to evaluate the magnetite-bearing taconite ore potential and characterize the metallurgical properties of the material. Therefore, conventional whole rock elemental assaying approaches utilized in evaluating most metallic ore deposits are eschewed in favor of methods designed to qualify and characterize recoverable magnetic concentrate.

11.1.1 Sample Preparation

The core is stage-crushed to 100% passing ¼ in. in size; initially crushed to minus one inch with a jaw crusher, then further reduced to -0.5 in. with a jaw crusher, and finally reduced to -1/4 in. in a roll crusher.

The sample is split into the following parts:

- Standard Davis Tube test and x-ray fluorescence (XRF) analysis: 40 g
- Liberation Index Study (LIS): 1,500 g
- Fee holder sample split: 500 g
- -10 mesh sample: 1,200 g are crushed to -10 mesh
- Excess sample: 2,000 g of excess crushed to -1/4 in.

11.1.2 Sample Analysis

The Davis Tube method and Saturation Magnetization Analyzer (Satmagan) are used to determine the crude MagFe percent, percent weight recovery (% wtrec), and concentrate silica in samples.

11.1.2.1 -200 Mesh Davis Magnetic Tube Separation Test

Iron formation samples interpreted by the logging geologist to have magnetic iron contents below 10%, or concentrate silica contents significantly above 10%, are assayed using the single-sample DT assay method per Lerch Laboratory Procedures (LLP). The DT method provides the same primary data as the LIS method (described below) at a greatly reduced cost. The single sample analysis does not provide the ability to target a specific grind and therefore has the potential to have more variation in the results than would be expected from the LIS



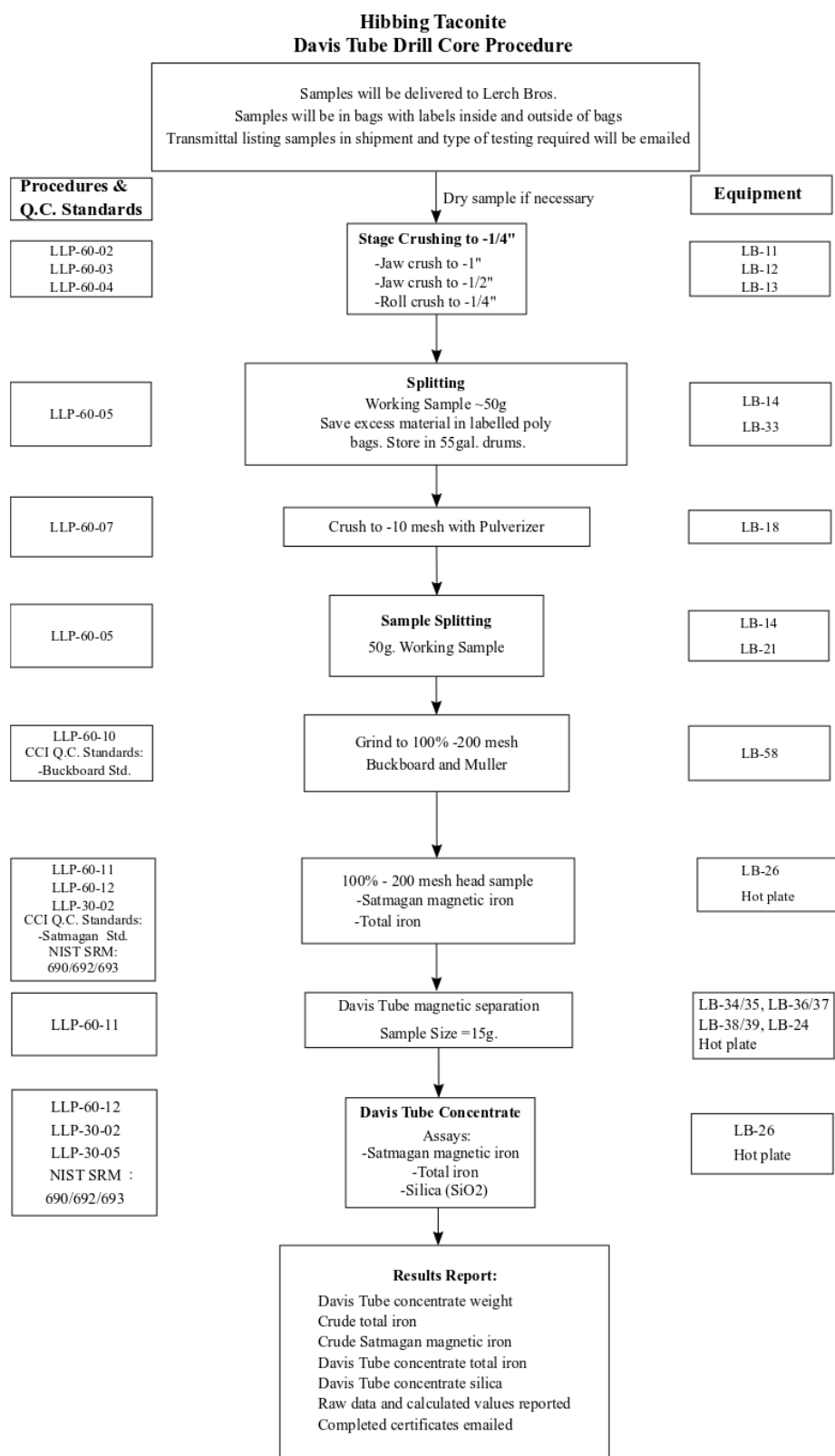
method. The potential variation of the DT method limits the use of this testing method to only samples expected to be below economic cut-off grades.

The samples are initially reduced using stage crushing with jaw and rolls crushers to $-1/4$ in. (LLP-60-02, LLP-60-03, LLP-60-04). From a working sample of 800 g, a 50 g sample is split out for further size reduction (LLP-60-05). Using a pulverizer, the 50 g subsample is ground to 100% passing 20 mesh (LLP-60-07). Using a buckboard and muller (LLP-60-10), the subsample is processed to 100% passing 200 mesh. Subsamples are split from the 100% passing 200 mesh sample for Satmagan MagFe analysis (LLP-60-12) and crude ore total soluble iron assay (LLP-30-02). A 15 g (0.529 oz) split is measured and utilized for the DT magnetic separation (LLP-60-11). Each DT concentrate is weighed, and total iron (LLP-30-02) and silica (LLP-30-05) assays are performed. Weight recovery is calculated as the ratio of recovered DT concentrate to DT head sample weight.

Sample preparation requires using a buckboard and muller to grind the sample to 100% -200 mesh. The buckboard is a cast iron plate with three steel sides and a smooth upper surface. It measures 18 in. by 24 in. The buckboard and muller pulverization method is used to reduce small amounts of -20 mesh material to -200 mesh under controlled conditions. The sample to be pulverized is poured on a 200 mesh screen, and oversize material is placed on the buckboard. The muller is passed over the sample 15 times, and the ground material is screened on the 200 mesh screen. Material that is +200 mesh is returned to the buckboard and the process is repeated until the entire sample is ground to -200 mesh. The buckboard and muller grinding method provides a more consistent particle size distribution than a pulverizer and requires less time than grinding mills. Figure 11-1 presents the HibTac DT drill core procedure.



Figure 11-1: Davis Tube Drill Core Procedure



Source: Cliffs 2021.



Davis Tube analysis involves a ground sample suspended in water being moved back and forth along the length of the tube while a magnet is positioned in a mid-point in the tube. The magnetic material in the sample clings to the side of the tube where the magnet is positioned. This magnetic material is then collected and weighed to determine % wtrec (as compared to the initial weight of the sample which enters this process). After weighing, the concentrate material is assayed for silica and iron by wet chemistry (see below).

Procedure LLP-60-11 is followed for recovering magnetic iron using the Davis Tube (Eriez Model EDT with a 1.5 in. inner diameter). The magnet is electric and is set at 100% strength with 115 V DC. A 15 g (0.359 oz) sample (100% passing 200 mesh) is put through the Davis Tube magnetic separator. Wash water of 19 psig is used for testing. The water flow is verified prior to each use. After the sample is run in the Davis Tube, the sample is dried and demagnetized. A weight is taken of the Davis Tube retained sample; the concentrate is tested for:

- Weight of magnetic fraction recovered in the tube
- Satmagan MagFe
- Total Fe
- Silica

Separated products of the test include tails and the tube concentrate. The excess head material is analyzed with Satmagan for magnetic iron (described below in section 11.1.2.3).

The DT tails are usually discarded but can be saved for future testing upon request.

11.1.2.2 Liberation Index Test

Potential crude ore grade samples are prepared according to LLP for LIS. Crude ore samples are initially reduced using stage crushing with jaw and roller crushers to $\frac{1}{4}$ in., with further crushing to -10 mesh using a gyratory crusher and buckboard and muller (LLP-60-02, LLP-60-03, and LLP-60-04). A subsample of approximately 1,000 g (2.2 lb) is collected (LLP-60-05) and further reduced to -20 mesh (LLP-60-06). Then it is screened through a 325 mesh screen, the oversize and undersize fraction weights are recorded, and the sample is recombined (LLP-60-08).

After the sample is recombined, and following LLP-60-09, three 200 g (0.44 lb) subsamples are split from the sample. The individual 200 g subsamples are charged separately into 4 in. x 6 in. grinding ball mills along with 100 mL (0.0264 gal) of water, 77 - $\frac{3}{4}$ in. balls (2,300 g to 2,450 g, 5 lb to 5.4 lb), and 117 - $\frac{1}{2}$ in. balls (1,100 g to 1,160 g, 2.4 lb to 2.6 lb). The three subsamples are ground for six minutes, 10 minutes, and 14 minutes at 96 rpm. After the end of each timed grind, the mill charge is screened through a 10 mesh screen to recover the grinding balls.

Each ground subsample is wet screened through a 325 mesh screen, dried, and weighed to determine the percent passing 325 mesh. Subsamples are split from the 10 minute grind for Satmagan magnetite determination (LLP-60-12) (LLP-30-02) and a crude ore total soluble iron assay (LLP-30-02). A 15 g (0.359 oz) split is obtained from each subsample for DT magnetic testing (LLP-60-11). Each DT concentrate is reduced to 100% passing -200 mesh, weighed, and iron (LLP-30-02) and silica (LLP-30-05) assays are obtained. Weight recovery is calculated as the ratio of recovered DT concentrate to DT head sample weight.

The DT concentrate silica is established for each timed grind. Then, for each principal assay parameter (wtrec, DT concentrate iron, kWh/LT, and % -325 mesh), a grind-grade, power-grade, or recovery-grade relationship is plotted (as naturally (x) vs. DT concentrate silica). A



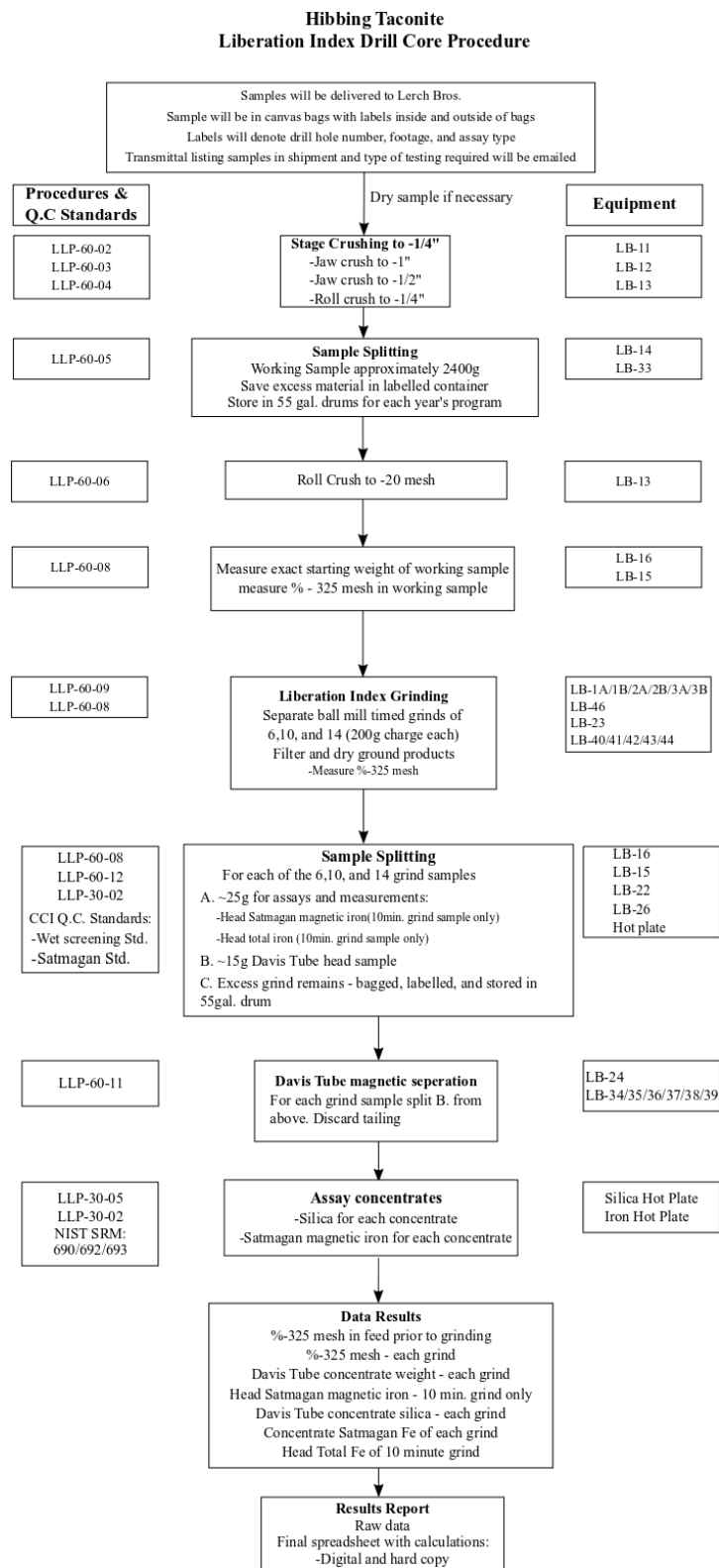
linear regression is calculated for the three data points, and the grade, grind, or power value corresponding to target 3.45% concentrate silica is determined; this is the value included in the assay database. DT magnetic iron is calculated as the product of the percent weight recovery and percent concentrate iron at 3.45% target concentrate silica. The plant target concentrate silica of 4.15% is empirically determined to be equivalent to 3.45% target concentrate silica from the Davis Tube.

Experience at HibTac in utilizing the Liberation Index data has proven its superior capabilities for ore grading purposes over the standard -200 mesh data. However, additional, hypothetical -200 mesh DT parameters of weight recovery and concentrate silica are modeled from the Liberation Index data, in order to maintain a consistent historical record for the -200 mesh data set, especially for mine planning purposes.

Silica and weight recovery at HibTac are projected from the LIS test as if they were from a -200 mesh DT, assuming that 100% passing -200 mesh reflects (on average) a narrow range of passing %-325 mesh, based on 3,600 like samples. Then silica has an empirical adjustment added to it (approximately 2% depending on the geologic unit) for an “adjusted silica” to be used in ore grading and resource estimation.



Figure 11-2: Liberation Index Testing Procedures



Source: Cliffs 2021.



11.1.2.3 Satmagan Magnetic Iron Determination

A direct measure of the magnetic iron in crude ore is carried out with a Saturation Magnetization Analyzer (Satmagan), which measures the total magnetic force acting on a sample to a precision of 0.1%. Satmagan analysis involves a ground sample being placed into a Satmagan machine, which is used to measure the magnetic field of the sample, which is then reported as a percent MagFe in the sample.

The Satmagan is a magnetic balance in which the sample is weighed gravitationally and in a magnetic field. The ratio of the two weights is linearly proportional to the amount of magnetic material in the magnetically saturated sample.

Per Lerch procedure LLP-60-11, a minimum of two grams of sample ground to 100% -200 mesh is needed for Satmagan analysis. Any oversize material is further processed with a mortar and pestle, and the sample to be tested is placed in a plastic testing container. Per LLP-60-12, the prepared sample is demagnetized using the demagnetization coil (demag coil). While the demag coil is on, the sample is moved into and out of the magnetic field until the sample is demagnetized. A blank sample is run on the Satmagan on a daily basis to ensure the device is zeroed. The sample is placed on the magnetic balance and the strength of the magnetic field is noted.

The Satmagan calibration is verified daily by Lerch technicians using two HibTac magnetic iron standards with a known magnetic iron content to ensure the machine is operating within specifications. The machine is re-calibrated every six months, or as necessary, using 17 HibTac standards. The labeled standards have a known weight percent magnetic iron, and each of the 17 standards are measured once. The results are plotted, and the equation used to calculate a calibration curve. The explanation of the calibration procedures is supplied in the user's manual for the Satmagan instrument. If the results of verification standards are not within specifications, the Satmagan is re-calibrated.

11.1.2.4 Total Iron Determination Using Dichromate Titration

Total Iron (Titanium Trichloride) Titration is based on ASTM E246-10, Standard Test Method for Determination of Iron in Iron Ores and Related Materials by Dichromate Titrimetry; and Test Method – B - Iron by the Stannous Chloride Reduction Dichromate Titration Method (Modified).

Per procedure LLP-30-02, in the titrimetric method, iron oxide samples are digested in hydrochloric acid and reduced to Fe^{2+} by SnCl_2 in a nearly boiling solution. After cooling, Fe^{2+} is titrated with a potassium dichromate solution of known concentration. When all Fe^{2+} is consumed by potassium dichromate, violet color indicates the titration endpoint in the presence of the indicator sodium diphenylamine sulfonate. The percent total iron is a direct reading off the titrating solution burette. The value is corrected against percent total iron based on the analyses of three total iron standards analyzed each shift.

11.1.2.5 Hydrofluoric Acid Silica Determination

Silica values reported are based on American Society for Testing and Materials (ASTM) E247-96, Standard Test Method for Determination of Silica in Manganese Ores, Iron Ores, and Related Materials by Gravimetry. Per procedure LLP-30-05, samples are first partially digested in hydrochloric acid to dissolve the non-silica components of the sample. The sample is then filtered and rinsed with more hydrochloric acid. The rinsed sample is then treated with hydrofluoric acid and sulfuric acid to dissolve the silica and remove residual iron, aluminum, and titanium. The silica is desiccated to drive off water, and the weight is recorded.



11.1.2.6 Density

A water-immersion method has been used by Hibbing Taconite to determine the density of drill core samples in order to obtain density factors for each subunit. The procedure used by Hibbing Taconite weighs the entire core sample interval suspended from a spring scale in air and while immersed in water. The density of the sample is calculated with the difference of the submerged weight of the sample and the dry weight of the sample. The density is calculated using the dry weight divided by the difference in the dry and suspended weight:

$$\text{Density (sample)} = \text{density (water)} * (\text{dry weight}) / (\text{dry} - \text{immersed weight})$$

A density study was performed at HibTac in 2004-2005, comprising more than 1,100 core samples from the deposit. Samples were typically full 10-ft run lengths. Tonnage factors (volume/mass), or the inverse of density, are used at HibTac because units are in feet and long tons. Results of the study indicate that tonnage factor is a function of the iron content of the rock, and that function is now used to assign density to the block model for the Biwabik IF. The tonnage factor of glacial overburden is set at 18.0 ft³/LT, and the tonnage factor of stockpile material is set at 15.0 ft³/LT.

Currently, density for the Biwabik units is calculated in the block model as a function of Satmagan MagFe (smgfe) and total crude iron (ciron) content. The equation is:

$$\text{Density (LT/ft}^3\text{)} = 1 / (13.05566 - (0.03179 * (\text{smgfe})) - (0.0420424 * (\text{ciron}))).$$

11.2 Quality Assurance and Quality Control

Quality assurance (QA) consists of evidence to demonstrate that the assay data has precision and accuracy within generally accepted limits for the sampling and analytical method(s) used in order to have confidence in a resource estimate. Quality control (QC) consists of procedures used to ensure that an adequate level of quality is maintained in the process of collecting, preparing, and assaying the exploration drilling samples. In general, QA/QC programs are designed to prevent or detect contamination and allow assaying (analytical), precision (repeatability), and accuracy to be quantified. In addition, a QA/QC program can disclose the overall sampling-assaying variability of the sampling method itself.

Hibbing Taconite does not yet have a formal procedure for exploration drill core QA/QC (see section 11.2.1 below). When Roscoe Postle Associates Inc. (RPA), now part of SLR, audited Mineral Resource documentation for other Cliffs operations in autumn 2019, RPA recommended there be a campaign QA/QC report for every DD program and formal documentation of QA/QC procedures.

11.2.1 QA/QC Procedure

There is no formal HibTac QA/QC procedure for drill core processing and analysis. For future campaign reports, a formalized procedure should be referenced in the campaign QA/QC report.

Prior to the 2010 drilling program, no standards, blanks, or duplicate samples were inserted into the stream of DD samples. Beginning with the 2010 drilling program, duplicate samples and standards were inserted into the sample stream. However, templates for QA/QC analysis of standards and duplicates were not created until 2015 (Orobona, 2015) and were not implemented in real time until 2017, for a portion of the 2015 DD program that was deferred pending implementation of controls on Satmagan instrument calibration and sample preparation, and tooling/testing of new LIS mills recommended in Orobona (2015). Active monitoring of quality assurance sample results only proceeded for a short time before



AMUSA assumed management of the Mine, and the 2018-2019 DD program results were only reviewed upon resumption of Cliffs' management preceding this Technical Report.

11.2.2 Reference Materials (Standards)

A crude ore standard (HTCCOS) was prepared in 2009 from ore-grade material collected from the HibTac Mine. A 10-tonne (metric ton of 2,204.6 lb) sample was crushed to -¼ in., homogenized, and then split into approximately 5 kg subsamples by the Coleraine Mineral Research Laboratory of the University of Minnesota. The standard is analyzed according to the current crude ore characterization procedure (using three timed grinds) and undergoes the same series of preparation, magnetic separation, and chemical assay steps that crude ore samples undergo. Use of this standard commenced in conjunction with assaying of drill core obtained during the 2010 HibTac drilling program.

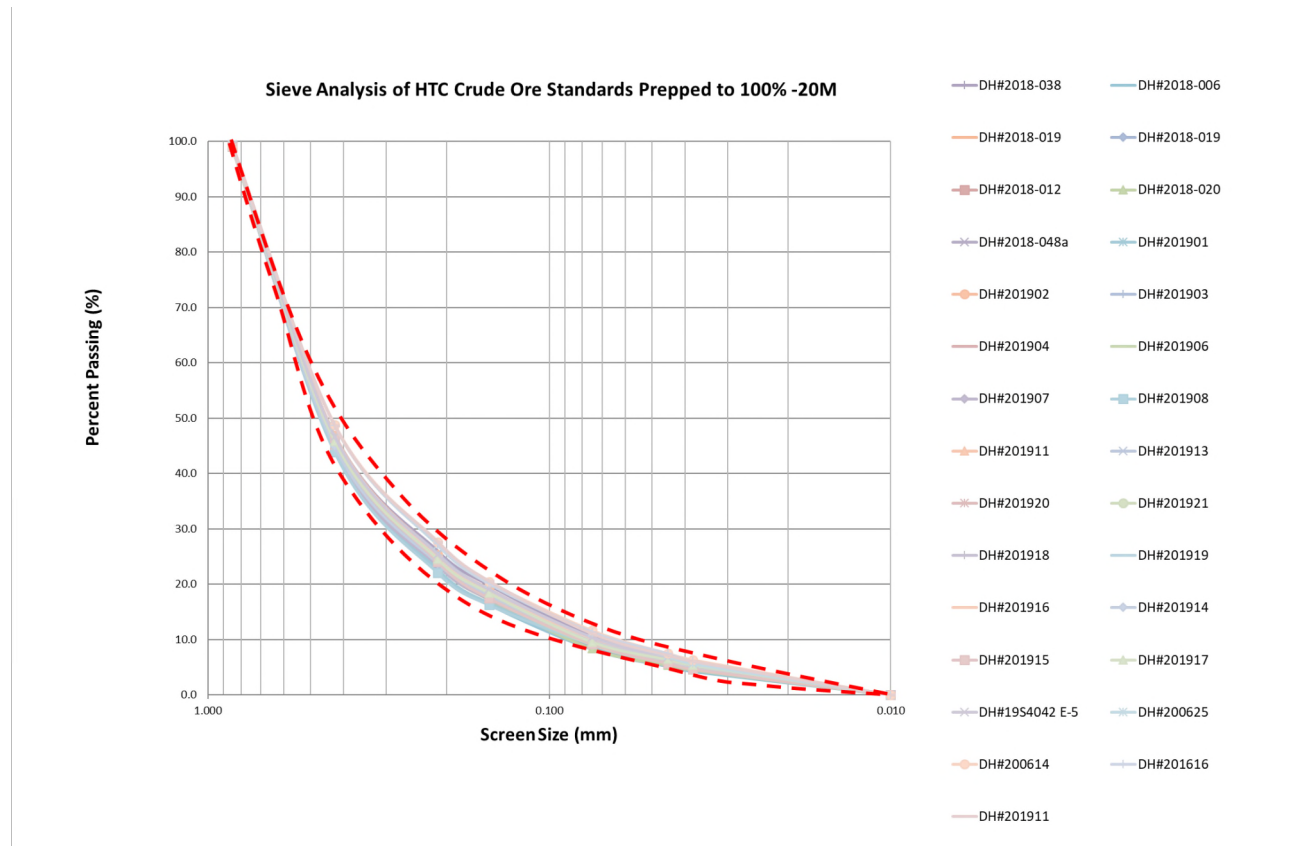
11.2.2.1 Sample Preparation

For every standard tested at Lerch, a screen size analysis is run to ensure consistency in sample preparation to -20 mesh. Results are tabulated on a tracking spreadsheet and illustrated in Figure 11-3. The spreadsheet chart template used for analysis is not shared with Lerch.

Results of screen analyses are entirely within historical norms established during baseline testing conducted prior to the study period (red limits on Figure 11-3), and it is Cliffs' and SLR QP's opinion that the sample preparation process meet industry best practice. Due to the very consistent overall results illustrated in Figure 11-3, mean ($\bar{x}$) and moving range ($\overline{MR}$) control charts created for each individual %-passing and sieve-size range bin are not detailed in this Technical Report.



Figure 11-3: Sieve Analysis of HibTac Crude Ore Standards (HTCCOS) Prepared to 100% -20M



Source: Cliffs 2021.

11.2.2.2 Liberation Index Study Analytical Test Work

Available data include all standards analyzed since 2010. Following a period of standard sampling without QA/QC analysis from 2010 through 2015, statistical process control (SPC) charts for individuals $\bar{x}$ and $\overline{MR}$ were re-established in 2016 for all physical and chemical measurements and calculated variables from the LIS crude ore characterization protocol. Active monitoring of QA sample results only proceeded for a short time before AMUSA assumed management of the Hibbing JV, and the 2018-2019 DD program results were only reviewed upon resumption of Cliffs' management preceding this report. Therefore, there has only been a limited window of active monitoring and investigations of failures.

Data are currently tracked and charted on a spreadsheet stored on the CTG LAN.

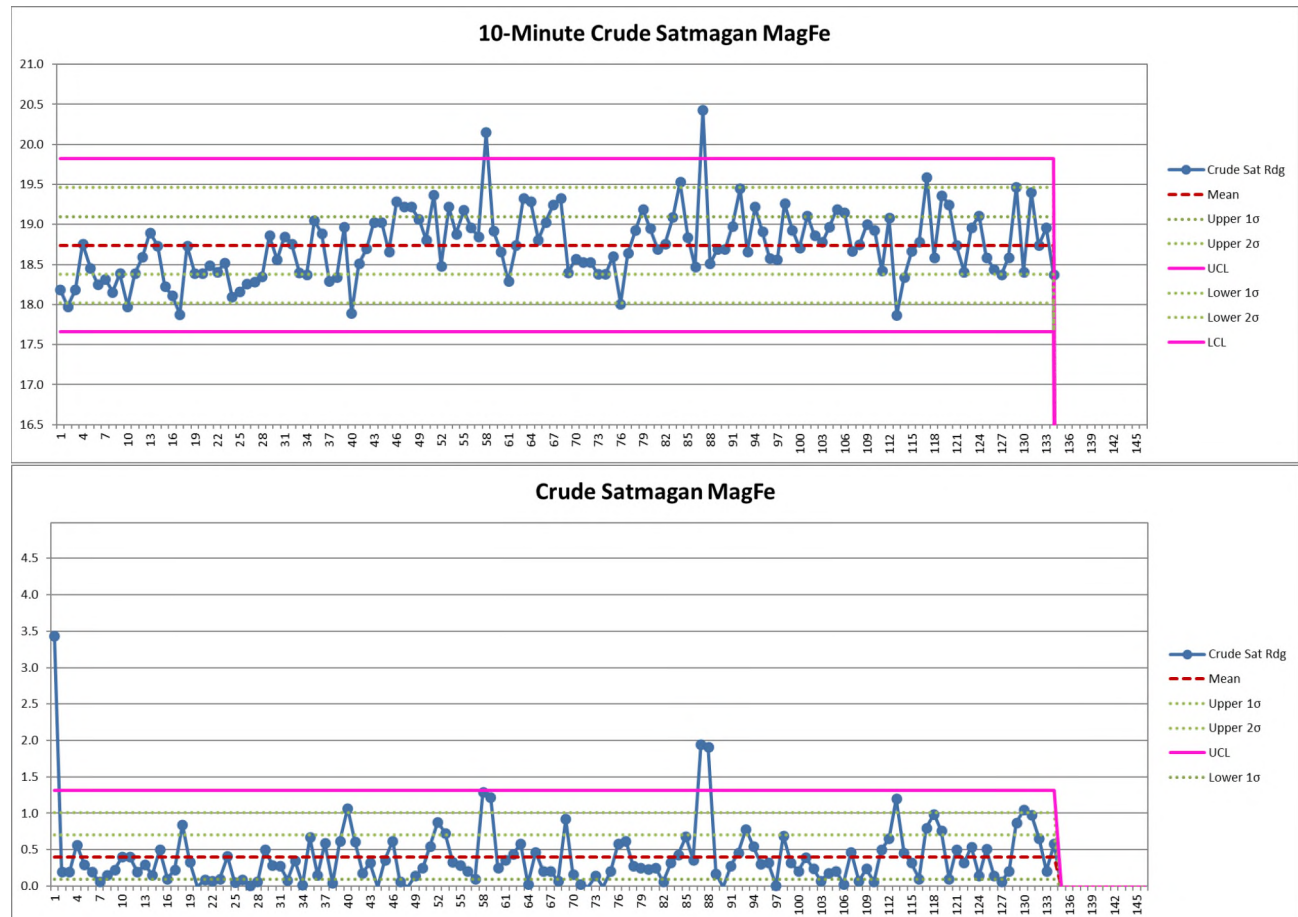
Control limits are based on the common approach for Shewhart control charts. For "individuals", control limits are $\pm 2.66 * \text{Mean}_{\text{moving range}}$. For the MR charts, control limits are $3.267 * \text{Mean}_{\text{moving range}}$. In both cases, 1σ and 2σ are respectively one-third and two-thirds of the difference between the mean(s) and control limits. This approach is commonly used in statistical process control software and narrows control limits relative to three standard deviations (SD) from the mean of the data.



Crude Satmagan Magnetic Iron 2016-2019

Satmagan MagFe is measured on the 10-minute grind prior to DT concentration using the Satmagan instrument (Figure 11-4). There were two instances of points beyond the control limits during the study period. Ensuing data quickly returned to control, and the instances were not investigated. However, the incidence for standard sample HT0001325 is coincident with increased crude Fe, so the higher Satmagan Fe may be “real” and a function of variation in standard mixing/splitting. Historically, crude MagFe has been the single most important variable for reporting of Mineral Resources at HibTac.

Figure 11-4: Crude Satmagan Magnetic Iron 2016-2019



Tests for Special Causes - Individuals: Crude Satmagan Reading								
Number of Data Points Failing Tests = 0								
Observation No.	Test 1: 1 point more than 3 Stdev from CL	Test 2: 9 points in a row on same side of CL	Test 3: 6 points in a row all increasing or all decreasing	Test 4: 14 points in a row alternating up and down	Test 5: 2 out of 3 points more than 2 Stdev from CL (same side)	Test 6: 4 out of 5 points more than 1 Stdev from CL (same side)	Test 7: 15 points in a row within 1 Stdev from CL (either side)	Test 8: 8 points in a row more than 1 Stdev from CL (either side)

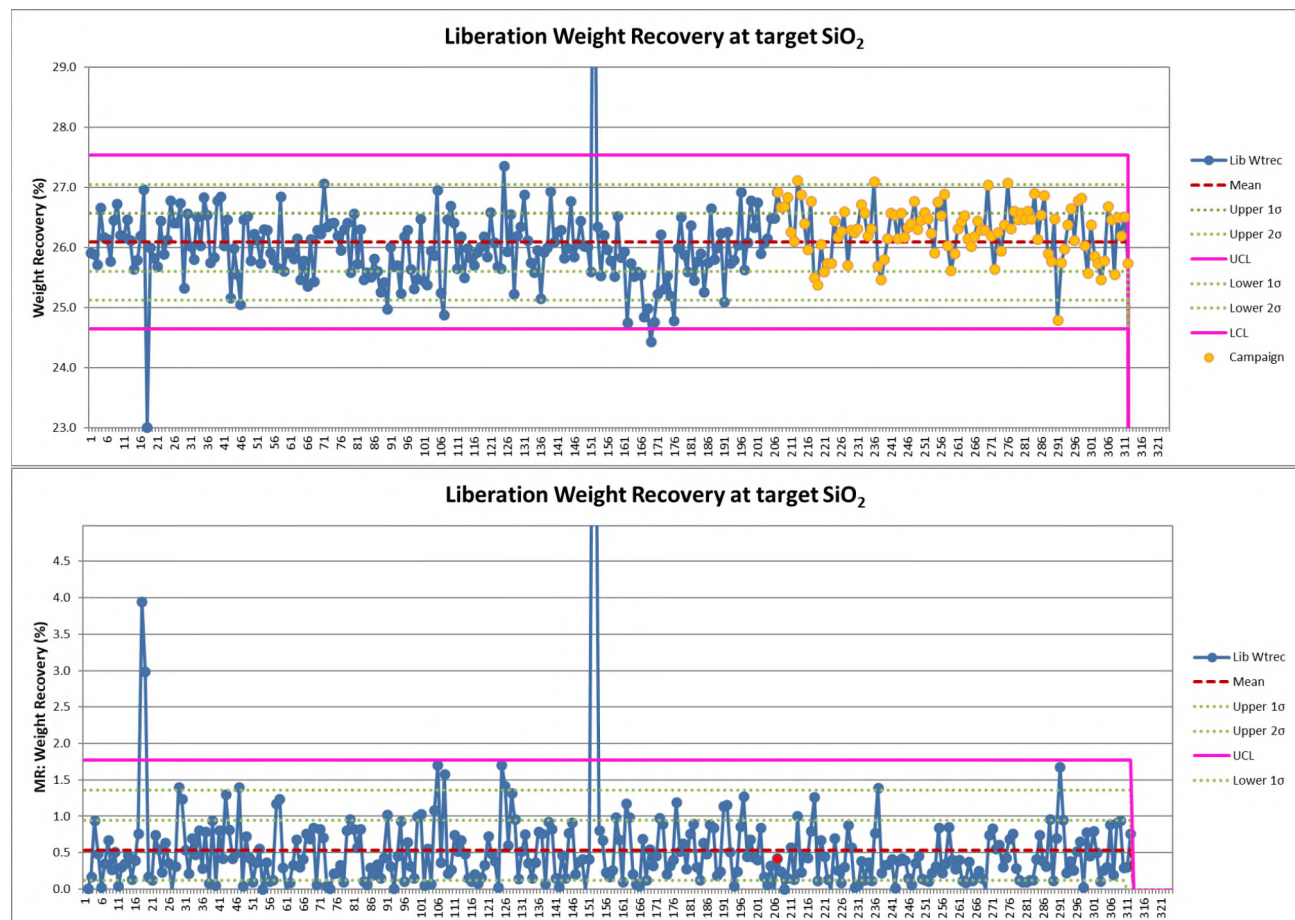
Source: Cliffs 2021.



Liberation Weight Recovery 2010-2019

Liberation weight recovery at target silica is calculated from grade-recovery curves generated by three timed grinds. Figure 11-5 illustrates the good continuity of Liberation weight recovery over the entire period of quality sampling. For the study period's standards results (highlighted in orange), the only failures were stretches of more than nine points on either side of the CL, and no samples were outside of tolerance limits. These occurrences were not investigated. The control limits here are based on all the data collected since 2010; however, control limits based on the study period are virtually identical.

Figure 11-5: Liberation Weight Recovery 2010-2019



Tests for Special Causes - Individuals: Liberation Weight Recovery

Number of Data Points Failing Tests = 0

Observation No.	Test 1: 1 point more than 3 Stdev from CL	Test 2: 9 points in a row on same side of CL	Test 3: 6 points in a row all increasing or all decreasing	Test 4: 14 points in a row alternating up and down	Test 5: 2 out of 3 points more than 2 Stdev from CL (same side)	Test 6: 4 out of 5 points more than 1 Stdev from CL (same side)	Test 7: 15 points in a row within 1 Stdev from CL (either side)	Test 8: 8 points in a row more than 1 Stdev from CL (either side)

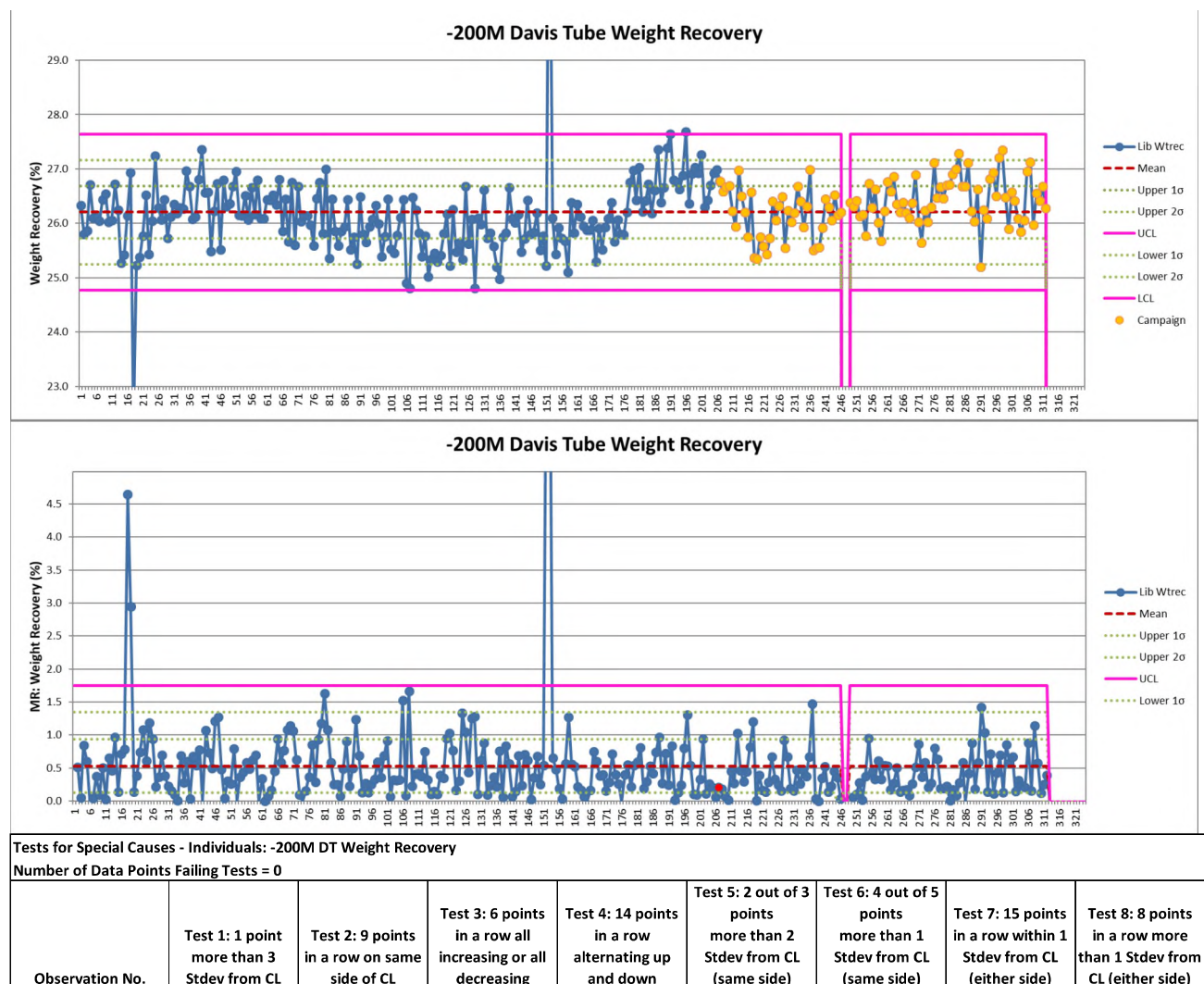
Source: Cliffs 2021.



Modeled -200 Mesh Davis Tube Weight Recovery

Modeled -200 mesh DT weight recovery is also calculated from grade-recovery curves generated by three timed grinds. Theoretically, the -200 mesh DT parameters of weight recovery and concentrate silica can be modeled from the Liberation Index data (Mahin and Graber 2001). The key to this modeling is the assumption that the relative grind fineness at 100% -200 mesh possesses a relatively narrow range of equivalent percent passing 325 mesh based on 3,600 like samples that were each subjected to the LIS and DT tests. If so, a target 325 mesh number can be utilized in the grind-grade-recovery equations of the LIS test results to predict the -200 mesh parameters. Modeled -200 mesh DT weight recovery is the weight recovery used in HibTac ore grading and Mineral Resource estimations. Figure 11-6 illustrates the good continuity of weight recovery over the entire period of quality sampling. For the study period's standards results, no failures were noted. The control limits here are based on all the data collected since 2010; however, control limits based on the study period are virtually identical.

Figure 11-6: Modeled -200 mesh Davis Tube Weight Recovery



Source: Cliffs 2021.

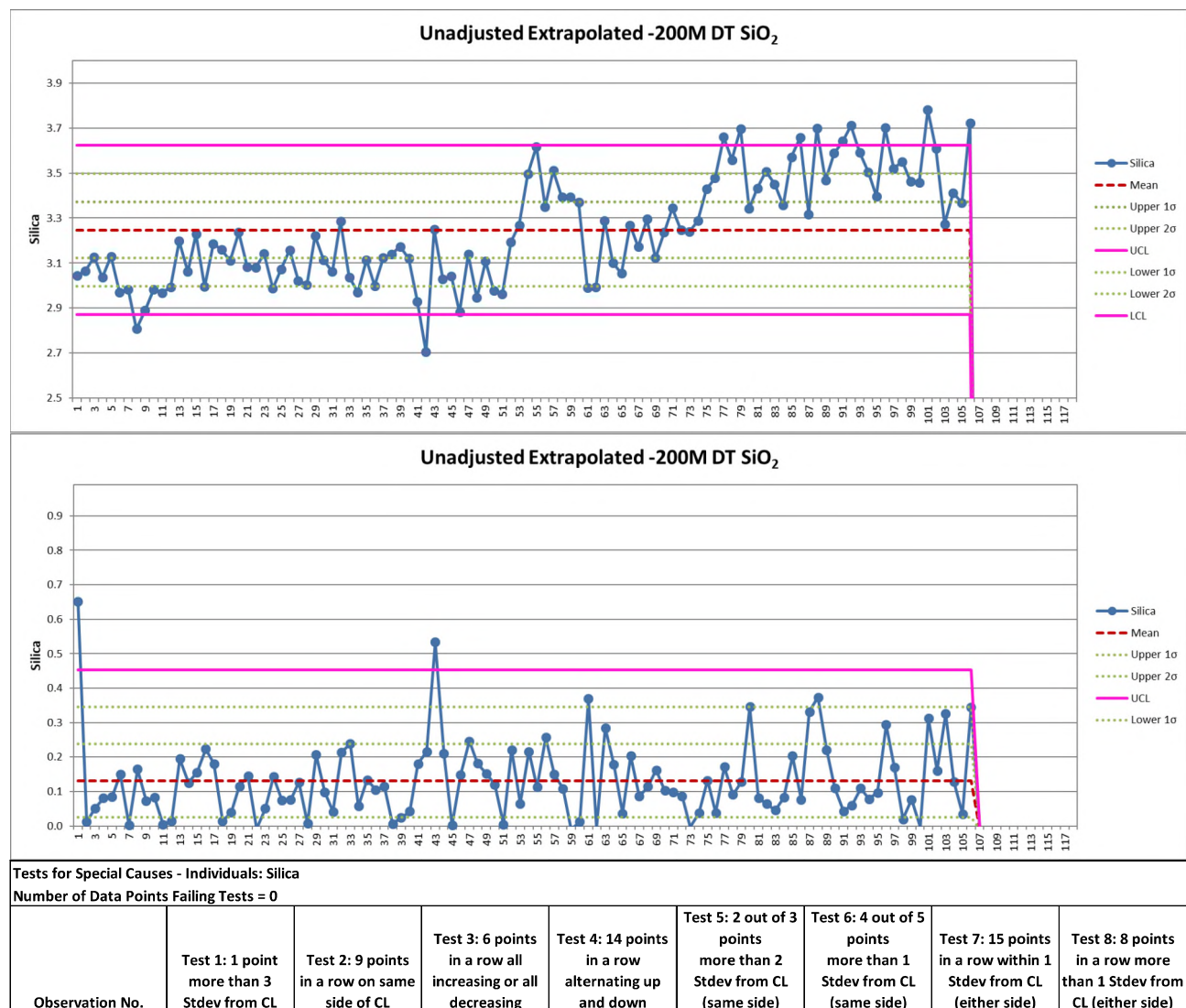


Modeled -200 Mesh Silica (unadjusted)

Modeled -200 mesh DT silica is also calculated from grade-grind curves generated by three timed grinds. Theoretically, the -200 mesh DT parameters of weight recovery and concentrate silica can be modeled from the Liberation Index data. The key to this modeling is the assumption that the relative grind fineness at 100% -200 mesh possesses a relatively narrow range of equivalent percent passing 325 mesh. If so, a target 325 mesh number can be utilized in the grind-grade-recovery equations of the LIS test results to predict the -200 mesh parameters.

The apparent step change during the reporting period observed in Figure 11-7 was not investigated, as it occurred during the period of AMUSA's management of HibTac. However, the step is coincident with a new DD analysis campaign following a year hiatus between HibTac DD programs. In that time, there would have been wear on the grinding mills from other site(s) DD programs.

Figure 11-7: Modeled -200 Mesh Davis Tube Silica (unadjusted)



Source: Cliffs 2021.

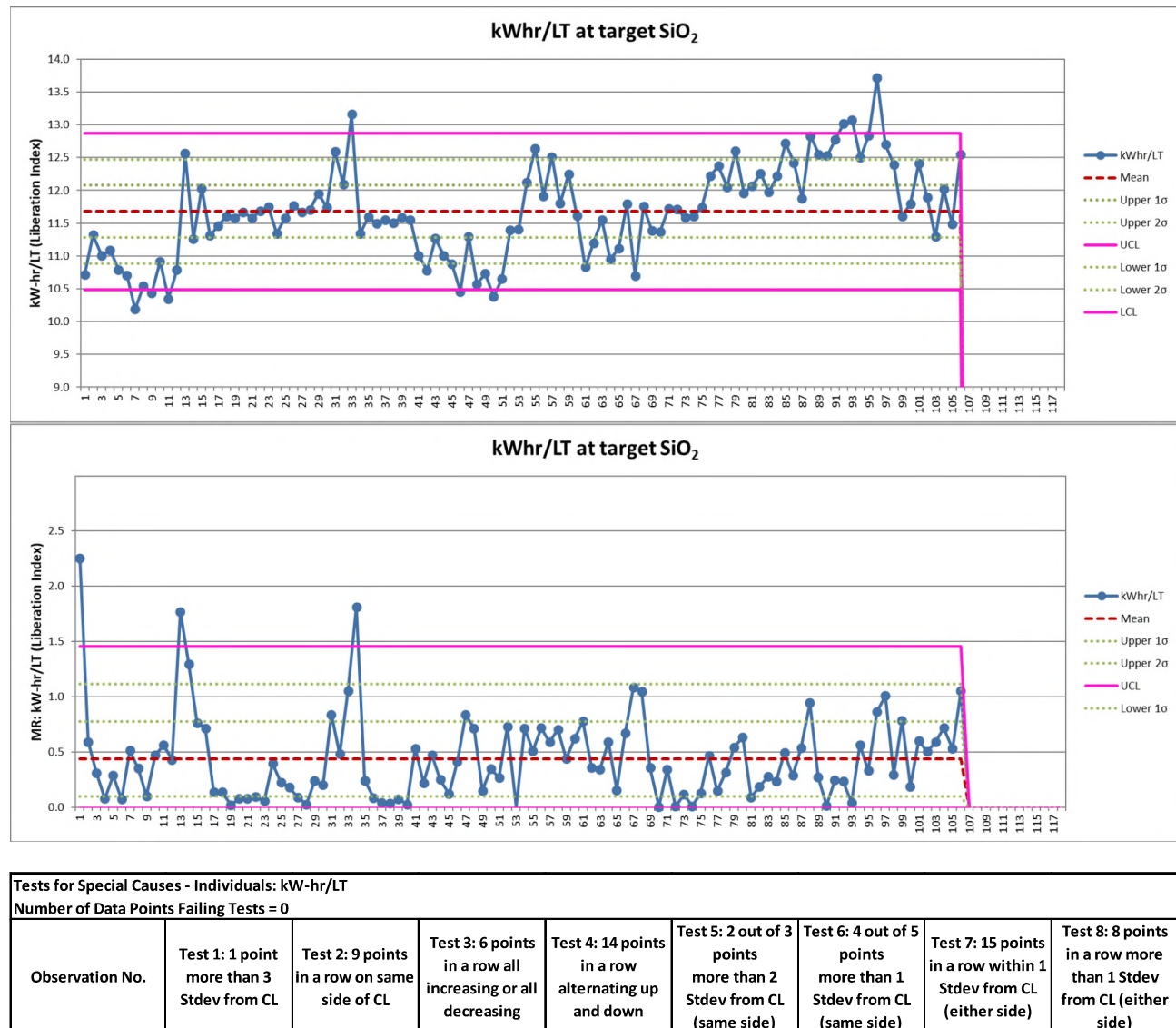


kWh/LT 2016-2019

The Liberation Index, kWh/LT, at target silica is calculated from power-grade curves generated by three timed grinds. It is a measure of the relative power required to achieve target silica liberation.

Observed step changes and periods of potential drift during the reporting period observed in Figure 11-8 were not investigated, as they largely occurred during the period of AMUSA's management of HibTac.

Figure 11-8: kWh/LT 2016-2019



Source: Cliffs 2021.

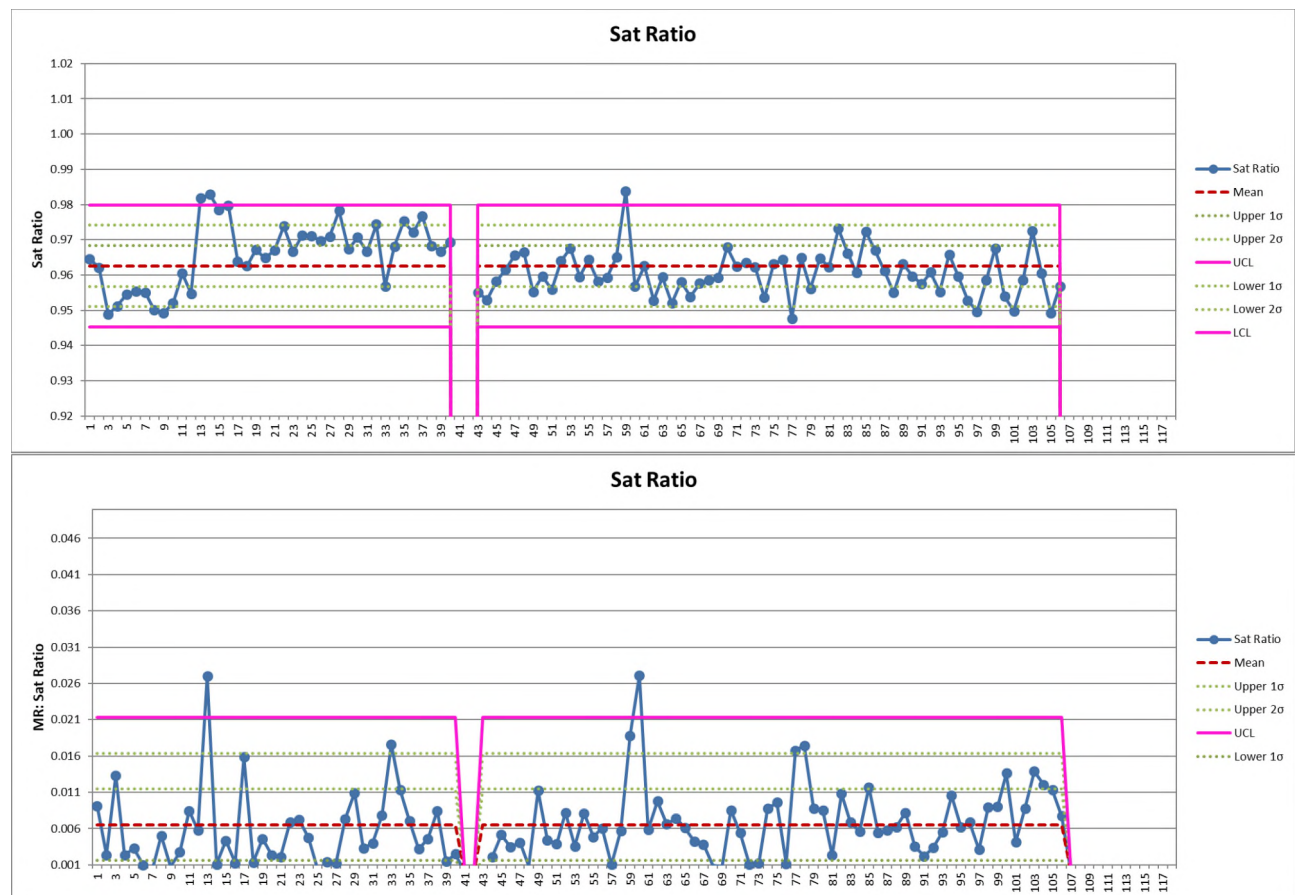


Sat Ratio

Sat Ratio (Figure 11-9) is calculated as the ratio of Satmagan MagFe and total Fe of the 10-minute DT concentrate. It is used to model oxidation zones of waste rock (Sat Ratio < 0.9).

There were four sequential points hovering near or above the upper control limit. All other data were in apparent control, and the occurrence was not investigated.

Figure 11-9: Sat Ratio 2016-2019



Tests for Special Causes - Individuals: Sat Ratio							
Number of Data Points Failing Tests = 0							
Observation No.	Test 1: 1 point more than 3 Stdev from CL	Test 2: 9 points in a row on same side of CL	Test 3: 6 points in a row all increasing or all decreasing	Test 4: 14 points in a row alternating up and down	Test 5: 2 out of 3 points more than 2 Stdev from CL (same side)	Test 6: 4 out of 5 points more than 1 Stdev from CL (same side)	Test 7: 15 points in a row within 1 Stdev from CL (either side)
							Test 8: 8 points in a row more than 1 Stdev from CL (either side)

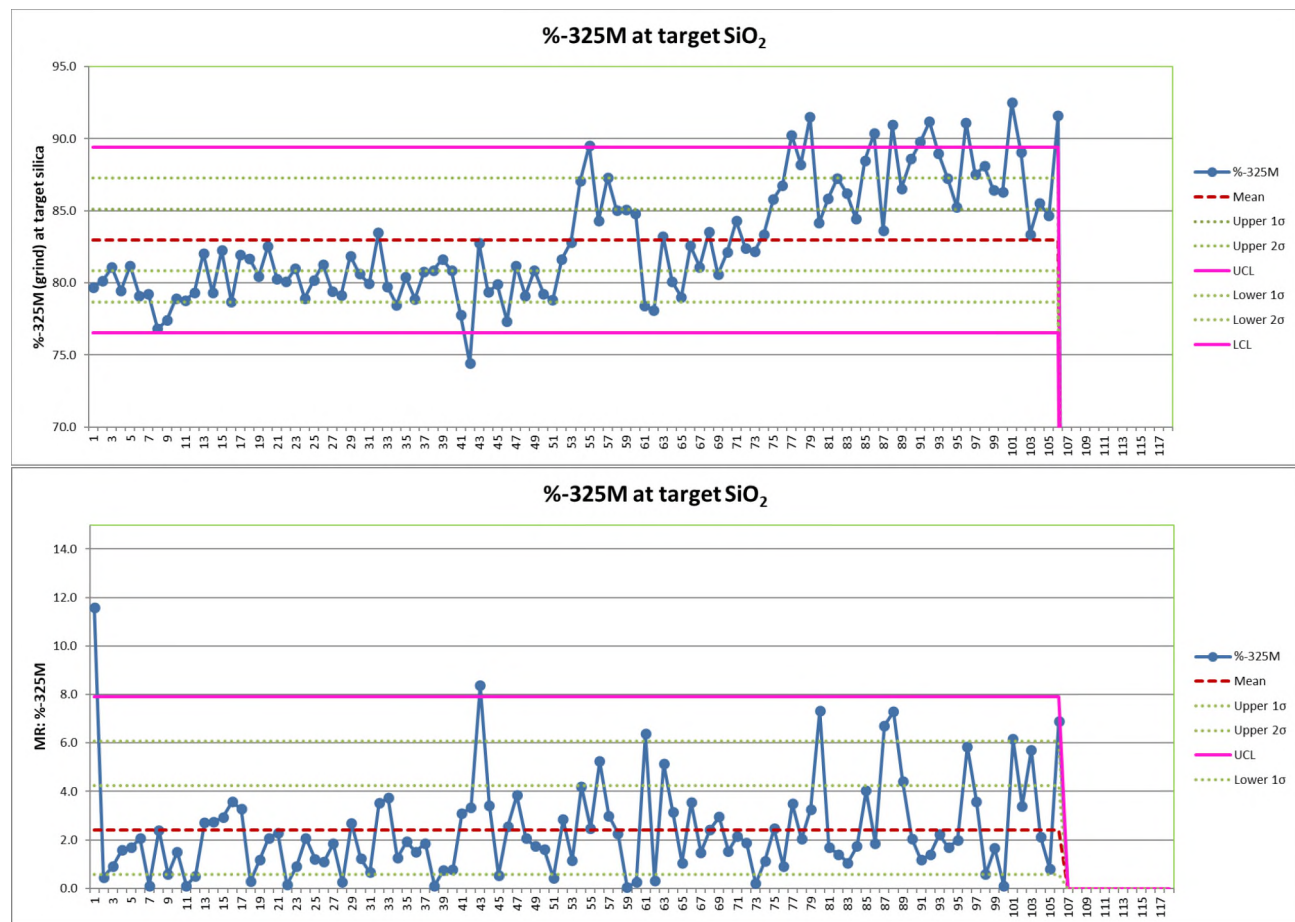
Source: Cliffs 2021.



Grind at Target Silica

Grind (%-325 mesh) at target silica (Figure 11-10) is calculated from grind-grade curves generated by three timed grinds, where the -325 mesh fraction is screened and weighed from each timed grind's mill product, and silica is measured for each grind's DT concentrate. The step change in higher grind at target silica as seen on the control chart was not investigated, and its significance was not determined, as it occurred during AMUSA's management of the HibTac operation. However, the step is coincident with a new DD analysis campaign following a year hiatus between HibTac DD programs. In that time, there would have been wear on the grinding mills from other site(s) DD programs.

Figure 11-10: Grind at Target Silica



Tests for Special Causes - Individuals: %-325M at target SiO₂

Number of Data Points Failing Tests = 0

Observation No.	Test 1: 1 point more than 3 Stdev from CL	Test 2: 9 points in a row on same side of CL	Test 3: 6 points in a row all increasing or all decreasing	Test 4: 14 points in a row alternating up and down	Test 5: 2 out of 3 points more than 2 Stdev from CL (same side)	Test 6: 4 out of 5 points more than 1 Stdev from CL (same side)	Test 7: 15 points in a row within 1 Stdev from CL (either side)	Test 8: 8 points in a row more than 1 Stdev from CL (either side)

Source: Cliffs 2021.



HTCCCOS Standards Results Discussion

Additional control charts are maintained and monitored for feed kWh/LT and individual timed-grinding results (6-minute, 10-minute, 14-minute) for DT concentrate Satmagan MagFe, %-325 mesh (grind), weight recoveries, and silica that were used to calculate final results at target silica. Results for individual timed grinds should be the first element of investigation for any out-of-control final results. Prior to submission of final results to Cliffs, the Lerch laboratory manager reviews the coefficient of determination (r^2) for each grind versus grade-power-recovery curve generated by the three timed grinds for all standards samples (and normal samples in the dispatch). Any r^2 less than 0.9 triggers an automatic re-analysis of the DT products for each grind of the LIS test, so Cliffs does not typically receive results that fail this internal laboratory check.

Standards generally performed within the range of acceptability for the main derived variables ($\pm 3\sigma$) except where noted above. These instances were not investigated, largely due to transition to external site management. As-received monitoring and investigation of “failures” or trends is recommended by Cliffs and SLR QP for the future.

11.2.3 Duplicates

Beginning with the 2010 drilling program, a program of assaying duplicate samples was incorporated into the standard HibTac work program. Preparation duplicate samples consist of paired assays split from the $\frac{1}{4}$ in. coarse crush material and then prepared and analyzed in the same sample batch. The preparation duplicates are not “blind.” To date, all duplicate sample pairs have been assayed by Lerch in Hibbing, Minnesota.

For each analyte or measured/calculated variable, plots generated include x-y (scatter) and a time series of mean relative percent difference.

Scatter plots include the standard least squares trendline (the typical regression used by spreadsheet software). A second least squares trendline is generated assuming all error in “X.” The RMA line, the reduced major axis, assumes that neither axis depends on the other and is a best-fit regression that should closely trend with the 1:1 line for a sample set in good precision.

Control limits to the mean relative percent difference between duplicate pairs are based on 3SD from the mean of data, where 1σ and 2σ are obviously 1SD and 2SD from the mean of the data. The Shewhart control approach used for the standards is not appropriate, since the QC metrics are not currently set up to track moving range.

Also monitored are Thompson and Howarth plots (Thompson and Howarth, 1978), where the mean of each replicate pair is plotted against the absolute difference between the two analyses. On these plots, lines are drawn for any predefined precision level (e.g., 10% and/or 20%) and percentile (e.g., 90th or 99th), and the overall quality of the replicate analyses at different concentration ranges can be grasped at a glance. Precision within 20% is recommended for HibTac data unless otherwise noted. Pairs that deviate from the general trend should be identified and discussed with the laboratory. Two additional ways to plot the same results include plotting the mean of duplicates against the ratio between duplicates and the mean of duplicates against the relative standard deviation (RSD). An acceptable RSD of 15% is approximately equal to the recommended 20% relative difference acceptance. Each plot has advantages and disadvantages; using all four provides insight into data quality and analytical precision.

In the following figures (Figure 11-11 through Figure 11-16), data from the 2016-2019 study period is plotted as orange points to compare with the larger set of historical results dating back



to 2010 (blue points). Control limits and trend lines are based on the larger population. As the resource QA database expands, results will be e-mailed to the site geologist and shared in a central location.

11.2.3.1 Crude Satmagan Magnetic Fe Preparation Duplicates

For all duplicate pairs from the 2016-2019 study period but one, the absolute difference is within 10% of the mean for Satmagan MagFe, and the RMA is very close to the 1:1 line, demonstrating excellent precision. For the single data point, the absolute difference is at just under 20% of the mean. The time series of mean relative percent difference demonstrates improved precision with time, corresponding to process improvements implemented immediately before the study period (Orobona 2015) and monitoring of QA/QC results. Results triggered no investigations.

11.2.3.2 Modeled -200 Mesh Davis Tube Weight Recovery Preparation Duplicates

Modeled -200 mesh DT weight recovery is calculated from grade-recovery curves generated by three timed grinds. Theoretically, the -200 mesh DT parameters of weight recovery and concentrate silica can be modeled from the Liberation Index data. The key to this modeling is the assumption that the relative grind fineness at 100% -200 mesh possesses a relatively narrow range of equivalent percent passing 325 mesh based on 3,600 like samples that were each subjected to the LIS and DT tests. If so, a target 325 mesh number can be utilized in the grind-grade-recovery equations of the LIS test results to predict the -200 mesh parameters.

For all duplicate pairs from the 2016-2019 study period, the absolute difference is within the recommended 20% of the mean for weight recovery (all are within 10% for recoveries within the range of ore grades), and the RMA of the greater population is very close to the 1:1 line, demonstrating excellent precision. The time series of mean relative percent difference demonstrates improved precision with time. Results triggered no investigations.

Liberation weight recovery (weight recovery at target silica calculated from grade-recovery curves generated by three timed grinds) results are virtually identical and are not illustrated here.

11.2.3.3 Modeled -200 Mesh Davis Tube Silica (unadjusted)

Modeled -200 mesh DT silica is calculated from grind-grade curves generated by three timed grinds. Theoretically, the -200 mesh DT parameters of weight recovery and concentrate silica can be modeled from the Liberation Index data. The key to this modeling is the assumption that the relative grind fineness at 100% -200 mesh possesses a relatively narrow range of equivalent percent passing 325 mesh. If so, a target 325 mesh number can be utilized in the grind-grade-recovery equations of the LIS test results to predict the -200 mesh parameters.

For all but two duplicate pairs from the 2016-2019 study period, the absolute difference is within the recommended 20% of the mean for unadjusted silica, and the RMA of the greater population is very close to the 1:1 line, demonstrating acceptable precision. Results triggered no investigations.

11.2.3.4 kWh/LT (Liberation Index) Preparation Duplicates

The Liberation Index, kWh/LT, at target silica is calculated from power-grade curves generated by three timed grinds. For all duplicate pairs from the 2016-2019 study period, the absolute difference is within the recommended 20% of the mean for the Liberation Index (all but one are within 10%), and the RMA is very close to the 1:1 line for the greater population, demonstrating



excellent precision. The time series of mean relative percent difference demonstrates improved precision with time, corresponding to process improvements implemented immediately before the study period (Orobona 2015) and monitoring of QA/QC results. Results triggered no investigations.

11.2.3.5 Grind (%-325 Mesh) Preparation Duplicates

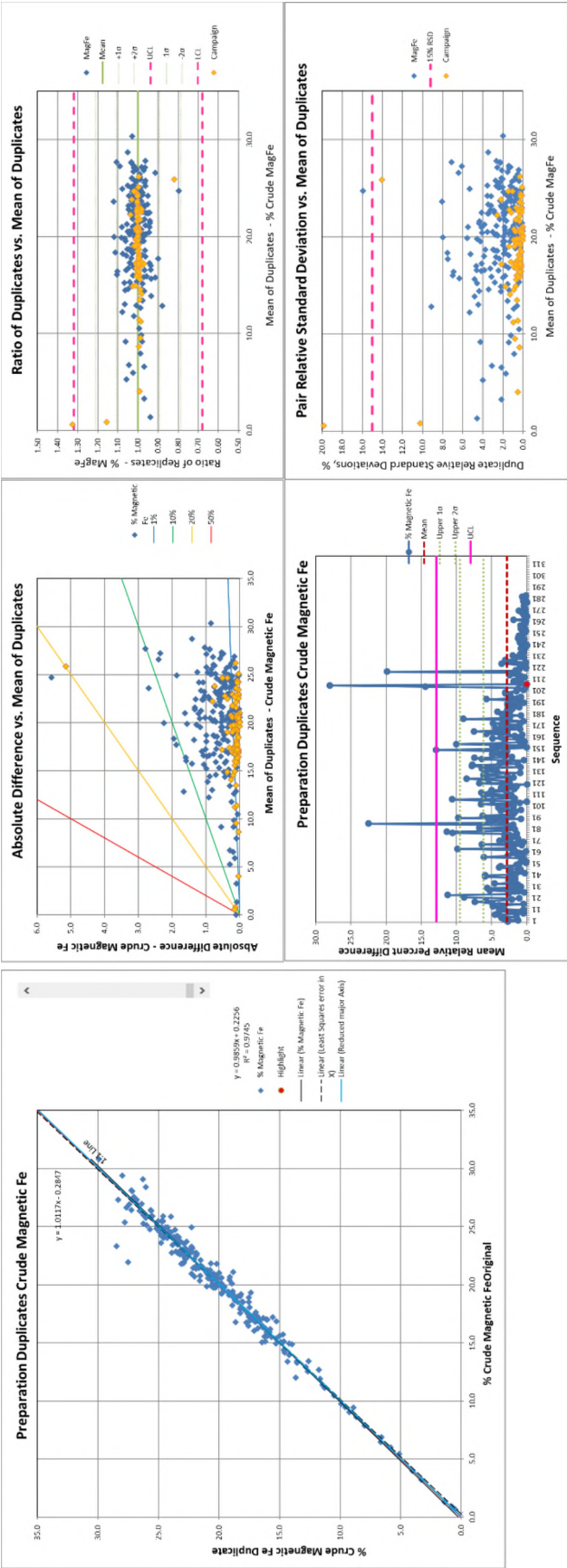
Grind at target silica is calculated from grind-grade curves generated by three timed grinds. For all duplicate pairs from the 2016-2019 study period, the absolute difference is within the recommended 20% of the mean for Grind estimated at target silica (all but three are within 10%), and the RMA of the greater population is very close to the 1:1 line, demonstrating excellent precision. The time series of mean relative percent difference demonstrates improved precision with time, corresponding to process improvements implemented immediately before the study period (Orobona 2015) and monitoring of QA/QC results. Results triggered no investigations.

11.2.3.6 Sat Ratio Preparation Duplicates

The Sat Ratio is the proportion of Satmagan MagFe to total Fe from wet chemistry in the 10-minute grind Davis Tube concentrate. For all duplicate pairs from the 2016-2019 study period, the absolute difference is within the recommended 20% of the mean for silica estimated at target Grind (almost all are within 10%), and the RMA is very close to the 1:1 line for the greater population, demonstrating excellent precision. The time series of mean relative percent difference demonstrates slightly improved precision with time, corresponding to Satmagan calibration improvements implemented immediately before the study period (Orobona, 2015) and monitoring of QA/QC results. Results triggered no investigations.



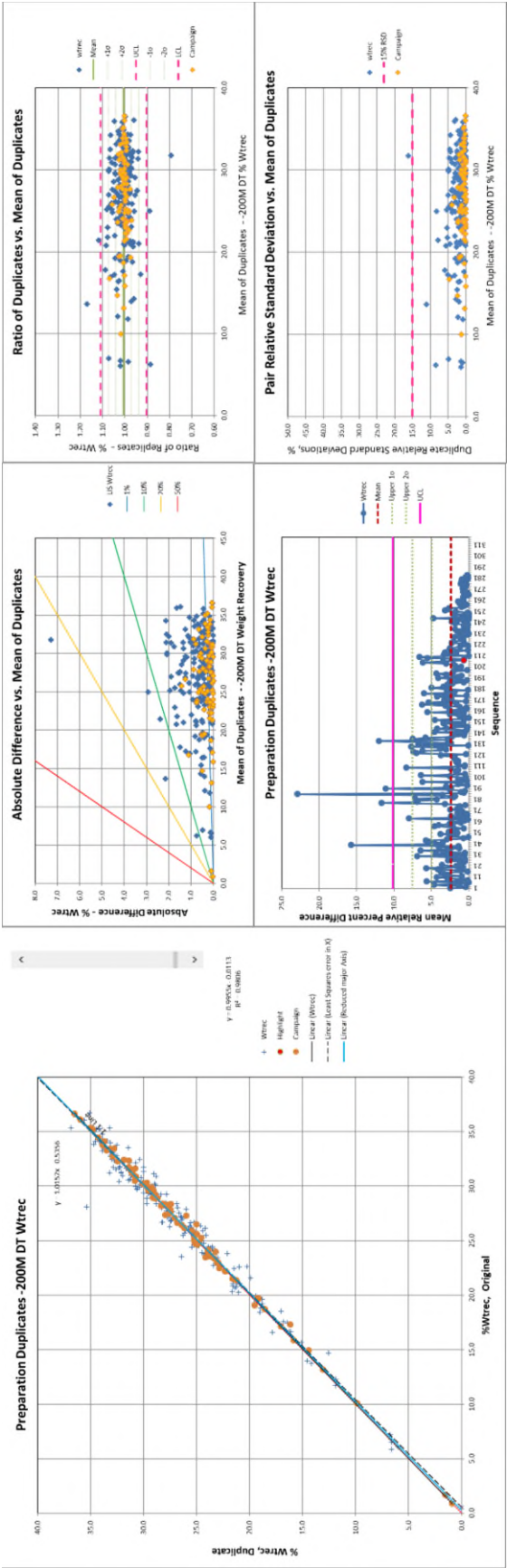
Figure 11-11: Crude Satmagan Magnetic Fe Preparation Duplicates



Source: Cliffs 2021.



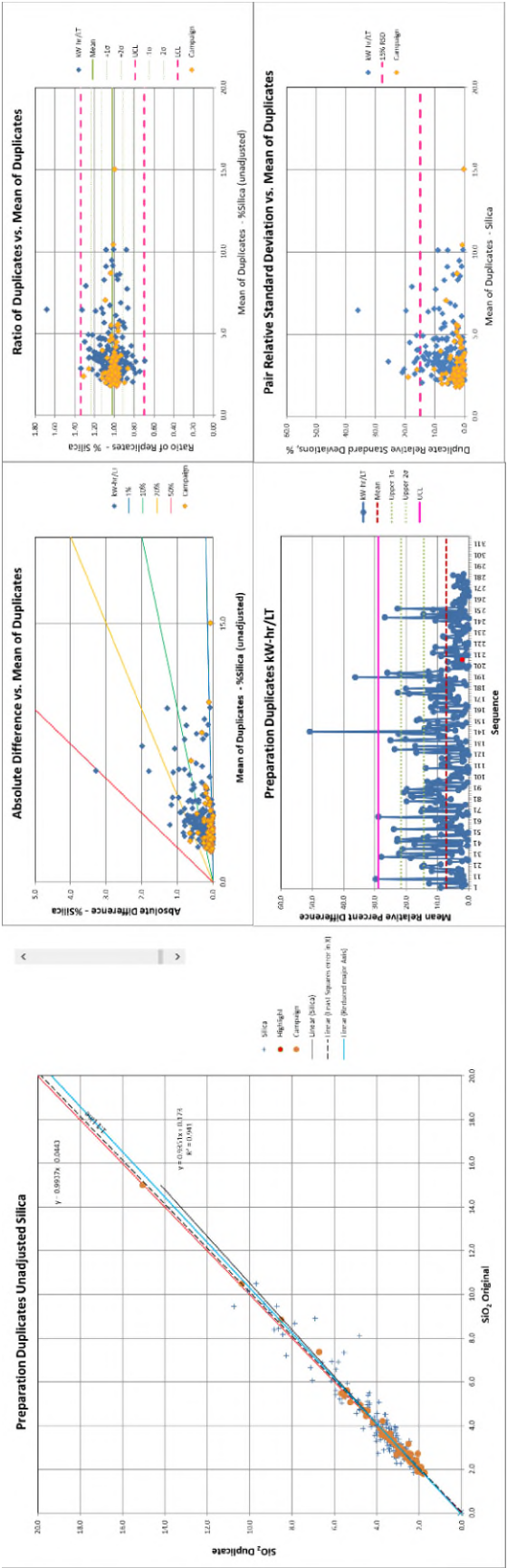
Figure 11-12: Modeled -200 Mesh Davis Tube Weight Recovery Preparation Duplicates



Source: Cliffs 2021.



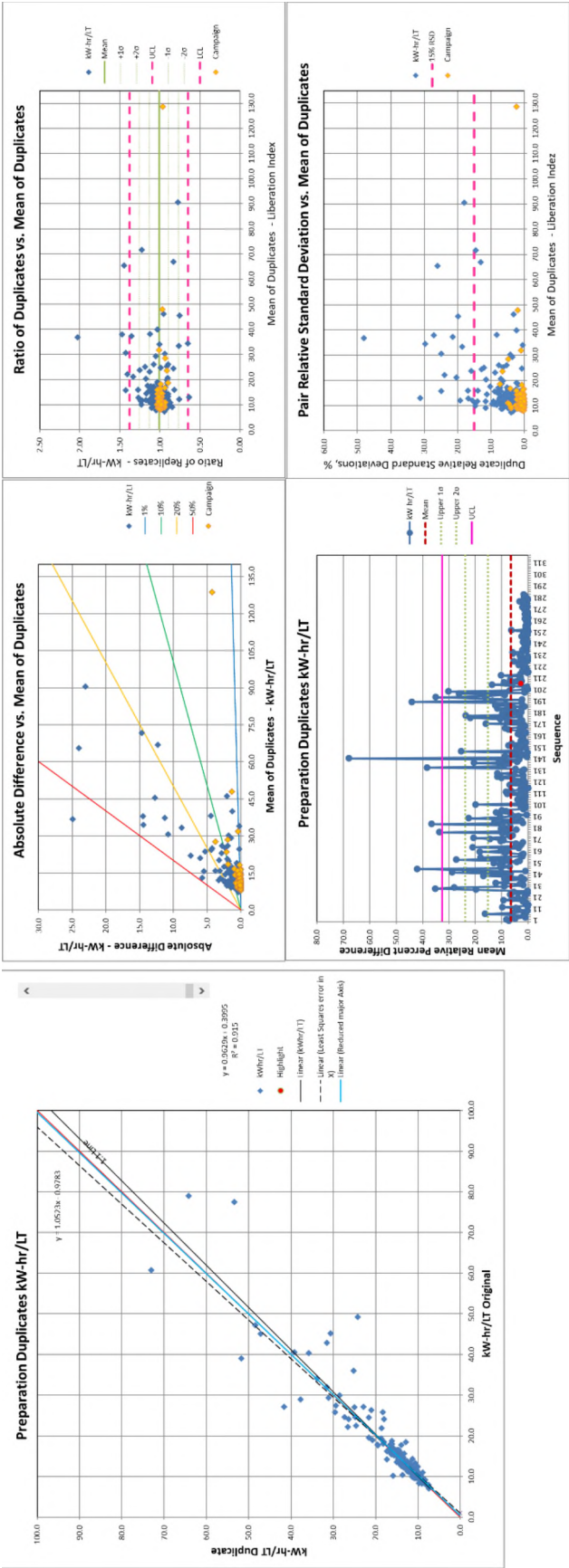
Figure 11-13: Modeled -200 mesh Davis Tube Silica Preparation Duplicates



Source: Cliffs 2021.



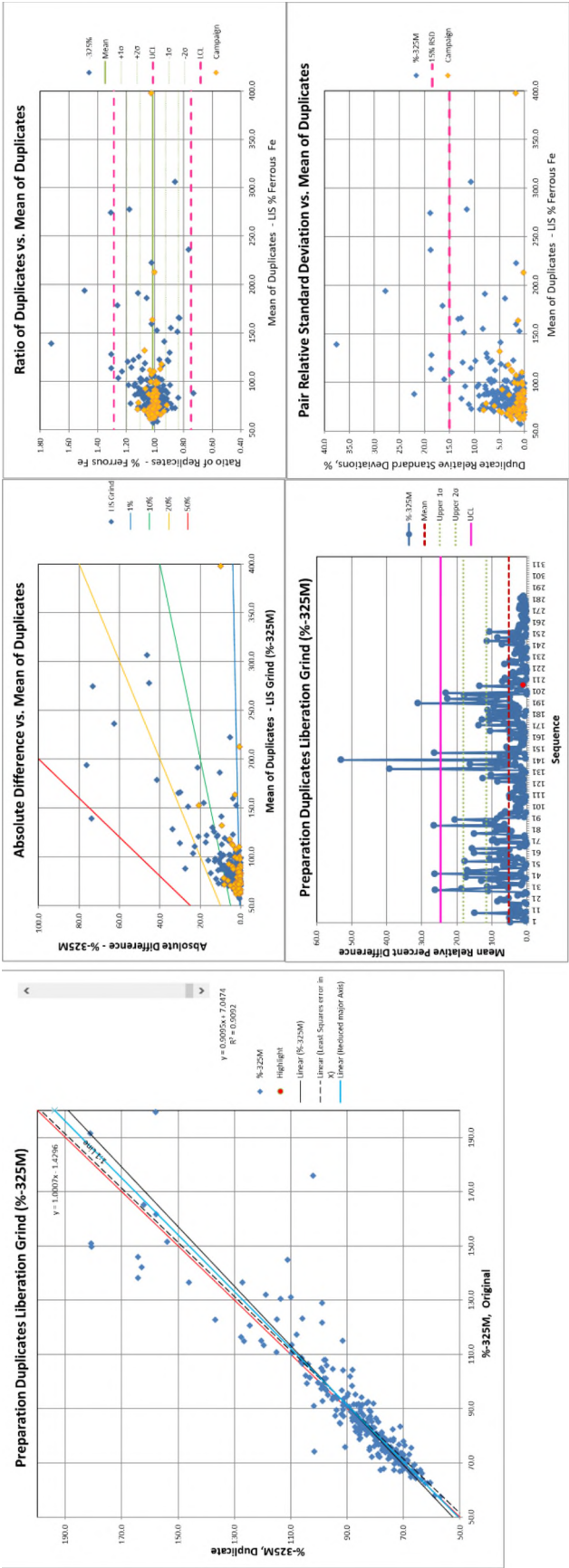
Figure 11-14: kWh/LT (Liberation Index) Preparation Duplicates



Source: Cliffs 2021.



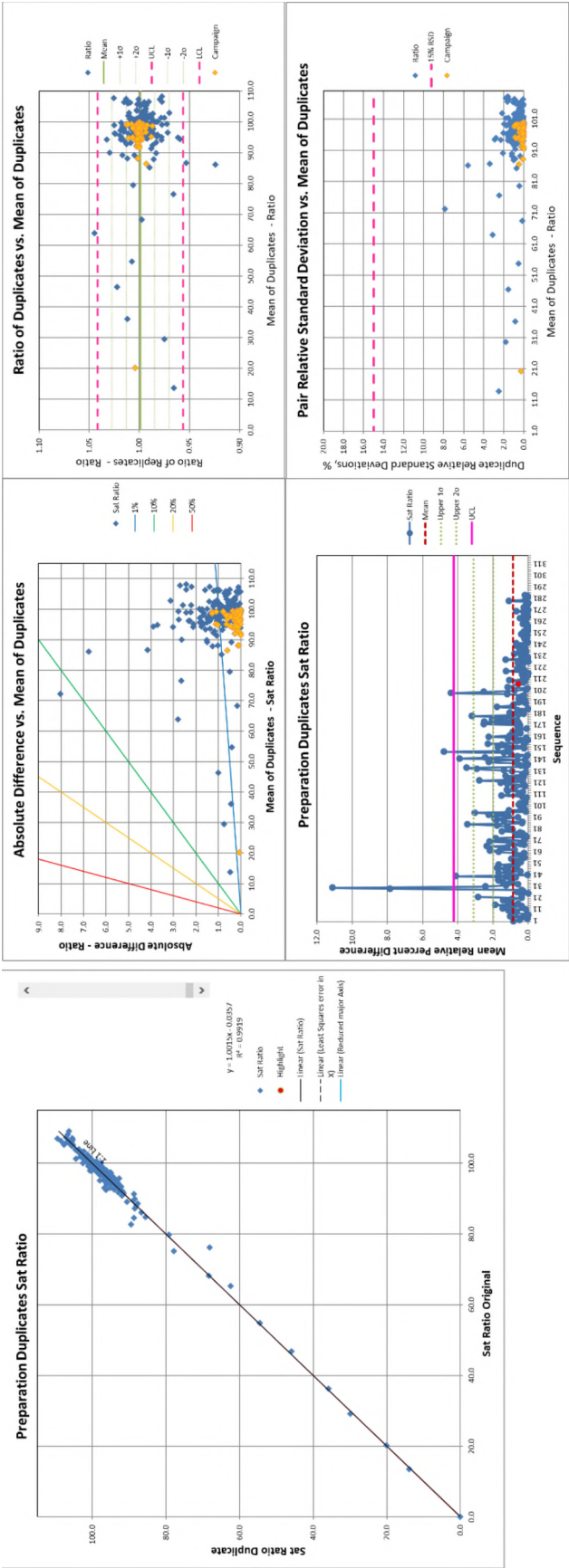
Figure 11-15: Grind (%-325 Mesh) Preparation Duplicates



Source: Cliffs 2021.



Figure 11-16: Sat Ratio Preparation Duplicates



Source: Cliffs 2021.



11.2.3.7 Duplicates Discussion

Additional charts are maintained and monitored for crude Fe, 10-minute concentrate Fe, and for individual timed-grinding results (6-minute, 10-minute, 14-minute) for DT silica, Satmagan MagFe, %-325 mesh, and weight recoveries that were used to calculate final results at target silica. Results for individual timed grinds should be the first element of investigation for any out-of-control final results. Also, prior to submission of final results to Cliffs, the Lerch laboratory manager reviews the coefficient of determination (r^2) for each grind versus grade-power-recovery curve generated by the three timed grinds for all duplicate samples (and normal samples in the dispatch). Any r^2 less than 0.9 triggers an automatic re-analysis of the DT products for each grind of the LIS test, so Cliffs does not typically receive results that fail this internal laboratory check.

The RSD is widely used in analytical chemistry to express the precision and repeatability of an assay. For the case of a duplicate pair, RSD is the square root of the square of the difference divided by two, divided by the duplicate pair mean:

$$\text{RSD} = \sqrt{[(x_1 - x_2)^2 / 2] / (x_1 + x_2) / 2}, \text{ expressed as a percentage}$$

In general, variation in the precision of grading variables is statistically negligible with increasing grade. However, the key analytical flowsheet variable controlling the accuracy of these assays is believed to be the recovery of concentrate from the Davis Tube. Virtually all campaign samples were well within an acceptable RSD of 15% for all major grading variables, which is approximately equal to a 20% relative difference acceptance.

Duplicate pairs are analyzed close enough in sequence that time-based biases are not observed in scatter plots or ratio plots for any variable.

11.2.4 Blanks

Due to the preponderance of metallurgical testing rather than traditional assays, blanks are not used in conjunction with QA/QC procedures, nor are they relevant.

11.2.5 Check Assays

Check assays are not currently conducted for HibTac drill core. Cliffs' Northshore Mine has the equipment and capability to conduct similar test work. Potential external providers include the Natural Resources Research Institute (NRRI) laboratory in Coleraine, Minnesota and Midland Research in Marble, Minnesota. Lerch is a small, independent provider that relies on Cliffs' facilities and equipment; strategic evaluation of additional laboratory providers should be considered, and a calibration study has recently been initiated by NRRI as possible overflow support for Cliffs' nearby United Taconite drill program.

11.3 Conclusions

QA/QC results for the period 2016-2019 are appropriate for the style of mineralization and are sufficient to generate a drill hole assay database that is adequate for mineralized material estimation by international reporting standards and supported with good agreement between planned and actual production over more than 45 years. Data are specifically robust for the key grading variables of -200 mesh weight recovery and magnetic iron for the study period; however, lack of analysis during the study period prevented investigation and documentation of failures that could have explained variation and further reduced variability.



The QP is of the opinion that HibTac's sample preparation and analytical QA/QC results from the 2016-2019 reporting period are acceptable to validate the drill hole assay database used for Mineral Resource estimation and meet NI 43-101 reporting standards. Sample preparation and analyses follow established, written procedures maintained by Lerch. The laboratory is accredited with ASQ/ANSI ISO-9001:2015 for its system of quality management. The samples are securely delivered to the assay laboratory, and the logging and sampling methods are professionally conducted in an unbiased manner.

11.4 Recommendations

- 1 Quality results documented in this report support an initial standard and duplicate submission rate of 5% each.
- 2 HibTac should submit a small number of "preparation duplicate" samples to a secondary accredited laboratory to document capability(ies), cost, and time-efficiency of alternate provider(s) and confirm that results are comparable to those of the current provider.



12.0 Data Verification

The SLR QP visited HibTac on April 28, 2021. While at site, the QP spoke with the technical team and found them to have a strong understanding of the mineralization types and their processing characteristics, and of how the analytical results are tied to the results. SLR received the project data from Cliffs for independent review as a series of MS Excel spreadsheets, a Vulcan database, and associated digital files (lithologic surfaces, topography surface, and pit shapes).

Data verification is the process of confirming that data has been generated with proper procedures, transcribed accurately from its original source into the project database, and is suitable for use for the purpose of the Technical Report.

During 2021, a data verification exercise was performed by Cliffs geologists (Larson, 2021) and audited by SLR for a random subset of HibTac drill holes for database drill collar, assay, and geotechnical data against as-drilled records. Approximately 10% of the drill holes (30 holes of 301 HibTac DD holes) within the current, 2021 LOM perimeter footprint were selected for database verification. Holes were selected to provide spatial coverage of the future mining areas and represent holes from a variety of time periods. Figure 12-1 shows the location within the HibTac LOM areas of the drill holes selected for verification.

The following aspects were reviewed:

- Collar survey information relative to historical logs or paper recorded logging. Comparison of database drill collar elevations against logs shows that the elevations of six of 30 drill holes were rounded to the nearest foot, likely due to rounding, resulting in lower-precision vertical control on the drill holes. The six audited holes drilled between 2014 and 2018 show discrepancies in horizontal control, approximately three feet north-south and 55 ft east-west. These discrepancies were likely introduced during a coordinate conversion exercise.
- A comparison of original lithology logging to the current database. Original classification of the Biwabik IF into the Upper Slaty, Upper Cherty, Lower Slaty, and Lower Cherty members has long been recognized throughout the Mesabi District. Throughout the history of drilling, HibTac geologists have evolved the classification scheme to further subdivide the original members into smaller subunits, each having continuity across appreciable areas. In preparation for the use of Vulcan for geologic modeling in 2019, HibTac's geological staff developed the currently utilized classification of the Biwabik IF that recognizes 16 subunits based on lithologic, metallurgical, and mineralogical characteristics within the local mine area.
- Printed/scanned lithologic logs were located for 29 of the 30 drill holes. Lithologic logs were compared against hard copy and scanned original construction records. Parameters checked include interval footages and logged lithologic units. All drill logs selected for examination were found to have recorded a geological interpretation based on the classification scheme that was in use at the time of drilling. No discrepancies were identified or noted during Cliffs' internal audit.
- Assays used for modeling crude ore grades and characteristics at HibTac are direct measurements taken from laboratory assays. Printed/scanned assay data sheets were located for 28 of the 30 drill holes. Hard copy or scanned assay data sheets were not located for any drill holes for calendar years 1991 and 1995. A hard copy or digital scanned log was not located for drill hole 201552. Database assay values for 9912 and



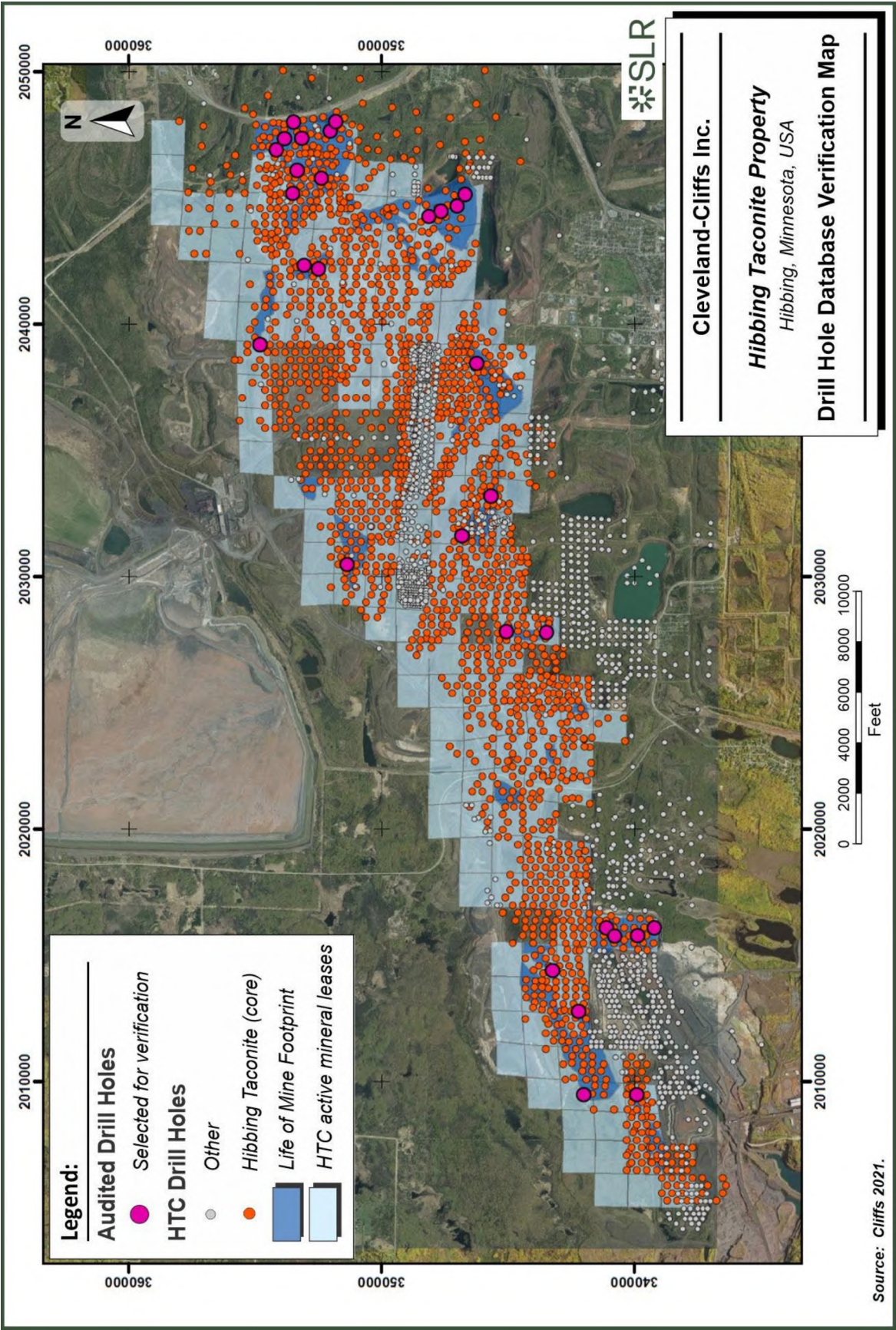
9945 reflect the original -200 mesh DT assays, and not later LIS re-assays. Thirteen of twenty-four -200 mesh DT assays for hole 200028 are updated in the database to reflect later LIS re-assays. Geotechnical data for drill holes from 2014-2019 are not included with the drill logs.

- Assay records were limited to a check on the total iron (crude). The selected holes span essentially the life span of the property and include holes that were assayed using both the single-grind, -200 mesh DT assay and the three-grind Liberation Index assay (since 2000). Since the method for calculating grading parameters such as weight recovery, magnetic iron, and concentrate silica are calculated slightly different for the two assay methods and are not reflected as raw data, comparison between assay results and database values are limited to total iron (crude).
- Seventy-eight feet of 6,165.2 cumulative assay feet were missing from two drill holes in the database. In addition, total iron (crude) was missing for 168 ft in one drill hole. No discrepancies between hard copy or digital (scanned) total iron and database iron values were noted.

HibTac has been in near-continuous production for almost 45 years. There has been adequate drilling to develop the Mineral Resource models that have been used in the Mineral Reserve models and for historically successful mine planning. The Mineral Resource models have performed well, indicating the drill hole database contains valid data. The QP is of the opinion that database verification procedures for HibTac comply with industry standards and are adequate for the purposes of Mineral Resource estimation.



Figure 12-1: Drill Hole Database Verification Map



13.0 Mineral Processing and Metallurgical Testing

13.1 Historical Metallurgical Testing

Metallurgical testing was conducted in the 1970s to develop the processing plant flowsheet. The testing resulted in the successful commissioning of the Plant. A description of the current process and plant performance is provided in Section 17 of this Technical Report. As the mine has expanded over the years, drill core samples were taken and analyzed to classify ore and waste rock for resource estimation, reserve classification, and ore grading. The ore is material that has metallurgical properties suitable for economic processing. These properties have been developed based on previous test work and processing plant experience.

Hibbing Taconite is a registered ISO 9001:2015 – ASQ/ANSI/ISO 9001:2015 company by SRI Quality System Registrar. This certification demonstrates the company's ability to consistently provide products and services that meet customer, applicable statutory, and regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements. Hibbing Taconite has held an ISO9001 Quality Management Certification since 1997.

The HibTac laboratory has written Standard Operating Procedures (SOP) for each of the tests conducted. The procedures follow ASTM procedures where applicable. Calibration and standard checks are performed regularly to ensure precise and accurate results.

13.2 Sampling and Metallurgical Testing

13.2.1 Drill Sample Preparation and Testing

Hibbing Taconite has historically conducted programs of systematic infill and step-out diamond drilling to identify the Mineral Resource and update mine plans accordingly. The drill core analysis is performed by Lerch. Lerch is an ISO9001:2015 Quality Management certified company. More information on drill core analysis can be found in Section 11 of this Technical Report.

13.2.2 Process Plant Metallurgical Sampling and Testing

13.2.2.1 Process Plant Routine Sample Locations

Hibbing Taconite conducts plant sampling for the purposes of process control and product quality reporting for compliance with daily plant and cargo specifications. These samples are collected on a routine basis from established sample collection points. The concentrate sample is a composite of concentrate samples composited throughout the shift. Filter cake samples are composited from the filter cake table feeders on each line. Green-ball samples are collected from each balling drum and composited by line. Pellet samples are collected from the discharge end of each individual furnace every three hours.

13.2.2.2 Concentrate and Pellet Sampling Procedures

Hibbing Taconite has an onsite metallurgical laboratory that continuously samples concentrate and pellets. The results are used to make process adjustments and ensure that a high-quality pellet is produced.

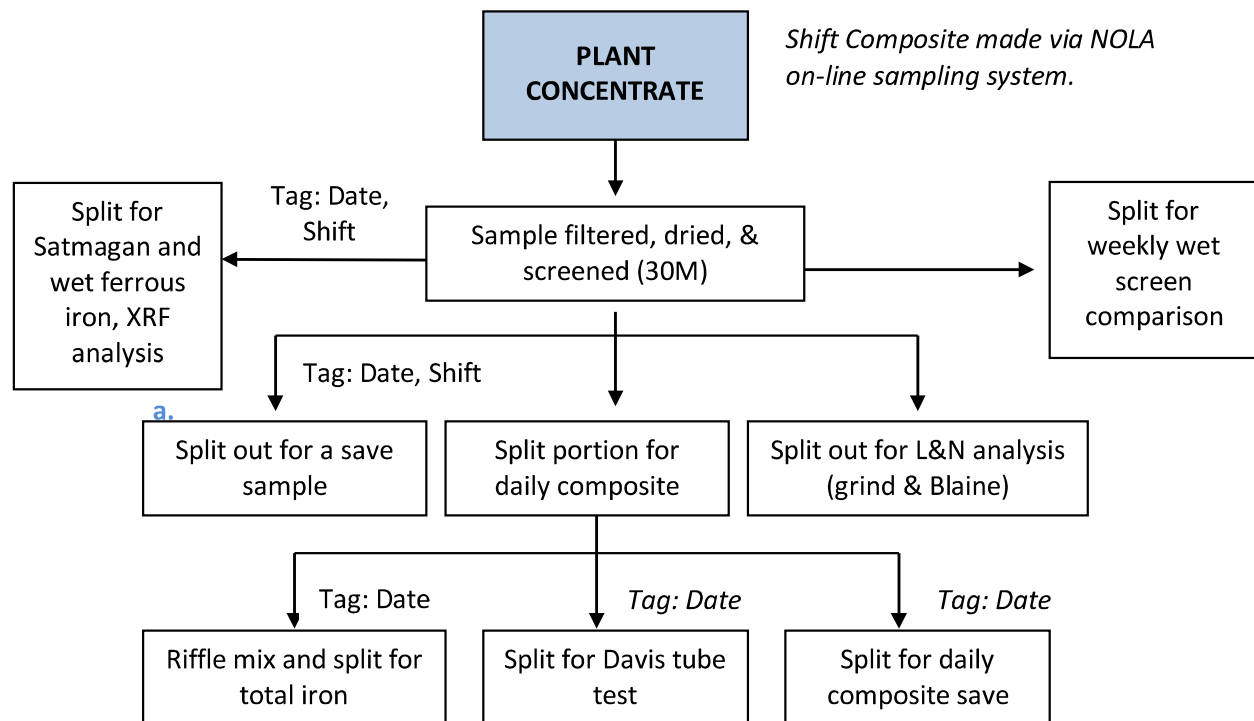


Plant concentrate is continuously run through the Nuclear On-Line Analyzer (NOLA) to measure the silica (SiO_2) content. This analysis guides the concentrator in making process adjustments to meet silica specifications. A composited shift sample from the NOLA is analyzed for grind, Blaine (specific surface area of fines per mass), Satmagan iron, ferrous iron, silica, and trace elements. A DT analysis is run on the daily composite sample to determine percent magnetic iron. This information is used to monitor the ore blend and process performance.

13.2.2.3 Plant Concentrate Sample Preparation Flowsheet

Figure 13-1 presents the concentrate sample handling and preparation procedures. Filter cake samples are collected every three hours from each phase of the plant (phase 1 is furnace lines 1 and 2; phase 2 is furnace line 3). Each sample is analyzed for moisture, Blaine, and grind. Green-ball samples are collected every three hours from each line and analyzed for moisture.

Figure 13-1: Plant Concentrate Sample Handling Flowsheet



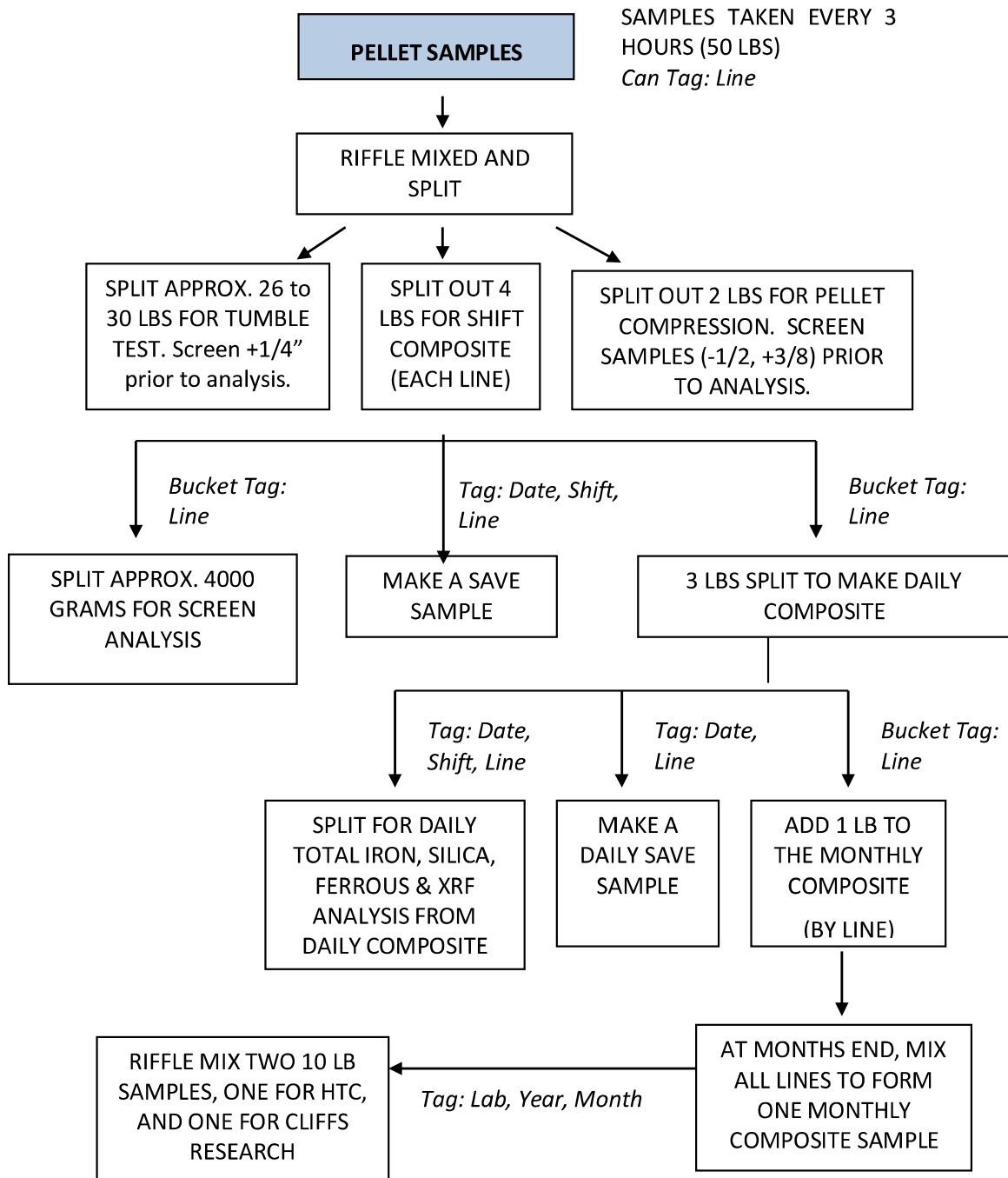
Source: Cliffs 2021.

13.2.2.4 Pellet Sample Preparation Flowsheet

Figure 13-2 presents the pellet sample handling and preparation procedures. Pellet samples are collected every three hours from each running line. An analysis is carried out to determine the compression strength and after tumble percent $+\frac{1}{4}$ in. and percent -28 mesh. Pellets are also composited into shift and daily samples, which are analyzed for size distribution, iron, silica, and trace elements. Silica and trace elements are determined by an XRF spectrometer. These analyses determine what process adjustments are needed to produce a high-quality product and assist in determining the cause of any quality issues. Below is the pellet sample handling flowsheet.



Figure 13-2: Pellet Sample Handling Flowsheet



Source: Cliffs 2021.



13.2.3 Material Characterization

13.2.3.1 Ore Quality Specifications

Ore quality specifications are established based on historical testing and experience. The current plant ore specifications are shown in the Table 13-1.

Table 13-1: Plant Ore Quality Specifications

Specification	Target	Limits
Silica	4.8%	4.4% - 5.4%
DD Weight Recovery	27.79%	25.0%-31.4%
Percent of 1-5/6 ore	75%	52% - 100%
Percent of 1-3/4 ore	15%	0% - 48%
Percent of 1-7 ore	7%	0% - 20%
Liberation Index	11.97 kW/LT	10.0 kW/LT – 12.8 kW/LT
Percent Magnetic Iron	19.3%	19.0% - 23.0%

13.2.3.2 Concentrate Specifications

The key concentrate specification is the silica. HibTac's concentrate silica specification is 3.80% to 4.30%.

13.2.3.3 Pellet Quality Specifications

The 2021 pellet quality specifications are presented in Table 13-2. The specifications are reviewed annually (and modified if needed) to meet the owners' and customers' requirements.

Table 13-2: 2021 Pellet Quality Specifications

Plant Product (Daily)	Standard	High Compression
% Dry Iron	66.15 + 0.20	66.00 + .30
% Dry SiO ₂	4.50 + 0.20	4.50 + .20
% +1/4 in. A.T.	96.0 + 0.8	97.0 + .5
% -28 Mesh A.T.	3.6 + 0.5	2.7 +.5
Average Compression (lb)	470+ 40	560+ 20
% -300 lb Compression	< 15.3	
% Sizing +1/2 in.	< 5.0	< 5.0
% Sizing -1/2 +3/8 in.	93.0 + 2.0	93.0 + 2.0

Boat Cargo (Boat)	Standard	High Compression
% Dry Iron	66.15± 0.20	66.00 ± .30
% Dry SiO ₂	4.50 ± 0.20	4.50 ± .20



Boat Cargo (Boat)	Standard	High Compression
% +1/4 in. B.T.	≥ 97.0	≥ 96.0
% +1/4 in. A.T.	≥ 95.2	≥ 96.0
% -28 Mesh A.T.	3.8 ± 0.5	$2.9 \pm .5$
Average Compression (lb)	460 ± 40	≥ 510
% -300 lb. Compression	≤ 15.3	
% Sizing -1/2 in. + 3/8 in.	92.0 ± 2.0	92.0 ± 2.0
% Moisture	≤ 3.25	≤ 4.0



14.0 Mineral Resource Estimates

14.1 Summary

Mineral Resource estimates for the HibTac deposit were prepared by Cliffs and audited and accepted by SLR using available data from 1938 to 2019.

The 2021 HibTac Mineral Resource estimate was completed using a conventional block modeling approach. The general workflow included the construction of a geological or stratigraphic model in Vulcan representing the Biwabik IF from drill hole logging and sampling data, which was used to define discrete domains and surfaces representing the upper contact of each unit of non-iron formation and iron formation subunits. Cliffs used the geologic model in Vulcan for resource estimation. Sub-blocked model estimates used inverse distance squared (ID^2) and length-weighted, 10 ft, uncapped composites to estimate relevant analytical variables (Satmagan MagFe, wtrec, kWhr/LT, Sat Ratio, and silica in concentrate) in an omni-directional, single search-pass approach, using hard boundaries between subunits, ellipsoidal search ranges, and search ellipse orientation informed by geology. Average density values are calculated in the block model as a function of Satmagan MagFe and total iron content.

Mineral Resources were classified in accordance with the definitions for Mineral Resources in CIM (2014) as incorporated into NI 43-101. Blocks were classified as Measured, Indicated, or Inferred using distance-based and qualitative criterion. Cliffs classifies the Mineral Resources based primarily on drill hole spacing, while classification is influenced by geologic continuity, ranges of economic criteria, and reconciliation. Some post-processing is undertaken to ensure spatial consistency and remove isolated and fringe blocks. The resource area is limited by a polygon and subsequent pit shell based on practical mining limits. A block of mineralized material is classified as Measured if the distance to the nearest drill hole is within 400 ft and estimated with interpolation pass 1. If the nearest drill hole is between 400 ft and 1,200 ft and estimated in pass 2, it is classified as Indicated. All remaining blocks are classified as Inferred; they are considered waste and excluded from the Mineral Resource estimate.

Estimates were validated using standard industry techniques including visual grade comparisons, reviews of block model coding, and statistical reviews of the global accuracy of the estimated variables and evaluation of the local accuracy through the preparation of comparative statistics.

To ensure that all Mineral Resource statements satisfy the “reasonable prospects for eventual economic extraction” requirement, the Mineral Resource estimate for HibTac considered factors significant to technical feasibility and potential economic viability. Mineral Resources were defined and constrained within LOM phase units prepared by Cliffs. Mineral Resources with an effective date of December 31, 2021, exclusive of Mineral Reserves, using a cut-off grade greater than 13% MagFe are presented in Table 14-1.



Table 14-1: Summary of Mineral Resources - December 31, 2021

Class	Crude Ore Mineral Resources	Crude Ore MagFe	Process Recovery	Pellets	Cliffs Attributed Basis	Cliffs Crude Ore Mineral Resources	Cliffs Pellets
	(MLT)	(%)	(%)	(MWLT)	(%)	(MLT)	(MWLT)
Measured	10.1	19.2	25.4%	2.6	85.3	8.6	2.2
Indicated	0.6	18.7	25.0%	0.1	85.3	0.5	0.1
Measured + Indicated	10.7	19.2	25.4%	2.7	85.3	9.1	2.3
Notes: 1. Tonnage is reported in long tons equivalent to 2,240 lb. 2. Mineral Resources are reported exclusive of Mineral Reserves and have been rounded to the nearest 100,000. 3. Mineral Resource estimates are based on a cut-off grade formula dependent on a few variables and restricted to material greater than 13% MagFe. 4. Classification of Mineral Resources is in accordance with CIM (2014) definitions. 5. Bulk density is calculated based on magnetic iron and total iron content. 6. Mineral Resources are 85.3% attributable to Cliffs and 14.7% attributable to U.S. Steel. 7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. 8. Numbers may not add due to rounding.							

Hibbing Taconite has been in operation for many years, and land and mineral control has been long established. The QP is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

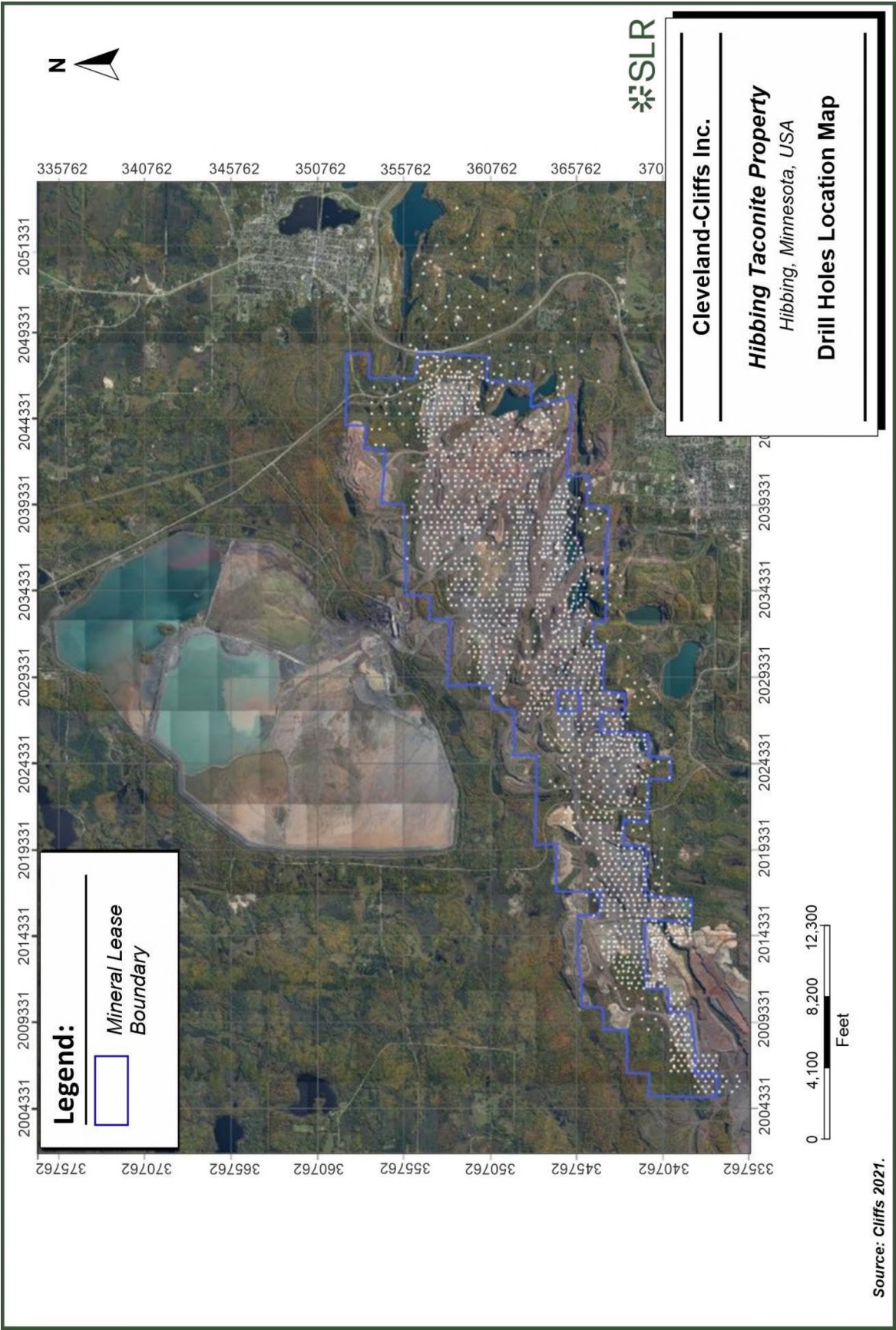
While the estimate of Mineral Resources is based on the QP's judgment that there are reasonable prospects for eventual economic extraction, no assurance can be given that Mineral Resources will eventually convert to Mineral Reserves.

14.2 Resource Database

Cliffs maintains a property-wide drill hole database in acQuire, with exports used to populate Vulcan modeling software. The HibTac Vulcan resource database dated August 28, 2020 includes drill hole collar locations, assay, and lithology data from 2,655 drill holes totaling 560,136 ft of drilling, completed between 1974 and 2019. Of these, only 1,689 drill holes pertain to the resource database and have a total of 330,158 ft of drilling. The minimum depth is 24.0 ft, and the maximum depth is 927.0 ft; the average depth is 195.5 ft. The drilling is on an approximate 400 ft x 400 ft grid. Figure 14-1 shows the location of the drill holes at HibTac.



Figure 14-1: Drill Hole Location Map



There are a total 17,405 lithology records and 27,950 assay (samples) records that have values for at least one key economic variable (KEV). Key economic variables include Satmagan MagFe, wtrec, kWhr/LT, Sat Ratio, and silica in concentrate.

14.3 Geological Interpretation

14.3.1 Stratigraphy

The geologic model includes surfaces generated in Vulcan for structural floors of the stratigraphic units. The stratigraphic units in the drill hole database are loaded into the Vulcan software Integrated Stratigraphic Modeler to create Vulcan map files, which are then used to create grid surfaces for the floor of each unit. Table 14-2 shows the stratigraphic units that are modeled in this way. Subunits 1-7, 1-6, 1-5, 1-4, and 1-3 are considered to be ore types. All other subunits are considered to be non-ore types.

Table 14-2: Modeled Stratigraphic Units

Unit	Member of Biwabik IF	Code	Ore
Stockpiles		504	No
Topographic surface		500	No
UC6	Upper Cherty	311	No
UC5	Upper Cherty		No
UC4	Upper Cherty		No
UC3	Upper Cherty		No
UC2	Upper Cherty		No
UC1	Upper Cherty		No
3-1*	Upper Cherty	311	No
2-1	Lower Slaty	211	No
1-8	Lower Cherty	181	No
1-7	Lower Cherty	172	Yes
		171	Yes
1-6	Lower Cherty	162	Yes
		161	Yes
1-5	Lower Cherty	153	Yes
		152	Yes
		151	Yes
1-4	Lower Cherty	141	Yes
1-3	Lower Cherty	132	Yes
		131	Yes
8-3	Lower Cherty	831	No
1-2	Lower Cherty	121	No



Unit	Member of Biwabik IF	Code	Ore
1-0	Lower Cherty	101	No
Top of Quartzite		1	No

The stratigraphic model is constructed using the integrated stratigraphic modeler package of Vulcan software. The modeling sequence progresses as follows:

- Surfaces are created that are used in defining the rest of the geologic units:
 - Floor of glacial till or topography, and
- Roof, floor, and structural thickness are created for each of the stratigraphic subunits:
 - The structural thickness and floor of the 161 subunit is created, then
 - The structural floor, thickness, and roof are created for each successive subunit overlying and underlying the 161, and
 - The Pokegama Quartzite (code 1) is given a constant thickness of 20 ft.
- Units 131, 151, 161, and 171 are split using grid arithmetic and tested against elevation of the underlying and overlying subunits:
 - 131: The 131 subunit is redefined as the lower 10 ft of the 131 subunit. The remaining upper subunit is defined as the 132 subunit,
 - 151: The 151 subunit is redefined as the lower 10 ft of the 151 unit, the 152 is defined as the 20 ft above the new 151 subunit, and the remaining thickness is defined as the 153 subunit,
 - 161: The 161 unit is redefined as the lower 15 ft of the 161 subunit, and the remainder of the original unit is defined as the 162 subunit, and
 - 171: The 171 subunit is redefined as the lower 10 ft of the original 171 subunit, and the remaining thickness is defined as the 172 subunit.
- Triangulation models are created of the floor grid for each of the units.

Fault zones are treated as vertical, and a fault layer in the Vulcan model effectively creates domain boundaries to the stratigraphic modeling.

The resulting units are listed in Table 14-3 and used in the block model and in coding the composite file for mineralized material estimation.

Table 14-3: Stratigraphic Codes for Block Model and Composites

Unit	Model Code	Ore
Stockpiles	504	No
3-1	311	No
2-1	211	No
1-8	181	No
1-7	172	Yes
	171	Yes
1-6	162	Yes



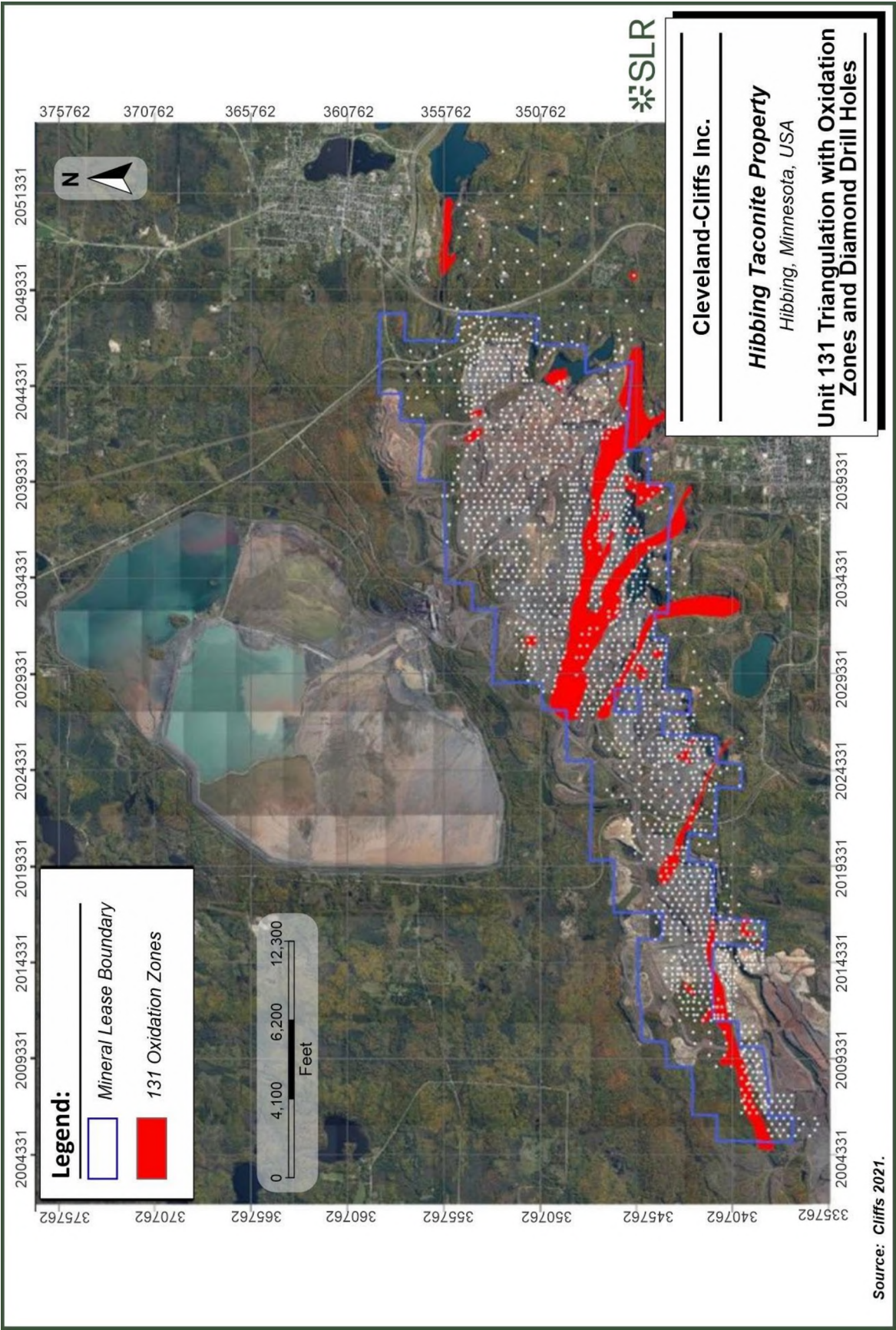
Unit	Model Code	Ore
	161	Yes
1-5	153	Yes
	152	Yes
	151	Yes
1-4	141	Yes
1-3	132	Yes
	131	Yes
8-3	831	No
1-2	121	No
1-0	101	No
Quartzite	1	No

14.3.2 Oxidation

Secondary oxidation within the deposit is structurally and stratigraphically controlled. Oxidation is found close to structural controls such as joints and faults and is also stratabound within specific geologic subunits. Oxidation zones are modeled using the ratio (Ratio) between Satmagan-measured magnetic iron and the measured total iron in a DT concentrate in the composite database. Ratios of less than 90 are considered to be oxidized waste. In addition, some intervals of poor core recovery that visually appear to be oxidized based on drill logs have been modeled in the oxidation zones despite Ratio values greater than 90. Wireframe solids are created for the oxidized zones for each stratigraphic unit. The solids are used to code the block model and the composite database. Figure 14-2 shows unit 131 with composites and outlines of the oxidized areas.



Figure 14-2: Unit 131 Triangulation with Oxidation Zones (Red Outlines) and Diamond Drill Holes



14.4 Resource Assays

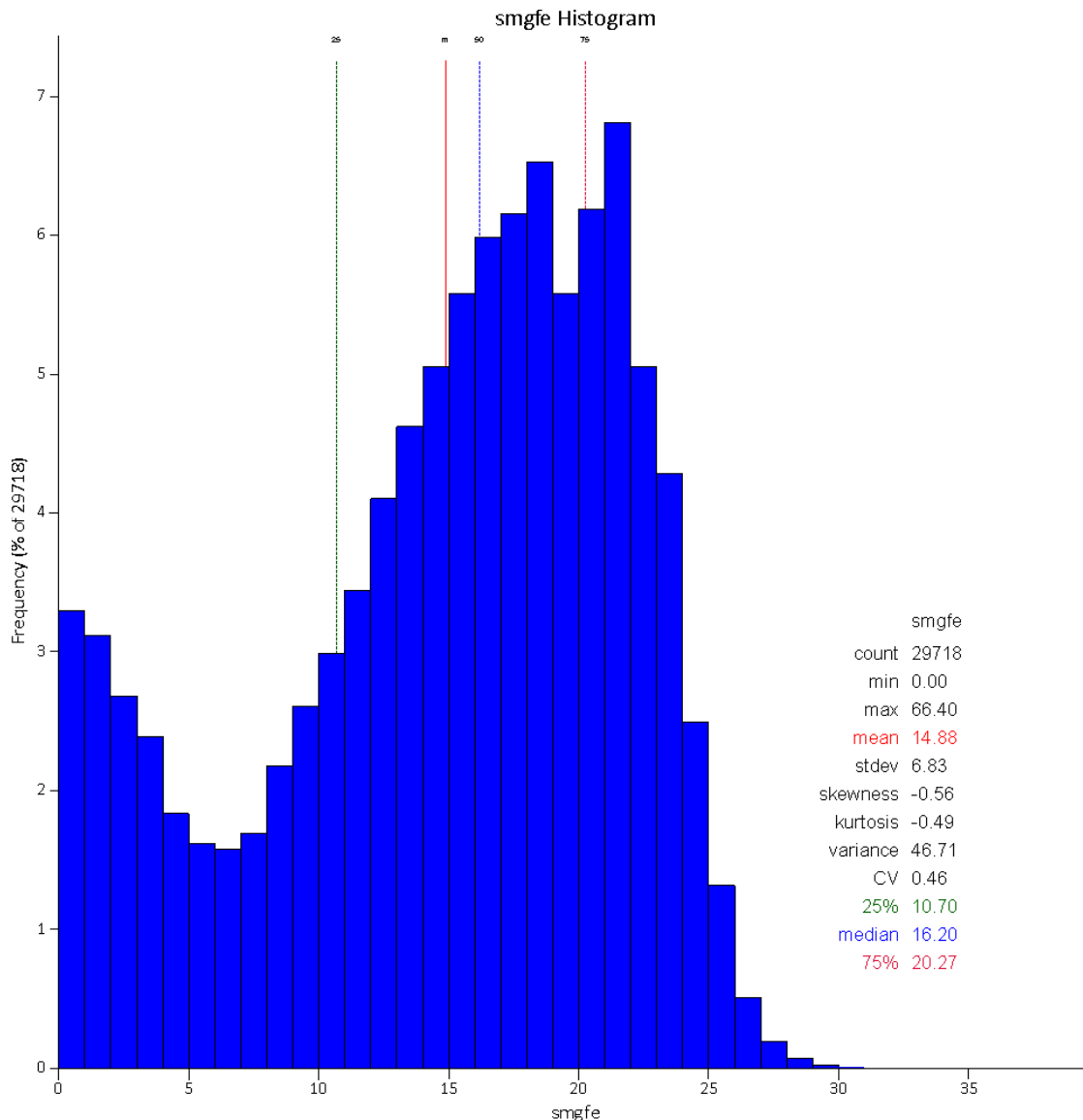
The unweighted data presented in Table 14-4 is effective as of August 27, 2020.

Table 14-4: Drilling Statistics

Variable	Count	Min (%)	Median (%)	Max (%)	Mean (%)	CV
smgfe	18,967	0.10	15.23	56.32	13.62	0.52
wtrec	19,389	0.10	22.70	44.86	20.11	0.50
silica	17,941	0.00	3.00	46.00	4.00	0.67
ciron	18,955	0.10	27.83	59.23	25.80	0.33
iron	18,533	0.10	67.67	98.60	54.94	0.45
satfe	16,431	0.10	65.28	75.37	59.17	0.27
ratio	16,422	0.00	95.00	235.00	87.00	0.25
kw_lt	8,713	1.00	12.35	25.00	12.32	0.52
libwt	8,709	0.10	24.26	82.46	21.54	0.45
libfe	5,609	1.00	NaN	29.99	20.39	0.29
lib325	8,710	0.10	74.20	150.00	69.94	0.45



Figure 14-3: Grade Histograms: Hibbing Assay Grade Histogram (MagFe_dt)



14.5 Compositing and Capping

14.5.1 Treatment of High Value Assays

Where the assay distribution is skewed positively or approaches log-normal, erratic high-grade assay values can have a disproportionate effect on the average grade of a deposit. One method of treating these outliers in order to reduce their influence on the average grade is to cut or cap them at a specific grade level. Assessing the influence of outliers involves a number of statistical analytical methods to determine an appropriate capping value including preparation of frequency histograms, probability plots, decile analyses, and capping curves. Using these methodologies, Cliffs examined the selected capping values for each of the KEVs. Capping limits for the KEVs are shown in Table 14-5.



Table 14-5: HibTac Capping Limits for Key Economic Variables

Variable	Cap Level
smgfe (%)	none
wtrec (%)	none
silica (%)	none
ciron (%)	none
iron (%)	none
satfe (%)	none
ratio	none
kw_lt	25
libwt	100
libfe	30
lib325	150

14.5.2 Compositing

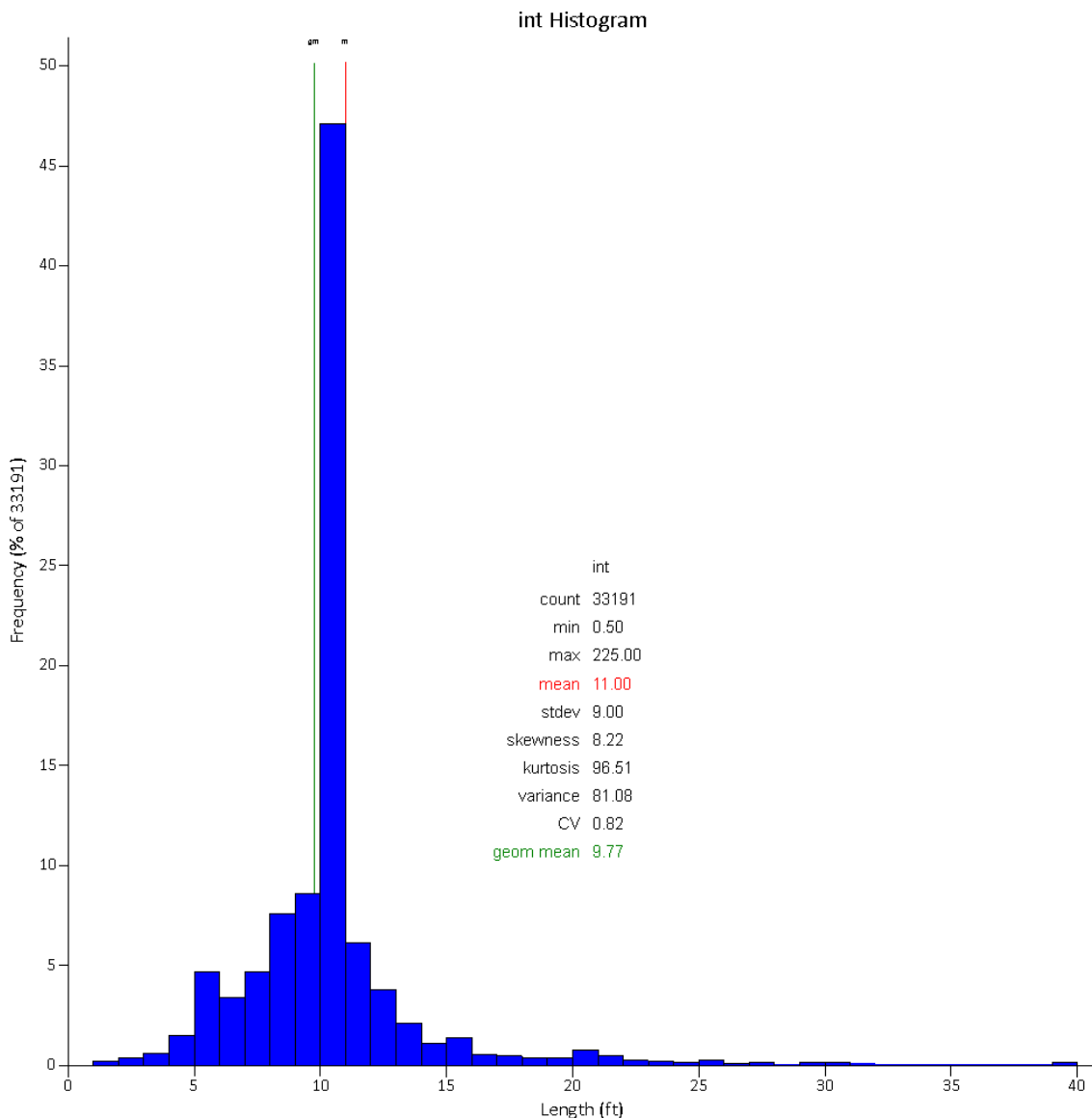
The composite lengths used during interpolation were chosen considering the predominant sampling length, the minimum mining width, style of mineralization, and continuity of grade. Sample lengths range from 0.5 ft to 88.5 ft, with 49% of the samples taken at 10-ft intervals (Figure 14-4). Given this distribution, HibTac chose to composite to 10 ft lengths.

Compositing is performed using Vulcan software. A 10-ft run-length compositing method is used, with the majority geological unit code recorded and intervals broken by geological domain. There are 39,999 composite intervals in the composite database. The average composite length is 6.72 ft. The smallest composite length is 0.001 ft, and the longest is 10 ft.

The QP is of the opinion that this composite length is appropriate for this style of mineralization.



Figure 14-4: HibTac Histogram of Sample Length



14.6 Variography

HibTac does not use kriging in its estimations as the deposit is homogeneous and stratigraphic. HibTac reported that in 2007 a limited variography study on Liberation Index variables was completed by Isobel Clark of Geostokos Limited; however, this study is not material to the Mineral Resource estimate and was not used.

Current estimation practices at HibTac do not incorporate modeled semi-variogram results within the estimation, as all variables are interpolated using an inverse distance weighted (IDW) approach. Cliffs elected to use ID² for the estimation of quality variables.

14.7 Block Models

Sub-block and regularized block models were created by Cliffs' geologists and audited by SLR to support the Mineral Resource estimate for the iron deposits at the Property.



14.7.1 Base Sub-blocked Model

A sub-blocked base model (htcmodel2019_Q1_R1.bmf) for HibTac constructed in 2019 using Vulcan software is oriented with an azimuth of 90°, a dip of 0.0°, and a plunge of 0.0° to align with the overall strike of the mineralization within the model. Sub-blocking was used to give a more accurate volume representation of the geologic contacts (wireframes) in the gently dipping ore body using a parent block size of 100 ft by 100 ft in the X (along strike) and Y (across strike) direction and 2,000 ft in the Z (vertical or bench height) direction, honoring modeled geological surfaces. Sub-blocks are 100 ft (X) by 100 ft (Y) by 1 ft (Z). The model fully enclosed the modeled resource wireframes, with the model origin (lower-left corner at lowest elevation) at State Plane MN North NAD27 coordinates 2,004,450E, 33,595N and 0.0 (MASL) elevation. A summary of the block model extents is provided in Table 14-6. Stratigraphic codes as shown previously in Table 6-1 are assigned to the blocks during block model generation.

After the block model is created, the variable OXZONE is given a default value of “non oxidized”, and those blocks where the centroid is within the oxide wireframes solid are given a value of “oxidized.” The coding is done by stratigraphic unit using wireframes specific to each unit.

The QP considers the HibTac base block model parameters to be acceptable for a Mineral Resource estimate.

Upon completion of a base model by Cliffs’ geologists, the block model is delivered to the Cliffs Mine Engineering team for re-blocking and estimation of Mineral Resources and Mineral Reserves.

Table 14-6: Block Model Parameters

Deposit	Schema	Bearing	Plunge	Dip	Origin			Block Model Length (ft)			Block Dimension (ft)		
		(°)	(°)	(°)	X	Y	Z	X	Y	Z	X	Y	Z
HibTac	Parent	905	0	0	2,004,450	335,950	0	54,600	23,000	2000	100	100	200
	Sub-block										100	100	1

14.7.2 Estimation Methodology

Grade interpolation at HibTac was conducted in Vulcan using ID² and hard boundaries, with a one pass omni-directional search radius of 6,000 ft; a minimum of one and maximum of 15 samples were used per estimate within BIF units. The following variables are estimated or assigned into the block model using ID² weighting:

- Davis Tube Variables include:
 - ciron: Total Fe % in crude sample
 - smgfe: % magnetic Fe in crude sample;
 - wtrec: weight recovery from Davis Tube test;
 - iron: total Fe % in concentrate;
 - satfe: % magnetic Fe in concentrate;
 - ratio: ratio of satfe to iron;
 - silica: % silica in concentrate;



- cmgfe: calculated crude magnetic Fe from 10-minute grind DT wtrec and concentrate Fe; and
- oxidation code
- Liberation Index variables include:
 - libwt: weight recovery at target concentrate silica;
 - lib325: %-325 mesh (grind) at target concentrate silica;
 - kw_lt: “Liberation Index”, relative power to achieve target concentrate silica;
 - ratcal: calculated ratio; and
 - oxidation code

The estimations are conducted as follows:

- The DT variables are estimated in all blocks using only the non-oxidized composites. The variables for the non-ore types are estimated in a single pass per unit. For the ore types, the estimation is conducted for each variable separately.
- The DT variables in the ore type blocks coded as oxidized are estimated using the oxidized composites. The non-ore type blocks are not re-estimated in this pass.
- The Liberation Index variables are estimated in the ore type blocks using only the non-oxidized composites. The non-ore type blocks are not estimated, as there is little Liberation Index data in the non-ore types. The Liberation Index variables for the blocks coded as oxidized are estimated using the oxide composites. The non-ore type blocks are not estimated as there is little or no Liberation Index data in the non-ore types.
- A temporary variable is estimated for the distance (ldist) to the closest composite used in the estimation for non-oxidized blocks. This estimation uses a single composite in the estimation.
- A second temporary variable is estimated for the distance (ddist) to the closest composite used in the estimation for oxidized blocks. This estimation uses a single composite in the estimation.

14.7.3 Resource and Reserve Regularized Block Model

A new mine planning block model for the Mine (htcmodel2019_Q1_R1_l.r.bmf) was constructed from the base geologic model (htcmodel2019_Q1_R1.bmf). The mine planning block model was re-blocked (regularized) to 100 ft by 100 ft by 20.0 ft. Scripts within Vulcan are executed that add variables for economic evaluation and mine planning, flag in-pit stockpile backfills, flag the current topography, re-block the model to represent the selective mining unit (SMU), incorporate crude ore loss and dilution impacts, and reinforce cut-off grades.

Iron formation can only be initially considered as “candidate” crude ore if the stratigraphy is one of the geologic subunits (as detailed in Section 6.0). All other geologic subunits are considered to be waste rock.

14.7.4 Post-estimation Script Calculations

After estimation is completed, scripts functions include adding variables, removing negative values, flagging blocks with missing or bad data, calculating ratios, adjusting silica content by



geologic layer, depleting resources to the current topographic surface, assigning ore type, and classification.

The empirical silica adjustment is based on reconciliations between the DT silica in the block model and concentrate silica produced by the less efficient plant. Silica_adj is used for ore quality prediction (ore grading) and reconciliations.

Candidate crude ore must satisfy the metallurgical cut-off grades described in Table 14-7 to be considered crude ore blocks:

Table 14-7: Assignment of Ore Types and Metallurgical Cut-off Grades

Otype2 Code	Description
0	default
1	General waste (material below 131 layer and not mined)
2	surface and in-pit stockpiles
3	-10 (% smgfe) rock stockpile material.
4	+10 (% smgfe) rock stockpile material.
5	Low or lean Taconite (for layers 131, 132, and 141)
6	High Taconite (layers 151, 152, 153, 161, 162)
7	High Taconite (layers 171, 172)
8	Upper Cherty Low Taconite (layers uc1, uc2, uc3, uc4, uc5, uc6)

Otype2 Code	Kw_lt (%)	Silica_adj (%)	Ratio	wtrec (%)	smgfe (%)	Ore Type
5	< 17.0	< 6.5	> 90	≥ 15.0	≥ 13.0	1-3/1-4 ore
6	< 17.0	< 6.5	> 90	≥ 18	≥ 15.0	1-5/1-6 ore
7			> 90	≥ 18	≥ 18.0	1-7 ore

14.7.5 Bulk Density

A density study was performed at HibTac in 2004-2005, comprising more than 1,100 core samples from the deposit. Samples were typically full 10 ft run lengths. Density is reported as a tonnage factor, ft³/LT, at HibTac. Results of the study indicate that tonnage factor is a function of the iron content of the rock, and that function is now used to assign density to the block model for the Biwabik IF. The tonnage factor of glacial overburden is set at 18.0 ft³/LT, and the tonnage factor of stockpile material is set at 15.0 ft³/LT.

Currently, density for the Biwabik units is calculated in the block model as a function of Satmagan magnetic iron and total crude iron content. The equation is:

$$\text{Density (LT/ft}^3\text{)} = 1 / (13.05566 - (0.03179 * (\text{smgfe})) - (0.0420424 * (\text{ciron})))$$

14.8 Cut-off Grade

To ensure that all Mineral Resource statements satisfy the “reasonable prospects for eventual economic extraction” requirement, the Mineral Resource estimate for the HibTac deposit



considered factors significant to technical feasibility and potential economic viability. Mineral Resources were defined and constrained within LOM phase units, prepared by Cliffs.

14.9 Classification

Definitions for resource categories used in this Technical Report are those defined by CIM (2014) as incorporated into NI 43-101. Mineral Resources are classified into Measured, Indicated, and Inferred categories.

Cliffs classifies the Mineral Resources based primarily on drill hole spacing; classifications are influenced by geologic continuity, ranges of economic criteria, and reconciliation. Some post-processing is undertaken to ensure spatial consistency and remove isolated and fringe blocks. The resource area is limited by a polygon and subsequent pit shell based on practical mining limits. A block of ore is classified as Measured if the distance to the nearest drill hole is within 400 ft and estimated with the interpolation pass 1. If the nearest drill hole is between 400 ft and 1,200 ft and estimated in pass 2, it is classified as Indicated. All remaining blocks are classified as Inferred; they are considered waste and excluded from the Mineral Resource estimate. Classification of LOM Mineral Resources inclusive and exclusive of Mineral Reserves is shown in Figure 14-5 and Figure 14-6, respectively.

In addition to numeric-based parameters, the relative confidence of all the data inputs during the assignment of the resource confidence category has been considered, including:

- the reliability of the drilling data,
- reliability or certainty of the geological and grade continuity, geological model interpretation, structural interpretation, and the assay database,
- reliability of inputs to assess reasonable prospects for eventual economic extraction and cut-off grades (e.g., the ability to obtain permits, social license, etc.), and
- legal and land tenure considerations.

The QP is of the opinion that the classification at HibTac is acceptable for the disclosure of Mineral Resources.



Figure 14-5: LOM Phase Mineral Resource Classification

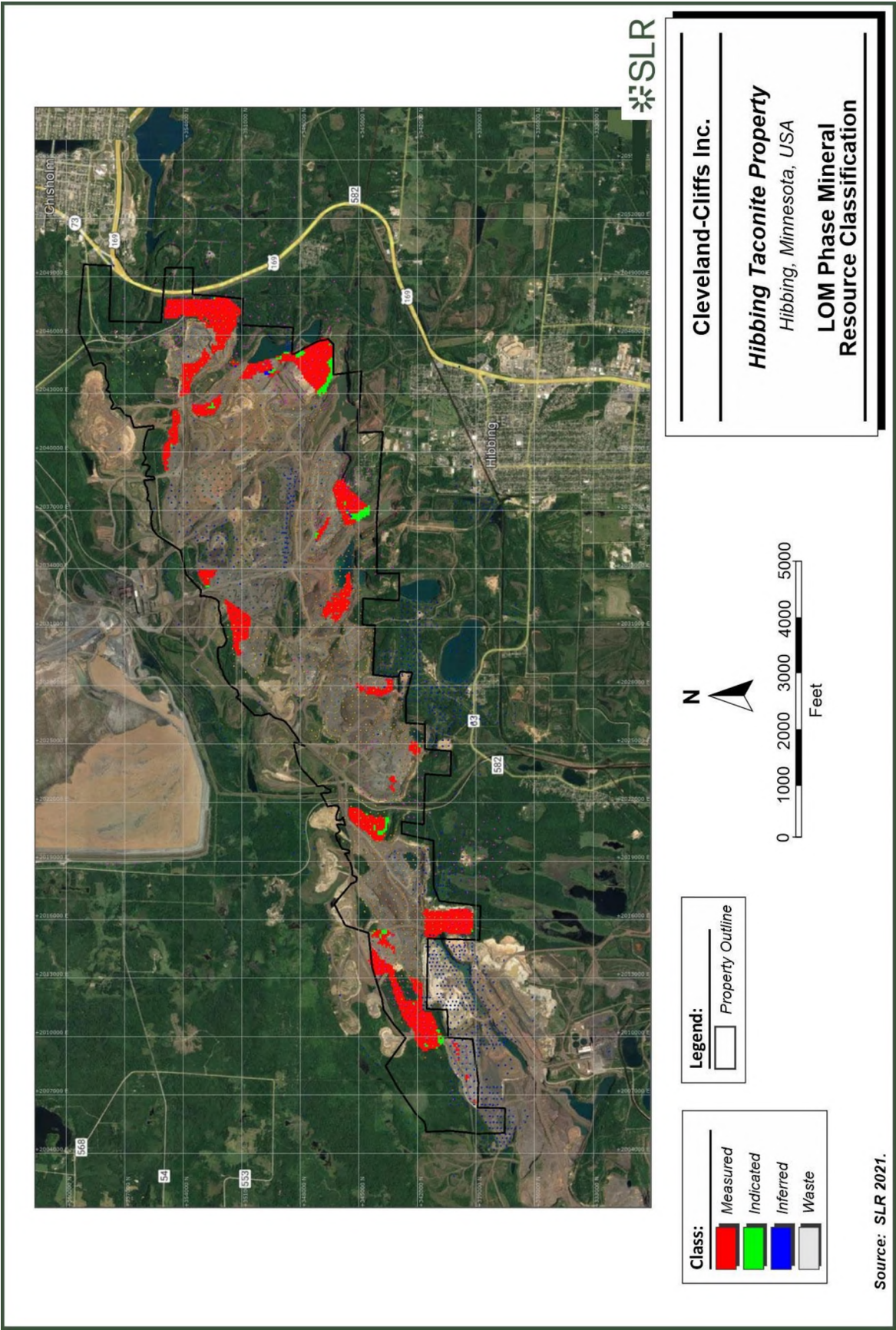
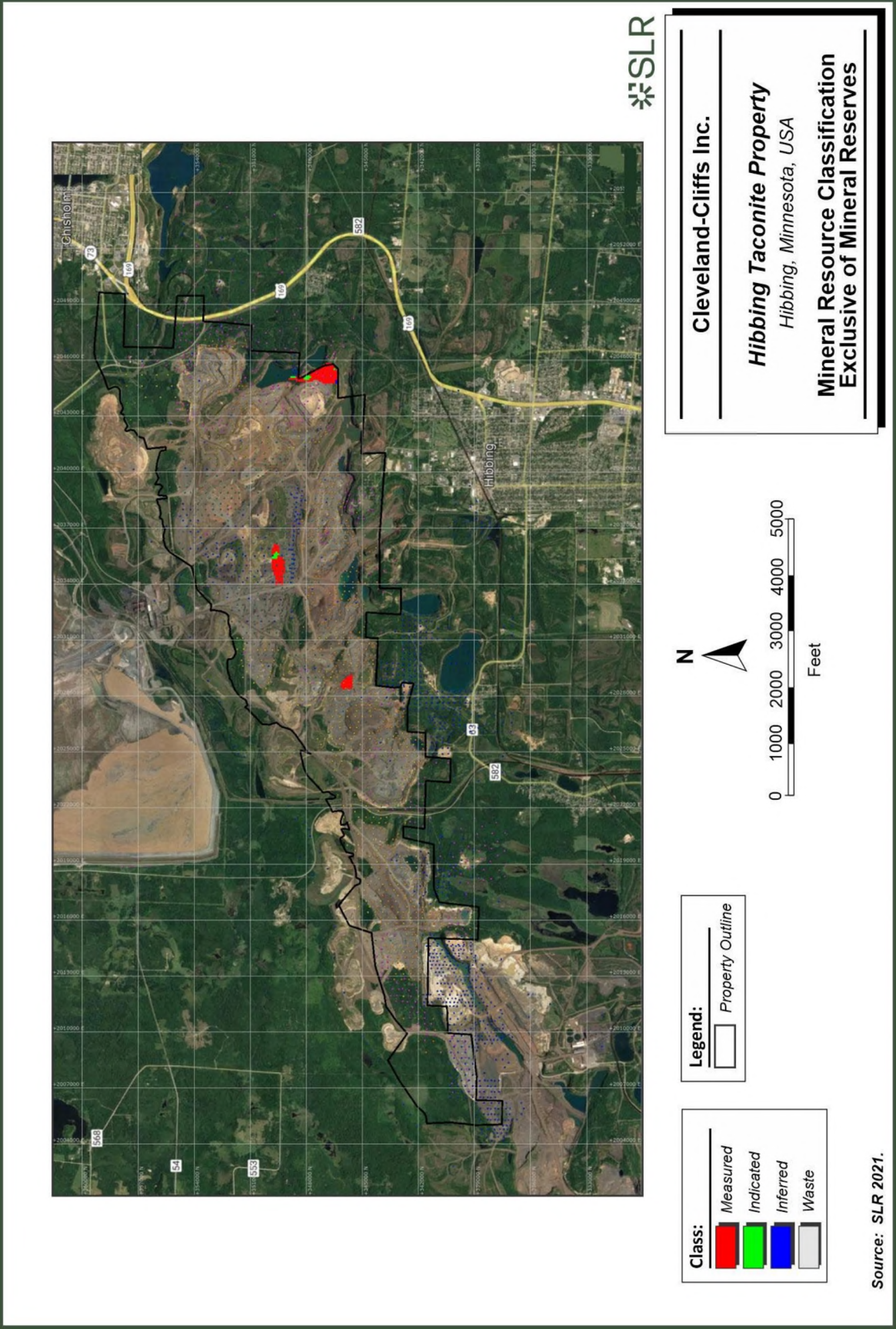


Figure 14-6: Mineral Resource Classification Exclusive of Mineral Reserves



Validation of the Mineral Resource estimate results included visual grade comparisons, reviews of block model coding, and statistical reviews of the global accuracy of the estimated variables and evaluation of the local accuracy through the preparation of comparative statistics.

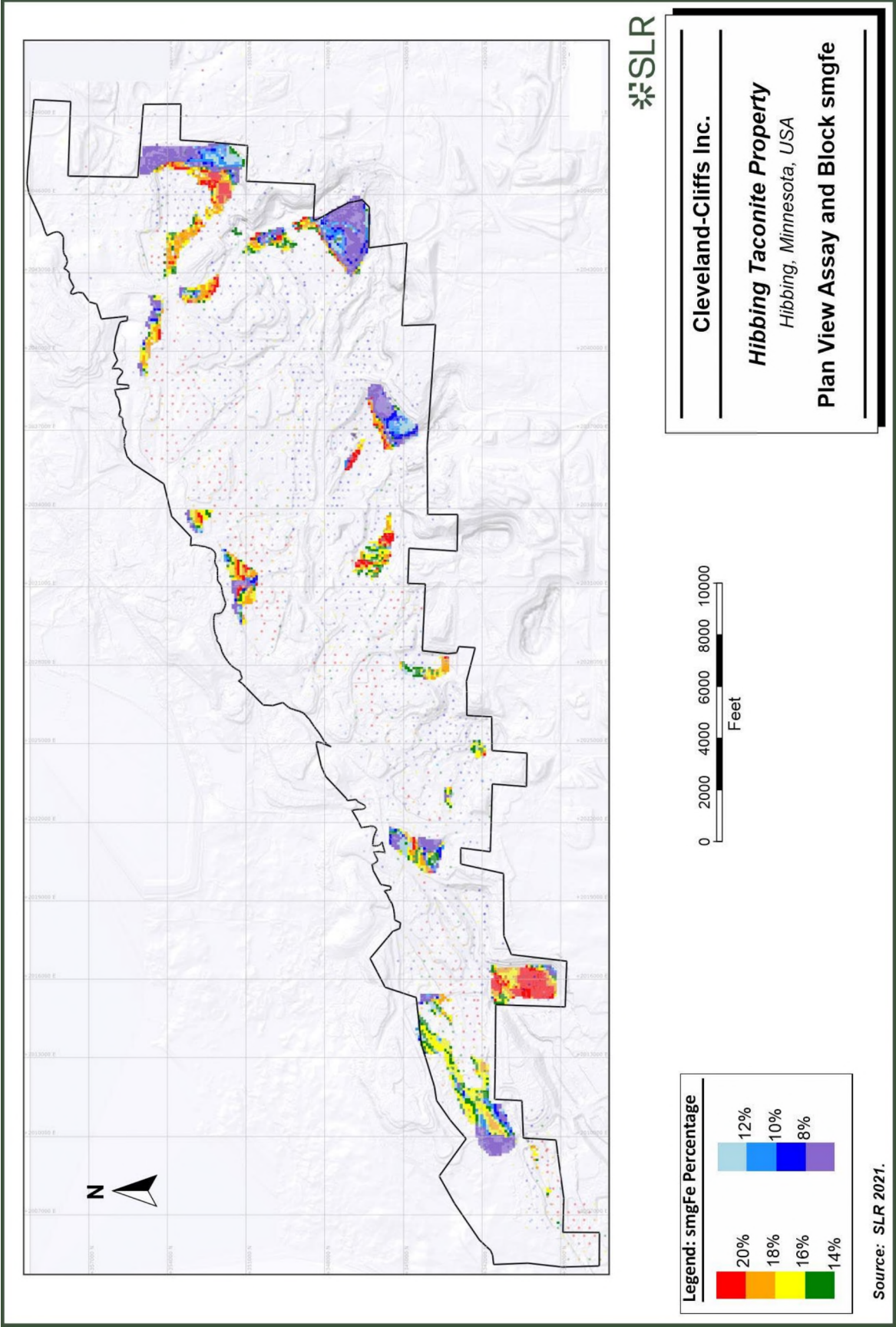
14.9.1 Visual Inspection

Visual comparisons between the composites and estimated block grades were conducted on vertical sections and plan views. The QP is of the opinion that the estimated block grades reflect the local drill hole composite value and that the trends displayed are as intended. A plan-view comparison is shown in Figure 14-7.

SLR reviewed the smgfe variable relative to blocks, drilled grades, and composites. SLR observed that the block grades exhibited general accord with drilling and sampling and did not appear to smear significantly across sampled grades.



Figure 14-7: Plan View Assay and Block smgfe



14.9.2 Comparative Statistics Composites vs. Block Grades

Comparative statistics between composite and block data was not reliable due to the clustered nature of the drill data. In place of this, the final estimated value was compared to a NN estimate, as a proxy of the declustered input data. No reconciliation with the short-term model was carried out; however, SLR understands that a comprehensive reconciliation study is currently underway.

The mean grades in composites and blocks compare favorably for the smgfe evaluated in Lower Cherty and Upper Cherty (Table 14-8, Figure 14-8 through Figure 14-10).

Table 14-8: Comparative Statistics of Composites and Blocks for Key Economic Variables

Data	Domain Field	Domain	Variable	Count	Min (%)	Max (%)	Mean (%)	CV	StDev (%)	% Mean Δ
Block Model	otype2	1	smgfe	162,749	0.47	25.99	8.99	0.41	3.67	15.70%
Composite	otype2	1	smgfe	2,958	0.10	26.53	7.77	0.68	5.27	
Block Model	otype2	3	smgfe	144,719	0.01	10.00	4.60	0.67	3.07	
Composite	otype2	3	smgfe							
Block Model	otype2	4	smgfe	182,657	10.00	27.34	13.85	0.17	2.39	
Composite	otype2	4	smgfe							
Block Model	otype2	5*	smgfe	110,011	13.00	26.95	16.34	0.10	1.58	10.26%
Composite	otype2	5*	smgfe	4,994	0.30	27.12	14.82	0.28	4.21	
Block Model	otype2	6*	smgfe	147,025	15.00	27.36	19.84	0.10	2.01	19.45%
Composite	otype2	6*	smgfe	7,227	0.13	37.69	16.61	0.45	7.55	
Block Model	otype2	7*	smgfe	37,950	15.00	26.49	17.49	0.10	1.70	32.30%
Composite	otype2	7*	smgfe	1,773	0.23	29.00	13.22	0.50	6.60	
Block Model	otype2	8	smgfe	254	13.01	20.78	15.72	0.10	1.62	84.72%
Composite	otype2	8	smgfe	695	0.10	56.32	8.51	0.68	5.79	
Block Model	otype2	1	wtrec	162,749	0.01	34.42	13.52	0.39	5.22	12.85%
Composite	otype2	1	wtrec	2,951	0.10	38.80	11.98	0.65	7.76	
Block Model	otype2	3	wtrec	144,719	0.00	32.73	7.95	0.76	6.07	
Composite	otype2	3	wtrec							
Block Model	otype2	4	wtrec	182,657	2.76	42.19	21.11	0.18	3.78	
Composite	otype2	4	wtrec							
Block Model	otype2	5*	wtrec	110,011	15.09	35.22	22.85	0.10	2.29	12.48%
Composite	otype2	5*	wtrec	5,171	0.50	35.56	20.32	0.35	7.09	
Block Model	otype2	6*	wtrec	147,025	18.04	39.44	28.36	0.10	2.94	14.88%
Composite	otype2	6*	wtrec	7,498	0.60	42.70	24.69	0.41	10.11	
Block Model	otype2	7*	wtrec	37,950	19.06	40.99	25.16	0.11	2.83	21.19%
Composite	otype2	7*	wtrec	1,776	0.40	44.54	20.76	0.44	9.22	



Data	Domain Field	Domain	Variable	Count	Min (%)	Max (%)	Mean (%)	CV	StDev (%)	% Mean Δ
Block Model	otype2	8	wtrac	254	17.49	28.90	22.55	0.12	2.73	62.91%
Composite	otype2	8	wtrac	687	0.13	33.89	13.84	0.61	8.48	
Block Model	otype2	1	silica	162,749	0.00	26.00	7.00	0.41	3.00	16.67%
Composite	otype2	1	silica	2,419	0.00	46.00	6.00	0.73	4.00	
Block Model	otype2	3	silica	143,567	0.00	45.00	6.00	0.40	2.00	
Composite	otype2	3	silica							
Block Model	otype2	4	silica	182,657	0.00	28.00	5.00	0.44	2.00	
Composite	otype2	4	silica							
Block Model	otype2	5*	silica	110,011	1.00	4.00	3.00	0.17	1.00	0.00%
Composite	otype2	5*	silica	4,949	1.00	15.00	3.00	0.36	1.00	
Block Model	otype2	6*	silica	147,025	1.00	4.00	3.00	0.21	1.00	0.00%
Composite	otype2	6*	silica	7,136	1.00	22.00	3.00	0.48	2.00	
Block Model	otype2	7*	silica	37,950	1.00	5.00	3.00	0.16	0.00	-25.00%
Composite	otype2	7*	silica	1,701	1.00	28.00	4.00	0.50	2.00	
Block Model	otype2	8	silica	254	3.00	4.00	4.00	0.05	0.00	-33.33%
Composite	otype2	8	silica	640	1.00	20.00	6.00	0.47	3.00	

Note.* Ore Domains.

Figure 14-8: Whisker Plots for smgfe Composites and Blocks Otype2 Domains

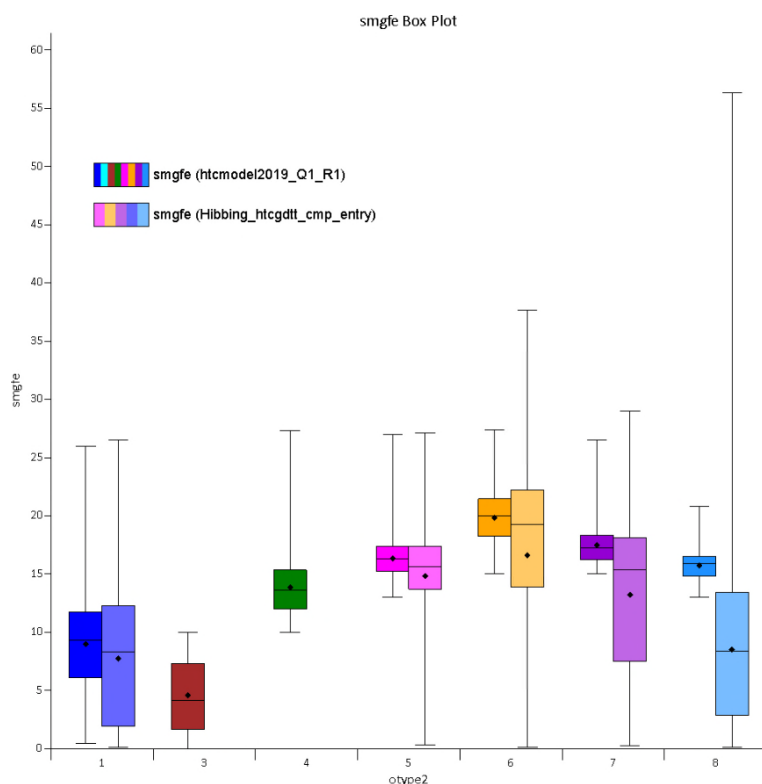


Figure 14-9: Histogram for smgfe Composites and Blocks Otype2 Domains

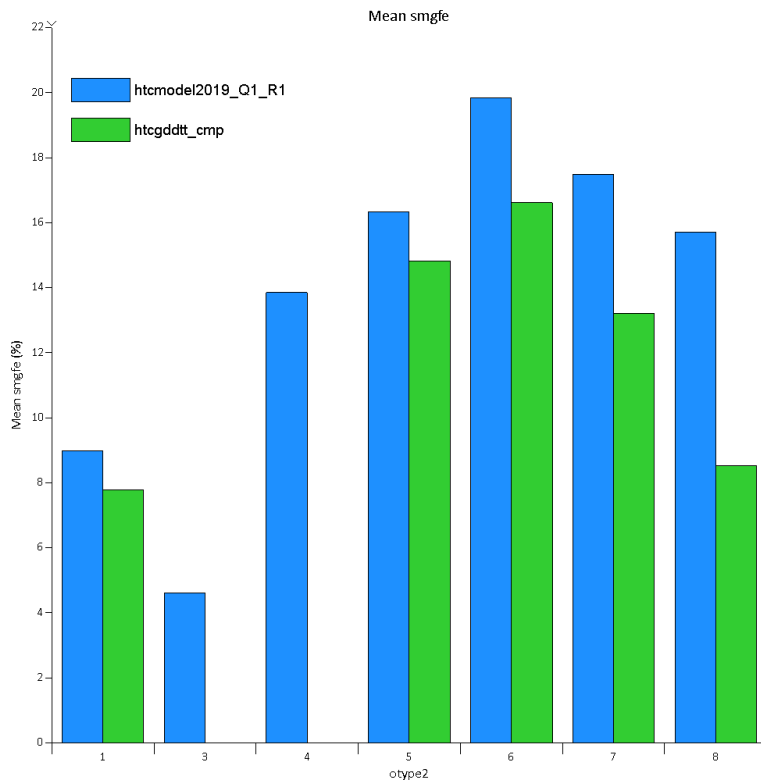
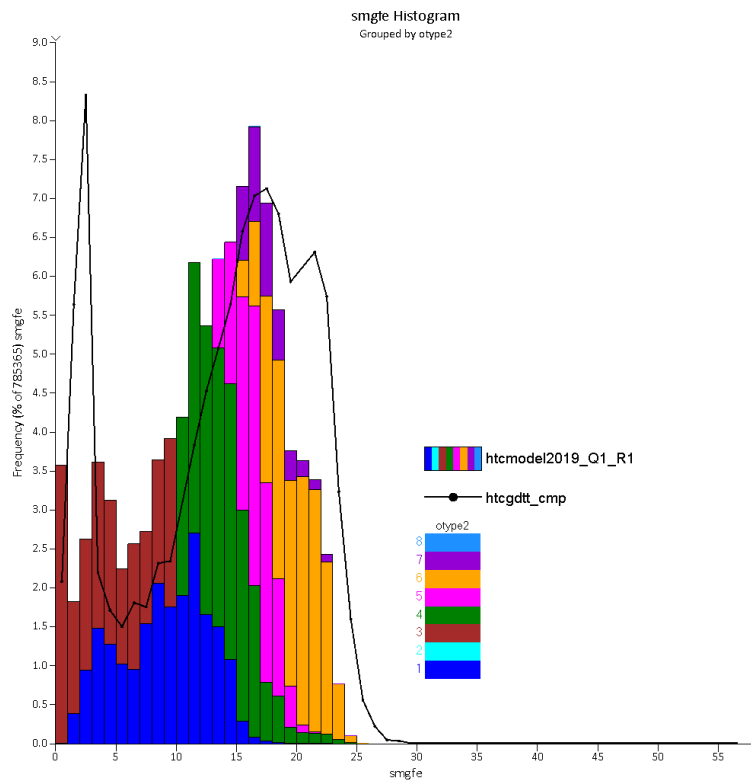


Figure 14-10: Histogram smgfe Composites and Blocks Otype2 Domains



While the industry-standard validation steps are not typically conducted by HibTac personnel, SLR assigned the block grades to the composite file in order to construct scatter plots of block grades versus composite grades for the HibTac base model. Figure 14-11 through Figure 14-13 show scatter plots for magnetite (smgfe), wtrec, and silica, which illustrate that the composite grades and the associated block grades compare reasonably well. As the model process has remained constant through the years, and as HibTac continues to make its production targets, it is reasonable to assume that results would be similar for subsequent Mineral Resource estimations.

Figure 14-11: Scatter Plot smgfe Grade Composites versus Blocks Otype2 (5, 6, and 7) Domains

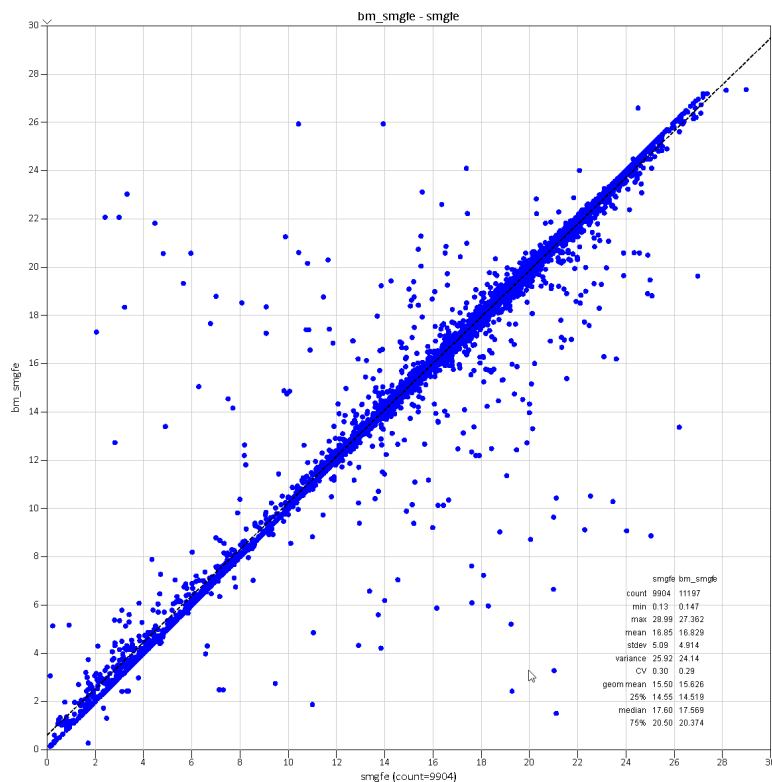


Figure 14-12: Scatter Plot wtrec Grade Composites versus Blocks Otype2 (5, 6, and 7) Domains

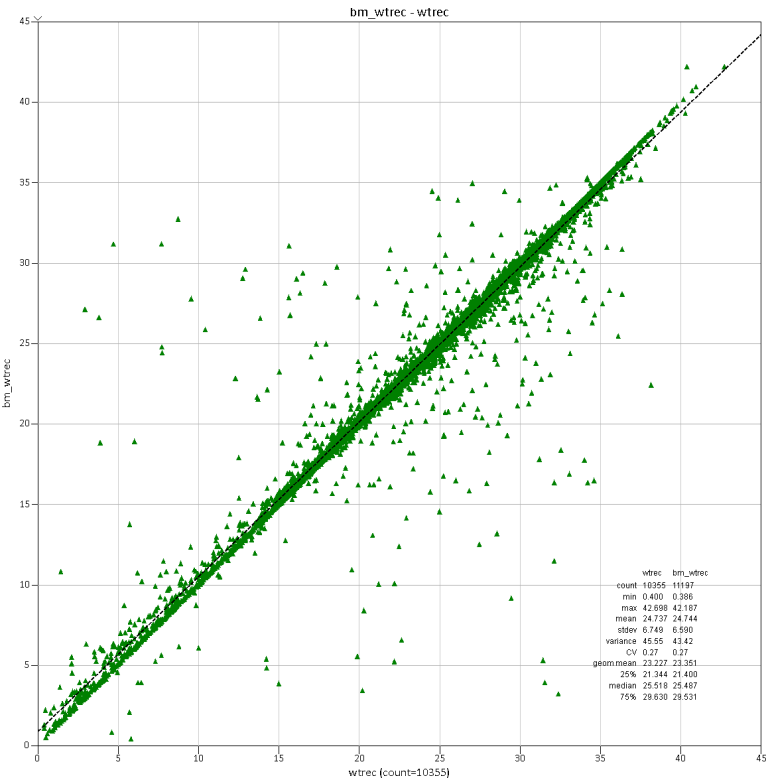
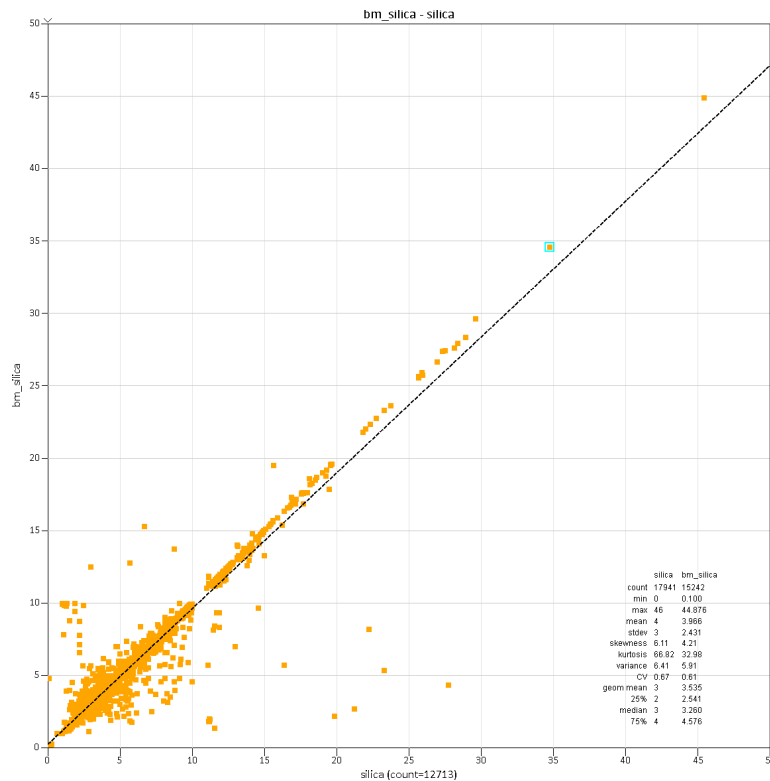


Figure 14-13: Scatter Plot Silica Grades Composites versus Blocks Otype2 (5, 6, and 7) Domains



14.10 Model Reconciliation

Reconciliation results, comparing actual production versus model-predicted values of crude ore, for wtrec and silica_adj between 2019 and 2020 are presented in Table 14-9.

Table 14-9: 2019 to 2020 Model Reconciliation

Description	2019		2020		2019 & 2020		
	Modeled	Actual	Modeled	Actual	Modeled	Actual	%Δ
Total Tons	55,631,443	59,275,823	47,610,961	45,246,116	103,242,404	104,521,939	1.2%
Total Ore ¹	21,146,962	27,311,896	16,195,498	21,467,572	37,342,460	48,779,468	23.4%
Total Waste	34,484,481	31,963,927	31,415,463	23,778,544	65,899,944	55,742,471	-18.2%
Strip Ratio	1.63	1.17	1.94	1.11	1.76	1.14	
1-7_ore	907,738	1,649,116	641,917	1,275,081	1,549,656	2,924,197	47.0%
1-56_ore	15,060,057	17,723,603	13,607,781	16,467,015	28,667,839	34,190,618	16.2%
1-34_ore	5,179,166	7,939,177	1,945,800	3,725,476	7,124,966	11,664,653	38.9%
stockpile	6,717,987	7,525,975	6,609,613	6,067,949	13,327,600	13,593,924	2.0%
+10_rock ²	9,940,532	24,437,952	10,915,389	17,710,595	20,855,921	42,148,547	50.5%
-10_rock	17,825,962	0	13,890,461	0	31,716,423	0	



Description	2019		2020		2019 & 2020		
	Modeled	Actual	Modeled	Actual	Modeled	Actual	%Δ
Wtrec (%)	27.28	26.53	27.26	25.79	27.27	26.20	22.72
Smgfe (%)	19.40	18.76	19.60	18.03	19.49	18.44	15.01
silica_adj (%)	4.72	4.78	4.59	4.90	4.66	4.83	5.50
Wet Pellets ³	5,599,865	7,300,000	4,284,498	5,454,000	9,884,363	12,754,000	22.5
Notes: 1. Excluding approximately 750 kLT of In-pit Crushing and Cobbing (IPCC) material from both the modeled estimate on the voids and actual tonnages 2. Actual production numbers did not differentiate between +10/-10 waste rock, all was accumulated in the +10 row 3. Actual pellets were taken from the 10-K depletion numbers (2019 adjusted to estimate the removal of the IPCC contribution)							

Overall, the block model is slightly conservative and matching well to total tons but under-reporting against actual ore production:

- Total ore under-predicted by 23.4%.
- Waste over-predicted by 18.2%.

14.11 Mineral Resource Statement

The Mineral Resource estimate for HibTac was prepared by Cliffs and audited and accepted by SLR using available data from 1938 to 2019.

To ensure that all Mineral Resource statements satisfy the “reasonable prospects for eventual economic extraction” requirement, the Mineral Resource estimate for the HibTac deposit considered factors significant to technical feasibility and potential economic viability. Mineral Resources were defined and constrained within LOM phase units, prepared by Cliffs.

The Mineral Resource estimate as of December 31, 2021, is presented in Table 14-10.

Table 14-10: Summary of Mineral Resource - December 31, 2021

Class	Crude Ore Mineral Resources	Crude Ore MagFe	Process Recovery	Pellets	Cliffs Attributed Basis	Cliffs Crude Ore Mineral Resources	Cliffs Pellets
	(MLT)	(%)	(%)	(MWLT)	(%)	(MLT)	(MWLT)
Measured	10.1	19.2	25.4%	2.6	85.3	8.6	2.2
Indicated	0.6	18.7	25.0%	0.1	85.3	0.5	0.1
Measured + Indicated	10.7	19.2	25.4%	2.7	85.3	9.1	2.3



Notes:

1. Tonnage is reported in long tons equivalent to 2,240 lb.
2. Mineral Resources are reported exclusive of Mineral Reserves and have been rounded to the nearest 100,000.
3. Mineral Resource estimates are based on a cut-off grade formula dependent on a few variables and restricted to material greater than 13% MagFe.
4. Classification of Mineral Resources is in accordance with CIM (2014) definitions.
5. Bulk density is calculated based on magnetic iron and total iron content.
6. Mineral Resources are 85.3% attributable to Cliffs and 14.7% attributable to U.S. Steel.
7. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
8. Numbers may not add due to rounding.

Resource estimates take account of the minimum block size that can be selectively extracted. Mineral Resources are exclusive of Mineral Reserves and are reported at equal to or greater than 13% MagFe cut-off grade. Mining recovery is typically 100%, although the grade tends to be diluted by 1% MagFe due to geological conditions and mining practices.

HibTac has been in operation for many years, and land and mineral control has been long established. The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Resource estimate.

While the estimate of Mineral Resources is based on the QP's judgment that there are reasonable prospects for eventual economic extraction, no assurance can be given that Mineral Resources will eventually convert to Mineral Reserves.

The QP offers the following conclusions with respect to the HibTac Mineral Resource estimates:

- The KEVs in the block models for HibTac compare well with the source data.
- The methodology used to prepare the block model is appropriate and consistent with industry standards.
- Validations compiled by the QP indicate that the block model reflects the underlying support data appropriately.
- The classification at HibTac is acceptable for the disclosure of Mineral Resources.

The QP offers the following recommendations with respect to the HibTac Mineral Resource estimates:

- 1 Apply a minimum of two holes during the first pass estimation for HibTac in future updates.
- 2 In future updates, use local drill hole spacing in place of a distance-to-drill hole criterion for block classification.



15.0 Mineral Reserve Estimates

Mineral Reserves in this Technical Report are derived from the current Mineral Resources. The Mineral Reserves are reported as crude ore and are based on open pit mining from the Mine. Crude ore is the unconcentrated ore as it leaves the mine at its natural *in situ* moisture content. The Proven and Probable Mineral Reserves for HibTac were estimated as of December 31, 2021, and are reported in Table 15-1.

Table 15-1: Summary of HibTac Mineral Reserves – December 31, 2021

	Crude Ore Mineral Reserves (MLT)	Crude Ore MagFe (%)	Process Recovery (%)	Wet Pellets (MLT)	Cliffs Attributed Basis (%)	Cliffs Crude Ore Mineral Reserves (MLT)	Cliffs Wet Pellets (MLT)
Proven	100.1	18.7	25.4	25.5	85.3	85.4	21.7
Probable	9.1	18.7	25.6	2.3	85.3	7.8	2.0
Proven + Probable	109.3	18.7	25.5	27.8	85.3	93.2	23.7
Notes: 1. Tonnage is reported in long tons (equivalent to 2,240 lb) and has been rounded to the nearest 100,000. 2. Mineral Reserves are estimated based on a cut-off grade formula dependent on a few variables and restricted to material greater than 13% MagFe. 3. The Mineral Reserve mining stripping ratio (waste units to crude ore units) is at 1.0. 4. Pellets are reported as a wet standard equivalent containing 66% Fe. 5. Tonnage estimate based on December 31, 2021 production depletion from surveyed topography on June 15, 2021. 6. Mineral Reserve tons are as delivered to the primary crusher; pellets are as loaded onto lake freighters in Superior, Wisconsin. 7. Classification of the Mineral Reserves is in accordance with CIM (2014) definitions. 8. Mineral Reserves are 85.3% attributable to Cliffs and 14.7% attributable to U.S. Steel. 9. Numbers may not add due to rounding.							

The QP is not aware of any mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the Mineral Reserve estimate.

15.1 Conversion Assumptions, Optimization Parameters, and Methods

Using the mine planning block model for HibTac, pit designs are conducted to convert the Mineral Resources to Mineral Reserves.

Iron formation can only be initially considered as “candidate” crude ore if the stratigraphy is one of the following geologic subunits (as detailed in Section 11.0):

- Low or Lean Taconite (litho codes 131, 132, and 141)
- High Taconite (litho codes 151, 152, 153, 161, and 162)
- High Taconite (litho codes 171 and 172)

All other geologic subunits are waste.

Candidate crude ore must then meet the following additional criteria to be considered crude ore blocks:



- Satisfy the metallurgical cut-off grades as described in section 14.7.4. In summary, candidate crude ore with MagFe lower than 15% (13% for 1-3/1-4 ore) is waste and is stockpiled separately.
- Be classified as a Measured or Indicated Mineral Resource (Inferred Mineral Resources are considered to be waste).
- Not occur within a mining restricted area.
- Generate a net block value greater than the cost of the block as if it were mined as waste.

A new mine planning block model for the HibTac pit (htcmodel2019_Q1_R1_lr.bmf) was constructed in July 2021 from the geologic model (htcmodel2019_Q1_R1.bmf). Scripts within Vulcan are executed that add variables for mine planning, flag in-pit stockpile backfills, flag the current topography, re-block the model to represent the selective mining unit (SMU), incorporate crude ore loss and dilution impacts, and reinforce cut-off grades. The resulting block models are evaluated using the Chronos scheduling packages in Vulcan.

A comparison of the actual pellet production to the modeled pellet production (against htcmodel2019_Q1_R1_lr.bmf) for 2019 and 2020 indicates a positive reconciliation. HibTac has been increasing dilution considerably as it nears the end of mine life. This is one of the strategies the site has implemented to extend the mine life, but which is not included in long range planning. This strategy is likely to result in the LOM plan under-predicting pellet production in the long term as confirmed by the 2019 and 2020 results. To incorporate the crude ore loss and mining dilution assumptions into the Mineral Reserve estimate, the mine planning model used an SMU to re-block the model and better reflect mining selectivity. The mine planning model was re-blocked to 100 ft by 100 ft by 20 ft (i.e., half the bench height) to represent the site's operational practice of top-cutting blasts that include the ore/waste transition.

HibTac has a long history of plant recovery, which is used as part of the pit optimization. The following summarizes the empirical relationship for pellet production based on crude ore tons and DT weight recovery:

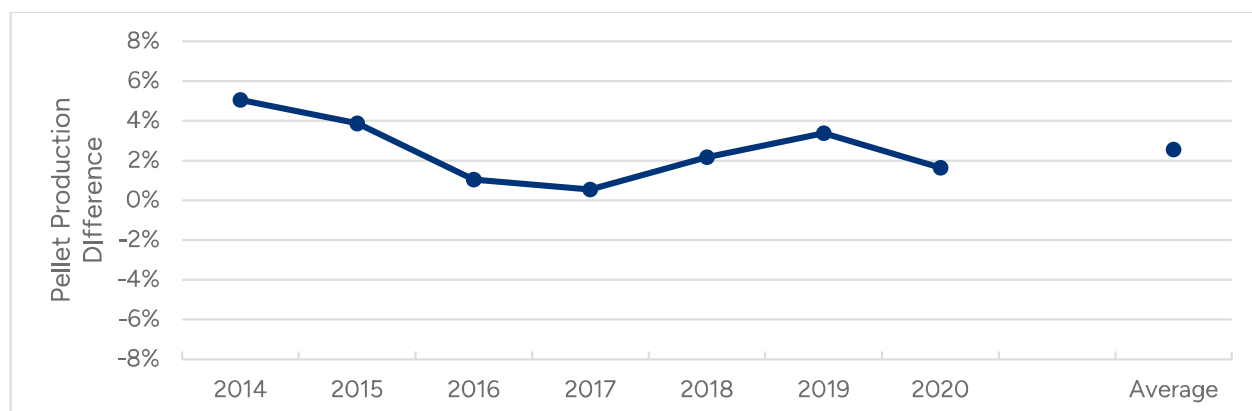
$$\text{Wet Pellet Tons} = (\text{Crude Ore Tons} \times (\text{DT Weight Recovery} - \text{Discount}) / 100 \times \text{Recovery Factor}) / (1 - \% \text{Pellet Moisture})$$

Where:

- Discount = 1.2%;
- Pellet Moisture = 2.0%; and
- Recovery Factor = 0.995.
- From 2014 through 2020, the equation has reconciled within 3% of the production years when comparing calculated wet pellet production to actual wet pellet production. Figure 15-1 shows the 2014 through 2020 variance between calculated and actual fluxed pellet production.



Figure 15-1: 2014–2020 Calculated versus Actual Pellet Production



Note. All Measured and Indicated Mineral Resources within the final designed pit that meet the above criteria are converted into Mineral Reserves.

15.2 Previous Mineral Reserve Estimates

Cliffs has had an interest in the Property since 1986 and acquired 85% of the Mine during the 2020 purchase of AMUSA's assets. The SEC-reported Mineral Reserves for the past ten years are listed in Table 15-2. These Mineral Reserves were not prepared under the recently adopted SEC guidelines; however, they followed SEC Guide 7 requirements for public reporting of Mineral Reserves in the United States.

Table 15-2: Previous Mineral Reserves

Year ⁽¹⁾	Crude Ore		Product	
	Total Proven & Probable (MLT)	Grade (% MagFe)	Process Recovery (%)	Pellets Wet (MWLT)
2011	378	19.8	26.2	99
2012	349	19.8	26.2	91
2013	288	19.0	26.1	75
2014	260	18.9	26.1	68
2015	231	18.8	26.1	60
2016	233	19.5	26.5	62
2017	179	19.6	26.4	47
2018	150	19.7	26.5	40
2019	122	19.7	26.6	32
2020	101	19.7	26.9	27

Source:

- Cliffs 10-K Filing.



15.3 Pit Optimization

HibTac's Mineral Reserves fully capture all material that is currently identified as mineable. Pit optimizations were not completed.

15.4 Mineral Reserve Cut-off Grade

The Mineral Reserve cut-off grade is governed by metallurgical constraints applied in order to produce a saleable product followed by verification through a break-even cut-off grade calculation. The Mineral Reserves are reported at a 15% crude magnetic iron (13% for 1-3/4 ore; BM variable : smgfe), which is the same cut-off criteria used for Mineral Resources described in Section 14.7.4 for a minimum magnetic iron content. In addition to MagFe, limits on the following also apply:

- Adjusted Silica (silica_adj) less than 6.5%
- Kw_It (Liberation Index; relative power to achieve target concentrate silica; BM variable: Kwhlt) less than 17%
- Ratio (satfe/iron; measure of oxidation) $\geq 90\%$

15.5 Mine Design

The Mine's final pit designs incorporate several design variables that include geotechnical parameters (e.g., wall angles and bench configurations), equipment size requirements (e.g., mining height and ramp configuration), and physical mining limits (e.g., property boundaries and existing infrastructure). The following summarizes the design variables and final pit results; more detail is provided in the preceding subsections and in Section 13.0.

The final highwall pit slope is designed at an inter-ramp angle (IRA) of 42.5° for *in situ* bedrock and 18.4° for surface overburden. The bench design for bedrock consists of double-stacked, 40-ft-high mining benches with a 65° bench face angle (BFA) and a 50-ft catch bench (CB). There are no ramps designed into the final highwall, as the footwall slope is less than 8% for most of the mining areas and can support the development of haulage ramps.

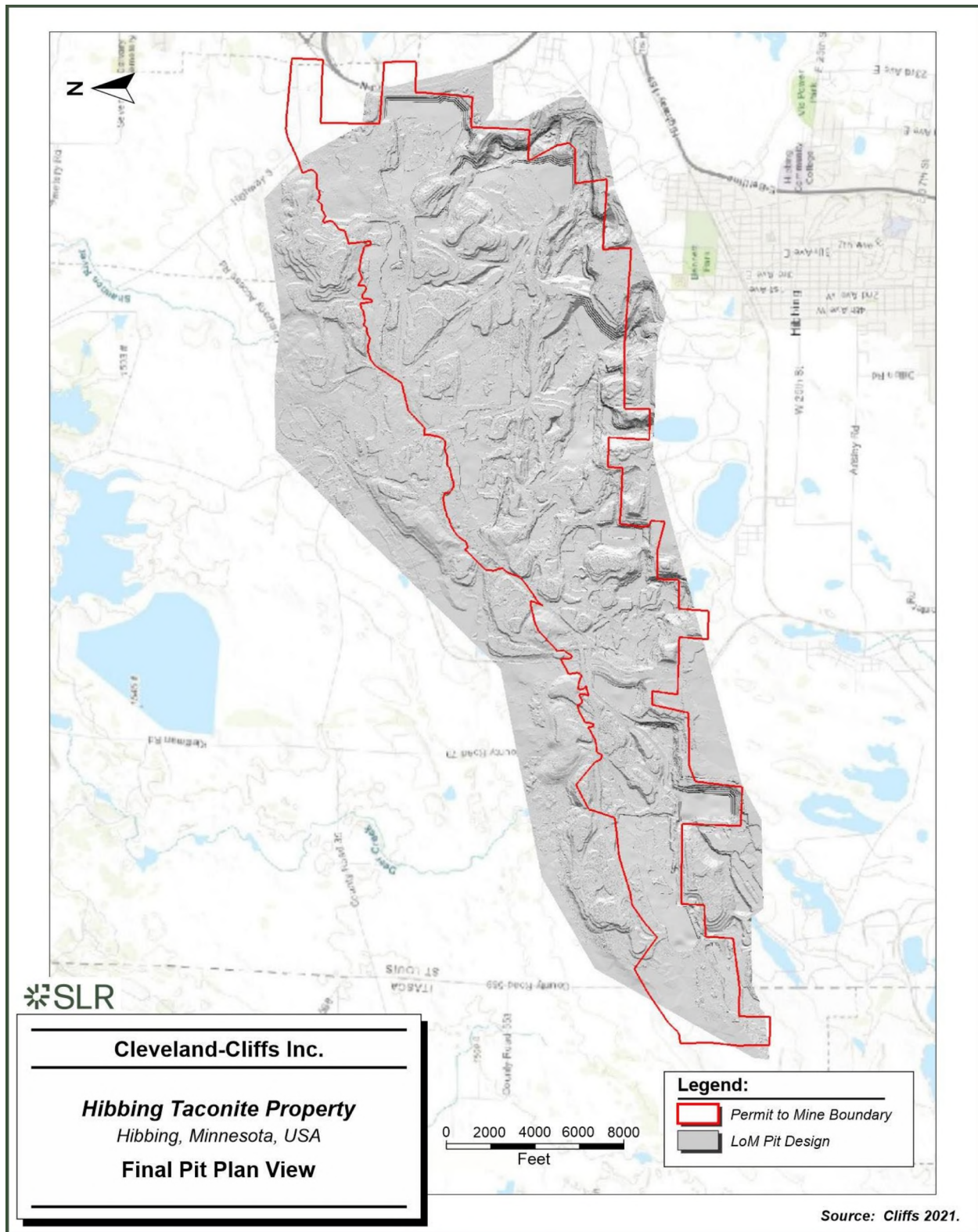
There are multiple physical mining limits that are applied to the mine plan:

- The crude ore Mineral Reserve boundary resides within controlled mineral lease areas and also within the existing Permit to Mine;
- Mining limits are set at 2,000 ft from the closest buildings in the local communities; and
- Mining limits are set at 200 ft from the centerline of local roads and highways.

The LOM final pit designs are shown in Figure 15-2.



Figure 15-2: Final Pit Plan View



16.0 Mining Methods

16.1 Mining Methods Overview

HibTac is mined using conventional surface mining methods. The Mine requires large 200-plus ton mining trucks, and some areas of the pit require long hauls. The surface operations include:

- Clearing and grubbing
- Overburden (glacial till) removal
- Drilling and blasting (excluding overburden)
- Loading and haulage

The Mineral Reserve is based on the ongoing annual average ore production of 21.9 MLT from the Group I, II, III, IV, and V pits, producing an average of 5.6 MLT/y of wet pellets for domestic consumption. The HibTac operations have no current expansion plans and are likely to cease operating once the reserves are depleted by 2026.

Mining and processing operations are scheduled 24 hours per day, and the mine production is scheduled to directly feed the processing operations.

The current LOM plan has mining scheduled for five years and mines the known Mineral Reserve. The average stripping ratio is 1.0 waste units to 1.0 crude ore units (1.0 stripping ratio).

There are 20 mining pits/phases with varying dimensions, with a maximum depth of approximately 600 ft attained in two of the pits/phases.

Primary production for all mine pits includes drilling 16.00-in.-diameter rotary blast holes. Production blast hole depth to 40-ft bench heights is drilled. Burden and spacing varies depending on the material being drilled. The holes are filled with explosive and blasted. A combination of front-end loaders (FEL) and electric shovels load the broken material into 240 ton-payload mining trucks for transport from the pit.

The Mine follows strict crude ore blending requirements to ensure that the Plant receives a uniform head grade. Generally, three groupings of geological subunits are mined at one time to obtain the best blend for the Plant. Operationally, blending is done on a shift-by-shift basis. HibTac mines from three to four ore locations for blending. Crude ore is hauled to the crushing facility and either direct tipped to the primary crusher or stockpiled in an area adjacent to the primary crusher. Haul trucks are alternated to blend delivery from the multiple crude ore loading points. The crude ore stockpiles are used as an additional source for blending and production efficiency.

The major pieces of pit equipment include electric shovels, FELs, haul trucks, drills, bulldozers, and graders. Extensive maintenance facilities are available at the mine site to service mine equipment and the rail fleet.

16.2 Pit Geotechnical

16.2.1 Summary

The pits at HibTac are generally shallow, with a maximum pit depth and highwall exposure of approximately 600 ft. The final wall slopes are effectively the IRA, as there are no haul ramps in



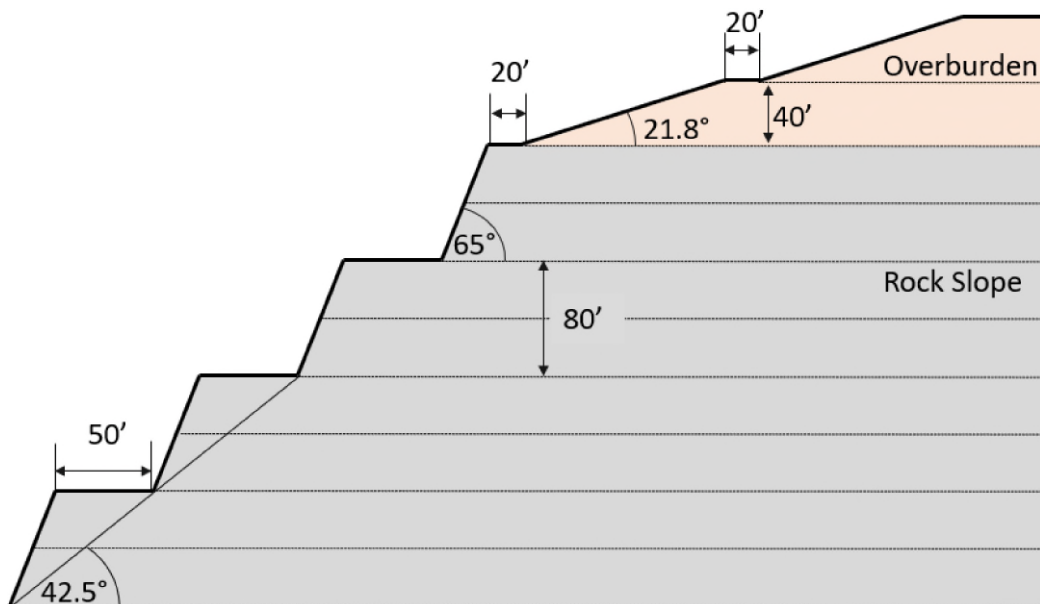
the final highwall. Haul ramps are incorporated into the pit design footwall and can safely support traffic of the 240 ton payload mining trucks. Slope parameters used for design are summarized in Table 16-1.

The overburden (glacial till) is excavated in 40-ft-high benches with a design BFA of 22°; benches are separated by 20 ft wide berms and are set-back at least 20 ft from the top of the rock slope in accordance to Standard 6130.2900 of the Minnesota Administrative Rules for Ferrous Metal Mineral Mining. Benches in the rock slopes are created by double benching two, 40-ft benches to create a final 80 ft bench face. See Figure 16-1.

Table 16-1: Geotechnical Parameters

Parameter	Unit	Final Wall	Backfill	Overburden
IRA	Degrees	42.5	23.4	18.4
BFA	Degrees	65.0	36.0	21.8
BH	ft	40	40	40
CB - Primary	ft	50	50	20
CB - Secondary	ft	0	25	20
Ramp Width - 2 way	ft	150	150	150
Ramp Width - 1 way	ft	90	90	90
Ramp Gradient (Shortest)	%	8	8	8

Figure 16-1: Example of Final Pit Wall Geometry



Source: SLR 2022.



16.2.2 Geotechnical Data

Geotechnical laboratory test data for HibTac is limited with two uniaxial compressive strength (UCS) tests taken for a back analysis of a wedge failure in the Scranton Pit and, more recently, 10 UCS tests, 11 point load tests, and seven Brazilian tensile tests completed for a wall control blasting study by Barr Engineering Co. (Barr) in 2018.

Structural measurements were taken during a field visit for a final pit slope stability study completed by Barr in 2012 (Barr, 2012). The rock mass was observed to be highly fractured; the dominant discontinuities include the shallow-dipping bedding planes dipping between 5° and 15° to the southeast and two to three near-vertical joint sets dipping between 80° and 90°. Further joint orientation data has been collected from Maptek I-Site laser scans, including from the Group IV Kleffman area used for a wall control blasting study completed by Barr in 2018 (Barr, 2018), and from the Group V East, West 1, and West 2 areas, used for a structural geology and rock-fall analysis also completed by Barr in 2019 (Barr, 2019).

16.2.3 Material Strength Parameters

Geotechnical input data for the Barr (2012) study was limited, so stability analysis relied upon engineering judgement and approximations from other similar projects. Mohr-Coulomb strength parameters were estimated for the glacial till. The Hoek-Brown strength criterion was used to estimate the strength of the rock mass. Material properties are summarized in Table 16-2. Two sets of strength parameters are provided, one for the blasting practices observed in 2012 with a blast disturbance factor D of 1.0, and the second with a lower D of 0.7, which assumes improvements through the introduction of wall-control blasting such pre-splitting, smooth-wall blasting, or cushion (buffer) blasting.

Table 16-2: Material Properties Used in Stability Analysis

Parameter	Overburden	Disturbed Rock	Less Disturbed Rock
Unit Weight, pcf	128	192.4	192.4
Cohesion, psf	-	-	-
Friction Angle, °	32	-	-
Intact Rock Uniaxial Compressive Strength, psf	-	1,800,000	1,800,000
Intact Rock Parameter (mi)	-	19	19
Geological Strength Index (GSI)	-	45	45
Disturbance Factor (D)	-	1.0	0.7

Source: Barr 2012.

16.2.4 Hydrogeology and Pit Water Management

Dewatering is from sump pumping for within the pits. The final highwall design assumes that the piezometric surface is sufficiently far from the pit wall that it does not dictate slope failures.

16.2.5 Stability Assessment

A kinematic assessment for bench-scale failure was conducted by Barr (2012); however, based on the joint orientations, planar and wedge type failures were judged to be limited. Toppling would be associated with slopes where the steeply dipping joints dip into the slope face.



Raveling of rock blocks was determined to be the most likely bench-scale failure mechanism, requiring effective excavation and scaling to control rock-fall risk.

Overburden stability was assessed through the Morgenstern-Price method of limit-equilibrium analysis in Geoslope Slope/W software. The factor of safety (FoS) was calculated at 1.57 assuming the groundwater surface was set back from the slope face.

Limit-equilibrium analysis was completed for a proposed rock slope geometry including an 80-ft-high benches, 80° bench face angle and 40-ft berm width, with an IRA of 56°. The resultant FoS of 1.24 is reliant on the application of wall-control blasting techniques, recommendations for which were provided in the Barr (2012) report and later by Barr in 2018, in the Design and Implementation Report for a wall-control blasting study (Barr, 2018).

A structural geology and rock-fall analysis was completed in January 2019 by Barr to gain a better understanding of the Group V area and to determine an appropriate safe bench width design. Rock-fall analysis was undertaken using Rocscience Rocfall 7.0 software. Twelve cases were modeled based on 80-ft bench heights, with benches faces of 75° and 80°, berm widths of 40 ft and 50 ft, and with and without crest loss and talus material along the bench toes. A similar assessment was also made for a 40-ft high bench. Barr concluded that the batters should be pre-split at 80°, aside from the east wall, which should be battered at 75° due to adverse geological structure. A bench width of 40 ft was proposed, with a 5-ft-high berm placed on the bench to catch rock fall. The resultant IRA would be 56° (Barr, 2019).

The current slope design used for the rock slopes at HibTac includes an IRA of 42.5°, which is significantly less than the Barr 2012 and 2019 proposed IRAs. The adopted BFA is also less, at 65°, as opposed to 75° to 80° proposed by Barr. The QP, therefore, considers the slope parameters used by HibTac to be appropriate, and the geotechnical risk of overall slope instability and rock-fall to be low.

16.2.6 Waste Rock Stockpile Stability

The HibTac waste rock stockpiles were subject to an assessment of stability rating and hazard classification as per a report completed by Golder Associates Inc. (Golder) in April 2019. The report was based on a site visit conducted on July 16, 2018 and involved the inspection and assessment of waste rock stockpiles 2970 and 4082 and overburden stockpiles 5001, 5039, 5014, and 5020. The assessment was completed in accordance with the WSRHC system described in Hawley and Cuning (2017). The system includes the assessment of geographic location, climate and seismicity, foundation conditions, material quality, geometry, mass, stability assessment, construction method, and loading rate. The results indicate the existing stockpiles fall into the low or moderate hazard classification.

Upon completion, surface stockpiles must be graded to an overall slope angle of 2.5H:1V (21.8°), and rock stockpiles must be covered with at least two feet of surface material, in accordance with The Minnesota Administrative Rules, chapter 6130 (MDNR 2008). SLR understands that the stockpiles at HibTac are subject to annual inspections to verify compliance with these standards.

16.3 Open Pit Design

The HibTac pit designs combine current site access, mining width requirements, geotechnical recommendations, and hard mining limits as described previously in Sections 12.0 and 13.0.



Intermediate phase designs, or pushbacks, are included in the LOM planning. The main purpose for phased designs is to balance waste stripping and haulage profiles over the LOM and ensure haulage access is maintained while developing the pit.

Intermediate phase designs are largely driven by the effective mining width and access to the Mineral Reserves. The phase designs incorporate the transition from intermediate, non-reclaimed overburden slopes to final reclamation overburden slopes.

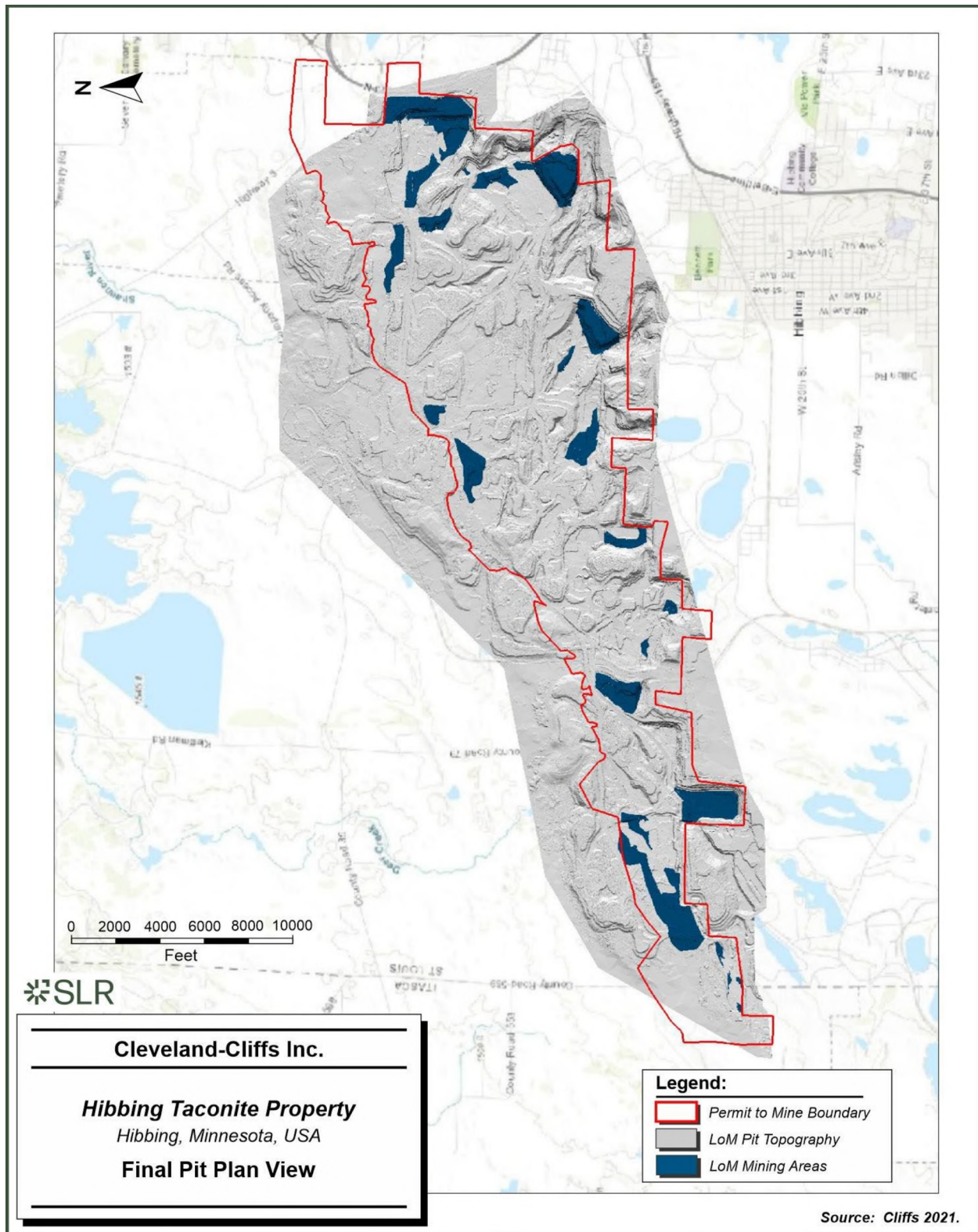
Table 16-3 details the final pit design totals as of the June 15, 2021 surveyed topography. Figure 13-2 presents a plan view of the final pit designs.

Table 16-3: Final Pit Design Totals

Phase	Crude Ore (MLT)	Grade (% MagFe)	Stripping (MLT)	Total Material (MLT)	Strip Ratio
Agn_xx1	3.9	17.8	0.9	4.8	0.2
Grp1_ph1	4.0	17.6	0.5	4.5	0.1
Grp1_ph2	6.3	19.0	1.0	7.3	0.2
Grp1_ph3	21.0	19.5	31.6	52.6	1.5
Grp3_xx1	2.3	16.7	0.6	2.8	0.3
Grp4_xx1	0.9	15.9	0.3	1.2	0.3
Grp5n_xx1	10.5	16.7	11.5	22.0	1.1
Klef_ph1	5.0	16.8	5.6	10.5	1.1
Mace_xx1	0.2	16.9	0.1	0.3	0.2
Maho_xx1	20.7	19.1	1.6	22.2	0.1
Morris_ph1	0.1	15.8	0.0	0.1	0.4
Su_xx1	3.8	17.4	2.5	6.2	0.7
Su_xx2	1.0	17.1	0.3	1.3	0.3
Su_xx3	2.2	17.5	1.3	3.6	0.6
View_fw1	1.1	18.8	0.2	1.3	0.2
View_ph1	16.6	19.6	19.5	36.1	1.2
Webb_ph2	2.1	17.4	3.2	5.3	1.5
Webb_ph3	19.8	19.4	46.4	66.2	2.3
Win_xx1	3.2	18.0	2.6	5.8	0.8
Webb_ph3r	0.0	0.0	0.4	0.4	
Total	124.6	18.7	130.1	254.7	1.0



Figure 16-2: Final Pit Plan View



16.4 Production Schedule

16.4.1 Clearing

Before mining operations commence in new undeveloped areas, it is necessary to remove any overburden material. Primary clearing and grubbing equipment includes bulldozers, electric shovels, FELs, and trucks. This equipment has been successfully deployed in historical overburden clearing operations at HibTac.

16.4.2 Grade Control

As described in Section 6.0 of this Technical Report, the geology is well known with two simplified crude ore types identified at the Mine: high-grade ore (1-5/1-6 ore) and lean ore (1-7 ore, 1-3/1-4 ore). HibTac uses blast hole magnetic susceptibility probing to assist in delivering a consistent blend of ore by more sharply delineating ore/waste boundaries.

Generally, three or four crude ore faces are mined at a time. The short-range (weekly) mine plan provides instruction on the amount of material from each mining location that is to be blended at the crusher. Blending is carried out on a shift-by-shift basis, with mid-shift load counts being conducted to monitor compliance to the planned crude ore blend. If the crushing facility is down for maintenance, then the loads are stockpiled on the ground next to the crusher and picked up later and crushed.

16.4.3 Production Schedule

As shown in Table 16-4, the basis of the production schedule is to:

Preserve blending of the three crude ore types for as long as possible, particularly to keep 1-3/1-4 ore percentage below 48. SLR notes that since 1-3/1-4 ore is the lowermost mined layer stratigraphically, it is not possible to keep 1-3/1-4 ore contributions below 48% in the last few years of the operation.

Limit total mined tons per annum in the range of 57 MLT to 60 MLT to balance both stripping requirements and mine equipment fleet utilization in addition to the pellet production.

The production schedule is planned yearly throughout the LOM. Crude ore is mined from several HibTac pit phases concurrently throughout the schedule and is blended at the crusher.

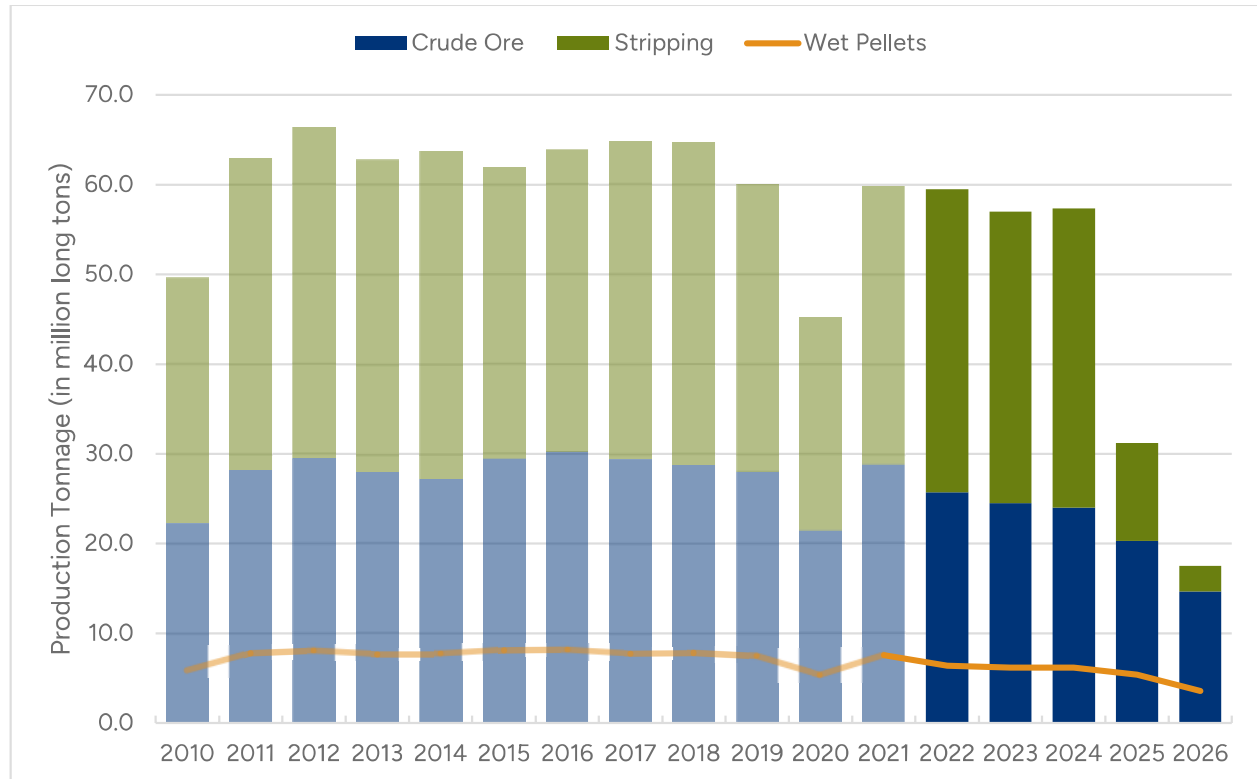
Table 16-4: LOM Mine Production Schedule

Year	Crude Ore (MLT)	MagFe (%)	Stripping (MLT)	Total Material (MLT)	Strip Ratio	Process Recovery (%)	Concentrate SiO ₂ (%)	Wet Pellets (MLT)
2022	25.7	18.2	33.8	59.5	1.3	24.9	4.7	6.4
2023	24.5	18.3	32.5	57.0	1.3	25.3	3.2	6.2
2024	24.0	18.8	33.4	57.4	1.4	25.8	3.1	6.2
2025	20.3	19.5	8.1	28.4	0.4	26.6	3.7	5.4
2026	14.8	19.3	3.7	18.5	0.3	24.9	3.5	3.6
LOM Schedule	109.3	18.7	111.5	220.8	1.0	25.5	3.5	27.8

Historical (2010 to current) and LOM planned production for HibTac is summarized graphically in Figure 16-3.



Figure 16-3: Historical and LOM Production



Source: Cliffs 2021.

SLR notes that there was a downturn in 2020 due to the COVID-19 pandemic.

16.5 Overburden and Waste Rock Stockpiles

Overburden and waste rock material is stockpiled in designated stockpile areas.

The HibTac LOM plan has more stockpiling capacity than is required, with two waste rock storage facilities located outside of the Permit to Mine boundary.

The overburden and waste rock stockpile design parameters are detailed in Table 16-5.

Table 16-5: Stockpile Parameters

Parameter	Units	Waste Rock	Overburden
Overall Slope Angle	Degrees	22.8	18.4
BFA	Degrees	36.0	21.8
BH	ft	30	40
Berm Width	ft	30	20
Ramp Width - 2 way	ft	150	150
Ramp Width - 1 way	ft	80	80
Ramp Gradient	%	8-10	8



Rock and overburden stockpiles were designed, and 3D solids generated, to calculate the volume of the stockpiles. Swell factors of approximately 33% for *in situ* rock and 12.5% for overburden were used to calculate the annual stockpile volume requirement.

The designed stockpile volume capacity and total LOM stockpiling requirements for the HibTac pits as of June 15, 2021 are summarized in Table 16-6.

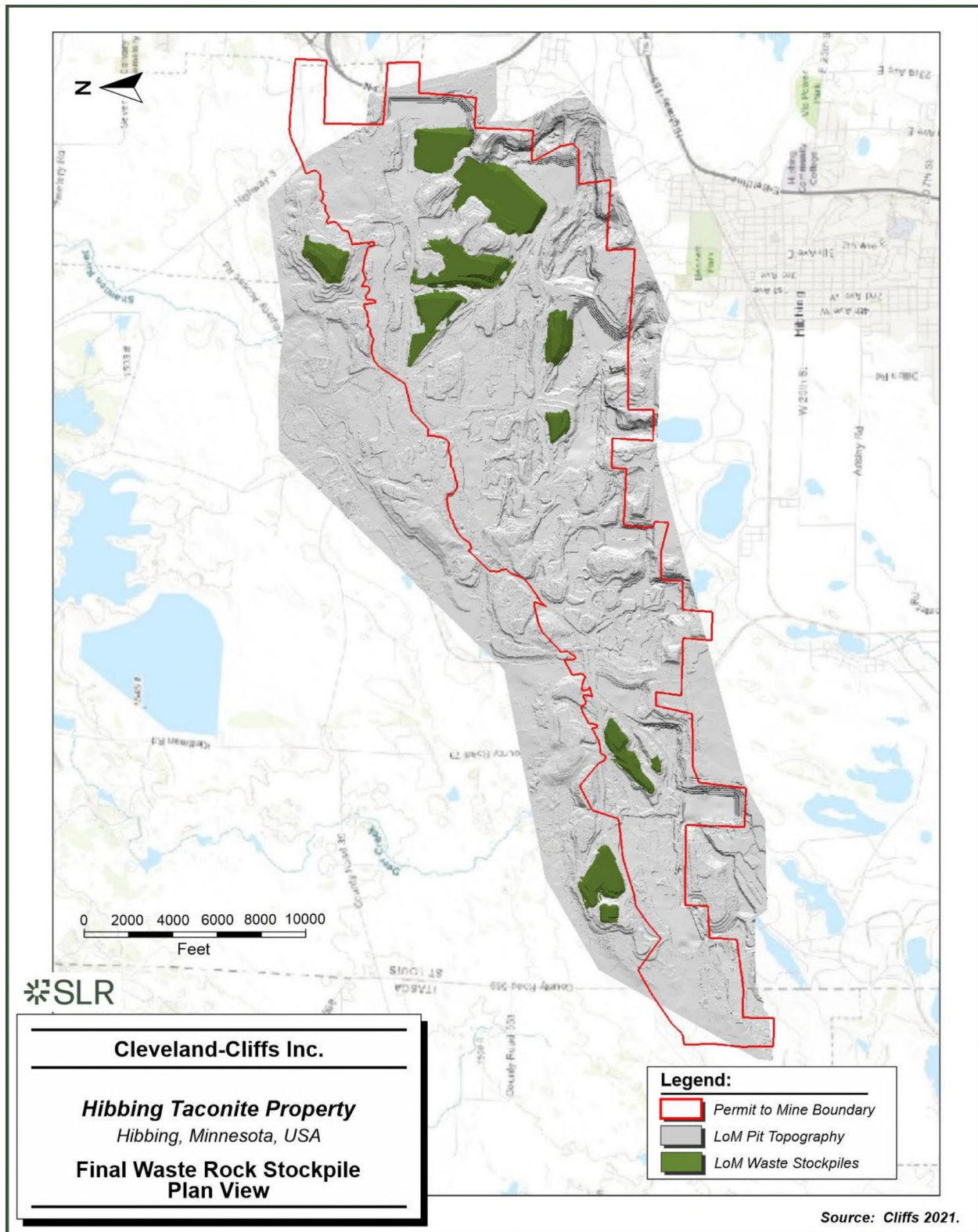
Table 16-6: Pit Stockpile Capacities

Name	Capacity (million ft ³)	
	Waste Rock	Overburden
Total HibTac Stockpile Capacity	2,467	371
2021 LOM Stockpile Requirements	1,715	268

SLR notes there is sufficient overburden and waste rock stockpile capacity included in the LOM plan. The final stockpile layouts including the pit backfills are shown in Figure 16-4. Final reclamation will involve relocating some of the stockpiled overburden as cover for the remainder of the disturbed area.



Figure 16-4: Final Waste Rock Stockpile Plan View



16.6 Mining Fleet

The primary mine equipment fleet consists of large drills, electric shovels, and off-road dump trucks. In addition to the primary equipment, there are FELs, bulldozers, graders, water trucks, and backhoes for mining support. Additional equipment is on site for non-productive mining fleet tasks. The current fleet is to be maintained with replacement units as the current equipment reaches its maximum operating hours.

Table 16-7 presents the existing fleet (2022) and planned average major fleet requirements estimated to achieve the LOM plan.

Table 16-7: Major Mining Equipment

Year	Drills	Shovels	Trucks	Loaders	Bulldozers	Graders
2022	4	6	29	1	10	3
2023	4	5	28	1	9	3
2024	4	5	27	1	9	3
2025	3	3	18	1	6	3
2026	3	3	12	1	6	2
Size/Payload	120,000 lb	38 yd ³	240 ton	37 yd ³	57 yd ³	16 ft
Useful Life (hrs)	90,000	160,000	100,000	60,000	80,000	80,000
Example Unit	P&H 120A	P&H 2800XPC	Komatsu 830E	LeTourneau L1850	CAT-D11	CAT-16M

The primary loading and hauling equipment were selected to provide synergy between mine selectivity of crude ore and the ability to operate in wet and dry conditions. Since crude ore is blended at the primary crusher, the loading units in crude ore do not operate at capacity.

Longer haulage distances will be realized in some of the HibTac pits as they deepen. In general, the major mining equipment requirement scales down with production, towards the end of the LOM plan.

16.7 Mine Manpower

Current mining manpower totals 368 and is summarized as follows:

- Mine operations – 219
- Mine maintenance (excluding mine crusher) – 115
- Mine supervision and technical services – 34



17.0 Recovery Methods

17.1 Processing Methods

17.1.1 HibTac Ore Types, Upgrading and Blending

HibTac's concentrator is designed to process approximately 80,000 LT of magnetite ore per day through a standard iron ore process flowsheet that includes primary crushing, autogenous grinding, and magnetic separation.

Three distinct ore types are processed at HibTac and are referred to as blend component 1-7 (lean ore), blend component 1-5/1-6 (high-grade ore) and blend component 1-3/1-4 (low-grade ore). The major characteristics of each ore type are summarized in Table 17-1. Blend component 1-7 is thick bedded and contains relatively high silica in concentrate and Liberation Index (relative grinding energy for magnetite liberation to target concentrate silica) and is limited to 20 wt% of the ore blend to the concentrator. Blend component 1-5/1-6 contains relatively high MagFe that results in high weight recoveries and is the dominant ore type, contributing greater than 60 wt% to the ore blend sent to the concentrator. Blend component 1-3/1-4 is thin bedded with fine laminations and contains relatively low MagFe that results in low weight recoveries, and it is limited to 48 wt% of the daily ore blend in the current LOM.

Table 17-1: Characteristics of Ore Types

Ore Characteristics	Unit 1-7	Unit 1-5/1-6	Unit 1-3/1-4
MagFe %	17.2	19.7	16.2
Wt % Recovery	24.9	28.8	23.1
SiO ₂ %	4.5	4.7	4.6
kWh/LT	14.9	12.7	13.4
Max. Blend %	15	80	30
Source: Hibbing Taconite.			

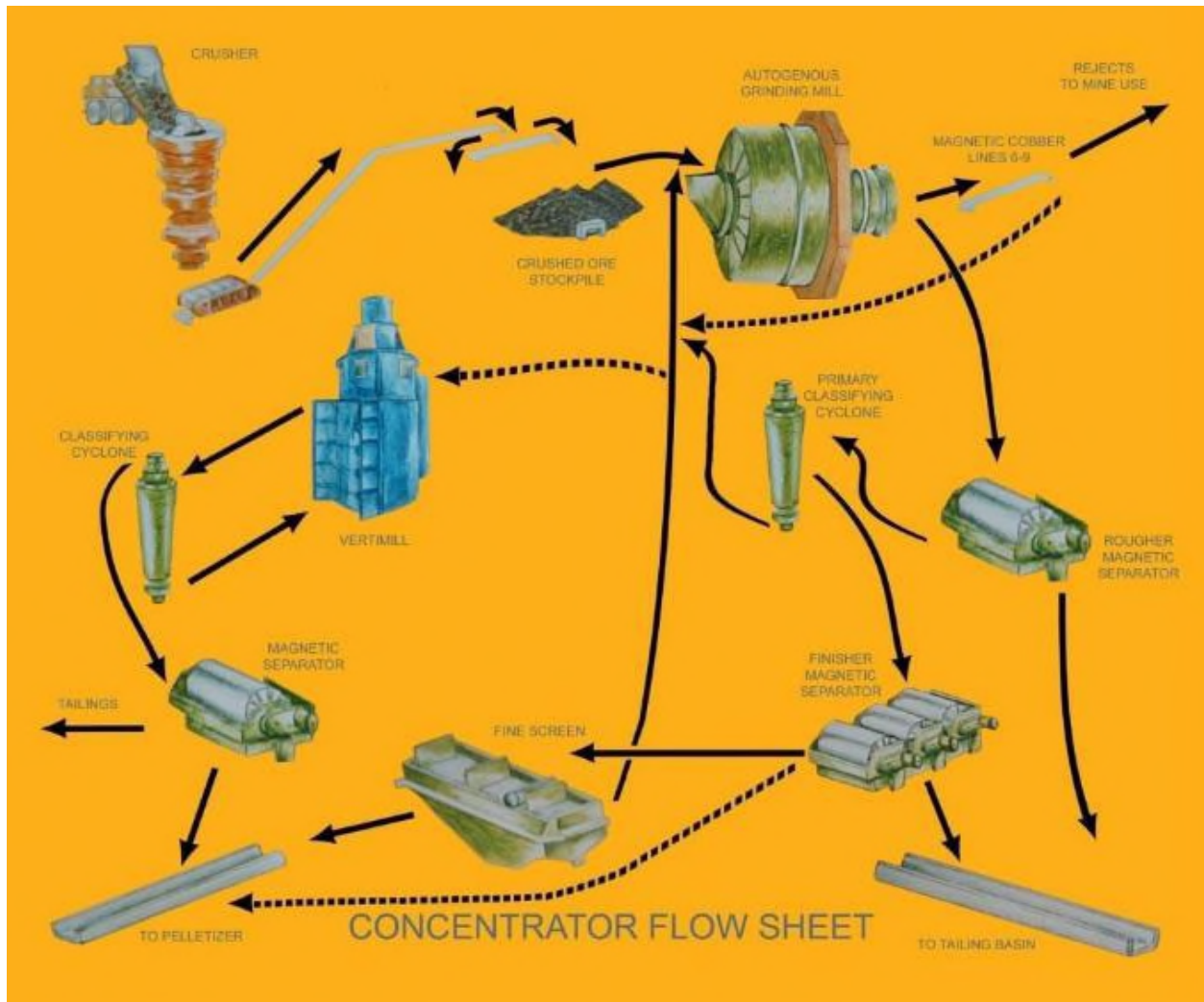
17.1.2 Crushing and Concentrating

The crushing plant consists of two 60 in. x 109 in. Allis Chalmers gyratory crushers that crush run of mine (ROM) ore to minus 10 in., which is then conveyed to the 450,000-ton, crushed ore stockpile, referred to as the COSP, providing up to five days of crushed ore surge capacity ahead of the concentrator. Crushed ore is reclaimed from the COSP to feed the primary grinding circuit, which consists of nine, 36 ft x 15 ft autogenous grinding (AG) mills, which grind the ore to $-3/16$ in. The discharge from each AG mill is pumped to five, 48-in.-diameter x 10-ft-long, single-drum rougher magnetic separators, which produce a rougher magnetic concentrate. The non-magnetic fraction from the rougher magnetic separators is fed to the hydroseparators. The rougher magnetic concentrate produced from each grinding line is classified in hydrocyclones to produce an 80% passing 44 micron cyclone overflow product that is then advanced to the finisher magnetic separators, which consist of three triple-drum and two double-drum magnetic separators per grinding line. The magnetic rougher cyclone underflow is cycled back to the AG mills for additional grinding. The finisher magnetic product goes directly to the screens. The secondary cyclone underflow is screened at 100 mesh, with the screen undersize advancing to the pellet plant. The screen oversize from all grinding lines is reground



in two, 1,250-hp Vertimills operated in closed circuit with cyclones to produce a cyclone overflow of 90% passing 44 microns, which is then subjected to a second stage of finisher magnetic separation. The concentrate from this stage of finisher magnetic separation is advanced to the pellet plant, and the finisher tails go to the main launders and directly to the basin. Final magnetic concentrate averages approximately 66% MagFe and 4.1% SiO₂ at a final grind of 80% passing 44 microns. The final pellet contains 4.5% SiO₂. A simplified concentrator flowsheet is shown in Figure 17-1.

Figure 17-1: Concentrator Process Flow Sheet



Source: Cliffs 2021.

17.2 Pellet Plant

Iron concentrate from the concentrator is thickened and then pumped to agitated storage tanks where it is stored prior to filtration to approximately 9.25% moisture at the pellet plant. The filtration circuit consists of two phases. Phase 1 is equipped with three, 9-ft-diameter x 12 disc Eimco vacuum filters and five, 10-ft-diameter x 12 disc North Star vacuum filters and provides filtered concentrate to two of three pelletizing lines. Phase 2 is similar, but is equipped with four North Star disc filters, which provide concentrate to the third pelletizing line. The filtered

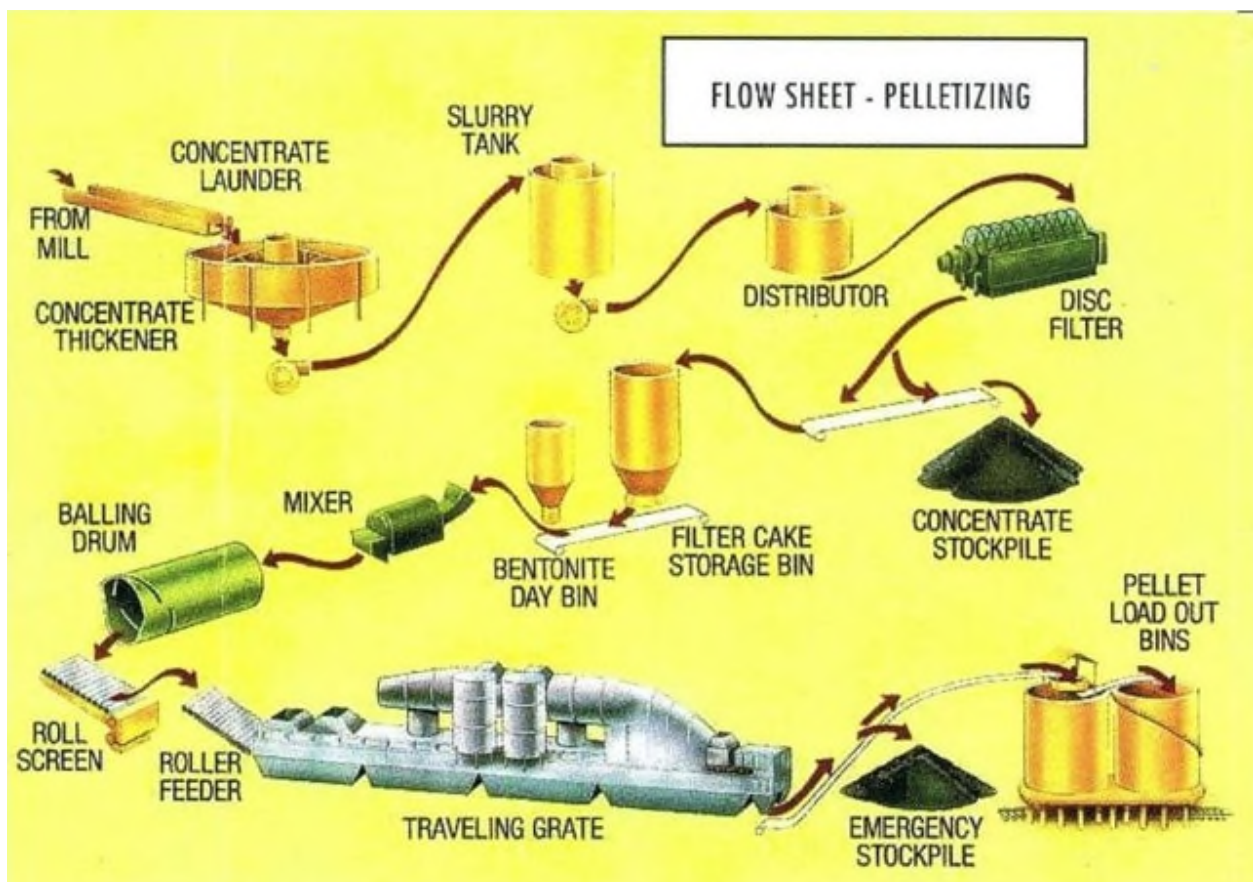


concentrate is blended with bentonite at approximately 18.5 lb/LT of concentrate and subjected to high-speed mixing prior to advancing to pelletizing to produce standard-compression pellets. When high-compression pellets are required, limestone is added in addition to the bentonite.

Each pelletizing line consists of four 12 ft-diameter x 32-ft-long Sala balling drums, each of which discharge across roll screens, which serve to produce green (unfired) balls that are closely sized at $-\frac{1}{2}$ in. + $\frac{3}{8}$ in. and contain 9.2% to 9.46% moisture. Roll screen oversize is fed to a shredder and returned to the balling drums along with the roll screen undersize. Green balls with a proper size are then conveyed to a roll feeder in front of each Dravo Traveling Grate indurating furnace. Each of the three indurating furnaces is 13 ft wide by 243 ft long with 243 pallet cars that move through seven different zones supported by 38 windboxes and five process fans. Pellets discharged from the indurating furnaces are the final product and are conveyed to the pellet load-out bins, or to the emergency stockpile. A simplified pellet plant flowsheet is shown in Figure 17-2, and a list of major equipment in the pellet plant is provided in Table 17-3.

Pellet production is monitored by a weightometer on the furnace feed and furnace returns (roll feeder undersize). Actual production is adjusted to actual train shipments once per month. Typical adjustments are in the range of 2,000 LT to 3,000 LT over a total production of 700,000 LT (<0.5% adjustment).

Figure 17-2: Pellet Plant Process Flow Sheet



Source: Cliffs 2021.



17.3 Major Process Plant Equipment

Table 17-2 and Table 17-3 provide a list of major processing equipment at HibTac.

Table 17-2: Concentrator Major Equipment List

Equipment	Type	Quantity	Manufacture	Size	HP
Primary Crusher	Gyratory	2	Allis-Chlamers	60" x 109"	
Grinding Mills	Autogenous	9	Metso/Koppers	36 ft x 15 ft	12,000
Regrind Mills	Vertimill	2	Metso		1,250
Magnetic Separator - Rougher	Single Drum	45	Eriez	48" x 10 ft	
Magnetic Separator - Finisher	Triple Drum	27	Eriez	36" x 10 ft	
Magnetic Separator - Finisher	Double Drum	18	Eriez	48" x 10 ft	
Tailings Hydroseparator		1	Westec	65 ft	
Tailings Hydroseparator		1	Westec	90 ft	

Source: Hibbing Taconite.

Table 17-3: Pellet Plant Major Equipment List

Equipment	Type	Quantity	Manufacture	Size
Vacuum Filter	Disc	3	Eimco	9 ft x 12 disc
Vacuum Filter	Disc	9	North Star	10 ft x 12 disc
Ball Drums		12	Sala	12 ft x 32 ft
Roll Feeder	Roll	3	Dravo/Abe Mathews	12.8 ft x 16.5 ft
Roll Screens	Roll	12	Dravo/Abe Mathews	8 ft x 21 ft
Indurating Furnace	Traveling Grate	3	Dravo	13 ft x 243 ft
Load-out Bin (West)	Train	1		11,000 ton
Load-out Bin (East)	Train	1		8,500 ton

Source: Hibbing Taconite.

17.4 Process Plant Performance

Production performance for HibTac's concentrator and pellet plant is summarized in Table 17-4, which presents crude wet ore tons, dry concentrate tons, and wet pellet tons produced for the period 2015 to 2020. The average ore delivered to the primary crusher was 28,083,000 LT/y with an average magnetic iron grade of 19.2% and silica content of 4.9% for the period. Weight



recovery to concentrate averaged 26.4% over this period, and wet pellet production averaged 7,400,200 WLT/y. Pellets averaged 66.1% Fe, 4.5% SiO₂, and 2.1% moisture for the period.

- Ore feed tons to the concentrator are reported as wet tons and are based on the crusher plant weigh scales.
- Ore feed to the process is based on weight percent recovery data reported by the mine, which is derived from the mine production model. No concentrator feed grade assays are obtained. For production forecasting, the concentrator reduces the weight percent recovery reported by the mine by the budgeted discount factor to allow for production losses. In 2015, the discount factor was lowered to 1.0 due to reconciliation.
- Concentrate production is reported by the pellet plant, and is based on dry pellets produced plus ending inventories of filter cake in stockpile and concentrate slurry minus filter cake and concentrate slurry starting inventories.
- Concentrator weight percent recovery is calculated by dividing the concentrate production tons reported by the pellet plant by wet ore tons recorded at the crushing plant. Prior to June 2012, this calculation was based on dry tons of concentrate. Since June 2012, weight percent recovery is based on wet tons of concentrate.
- MagFe recovery is tracked in the concentrator and used as an aid for the operators to monitor concentrator daily performance. It is not used for prediction of concentrator production due to inaccuracies associated with the MagFe recovery calculation (based on assumed feed grade to the concentrator and MagFe analyses on the final tailing).
- Pellet production is monitored on a daily basis by the furnace feed and furnace return weightometers and is adjusted monthly to actual train shipments of pellets. Monthly adjustments are typically in the range of 2,000 LT to 3,000 LT over a total reported pellet production in the range of 700,000 LT (<0.5% adjustment), indicating very good production accounting.

Table 17-4: Summary of Process Plant Production

	2015	2016	2017	2018	2019	2020
Total ROM (kLT) Primary Crusher Feed	29,846.1	30,731.1	29,928.0	29,492.0	28,395.0	20,106.0
%Fe (mag)	19.7%	19.9%	19.3%	19.5%	18.8%	18.2%
% SiO ₂	4.7%	4.9%	5.0%	5.0%	4.8%	4.8%
% Moisture	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Feed to Processing Plant (kWLT) Rod Mill Feed	29,846.1	30,731.1	29,928.0	29,345.0	28,395.0	20,106.0
% Mass Yield	26.5%	26.3%	25.9%	26.2%	26.3%	27.3%
Finished Concentrate Production (kWLT)	7,909.2	8,097.0	7,736.6	7,693.0	7,467.8	5,497.8
% MagFe Recovery	97.8%	96.8%	96.9%	97.0%	98.0%	97.2%
Finished Production (kWLT)	7,909.2	8,097.0	7,736.6	7,693.0	7,467.8	5,497.8
Pellet	7,909.2	8,097.0	7,736.6	7,693.0	7,467.8	5,497.8



	2015	2016	2017	2018	2019	2020
Tailings/Processing Waste (kWLT)	6,600	6,401	6,042	6,141	6,214	6,199
Tailings Fe% (total)	2.2%	3.2%	3.1%	3.0%	2.0%	2.8%
Product Quality KPIs						
Fe% - Final Product	66.07%	66.06%	66.11%	66.12%	66.06%	66.00%
SiO ₂ % - Final Product	4.51%	4.52%	4.47%	4.49%	4.50%	4.50%
% Moisture - Final Product	2.1%	2.7%	2.1%	1.9%	2.0%	2.0%
Year End Product Inventory (kWLT)	22.0	38.2	46.5	16.0	42.4	-
Pellet	22.0	38.2	46.5	16.0	42.4	-
Finished Shipments (kWLT)	8,078.0	8,154.8	7,683.1	7,571.0	7,406.0	5,540.2
Pellet	8,078.0	8,154.8	7,683.1	7,571.0	7,406.0	5,540.2
Source: Hibbing Taconite Annual Operating and Financial Reports.						

17.5 Pellet Quality

HibTac's pellet quality specifications for both standard and high-compression pellets are summarized in Table 17-5. Aside from achieving the iron grade specification, considerable effort is devoted to ensuring that the silica specification of 4.5% SiO₂ is consistently achieved.

Table 17-5: Summary of Specifications for Standard and High Compression Pellets

Criteria	Standard Pellet	High Compression Pellet
% Dry Iron	66.15 +/- 0.20	66.00 +/- 0.30
% Dry SiO ₂	4.50 +/- 0.20	4.50 +/- 0.20
%+1/4 in. A.T.	96.0 +/- 0.8	97.0 +/- 0.5
%-28 mesh A.T.	3.6 +/- 0.8	2.7 +/- 0.5
Average compression (lb)	470 +/- 40	560 +/- 20
%-300 lb compression	< 15.3	< 15.3
% Sizing +1/2 in.	<5.0	<5.0
% Sizing -1/2 +3/8 in.	93.0 +/- 2.0	93.0 +/- 2.0
Moisture	<3%	<3%

17.6 Consumable Requirements

Table 17-6 and Table 17-7 present the energy and materials that HibTac used in 2018, 2019, and 2020.



Table 17-6: 2018 to 2020 Energy Usage

Energy Usage	Units	2018		2019		2020	
		Usage	Usage/LT Pellets	Usage	Usage/LT Pellets	Usage	Usage/LT Pellets
Mining	kWh	44,567,127	5.71	41,414,474	5.54	34,429,030	6.31
Crushing	kWh	12,637,215	1.62	13,564,862	1.82	11,558,584	2.12
Processing	kWh	825,300,722	105.82	784,096,898	104.92	615,974,040	112.93
Post Processing	kWh	364,071,974	46.68	348,619,857	46.65	267,484,857	49.04
Maintenance	kWh	2,280,175	0.29	2,447,553	0.33	1,896,556	0.35
General Operations	kWh	922,787	0.12	990,525	0.13	844,025	0.15
Total	kWh	1,249,779,999	160.24	1,191,134,169	159.38	932,187,092	170.90
Natural Gas							
Natural Gas - Process	MBtu	1,961,033	0.25	2,095,335	0.28	1,787,182	0.33
Natural Gas - Heating	MBtu	760,459	0.10	712,255	0.10	637,378	0.12
Fuel							
Diesel Fuel	gals	7,135,684	0.91	7,157,733	0.96	5,317,569	0.97
Gasoline	gals	101,158	0.01	106,146	0.01	82,833	0.02
Total Pellets	WLT	7,799,330		7,473,344		5,454,679	

Table 17-7: 2018 to 2020 Materials Usage

Materials	Units	2018		2019		2020	
		Usage	Usage/LT Pellets	Usage	Usage/LT Pellets	Usage	Usage/LT Pellets
Bentonite	lb	149,711,020	19.20	116,245,206	15.55	89,616,436	16.43
Limestone	lb	45,724,260	5.86	51,430,260	6.88	42,139,660	7.73
Total Pellets	WLT	7,799,330		7,473,344		5,454,679	

17.7 Process Manpower

Current processing manpower totals 260 and is summarized as follows:

- Plant operations – 166
- Plant maintenance – 58
- Mine supervision and technical services – 36



18.0 Project Infrastructure

18.1 Roads

The Mine and Plant are both located on the mine site. Access to the mine site is by US Highway 169/State Highway 73 to County Highway 5, north 2.3 mi to the HibTac access road, and east two miles to the site. The road access to the site is by paved roads that allow easy access for material and the work force. Figure 18-1 shows the general location and basic infrastructure of the site.



18.2 Rail

A railroad system serves the operation and provides both raw materials for the processing of ore and delivery of product to the port facility located in Superior, Wisconsin. The rail system on the mine site consists of an approximately 6.5 mi main line with a loop track that accesses dual taconite pellet storage silos and train load-out facility. The silos each have a capacity of approximately 10,000 LT. The facility and loop track allow loading of unit trains consisting of 184 cars equaling 18,500 LT of pellets per unit train. Unit train loading takes between 2.0 and 2.5 hours. There is an average of two trains per day. The loaded pellet cars are delivered by rail operator BNSF approximately 90 mi south to the Allouez Taconite Facility in Superior, Wisconsin on the western edge of Lake Superior.

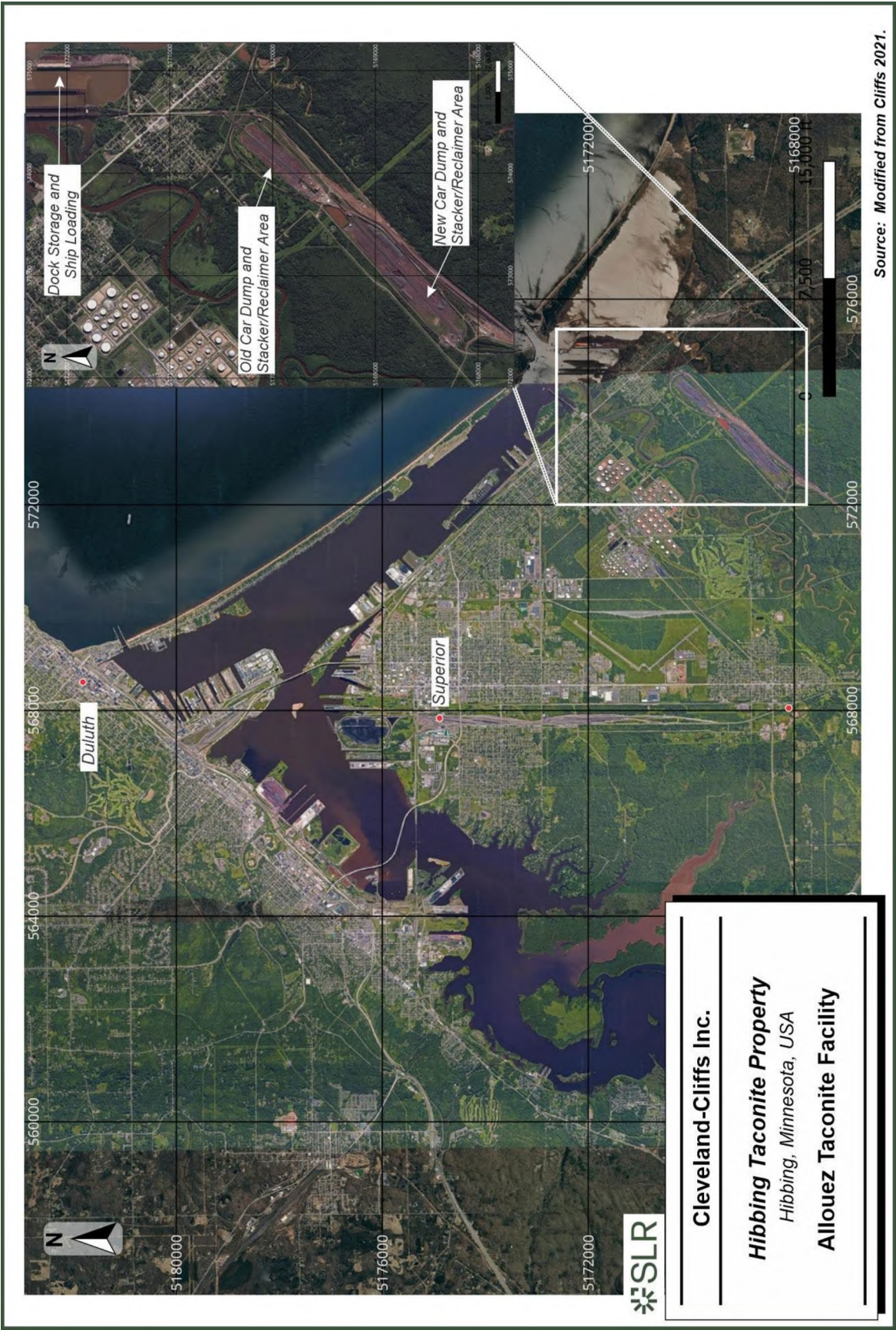
A secondary system with two side tracks at the site allows supply trains to provide supplies of bentonite to the Plant. The bentonite is stored in two bentonite silos with a capacity of 3,672 tons each. The site receives 12 to 16 cars of bentonite at 97 tons per car delivered in two deliveries per week. The bentonite is delivered at a rate of approximately 6,250 tons per month (64 cars), which equates to 75,000 tons per year.

18.3 Port Facilities

Taconite pellets from HibTac are transported by rail to the port transshipment location known as the Allouez Taconite Facility. The facility consists of two separate train unloading systems, a stockpile area, reclaimer systems, dock storage silos, and ship loading system. The facility is owned, operated, and managed by BNSF and located in Superior, Wisconsin (Duluth area) on the western tip of Lake Superior. The facility provides unloading, stockpiling, blending, and ship loading capabilities. Figure 18-2 shows the general location of the facility and general layout of the systems.



Figure 18-2: Allouez Taconite Facility



The Allouez Taconite Facility receives an average of three trains per day. HibTac provides two taconite pellet unit trains per day. The unit trains consist of 184 cars, rated at just over 100 LT per car, equaling 18,500 LT per train. The trains report to either the new car dump system or the old car dump system that allow taconite pellets to either be stockpiled or delivered directly to the dock storage silos.

The new car dump, placed in service in 1977, is designed to unload three cars at a time. The system has a capacity of 3.3 MLT/y and covers approximately 90 acres. The cars are indexed using a hydraulic positioner, and doors are opened or closed by automatic door machines. The cars are dumped into holding bins below the cars. There are two feeders that feed into the conveyor system that reports to the stacker/reclaimer. A unit train can be unloaded in approximately four hours on the new car dump.

The old car dump, placed in service in 1966, is designed to unload two 35-ft cars or one 42-ft car at one time. The system has a capacity of 1.5 MLT and covers 60 acres. The system has the same configuration as the new system, other than the size and number of cars that can be dumped. It takes approximately six hours to unload a train on the old car dump.

Feeders remove material from the car dump bins onto a conveyor system with over 12 mi of installed belt. The conveyor system for the new dump has a capacity of 6,000 LT per hour (LT/h). The old dump system has a capacity of 2,500 LT/h. Average belt speed is 670 ft per minute making it a 25-minute trip from the new car dump to Dock #5 on the belts that range from 36 in. to 72 in. in width. The pellets can either report directly to Dock #5, which is 3.5 mi from the new car dump, or be stacked out through the stacker reclaimer system.

The stacker/reclaimer system consists of three crawler-mounted bucket wheel reclaimers. Two reclaimers have a capacity of 3,500 LT/h, and the third has a capacity of 2,500 LT/h. The reclaimers stack onto segregated piles for blending or direct the reclaimed taconite onto the belts for transport to the ship loading area.

The ship loading area consists of silos and ship loaders and has a storage capacity of 72,000 LT. There are 36 silos with a capacity of 2,000 LT each. Each silo is 42 ft in diameter and 92 ft high. The silos are loaded by a computerized traveling tripper that is fed from the stacker/reclaimer. The silos are unloaded and ships are loaded at 1,000 LT/h by shuttle conveyors that are 45 ft above water level and are capable of extending 65 ft. Figure 18-3 shows a photograph of the ship loading area and silos.



Figure 18-3: Allouez Taconite Facility Ship Loader and Silos



Source: Cliffs 2021.

The facility typically loads two types of ships. The first is a 1,000-ft-long ship with a typical cargo weight of 55,000 LT. The second is an 800-ft ship with typical cargo weight of 25,000 LT to 30,000 LT. These ships can be loaded in four hours.

Blending plans are created by Hibbing Taconite and given to BNSF to execute in order to meet cargo quality specifications. Blending is performed at the time of cargo loading and is accomplished by either blending different stockpiles together or by blending stockpiled material with fresh production from the train.

18.4 Tailings Disposal

The construction of HibTac TSF commenced in 1974, and production began in 1976. From relatively low-grade taconite, the iron ore processing plant, at full capacity, produces approximately 16 MLT/y of tailings that are stored in the TSF situated just north of the Plant (Barr, 2017a). The TSF is located approximately four miles north of the town of Hibbing and three miles east of the town of Chisholm, Minnesota. The HibTac TSF is a paddock dam-type TSF consisting of five cells: West Area 1, 2, and 3 (WA-1, WA-2, and WA-3 with approximately 2,080 acres, 510 acres, and 1,000 acres of impoundment area, respectively), used for tailings deposition; SD-3 Reservoir (approximately 1,340 acres of impoundment area), used as a return water reservoir; and East Area (approximately 830 acres of impoundment area), which is currently not in use, but will be brought into production at a later date.

The tailings basins were permitted as unlined facilities, with the foundation materials and tailings providing a low-permeability material to reduce seepage.

Prior to 2011, total tailings were deposited in the basin via gravity discharge through launders. In 2011, Hibbing Taconite began operating a hydroseparator system, which is used to separate out the coarse-fraction tailings from the total tailings. Approximately 40% of the total tailings are



coarse-fraction tailings. The coarse-fraction tailings from the hydroseparator (underflow) are pumped to various locations around the tailings basin using the Main Tailing Pumphouse (MTP). The coarse-fraction tailings are used for hydraulic dam construction, stockpiled for use in mechanical dam construction, or for other mine purposes. All of the interior dams and some of the perimeter dams are planned to be raised by hydraulic methods. If hydraulic dam construction cannot be completed in time to meet dam freeboard requirements, portions of the dams will likely need to be constructed mechanically. The remaining approximately 60% is considered fine-fraction tailings, which are deposited via gravity as slurry and mixed with approximately 120,000 gallons per minute (gpm) of water. Fine-fraction and coarse-fraction tailings are conveyed via gravity at between 25% and 30% solids, respectively (Knight Piésold Limited (KP), 2020). Approximately 120,000 gpm is pumped from the SD-3 Reservoir to the process plant.

The location of the tailings basin is shown on Figure 18-4.

18.4.1 Facility Description

Hibbing Taconite currently maintains approximately 13 mi of perimeter dams that are designed to retain tailings produced during the concentration of iron ore from mining operations and encompasses approximately 6,500 acres. Approximately 4.5 mi of interior dams are used to divide the basin into two tailings disposal cells (West Area and East Area) and a clear-water reservoir (SD-3 Reservoir). The HibTac TSF configuration, which includes the internal and external dams, is shown in Figure 18-5.



Figure 18-4: TSF Location

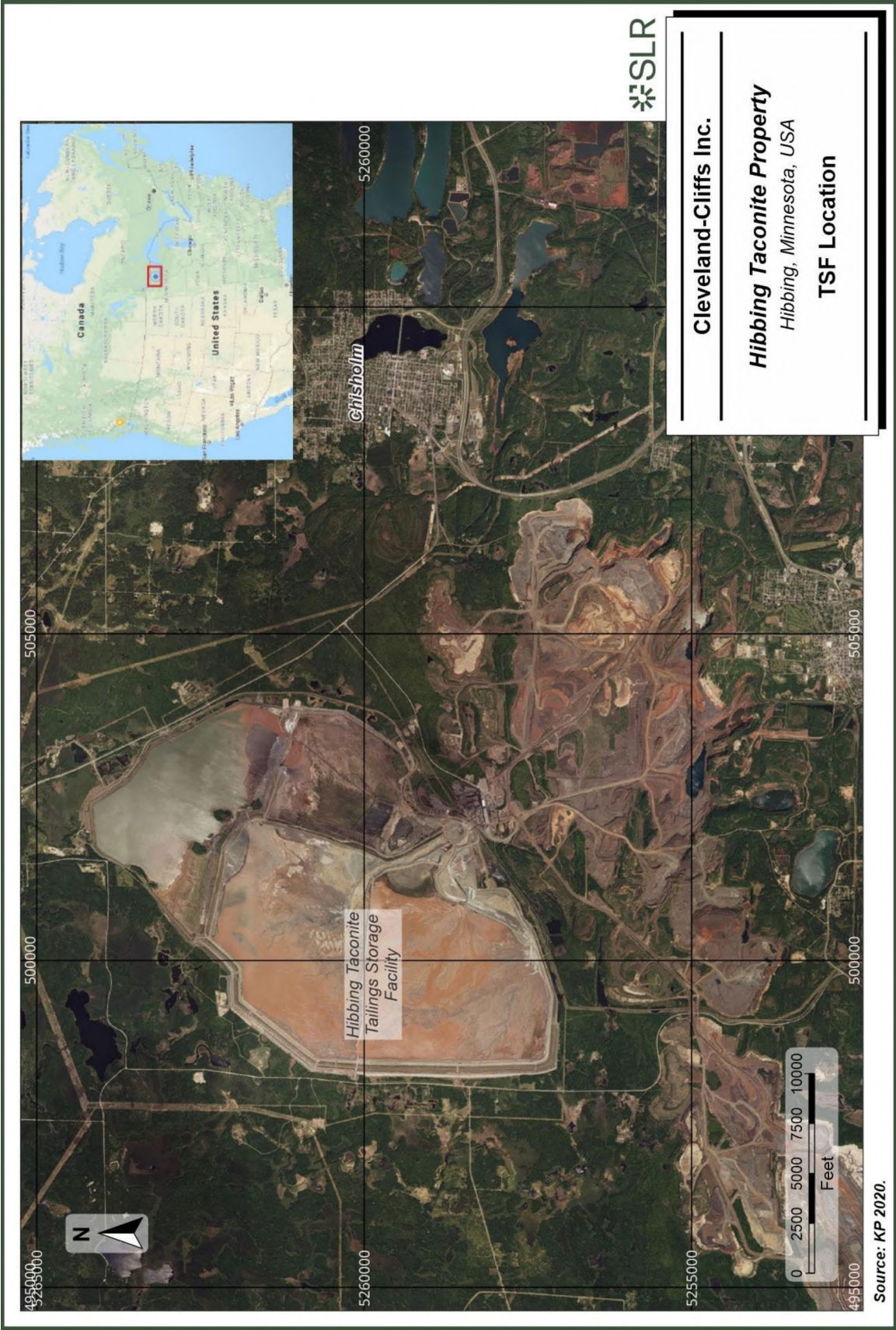
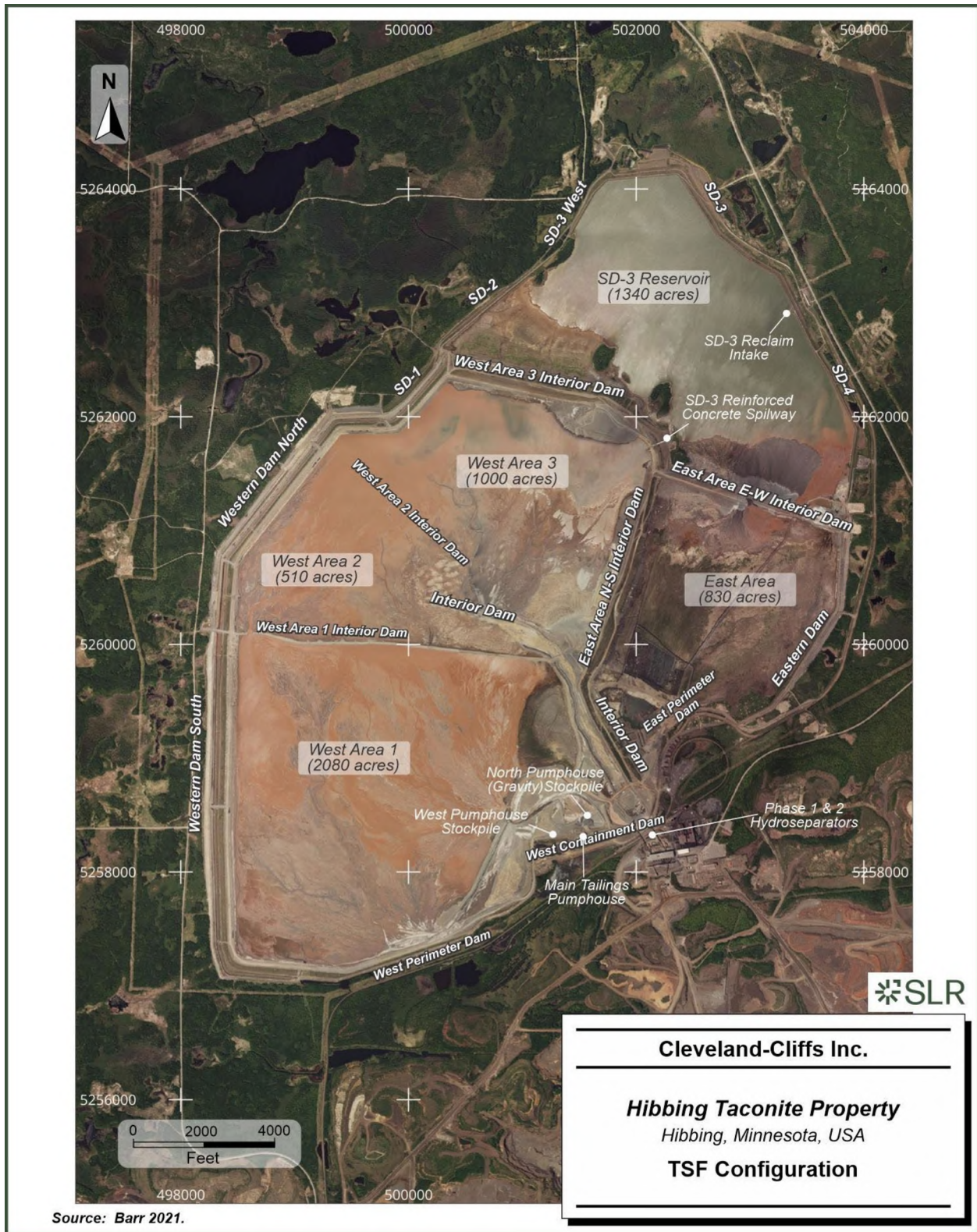


Figure 18-5: TSF Configuration



The impoundment of tailings and solution provided is by the following eight, earth-fill, engineered dams along the perimeter, which are shown in Figure 18-5, and described below as follows:

- West Perimeter Dam (WPD) is an approximately 8,200-ft-long dam raised using offset upstream construction, with a current maximum height of approximately 35 ft.
- Western Dam South (WDS) is an approximately 12,000-ft-long dam raised using offset upstream construction, with a current maximum dam height of approximately 85 ft.
- Western Dam North (WDN) is an approximately 9,000-ft-long dam raised using offset upstream construction, with a current maximum dam height of approximately 75 ft.
- SD-1 Dam (SD-1) is approximately 2,300 ft long with a current maximum dam height of approximately 140 ft.
- SD-2 Dam (SD-2) is approximately 4,000 ft long with a current maximum dam height of approximately 60 ft.
- SD-3 Dam (SD-3) is approximately 12,000 ft long with a current maximum dam height of approximately 75 ft.
- SD-4 Dam (SD-4) is approximately 4,800 ft long with a current maximum dam height of approximately 65 ft.
- Eastern Dam (ED) is approximately 5,000 ft long with a current maximum dam height of approximately 50 ft.

Active tailings disposal is occurring in the West Area cell, with excess supernatant being allowed to overflow into the SD-3 Reservoir via the WA 3 Reinforced Concrete Spillway. SD-3 is not outfitted with an emergency spillway; however, the dam has been sized to contain tailings, a long-term pond elevation, plus additional dam height to contain the design storm event and wave run-up.

Hibbing Taconite plans to resume tailings deposition in the East Area at a later date, which has been idle since 2011. Historically, the West Area cell was divided into three cells (WA-1, WA-2, and WA-3), which were separated by the WA-1 Interior Dam, WA-2 Interior Dam, and the Interior Dam. The WA-2 Interior Dam is no longer being raised and has been submerged. The WA-1 Interior Dam continues to be raised and is currently used as a haul road. The West Area and East Area are separated by the Interior Dam and the East Area N-S Interior Dam. The WA-3 Interior Dam separates the West Area from the SD-3 Reservoir, and the East Area E-W Interior Dam separates the East Area from the SD-3 Reservoir.

The downstream method was used originally to raise most of the dams before switching to the upstream raise method in the later 1980s. The switch to an upstream raise method caused uplift pressures to develop beneath the upstream sloping clay core for the corners of the perimeter dams. These corner areas became critical for stability. The offset upstream method was then used after uplift pressures were recognized, utilizing staged construction techniques and the use of frozen ground for initial placement of tailings.

18.4.2 Design and Construction

The QP understands that Hibbing Taconite has retained Barr as the Engineer of Record (EOR) for the TSF. Typical EOR services include the design (i.e., volumetrics, stability analysis, water balances, hydrology, seepage cut-off design, etc.), construction and construction monitoring, inspections (i.e., annual dam safety inspections) and instrumentation monitoring data review



(i.e., regularly scheduled instrumentation monitoring and interpretation), to verify that the tailings basins are being constructed and operated by Hibbing Taconite as designed and to meet all applicable regulations, guidelines, and standards.

Barr has designed vertical dam raises for SD-1 and WDN, increasing the current crest elevation of 1,600 ft to 1,630 ft, which will result in an ultimate dam height of approximately 170 ft for SD-1. Barr states that the slope stability FoS and the flood storage requirements for SD-1 and WDN meet the minimum specified requirements (Barr, 2021 and Barr, 2020a). KP (2019) noted that this raise will provide enough tailings storage capacity until 2026 based on an annual production of 21.2 MLT.

18.4.3 Audits

The most recent audit was performed by KP in 2019 (KP, 2020). The previous audit was undertaken by SRK in 2015 (SRK, 2015).

The QP understands that an External Peer Review Team (EPRT) was established in 2019 as part of the tailings basin design and operations review. The EPRT is an independent group that is not associated with the day-to-day engineering activities performed by Barr or Hibbing Taconite and works with Barr and Hibbing Taconite to review design, construction, monitoring, and risk management.

18.4.4 Inspections

Regular inspection and monitoring are carried out by Barr, which is currently identified as the EOR for the TSFs, and include dam inspections (Barr, 2020b) and visual inspections, as well as a semi-annual report of all the instrumentation readings, including the piezometer levels.

18.4.5 Reliance on Data

The QP relies on the statements and conclusions of Barr, Hibbing Taconite, and KP, and provides no conclusions or opinions regarding the stability of the listed dams and impoundments.

18.4.6 Recommendations

The HibTac TSF has been operating since 1976, which is currently operating under the requirements of the MDNR. Dam Safety Unit Upstream tailings dam raises, such as those carried out by Hibbing Taconite at the Property, are typically done in low-seismic zones and can be constructed using the coarse-fraction tailings (sand) material. This type of construction approach, however, requires a comprehensive communication and documentation system, careful water management, monitoring of the dam and foundation performance, and the placement of tailings material to ensure that it meets the design requirements. To address these issues, Hibbing Taconite has retained Barr as the EOR, which is an industry standard for tailings management, as the EOR typically verifies that the tailings storage basin cells are being constructed and operated by Hibbing Taconite as designed and to meet all applicable regulations, guidelines, and standards.

Based on a review of the documentation provided, the QP has the following recommendations:

- 1 The Operations, Maintenance, and Surveillance (OMS) Manual for the TSF should be updated with the EOR in accordance with Mining Association of Canada (MAC) guidelines and other industry-recognized, standard guidance for tailings facilities.



- 2 The remediation, or resolution, of items of concern noted in TSF audits or inspection reports should be documented, prioritized, tracked, and closed out in a timely manner.

18.5 Power

Electrical power is supplied to the site by Minnesota Power. The site load is approximately 167 MW. Power is supplied through a loop system with a 115-kV distribution line that runs along the eastern portion and northern portion of the Property. A 230-kV line runs in a north-south direction along the northern half of the western Property boundary. A 115-kV line provides the southern segment of the loop, with the 115-kV line providing power at three substations. A 500-kV, high-voltage transmission line runs along the eastern and northern areas of the Property. Figure 18-6 shows the electrical distribution.

HibTac is fed by four separate, 75MW 115 kV lines. The main substation has three, 75-MVA transformers with dual secondaries feeding six, 13.8-kV distribution busses for the connected load.

18.6 Natural Gas

Natural gas fuel is provided by Northern Natural Gas (NNG) to the mine site in a supply pipeline that parallels the entrance road on the eastern side of the Property. NNG primarily provides natural gas from Texas and ships it into the area through a high-pressure natural gas line. Natural gas is used at a rate of 310 MMBtu/LT of pellets (five year average). Gas supply is adequate for planned plant needs. Figure 18-6 shows the regional natural gas distribution.



Figure 18-6: Regional Electrical Power Distribution

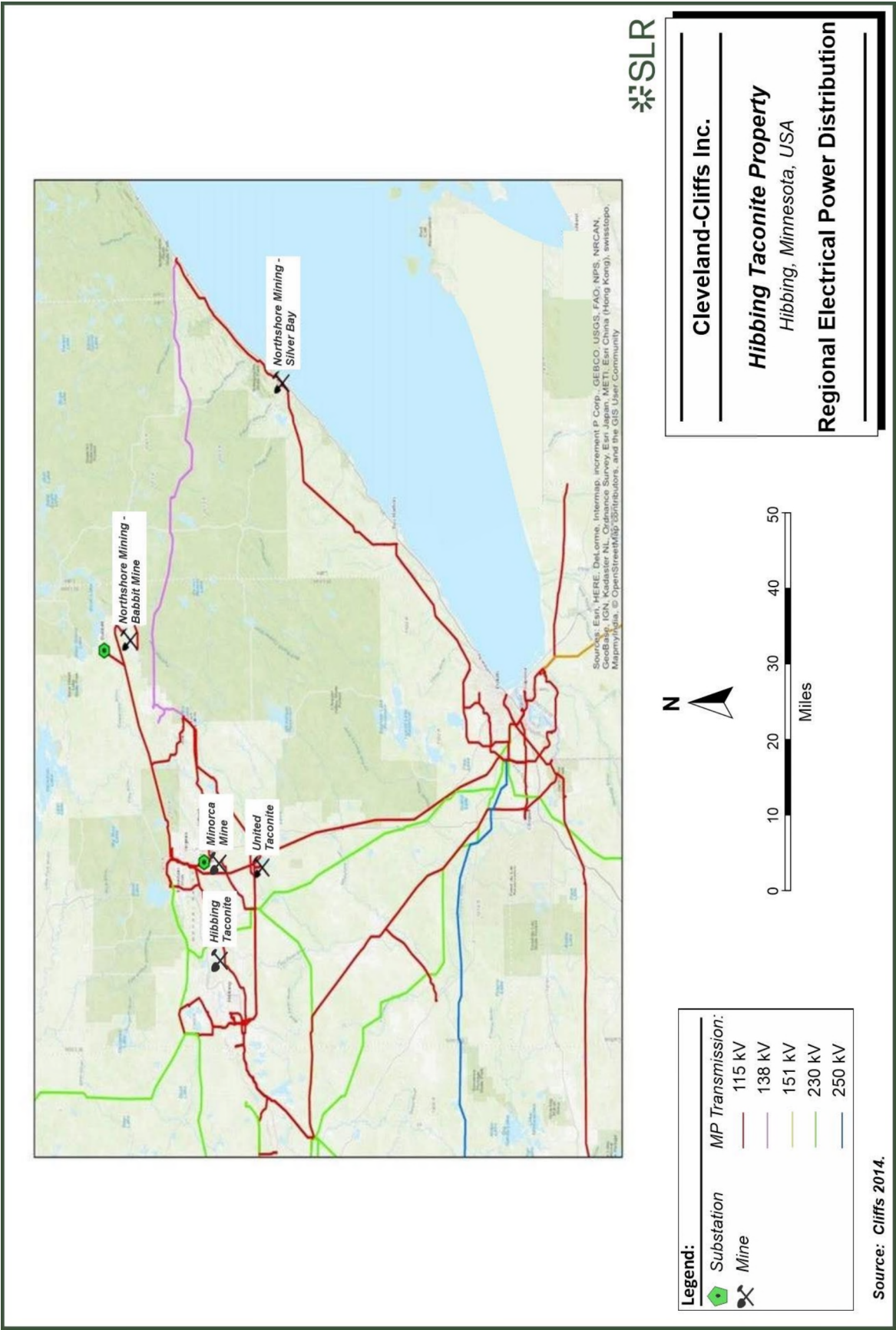


Figure 18-7: Regional Natural Gas Supply



18.7 Diesel, Gasoline, and Propane

Large diesel equipment is fueled in the field by a contractor. Small diesel and gasoline fueling stations are used for small maintenance equipment and fleet vehicles. Best Oil supplies diesel fuel to all of Cliffs' Minnesota operations, while Thompson Gas supplies propane. There is sufficient fuel supply in the region to meet the requirements of the operation.

18.8 Water Supply

The water for mining and processing operations is provided by makeup water from the Scranton and Morton pits and recycles water from the TSF. The makeup water is provided at approximately 5,000 gpm by pit pumps. The source of makeup water is adjusted based on the mine plan. The reclaim water from the tailings is used for process water at the Plant. The water supply is more than adequate, especially considering that the Mine is a net positive water situation requiring daily discharge of excess water from pit dewatering. Pit dewatering is a substantial effort on this project, and a number of processes are in place to meet targeted needs driven by the mine plan.

18.9 Communications

The Property has a substantial communication system in place. The infrastructure includes telephones, cell phones, mine/plant radios, mine/plant paging system (the paging system will soon have the capability to broadcast emergency communications over all radio channels simultaneously), and truck dispatch system. Internet (cable and wireless) is also used at the site.

18.10 Mine Support Facilities

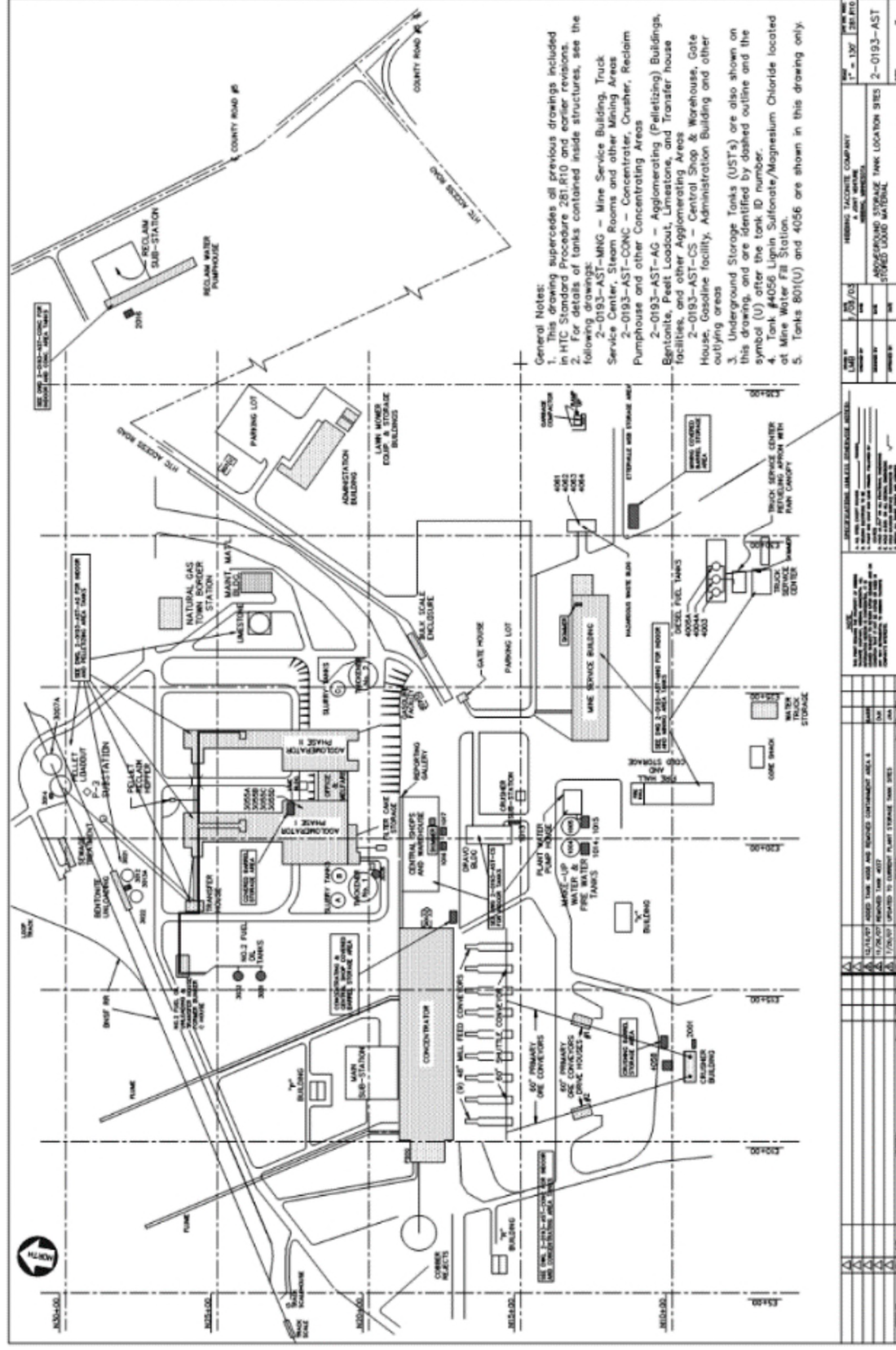
See below under Plant Support facilities.

18.11 Plant Support Facilities

The Plant area includes the following buildings and adjacent sites: administrative building, tire yard, mine service building, truck service center, fire hall, plant water pump house, central shops and warehouse, solid waste transfer station, crusher, drive houses, concentrator, agglomerator, agglomerator thickeners, transfer house, pellet load out and bentonite unloading site, sewage treatment plant, various dry storage buildings, power substations, fuel storage and refueling sites, parking lots, and offices. The analytical laboratory is located in the concentrator. Additional ancillary facilities include explosives storage, a truck scale facility, and a secured guard gate-controlled access to the Plant facilities. The general arrangement of the Plant facilities is illustrated in Figure 18-8.



Figure 18-8: Hibbing Taconite Facilities General Arrangement Drawing



Source: Barr Engineering SPC Plan 2012 for Hibbing Taconite Company (supplied by HibTac)



18.11.1 Administration Buildings and Offices

The 20,000 ft² administrative facilities provide offices for general management, safety, environmental, accounting, human resources, and administrative staff. Mine engineering and geology offices are located in the mine services building, and process engineering offices are located in the Plant.

18.11.2 Maintenance Shop

The maintenance facilities on-site include a 37,000 ft² central shop and warehouse, a 2700 ft² maintenance material building, and a 67,500 ft² mine services building with four designated bays to service mine trucks and larger production equipment. All facilities are fully stocked with maintenance equipment and tools for maintenance activities, including welding and machining, hydraulic hose supply and repair, electrical testing, tire repair, fuel storage, lubrication and used oil storage, hazardous waste control, and firefighting.



19.0 Market Studies and Contracts

19.1 Markets

Note that while iron ore production is listed in long or gross tons (2,240 lb), steel production is normally listed in short tons (2,000 lb) or otherwise noted.

Cliffs is the largest flat-rolled producer in North America. It is also the largest supplier of iron ore pellets in North America. In 2020, Cliffs acquired two major steelmakers, AMUSA and AK Steel (AK), vertically integrating its legacy iron ore business with steel production and emphasis on the automotive end market.

Cliffs owns or co-owns five active iron ore mines in Minnesota and Michigan. Through the two acquisitions and transformation into a vertically integrated business, the iron ore mines are primarily now a critical source of feedstock for Cliffs' downstream primary steelmaking operations. Based on its ownership in these mines, Cliffs' share of annual rated iron ore production capacity is approximately 28.0 million tons, enough to supply its steelmaking operations and not have to rely on outside supply.

In 2021, with underlying strength in demand for steel, the price reached an all time high. It is expected to remain at historically strong levels going forward for the foreseeable future. In 2020, North America consumed 124 million tons of steel, while producing only 101 million tons, which is consistent with the historical trend of North America being a net importer of steel. That trend is expected to continue going forward, as demand is expected to outpace supply in North America. Given the demand, it will likely be necessary for most available steelmaking capacity to be utilized.

On a *pro-forma* basis, in 2019 Cliffs shipped 16.5 million tons of finished, flat-rolled steel. The next three largest producers were Nucor with 12.7 million tons, U.S. Steel with 10.7 million tons, and Steel Dynamics with 7.7 million tons. In 2019, total US flat-rolled shipments in the United States were approximately 60 million tons, so these four companies make up approximately 80% of shipments.

With respect to its blast furnace (BF) capacity, Cliffs' ownership and operation of its iron ore mines is a primary competitive advantage against electric arc furnace (EAF) competitors. With its vertically integrated operating model, Cliffs is able to mine its own iron ore at a relatively stable cost and supply its BF and direct reduced iron (DRI) facilities with pellets in order to produce an end steel or hot briquetted iron (HBI) product, respectively. Flat-rolled EAFs rely heavily on bushelling scrap (offcuts from domestic manufacturing operations and excludes scrap from obsolete used items), which is a variable cost. The supply of prime scrap is inelastic, which has caused the price to rise with the increased demand. S&P Global Platts has stated that the open-market demand for scrap could grow by nearly 9 million tons through 2023 as additional EAF capacity comes online with the impact of the scrap market to continue to tighten as all new steel capacity slated to come online is from EAFs (S&P Global Platts, news release, March 18, 2021).

In addition to its traditional steel product lines, Cliffs-produced steel is found in products that are helping in the reduction of the global emissions and modernization of the national infrastructure. For example, Cliffs' research and development center has been working with automotive manufacturer customers to meet their needs for electric vehicles. Cliffs also offers a variety of carbon and plate products that can be used in windmills, while it is also the sole producer of electrical steel in the United States. Additionally, in Cliffs' opinion, future demand for steel given



its low CO₂ emissions positioning will increase relative to other materials such as aluminum or carbon fiber.

Cliffs is uniquely positioned for the present and future due to a diverse portfolio of iron ore, HBI, BF's, and EAFs generating a wide variety of possible strategic options moving forward, especially with iron ore. For instance, Cliffs has the optionality to continue to provide iron ore to its BF's, create more DRI internally, or sell iron ore externally to another BF or DRI facility.

The necessity for virgin iron materials like iron ore in the industry is apparent as EAFs rely on bushelling scrap, or metallics. As of 2020, EAFs accounted for 71% of the market share, a remarkably high percentage among major steelmaking nations. Because scrap cannot be consistently relied upon as feedstock for high-quality steel applications, the industry needs iron ore-based materials that Cliffs provides to continue to make quality steel products.

The US automotive business consumes approximately 17 million tons of steel per year, which is expected to continue around or at this level over time for the foreseeable future. Cliffs iron ore reserves provide a competitive advantage in this industry as well, due to high quality demands, which scrap-based steelmakers have more difficulty supplying. As a result, Cliffs is the largest supplier of steel to the automotive industry in the United States, by a large margin.

Table 19-1 shows the historical pricing for hot rolled coil (HRC) product, Bushelling Scrap feedstock, and IODEX iron ore indexes for the last five years. The table also includes the 2021 pricing for each index, which shows a significant increase that is primarily driven by demand.

Table 19-1: Five Year Historical Average Pricing

Indices	2017	2018	2019	2020	2021	5 Yr. Avg.
U.S. HRC (\$/short ton)	620	830	603	588	1,611	850
Busheling (\$/gross ton)	345	390	301	306	562	381
IODEX (\$/dry metric ton)	71	69	93	109	160	100

The economic viability of Cliffs' iron ore reserves will in many cases be dictated by the pricing fundamentals for the steel it is generated for, as well as scrap and seaborne iron ore itself.

The importance of the steel industry in North America, and specifically the US, is apparent by the actions of the US federal government by implementing and keeping import restrictions in place. Steel is a product that is a necessity to North America. It is a product that people use every day, often without even knowing. It is important for middle-class job generation and the efficiency of the national supply chain. It is also an industry that supports the country's national security by providing products used for US military forces and national infrastructure. Cliffs expects the US government to continue recognizing the importance of this industry and does not see major declines in the production of steel in North America.

For the foreseeable future, Cliffs expects the prices of all three indexes to remain well above their historical averages, given the increasing scarcity of prime scrap as well as the shift in industry fundamentals both in the US and abroad.

19.2 Contracts

19.2.1 Pellet Sales

Since Cliffs' 2020 acquisition of AK and AMUSA's BF steel making facilities, HibTac pellets are shipped predominantly to Cliffs' steelmaking facilities in the Midwestern USA. For cash flow



projections, Cliffs uses a blended three-year trailing average revenue rate based on the dry standard pellet from all Cliffs' mines, calculated from the blended wet pellet revenue average of \$98/WLT Free on Board (FOB) Mine as shown in Table 19-2. Pellet prices are negotiated with each customer on long-term contracts based on annual changes in benchmark indexes such as those shown in Table 19-1 and other adjustments for grade and shipping distances.

Table 19-2: Cliffs Consolidated Three-Year Trailing Average Wet Pellet Revenue

Description	2017	2018	2019	3YTA
Revenue Rate (\$/WLT)	88.02	105.64	99.50	98.00
Total Pellet Sales (MWLT)	18.7	20.6	19.4	19.5

SLR examined annual pricing calculations provided by Cliffs for the period 2017-2019 for external customers, namely AK. The terms appear reasonable. It should be noted that Cliffs has subsequently acquired AK and AMUSA steelmaking facilities in 2020, making the company a vertically integrated, high-value steel enterprise, beginning with the extraction of raw materials through the manufacturing of steel products, including prime scrap, stamping, tooling, and tubing.

For the purposes of this Technical Report, it is assumed that the internal transfer pellet price for Cliffs' steel mills going forward is the same as the \$98/WLT pellet price when these facilities were owned by AK and AMUSA. Based on macroeconomic trends, the QP is of the opinion that Cliffs pellet prices will remain at least at the current three-year trailing average of \$98/WLT or above for the next five years.

19.2.2 Operations

Major current suppliers for the HibTac operation include, but are not limited to, the following:

- Electrical Grid Power: Minnesota Power
- Natural Gas: NNG with scheduling by Constellation Energy
- Diesel Fuel: Best Oil
- Propane: Thompson Gas
- Pellet Rail Transport and Two Harbors Port ship loading: BNSF Railway



20.0 Environmental Studies, Permitting, and Social or Community Impact

The SLR review process for the HibTac operation included updating information that was provided by Cliffs. SLR also conducted a site visit at HibTac on April 28, 2021. SLR has not seen nor reviewed environmental studies, management plans, permits, compliance documentation and reports, or monitoring reports. The original and updated information included in this section is based on the information provided by the Cliffs project team.

20.1 Environmental Studies

HibTac has been operating for 45 years, and baseline and other environmental studies have been undertaken as needed to support various approvals and compliance-based reporting over the site's operating history. Currently, additional environmental studies, including collecting new or updated baseline information, are undertaken on an as-required basis to support new permit applications or to comply with specific permit conditions.

Recent environmental studies included an Investigation Plan, which was approved by the Minnesota Pollution Control Agency (MPCA) for the North Hibbing Voluntary Investigation and Clean-up (VIC) site.

20.2 Environmental Requirements

Hibbing Taconite maintains an environmental management system (EMS) that is registered to the international ISO 14001:2015 standard. The ISO standard requires components of leadership commitment, planning, internal and external communication, operations, performance evaluation, and management review. Hibbing Taconite's continued registration to the ISO standard is evaluated annually through internal auditors and every other year through external auditors.

Cliffs maintains a regulatory matrix as part of its EMS, as well as a regulatory tracker. Hibbing Taconite conducts internal auditing of its compliance system on a regular basis, and Cliffs corporate conducts a formal compliance audit on a routine basis.

Impacts to surrounding communities (noise, vibration, etc.) are considered by the EMS, and views of interested parties are part of the ranking process when ranking environmental aspects.

There are no known environmental issues that could materially impact Cliffs' ability to extract Mineral Resources and Mineral Reserves.

20.2.1 Site Monitoring

HibTac operates through permission granted by multiple permits, which are summarized in Table 20-1. The permits contain requirements for site monitoring including air, water, waste, and land aspects of the HibTac operation. The permit-required data are maintained by the facility, and exceptions to the monitoring obligations, if they occur, are reported to the permitting authority as defined in the individual permit. Monitoring is conducted in compliance with permit requirements, and management plans are developed as needed to outline protocols and mitigation strategies for specific components or activities. Monitoring and management programs currently undertaken in compliance with Hibbing Taconite's existing permits include:

- Air Quality: Management plans including fugitive dust control plans, operation and maintenance plans, and startup, shutdown, and malfunction plans; monitoring of fugitive



sources and stacks, visible dust emission monitoring at the tailings facility; and greenhouse gas (GHG) emissions monitoring and reporting.

- Noise and Vibration: Blast management plans including vibration monitoring.
- Surface Water: Routine water quality sampling in receiving waters; quantity of water takings and discharges.
- Groundwater: Routine water quantity of water takings.
- Wetlands: Monitoring of nearby wetlands where the potential for an impact has been identified, including potential indirect impacts, where appropriate.
- Wildlife: Monitoring of endangered species in accordance with specific permit conditions.

There are no specific management plans related to social aspects in place.

With regard to compliance, there are currently no outstanding enforcement actions at the facility.

The State and Federal government conduct regional ecologic monitoring in the vicinity of the facility operations. Two recent examples of such monitoring include:

- EPA conducted its residual risk and technology review (RTR) of the Taconite NESHAP (40 CFR 63). EPA's final rule on July 28, 2020 documents that risks from the taconite iron ore processing source category are acceptable, and the current standards provide a margin of safety to protect public health and prevent an adverse environmental effect.
- The State of Minnesota conducts regional watershed monitoring to assess the overall health of waterbodies throughout the state including water quality and macroinvertebrate and fish population diversity and health. The State may develop watershed management tools for water bodies of concern such as Total Maximum Daily Load (TMDL) plans. HibTac is not currently subject to any TMDL-based load restrictions.

20.2.2 Water

HibTac presently maintains National Pollution Discharge Elimination System (NPDES)/State Disposal System (SDS) permits for the mining area, NPDES/SDS Permit No. MN0001465, and plant site and tailings basin area, NPDES/SDS Permit No. MN004976. Monitoring is conducted at multiple discharge outfalls and surface water monitoring locations. Reporting for the NPDES/SDS permits includes monthly and annual stormwater reporting and annual chemical dust suppression reporting.

HibTac maintains five water appropriations permits through the water appropriations program that facilitate surface and groundwater use with adequate capacity for the mine and plant sites. Monitoring of the amount of water appropriated or used is conducted and reported monthly.

20.2.3 Hazardous Materials, Hazardous Waste, and Solid Waste Management

HibTac typically generates small quantities of hazardous waste and is a small quantity generator per Minnesota hazardous waste rules and generation quantity and according to the federal Resource Conservation and Recovery Act (RCRA). Hazardous waste management is authorized by permits from the applicable regulatory authorities. See Table 20-1 for a full list of permits. HibTac generates other waste materials typical of any large industrial site and manages those wastes offsite through approved vendors.



20.2.4 Tailings Disposal, Mine Overburden, and Waste Rock Stockpiles

Requirements for tailings disposal are discussed in Section 18.4 of this Technical Report. This section is only related to the permitting and compliance. Tailings disposal is authorized by permits from the applicable regulatory authorities. See Table 20-1 for a full list of permits.

The tailings basin comprises five areas constructed over the mine life to date covering approximately 6,400 acres. The basin stores approximately 11,800 acre-feet per year of bulk solids while recycling approximately 125,000 gpm of water. The perimeter of the tailings basin is approximately 13 mi in length. A discussion of the tailings system is provided in more detail in Section 15.4.

Because iron ore geochemistry is different from other metallic mineral deposits, acid rock drainage is not a concern with the iron ore bodies and associated tailings in Minnesota. Moreover, EPA itself describes the iron ore mining and beneficiation process as generating wastes that are “earthen in character.” Chemical constituents from iron ore mining include iron oxide, silica, crystalline silica, calcium oxide, and magnesium oxide—none of which are Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances. The acid-neutralizing potential of carbonates in iron ore offsets any residual acid rock drainage risks, leading to pit water that naturally stabilizes at a pH of 7.5 to 8.5. Generally, water chemistry has not appeared to be an issue; however, some seeps developed along a portion of the Western Dam North that have distinct coloration, which may be indicative of geochemical/biological activity. The water from these seeps and additional relief wells is pumped back into the tailings basin.

Annual inspections and review of dam performance identified that minimum factors of safety, related to stability and seepage, have been met. Recommendations for corrective actions were made and are currently being implemented.

Requirements for the disposal of mine overburden and non-mineralized or lean waste rock are discussed in section 16.5 of this Technical Report. Stockpiling of these materials is authorized by permits from the applicable regulatory authorities. See Table 20-1 for a full list of permits.

20.3 Operating Permits and Status

HibTac operates through permission granted by multiple permits, which are summarized in Table 20-1.

While permitting always involves varying degrees of risk due to external factors, Hibbing Taconite has indicated that it has a demonstrated record of obtaining necessary environmental permits without unduly impacting the facility operational plan. HibTac is not aware of any issues that could lead to future operation issues that are not otherwise being actively addressed at this time. The following permit applications are pending with a permitting authority:

- MPCA
 - Mine Area permit: Major modification to NPDES/SDS Permit #MN0001465 to increase the rate of pit dewatering surface discharge.
- MDNR
 - Mine area: Substantial modification to the Permit to Mine to add four areas into the pit area and request a variance to work within the right-of-way of Highway 169.
 - Basin area: Request for authorization for fill under the Wetland Conservation Act to support buttressing along Western Dam South.



- United States Army Corps of Engineers (USACE)
 - Basin area: Request for authorization for fill under the Clean Water Action Section 404 to support buttressing along Western Dam South.

Table 20-1: List of Existing Environmental Permits

Permit No	Description	Type	Jurisdiction	Agency	Status
MN13700061	Air Permit MN13700061	Air	State	MPCA	Active, Administratively Extended
MN0049760	NPDES/SDS Plant and Tailing Basin	NPDES/SDS	State	MPCA	Active, Administratively Extended
MN0001465	NPDES/SDS Mining Area	NPDES/SDS	State	MPCA	Active, Administratively Extended
1990-2196	Water Appropriations Mahoning Ponds	Water	State	DNR	Active
1970-1081	Water Appropriations Process Water	Water	State	DNR	Active, Amendment in progress
2000-2041	Water Appropriations Groundwater	Water	State	DNR	Active
2002-2059	Water Appropriations Stevenson	Water	State	DNR	Active
1968-1558	Water Appropriations Pit Dewatering	Water	State	DNR	Active, Amendment in progress
2008-02566-DWW	404 Wetland Permit	Wetland	Federal	ACOE	Active
2014-00396-DWW	404 Wetland Permit	Wetland	Federal	ACOE	Active
2015-03435-DWW	404 Wetland Permit	Wetland	Federal	ACOE	Active
2019-02609-RQM	404 Wetland Permit	Wetland	Federal	ACOE	Active
NA	MDNR Permit to Mine – Original Permit	Land	State	MNDNR	Active
Dam Safety Permit 2015-2549	MDNR Dam Safety Permit	Dam	State	MNDNR	Active
MND091728683	Hazardous Materials Certificate of Registration	Waste	State	MPCA	Active
WTSF-103	Waste Tire Facility Permit	Waste	State	MPCA	Active
MN1088-100-69	Radiation License	Radiation	State	MDH	Active



Regulatory issues that could have a bearing on Hibbing Taconite's current plans to address any issues related to environmental compliance and permitting are actively monitored and disclosed in Cliffs' 10-K; Part I Environment, which has discussion relevant to:

- Minnesota's Sulfate Wild Rice Water Quality Standard
- Evolving water quality standards for conductivity; Definition of "Waters of the United States" Under the Clean Water Act
- Mercury TMDL and Minnesota Taconite Mercury Reduction Strategy
- Climate Change and GHG Regulation
- Regional Haze FIP Rule
- Conductivity
- Regulation of Discharges to Groundwater

20.4 Mine Closure Requirements

HibTac has approximately five years of remaining mine life and is not required to submit a deactivation plan to the MDNR until at least two years prior to deactivation in accordance with Minnesota Administrative Rule 6130.4100. The post-mining landscape is required to be stable, non-polluting, minimize the need for fencing, be compatible with adjacent land uses and projected land use trends, and be maintenance free to the extent possible. This rule sets time limitations for removing structures or providing provisions for continued use.

Cliffs is also a partner and financial contributor to the Laurentian Vision Partnership, a regional non-profit coalition of industry, state, and community stakeholders that promotes the development of productive post-mining landscapes on the Mesabi Iron Range.

HibTac prepared an asset retirement obligation (ARO) cost for the sites of approximately US\$143 million that covers: monitoring and maintenance; reclamation and vegetation; remediation; structure removal; watershed restoration; and long-term water management at the tailings basin, namely post-closure seepage control.

20.4.1 Concurrent Reclamation

HibTac has approximately five years of remaining mine life. Concurrent reclamation activities are underway with good results to date. These activities include seeding as well as natural colonization. Reclamation success is overseen by the MDNR, which expects to see 95% cover after 10 years.

20.5 Social and Community

Cliffs has been investing in the region for over a century, including direct employment and contributions to state, local, and taconite taxes. Taconite taxes contribute to an existing government-administered property tax credit program for people living in the Mesabi Iron Range mining area funded through mining production taxes. The QP is not aware of any formal commitments to local procurement and hiring; however, Cliffs has indicated that it has long-standing relationships with local vendors and also purchases through local and regional services and supplies.

With respect to community agreements, HibTac is located in close proximity to the towns of Hibbing and Chisholm, Minnesota. Cliffs employs a public relations expert who is located in



Forbes, Minnesota, only 30 mi away from HibTac, with the goal of responding to residents' complaints in a systematic manner. Hibbing Taconite has an ongoing lease agreement with the City of Hibbing's Public Utilities Department that provides access to Hibbing Taconite-owned property where the city operates a well. In 2017, Hibbing Taconite executed a land swap agreement with the City of Hibbing that was part of a plan to relocate the community's mine overlook and educational center so mining activities could commence at the former location (which was located on the HibTac Property) without significantly impacting the community.

Cliffs' employees make contributions to local United Way chapters through donations that are supported with a matching contribution from the company. Employees also serve as board members and volunteers for the United Way. Another initiative includes agreements with local municipalities or organizations to make Cliffs-owned and leased land that is not utilized for mining available for local community use including trails used for snowmobiling, biking, and ATV use. Cliffs' goal is to work collaboratively with stakeholders to support activities that are of benefit to the communities in which the company operates.

The QP is not able to verify the adequacy of management of social issues and what the general issues raised are, but understands that Cliffs has a positive relationship with stakeholders and that in the event of a complaint, Cliffs works directly with affected community members to develop a mutually acceptable resolution. Public affairs representatives from Cliffs formally engage with the community on an ongoing basis and serve as the face of the company. They sit on boards of community and business organizations at regional and local levels, participate in discussions with government officials, and act as a point of contact within the community. In doing so, they keep stakeholders apprised of critical issues to the operations, understand important topics in the community, and seek to listen to any questions or concerns. Cliffs indicated that this strategy allows it to maintain an ongoing relationship with stakeholders and collaborate with communities to find solutions should any issues arise. Cliffs' Public/Government Affairs maintains a list of stakeholders for Cliffs' iron ore mine operations.



21.0 Capital and Operating Costs

Cliffs' forecasted capital and operating costs estimates are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would be classified as Class 1 with an accuracy range of -3% to -10% to +3% to +15%.

21.1 Capital Costs

Table 18-1 shows the sustaining capital cost forecast for the five-year period from 2022 to 2026, which totals \$27.0 million, or \$0.97/WLT pellet. These costs include but are not limited to:

- \$21.2 million in mobile equipment additions and replacements
- \$2.2 million in environmental upgrades
- \$3.7 million in infrastructure and fixed equipment improvements

Table 21-1: LOM Capital Costs

Type	Values	Total	2022	2023	2024	2025	2026
Sustaining	\$ millions	27.0	15.4	7.9	2.4	1.3	0.1
Concurrent Closure	\$ millions	29.4	18.8	10.7			
Total	\$ millions	56.5	34.2	18.6	2.4	1.3	0.1

A final closure reclamation cost of \$143 million is estimated, with \$48 million spent annually starting in the last year of production in 2026 and the two subsequent years. There is an additional \$29 million in concurrent closure during years 2022 to 2023 associated with Hibbing Taconite's decision to move to a more conservative method of TSF design, with the addition of downstream fill to strengthen the dam cross-section.

21.2 Operating Costs

Operating costs for the LOM are based on the 2022 plan. For this period, costs are based on a full run rate of standard pellet production consistent with what is expected for the LOM. After that point in time, however, there are no items identified that should significantly impact operating costs either positively or negatively for the evaluation period. Minor year-to-year variations should be expected based upon maintenance outages and production schedules. Forecasted 2022 and average operating costs over the remaining five years of mine life are shown below in Table 18-2.

Table 21-2: LOM Operating Costs

Parameter	2022 (\$/WLT Pellet)	LOM (\$/WLT Pellet)
Mining	22.22	19.87
Processing	35.39	34.57
Site Administration	2.30	2.30
Pellet Transportation and Storage	10.35	10.35



Parameter	2022 (\$/WLT Pellet)	LOM (\$/WLT Pellet)
General/Other Costs	8.25	8.20
Operating Cash Cost (\$/WLT Pellet)	78.52	75.29

Processing costs consist of hauling ore from the Mine to the Plant, as well as typical crushing, grinding, concentrating, pelletizing, and tailings basin disposal. Pellet Transportation and Storage costs include rail transport of pellets to Superior, Wisconsin port and ship loading. General/Other costs include production tax and royalty costs, insurance, and other minor costs.

The operation employs a total of 733 salaried and hourly employees as of Q4 2021 consisting of 132 salaried and 601 hourly employees; the majority of the hourly employees are United Steelworkers production and maintenance bargaining unit members.

Table 18-3 summarizes the current workforce levels by department for the Property.

Table 21-3: Workforce Summary

Category	Salary	Hourly	Total
Mine	34	334	368
Plant	36	224	260
Asset Management	30	43	73
General Staff Organization	32	0	32
Total	132	601	733



22.0 Economic Analysis

22.1 Economic Criteria

The economic analysis detailed in this section was completed after the mine plan was finalized. The assumptions used in the analysis are current for the time the analysis was completed (Q3 2021), which may be different from the economic assumptions defined in Sections 11 and 12 when calculating the economic pit. For this period, costs are based on a full run rate of pellet production consistent with what is expected for the LOM.

An un-escalated, technical-financial model was prepared on an after-tax discounted cash flow (DCF) basis, the results of which are presented in this section. Key criteria used in the analysis are discussed in detail throughout this Technical Report. General assumptions used are summarized in Table 22-1.

Cliffs uses a 10% discount rate for DCF analysis incorporating quarterly cost of capital estimates based on Bloomberg data. The QP is of the opinion that a 10% discount/hurdle rate for after-tax cash flow discounting of large iron ore and/or base metal operations is reasonable and appropriate.

Table 22-1: Technical-Economic Assumptions

Description	Value
Start Date	December 31, 2021
Mine Life	Five years
Three-Year Trailing Average Revenue	\$98/WLT Pellet
Operating Costs	\$75.29/WLT Pellet
Sustaining Capital	\$27 million
Discount Rate	10.0%
Discounting Basis	End of Period
Inflation	0%
Federal Income Tax	20%
State Income Tax	None – Sales made out of state

The operating cost of \$75.29/WLT pellet include royalties and State of Minnesota production taxes.

The production and cost information developed for the Property are detailed in this section. Table 22-2 is a summary of the estimated mine production over the remaining five year mine life. Note that the mining rate values indicate average full production rates and do not include the much lower rates in the last two years of mine life.



Table 22-2: LOM Production Summary

Description	Units	Value
Ore	MLT	109.3
Total Material	MLT	220.8
Grade	% MagFe	18.7
Annual Mining Rate	MLT/y	58

Table 22-3 is a summary of the estimated plant production over the remaining five year mine life. Note that the processing and pellet production rate values indicate average full production rates and do not include the much lower rates in the last two years of mine life.

Table 22-3: LOM Plant Production Summary

Description	Units	Value
ROM Material Milled	MLT	109.3
Annual Processing Rate	MLT/y	24.7
Process Recovery	%	25.5
Total Pellet	MWLT	27.8
Annual Pellet Production Rate	MWLT/y	6.3

22.2 Cash Flow Analysis

The indicative economic analysis results, presented in Table 22-4, indicate an after-tax NPV, using a 10% discount rate, of \$269 million at an average blended wet pellet price of \$98/WLT. The after-tax IRR is not applicable as the Plant has been in operation for a number of years. Capital identified in the economics is for sustaining operations and TSF buttressing.

Project economic results and estimated cash costs are summarized in Table 22-4 showing annual estimates of mine production and pellet production with associated cash flow.

The economic analysis was performed using the estimates presented in this Technical Report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves.

Table 22-4: After-Tax Cash Flow Summary

Mine Life		1	2	3	4	5	6	7
Calendar Years	Total	2022	2023	2024	2025	2026	2027	2028
Reserve Base								
Hibbing Taconite Mining Ore Pellet Reserve Tons (millions)	27.8	21.4	15.2	9.0	3.6	(0.0)		
Tonnage Data:								
Hibbing Taconite Mining Total Tons Moved (millions)	220.8	57.3	57.0	57.4	31.2	17.9	-	-



Mine Life		1	2	3	4	5	6	7
Calendar Years	Total	2022	2023	2024	2025	2026	2027	2028
Hibbing Taconite Mining Crude Ore Tons Mined (millions)	109.3	25.6	24.5	24.0	20.3	14.9	-	-
Hibbing Taconite Mining Pellet Production Tons (millions)	27.8	6.4	6.2	6.2	5.4	3.6		
Inputs:								
Hibbing Taconite Mining Pellet Revenue Rate (\$/ton)	98	98	98	98	98	98	-	-
Income Statement:								
Hibbing Taconite Mining Gross Revenue (\$ in millions)	2,726	627	608	609	529	353	-	-
Mining	553	142	142	142	78	49	-	-
Processing	961	227	214	211	181	129	-	-
Site Administration	64	15	14	14	12	8	-	-
Pellet Transportation and Storage	288	66	64	64	56	37	-	-
General / Other Costs	228	53	51	51	44	30	-	-
Hibbing Taconite Mining Operating Cash Cost (\$ in millions)	2,094	503	485	483	371	253	-	-
Operating Cash Costs (\$/LT Pellet)	75.29	78.52	78.27	77.73	68.63	70.20	-	-
Hibbing Taconite Mining Operating Income (excl. Depreciation & Amortization)	632	125	122	126	159	100	-	-
Federal Income Taxes (\$ in millions)	(126)	(25)	(24)	(25)	(32)	(20)	-	-
Depreciation Tax Savings (\$ in millions)	13	3	3	3	3	1	-	-
Accretion Tax Savings (\$ in millions)	7	1	2	2	2	2	-	-
Hibbing Taconite Mining Income after Taxes (\$ in millions)	526	104	103	105	131	83	-	-



Mine Life		1	2	3	4	5	6	7
Calendar Years	Total	2022	2023	2024	2025	2026	2027	2028
Other Cash Inflows & Outflows (\$ in millions):								
Sustaining Capital Investments	(27)	(15)	(8)	(2)	(1)	(0)	-	-
Productive Capital Investments	-	-	-	-	-	-	-	-
Mine Closure Costs	(172)	(19)	(11)	-	-	(48)	(48)	(48)
Hibbing Taconite Mining Cash Flow (\$ in millions)	327	70	84	103	130	35	(48)	(48)
Hibbing Taconite Mining Discounted Cash Flow (\$ in millions)	269	63	69	77	89	22	(27)	(24)

22.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities. The operation is nominally most sensitive to market prices (revenues) followed by operating cost as demonstrated in Table 22-5. For each dollar movement in sales price and operating cost, respectively, the after-tax NPV changes by approximately \$18 million.

The QP notes that recovery and head grade sensitivity do not vary much in iron ore deposits compared to metal price sensitivity. In addition, sustaining capital expenditures amount to less than 2% of LOM operating costs and, therefore, do not have much impact on the viability of operating mines.

Table 22-5: After-tax NPV at 10.0% Sensitivity Analysis

		Operating Costs (\$/WLT Pellet)					
		90	85	80	75	70	65
Sales Price (\$/WLT Pellet)	83	(\$256)	(\$168)	(\$81)	\$7	\$94	\$182
	88	(\$168)	(\$81)	\$7	\$94	\$182	\$269
	93	(\$81)	\$7	\$94	\$182	\$269	\$357
	98	\$7	\$94	\$182	\$269	\$357	\$444
	103	\$94	\$182	\$269	\$357	\$444	\$532
	108	\$182	\$269	\$357	\$444	\$532	\$619
	113	\$269	\$357	\$444	\$532	\$619	\$707
	118	\$357	\$444	\$532	\$619	\$707	\$794
	123	\$444	\$532	\$619	\$707	\$794	\$882



23.0 Adjacent Properties

There are several iron mines along the Iron Range in Minnesota. The Mineral Resources and Mineral Reserves stated in this Technical Report are contained entirely within the Hibbing Taconite's mineral leases and information from other operations was not used in this Technical Report.



24.0 Other Relevant Data and Information

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.



25.0 Interpretation and Conclusions

The Property has been a successful producer of iron pellets for over 45 years. The update to the Mineral Resource and Mineral Reserve does not materially change any of the assumptions from previous operations. An economic analysis was performed using the estimates presented in this Technical Report and confirms that the outcome is a positive cash flow that supports the statement of Mineral Reserves for a remaining five-year mine life. There are no significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Mineral Resource or Mineral Reserve estimates or HibTac's continued economic viability.

The QPs offer the following conclusions by area.

25.1 Geology and Mineral Resources

- Above a crude MagFe cut-off grade of 13%, Measured and Indicated Mineral Resources exclusive of Mineral Reserves attributable to Cliffs 85.3% ownership at HibTac are estimated to total 9.1 MLT at an average grade of 19.2% MagFe.
- The HibTac deposit is an example of Lake Superior-type BIF deposits. Both the site and corporate technical teams have a strong understanding of the HibTac geology and mineralization, as well as their processing characteristics.
- Exploration sampling, preparation, analyses, and security processes for both physical samples and digital data are appropriate for the style of mineralization and are sufficient to support the estimation of Mineral Resources.
- QA/QC results for the 2021 verification study are appropriate for the style of mineralization and are sufficient to generate a drill hole assay database that is adequate for Mineral Resource estimation in compliance with international reporting standards. In conjunction with good agreement between planned and actual product produced over more than 45 years, it is the QP's opinion that procedures are consistent with industry standards.
- The KEVs in the block models for HibTac compare well with the source data.
- The methodology used to prepare the block model is appropriate and consistent with industry standards.
- The block model represents an acceptable degree of smoothing at the block scale for prediction of quality variables at HibTac. Visually, blocks and composites in cross-section and plan view compare well.

25.2 Mining and Mineral Reserves

- The HibTac JV has been in production since 1976 and specifically under 100% Cliffs operating management of the JV since 2020. Cliffs conducts its own Mineral Reserve estimations.
- Total Proven and Probable Mineral Reserves are approximately 109 MLT of crude ore at an average grade of 18.7% MagFe.
- Mineral Reserve estimation practices follow industry standards.
- The LOM of HibTac is limited to the next five years, with mining operations ceasing in 2026.



- The geotechnical design parameters used for pit design are reasonable and supported by previous operations.
- The LOM production schedule is reasonable and incorporates large mining areas and open benches.
- An appropriate mining equipment fleet, maintenance facilities, and manpower are in place, with various options for additions and replacements estimated, to meet the LOM production schedule requirements.
- Sufficient storage capacity for waste stockpiles and tailings has been identified to support the production of the Mineral Reserve.

25.3 Mineral Processing

- Three ore types are processed at Hibbing and are referred to as blend components 1-7 (lean ore, <20%), 1-5/1-6 (high-grade ore, >60%), and 1-3/1-4 (low-grade ore, <30%).
- Routine plant samples are collected and analyzed in the HibTac onsite laboratory for process control, product quality monitoring, and reporting to comply with plant and cargo specifications.
- The crushing plant consists of two Allis Chalmers gyratory crushers that crush run of mine (ROM) ore to minus 10 in. The concentrator is based on nine lines of autogenous grinding (AG) mills with two stages (rougher and finisher) of magnetic separation, hydrocyclone classification to close the milling circuits, and hydro-separators for classification of non-magnetic tailings. Finisher magnetic concentrate is screened to obtain final product at 100% passing (P_{100}) 325 mesh. The magnetic concentrate reports to the concentrate thickener, and the non-magnetic fraction reports to the tailings.
- Concentrate is filtered using vacuum disc filters to approximately 9.25% moisture and blended with bentonite prior to pelletizing to produce standard compression pellets, and limestone is added to the mix when producing high-compression pellets.
- Each pelletizing line consists of four Sala balling drums, which discharge across roll screens, producing green (unfired) balls. Sized green balls are conveyed to three, 13-ft-wide by 243-ft-long Dravo Traveling Grate indurating furnaces. Pellets discharged from the indurating furnaces are the final product and are conveyed to the pellet load-out bins or to the emergency stockpile.
- Final pellet production is determined by actual train shipments once per month and compared with operating plant measurements. Typical adjustments are in the range of 2,000 LT to 3,000 LT over a total production of 700,000 LT (<0.5% adjustment).
- The ore delivered to the primary crusher from 2015 to 2020 averaged 28,083,000 WLT/y with an average crude magnetic iron grade of 19.2% and concentrate silica content of 4.9%. Weight recovery to concentrate averaged 26.4% over this period, and wet pellet production averaged 7,400,200 WLT/y. Pellet grades averaged 66.1% Fe, 4.5% SiO₂, and 2.1% moisture for the period.

25.4 Infrastructure

- The Property is in a historically important, iron-producing region of Northeastern Minnesota. All the infrastructure necessary to mine and process significant commercial quantities of iron ore is in place.



- The HibTac TSF has been operating since 1976 and is currently operating under the requirements of the MDNR. The TSF is a paddock dam-type TSF consisting of five cells: West Area 1, 2, and 3 (WA-1, WA-2, and WA-3 with approximately 2,080 acres, 510 acres, and 1,000 acres of impoundment area, respectively), which are used for tailings deposition; SD-3 Reservoir (approximately 1,340 acres of impoundment area), which is used as a return water reservoir; and East Area (approximately 830 acres of impoundment area), which is currently not in use but will be brought into production at a later date.

25.5 Environment

Hibbing Taconite maintains the requisite state and federal permits and is in compliance with all permits. Environmental liabilities and permitting are further discussed in Section 17 of this Technical Report.

A mine closure plan is not required by the state of Minnesota until at least two years in advance of deactivation of the mining area. HibTac's current mine life is projected at five years; therefore, a detailed closure plan has not been prepared. Cliffs performs annual reviews of changes to HibTac's ARO cost estimate and has calculated ARO legal obligations for closure and reclamation costs.



26.0 Recommendations

26.1 Geology and Mineral Resources

- 1 Continue to develop and expand the QA/QC program to ensure that the program includes defined limits where follow-up is required, and that results are reviewed and documented in a report including conclusions and recommendations regularly and in a timely manner.
- 2 Quality results documented in this report support an initial standard and duplicate submission rate of 5% each.
- 3 HibTac should submit a small number of “preparation duplicate” samples to a secondary accredited laboratory to document capability(ies), cost, and time efficiency of alternate provider(s) and confirm that results are comparable to those of the current provider.

26.2 Mining and Mineral Reserves

- 1 Complete additional permitting work at HibTac to finalize decision on conversion of on-strike Mineral Resources to Mineral Reserves and update mine planning accordingly.

26.3 Mineral Processing

- 1 While plant operational performance including concentrate and pellet production and pellet quality continue to be consistent year over year, continue to maintain diligence in process-oriented metallurgical testing and in plant maintenance going forward.

26.4 Infrastructure

- 1 The OMS Manual for the TSF should be updated with the EOR in accordance with MAC guidelines and other industry-recognized, standard guidance for tailings facilities.
- 2 The remediation, or resolution, of items of concern noted in TSF audits or inspection reports should be documented, prioritized, tracked, and closed out in a timely manner.

26.5 Environment

- 1 While it is acknowledged that a closure plan and other post-mining plans are not required to be prepared until two years prior to anticipated closure, the QP recommends that a closure plan including costing be completed to prepare the operation for eventual closure in approximately five years.



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28.0 Date and Signature Page

This report titled “NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA” with an effective date of December 31, 2021 was prepared and signed by the following authors:

(Signed & Sealed) Mark B. Mathisen

Dated at Lakewood, CO
August 16, 2024

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August 16, 2024

Andrew P. Hampton, M.Sc., P.Eng.

(Signed & Sealed) Balaji Subrahmanyam

Dated at Lakewood, CO
August 16, 2024

Balaji Subrahmanyam, SME(RM)

(Signed & Sealed) Dean K. Korri

Dated at Cleveland, OH
August 16, 2024

Dean K. Korri, P.E., MASCE

(Signed & Sealed) Brooke A. Lund

Dated at Forbes, MN
August 16, 2024

Brooke A. Lund, C.P.G.

(Signed & Sealed) Grant A. Malensek

Dated at Lakewood, CO
August 16, 2024

Grant A. Malensek, M.Eng., P.Eng.



29.0 Certificate of Qualified Person

29.1 Mark B. Mathisen

I, Mark B. Mathisen, C.P.G., as an author of this report entitled “NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA” with an effective date of December 31, 2021 prepared for Cleveland-Cliffs Inc., do hereby certify that:

1. I am Principal Geologist with SLR International Corporation, of Suite 100, 1658 Cole Boulevard, Lakewood, CO, USA 80401.
2. I am a graduate of Colorado School of Mines, Golden, CO, USA in 1984 with a Bachelor of Science degree in Geophysical Engineering.
3. I am a Registered Professional Geologist in the State of Wyoming (Reg.# PG-2821), a Certified Professional Geologist with the American Institute of Professional Geologists (Reg.# CPG-11648), and a Registered Member of SME (Reg.# 04156896). I have worked as a geologist for a total of 28 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Mineral Resource estimation and preparation of NI 43-101 Technical Reports.
 - Director, Project Resources, with Denison Mines Corp., responsible for resource evaluation and reporting for uranium projects in the USA, Canada, Africa, and Mongolia.
 - Project Geologist with Energy Fuels Nuclear, Inc., responsible for planning and direction of field activities and project development for an in situ leach uranium project in the USA. Cost analysis software development.
 - Design and direction of geophysical programs for US and international base metal and gold exploration joint venture programs.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Hibbing Taconite Property on April 28, 2021.
6. I am responsible for Sections 4 to 12, 14, and 23 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. I was involved in the preparation of an S-K 1300 Technical Summary Report dated February 7, 2022.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections in the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



Dated this 16th day of August, 2024.

(Signed & Sealed) *Mark B. Mathisen*

Mark B. Mathisen, C.P.G.



29.2 Andrew P. Hampton

I, Andrew P. Hampton, M.Sc., P.Eng., as an author of this report entitled "NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA" with an effective date of December 31, 2021 prepared for Cleveland-Cliffs Inc., do hereby certify that:

1. I am Principal Metallurgist with SLR International Corporation, of Suite 100, 1658 Cole Boulevard, Lakewood, CO, USA 80401.
2. I am a graduate of Southern Illinois University in 1979 with a Bachelor of Science degree in Geology, and a graduate of the University of Idaho in 1985, with an Master of Science degree in Metallurgical Engineering.
3. I am registered as a Professional Engineer in the Province of British Columbia, Licence No. 22046. I have worked as an extractive metallurgical engineer for a total of 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Process plant engineering, operating and maintenance experience at mining and chemical operations, including the Sunshine Mine, Kellogg, Idaho, Beker Industries Corp, phosphate and DAP plants in Florida and Louisiana respectively, and the Delamar Mine in Jordan Valley Oregon.
 - Engineering and construction company experience on a wide range of related, precious metal projects and studies, requiring metallurgical testing, preliminary and detailed design, project management, and commissioning and start-up of process facilities and infrastructure. EPCM companies included Kilborn Engineering Pacific Ltd., SNC Lavalin Engineers and Constructors, Washington Group International Inc. and Outotec USA, Inc.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Hibbing Taconite Property on April 28, 2021.
6. I am responsible for Sections 13, 17, and 18 (except subsection 18.4) and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. I was involved in the preparation of an S-K 1300 Technical Summary Report dated February 7, 2022.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections in the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 16th day of August, 2024.

(Signed & Sealed) Andrew P. Hampton

Andrew P. Hampton, M.Sc., P.Eng.



29.3 Balaji Subrahmanyam

I, Balaji Subrahmanyam, SME(RM), as an author of this report entitled "NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA" with an effective date of December 31, 2021 prepared for Cleveland-Cliffs Inc., do hereby certify that:

1. I am Principal Mining Engineer with SLR International Corporation, of Suite 100, 1658 Cole Boulevard, Lakewood, CO, USA 80401.
2. I am a graduate of College of Engineering, Chennai, India in 1993 with a Bachelor of Science degree in Mining Engineering.
3. I am a Registered Member of the Society for Mining, Metallurgy & Exploration (SME RM# 04224038). I have worked as a mining engineer for a total of 30 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Open pit operational experience in Asia, Australia, Africa and abroad.
 - Review and report as a consultant on open pit mining projects and operations around the world for studies, audits, due diligence, and regulatory requirements.
 - Open pit mine planning and cost estimation.
 - Project cash flow modelling and economic analysis.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the Hibbing Taconite Property.
6. I am responsible for Sections 15 and 16 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. I was involved in the preparation of an S-K 1300 Technical Summary Report dated February 7, 2022.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections in the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 16th day of August, 2024.

(Signed & Sealed) Balaji Subrahmanyam

Balaji Subrahmanyam, SME(RM)



29.4 Dean K. Korri

I, Dean Korri, PE, MASCE, as a QP for this report entitled “NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA” with an effective date of December 31, 2021, prepared for Cleveland-Cliffs Inc., do hereby certify that:

1. I am Director – Civil Engineering/Tailings Basin Engineering with Cleveland-Cliffs Inc., 200 Public Square, Suite 3300, Cleveland, OH 44114
2. I am a graduate of Michigan Technological University in 1989 with a BSE in Civil Engineering.
3. I am registered as a Professional Engineer in the both the State of Michigan (#43181) and Minnesota (#62743). I have worked as a Civil – Geotechnical Engineer for a total of thirty-five (35) years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Oversight of all Cliffs’ site(s) dam safety, engineering, operations, and long-range planning.
 - Responsible for regulatory and dam safety compliance for all TSF basins in portfolio.
 - More than 35 years of experience in (dam safety) design, engineering, permitting, construction, monitoring, and reclamation of mine tailings storage facilities.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visit the Hibbing Taconite property regularly.
6. I have reviewed and accepted responsibility for information in Section 18.4 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. I have been with Cleveland-Cliffs, Inc. for 35 years.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Section 18.4 and related disclosure in Sections 1, 25, 26, and 27 in the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 16th day of August, 2024.

(Signed & Sealed) Dean K. Korri

Dean K. Korri, P.E., MASCE



29.5 Brooke A. Lund

I, Brooke A. Lund, CPG, as a QP for this report entitled "NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA" with an effective date of December 31, 2021 prepared for Cleveland-Cliffs Inc., do hereby certify that:

1. I am Project Manager of Environmental Permitting & Regulatory with Cleveland-Cliffs, 8470 Townline Road, Forbes, MN 55738.
2. I am a graduate of the University of Wisconsin Eau Claire in 2010 with a Bachelors of Science in Geology.
3. I am registered as a Certified Professional Geologist in the United States of America through the American Institute of Professional Geologists (Reg.# 12021). I have worked as a mining and environmental geologist for a total of 14 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Environmental permitting and compliance
 - Environmental studies
 - Hydrogeological studies
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Hibbing Taconite Property on a regular basis.
6. I have reviewed and accepted responsibility for information in Section 20 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am not independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report as an employee of Cleveland-Cliffs.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, Section 20 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 16th day of August, 2024.

(Signed & Sealed) Brooke A. Lund

Brooke A. Lund, CPG



29.6 Grant A. Malensek

I, Grant A. Malensek, M.Eng., P.Eng., as an author of this report entitled "NI 43-101 Technical Report for the Hibbing Taconite Property, Minnesota, USA" with an effective date of December 31, 2021 prepared for Cleveland-Cliffs Inc., do hereby certify that:

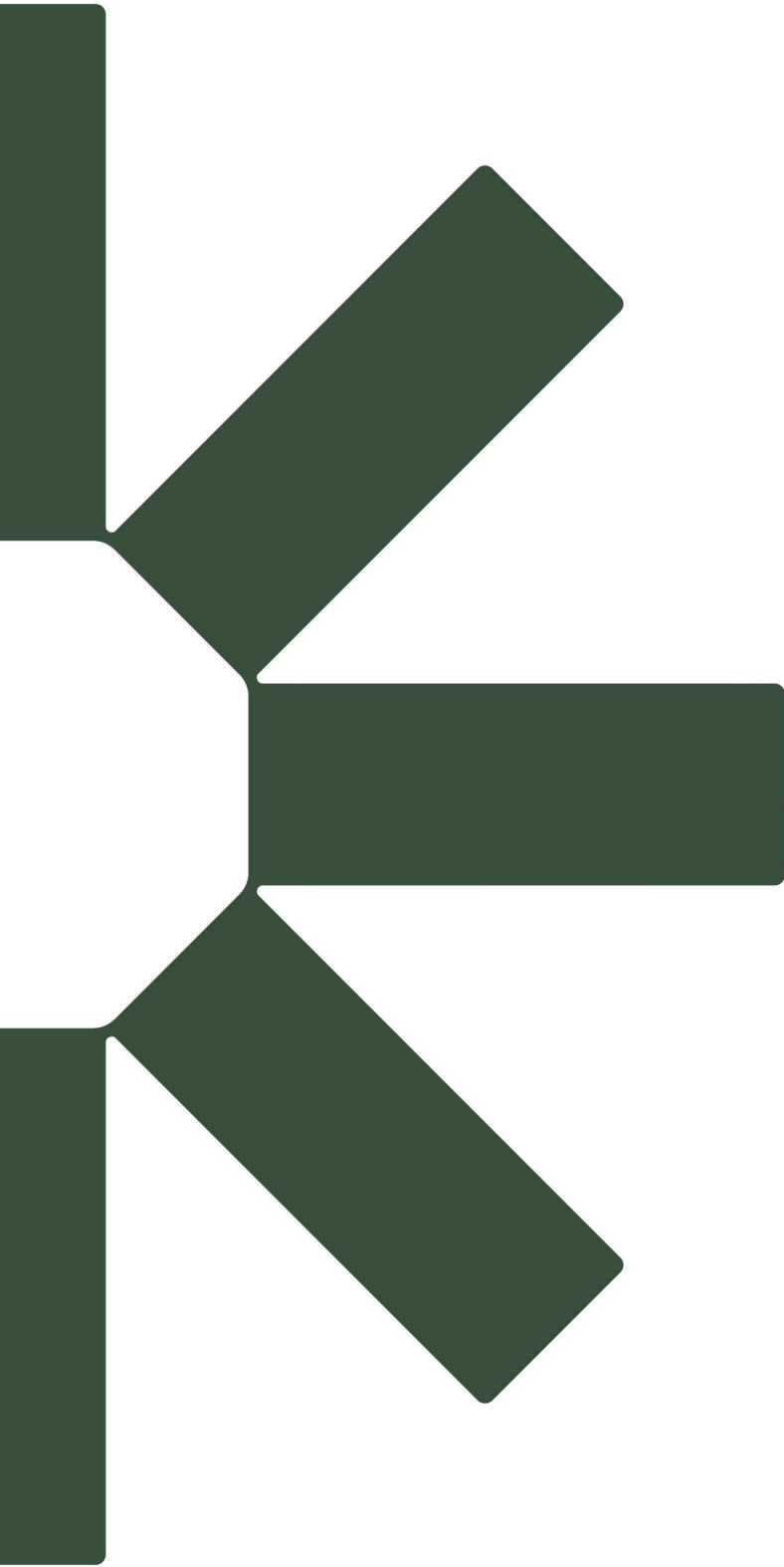
1. I am Technical Director – US Mining Advisory, and Senior Principal Mining Engineer with SLR International Corporation, of Suite 100, 1658 Cole Boulevard, Lakewood, CO, USA 80401.
2. I am a graduate of the University of British Columbia, Canada, in 1987 with a Bachelor of Science degree in Geological Sciences and Colorado School of Mines, USA in 1997 with a Master of Engineering degree in Geological Engineering.
3. I am registered as a Professional Engineer in the Province of British Columbia (Reg.# 23905). I have worked as a mining engineer/geologist for a total of 27 years since my graduation. My relevant experience for the purpose of the Technical Report is:
 - Feasibility, prefeasibility, and scoping studies
 - Fatal flaw, due diligence, and Independent Engineer reviews for equity and project financings.
 - Financial and technical-economic modelling, analysis, budgeting, and forecasting.
 - Property and project valuations.
 - Capital cost estimates and reviews.
 - Mine strategy reviews.
 - Options analysis and project evaluations in connection with mergers and acquisitions.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I visited the Hibbing Taconite Property on April 28, 2021.
6. I am responsible for Sections 2, 3, 19 to 22, and 24 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had prior involvement with the property that is the subject of the Technical Report. I was involved in the preparation of an S-K 1300 Technical Summary Report dated February 7, 2022.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections in the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 16th day of August, 2024

(Signed & Sealed) Grant A. Malensek

Grant A. Malensek, M.Eng., P.Eng.





Making Sustainability Happen