NI 43-101 TECHNICAL REPORT,

UPDATED LOW-IRON GLASS SAND RESOURCE ESTIMATE FOR CANADIAN PREMIUM SAND INC.'S WANIPIGOW SAND PROJECT IN MANITOBA, CANADA

Prepared For: **Canadian Premium Sand Inc.**
Suite 2000, 715 5 Avenue SW
Calgary AB Canada T2P 2X6

Prepared by: **APEX Geoscience Ltd.**
100, 11450 – 160 Street
Edmonton AB Canada T5M 3Y7

D. Roy Eccles, M.Sc., P. Geol. P. Geo.

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1 Summary

1.1 Issuer and Purpose

This technical report and updated silica sand glass resource estimate has been commissioned by, and completed for, Canadian Premium Sand Inc. (CPS, or the Company), a publicly traded company with its corporate headquarters in Calgary, AB, Canada. CPS owns 100% interest in the Wanipigow Sand Project in southeastern Manitoba, Canada.

The purpose of this technical report is to disclose 1) CPS's 2022 to 2024 mineral processing test work to beneficiate the Wanipigow Lower Black Island Member sand to low-iron levels that are sufficient for solar glass manufacturing, 2) update the glass sand resource estimations in accordance with the Canadian Securities Administration's National Instrument 43-101 and the Canadian Institute of Mining and Metallurgy definition standards and best practice guidelines (2014, 2019) and the disclosure rule National Instrument 43-101, and 3) make recommendations for future work programs.

While CPS's current focus is on glass sand, the Company disclosed a 2020 Prefeasibility Study in relation to using the Wanipigow sand as a source material for hydraulic fracturing in the energy industry. This previous work is still material to CPS and therefore the frac sand/proppant-specific resource, reserve, and economics are summarized in this report, which represents CPS's current technical report.

1.2 Authors and Qualified Professional Site Inspection

The technical report was prepared by Roy Eccles, M.Sc. P. Geol. P. Geo., a Qualified Persons as defined by National Instrument 43-101 with silica sand exploration and resource modelling and estimation experience for greenfield and brownfield silica sand deposits and operations in western Canada, central Canada, and northeastern United States.

Mr. Eccles conducted a Qualified Person site inspection on March 4-6, 2019, and verified CPS's drill sites, an active backhoe trenching program, archived drill core samples, and the Ordovician Winnipeg Formation silica sand mineralization.

1.3 Property Location and Description

The Wanipigow Sand Project is located approximately 160 km northeast of the City of Winnipeg, Manitoba, within the jurisdictional boundaries of the Incorporated Community of Seymourville and is adjacent to the Hollow Water First Nation's reserve lands.

The Wanipigow Sand Project consists of 41 contiguous Quarry Leases that grant CPS 100% exclusive right to mine quarry minerals such as silica sand on the Property. The area encompasses 2,148 hectares. The glass sand mineral resource areas reported occur within 7 separate, non-contiguous areas within the property.

The Wanipigow Sand Project can be accessed by Provincial paved and all-weather gravel roads, and exploration can be conducted year-round. CPS proposes that the Wanipigow sand could be processed on site and then trucked approximately 160 km to a proposed CPS glass manufacturing facility in the City of Selkirk, Manitoba.

1.4 Royalties and Economic Participation Agreements

CPS has entered into Economic Participation Agreements with Hollow Water First Nation and the Incorporated Community of Seymourville. CPS has also entered into various contractual agreements relating to the acquisition of title for 18 quarry leases that include advance and future royalty payments.

These Royalty and Economic Participation Agreements commit the Company to quarterly payments once production commences, totaling $3.30 per tonne silica sand sold as fracture proppant, $2.80 per tonne of silica sand sold, and $0.50 per tonne of construction aggregates sold. There is a further royalty payment of $1.00 per tonne of silica sand sold as fracture proppant, $0.50 per tonne of silica sand sold and $0.50 per tonne for construction aggregates sold relating to tonnes mined and sold specifically related to the quarry leases acquired from Gossan Resources Limited.

1.5 Environmental Act Licences

On July 27, 2023, CPS received Environment Act Licence No. 3285 R approval from the Government of Manitoba in accordance with T*he Environment Act* approval for the construction and operation of the Wanipigow Sand Extraction Project.

On May 3, 2023, CPS received an Environment Act Licence No. 3401 approval from the Government of Manitoba to construct and operate a solar glass manufacturing facility in the City of Selkirk, Manitoba.

1.6 Conditional Use Order

On May 9, 2019, the Incorporated Community of Seymourville issued a Conditional Use Order that approves the conditional use of lands within its jurisdictional boundaries for a silica sand extraction operation, including accessory uses, building and structures.

1.7 Community Consultation

CPS has conducted public engagement that has resulted in letters of support for the Project from local communities, including the Incorporated Communities of Seymourville, the Community of Manigotagan, the Northern Affairs Settlement of Aghaming and Hollow Water First Nation. CPS has Participation Agreements in place with Hollow Water First Nation and the Incorporated Community of Seymourville. Potential operations are anticipated to be a substantial benefit to local and regional communities in terms of training, employment, and potential business opportunities related to services required for the project.

1.8 Property-Related Risks and Uncertainties

The business of exploration for, and development of, silica sand involves a high degree of risk and there can be no assurance that the current program will result in profitable operations. Ownership in mineral properties involves certain risks due to the difficulties in determining the validity of certain leases and the potential for problems arising from the ambiguous conveyance history characteristics of many mining interests.

Other than the necessary federal, provincial, and/or municipal licences, authorizations, permits and/or approvals outlined in this technical report, and to the extent known, there are no other significant factors and risks that may affect access, title, or the right or ability for CPS to perform work on the property including potential future development of the Wanipigow Sand Project.

1.9 Geology

The silica sand deposit is hosted within a mature, well-rounded and quartzose sand-dominated portion of the Ordovician Winnipeg Formation of the Western Canada Sedimentary Basin. The basal subunit and focus of this report, the Lower Black Island Member sand, is characterized by grey-white silica sand with minor kaolinite cement. The Lower Black Island sand's upper and lower contacts represent the most distinguishable and best understood contacts within the Winnipeg Formation and the Wanipigow Sand Project.

The Winnipeg Formation represents the initial Williston Basin clastic sedimentary deposits associated with a Late Ordovician transgression that influenced most of the North American craton. Based on the Canadian Shield proximal setting and composition and texture of the Wanipigow silica sand, it is apparent that the Lower Black Island sand represents a mature marine shoreline sandstone deposit with a long history of reworking and minimal diagenesis.

The Lower Black Island Member sand domain underlies portions of the Wanipigow Sand Project, and when present, has global property thickness of between 0.4 m and 16.5 m with an average thickness of approximately 5.8 m. Within the mineral resource areas, the Lower Black Island sand has a normalized average thickness of 9.4 m.

1.10 History

The Ordovician Winnipeg Formation contains the largest known deposits of high-quality silica sand in Manitoba. Silica sand was reportedly first discovered in Manitoba in 1859, prior to being formerly documented in 1900. The first claims for silica sand were staked on Black Island in 1910, which is located approximately 5 km west of the

Wanipigow Property, and on and off silica sand production occurred between 1929 and 2003. The silica sand was used as feedstock to manufacture glass, fibreglass, and foundry sand.

The Qualified Person has been unable to verify the historical information, which includes the assessment of adjacent-property Winnipeg Formation sand, and therefore, the reader should be aware that this information is not necessarily indicative of the mineralization within the Wanipigow Sand Project.

1.11 Canadian Premium Sand Inc. Exploration Programs

In 2018, CPS completed a 93-hole sonic drillhole program (1,573.7 m) to test and delineate Winnipeg Formation sand associated with the Wanipigow Sand Project. In 2022, CPS completed an infill sonic drillhole program drilling an additional 17 holes totaling 283.5 m.

Based on drill logs, lithological observations, and grain size particle distributions, the current study subdivides the Winnipeg Formation into four distinguishable subunits that include from stratigraphic base to top Lower Black Island sand, a thin layer of Black Shale, Upper Black Island sand, and a veneer of Pleistocene surficial material.

A total of 761 samples were collected during the 2018 drill program and analyzed for particle grain size distributions that are reported in a series of mesh-sizes. These data were used to create a gradation database that was utilized in the mineral resource estimations presented in this technical report. An additional 183 samples were collected during the 2022 drill program.

During 2021, CPS collected 18 composite samples of Lower Black Island sand from 6 of the 2018 drillholes and analyzed the samples for whole-rock analysis by ICP Total Digestion, SiO_2 by ICP whole rock assay, and trace-elements by ICP-MS Total Digestion. The Lower Black Island sand samples yielded silica values of between 96.1 and 98.9 wt. % SiO_2 with an average 98.0 wt. % SiO_2 with iron values that ranged from 0.032 to 0.247 wt. % Fe_2O_3 with an average 0.117 wt. % Fe_2O_3. The silica and iron values are generally too low and too high, respectively, for specialty glass or Grade A-E glass, but is sufficient for coloured container and insulating fibre optical glass (Grades F-G).

Consequently, CPS initiated QEMSCAN analysis and Scanning Electron Microscopy - Energy-Dispersive X-ray Spectroscopy analysis to determine the nature and texture of the heavy iron-bearing minerals to assist with the removal of these grains from the silica sand.

Archived 2018 and 2022 Lower Black Island sand samples were utilized in 2022-2024 mineral processing test studies that included beneficiation test work to advance the sand to higher levels of silica and lower levels of iron for solar glass applications.

1.12 Beneficiation Test Studies and Reasonable Prospects

High-silica-purity and low-iron sand is imperative to produce clear glass and ensure maximum light transmission for the application and manufacturing of solar glass products. CPS defines a low-iron source sand as having ≤100 ppm iron (as Fe_2O_3) and the iron content of the resulting test glass melt samples should have ≤120 ppm Fe_2O_3 to be utilized in solar glass operations.

CPS conducted numerous 2020 to 2024 sand beneficiation and associated geochemical studies at several laboratories with experience in mineral sands metallurgical testing. The beneficiation test work typically involved, thorough mixing of the sand sample, drying the sand, sieving to obtain 125 µm to 500 µm (i.e., 35 to 120 mesh) fraction for the test work, attrition scrubbing, shaking or bumping table, heavy mineral liquid separation, spiral concentrator gravity separation, and magnetic separator tests.

The beneficiation testing successfully achieved Lower Black Island sand with ≤100 ppm Fe_2O_3 in sand sample intervals from 20 of 23 Wanipigow Sand Project drillholes. The Qualified Person has used the low-iron sand results to define 7 separate mineral resource areas in this report. Beneficiation of Lower Black Island sand from 3 of the 23 drillholes did not achieve low-iron sand; areas associated with these failed tests were not included in the resource estimation process.

CPS shipped a 3,084 kg sample of excavated Lower Black Island sand to Hazen Research Inc. and Northern Analytical Laboratory LLC with the objective of producing an 800 kg low-iron bulk sand sample with ≤100 ppm Fe_2O_3. A total of 1,752 kg of sand was processed using a combination of screening, attrition scrubbing, gravity separation, and magnetic separation. The final combined non-magnetic product yielded a 789 kg bulk sample that included 698 kg of the rougher nonmagnetic product (88.5%) and 91 kg of the scavenger nonmagnetic product (11.5%). The rougher non-magnetic fraction yielded the high silica purity fraction with 87 ppm Fe_2O_3. The scavenger non-magnetic fraction assayed an average of 95 ppm Fe_2O_3. The combined mass yield to non-magnetic fractions was 91.3%, at an estimated iron content of 88 ppm Fe_2O_3.

The resulting Lower Black Island low-iron bulk sand sample was used to formulate glass melt test samples at IGR Institut für Glas- und Rohstofftechnologie GmbH. Subsequent glass tests yielded high quality glass characterized by a low-iron glass content of 110 ppm Fe_2O_3 and positive physical properties (including high colour transparency, Working Range Index, Devitrification Index, Annealing Point, liquidus temperature, and capability for relatively high processing rates). Collectively, the glass melt test work shows the CPS test glass sample is suitable for specific glass applications that include solar glass where high thermal stability and workability is required.

Samples of glass from the melt test were sent to Pellucere Technologies. Uncoated glass, and glass with an applied anti-reflective solar coating solution, were tested and yielded Solar Weighted Transmittance values of 91.81% and 95.07%, respectively (the coated glass yielded a 3.6% gain in transmittance). The result demonstrates that a significant amount of solar energy can pass through the CPS glass melt test sample, particularly at wavelengths above 660 nanometres making the CPS coated glass a good candidate for solar and energy-efficient glass applications.

The beneficiation, melt test, and coated glass test show that CPS's Wanipigow Lower Black Island sand can achieve low-iron sand and low-iron glass melt specifications for solar glass products. Accordingly, and with respect to reporting a mineral resource estimate, it is the opinion of the Qualified Person that the Wanipigow Lower Black Island sand demonstrates reasonable prospects of eventual economic extraction.

1.13 Mineral Resource Estimation

The Lower Black Island sand domain within the Wanipigow Sand Project property encompasses a total area of 5.18 km^2. Within this domain, the updated Lower Black Island glass sand resource estimate is constrained to 7 separate resource areas where beneficiation testing achieved low-iron sand with ≤100 ppm Fe_2O_3. Collectively, the 7 resource areas encompass a surface area of 2.06 km^2. The remaining Lower Black Island sand area (3.12 km^2) was assessed as a conceptual exploration target.

Of the 110 drillholes and 761 gradation measurements that define the Wanipigow Sand Project geological model, the mineral resource areas collectively comprise 35 drillholes and 161 Lower Black Island gradation results. The combined resource areas have a minimum and maximum Lower Black Island thicknesses of between 0.04 and 16.5 m with an average normalized thickness of 9.4 m.

The Pleistocene glaciofluvial, Upper Black Island sand and Black Shale units, represent waste material overlying the Lower Black Island unit, and have been modelled within a single wireframe. The waste material is ubiquitous throughout the Wanipigow glass sand resource areas and extends from the surface to depths of between 0.7 and 15.1 m and averages 8.7 m.

The glass sand mineral resource is calculated using a block model with a size of 20 by 20 m in the horizontal directions and 2 m in the vertical direction. The block model was used to calculate the Wanipigow glass sand resource estimate of the different percentages of silica sand retained on the various screen sizes. Ordinary Kriging (OK) was used to estimate the size fraction values at each parent block that lies within the Lower Black Island sand wireframe.

The resource estimation of the individual Lower Black Island size fractions was completed and reported using a lower cutoff of mesh-sizes that are greater than or equal to 35-mesh (<500 µm) and less than or equal to 120-mesh (<125 µm). I.e., the +35 and -120 mesh size fractions are discarded from the estimation process.

A nominal *in-situ*, or compacted, sand bulk density of 1.877 g/cm^3 was applied to the Lower Black Island sand unit. The density is based on 36 representative loose bulk Lower Black Island density samples and the loose bulk densities were converted to an *in-situ* bulk density by using a bulking factor of 30%. The overlying waste material has a compacted bulk density of 1.902 g/cm^3.

The Qualified Person has a satisfactory level of confidence in, and understanding of, the geology and controls of the Lower Black Island geo-unit, but a lower level of confidence in the applicability of the sand unit, on a consistent basis, to meet the high-quality, beneficiated, low-iron sand levels required for a commercial-scale solar glass operation. Based on this criterion, the Lower Black Island glass sand resource is classified as an inferred mineral resource.

The Wanipigow glass sand resource estimate has been classified by the Qualified Person in accordance with the Canadian Institute of Mining, Metallurgy, and Petroleum definition standards and best practice guidelines (2014, 2019) and the disclosure rule National Instrument 43-101. The Effective Date of the mineral resource estimate is 9 April 2025. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

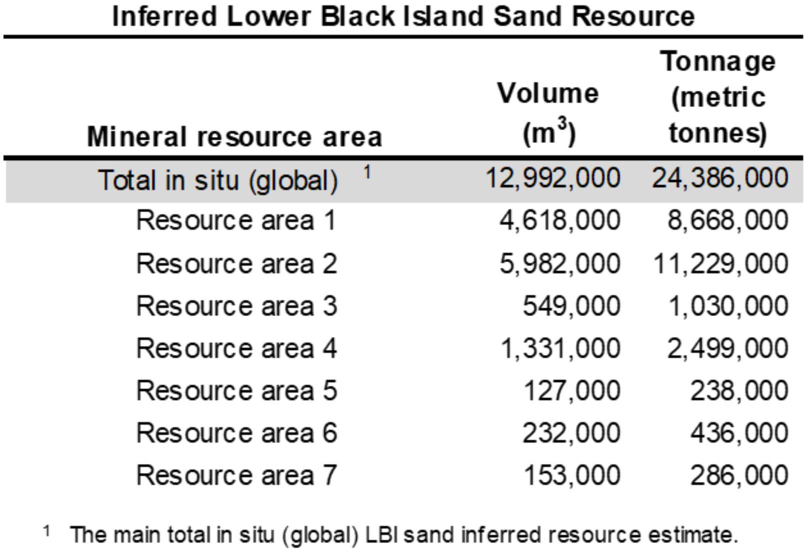
The inferred Wanipigow glass sand resource estimate predicts a total (i.e., global) Lower Black Island glass sand inferred resource of 24.386 million metric tonnes (Table 1.1). With respect to Lower Black Island sand tonnages within the individual mineral resource areas, resource area 2 has the highest tonnage (11.229 million metric tonnes), followed by resource area 1 (8.668 million metric tonnes), resource area 4 (2.499 million metric tonnes), resource area 3 (1.030 million metric tonnes), and resource areas 5, 6, and 7 have between 238,000 and 436,000 tonnes.

With respect to the overlying waste rock and using a compacted bulk density of 1.902 g/cm^3, the combined glaciofluvial, Upper Black Island sand, and Black Shale units overlying the 7 Lower Black Island sand resource areas have an estimated volume of 17.877 million m^3 and 34.002 million metric tonnes.

1.14 Conceptual Exploration Target

A conceptual exploration target incorporates all Lower Black Island sand in the Wanipigow Sand Project that is not included within the mineral resource areas and main inferred mineral resource. The exploration target has an area of 3.12 km^2 and was calculated using the same methodology as the inferred mineral resource. To disclose a conceptual range of values, the Qualified Person applied a plus or minus percentage of 20% to define an exploration target of between 11.944 million metric tonnes and 12.431 million metric tonnes of Lower Black Island sand. An exploration target has less confidence than an inferred mineral resource. The potential quantity is conceptual in nature as there has been insufficient exploration to define a mineral resource and it is uncertain if further test work and/or marketing will result in the exploration target being delineated as a mineral resource.

Table 1.1 The Wanipigow Glass Silica Sand Inferred Resource Estimate reported for the Lower Black Island sandstone geo-unit as a total (global) volume and tonnage.



Inferred Lower Black Island Sand Resource

Mineral resource area	**Volume (m^3)**	**Tonnage (metric tonnes)**
Total in situ (global) [1]	12,992,000	24,386,000
Resource area 1	4,618,000	8,668,000
Resource area 2	5,982,000	11,229,000
Resource area 3	549,000	1,030,000
Resource area 4	1,331,000	2,499,000
Resource area 5	127,000	238,000
Resource area 6	232,000	436,000
Resource area 7	153,000	286,000

[1] The main total in situ (global) LBI sand inferred resource estimate.

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by geology, environment, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs).

Note 3: The 'Total' (global) volume and weights are estimated on a global basis and represent the main Inferred Wanipigow Glass Sand Resource Estimate.

Note 4: The Wanipigow estimation of the individual sieve size fractions was completed and reported using a lower cutoff of mesh-sizes that are greater than or equal to 35-mesh and less than or equal to 120-mesh fraction.

Note 5: *In-situ* compacted bulk densities used to convert volume (cubic metres) to tonnage and include a Lower Black Island sand density of 1.877 g/cm^3 and an overlying waste material density of 1.902 g/cm^3.

1.15 Concluding Qualified Persons Statement and Recommendations

The geological, geochemical, and beneficiation, glass melt, and coated-glass test work discussed in this technical report demonstrates that the Wanipigow Sand Project is a project of merit and has reasonable prospects for eventual economic extraction.

CPS was successful in defining 7 areas that contained low-iron Lower Black Island sand at the Wanipigow Sand Project. A low-iron bulk sample was prepared from a single, near-surface, excavation site and the resulting glass melt and coated-glass tests demonstrated that CPS's Wanipigow Lower Black Island sand can meet low-iron sand and low-iron glass specifications for solar glass applications.

This technical report has been prepared by an independent Qualified Person because there is a greater than 100% change in CPS's mineral resource. The Wanipigow Lower Black Island glass sand mineral resource disclosed in the current technical report is 3.4

times larger than the resource reported in CPS's initial Lower Black Island glass sand resource (dated October 14, 2021). The increase in Lower Black Island glass sand mineral resource estimate is directly related to 1) expanded mineral resource area from 0.738 km^2 in a single 2021 resource polygon to an area of 2.060 km^2 that is collectively defined within 7 separate 2025 resource polygons, and 2) because the new mineral resource areas utilize some of the thickest sections of Lower Black Island sand (average 9.4 m) within the Wanipigow Lower Black Island sand domain (average 5.8 m).

A two-phase work approach is recommended to advance the Wanipigow Glass Sand Project with the objectives to:

1. Phase 1: Improve the geological confidence of the current resource areas and expand/reclassify the mineral resource and/or convert parts of the exploration target to mineral resources via infill and exploratory drilling. Additional geochemical, beneficiation, and glass melt test work to assess the scalability of the project toward potential commercialization.

2. Phase 2: Conduct mine planning and glass-manufacturing facility design that include modifying factor studies such as detailed mine design, product distribution, marketing studies, groundwater monitoring, environmental management planning, permitting, and social and local community engagement. The Phase 2 work recommendations are subject to the positive results of the Phase 1 work.

The collective estimated cost of the work recommendations, including a 10% contingency, is CDN$1,331,000 (Table 1.2).

Table 1.2 Future Lower Black Island glass sand work recommendations.

Phase	Objective	Item	Description	Cost Estimate (CDN$)	Totals (CDN$)
Phase 1	Improve the geological confidence of the mineral resource and exploration target areas and test the scalability of the project	Infill drilling within the current resource areas	Approximate 350 m of sonic drilling to improve geology/resource certainty and to better delineate waste material	$165,000	
		Exploration target area drill testing	Approximately 350 m of sonic drilling to assess conversion of exploration targets to mineral resources	$165,000	
		Geochemical test work	Ongoing geochemical assaying to further evaluate LBI sand quality.	$55,000	
		Beneficiation test work	Ongoing beneficiation test work to improve the workflow methodology	$40,000	
		Glass melt tests	Additional glass melt recipe testing to maximize the resulting glass chemnical and physical characteristics	$75,000	**$500,000**
Phase 2	Mine-planning and glass-manufacturing facility design with modifying factor studies	Detailed mine planning	Detailed mine design/plan; dewatering plan; productivity analysis; and operating costs estimates	$50,000	
		Processing facility design	Initiate processing facility design/plan	$250,000	
		Marketing studies	Market analyses including an assessment of market size, product demand, market concentration, and market volume.	$35,000	
		Groundwater monitoring	Ongoing hydrogeological studies and pump tests to assess groundwater conditions	$150,000	
		Environmental-planning and continued community consultation	Development of a Closure Plan, environmental plans, permitting, and continued social and local community engagement	$150,000	
		Technical reporting	Ongoing technical reporting in accordance with CIM (2014, 2019) and the disclosure rule NI 43-191	$75,000	**$710,000**
				Subtotal	**$1,210,000**
				10% Contingency	**$121,000**
				Total recommendations cost estimate	**$1,331,000**

2 Introduction

2.1 Issuer and Purpose

This technical report has been prepared for Canadian Premium Sand Inc. (CPS, or the Company); a publicly traded company with its corporate headquarters in Calgary, AB, Canada. CPS proposes to explore and potentially develop the high-silica Wanipigow Sand Project in southeastern Manitoba, Canada, as a low-iron sand source for solar glass manufacturing.

The Wanipigow Sand Project is approximately 160 km northeast of the City of Winnipeg, MB (Figure 2.1) and consists of 41 100% owned, contiguous, Quarry Leases that encompass an area of 2,147.87 ha. The Wanipigow silica sand is hosted within a mature, well-rounded and quartzose sand-dominated portion of the Ordovician Winnipeg Formation of the Western Canada Sedimentary Basin (WCSB, e.g., Bezys and Conley, 1998).

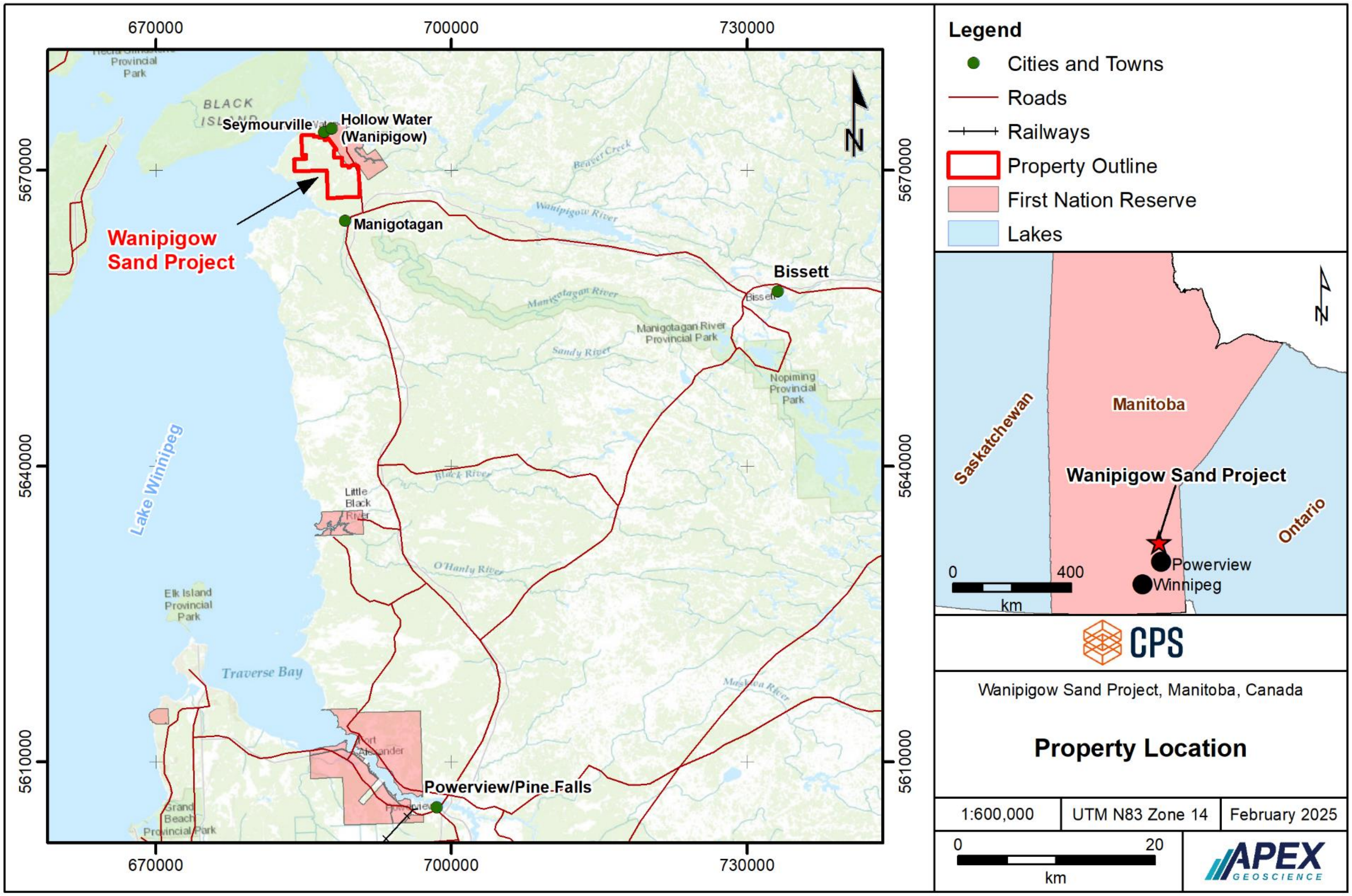
During 2018, CPS completed a 93-hole sonic drillhole program (totaling 1,574 m) and collected 763 core samples to conduct an initial assessment of using the Ordovician Winnipeg Formation silica sand as a frac sand, or proppant, for use in the oil and gas hydraulic fracking industry. In 2019, CPS disclosed mineral resource/mineral reserve estimations and a Preliminary Feasibility Study (PFS; Eccles et al., 2019). The proppant-based PFS is still material to the Company.

During 2020-2021, CPS assessed a high-silica sand member of the Winnipeg Formation, the Lower Black Island sand member (LBI sand), for its potential as a sand source for flat glass manufacturing and potential solar glass applications. An initial inferred glass sand resource technical report was disclosed by CPS (effectively dated October 18, 2021). Since this report, CPS has conducted a 17-hole sonic drillhole program (totaling 283.5 m) and a rigorous mineral processing test program intended to beneficiate the LBI sand to low-iron levels that comply with the manufacturing of high-quality, specialized, glass applications. A bulk low-iron sand sample was utilized within glass melt and anti-reflective solar coating glass tests.

Accordingly, the intent of this technical report is to 1) detail CPS's 2022 drill program, 2) discuss the mineral processing test work, 3) provide updated 2025 glass resource estimations, and 4) provide recommendations for future work. This updated 2025 mineral resource report replaces and supersedes all previous CPS reports.

The updated mineral resource estimations were prepared in accordance with the Canadian Institute of Mining and Metallurgy (CIM) *Definition Standards for Mineral Resources and Mineral Reserves* (CIM, 2014), and *Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines* (CIM, 2019), and the Canadian Securities Administration's (CSA's) disclosure rule National Instrument 43-101 (NI 43-101). The Effective Date of this technical report is 9 April 2025.

Figure 2.1. General location of Canadian Premium Sand Inc.'s Wanipigow Sand Project in southeastern Manitoba.



2.2 Authors and Site Inspection

This technical report was prepared by Roy Eccles, M.Sc. P. Geol. P. Geo. of APEX Geoscience Ltd. Mr. Eccles is a Qualified Person (QP) as defined by NI 43-101 and has been a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) for more than 35 years since his graduation from university. Mr. Eccles has been involved in mineral exploration, and mineral resource modelling and estimations, for greenfield and brownfield silica sand deposits and operations in west and central Canada and northeast United States.

Mr. Eccles conducted a personal site inspection at the Wanipigow Sand Project on March 4-6, 2019. The QP observed the location, physiography, and surficial geology, CPS's drill sites, an active backhoe trenching program, reviewed archived drill samples, and collected sand for independent analysis to verify the Winnipeg Formation, and its Black Island silica sand member, that is the focus of this technical report.

The mineral resource statistical analysis, three-dimensional modeling and estimations were prepared by Mr. Kevin Hon P. Geo. and Ms. Celine McEachern P. Geo., under the direct supervision of Mr. Eccles who accepts responsibility for all Items in this technical report.

2.3 Sources of Information

This Report includes publicly available information, and information obtained from CPS that includes publicly disclosed information and internal reports that were prepared on behalf of the Company. All reference citations are presented in Section 27.

References in this technical report are made to publicly available reports that were written prior to implementation of NI 43-101, including government geological publications and journal manuscripts available through the Government of Manitoba (GoM) or publishing houses. Government reports and journal articles include those that depict the Winnipeg Formation bedrock stratigraphy and its proppant potential (e.g., Vigrass, 1971; McCabe, 1978; Spiece, 1980; Pearson, 1984; Watson, 1985; Bezys and Conley, 1998; Bamburak, 1996; Bailes and Percival, 2000; Dott, 2003; Kreis, 2004; Matile and Keller, 2004; Dorador et al., 2014; Konstantinou et al., 2014; Lapenskie, 2016). Government reports and journal papers were generally prepared by a person, or persons, holding post-secondary geology or related degrees.

Miscellaneous industry Assessment File Reports and Company news releases were used to corroborate the stratigraphy and the Property's silica sand potential, and to reference historical mineral exploration work in the general Wanipigow Sand Project area (e.g., Chornoby, 2003; Pedersen, 2007; Cooke, 2008; Cooke, 2010; Canadian Premium Sand Inc., 2013, 2017, 2018a-d, 2020; Havilah Mining Corporation, 2018).

Other professionally prepared reports cited in this technical report include previous CPS technical reports (e.g., Puritch et al., 2014; Eccles et al., 2019, Eccles et al., 2020, and Eccles and Hough, 2021) and an Environment Act Proposal prepared by Gifford and Samoiloff (2018). These reports were prepared by professional geologists (P. Geol. P. Geo), engineers (P.Eng.), or biologists (P. Biol.) on behalf of CPS and are used for geological and exploration background, and environmental assessment information, in the current report.

The sand grain size particle distributions (gradations) and proppant analytical work was conducted by Turnkey Processing Solutions LLC (TPS) in Ottawa, IL, Stim-Lab Inc. (Stim-Lab) in Duncan, OK and Lonquist Frac Sand Services (Lonquist) in Edmonton, AB. The analytical work was reviewed and approved by certified Professional Engineers that cite recognized ASTM specifications pursuant to ISO 13503-2 for laboratory preparation, analysis and reporting.

Glass sand geochemical and/or beneficiation studies were conducted by laboratories with experience in mineral sands metallurgical test work and include 1) the Institut für Glas- und Rohstofftechnologie (IGR) in Göttingen, Germany, 2) IHC Robbins (IHC) in Yatala, Australia, 3) Saskatchewan Research Council (SRC) in Saskatoon, SK, 4) cm.project.ing GmbH (CMP) in Jülich, Germany and Industrial Mineral international (I.M.I.) in Aachen, Germany, 5) Northern Analytical Laboratory LLC (Northern Analytical) in Londonderry New Hampshire, U.S., and 6) Hazen Analytical Laboratory in Golden, Colorado, U.S.

IGR is accredited to DIN EN ISO / IEC 17025: 2018. IHC is accredited with ISO 45001 and ISO 9001 Quality Management System. The SRC is accredited in accordance with ISO/IEC 17025:2017. CMP is an independent, international holistic glass plant engineering company. Northern Analytical is accredited to ISO/IEC 17025:2017 by the ANSI National Accreditation Board and Nadcap Audit Criteria for Materials Testing Laboratories. Hazen Analytical Laboratory holds certifications from various state regulatory agencies and from the US Environmental Protection Agency (EPA).

A glass melt test was conducted by IGR Institut für Glas- und Rohstofftechnologie GmbH (IGR) in Düsseldorf, Germany. IGR is accredited to DIN EN ISO/IEC 17025:2005 (General requirements for the quality management system and the operation of testing and calibration laboratories).

Pellucere Technologies (Pellucere) of Springdale, Arkansas, U.S. conducted optical transmission and comparative reference measurements on coated glass samples. Pellucere specializes in nano-scale glass coating solutions that enhance performance, durability, and efficiency across a wide range of industries including solar, automotive, architectural, and aerospace.

The QP has reviewed information related to the status of CPS's Quarry Leases provided through verbal communication with CPS and their legal council and Manitoba's Integrated Mining and Quarrying System (iMaQs) at https://web33.gov.mb.ca/imaqs/. To the best of the QPs knowledge, CPS's 41 leases are active, in good standing, and owned 100% by CPS as of 9 April 2025.

Based on review of these documents and/or information, the QP has deemed that the sources of information, to the best of his knowledge, are valid contributions to this report, and therefore the QP takes ownership of the ideas and values as they pertain to the current technical report.

2.4 Units of Measure

With respect to units of measure, unless otherwise stated, this technical report uses:

- Abbreviated shorthand consistent with the International System of Units (International Bureau of Weights and Measures, 2006).

- ‘Bulk’ weight is presented in metric tonnes (tonnes; 1,000 kg or 2,204.6 lbs).

- Geographic coordinates are projected in the Universal Transverse Mercator (UTM) system relative to Zone 15 of the North American Datum (NAD) 1983.

- Density is grams/cubic centimetre (g/cm^3).

- Test sieve sizes as outlined in American Society of the International Association for Testing and Materials (ASTM) E11 (ASTM, 1995).

- Proppant specifications of ISO 13503-2:2006/ Amd.1:2009E (International Standards, 2009).

- Currency in Canadian dollars (CDN$, or C$), unless otherwise specified (e.g., U.S. dollars, US$; Euro dollars, €).

3 Reliance of Other Experts

The QP is not qualified to provide an opinion or comment on issues related to legal agreements, royalties, permitting and environmental matters. Accordingly, the QP disclaims portions of Section 4, Property Description and Location, in this technical report. This limited disclaimer of responsibility includes the following.

- The QP has reviewed but is not qualified to legally verify royalty structures and/or subsequent economic participation agreements that would be enacted in the event the Wanipigow Sand Project was to go into commercial production. A summary of the royalty and economic participation agreement payments was provided by CPS management (Mr. A. Vishal) to the QP on March 11, 2020. At the Effective Date of this report, the royalty agreements are still valid (Mr. A. Vishal, pers. comm., 2025). The information – as discussed in Section 4.5 – was partially verified by the QPs review of the royalty agreements, and as stated in various CPS News Releases, but overall, the QP is reliant on the information as provided by CPS.

- The QP relied on documents provided by CPS regarding permitting and environmental status of a proposed open pit silica sand mine and construction of a solar glass manufacturing facility in Selkirk, MB. CPS obtained Environmental Act Licence approvals for the mine and manufacturing facility from the GoM on July 27, 2023, and May 3, 2023, respectively. The approval documents were provided to the QP by CPS Management (Mr. A. Vishal) on March 13, 2025, in files entitled, "*2023-05-03 – 3401 Licence File No. 6137.00*" and "*CPS – EAL No. 3285 R – 2023-07-27*". The QP relies entirely on the information provided by CPS, which is summarily discussed in Section 4.6.

4 Property Description and Location

4.1 Location and Description

The Wanipigow Sand Project is approximately 160 km northeast of the City of Winnipeg, MB (Figure 2.1), within the jurisdictional boundaries of the Incorporated Community of Seymourville and is adjacent to the Hollow Water First Nation's reserve lands. Additionally, a portion of the Property occurs within the jurisdictional boundaries of the Community of Manigotagan, MB. The Project is approximately 67 km north of the Town of Powerview-Pine Falls.

The Wanipigow Property is in the National Topographic System 1:50 000 map sheet: 062P-01. The centre of the Property is at approximately: 687600 m Easting, 5670650 m Northing, Zone 14, NAD83.

The lands on which the Project is situated are owned by the Crown in Right of Manitoba who has issued CPS 41 contiguous Quarry Leases that grant CPS the exclusive right to mine quarry minerals on the Property (Figure 4.1). The legal descriptions of all 41 Quarry Leases are presented in Table 4.1.

The 41 Quarry Leases collectively encompass a contiguous area of 2,147.87 ha (5,307.50 acres; Table 4.1; Figure 4.1). The quarry leases individually range in size from 20.0 to 168.0 acres. CPS owns 100% of the legal interests in all 41 Quarry Leases.

The updated glass sand mineral resource areas reported in this technical report are presented in Figure 4.1. For comparison, CPS’s frac sand/proppant mineral resource/mineral reserve reported in Eccles et al. (2019, 2020) was completed over 22 Quarry Leases. Importantly, the glass sand mineral resource areas reported herein represents sub-portions of the overall silica sand deposit and, furthermore, focuses only on the Lower Black Island sub-member of the Winnipeg Formation.

4.2 Nature of Land Titles: Quarry Lease Acquisition

CPS (formerly Claim Post Resources Inc.) was incorporated on September 21, 2005, under the laws of the Province of Ontario. CPS obtained 100% ownership of the Wanipigow Sand Project Quarry Leases through a series of acquisitions from several third parties (e.g., Char Crete Ltd., Simmons Construction Ltd., and O/S Investment Corp., Gossan Resources Limited) and via application to the Manitoba Government (Canadian Premium Sand Inc., 2017, Canadian Premium Sand Inc., 2018a).

The Quarry Lease provincial approvals (Issue Dates) were issued between July 1996 and November 2019 (Table 4.1). The current Expiry Dates are between April 2025 and April 2026 (and can be renewed annually by CPS).

On November 15, 2018, Claim Post Resources Inc. changed its name to Canadian Premium Sand Inc. (Canadian Premium Sand Inc., 2018b).

Figure 4.1 Spatial orientation of issued Quarry Leases at the Wanipigow Sand Project.

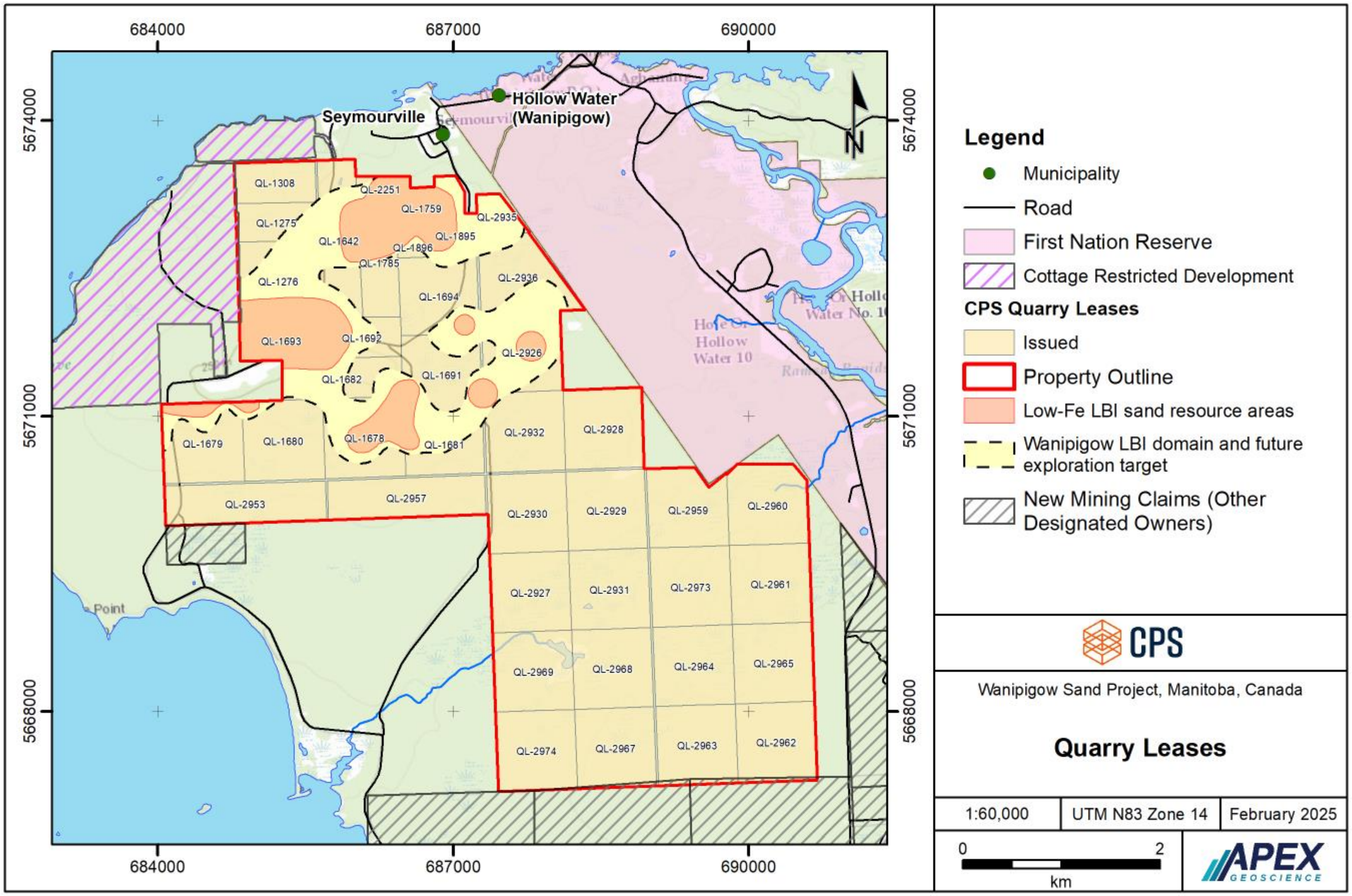


Table 4.1. Description of issued Quarry Leases at the Wanipigow Sand Project.

Lease Number	Lease Type	Status	Designated Title Holder	Public Land Survey System (section, township, range, meridion)	Area (acres)	Area (hectares)	Issue Date	Expiry Date
QL-1275	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 36 TWP 25 RGE 8 E1	79.99	32.37	1996-07-16	2025-08-15
QL-1276	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 36 TWP 25 RGE 8 E1	160.00	64.75	1996-07-16	2025-08-15
QL-1308	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 36 TWP 25 RGE 8 E1	79.99	32.37	1997-03-03	2026-04-02
QL-1642	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	160.00	64.75	2002-06-26	2025-06-26
QL-1678	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 30 TWP 025 RGE 009 E1	164.00	66.37	2003-06-20	2025-06-20
QL-1679	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 25 TWP 025 RGE 008 E1	154.28	62.44	2003-06-20	2025-06-20
QL-1680	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 25 TWP 025 RGE 008 E1	160.00	64.75	2003-06-20	2025-06-20
QL-1681	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 30 TWP 025 RGE 009 E1	119.99	48.56	2003-06-20	2025-06-20
QL-1682	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 30 TWP 025 RGE 009 E1	122.00	49.37	2003-06-20	2025-06-20
QL-1691	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 30 TWP 25 RGE 9 E1	158.47	64.13	2003-09-24	2025-09-24
QL-1692	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 30 TWP 25 RGE 9 E1	73.83	29.88	2003-09-24	2025-09-24
QL-1693	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 25 TWP 25 RGE 8 E1	77.90	31.53	2003-09-24	2025-09-24
QL-1694	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	152.49	61.71	2003-09-24	2025-09-24
QL-1759	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	87.52	35.42	2004-12-10	2025-12-10
QL-1785	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	110.01	44.52	2005-05-25	2025-05-25
QL-1895	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	26.76	10.83	2007-03-21	2025-04-20
QL-1896	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	20.00	8.09	2007-04-16	2025-05-16
QL-2251	Quarry Lease	Issued	(259535) Canadian Premium Sand	SEC 31 TWP 25 RGE 9 E1	22.49	9.10	2009-10-16	2025-10-16
QL-2926	Quarry Lease	Issued	(259535) Canadian Premium Sand	NW1/4 SEC 29 TWP 025 RGE 009 E1	159.88	64.70	2019-04-30	2025-05-30
QL-2927	Quarry Lease	Issued	(259535) Canadian Premium Sand	SW1/4 SEC 20 TWP 025 RGE 009 E1	159.88	64.70	2019-11-12	2025-12-12
QL-2928	Quarry Lease	Issued	(259535) Canadian Premium Sand	SE1/4 SEC 29 TWP 025 RGE 009 E1	158.64	64.20	2019-11-12	2025-12-12
QL-2929	Quarry Lease	Issued	(259535) Canadian Premium Sand	NE1/4 SEC 20 TWP 025 RGE 009 E1	159.88	64.70	2019-04-30	2025-05-30
QL-2930	Quarry Lease	Issued	(259535) Canadian Premium Sand	NW1/4 SEC 20 TWP 025 RGE 009 E1	159.88	64.70	2019-04-30	2025-05-30
QL-2931	Quarry Lease	Issued	(259535) Canadian Premium Sand	SE1/4 SEC 20 TWP 025 RGE 009 E1	159.88	64.70	2019-11-12	2025-12-12
QL-2932	Quarry Lease	Issued	(259535) Canadian Premium Sand	SW1/4 SEC 29 TWP 025 RGE 009 E1	159.88	64.70	2019-04-30	2025-05-30
QL-2935	Quarry Lease	Issued	(259535) Canadian Premium Sand	LS 12 SEC 32 TWP 025 RGE 009 E1	38.03	15.39	2016-06-16	2024-07-16
QL-2936	Quarry Lease	Issued	(259535) Canadian Premium Sand	LS 2,3,4,5 SEC 32 TWP 025 RGE 009 E1	150.83	61.04	2016-06-16	2024-07-16
QL-2953	Quarry Lease	Issued	(259535) Canadian Premium Sand	LS 13,14,15,16 SEC 24 TWP 025 RGE 008	36.79	14.89	2019-04-30	2025-05-30
QL-2957	Quarry Lease	Issued	(259535) Canadian Premium Sand	LS 13,14,15,16 SEC 19 TWP 025 RGE 009	159.14	64.40	2019-04-30	2025-05-30
QL-2959	Quarry Lease	Issued	(259535) Canadian Premium Sand	NW1/4 SEC 21 TWP 025 RGE 009 E1	151.77	61.42	2019-04-30	2025-05-30
QL-2960	Quarry Lease	Issued	(259535) Canadian Premium Sand	NE1/4 SEC 21 TWP 025 RGE 009 E1	154.44	62.50	2019-11-12	2025-12-12
QL-2961	Quarry Lease	Issued	(259535) Canadian Premium Sand	SE1/4 SEC 21 TWP 025 RGE 009 E1	159.63	64.60	2019-11-12	2025-12-12
QL-2962	Quarry Lease	Issued	(259535) Canadian Premium Sand	SE1/4 SEC 16 TWP 025 RGE 009 E1	160.12	64.80	2019-11-12	2025-12-12
QL-2963	Quarry Lease	Issued	(259535) Canadian Premium Sand	SW1/4 SEC 16 TWP 025 RGE 009 E1	158.64	64.20	2019-11-12	2025-12-12
QL-2964	Quarry Lease	Issued	(259535) Canadian Premium Sand	NW1/4 SEC 16 TWP 025 RGE 009 E1	159.63	64.60	2019-11-12	2025-12-12
QL-2965	Quarry Lease	Issued	(259535) Canadian Premium Sand	NE1/4 SEC 16 TWP 025 RGE 009 E1	158.89	64.30	2019-11-12	2025-12-12
QL-2967	Quarry Lease	Issued	(259535) Canadian Premium Sand	SE1/4 SEC 17 TWP 025 RGE 009 E1	144.80	58.60	2019-11-12	2025-12-12
QL-2968	Quarry Lease	Issued	(259535) Canadian Premium Sand	NE1/4 SEC 17 TWP 025 RGE 009 E1	159.88	64.70	2019-11-12	2025-12-12
QL-2969	Quarry Lease	Issued	(259535) Canadian Premium Sand	NW1/4 SEC 17 TWP 025 RGE 009 E1	159.88	64.70	2019-11-12	2025-12-12
QL-2973	Quarry Lease	Issued	(259535) Canadian Premium Sand	SW1/4 SEC 21 TWP 025 RGE 009 E1	159.63	64.60	2019-04-30	2025-05-30
QL-2974	Quarry Lease	Issued	(259535) Canadian Premium Sand	SW1/4 SEC 17 TWP 025 RGE 009 E1	147.77	59.80	2019-11-12	2025-12-12
				Total combined Quarry Leases	**5,307.50**	**2,147.87**		

4.3 Manitoba Quarry Lease Definition, Fees, and Royalties

In Manitoba, a quarry lease grants the holder the exclusive rights to explore for, develop and produce (which includes the rights to dig, work, mine, recover, procure, and carry away) the quarry minerals within the leased area, subject to the payment of royalties. "Quarry minerals" include silica sand, and this term is more fully defined under *The Mines and Minerals Act,* s. 1(1) where "quarry mineral" means a mineral, other than a diamond, ruby, sapphire, or emerald, that is obtained from a quarry, and includes:

> (a) sand, gravel, clay, shale, kaolin, bentonite, gypsum, salt, coal, and amber,
>
> (b) rock or stone that is used for a purpose other than as a source of metal, metalloid, or asbestos, and
>
> (c) a mineral that is prescribed as a quarry mineral.

A quarry lease is issued for a term not exceeding 10 years, and is renewable for further terms of 10 years, provided regulatory requirements are met. The Manitoba quarry lease schedule of fees, rentals, deposits, and expenditures is available at: https://www.manitoba.ca/iem/mines/quarry/quarry_pdfs/quarry_fees.pdf.

Quarry leases are exempt from assessment work but are subject to an annual tax that is payable when: 1) applying for new leases; or 2) renewing to hold current leases. Rental for a first term quarry lease and renewals for quarry minerals other than peat is $27 per hectare or fraction thereof per year.

With respect to surface rights, Quarry Leases are crown grants and include access to the surface. Accordingly, quarry leases in Manitoba include surface rights. Rental for a surface lease is $7 per hectare or fraction thereof per year but not less than $144.

With respect to royalty rates, any silica sand production from quarry leases is subject to a provincial royalty of $0.50 per tonne. In Manitoba, silica sand is defined as sand with greater than 95% silica content. A conversion factor of 1.78 tonnes per cubic metre shall be used where quarry mineral production is calculated in cubic metres

- Other applicable provincial quarry mineral royalties include, for example:
    1) Heavy Mineral Sand containing minerals such as ilmenite, rutile, zircon, garnet, monazite, magnetite, kyanite, tourmaline, sphene, apatite and biotite of $0.39/tonne.
    2) Gravel - including crushed or screened sand and gravel suitable for use (inter alia) in concrete aggregate, asphalt aggregate, mortar sand, and railroad ballast of 0.50/tonne.

3) Mining Backfill - quarry mineral used in a mining operation as structural fill at $0.21/tonne.

4.4 Rehabilitation Levy

A rehabilitation levy is required as per *The Mines and Minerals Act*. An operator of an aggregate quarry owned by the Crown will, no later than the 30th day following the anniversary date, or expiry of the quarry mineral disposition, remit to the recorder a rehabilitation levy in respect of the aggregate quarry minerals produced by the operator in the preceding year.

Every operator of an aggregate quarry shall pay an annual rehabilitation levy equal to the product of the number of tonnes of aggregate quarry mineral produced multiplied by $0.12.

4.5 Economic Participation and Contractual Agreements

CPS has entered into Economic Participation Agreements with Hollow Water First Nation and the Incorporated Community of Seymourville (Canadian Premium Sand Inc., 2018d). The Economic Participation Agreements are for the life of the Wanipigow Sand Project and reflect the parties' non-financial commitment and support for the Wanipigow Sand Project. The Economic Participation Agreements also commit CPS to certain participation payments over the life of the project.

CPS has also entered into various contractual agreements relating to the acquisition of title for 18 quarry leases that include advance and future royalty payments (Gossan Resources Limited, 2017; Canadian Premium Sand Inc., 2018a). Collectively, these Royalty and Economic Participation Agreements commit CPS to quarterly payments if/once production commences that total:

- $3.30 per tonne silica sand sold as fracture proppant.
- $2.80 per tonne of silica sand sold.
- $0.50 per tonne of construction aggregates sold.

There is a further royalty payment of $1.00 per tonne of silica sand sold as frac sand, or proppant, $0.50 per tonne of silica sand sold and $0.50 per tonne for construction aggregates sold relating to tonnes mined and sold specifically related to the Quarry Leases acquired from Gossan Resources Limited.

As part of certain agreements, CPS has made advance royalty payments that are recoverable as follows:

- Upon the Company attaining commercial production, the Company is entitled to recover $1.3 million plus interest at 9% compounded annually before the production royalty owing to Char Crete Ltd. commences.

- The Company pays Gossan Resources Limited a semi-annual advance royalty payment of $50,000 prior to initial production which started December 18, 2015. These advance royalty payments can be deducted from future production royalties owing once commercial production commences. The Company also has an option to re-acquire 50% of the production royalty for $1,500,000.

4.6 Approved Environmental Act Licences

4.6.1 Environment Act Licence Approval: Wanipigow Sand Extraction

On July 27, 2023, CPS received an Environment Act Licence No. 3285 R approval from the GoM, in accordance with T*he Environment Act (C.C.S.M. c. E125)* approval for the construction and operation of the Wanipigow Sand Extraction Project; a 300,000 tonnes per year open pit silica sand mine and processing facility located in the Incorporated Community of Seymourville. The proposed Wanipigow Sand Extraction Project consists of an active open pit silica sand mine for each year of operation, including progressive annual site reclamation of closed mines, 7.9 km access road, powerline, and ancillary facilities, and in accordance with the Proposal filed under *The Environment Act* on December 18, 2018 (and subsequent notices of alteration filed March 12, 2019, March 18, 2019, April 24, 2019, and November 10, 2022), and subject to the specifications, limits, terms and conditions outlined in the July 27, 2023 Environment Act Licence No. 3285 R.

Prior to construction of the development, CPS must prepare and submit for approval, environmental management plans that include the following plans, 1) Erosion and Sediment Control Plan, 2) Surface Water Management Plan, 3) Heritage Resources Management Plan, 4) Emergency Response Plan, and 5) implement the environmental management plans in accordance with the approvals.

Prior to operation of the development, must prepare and submit for approval, environmental monitoring management plans that include 1) Dust Management Plan, Air Quality Monitoring Plan, 2) Progressive Rehabilitation Plan, 3) Wildlife Monitoring Plan, 4) Groundwater Monitoring Plan, 5) Revegetation Monitoring Plan, and 6) and implement the environmental monitoring plans in accordance with the approvals.

CPS must also prepare and maintain the progressive rehabilitation plan to address ongoing monitoring, mitigation, and reclamation from mining activities and include objectives, methods and assessment criteria for reclamation and monitoring of the project area at the development.

Other plans include wildlife monitoring plan and annual operating plan that includes respecting construction, chemical storage and spill containment, solid wastes, dangerous goods and hazardous waste, mining (not exceed 5 ha at a time and commence reclamation of previous mine areas before starting in a new area), acid-generating material, roadways and traffic, wastewater, air pollution control devices, air emissions, and site water management ponds.

4.6.2 Environment Act Licence Approval: Solar Glass Facility

On May 3, 2023, CPS received an Environment Act Licence No. 3401 approval from the GoM to construct and operate a solar glass manufacturing facility in the City of Selkirk, MB. The facility proposes to use high-purity and low-iron silica sand sourced from the Wanipigow Sand Project. Two phases are included: In Phase 1, the facility will manufacture 600 to 800 tonnes of glass/day with capacity to increase to 1,200 tonnes/day in Phase 2. Air dispersion modelling, noise assessment, and traffic studies are required to assess potential environmental effects. The facility will use the City of Selkirk’s wastewater effluent as a water source.

CPS must obtain all necessary federal, provincial, and/or municipal licences, authorizations, permits and/or approvals for the construction of relevant components of the development prior to commencement of construction.

4.7 Canadian Environmental Assessment Act, 2012, Oversight Not Required

On May 17, 2019, the Federal Minister of Environment and Climate Change, the Honourable Catherina McKenna, issued CPS a letter informing the Company that the Wanipigow Sand Project has not been designated as a project requiring federal environmental oversight under the *Canadian Environmental Assessment Act (2012).*

4.8 Conditional Use Order

As the Project substantially falls within the jurisdictional boundaries of The Incorporated Community of Seymourville, the Company was required to apply to the Incorporated Community of Seymourville, to utilize lands that are zoned "natural areas", under applicable Zoning and Development Plan By-laws, for the purpose of harvesting silica sand and other ancillary commercial purposes. The Company made the required Conditional Use Application, and a hearing on its application was held on May 3, 2019.

On May 9, 2019, the Incorporated Community of Seymourville issued a Conditional Use Order to the Company, approving the conditional use of lands within its jurisdictional boundaries for a silica sand extraction operation, including accessory uses, building and structures.

A summary of the Quarry Leases (in whole or in part) that occur within the area of the Conditional Use Order are presented in Table 4.2. The Conditional Use Order applies to the Project through all phases of its lifecycle. Note: CPS will need to submit an amended Conditional Use Order application based on the revised mine plan outlined in this technical report.

4.9 Other Approvals

Other than the conditions of the Environment Act Licence (Section 14.6), other approval applications can include, for example:

- CPS will coordinate with Manitoba Infrastructure on approvals for the development of Project access roads, intersections and any other infrastructure development required as part of the revised logistics plan.

- General work permit(s) for the clearing of trees and land use will be requested in accordance with *The Crown Lands Act* (C.C.S.M. c C340) and applicable regulations.

- Burning permits to dispose of woody debris will be requested, as required, in accordance with Section 19(1) of *The Wildfires Act* (C.C.S.M. c W128).

- Water rights license(s) for use of groundwater needed to support the sand wash plant and associated facilities will be acquired in accordance with *The Water Rights Act*.

- In collaboration with Manitoba Hydro, coordinate the development of a powerline, including powerline capacity, required for the Wanipigow Sand Project.

4.10 Community Consultation

Potential operations associated with the Wanipigow Sand Project are anticipated to be a substantial benefit to the Local and Regional Project Area communities in terms of training, employment, and potential business opportunities related to the services that will be required for the Project.

CPS has conducted its own extensive public engagement that has resulted in letters of support for the Project from local communities, including the Incorporated Communities of Seymourville, the Northern Affairs Settlement of Aghaming and Hollow Water First Nation. CPS now has Participation Agreements in place with Hollow Water First Nation and the Incorporated Community of Seymourville.

The Company participated in all consultation initiatives, required by Manitoba, prior to EA Licencing. The consultation process has provided local Indigenous communities with an opportunity to become engaged and informed about the Wanipigow Sand Project and share any comments, concerns, and recommendations to protect Indigenous rights and environmental interests (Indigenous Business & Finance Today, 2019).

Other CPS actions that will further contribute to the socioeconomic benefits of the area are set out in the issued EA Licence (see Section 20) and Conditional Use Order (see Section 4.9).

4.11 Parks and Protected Areas

The nearest park or protected area to the Wanipigow Property is the Hecla/Grindstone Provincial Park (designated in 1969 and 1997 respectively). The Park is located approximately 2 km northwest of the Property and includes Hecla Island, Grindstone, Black Island, and several other small islands in Lake Winnipeg. The Park is 1,084 km^2 in size and is considered an IUNC Category V Protected Landscape/Seascape protected area. The Park area includes the historical silica sand mining quarry(s) at Black Island.

4.12 Property-Related Uncertainties

The business of exploration for, and development of, silica sand involves a high degree of risk and there can be no assurance that the current program will result in profitable operations. The Company's continued existence is dependent upon the preservation of its interest in the underlying properties, the discovery of economically recoverable resources/reserves, the achievement of profitable operations, and the ability of the Company to raise additional financing, if necessary, or alternatively upon the Company's ability to dispose of its interests on an advantageous basis.

Ownership in mineral properties involves certain risks due to the difficulties in determining the validity of certain leases and the potential for problems arising from the ambiguous conveyance history characteristics of many mining interests.

Other than the necessary federal, provincial, and/or municipal licences, authorizations, permits and/or approvals outlined in this Section, and to the extent known, there are no other significant factors and risks that may affect access, title, or the right or ability for CPS to perform work on the property (including development of the Wanipigow Sand Project).

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The Canadian Premium Sand's Wanipigow Sand Project is approximately 160 km northeast of the City of Winnipeg, MB, the capital and largest city in Manitoba (Figure 5.1). The property is along the east shore of Lake Winnipeg and occurs directly south of the Incorporated Community of Seymourville, MB and southwest of the Hollow Water (Wanipigow) First Nation Reserve. The largest community within an 80 km radius is Gimli, MB, which is about 70 km west of the Property (across Lake Winnipeg) and has a population of over 6,000 people.

From Winnipeg, the Property is best accessed by:

1. Travelling approximately 110 km on Provincial Trunk Highway 59N.

2. East and north on highway MB-304 N to the Town of Powerview-Pine Falls, MB, and continuing along highway MB-304 N for another approximately 75 km.

3. Exiting MB-304 N and driving straight north on an all-weather gravel road to Wanipigow (Figure 5.1).

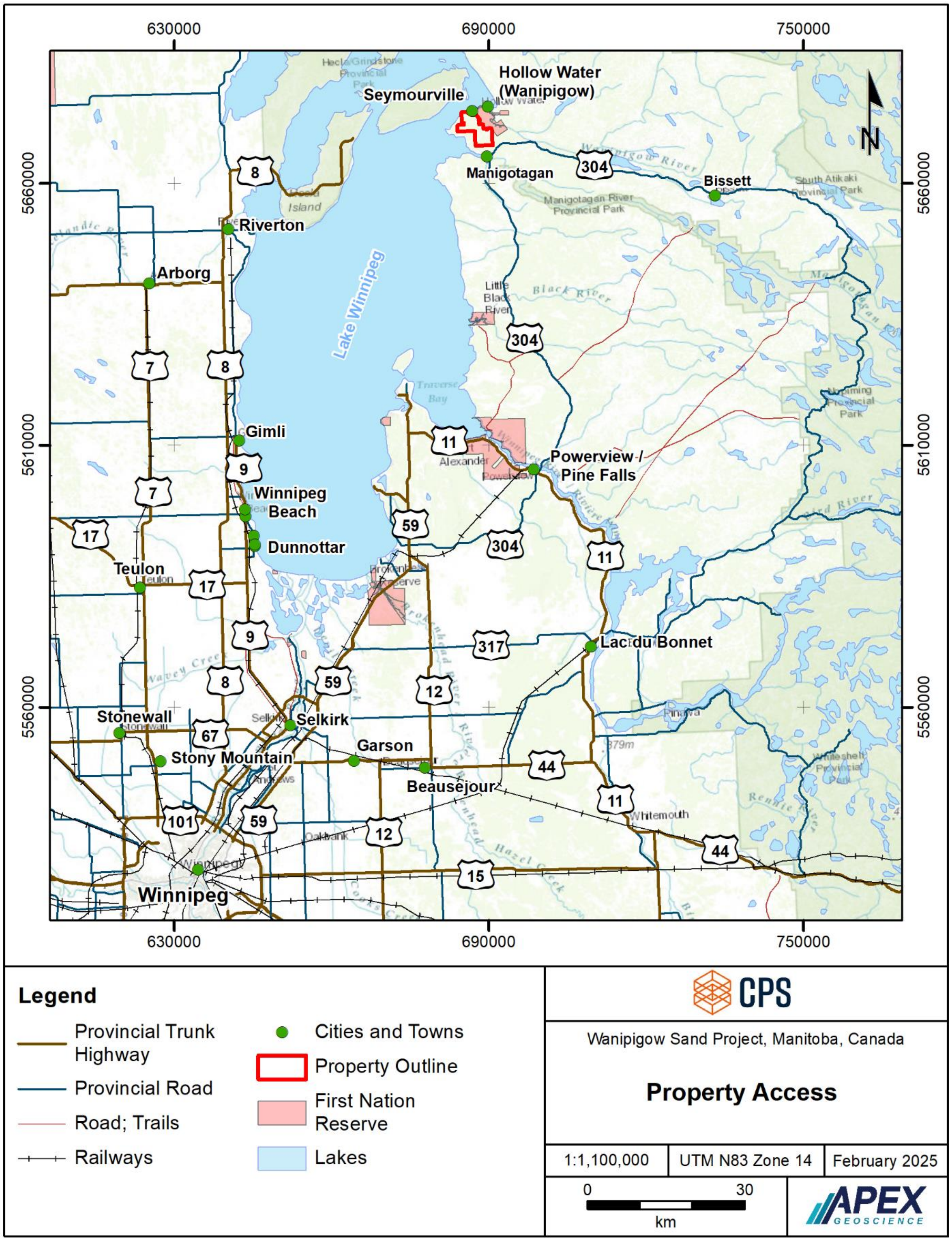
A gravel road directly west of the Property serves the communities of Manigotagan and Seymourville and permits access to cottages along the Winnipeg River system and Lake Winnipeg. This access route provides road access to the southeast part of the Property and extends northward through the northern portions of the Property.

The nearest commercial airport is Winnipeg International Airport in Winnipeg. Local general aviation airports include Riverton Airport (FAA ID: GKG2; approximately 53 km) and Gimli Industrial Park Airport (FAA ID: CJP7; approximately 95 km).

There is no rail line access to the Property; however, the Central Manitoba Railway (CEMR) Pine Falls subdivision once ran from Beach Junction in Winnipeg to Powerview-Pine Falls, MB. Most of the track is unused at present due to the closure of the mill in Pine Falls and much of the track north of Selkirk, MB (north of Winnipeg) has been lifted. In 2018, a refurbishment project was conducted for rebuilding the first several kilometres of the subdivision line and to bring the line up to 286K standard, among other improvements. The project was to include contributions from the Canadian federal government and Cando Rail Services.

On the western side of Lake Winnipeg, a Lake Line Railroad owned and operated as one of five Shortline Railways (SLRs) was formed in July 2012 to operate trains over two pieces of track, a portion of the CP Winnipeg Beach subdivision from Gimli (mile 58 and end of track) to Selkirk (mile 26.13), and a portion of the CP Lac du Bonnet subdivision from Beasejour to Molson. The Lake Line Railroad interchanges with the Canadian Pacific (CP) railway in Selkirk, MB.

Figure 5.1 Access to the Wanipigow Sand Project.



5.2 Site Topography, Elevation, Vegetation and Wildlife

The Wanipigow Sand Project is situated on the boundary between the Boreal Shield Ecozone and the Lac Seul Ecoregion. The boreal forest is the largest of Canada's 15 ecosystems and forms a continuous belt from the east coast to the Rocky Mountains. The Lac Seul Ecoregion, a subset of the Boreal Shield, is significantly smaller and extends eastward from Lake Winnipeg in Manitoba to the Albany River in northwestern Ontario.

The topography at the Property is relatively flat with elevation ranging from approximately 225 m to 250 m above sea level. The region is underlain with crystalline Precambrian bedrock of the Canadian Shield that forms broadly sloping uplands and lowlands. Hummocky Ordovician sandstone bedrock ridges and knolls unconformably overlie the basement rocks and are in turn covered with discontinuous and undulating glaciolacustrine and glaciofluvial deposits. Locally, sandy ridges, and fens and bog, dominate the northern and east-centre/southeast parts of the Property, respectively.

The dominant land cover is over-mature, mixed-wood forest. Characteristic vegetation includes trembling aspen with white and black spruce, jack pine and balsam fir. Mixed-wood forest dominated by trembling aspen commonly occurs in areas that are moderately well- to poorly drained underlain by relatively flat Quaternary surficial deposits comprised of unconsolidated sand, gravel, and sandy clay, and ground moraine till. Poorly drained areas covered by fens and bogs are dominated by spruce.

Soils at the Property include: 1) Dystric Brunisols in areas of shallow to deep sandy glaciofluvial sediment, and in areas where bedrock crops out, 2) Organic Mesisols and Fibrisols dominate peat-filled depressions, and 3) Gray Luvisolic and Gleysolic soils occur in areas of glaciolacustrine sediment.

Wildlife includes wolf, lynx, ermine, fisher, mink, moose, black bear, woodland caribou, red squirrel and snowshoe hare. Bird species include the spruce grouse, herring gull, and double-crested cormorant, as well as bald eagle, great horned owl, red-tailed hawk, and waterfowl. Wildlife species at risk in the region include Boreal Woodland Caribou (threatened), Little Brown and Northern Long-Eared bats (Endangered), and several threatened or endangered bird species (e.g., Common Nighthawk, Eastern Whip-poor-will, Barn Swallow, Golden-winged Warbler, Short-eared Owl).

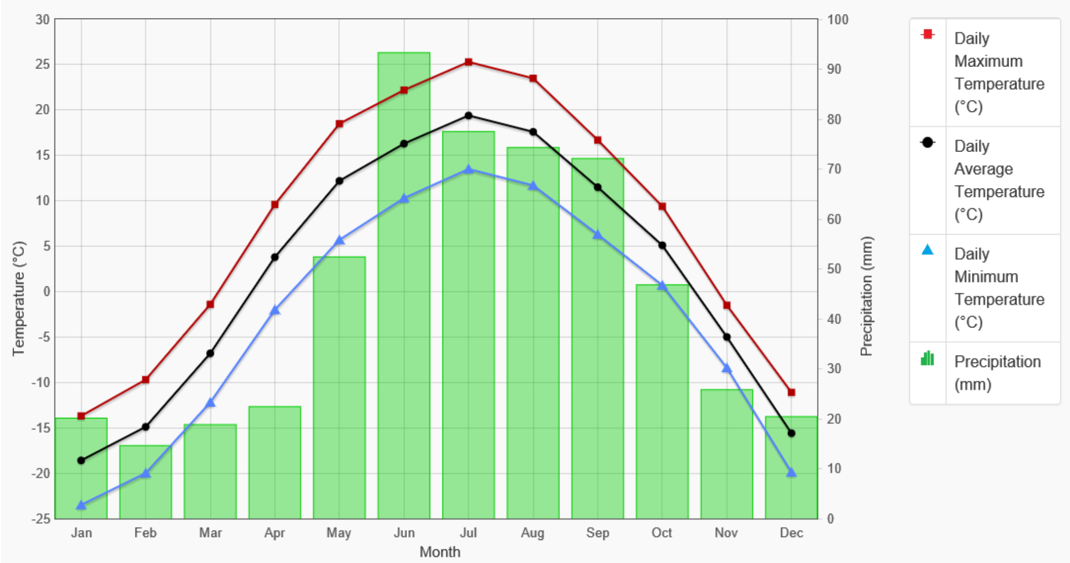
There are no fish on the Property and the nearest fish habitats are Lake Winnipeg, and the Wanipigow and Manigotagan rivers. The proposed barge loadout for transportation of wet processed sand is located on the shore of Lake Winnipeg where main fish species include walleye, sauger and lake whitefish. Other fish species include goldeye, mooneye, yellow perch and emerald shiner. Aquatic Species at Risk as per the *Species at Risk Act* (SARA) include the Mapleleaf (*Quadrula quadrula*), a mussel species that is listed as Threatened in Schedule 1 of SARA.

5.3 Climate

This ecoregion is classified as having a sub-humid mid-boreal eco-climate. The region has four distinct seasons, with short transitional periods between winter and summer. The property lies in the middle of the North American continent on a low-lying, flat plain. Due to its location in the Canadian Prairies, and its distance from both mountains and oceans, it has an extreme humid continental climate in that there are great differences between summer and winter temperatures (Figure 5.2).

Based on Powerview-Pine Falls and Seymourville climate records, the Wanipigow Property region has warm to hot summers and dry, cold subarctic winters. The mean annual temperature is approximately 2°C with a daily mean summer temperature of 19°C (July) and the daily mean winter temperature is -19°C (January). The mean annual precipitation is 540 mm with rainfall and snowfall averaging 439 mm and 100 m, respectively.

Figure 5.2 Temperature and precipitation graph for Powerview-Pine Falls. Source: Environment Canada 1971 to 2000 Canadian Climate Normals.



5.4 Local Resources and Infrastructure

Forestry, recreation, and hunting are the major land uses in this region. Powerview-Pine Falls was created as a paper mill town in the mid-1920's. In 2009, the mill was closed, and the site demolished in 2012. The mill was served by rail service, which ended after the mill closed. At present, the Interlake-Eastern Regional Health Authority Pine Falls Hospital (Pine Falls Health Complex) is the community's largest employer.

Other work opportunities for Powerview-Pine Falls, Seymourville and Hollow Water residents include gold exploration and mining opportunities associated with the Rice Lake gold belt. The Uchi Domain gold trend includes several significant gold deposits including Havilah Mining Corporation's True North (Rice Lake) Gold Mine near Bisset, MB, which is approximately 50 km northeast of the communities. Under the former guidance of Klondex Mines Ltd., True North Mine projects included refurbishing existing underground openings including test stope mining and conducting a historic tailings re-processing assessment project in 2016 (Puritch et al., 2016). Havilah Mining Corporation acquired True North in July 2018 and produced approximately 3,200 ounces of gold in roughly 4 months at an average grade of approximately 1 gram/tonne and the re-processing operation ran at an approximate rate of 900 tonnes per day (Havilah Mining Corporation, 2018).

Other past-producing or advanced projects near the True North Mine include Gunnar, Ogama-Rockland, Central Manitoba, Bissett Project and Cryderman Central gold deposits. The estimated total gold endowment in the belt is more than 5.6 million ounces (resources and past production), making it the largest gold deposit region discovered to date in Manitoba (Manitoba Commodity Files, 2017).

Workers from these communities were historically involved in mining silica sand at the Black Island silica sand quarry, which is directly northwest of the Property. The Black Island Quarry was mined periodically between 1929 and 1993 when extraction activities were abandoned, and the island became a Provincial Park. Hence, there is a history of silica sand mining in the region and neighboring communities offer potential sources for skilled and knowledgeable workers.

There is also an abundance of material and human resources that are available to support a mining operation from the City of Winnipeg.

Exploration in the region can be conducted year-round. Due to the cold winters, it is not uncommon for mining operations to close during the winter months. For example, the True North Mine has shut down its tailing reprocessing operation during the coldest winter months; current plans are to restart operations in April 2019 (Havilah Mining Corporation, 2018). It is anticipated that any silica sand operation in the region would close during the coldest winter months (e.g., November to April), but sand stockpiles could supply year-round feed to the processing plants, which may not be influenced by cold weather.

6 History

6.1 Adjacent-Property Silica Sand History

This sub-section contains adjacent-property information. The QP has been unable to verify the information, and therefore, the reader should be aware that the information is not necessarily indicative of the mineralization within the boundaries of the Wanipigow Property.

Silica sand was reportedly first discovered in Manitoba in 1859 prior to formal documentation in 1900 (Dowling, 1900; Watson, 1985). Since then, Quaternary, Cretaceous, and Ordovician quartz-rich sand has been explored for, and even quarried, in various forms in some areas of southern Manitoba.

The Ordovician Winnipeg Formation contains the largest known deposits of high-silica sand in Manitoba (Watson, 1985). The Winnipeg Formation was first described in 1900 (Watson, 1985) and is primarily exposed along the eastern shore and islands of Lake Winnipeg. Documented deposits – and their spatial relation to the Wanipigow Sand Project include:

- Black Island, which is 5 km west of the Wanipigow Property.
- Smith Point, which is 7.5 km south-southwest of the Wanipigow Property.
- Punk Island, which is 11 km west-northwest of the Wanipigow Property.

The first claims for silica sand were staked on Black Island in 1910 and historically, numerous silica sand quarry operations were located on the island, which is approximately 5 km west of the Property. The island and historical quarry operations are presently with a Provincial Park and quarrying is no longer permitted.

The silica sand operations on Black Island had been intermittently active from 1910-2003 and are described by Spiece (1980), Pearson (1984) and Watson (1985) as summarized below:

- 1929-1932: Lakeshore Sand and Gravel quarried and barged silica sand from both the north and south shores of the island to Mid-West Glass in Winnipeg. The operation was concentrated on the south shore until 1930 where the company constructed a 365 m pier to better facilitate barge loading. The operation was shut down in 1930 due to problems maintaining the pier.
- 1950: Dyson Limited quarried sand from the north shore and shipped it to their plant in Selkirk.
- 1962: The Selkirk Silica Division of The Winnipeg Supply and Fuel Company renewed quarrying on the southern shore.

- 1969-2003 Steel Brothers acquired the Black Island operation from Selkirk Silica Division and quarried up to 100,000 tons per year from the LBI unit of the Winnipeg formation. The sand was processed on site by a wash plant, stockpiled. and barged to Selkirk. Quarrying operated all year, but sand was shipped during the summer.

Sand for glass processing was historically barged from the deposit to manufacturing operations in both Winnipeg and Selkirk, MB (Spiece, 1980; Pearson, 1984; Watson, 1985). The sand was taken from the island quarry in Lake Winnipeg down the Red River system to the plants. The silica sand quarry on the south shore of Black Island is still accessible and possesses some of the best outcrop exposures of the Winnipeg Formation in Manitoba (Lapenskie, 2016).

6.2 Within-Property Silica Sand History

Early, historical, references to the Winnipeg Formation silica sand reference the deposit as the Seymourville deposit. This nomenclature remained intact to November 2018 when Claim Post Resources Inc. (now CPS) renamed the deposit to the Wanipigow Sand Project.

Outcrops of silica-rich Winnipeg Formation sandstone have been known to occur on the southeast shore of Lake Winnipeg since Dowling (1900) made his initial investigations in the area. Due mainly to accessibility issues through the early and mid 1990’s, the Property area was not investigated in detail until the late 1970’s and 1980’s (Watson, 1985).

With respect to the silica content of the Winnipeg Formation, Watson (1985) reported that the current Wanipigow Property comprises high-silica sand that is low in deleterious elements and cemented by kaolin and iron oxides that are readily removed by washing. In assessment of numerous potential sources of silica sand in Manitoba, it was reported that the Wanipigow Property area yielded the highest silica purity (up to 99% SiO_2) of all samples tested (e.g., Watson, 1985; Lapenskie, 2016).

From 1980 onward, the Wanipigow Property, and immediate Property area, has undergone numerous exploration programs conducted by Government and the minerals exploration industry. These programs tested the subsurface geology at the Property as summarized in Table 6.1 and in the text below.

In some instances, drilling took place adjacent to, or near, the Wanipigow Property. The QP has attempted to make a clear distinction between on- and off-Property drilling, and therefore, Table 6.1 and the text below focuses only on drilling and drill information that occurred within the boundaries of the Wanipigow Property.

Table 6.1 Summary of historical drilling conducted by Government and various companies at the Wanipigow Sand Project. The number of holes and drill information depicts only those holes that were drilled within the Wanipigow Property.

					Drill depth			Analytical work documented		
Year	Company	Number of holes	Drill type	Total drilling (m)	Min (m)	Max (m)	Avg (m)	Gradation	Proppant API	Reference
1981	Manitoba Energy & Mines	2	Diamond drill	39.0	12.0	27.0	19.5	Yes	/	Bamburak (1996)
1989	Manitoba Energy & Mines	7	Diamond drill	128.4	12.2	24.7	18.3	/	/	Bamburak (1996)
1992	Manitoba Energy & Mines	3	Diamond drill	18.4	4.9	6.6	6.1	/	/	Bamburak (1996)
2002	Claymore Kaolin	2	Diamond drill	36.6	15.2	21.3	18.3	Yes	/	Chornby (2003)
2004	Gossan Resources	11	Reverse Circulation	188.4	11.0	21.3	17.1	/	/	Pedersen (2007)
2006	Gossan Resources	23	Auger drill	378.1	7.3	22.9	16.4	/	/	Pedersen (2007)
2008	Gossan Resources	26	Sonic drill	377.4	10.7	19.2	14.5	Yes	Yes	Cooke (2008), Cooke (2010)
2014	Canadian Premium Sand	2	Sonic drill	36.6	18.3	18.3	18.3	/	/	CPS (pers. comm., 2014)
2014	Canadian Premium Sand	3	Auger drill	23.7	5.5	9.1	9.1	/	/	CPS (pers. comm., 2014)

In 1981, Manitoba Energy and Mines conducted a drill program across the Wanipigow area in which they drilled 12 diamond drillholes. Only 2 of the 12 holes were drilled on the present-day CPS quarry leases (Table 6.1). Of these two holes, a 25 m Winnipeg Formation silica sand intersection was reported (hole ID M20-81) with a silica yield of up to 96% SiO_2. The gradation and whole-rock geochemical tests completed on the samples returned an 80% recovery of well-rounded silica sand with sand sizes ranging from 20 to 100 mesh. The processed Winnipeg Formation sand had a silica purity of 98.2%, which was upgraded to 99.8% after an acid wash (Puritch et al., 2014). Manitoba Energy and Mines returned to the drill site on the Property in 1989 to drill 7 additional drillholes with silica sand intersections of 18 m (Bamburak, 1996).

In 1992, 3 diamond drillholes were drilled on the Property by Manitoba Energy and Mines. The results obtained less than 10 m thick intersection of Winnipeg Formation sand. This was possibly the result of erosion of the overlying beds (Bamburak, 1996). To the best of the QPs knowledge, no other data is available for these holes.

In 2002, Claymore Kaolin Ltd. & Cando Contracting Ltd. conducted exploration work on the Wanipigow Property. The work consisted of drilling 2 vertical diamond drillholes (S-1 and S-2); of the 2 holes, only S-2 intersected silica sand with a thickness of 14.19 m that analyzed 95.2% SiO_2. Gradation size analysis concluded that 12.1% of the sand was 20/40 mesh and 78.8% of the sand was in the 40/140 mesh fraction (Chornoby, 2003).

Gossan Resources Limited (Gossan Resources) acquired 9 quarry leases on the Wanipigow Property in 2001. In 2004 the Company completed a reverse circulation (RC) drill program that completed 11 drillholes. Reportedly, there was significant contamination of samples because of using the RC drilling process in a sandy substrate (Pedersen, 2007). In 2005, Gossan Resources acquired the quarry leases previously owned by Claymore Kaolin Ltd. In 2006, Gossan Resources completed a 23-hole auger drill program on the property totalling 378.07 m (Pedersen, 2007). The goal of this program was to determine a more accurate extent of the deposit and to delineate the sub-surface stratigraphy. Whole-rock geochemical analytical work on samples acquired during the drill program resulted in an average of 94.31% SiO_2, 2.50% Al_2O_3, 0.67% Fe_2O_3, and 0.23% CaO (Pedersen, 2007).

In addition to geochemical work, a grain size analysis study on the Gossan samples provided average percentages of 9.7% of 20/40 fraction and 71.6% of 40/200 fraction (Pedersen, 2007). The size analysis was questionable at the time because of potential contamination using the auger drill. While the program did lead to a more in depth understanding of the deposit dimensions, the drilling method led to generally poor sample return with contamination.

In 2007, Gossan Resources conducted a trenching program with no significant results published (Cooke, 2008). In 2008, Gossan Resources conducted further drilling in a program that utilized a sonic drill rig and resulted in 26 drillholes totalling 377.41 m (Note: only 366.13 m were logged due to a loss of sample material). The sonic drill provided a better sample return than what was previously acquired using a RC or auger drill; even then, complications did happen during the project and subsequently only 7 of the 26 holes were fully drilled through the Winnipeg Formation and into the underlying Precambrian basement rock (Cooke, 2008). Analyses were carried out on the sonic drill samples in the following years (from 2009-2010) to further evaluate the proppant quality of the sand.

The Gossan 2008 drill program samples were separated by colour and averaged to delineate the purity of the sand by colour. Geochemical analysis on these sample splits resulted in assay results as presented in Table 6.2, in which the multi-coloured sand splits yielded similar silica results of between 93.46% SiO_2 (intermixed sand colours) and 94.75% SiO_2 (tan-coloured sand). The sand was also sent for attrition scrubbing and sieve analysis revealed that approximately 60-75% of the sand was in the 40/140 fraction size.

Table 6.2 Assay results of the 2008 sonic drill program (Cooke, 2008).

Sand Colour	Average SiO_2 (%)	Range (%)	Average Al_2O_3 (%)	Range (%)	Average Fe_2O_3 (%)	Range (%)
Brown	94.12	89.15-96.37	1.51	0.39-3.78	1.73	0.28-2.19
Orange	94.67	90.94-98.26	1.08	0.46-3.25	2.10	0.66-3.52
White	94.40	88.33-98.84	1.66	0.42-5.56	1.60	0.16-2.08
Intermixed	93.46	89.24-97.61	1.98	0.45-4.26	1.56	0.04-2.84
Tan	94.75	93.20-98.02	1.16	0.64-2.15	1.75	0.29-2.84

In 2010, Gossan Resources conducted a market study to assess the viability and cost of maintaining the property (World Industrial Minerals, 2010). The study concluded that the sand “*meets specifications, and appears suitable for the following markets: frac, fiberglass, recreation, metallurgical, construction, filtration and well pack.*”

In 2014, CPS (then Claim Post Resources Ltd.) drilled 5 drillholes at the Property. The program consisted of 3 auger drillholes and 2 sonic drillholes. The program was unsuccessful due to

1. The auger drill not being powerful enough to penetrate the Pleistocene glaciofluvial; and

2. The sonic drill yielding poor material recovery and not being able to drill deeper than approximately 10 m.

Due to the drilling problems encountered and a small exploration budget, the program was cancelled with no adequate sample being collected.

In 2018 and 2022 CPS drilled 110 sonic drill drillholes that are discussed in Section 10.

7 Geological Setting and Mineralization

7.1 Regional Geology

The regional bedrock geology of the Wanipigow Sand Project area comprises Ordovician sandstone of the Winnipeg Formation that unconformably overlies the Precambrian crystalline basement (Figure 7.1). The Winnipeg Formation is overlain regionally by the Red River Formation carbonate rocks. The Ordovician units collectively form part of the WCSB, which can be viewed as a wedge of Phanerozoic strata above Precambrian crystalline basement. The WCSB wedge tapers from a maximum thickness of about 6000 m in the axis of the Alberta Syncline (just east of the Rock Mountains foothills front in Alberta) to a zero-subcrop-edge to the northeast-east along the Canadian Shield (in parts of Alberta, Saskatchewan and Manitoba).

The Winnipeg Formation is an erosional isolated element of the eastern North America Cratonic platform succession deposited across the Transcontinental Arch; a northeast–southwest trending tectonic feature across the western midcontinent of North America that had a significant tectonic influence during the Phanerozoic (Osadetz and Haidl, 1989; Bezys and Conley,1996). The Winnipeg Formation was deposited in shallow marine seas during the Middle Ordovician (Bezys and Conley,1996), and therefore is manifested laterally as a flat lying to shallow westerly dipping unit of clastic sedimentary rocks.

Regionally, the Winnipeg Formation consists of a complex sequence of interbedded sand and shale, ranging in composition from >90% shale to >90% sandstone (Bezys and Conley,1996). Sandstone dominant, and more specifically, silica sand-rich intervals of the formation are known to crop out on the eastern and western shores of Lake Winnipeg and on several islands in the eastern part of Lake Winnipeg including Black, Punk, Little Punk and Deer islands (Watson, 1985; Lapenskie, 2016). The Winnipeg Formation represents the silica sand unit that is being targeted by CPS along with the overlying Quaternary surficial material, which includes reworked Winnipeg Formation sandstone.

Geological descriptions of the Precambrian Basement, the Ordovician Winnipeg Red River formations, and the Quaternary surficial deposits are described in a regional perspective in the text below.

7.1.1 Precambrian Basement

The Precambrian crystalline basement is the lowermost geological unit in the project area (Figure 7.1). The basement rocks form part of the Archean Superior Province and may mark the Mesoarchean western margin of the North Caribou terrane, which is one of the largest blocks of Mesoarchean crust in the Superior Province (Percival et al., 2001).

While the regional basement geology is partially obscured by the Ordovician sedimentary rocks and Quaternary surficial deposits – especially in the Property area – the regionally underlying Archean rock assemblages include from north to south: North

Caribou Terrane biotite granodiorite (ca. 2.715 Ga); layered quartz diorite-diorite; Hole River arkose and conglomerate (ca. <2.706 Ga); and Rice Lake Belt greywacke and basalt (Percival et al., 2001). The East Shore Plutonic Complex contains a 1-2 km wide body of homogeneous hornblende-biotite tonalite that underlies the east shore of Lake Winnipeg and eastern islands (Figure 7.1). The pluton grades eastward into layered tonalite, quartz diorite, diorite and sheets of gabbro. Gabbroic sills minor serpentinite schist occurs sporadically within the tonalite within and near the Property.

The sedimentary-volcanic Lewis-Storey assemblage unconformably overlies the tonalitic basement along the eastern side of Lake Winnipeg. The assemblage includes arkosic grit overlain by quartzite, talc-serpentine schist, komatiite and banded iron formation. These are in turn overlain by lower greenschist-facies volcanic and volcaniclastic rocks of the Black Island assemblage (Bailes and Percival, 2000). A poorly preserved sedimentary-volcanic sequence occurs along the southern margin of tonalite in the Wanipigow River area.

Tectonic reconstruction of major lithotectonic domains is hindered by structural complexity and the general lack of exposure. The east trending Seymourville shear zone runs along the northern edge of the Property (Figure 7.1) and marks the southern limit of the Hole River sedimentary sequence.

A set of northwest-trending high-strain zones converge into this area, corelate with the Lewis-Storey assemblage and may bound structural domains (Percival et al., 2001). The Wanipigow Fault occurs east of the Property and separates tonalite to the north from metagreywacke to the south (Figure 7.1; Weber, 1991).

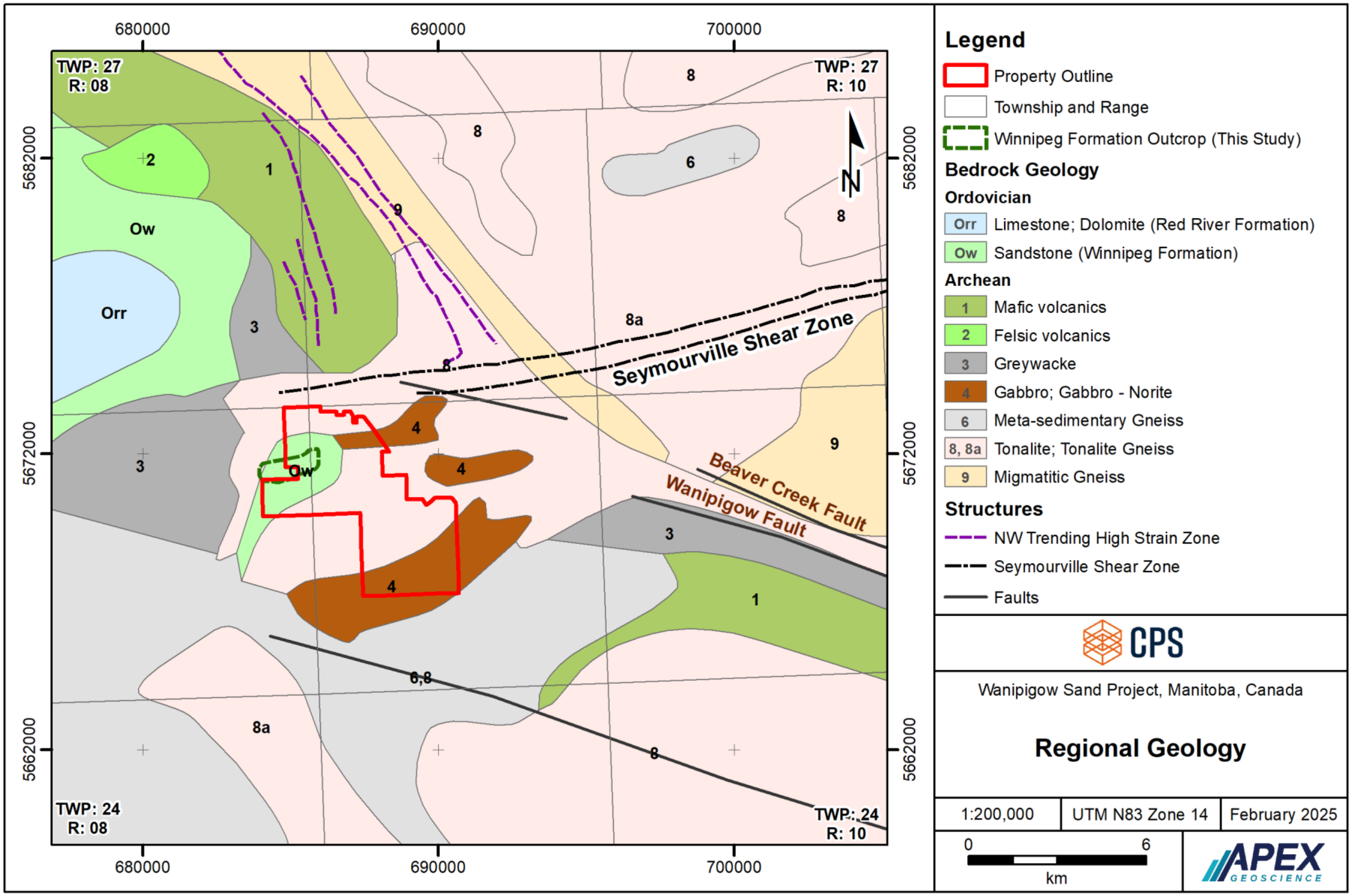
7.1.2 Ordovician Winnipeg Formation

The Winnipeg Formation unconformably overlies the Precambrian basement in the project area. The Formation ranges in thickness from 0-60 m and consists of interlayered sand and shale that were deposited in a shallow marine sea during the Middle Ordovician. Bezys and Conley (1996) describe the sands of the Winnipeg Formation as mostly poorly consolidated, medium grained, mature, well rounded, and quartzose. The Winnipeg Formation shale is mostly light olive-grey, kaolinitic, with variable sand and silt content.

The Winnipeg Formation can be sub-divided into the Black Island and the Iceberg members (Figure 7.2). The Black Island member is the lower stratigraphic member and consists of a thin basal sandstone overlain by interbedded sand and shale. Some shale zones of the Black Island Member contain pyritic, phosphatic, and/or limonitic concretions and ooids (Bezys and Conley, 1996).

The Iceberg Member is the upper stratigraphic member of the Winnipeg Formation and is considered a transitional zone between the Winnipeg Formation and the overlying Red River Formation (Bezys and Conley, 1996). The Iceberg Member is composed of grey and red shale and argillaceous sandstone.

Figure 7.1 Generalized bedrock geology in the Wanipigow Sand Project area.



7.1.3 Ordovician Red River Formation

The Red River Formation overlies the Winnipeg Formation with the Dog Head Member representing the lowermost subunit. It consists of carbonate dolostone and limestone. A transitional zone between the Winnipeg Formation and the Red River Formation is occasionally observed in the basal Red River Formation as strata containing argillaceous interbeds of Winnipeg-like lithology (Bezys and Conley, 1996). The Red River Formation is present on Black Island but does not occur within the Wanipigow Property.

7.1.4 Quaternary/Pleistocene Surficial Deposits

The northern and southern parts of the Property are dominated by Ordovician Winnipeg Formation bedrock and Quaternary surficial deposits, respectively (Figure 7.3). The QP has used Manitoba's Surficial Geology Compilation Map Series to make regional observations of Quaternary material in the general Property area (Matile and Keller, 2004a,b).

The Wanipigow Property is near major southern Manitoba landforms that include the Precambrian Shield, Birds Hill-Belair moraine and the northeast limit of carbonate glacial debris. In the Precambrian Shield region, Quaternary sediments can be quite thick, but discontinuous, and rarely completely infill bedrock lows.

In the Property area, the glacial advance was generally from the northeast and the glacial material such as glaciofluvial deposits are typically sand rich. The Interlake region of Manitoba is dominated by streamlined landforms in the lower areas and glacial retreat occurred in a series of steps marked by moraines such as the Birds Hill-Belair moraine, which extends 100 km from the Red River lowland northward to the eastern shore of Lake Winnipeg (Burt, 2002).

Glacial striations on Precambrian outcrops near the Property show the dominant direction of ice flow is east-northeast flowing to west-southwest (Matile and Keller, 2004a,b). Dominate surficial deposits in the Property area include:

- Offshore glaciolacustrine sediments composed of clay, silt and sand. These deposits are commonly 1 to 20 m thick and form low relief, massive and laminated deposits. The sediments were deposited from suspended offshore, deep water of glacial lake Agassiz, and were commonly scoured and homogenized by icebergs.

- Marginal glaciofluvial sediments of sand and gravel. The deposits are 1-20 m thick and form ridges, spits, bars, and littoral sand and gravel. Typically, these deposits were formed by wave action at the margin of glacial Lake Agassiz. Marginal glaciolacustrine are also evident.

Less prominent, sporadic surficial material includes organic deposits (peat and muck) that accumulated in in low relief wetland areas (fen, bog, swamp and marsh). Diamicton deposits, or till, occur as clay-rich subglacial deposits in low-relief areas.

Figure 7.2 Stratigraphic section examples for the Winnipeg Formation in the Wanipigow Sand Project area. The far right (C) section was constructed during the preparation of this technical report and its nomenclature is used throughout the report.

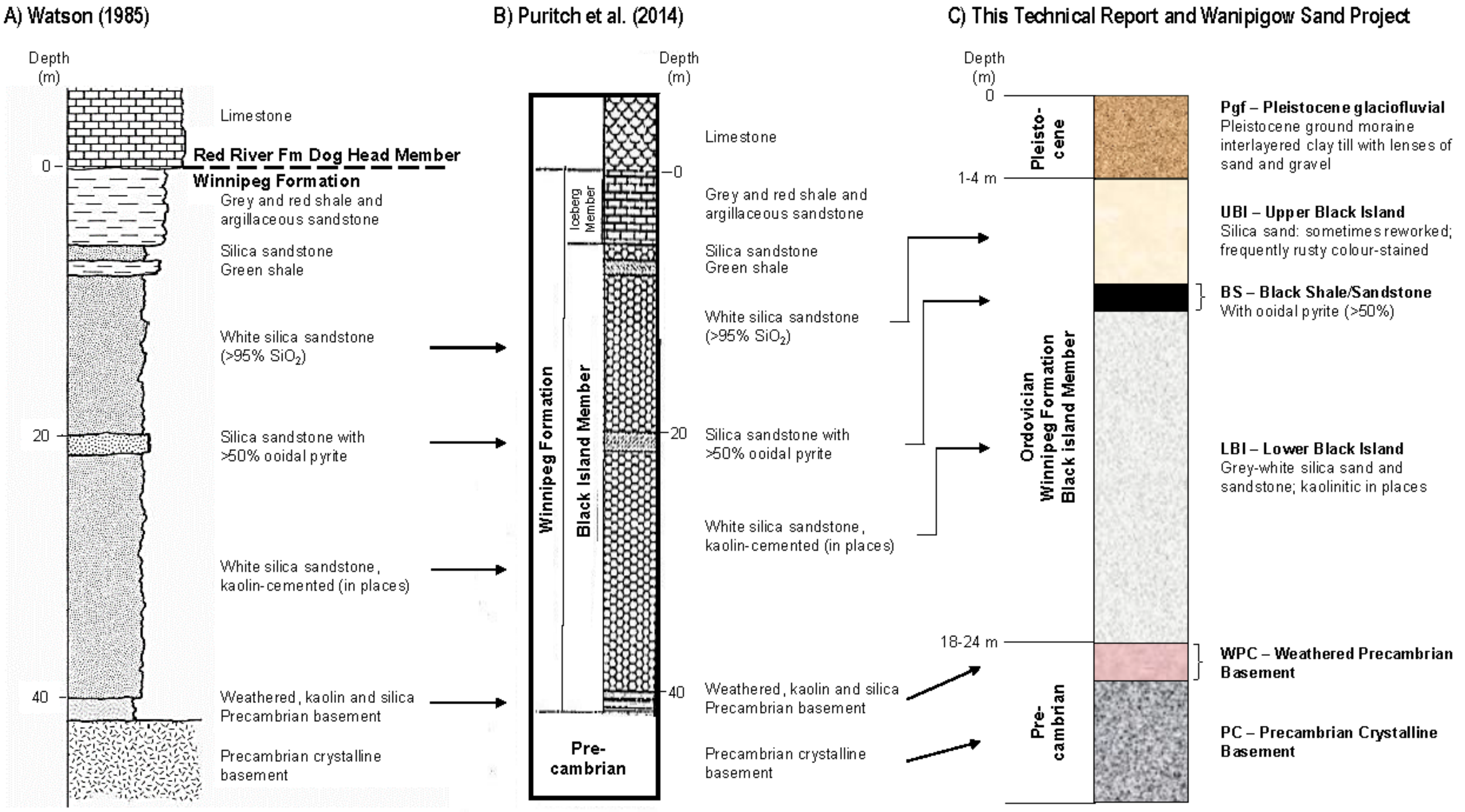
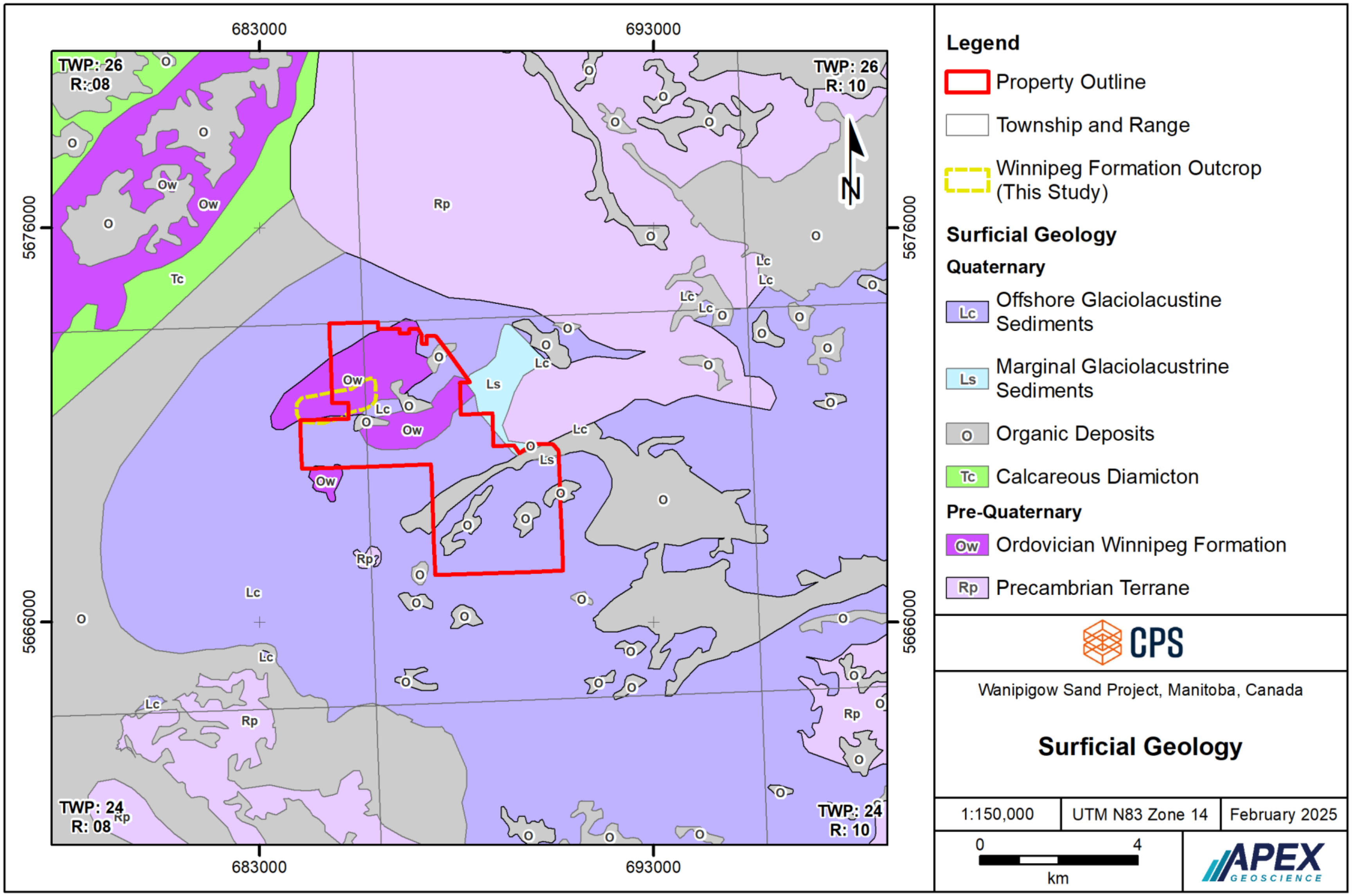


Figure 7.3 Quaternary surficial deposits in the Wanipigow Sand Project area.



7.2 Property Geology

The Winnipeg Formation unconformably overlies the Precambrian crystalline basement and crops out in the eastern part of the Wanipigow Property (Figure 7.1 and 7.3). All CPS 2018 drillholes (n=93) were drilled through the entire Winnipeg Formation sedimentary rock package and penetrated downward into the uppermost basement surface. Hence, the crystalline basement rocks form the basal surface of Wanipigow Sand Project's geological model. In drill core, the Precambrian basement is manifested as dominantly crystalline mafic volcanic and intrusive rocks that become increasingly weathered, kaolinitic and silica-enriched at the basement rocks uppermost contact with the Winnipeg Formation.

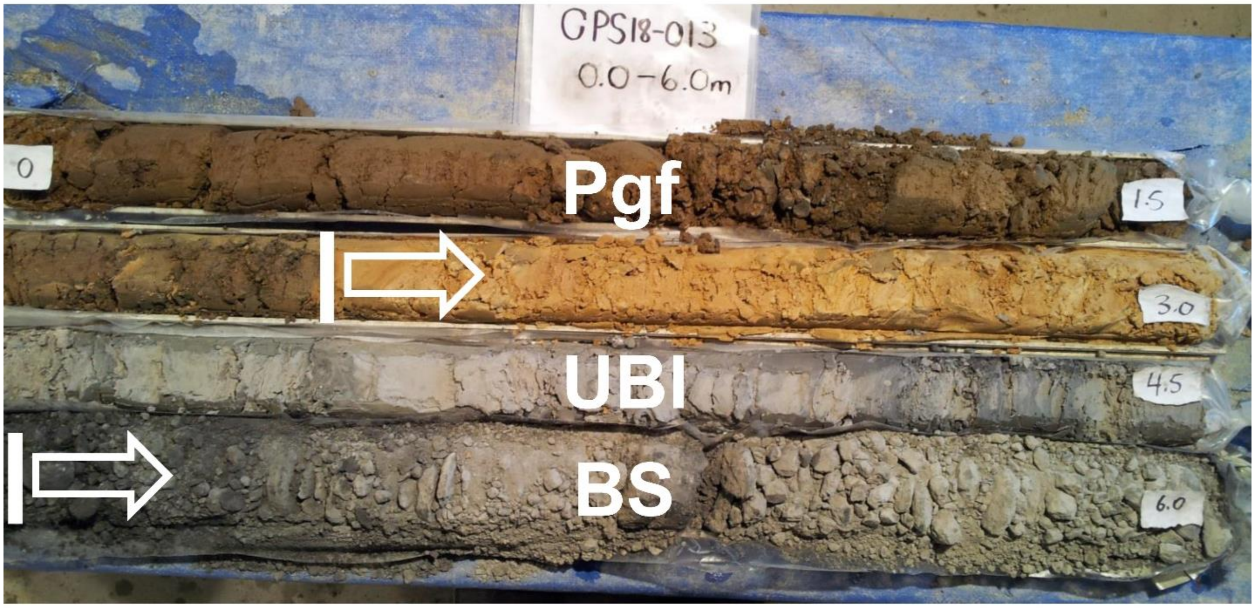
Drilling to the Precambrian basement allowed the QP to assess the entire Winnipeg Formation as it exists at the Property. Based on drill logs, lithological observations and grain size particle distributions, this current study subdivides the Winnipeg Formation into four distinguishable subunits that are presented in Figure7.2 and include from bottom to top: Lower Black Island; Black Shale; Upper Black Island; and Pleistocene glaciofluvial.

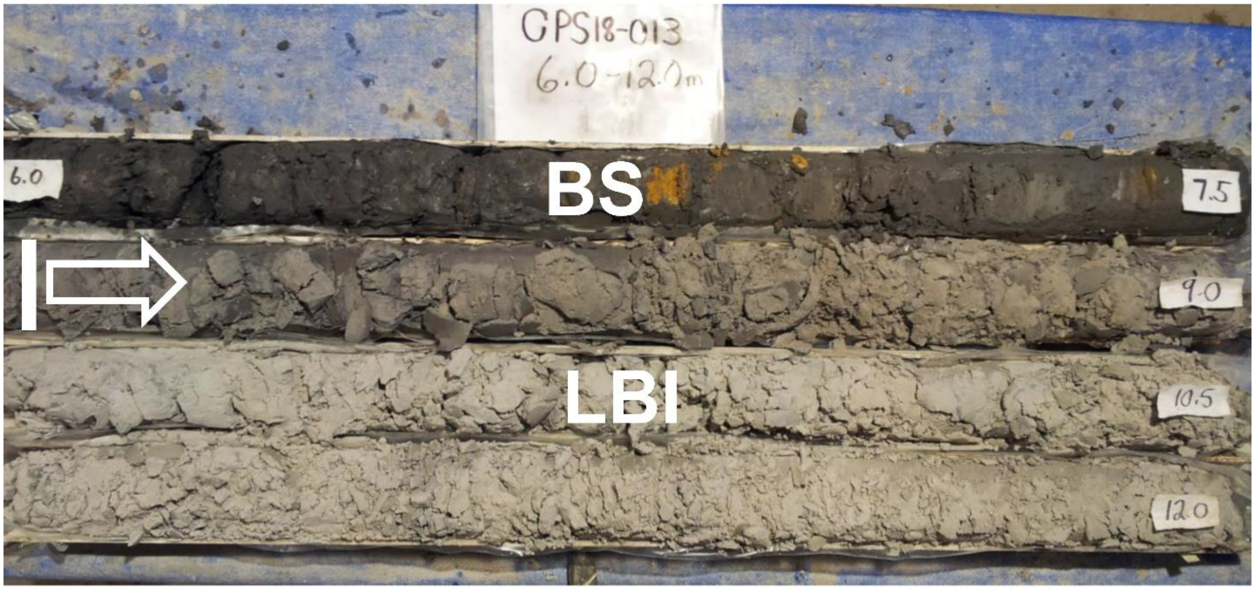
The units – as they exist at the Property – are described in the text that follows and shown in core photographs in Figure 7.4.

Lower Black Island (LBI): The basal subunit of the Winnipeg Formation is characterized by grey-white silica sand with minor kaolinite cement (Figure 7.4). The LBI was intersected in 45 drillholes (or 48% of the 2018 drillholes; see Section 10, Drilling). The thickest LBI intersections were up to 15.9 m and average approximately 7.9 m when present. As the LBI nears its contact with the overlying Black shale/sandstone unit, some orange-coloured staining is occasionally observed (especially if exposed at surface like on Black Island off property). This is most likely due to iron oxidation in the BS leaking into the surrounding units. The staining has been documented to be removed easily with scrubbing processes. The top of the LBI represents the most distinguishable and best understood contact in the Wanipigow Property subsurface.

Black Shale/Sandstone (BS): The BS shale/sandstone overlies LBI and is characterized by a thin layer of black shale that periodically comprises ooidal pyrite. The shale is often intermixed with sandstone and siltstone, which is stained black and therefore distinguishable from the underlying and overlying LBI and UBI (Figure 7.4). The BS unit occurs in the western part of the Property and resource area drilling showed that the BS pinches out completely in the east part of the Property. The BS was intersected in 14 drillholes (or 15% of the 2018 drillholes; see Section 10, Drilling). The thickest BS intersections were up to 3.5 m and average approximately 2.0 m when present.

Figure 7.4. Core photos illustrating the Lower Black Island (LBI), Black Shale (BS), Upper Black Island (UBI) and Pleistocene glaciofluvial (Pgf) subunits used in this technical report. From drillhole CPS18-013. Units in metres.





Upper Black Island (UBI): An upper Winnipeg Formation subunit (UBI) overlies the BS and is characterized by a white to rust-coloured/stained silica sand (Figure 7.4). Staining is likely related to the pyritic black shale underlying the UBI. Like the BS, the UBI is also best represented in the western part of the Property. The UBI crops out in the far western portion of the Property and pinches out eastward. The UBI was intersected in 22 drillholes (or 24% of the 2018 drillholes; see Section 10, Drilling). The thickest UBI intersections are up to 19.0 m and average approximately 4.6 m when present.

Pleistocene glaciofluvial (Pgf): Sand and gravel surficial deposits are more-or-less ubiquitous at the Property; only 7 drillholes, or 8% of the 2018 drillholes, did not intersect Quaternary material. The maximum thickness of the Pleistocene glaciofluvial is 24 m and averages approximately 10.7 m when present. At the Property scale, the Pgf is characterized by ground moraine till material comprised mainly of interlayered clay with lenses of sand and gravel. In places, the Pgf includes intercalated and/or lenses of reworked UBI, and black clay till with pebbles and cobbles to distinguish from mudstone. The Pgf overlies UBI in the eastern part of the Property. As the BS and UBI units pinch out in the central and western parts of the Property, the Pgf takes over and directly overlies LBI in the western Property.

The Red River Formation, which stratigraphically overlies the Winnipeg Formation, does not appear within the Property.

7.3 Mineralization

On behalf of CPS, Puritch et al. (2014) demonstrated the quartz-rich nature of the sand in that 255 sand samples from the Wanipigow Property had a mean silica value of 94.2% SiO_2. It is important to note that there was no differentiation between the LBI and UBI in this work, and hence the silica value is not representative of the LBI unit *stricto sensu*.

During 2021, CPS collected and geochemically analyzed a series of 10 composite LBI samples from the 6 drillholes that occur within the main glass sand resource area (see Section 9.2 Geochemical Study). The LBI sand in the main glass resource area had high SiO_2 values of between 96 and 99 wt. % SiO_2 with mean values of 98 wt. % SiO_2. In comparison, LBI samples on the west margin of the main glass sand resource area, which are partially ‘contaminated’ with UBI sand, had lower silica and higher iron. Hence, and from a geochemical perspective, the clean portions of LBI sand represent the mineralized portion of the Wanipigow silica sand deposit with respect to glass sand potential.

Analytical work conducted during CPS’s 2018 drill program focused on the particle grain size distribution of the sand as an advanced approach to model and evaluate the proppant resource potential of the deposit. The analysis shows the Wanipigow Sand Project yields particle gradation sizes that show:

- The Lower Black Island subunit comprises the highest mean percentages of 20-mesh to 70-mesh sand.

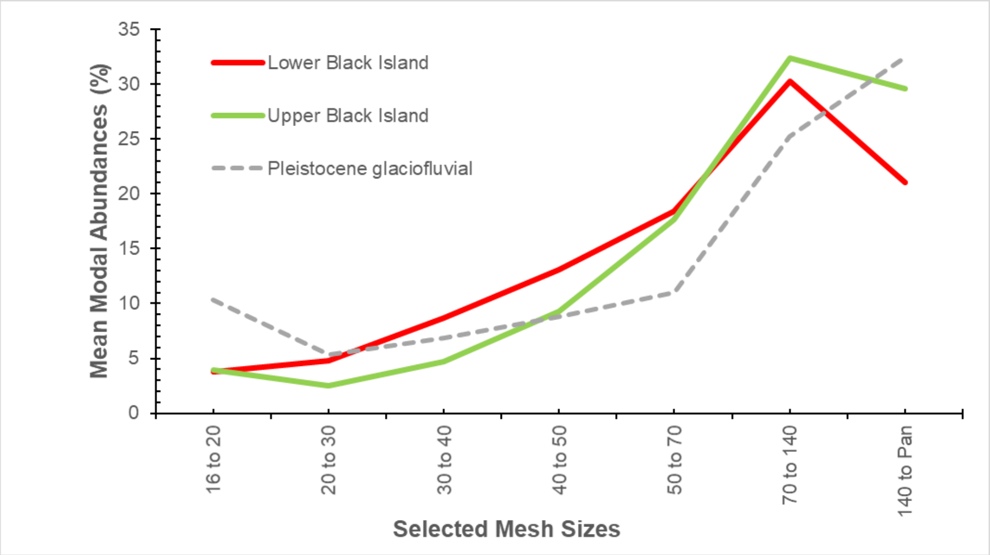
- The overlying Upper Black Island sand has the highest modal abundances of 70/140 fraction sand.

- The Pleistocene glaciofluvial has the highest amount of fine (140- and 200-mesh sand and Pan or -200 mesh sand; Table 7.1; Figure 7.5).

Table 7.1 Gradational summary of the of the Lower Black Island, Upper Black Island and Pleistocene glaciofluvial subunits.

Mesh size	Lower Black Island (mean %; n=236)	Upper Black Island (mean %; n=57)	Pleistocene glaciofluvial (mean %; n=451)
16 to 20	3.76	3.98	10.31
20 to 30	4.80	2.51	5.37
30 to 40	8.68	4.72	6.84
40 to 50	13.06	9.25	8.82
50 to 70	18.43	17.61	11.03
70 to 140	30.26	32.33	25.21
140 to Pan	21.01	29.60	32.43

Figure 7.5. Mean modal abundance of selected gradation sizes for Lower Black Island, Upper Black Island and Pleistocene glaciofluvial samples.



8 Deposit Types

8.1 Silica Sand

The best deposits of silica sand are characterized by super-mature marine shoreline sandstone deposits that have a long history of reworking, were never deeply buried, and underwent minimal diagenesis (or diagenesis that reduced or removed cements; Winfree, 1983; Dott et al., 1986; Dott, 2003). The depositional environment and factors to increase mineralogical maturity must include multiple cycles of mechanical reworking that enhance roundness, sphericity, and sorting of grains (Benson and Wilson, 2015). The most prospective settings for the accumulation of mineralogical and mechanically competent silica sand, therefore, occur in marine shoreline, marine shoreface, marine intertidal and deltaic settings, and coastal aeolian environments (e.g., Winfree, 1983; Dott et al., 1986; Dott, 2003).

The Wanipigow Sand Project fits into this category. The Ordovician Winnipeg Formation contains the largest deposits of silica sand in Manitoba (Watson, 1985). The sand is distinguished from all other sediments in the Williston Basin portion of the WCSB due to its high-silica content, well-rounded shape and loosely kaolinitic cementation.

With respect to the geological model that shaped the Wanipigow deposit, the Williston Basin is a large intracratonic sedimentary basin in eastern Montana, western North Dakota, South Dakota, and southern Saskatchewan and Manitoba. The Winnipeg Formation represents the initial Williston Basin clastic sedimentary deposits because of a Late Ordovician transgression that influenced most of the North American craton. Based on the Shield proximal setting and composition and texture of the Wanipigow silica sand, it is apparent that the Wanipigow Black Island Member sand represents a mature marine shoreline sandstone deposit with a long history of reworking, was never deeply buried, and underwent minimal diagenesis.

8.2 Glass Sand

Silica sand is the major raw material for almost all common commercial glasses, comprising 60% to 70% of the furnace batch (e.g., McLaws, 1971, Valchev et al., 2011). Because sand forms such a large component of the batch, its chemical quality is of paramount importance.

The quality of sand required for glass manufacturing depends largely on the type of glass made. For better grades of glass, the sand must have an extremely high silica content (99% or higher) and be essentially free of inclusions, coatings, stains, or accessory detrital heavy minerals. The quality must be guaranteed by the supplier, and the uniformity must be maintained.

Glass is divided into type based on its chemical composition. Soda-lime glass, lead glass and borosilicate glass represent the most common type of produced glass. However, as technology improves, the ability to manufacture glass with ultra high silica and ultra low iron has created significant interest in the solar application industry and to reduce energy usage. A summary of the most common glass types is provided as follows.

- Soda-lime glass, also known as soda-lime-silica glass (or window glass or architectural glass), is the most common and least expensive type of glass and is commonly used in windows (flat glass) and household glass containers (container glass). A typical composition of this glass is 70–75 wt. % SiO_2, 12–16 wt. % of Na_2O, and 10–15 wt. % CaO (Bauccio, 1994; Pfaender, 1996). The soda lowers the temperature at which the silica melts, while the lime stabilizes the silica. Flat glass has a higher magnesium oxide and sodium oxide content than container glass, and a lower silica, calcium oxide, and aluminium oxide content. Soda-lime accounts for 90% of glass manufactured.

- Lead glass, also called lead-oxide glass or lead crystal, is like soda-lime glass where lime is replaced by a larger part of lead oxide (PbO). Lead glass typically contains 55–65 wt. % SiO_2, 18–38 wt. % of PbO, and 13–15 wt. % Na_2O or K_2O (Bauccio, 1994; Pfaender, 1996). It has also been called flint glass since the original formula from the 1600s used calcined flint as a source of silica (flint is no longer used). It is a softer glass than soda-lime, making it easier to cut into designs that show off its high refractive index. It cannot withstand high temperatures or sudden changes in temperature. It is commonly used for decorative glass dishware and optical glasses because of its refractive index.

- Borosilicate glass contains substantial amounts of silica (SiO_2) and boron oxide (B_2O_3>8%) as glass network formers and is typically composed of 70–80 wt. % SiO_2, 7–13 wt. % of B_2O_3 4–8 wt. % Na_2O or K_2O, and 2–8 wt. % of Al_2O_3 (Bauccio, 1994; Pfaender, 1996). Durable and heat resistant, borosilicate glass is the material of choice for a wide range of applications, from cookware to laboratory use including test tubes, rods, beakers, graduated cylinders, pipettes, etc.

- Aluminosilicate glass is prepared from a ternary system with a typical composition 52–58 wt% SiO_2, 15–25 w. t% of Al_2O_3, and 4–18 wt. % CaO (Bauccio, 1994). It has comparable properties to borosilicate glass but is more heat resistant, tolerating temperatures up to 800º Celsius, and has a better chemical resistance. Aluminosilicate glass is commonly used for touch displays, such as smartphone screens, and for solar cells cover glass and laminated safety glass.

- High silica glass is composed of 95 to 99% silica making it extremely hard to melt, with a deformation temperature as high as 1,700° C. High silica glass has a very low thermal expansion, very good chemical durability, optical properties, and mechanical properties, but the extremely high processing temperatures is a limiting factor in the production and application on a larger scale. As technology improves, the ability to reach a greater purity of high silica glass has improved, making it possible to fabricate higher and higher qualities of glass.

- Low-iron glass, also known as optically clear glass, uses high quality grades of silica sand that are virtually free of iron oxide. This results in a transparent, high clarity glass that has higher transmission characteristics compared to normal soda lime glass. Maximizing light transmittance is important in solar applications where low-iron glass can improve solar performance, optimize energy usage, and reduce the reliance on artificial lighting. Light transmission levels are typically >90% with low-iron glass. Even higher transmission (up to 95% total transmission) can be achieved by specifying an anti-reflective thin film coating. However, there is no ASTM specification for low-iron glass, and clarity levels can vary widely based on the levels of iron in the manufacturer's formula.

- Photovoltaic glass (PV glass) is a technology that enables the conversion of light into electricity. To do so, the glass incorporates transparent semiconductor-based photovoltaic cells, which are also known as solar cells. The PV cells are protected by PV glass with high transmittance of light and sometimes sandwiched between two sheets of PV glass.

- Specialty glass relies on high-tech research that has generated new and profitable products. Numerous products are considered specialty glass such as tableware, fibre optics, flat panel display glass, scientific and medical equipment, light bulbs, and special impediment windows. The outlook for specialty glass is evolving rapidly in that the most profitable products today did not exist a decade ago.

8.3 Exploration Concepts and Standards

Geological models and concepts applied in the investigation of silica sand in southeastern Manitoba generally involve delineation of areas underlain by prospective rock units (i.e., Ordovician Winnipeg Formation), drilling or trenching to determine potential deposit dimensions and to obtain representative sample material for evaluation, and physical and chemical parameter testing of the sand unit to determine its quality and potential for petro hydraulic fracturing and/or applications glass manufacturing.

The suitability of silica sand for glass manufacturing is determined by the quality of the sand in terms of:

- Chemical analysis: The grade is determined by the impurities content of the quartz sand in the ground.

- Color: Very low iron content results in naturally white quartz sands that are preferred for some industrial applications.

- Grain size distribution: Normally unprocessed sand may be suitable for a limited range of applications. Washing and sizing considerably increases the possible product range.

There is no current standard, or industry-wide specifications, for the quality of silica sand with respect to glass manufacturing. The chemical composition of the sand is critical with higher classifications of glass sand corresponding to higher levels of silica expressed as SiO_2. The 3 main chemical contaminates in silica sand are usually the iron content, expressed as Fe_2O_3, the alumina content expressed as Al_2O_3, and titanium expressed as TiO_2.

The 1988 British Standard BS2975 includes recommended compositional limits of silica (SiO_2), iron (Fe_2O_3), aluminum (Al_2O_3) and chromium (Cr_2O_3) of glass sand for specified grades of glass (Table 8.1). The general chemical specifications for different uses of silica sand are presented in Table 8.2.

In the production of standard glass, there is both the need and requirement for silica to be chemically pure (composed of over 98% SiO_2), of the appropriate diameter (a grain size of between 0.075 mm and 1.18 mm), and color (must contain between 0.025% and 0.04% Fe_2O_3).

Specialty glass can require even higher silica (over 98% SiO_2) together with low iron silica sand. Ultra-clear PV glass, or ultra clear rolled glass, is used mainly as sealing glass of solar cells and is an indispensable part of photovoltaic solar cells (solar photovoltaic and photo-thermal transformation systems) due to its high sun light transmittance, low absorption rate, low reflectivity, and low iron content. One company, XINYI Solar Holdings Limited, lists the glass sand iron requirements for ultra-clear glass of ≤120 ppm (≤0.012%) Fe_2O_3 (XINYI Solar Holdings Limited, 2021).

In contrast, coloured container glass can have high iron (e.g., up to 0.25% Fe_2O_3). These requirements are extremely specific and technical, and variations in these elements help dictate the specific glass application for the sand (e.g., Table 8.1).

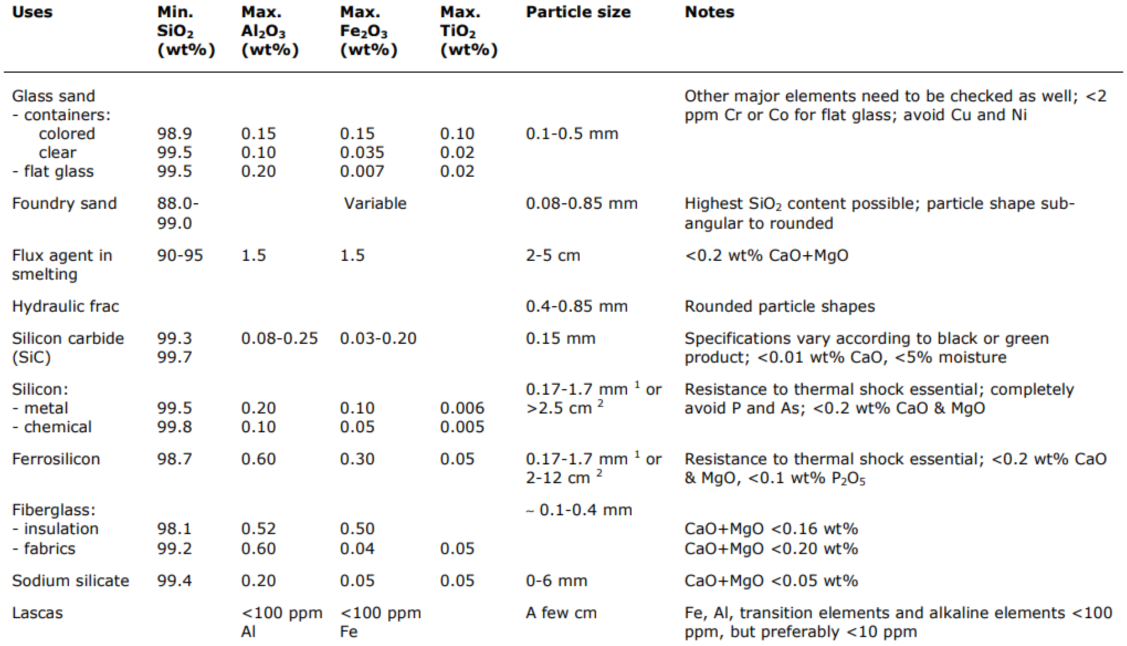
There are also limitations on alkalis, colourants, and refractory minerals. Flat glass, for example, typically has <2 ppm Cr or Co and little to no Cu and Ni. Mineralogical parameters that can negatively affect glass manufacturing include, for example, 1) titanium and chromium minerals that may melt if the grains are fine enough and could colour the glass, 2) larger grains of refractory minerals (e.g., chromite, rutile) may not melt and cause flaws in the glass that could lead to fractures, and 3) aluminum, magnesium, calcium, and alkalis (sodium, potassium) can affect the melting properties and should be kept at consistent levels.

Grain size and grading is another important requirement by the glass manufacturers. Finer grains are more likely to carry iron oxide and refractory mineral grains, while larger grains will melt slower than smaller grains and may remain un-melted causing inclusions in the final product. British Standard (1988) recommendations for size grading of glass-making sands are presented in Table 8.3.

Table 8.1 Chemical specifications of selected optical glass products. Sources: Johnson (1961), British Standards (1988), and Verburg (2020).

Source	Glass product	Grade/ quality	Minimum SiO_2 (%)	Maximum Fe_2O_3 (%)	Maximum Al_2O_3 (%)	Maximum Cr_2O_3 (%)	Maximum CaO+MgO (%)	Maximum TiO_2 (%)	Maximum NaCl (%)
British Standard (1988)	Optical	A	99.7	0.013	0.2	0.00015	/	/	/
	Tableware	B	99.6 (± 0.1)	0.010	0.2 (± 0.1)	0.0002	/	/	/
	Borosilicate	C	99.6 (± 0.1)	0.010	0.2 (± 0.1)	0.0002	/	/	/
	Colourless container	D	99.8 (± 0.2)	0.03 (± 0.003)	nominal (± 0.1)	0.0005	/	/	/
	Flat	E	99.0 (± 0.2)	0.1 (± 0.005)	0.5 (± 0.15)	/	/	/	/
	Coloured container	F	97.0 (± 0.3)	0.25 (± 0.03)	nominal (± 0.1)	/	/	/	/
	Insulating fibres	G	94.5 (± 0.5)	0.3 (± 0.06)	3.0 (± 0.05)	/	/	/	/
Verburg	Photovoltaic	/	>99.3	<0.01	<0.2%	/	/	/	/
(2020)	Specialty	/	>99.0	<0.008	<0.5%	/	<0.5%	<0.05%	<0.05%
Johnson (1961)	Optical	1	99.8	0.1	0.020	/	0.1	/	/
	Flint, tableware	2	98.5	0.5	0.035	/	0.2	/	/
	Flint, tableware	3	95.0	4.0	0.035	/	0.5	/	/
	Sheet and rolled	4	98.5	0.5	0.060	/	0.5	/	/
	/	5	95.0	4.0	0.060	/	0.5	/	/
	Green and window	6	98.0	0.5	0.300	/	0.5	/	/
	Green	7	95.0	4.0	0.300	/	0.5	/	/
	Amber	8	98.0	0.5	1.000	/	0.5	/	/
	Amber	9	95.0	4.0	1.000	/	0.5	/	/

Table 8.2 General specifications for different uses of silica. Source: Sidex (2021).



Uses	Min. SiO_2 (wt%)	Max. Al_2O_3 (wt%)	Max. Fe_2O_3 (wt%)	Max. TiO_2 (wt%)	Particle size	Notes
Glass sand						Other major elements need to be checked as well; <2 ppm Cr or Co for flat glass; avoid Cu and Ni
- containers:						
colored	98.9	0.15	0.15	0.10	0.1-0.5 mm	
clear	99.5	0.10	0.035	0.02		
- flat glass	99.5	0.20	0.007	0.02		
Foundry sand	88.0-99.0		Variable		0.08-0.85 mm	Highest SiO_2 content possible; particle shape sub-angular to rounded
Flux agent in smelting	90-95	1.5	1.5		2-5 cm	<0.2 wt% CaO+MgO
Hydraulic frac					0.4-0.85 mm	Rounded particle shapes
Silicon carbide (SiC)	99.3 99.7	0.08-0.25	0.03-0.20		0.15 mm	Specifications vary according to black or green product; <0.01 wt% CaO, <5% moisture
Silicon:					0.17-1.7 mm ^{1} or >2.5 cm ^{2}	Resistance to thermal shock essential; completely avoid P and As; <0.2 wt% CaO & MgO
- metal	99.5	0.20	0.10	0.006		
- chemical	99.8	0.10	0.05	0.005		
Ferrosilicon	98.7	0.60	0.30	0.05	0.17-1.7 mm ^{1} or 2-12 cm ^{2}	Resistance to thermal shock essential; <0.2 wt% CaO & MgO, <0.1 wt% P_2O_5
Fiberglass:					~ 0.1-0.4 mm	
- insulation	98.1	0.52	0.50			CaO+MgO <0.16 wt%
- fabrics	99.2	0.60	0.04	0.05		CaO+MgO <0.20 wt%
Sodium silicate	99.4	0.20	0.05	0.05	0-6 mm	CaO+MgO <0.05 wt%
Lascas		<100 ppm Al	<100 ppm Fe		A few cm	Fe, Al, transition elements and alkaline elements <100 ppm, but preferably <10 ppm

Table 8.3 Recommended particle size distribution and moisture content of glass-making sands. Source: British Standard (1988).

Glass product Grade	Optical A	Tableware B	Boro-silicate C	Colourless container D	Flat E	Coloured container F	Insulating fibres G
Particle size distribution. Retained on sieve nominal aperature 1.00 mm (18 mesh) [1]	—	Nil	Nil	Nil	Nil	Nil	—
Particle size distribution. Retained on sieve nominal aperature 0.71 mm (25 mesh)	—	0.25 max.	0.25 max.	0.25 max.	0.25 max.	0.25 max.	—
Particle size distribution. Retained on sieve nominal aperature 0.50 mm (35 mesh)	—	5 max.	5 max.	5 max.	5 max.	5 max.	Nil
Particle size distribution. Retained on sieve nominal aperature 0.355 mm (45 mesh)	Nil	—	—	—	—	—	—
Particle size distribution. Retained on sieve nominal aperature 0.25 mm (60 mesh)	15 max.	—	—	—	—	—	20 max.
Particle size distribution. Retained on sieve nominal aperature 0.125 mm (120 mesh)	5 max.	5 max.	13 max.	5 max.	5 max.	5 max.	—
Particle size distribution. Retained on sieve nominal aperature 0.90 mm (170 mesh)	—	Nil	Nil	Nil	Nil	Nil	—

[1] Sieve sizes adapted to US Mesh sizes used in this Technical Report

9 Exploration

CPS's 2018 and 2022 drill programs are discussed in Section 10. Geological sample preparation, analyses, and security is discussed in Section 11. Sand beneficiation testing and glass melt and anti-reflective solar coating test work results are discussed in Section 13.

9.1 Lower Black Island Sand Stratigraphy

Based on the review of all CPS drill logs and core photos, the QP prepared a 3D geological model of the subsurface geology at the Wanipigow Sand Project. The focus of this technical report is on those areas of continuous LBI sand within the Wanipigow Sand Project, which have been modelled as the Wanipigow LBI sand domain (see Section 14).

Geological cross-sections of one of the glass sand resource areas evaluated in this report are presented in Figure 9.1 (East-West) and Figure 9.2 (North-South). The sections include the LBI sand lower contact with the underlying Precambrian basement, top LBI contact with the overlying Upper Black Island sand and glaciofluvial material, and the gradation results for the 20/140 sand fraction.

The sections demonstrate the lateral and vertical continuity of the LBI sand within portions of the Wanipigow Property's LBI sand domain. I.e., within the selected glass sand resource area, which is situated in the northern part of the Property and was the focus of CPS's initial mineral resource report (Eccles and Hough, 2021).

The gradation profiles show the LBI and UBI have similar amounts of sand within the 20/140 fraction.

9.2 Geochemical Study in the Main Glass Sand Resource Area

In conjunction with the QPs stratigraphic review, the QP collected a total of 18 LBI sand samples from within the Wanipigow Property for whole-rock and trace-element geochemical analysis. The sand was collected as composite samples that were divided based on physical and textural variations of the LBI sand as imaged in the Figure 9.3 photo.

The samples presented in Table 9.1 consist of composite LBI samples from drillhole cores that occur within the mineral resource areas depicted in this technical report (n=14 analyses) versus those samples from drillholes that occur outside of the resource areas (n=4 analyses).

The LBI sand samples were sent to the SRC for whole-rock analysis by ICP Total Digestion, SiO_2 by ICP whole rock assay, and trace-elements by ICP-MS Total Digestion. The bulk composite samples were first sieved, and the analytical work was completed on the >125 um and <710 um size fraction (20/120 mesh fraction).

Figure 9.1 East-west cross-section across the main glass sand resource area.

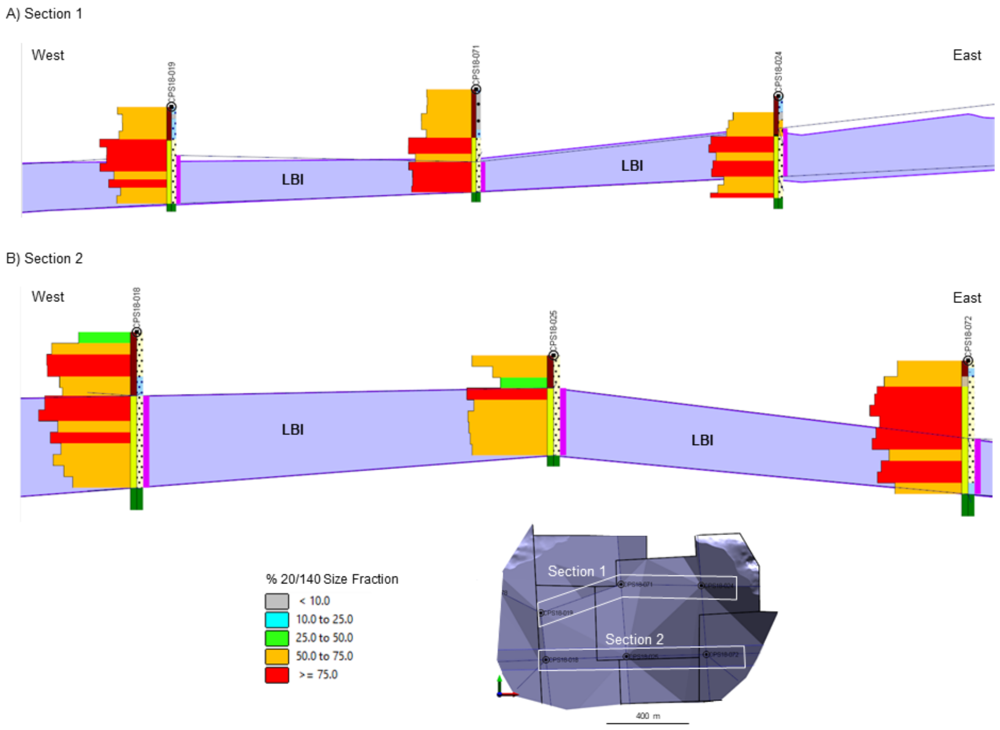


Figure 9.2 North-south cross-section across the main glass sand resource area.

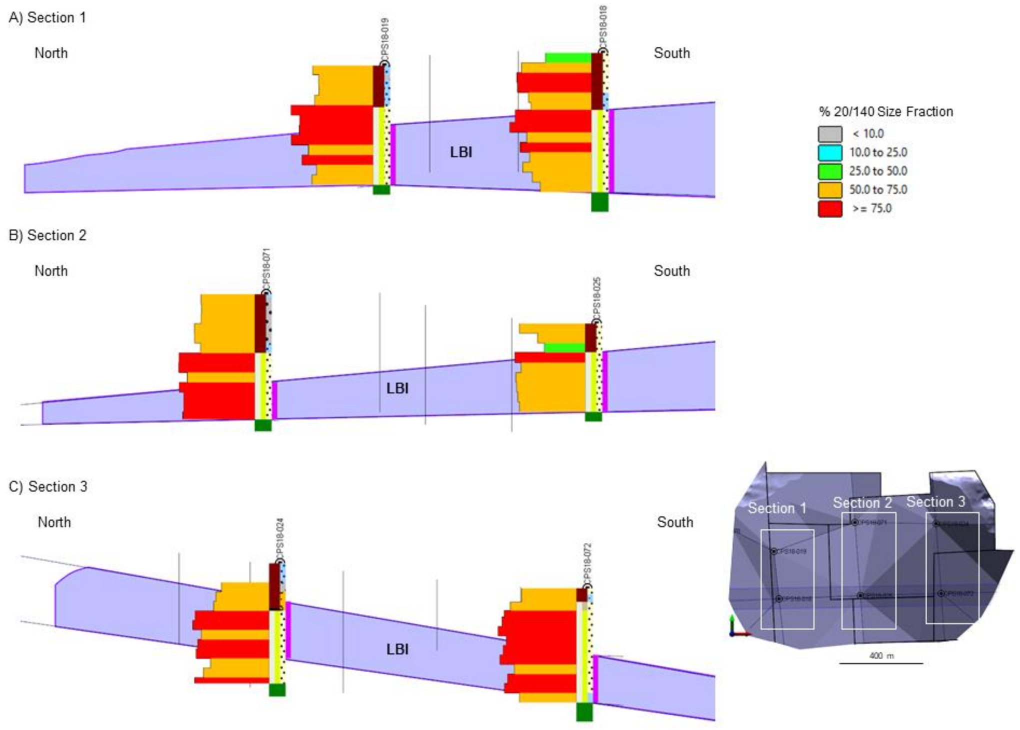
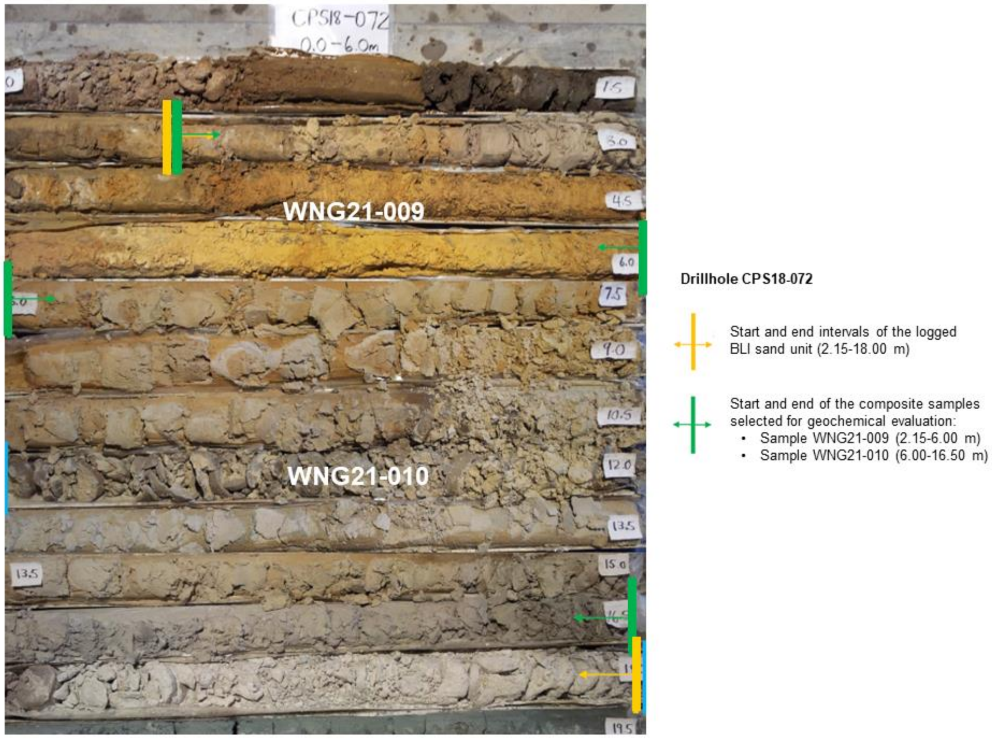


Figure 9.3 Core photo to illustrate how the LBI unit was divided into two composite samples within drillhole CPS18-72.



The analytical results are presented in Table 9.1. Observations include:

- LBI sand samples that were collected from drillholes within the glass sand resource areas yields silica values of between 96.1 and 98.9 wt. % SiO_2 with an average of 98.0 wt. % SiO_2. The silica analyses have a very low RSD% of 0.8%.

- LBI sand samples that were collected from drillholes situated outside of the glass sand resource areas yields silica values of between 82.4 and 96.6 wt. % SiO_2 with an average of 89.7 wt. % SiO_2. The iron analyses have a low RSD% of 8.4%.

- LBI sand samples that were collected from drillholes within the glass sand resource areas yields iron values of between 0.03 and 0.51 wt. % Fe_2O_3 with an average of 0.16 wt. % Fe_2O_3. The iron analyses have a high RSD% of 86.5%.

- LBI sand samples that were collected from drillholes situated outside of the glass sand resource areas yields iron values of between 0.20 and 1.04 wt. % Fe_2O_3 with an average of 0.61 wt. % Fe_2O_3. The iron analyses have a low RSD% of 8.4%.

The variation in LBI sand silica and iron content suggests the LBI sand geochemistry is not consistent within the entire Wanipigow LBI sand domain. The iron geochemical results indicate a wider distribution of iron in comparison to silica. The QP hypothesizes that the lower silica values may relate to mixing between the LBI and UBI sands.

Table 9.1 Whole-rock and selected trace-element geochemical results of the LBI sand in consideration of within- and outside of-mineral resource areas depicted in this report.

Sample ID	Drillhole ID	From (m)	To (m)	Mineral resource area ID (this report)	LBI sand lithology	SiO_2 (wt.%)	Fe_2O_3 (wt.%)	Al_2O_3 (wt.%)	CaO (wt.%)	K_2O (wt.%)	MgO (wt.%)	MnO (wt.%)	Na_2O (wt.%)	P_2O_5 (wt.%)
WNG21-001	CPS18-018	8.60	21.00	1	White sand with possible 15% brown color due to clays	98.40	0.067	0.58	0.10	0.177	0.026	<0.001	0.01	0.009
WNG21-002	CPS18-019	6.00	9.00	1	Stained sand, includes 10% brown sand	98.01	0.102	0.83	0.21	0.132	0.046	0.001	0.19	0.013
WNG21-003	CPS18-019	9.00	18.00	1	White sand with upto 25% brown material intermixed (clay contamination)	97.90	0.083	0.69	0.20	0.177	0.056	0.002	0.03	0.006
WNG21-004	CPS18-024	7.50	12.00	1	Stained sand	98.90	0.032	0.3	0.01	0.024	0.009	<0.001	<0.01	0.010
WNG21-005	CPS18-024	12.00	18.95	1	White sand	98.40	0.047	0.46	0.24	0.074	0.029	<0.001	<0.01	0.007
WNG21-006	CPS18-025	4.40	13.50	1	White sand with possible 2-3% gray color contamination (clay)	98.20	0.069	0.52	0.22	0.094	0.036	<0.001	<0.01	0.006
WNG21-007	CPS18-071	9.00	12.00	1	Stained sand with upto 5% brown sand	96.10	0.241	1.79	0.28	0.275	0.104	0.006	0.33	0.017
WNG21-008	CPS18-071	12.00	19.15	1	White sand with possible 5% brown staining due to clay	98.60	0.050	0.66	0.02	0.159	0.024	<0.001	<0.01	0.007
WNG21-009	CPS18-072	2.15	6.00	1	Orange stained Sand	98.40	0.235	0.66	0.02	0.191	0.029	0.001	0.02	0.011
WNG21-010	CPS18-072	6.00	16.50	1	White sand with <5% weak orange staining from above unit	97.40	0.247	0.74	0.33	0.088	0.051	0.002	<0.01	0.020
WNG21-011	CPS18-078	1.60	3.40	None [1]	Weakly orange stained sand	82.40	1.038	9.36	1.73	1.740	0.988	0.013	2.45	0.038
WNG21-012	CPS18-078	3.40	6.50	None [1]	White sand	96.60	0.244	1.42	0.30	0.343	0.142	0.003	0.22	0.012
WNG21-013	CPS18-001	6.00	12.00	None [1]	Grey stained sand	84.10	0.957	7.61	2.16	1.480	0.601	0.012	2.09	0.054
WNG21-014	CPS18-001	12.00	16.85	None [1]	White sand	95.80	0.197	1.58	0.60	0.345	0.158	0.003	0.30	0.012
WNG21-015	CPS18-031	3.00	12.00	4	Wk-mod orange stained sand	98.50	0.320	0.36	0.01	0.087	0.013	<0.001	<0.01	0.011
WNG21-016	CPS18-031	12.00	17.50	4	White sand, may include upto 30% darker grey staining (clay?)	97.70	0.139	0.96	0.04	0.152	0.021	<0.001	0.01	0.004
WNG21-017	CPS18-075	6.00	9.00	2	Grey sand	96.70	0.511	1.16	0.14	0.189	0.1	0.002	0.09	0.014
WNG21-018	CPS18-075	9.00	19.80	2	White sand	98.40	0.074	0.68	0.12	0.090	0.03	<0.001	0.03	0.009

[1] None - Means the sample was collected from a drillhole that is outside of the current mineral resource areas depicted in this report.

LBI glass sand within the mineral resource areas

	SiO_2 (wt.%)	Fe_2O_3 (wt.%)	Al_2O_3 (wt.%)	CaO (wt.%)	K_2O (wt.%)	MgO (wt.%)	MnO (wt.%)	Na_2O (wt.%)	P_2O_5 (wt.%)
Minimum	96.10	0.03	0.30	0.01	0.02	0.01	0.00	0.01	0.00
Maximum	98.90	0.51	1.79	0.33	0.28	0.10	0.01	0.33	0.02
Average	97.97	0.16	0.74	0.14	0.14	0.04	0.00	0.09	0.01
Standard deviation	0.78	0.14	0.38	0.11	0.06	0.03	0.00	0.11	0.00
%RSD	0.8	86.5	50.8	78.8	47.4	70.8	79.8	129.5	43.7

LBI sand from outside of the mineral resource areas

	SiO_2 (wt.%)	Fe_2O_3 (wt.%)	Al_2O_3 (wt.%)	CaO (wt.%)	K_2O (wt.%)	MgO (wt.%)	MnO (wt.%)	Na_2O (wt.%)	P_2O_5 (wt.%)
Minimum	82.40	0.20	1.42	0.30	0.34	0.14	0.00	0.22	0.01
Maximum	96.60	1.04	9.36	2.16	1.74	0.99	0.01	2.45	0.05
Average	89.73	0.61	4.99	1.20	0.98	0.47	0.01	1.27	0.03
Standard deviation	7.52	0.45	4.10	0.89	0.74	0.40	0.01	1.17	0.02
%RSD	8.4	73.9	82.0	74.3	75.6	85.6	71.0	92.5	71.3

9.3 QEMSCAN Analytical Results

QEMSCAN analyses, which was completed by the Saskatchewan Research Council (Wudrick, 2021), represents a collection of back-scattered electron images and semi-quantitative point chemical analyses used to calculate various parameters such as particle size distribution, mineral associations and liberation, modal abundances, etc.

Based on the results of the geochemical analyses presented in Section 9.2, a split of the sieved sample fractions was amalgamated into 2 separate composite samples for QEMSCAN analysis:

1. A ‘low iron’ sample (n=8 samples) that ranges between 0.032 and 0.241 wt. % Fe_2O_3 with an average of 0.086 wt. % Fe_2O_3.

2. A ‘high iron’ sample (n=6 samples) that ranges between 0.197 and 0.320 wt. % Fe_2O_3 with an average of 0.230 wt. % Fe_2O_3.

The objective of the QEMSCAN analysis was to determine the percentage of, and mineralogy, of iron-bearing grains.

A representative 5 g portion of the low- and high-iron samples were prepared as polished sections. The low iron sample analyzed a total of 20,002 grains using 894,615 x-ray data points at a pixel spacing of 4.76 µm. The high iron sample analyzed a total of 20,134 grains using 982,680 x-ray data points at a pixel spacing of 4.76 µm. The modal mineralogy is calculated from the combined analysis of the back-scattered electron images and the mineral identification from the semi-quantitative point chemical analyses (EDS). The volumetric abundance of the minerals is converted to mass percent from density data for typical mineral compositions.

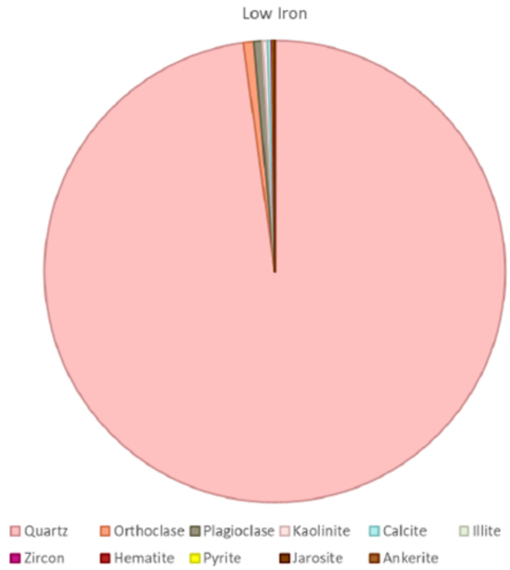
The low iron sample is almost entirely quartz (97.70%). Some plagioclase, orthoclase, calcite, and clay minerals such as kaolinite and illite are also present in lesser amounts. There are fewer iron minerals than above. They include hematite, pyrite, jarosite, and ankerite. Some minor zircon is also present (Figure 9.4a).

The high iron sample is almost entirely quartz (96.45%). Some plagioclase, orthoclase, calcite, and clay minerals such as kaolinite and illite are also present in lesser amounts. Some grains altered to chlorite are present. Iron minerals include biotite, jarosite, hematite, ilmenite, pyrite, and ankerite. Some minor zircon is also present (Figure 9.4b).

A review of individual grains is presented in Figure 9.5 and shows that iron-bearing minerals and/or grains within the LBI sand unit form as isolated grains within a remarkably clean, quartz-dominated sand. These unique grains comprise iron minerals that form mainly as alteration replacement minerals along the edges of grains, within fractures, or pervasively replacing, for example, a carbonate grains, and more rarely as, 2) inclusions within quartz grains.

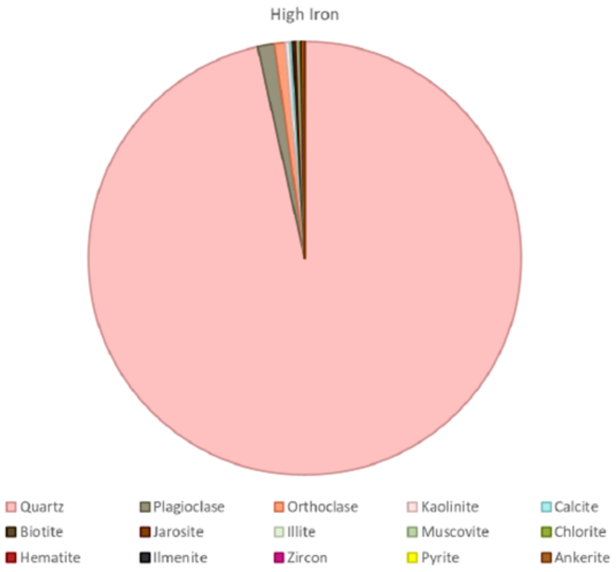
Figure 9.4 QEMSCAN analytical results of the low iron and high iron samples.

A) QEMSCAN results of a 5 g portion of the ‘low iron’ silica sand sample (average 0.086% Fe_2O_3).



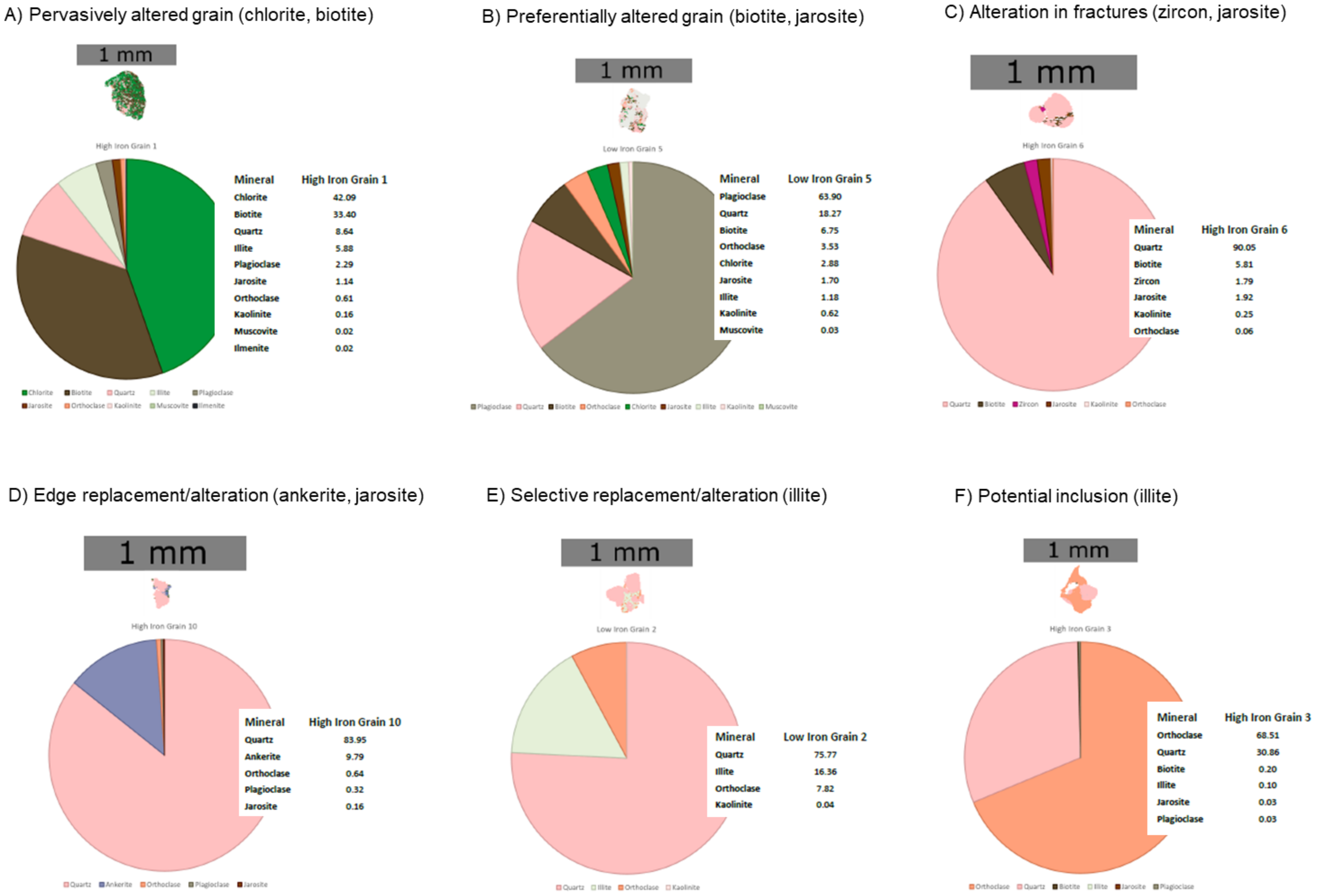
Mineral	Low Iron
Quartz	97.70
Orthoclase	0.72
Plagioclase	0.62
Kaolinite	0.34
Calcite	0.25
Illite	0.06
Zircon	0.06
Hematite	0.05
Pyrite	0.05
Jarosite	0.03
Ankerite	0.02

B) QEMSCAN results of a 5 g portion of the ‘high iron’ silica sand sample (average 0.230% Fe_2O_3).



Mineral	High Iron
Quartz	96.45
Plagioclase	1.25
Orthoclase	0.79
Kaolinite	0.35
Calcite	0.21
Biotite	0.18
Jarosite	0.17
Illite	0.11
Muscovite	0.09
Chlorite	0.09
Hematite	0.06
Ilmenite	0.06
Zircon	0.05
Pyrite	0.05
Ankerite	0.04

Figure 9.5 Mineralogical and textural examples of select iron-bearing mineral grains captured in the QEMSCAN analyses.



A) Pervasively altered grain (chlorite, biotite)

Mineral	High Iron Grain 1
Chlorite	42.09
Biotite	33.40
Quartz	8.64
Illite	5.88
Plagioclase	2.29
Jarosite	1.14
Orthoclase	0.61
Kaolinite	0.16
Muscovite	0.02
Ilmenite	0.02

B) Preferentially altered grain (biotite, jarosite)

Mineral	Low Iron Grain 5
Plagioclase	63.90
Quartz	18.27
Biotite	6.75
Orthoclase	3.53
Chlorite	2.88
Jarosite	1.70
Illite	1.18
Kaolinite	0.62
Muscovite	0.03

C) Alteration in fractures (zircon, jarosite)

Mineral	High Iron Grain 6
Quartz	90.05
Biotite	5.81
Zircon	1.79
Jarosite	1.92
Kaolinite	0.25
Orthoclase	0.06

D) Edge replacement/alteration (ankerite, jarosite)

Mineral	High Iron Grain 10
Quartz	83.95
Ankerite	9.79
Orthoclase	0.64
Plagioclase	0.32
Jarosite	0.16

E) Selective replacement/alteration (illite)

Mineral	Low Iron Grain 2
Quartz	75.77
Illite	16.36
Orthoclase	7.82
Kaolinite	0.04

F) Potential inclusion (illite)

Mineral	High Iron Grain 3
Orthoclase	68.51
Quartz	30.86
Biotite	0.20
Illite	0.10
Jarosite	0.03
Plagioclase	0.03

10 Drilling

10.1 Canadian Premium Sand Inc. 2014 Drill Program

In 2014, Claim Post Resources Ltd. drilled 5 holes at the Wanipigow Property consisting of 3 auger and 2 sonic drillholes. The program was unsuccessful due to 1) the auger drill not being powerful enough to penetrate the Pleistocene glaciofluvial unit; and 2) the sonic drill yielded poor material recovery and was not able to drill deeper than approximately 10 m. Due to the drilling problems, the program was cancelled, and no sand sample were collected.

10.2 Canadian Premium Sand Inc. 2018 Drill Program

In September 2018, CPS commissioned: 1) Boart Longyear of Calgary, AB as a third-party drill contractor; and 2) APEX to provide independent geological and geotechnical support related to a 93-drillhole program to test and delineate the Wanipigow Silica Sand Project. The drill program was initiated on September 27, 2018, and completed on December 13, 2018.

The drill collar descriptions and location of the 93 drillholes totaling 1,573.7 m is presented in Table 10.1 and Figure 10.1, respectively. The drillhole nomenclature includes the company name (CPS), drill year (2018), and drillhole number (e.g., CPS18-001). The drillhole IDs in Table 10.1 have incremental gaps where holes were either not drilled or the initial hole was terminated at a shallow depth and re-drilled with the second repeat hole designated with an “A” at the end of the drill ID (e.g., CPS18-004A). A total of 9 holes were re-spudded and drilled due to drill complications in the original hole.

All holes were drilled using a track-mounted LS 250 mini sonic drill. A sonic drill rig was selected to obtain the most representative sample of the sand lithologies. The holes were drilled at Azimuth 0° and vertically (-90°). The drilling grid pattern attempted a 400 m spacing. Infill drilling was periodically conducted at a drillhole spacing of 150 to 200 m.

The drillhole collars were surveyed in the field using a Garmin 60CX handheld GPS that recorded Easting, Northing and Elevation data in UTM NAD 83 Zone 14 coordinates. The collar elevations were rectified afterwards using LiDar imagery to correctly position the vertical placement of the drill collar (Table 10.1).

Sonic coring was conducted from the surface collar through the entire targeted Winnipeg Formation and terminated in Precambrian Basement. Core retrieval was in continuous 1.5 m intervals (core tube length) and 10.8 cm in diameter. The sample material was vibrated out of the core barrel and collected in plastic PVC tubes that were labeled with the hole ID, depth interval and core direction. The tubes were capped and sealed with duct tape and delivered to the core shack for detailed logging and sampling. Upon arrival at the core shack 3 to 4 tubes were placed in order on the table and opened by cutting the plastic. The core was photographed logged and sampled. Sampling procedures are presented in section 11, Sample Preparation, Analyses and Security.

Table 10.1. Collar description of Canadian Premium Sand Inc.'s 2018 and 2022 drillhole programs.

A) CPS 2018 drilling program

Drillhole ID	Easting (m) (UTM, Z12, NAD83)	Northing (m) (UTM, Z12, NAD83)	Elevation (m)	Adjusted elevation (m) [1]	Azi-muth (°)	Dip (°)	End of hole (m)
CPS18-001	685657	5672814	248	246.80	0	-90	18.9
CPS18-002	685673	5672390	249	247.27	0	-90	14.93
CPS18-003	685687	5672003	250	251.76	0	-90	22.5
CPS18-004	685699	5671764	252	252.49	0	-90	7.5
CPS18-004A	685700	5671762	250	252.48	0	-90	23.62
CPS18-005	686714	5671022	255	250.10	0	-90	21
CPS18-006	686477	5671620	252	249.45	0	-90	21
CPS18-007	686683	5671830	247	247.23	0	-90	10.5
CPS18-008	686932	5672012	253	247.40	0	-90	16
CPS18-009	687173	5672407	250	247.08	0	-90	25.5
CPS18-010	685278	5671595	246	253.37	0	-90	9
CPS18-010A	685278	5671594	255	253.38	0	-90	27
CPS18-011			Hole not drilled				
CPS18-012	684397	5671555	251	252.58	0	-90	21
CPS18-013	684094	5671149	240	249.20	0	-90	24
CPS18-014			Hole not drilled				
CPS18-015	684209	5670346	235	229.29	0	-90	12
CPS18-016	686114	5672008	255	249.36	0	-90	19
CPS18-017	686092	5672398	241	246.48	0	-90	18
CPS18-018	686073	5672819	246	248.82	0	-90	24
CPS18-019	686048	5673049	247	246.92	0	-90	19.5
CPS18-020	685269	5671990	248	248.79	0	-90	7.5
CPS18-020A	685273	5671988	245	248.84	0	-90	21
CPS18-021	685241	5672378	247	246.80	0	-90	21
CPS18-022	684864	5671970	247	247.53	0	-90	19.5
CPS18-023	684850	5672374	238	241.30	0	-90	13.5
CPS18-024	686832	5673183	246	248.92	0	-90	21
CPS18-025	686466	5672835	245	245.68	0	-90	15
CPS18-026	686498	5672397	246	246.12	0	-90	18
CPS18-027	686486	5672028	252	246.97	0	-90	18
CPS18-028	686899	5672406	242	248.71	0	-90	21
CPS18-029	686111	5671608	257	250.17	0	-90	23
CPS18-030	686118	5671302	248	248.65	0	-90	9.45
CPS18-030A	686111	5671192	246	248.24	0	-90	18
CPS18-031	686082	5670754	253	248.23	0	-90	21
CPS18-032	686135	5670434	239	242.27	0	-90	15
CPS18-033	686550	5671248	255	248.51	0	-90	16.5
CPS18-034	686514	5670785	248	249.47	0	-90	21
CPS18-035	686564	5670415	243	240.94	0	-90	12
CPS18-036	687115	5671923	244	245.72	0	-90	18
CPS18-037	686951	5671149	250	247.03	0	-90	18
CPS18-037A	686906	5671162	244	246.79	0	-90	21
CPS18-038	686960	5670813	256	250.02	0	-90	18
CPS18-039	686912	5670409	239	238.88	0	-90	7.5
CPS18-039A	686913	5670414	239	238.94	0	-90	7.5
CPS18-040	685296	5671167	249	246.10	0	-90	20
CPS18-040A	685297	5671168	249	246.11	0	-90	19.5
CPS18-041	684918	5671132	257	246.69	0	-90	19.5
CPS18-042	684490	5671101	248	247.51	0	-90	21
CPS18-043			Hole not drilled				
CPS18-044	685487	5671383	250	249.51	0	-90	7.5
CPS18-044A	685487	5671383	250	249.51	0	-90	22.5
CPS18-045	685913	5671338	248	248.87	0	-90	17.68
CPS18-046	686299	5671415	256	248.78	0	-90	19.5
CPS18-047	686643	5671445	243	247.00	0	-90	18
CPS18-048	687288	5672051	250	243.13	0	-90	12
CPS18-049	686323	5671647	242	246.04	0	-90	18
CPS18-050	687302	5671229	243	247.77	0	-90	15
CPS18-051	687358	5670829	252	242.51	0	-90	11.5
CPS18-052	687361	5670447	239	236.99	0	-90	12
CPS18-053			Hole not drilled				
CPS18-054			Hole not drilled				
CPS18-055			Hole not drilled				
CPS18-056			Hole not drilled				
CPS18-057			Hole not drilled				
CPS18-058			Hole not drilled				
CPS18-059	684016	5671536	249	247.52	0	-90	21
CPS18-060	684419	5671796	243	248.37	0	-90	21
CPS18-061	687579	5671960	245	243.72	0	-90	10.5
CPS18-062	687791	5671707	249	251.03	0	-90	18
CPS18-063	687527	5671425	247	249.79	0	-90	16.5
CPS18-064	684505	5670749	239	237.90	0	-90	12
CPS18-065	684934	5670791	235	236.97	0	-90	16.5
CPS18-066	685295	5670750	236	238.88	0	-90	18
CPS18-067	685730	5670378	246	237.69	0	-90	18
CPS18-068	684002	5671796	247	243.78	0	-90	21
CPS18-069	688046	5671762	243	243.73			9
CPS18-070			Hole not drilled				
CPS18-071	686440	5673189	244	250.18	0	-90	21
CPS18-072	686857	5672845	246	244.98	0	-90	21
CPS18-073	684081	5670732	237	237.17	0	-90	10.5
CPS18-074	684871	5671564	247	254.00	0	-90	25.5
CPS18-075	685685	5671613	248	251.55	0	-90	21
CPS18-076	685734	5671171	251	246.00	0	-90	15
CPS18-077	685718	5670774	250	244.72	0	-90	18
CPS18-078	685727	5673147	242	236.48	0	-90	9.93
CPS18-079	685766	5673700	233	229.96	0	-90	12
CPS18-080			Hole not drilled				
CPS18-081	687098	5670639	254	243.52	0	-90	12
CPS18-081A	687099	5670628	253	243.37	0	-90	15
CPS18-082	686724	5670569	246	244.50	0	-90	13.5
CPS18-083	686714	5671021	253	248.58	0	-90	15
CPS18-084	686330	5670632	251	246.96	0	-90	19
CPS18-085	685949	5670588	248	247.81	0	-90	18
CPS18-086	687138	5671007	252	251.39	0	-90	18.7
CPS18-087	687154	5671522	251	246.49	0	-90	15.5
CPS18-088	685900	5670965	248	246.31	0	-90	18
CPS18-089	686313	5670971	250	248.27	0	-90	18
CPS18-090			Hole not drilled				
CPS18-091			Hole not drilled				
CPS18-092			Hole not drilled				
CPS18-093	687797	5671415	242	244.61	0	-90	12
CPS18-094	687528	5671082	239	242.58	0	-90	9
CPS18-095	684270	5670941	243	243.29	0	-90	18
CPS18-096	684699	5670988	244	241.58	0	-90	15
CPS18-097	685082	5670974	237	239.89	0	-90	18
CPS18-098	685254	5672782	241	238.48	0	-90	13.5

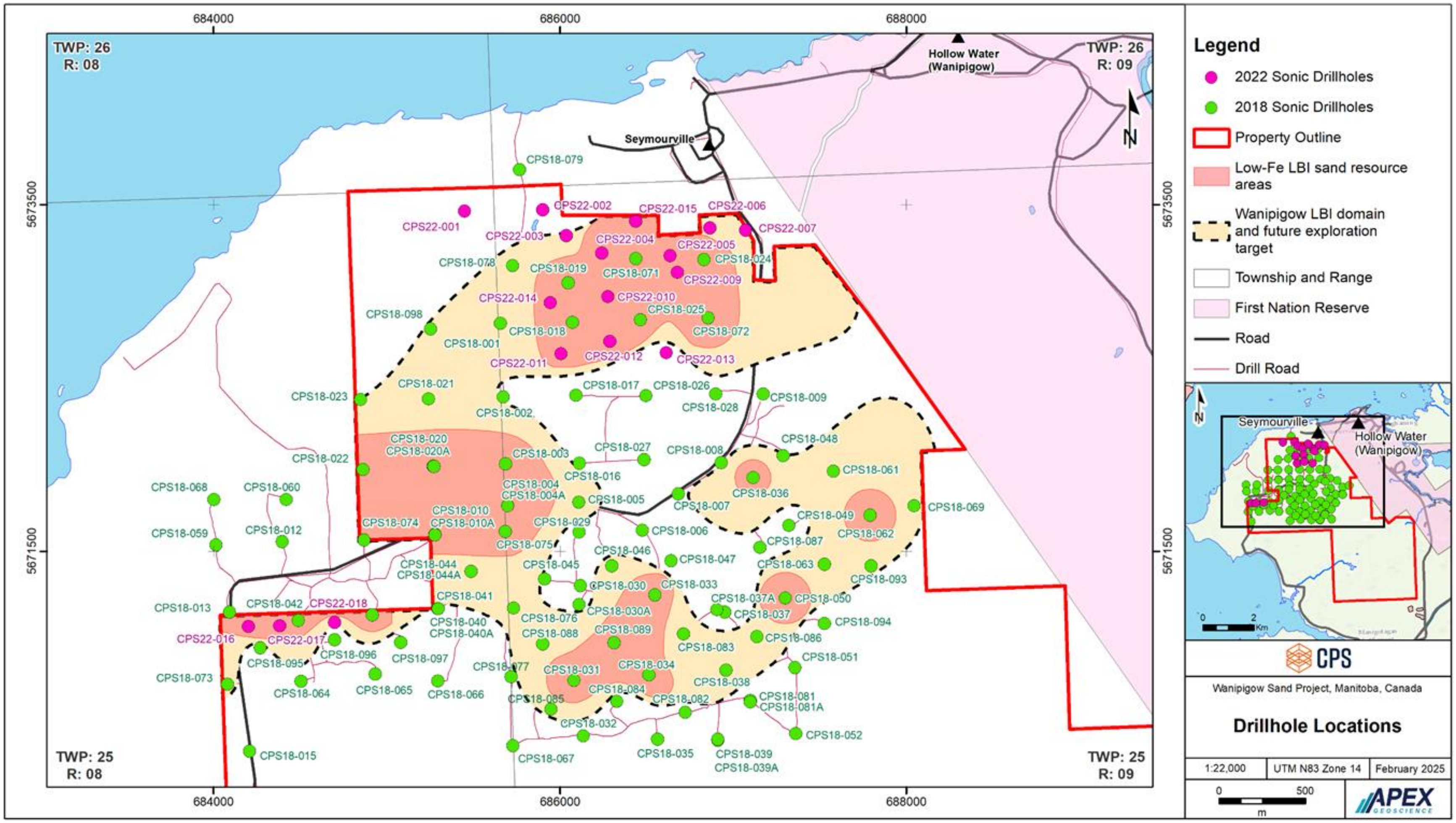
[1] Collar elevation adjusted to Light Detection and Ranging (LiDar) bare earth surface topography.

B) CPS 2022 drilling program

Drillhole ID	Easting (m) (UTM, Z12, NAD83)	Northing (m) (UTM, Z12, NAD83)	Elevation (m) [2]	Adjusted elevation (m) [2]	Azi-muth (°)	Dip (°)	End of hole (m)
CPS22-001	685451	5673463	/	/	0	-90	16.5
CPS22-002	685900	5673469	/	/	0	-90	4.5
CPS22-003	686037	5673321	/	/	0	-90	7.5
CPS22-004	686241	5673220	/	/	0	-90	15.0
CPS22-005	686637	5673206	/	/	0	-90	19.5
CPS22-006	686866	5673366	/	/	0	-90	18.0
CPS22-007	687072	5673353	/	/	0	-90	21.0
CPS22-008			Hole not drilled				
CPS22-009	686678	5673109	/	/	0	-90	24.0
CPS22-010	686278	5672968	/	/	0	-90	15.0
CPS22-011	686008	5672639	/	/	0	-90	21.0
CPS22-012	686289	5672709	/	/	0	-90	18.0
CPS22-013	686614	5675645	/	/	0	-90	18.0
CPS22-014	685945	5672934	/	/	0	-90	19.5
CPS22-015	686438	5673403	/	/	0	-90	9.0
CPS22-016	684202	5671064	/	/	0	-90	19.5
CPS22-017	684382	5671069	/	/	0	-90	19.5
CPS22-018	684700	5671089	/	/	0	-90	18.0

[2] Collar elevations were not provided.

Figure 10.1 Location of 2018 and 2022 drillholes drilled by Canadian Premium Sand.



10.3 Canadian Premium Sand Inc. 2022 Drill Program

In September 2022, CPS commissioned: 1) Boart Longyear of Calgary, AB as a third-party drill contractor; and 2) Edge Engineering and Geoscience Ltd. to provide independent geological and geotechnical support related to a 17-drillhole program designed to provide infill drilling in relation to the 2018 drill program. The drilling was conducted on November 15 to December 2, 2022.

A total of 17 holes totaling 283.5 m were drilled using a track-mounted sonic drill rig. Core was recovered from all holes and forwarded to the logging station where all core was received, opened, photographed, logged and sampled. Samples were recorded for each hole and placed in two wooden shipping crates. The crates were sealed shut with screws, and tamper-proof security tape was placed on each shipping crate.

10.4 Lithological Summary

A lithological summary of the drill logging is presented in Table 10.2 (2018 drilling) and Table 10.3 (2022 drilling). Graphical representations of the lithologies are presented in Figure 10.2 and 10.3.

The Winnipeg Formation sandstone (UBI or LBI) was intersected in 59 of the 110 drillholes (54%). The thickness of the entire Winnipeg Formation ranged from 0.2 to 20.2 m. The strata are generally flat-lying, and hence, this thickness can be considered to represent the true thickness of the formation. In western Property drillholes where the thickest intersections of sandstone occurred, all three Winnipeg Formation members were present (UBI, BS, LBI). In the eastern Property and in areas where the sandstone was less than 10 m thick, only the LBI member was present.

A breakdown of the lithological logging results, as per Tables 10.2 and 10.3, is as follows:

Lower Black Island (LBI): The LBI was intersected in 58 drillholes (or 53%) with the thickest LBI intersections were up to 15.9 m and averages 7.9 m.

Black Shale/Sandstone (BS): The BS was intersected in 14 drillholes (or 13%) with the thickest BS intersections were up to 3.5 m and averages 2.0 m when present.

Upper Black Island (UBI): The UBI was intersected in 22 drillholes (or 20%) with the thickest UBI intersections were up to 19.0 m and averages 4.6 m when present.

Pleistocene glaciofluvial (Pgf): Glaciofluvial material is more-or-less ubiquitous at the Property; only 7 drillholes, or 6%, did not intersect Quaternary material. The maximum thickness of the Pgf geo-unit is 23.6 m and averages 10.7 m when present.

There were instances where it was not possible to recover 100% of the core. This occurred mostly in the uppermost Pleistocene glaciofluvial units due to large cobbles or boulders that became lodged in the core barrel and caused sand to wash away.

Table 10.2. Lithological summary of core logging from CPS's 2018 drill program.

DDH	Easting (m) UTM N83 Z14	Northing (m) UTM N83 Z14	Pliestocene glaciofluvial thickness (m)	Upper Black Island thickness (m)	Pyritic Black Shale thickness (m)	Lower Black Island thickness (m)	Precambrian thickness (m)	End of Hole (m)
CPS18-001	685657	5672814	6.0	6.0	0.0	4.9	2.1	18.9
CPS18-002	685673	5672390	14.8	0.0	0.0	0.0	0.1	14.9
CPS18-003	685687	5672003	0.0	6.0	3.0	11.9	1.6	22.5
CPS18-004	685699	5671764	0.0	6.0	1.5	0.0	0.0	7.5
CPS18-004A	685700	5671762	0.0	6.0	3.0	14.0	0.6	23.6
CPS18-005	686110	5671782	12.6	0.0	0.0	5.5	2.9	21.0
CPS18-006	686477	5671620	0.0	19.0	0.0	0.0	2.0	21.0
CPS18-007	686683	5671830	9.8	0.0	0.0	0.0	0.8	10.6
CPS18-008	686932	5672012	15.0	0.0	0.0	0.0	1.0	16.0
CPS18-009	687173	5672407	23.6	0.0	0.0	0.0	1.9	25.5
CPS18-010	685278	5671595	0.0	7.5	0.0	0.0	1.5	9.0
CPS18-010A	685278	5671594	0.0	7.5	1.9	14.6	3.0	27.0
CPS18-012	684397	5671555	1.5	6.8	2.2	10.5	0.0	21.0
CPS18-013	684094	5671149	1.8	2.7	3.0	14.5	2.0	24.0
CPS18-015	684209	5670346	10.7	0.0	0.0	0.0	1.3	12.0
CPS18-016	686114	5672008	18.0	0.0	0.0	0.0	1.0	19.0
CPS18-017	686092	5672398	17.7	0.0	0.0	0.0	0.3	18.0
CPS18-018	686073	5672819	8.6	0.0	0.0	12.4	3.0	24.0
CPS18-019	686048	5673049	6.3	0.0	0.0	11.7	1.5	19.5
CPS18-020	685269	5671990	6.0	1.5	0.0	0.0	0.0	7.5
CPS18-020A	685273	5671988	6.5	2.3	1.7	9.1	1.4	21.0
CPS18-021	685241	5672378	15.0	0.0	0.0	4.5	1.5	21.0
CPS18-022	684864	5671970	3.7	0.9	1.4	12.3	1.2	19.5
CPS18-023	684850	5672374	11.6	0.2	0.0	0.2	1.5	13.5
CPS18-024	686832	5673183	7.5	0.0	0.0	11.5	2.1	21.0
CPS18-025	686466	5672835	4.4	0.0	0.0	9.1	1.5	15.0
CPS18-026	686498	5672397	15.0	0.0	0.0	0.0	3.0	18.0
CPS18-027	686486	5672028	16.5	0.0	0.0	0.0	1.5	18.0
CPS18-028	686899	5672406	20.3	0.0	0.0	0.0	0.7	21.0
CPS18-029	686111	5671608	21.0	0.0	0.0	0.0	2.0	23.0
CPS18-030	686118	5671302	9.5	0.0	0.0	0.0	0.0	9.5
CPS18-030A	686111	5671192	16.5	0.0	0.0	0.0	1.5	18.0
CPS18-031	686082	5670754	1.5	0.9	0.6	15.4	2.5	20.9
CPS18-032	686135	5670434	14.2	0.0	0.0	0.0	0.8	15.0
CPS18-033	686550	5671248	9.0	0.0	0.0	6.5	1.0	16.5
CPS18-034	686514	5670785	12.0	0.0	0.0	6.0	3.0	21.0
CPS18-035	686564	5670415	9.5	0.0	0.0	0.0	2.5	12.0
CPS18-036	687115	5671923	6.0	0.0	0.0	9.0	3.0	18.0
CPS18-037	686951	5671149	17.6	0.0	0.0	0.0	0.4	18.0
CPS18-037A	686906	5671162	18.0	0.0	0.0	0.0	3.0	21.0
CPS18-038	686960	5670813	9.0	0.0	0.0	6.0	3.0	18.0
CPS18-039	686912	5670409	6.0	0.0	0.0	0.0	1.5	7.5
CPS18-039A	686913	5670414	6.0	0.0	0.0	0.0	1.5	7.5
CPS18-040	685296	5671167	18.0	0.0	0.0	0.0	2.0	20.0
CPS18-040A	685297	5671168	18.0	0.0	0.0	0.0	1.5	19.5
CPS18-041	684918	5671132	3.0	0.0	1.5	14.2	0.8	19.5
CPS18-042	684490	5671101	1.5	1.1	2.1	13.4	2.9	21.0
CPS18-044	685487	5671383	7.5	0.0	0.0	0.0	0.0	7.5
CPS18-044A	685487	5671383	9.0	0.0	0.0	9.6	3.9	22.5
CPS18-045	685913	5671338	17.7	0.0	0.0	0.0	0.6	18.3
CPS18-046	686299	5671415	13.0	0.0	0.0	2.0	4.5	19.5
CPS18-047	686643	5671445	15.0	0.0	0.0	0.0	3.1	18.0
CPS18-048	687288	5672051	10.0	0.4	0.0	0.0	1.6	12.0
CPS18-049	687323	5671647	16.2	0.0	0.0	0.0	1.9	18.0
CPS18-050	687302	5671229	9.0	0.0	0.0	4.5	1.5	15.0
CPS18-051	687358	5670829	10.1	0.0	0.0	0.0	1.4	11.5
CPS18-052	687361	5670447	11.0	0.0	0.0	0.0	1.0	12.0
CPS18-059	684016	5671536	0.9	3.2	3.5	12.0	1.5	21.0
CPS18-060	684419	5671796	4.5	0.0	1.5	13.5	1.5	21.0
CPS18-061	687579	5671960	5.4	0.0	0.0	4.8	0.3	10.5
CPS18-062	687791	5671707	10.3	0.0	0.0	6.8	0.9	18.0
CPS18-063	687527	5671425	9.0	0.0	0.0	5.6	1.9	16.5
CPS18-064	684505	5670749	9.0	0.0	0.0	0.0	3.0	12.0
CPS18-065	684934	5670791	13.3	0.0	0.0	0.0	3.2	16.5
CPS18-066	685295	5670750	17.1	0.0	0.0	0.0	0.9	18.0
CPS18-067	685730	5670378	16.5	0.0	0.0	0.0	1.5	18.0
CPS18-068	684002	5671796	18.0	0.0	0.0	0.0	3.0	21.0
CPS18-069	688046	5671762	5.7	0.0	0.0	1.6	1.7	9.0
CPS18-071	686440	5673189	9.0	0.0	0.0	10.2	1.9	21.0
CPS18-072	686857	5672845	2.2	0.0	0.0	15.9	3.0	21.0
CPS18-073	684081	5670732	7.5	0.0	0.0	1.5	1.5	10.5
CPS18-074	684871	5671564	0.0	8.5	1.4	14.1	1.5	25.5
CPS18-075	685685	5671613	2.1	3.5	1.9	12.3	1.2	21.0
CPS18-076	685734	5671171	12.0	0.0	0.0	1.6	1.4	15.0
CPS18-077	685718	5670774	15.0	0.0	0.0	0.0	3.0	18.0
CPS18-078	685727	5673147	1.6	1.8	0.0	3.1	3.4	9.9
CPS18-079	685766	5673700	2.8	7.9	0.0	0.0	1.3	12.0
CPS18-081	687098	5670639	12.0	0.0	0.0	0.0	0.0	12.0
CPS18-081A	687099	5670628	13.1	0.0	0.0	0.0	1.9	15.0
CPS18-082	686724	5670569	12.9	0.0	0.0	0.0	0.6	13.5
CPS18-083	686714	5671021	10.1	0.0	0.0	4.9	0.1	15.0
CPS18-084	686330	5670632	18.0	0.0	0.0	0.0	1.0	19.0
CPS18-085	685949	5670588	12.0	0.0	0.0	3.0	3.0	18.0
CPS18-086	687138	5671007	15.0	0.0	0.0	2.2	1.5	18.7
CPS18-087	687154	5671522	14.0	0.0	0.0	0.0	1.5	15.5
CPS18-088	685900	5670965	10.9	0.0	0.0	5.5	1.7	18.0
CPS18-089	686313	5670971	11.6	0.0	0.0	3.4	3.0	18.0
CPS18-093	687797	5671415	9.0	0.0	0.0	1.5	1.5	12.0
CPS18-094	687528	5671082	8.5	0.0	0.0	0.0	0.5	9.0
CPS18-095	684270	5670941	15.0	0.0	0.0	0.0	3.0	18.0
CPS18-096	684699	5670988	13.1	0.0	0.0	0.0	1.9	15.0
CPS18-097	685082	5670974	17.1	0.0	0.0	0.0	0.9	18.0
CPS18-098	685254	5672782	9.0	2.3	0.0	0.7	1.5	13.5
		Minimum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**7.5**
		Maximum	**23.6**	**19.0**	**3.5**	**15.9**	**4.5**	**27.0**
		Average (where present)	**10.7**	**4.6**	**2.0**	**7.9**	**1.7**	**16.9**
		Total	**930.6**	**102.0**	**30.2**	**357.3**	**154.3**	**1,574.3**

Figure 10.2 Occurrence of Winnipeg Formation silica sand in the 2018 drillholes.

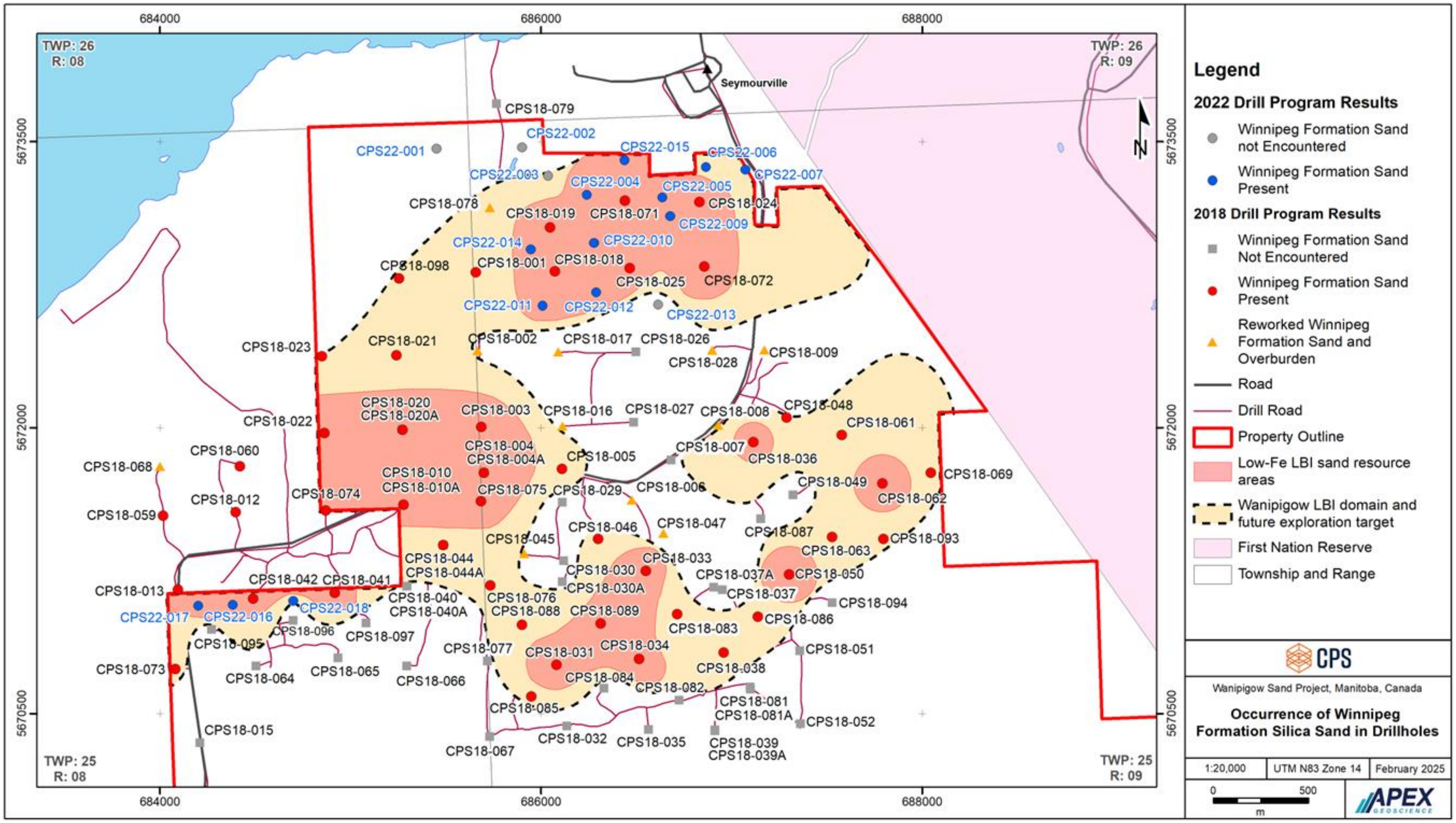


Figure 10.3 Normalized percentage of Pleistocene glaciofluvial, Upper Black Island and Lower Black Island thickness intersections in the 2018 drillholes.

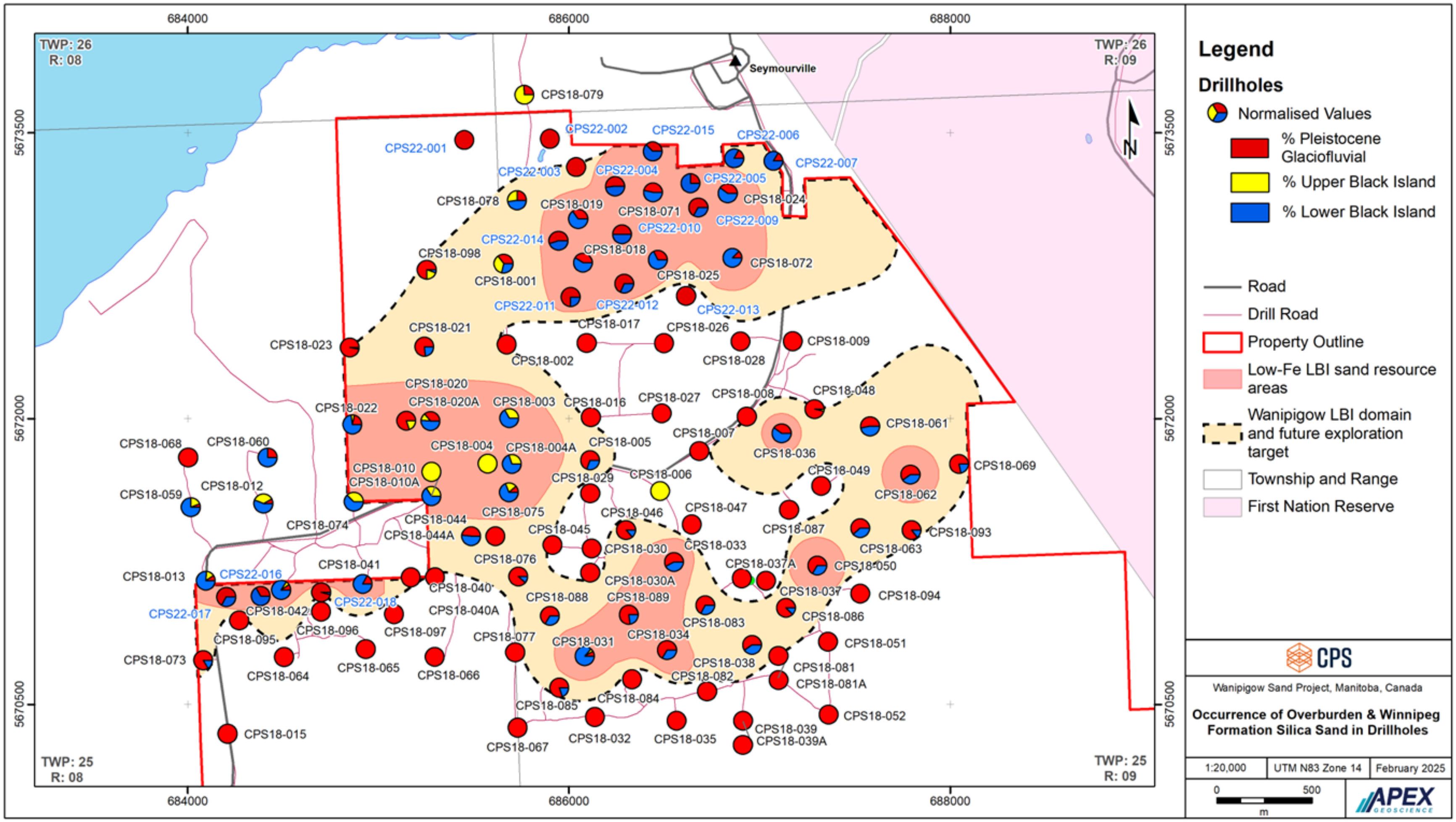


Table 10.3 Lithological summary of core logging from CPS's 2022 drill program.

			Thickness (m)							
DDH	Easting (m) UTM N83 Z14	Northing (m) UTM N83 Z14	Organic	Pliestocene glaciofluvial	Upper Black Island	Pyritic Black Shale	Lower Black Island	Precambrian	Total core loss	End of Hole (m)
CPS22-001	685451	5673463	0.4	14.1	/	/	/	1.1	0.9	16.5
CPS22-002	685900	5673469	/	3.5	/	/	/	/	1.0	4.5
CPS22-003	686037	5673321	/	7.5	/	/	/	/	/	7.5
CPS22-004	686241	5673220	/	7.0	/	/	6.5	1.5	/	15.0
CPS22-005	686637	5673206	/	4.5	/	/	13.5	1.5	/	19.5
CPS22-006	686866	5673366	0.2	2.8	/	/	13.5	1.5	/	18.0
CPS22-007	687072	5673353	0.7	2.8	/	/	14.0	3.0	0.5	21.0
CPS22-009	686678	5673109	/	12.0	/	/	6.0	6.0	/	24.0
CPS22-010	686278	5672968	/	7.5	/	/	7.5	/	/	15.0
CPS22-011	686008	5672639	/	13.5	/	/	4.5	3.0	/	21.0
CPS22-012	686289	5672709	/	10.3	/	/	4.7	3.0	/	18.0
CPS22-013	686614	5675645	/	18.0	/	/	/	/	/	18.0
CPS22-014	685945	5672934	/	9.0	/	/	7.5	3.0	/	19.5
CPS22-015	686438	5673403	0.2	2.6	/	/	4.5	1.5	0.2	9.0
CPS22-016	684202	5671064	/	12.0	/	/	6.0	1.5	/	19.5
CPS22-017	684382	5671069	/	6.0	/	/	12.0	1.5	/	19.5
CPS22-018	684700	5671089	/	12.9	/	/	0.6	2.4	2.1	18.0
		Count	4	17	0	0	13	13	5	17
		Minimum	0.2	2.6	/	/	0.6	1.1	0.2	4.5
		Maximum	0.7	18.0	/	/	14.0	6.0	2.1	24.0
		Average (where present)	0.4	8.6	/	/	7.8	2.3	0.9	16.7
		Total	1.5	146.0	/	/	100.8	30.5	4.7	283.5

In cases where significant core loss occurred within the target Winnipeg Formation, the hole was re-drilled. In these instances, the drill was collared directly adjacent to the original drillhole and re-drilled to acquire Winnipeg Formation sandstone at the same grid coordinate.

The sonic drill and re-drilling approach were successful, and overall, the drill program sampling achieved an approximate recover rate of 94%. The exception to the re-drilling process to obtain completed cores include 1) Drillhole CPS 18-059, which lost core within the Winnipeg Formation from 12-15 m depth, and 2) Drillhole CPS 18-012, which lost core from 18-21 m depth. In both cases the drill rods in these 2 holes became stuck and the sample was lost due to the force exerted by the drill when the drillers attempted to remove them.

A total of 761 samples and 15 field duplicate samples were collected during the 2018 drill program. Of the 761 samples, there are 1) 450 Pleistocene glaciofluvial; 2) 57 Upper Black Island or UBI; 3) 17 Black Shale or BS; and 4) 237 Lower Black Island or LBI samples. The sampling process is discussed in Section 11.

With respect to the 2022 drill program, a total of 183 samples were collected and are archived at CPS's core storage facility at the Wanipigow Sand Project. The samples included 3 samples of surficial organic material, 92 samples of Pleistocene glaciofluvial, 72 samples of Lower Basal Island, and 16 samples of the Precambrian basement.

10.5 Gradation Summary

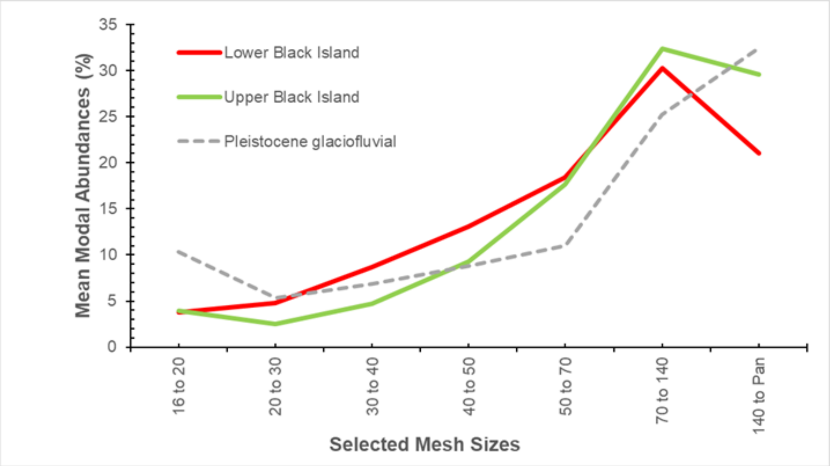
The gradation analyses are summarized in Table 10.4 and Figure 10.4, and general observations include:

- The Lower Black Island subunit comprises the highest mean percentages of 20-mesh to 70-mesh sand including the highest modal abundance of 30/50 and 50/140 sand fractions.
- The overlying Upper Black Island sand has the highest modal abundances of 70/140 fraction sand and appreciable amounts 30/50 and 50/140 sand.
- The Pleistocene glaciofluvial has the highest amount of fine clay or ultra-fine sand (140- and 200-mesh sand and Pan or -200 mesh sand).

Table 10.4 Gradational summary of the Lower Black Island, Upper Black Island and Pleistocene glaciofluvial subunits.

Mesh size	Lower Black Island (mean %; n=236)	Upper Black Island (mean %; n=57)	Pleistocene glaciofluvial (mean %; n=451)
16 to 20	3.76	3.98	10.31
20 to 30	4.80	2.51	5.37
30 to 40	8.68	4.72	6.84
40 to 50	13.06	9.25	8.82
50 to 70	18.43	17.61	11.03
70 to 140	30.26	32.33	25.21
140 to Pan	21.01	29.60	32.43

Figure 10.4 Mean modal abundance of selected gradation sizes for Lower Black Island, Upper Black Island and Pleistocene glaciofluvial samples.



Select drillhole gradation are presented in Figure 10.5 and include geology and 30/50 and 50/140 fractions. The figure demonstrates how the BS and UBI units pinch out and are non-existent at the eastern parts of the Property, but the LBI sand is relatively uniform across the Wanipigow Sand Project.

10.6 Bulk Density Measurements

A total of 52 sample splits were collected from drillhole samples for bulk density analysis (Figure 10.6). The samples were sent to Stim-Lab in Duncan, Oklahoma for ISO 13503-2 standard loose-sand bulk density analysis. The 52 samples selected for density measurements include:

- 36 samples of LBI sand.
- 16 samples of waste material overlying the LBI sand, which includes 13 samples of Pleistocene glaciofluvial and/or reworked UBI sand and 3 samples of UBI.

Loose bulk density is the unit mass of an untapped or unsettled proppant that will occupy a specific known volume, e.g., how many grams per cubic centimeter. Bulk Density includes both the mass of the proppant and the volume of air occupying the interstitial spaces between proppant particles.

The loose bulk density measurements for the LBI sand and the overlying waste material (glaciofluvial and UBI sand) are presented in Tables 10.4 and 10.5, respectively.

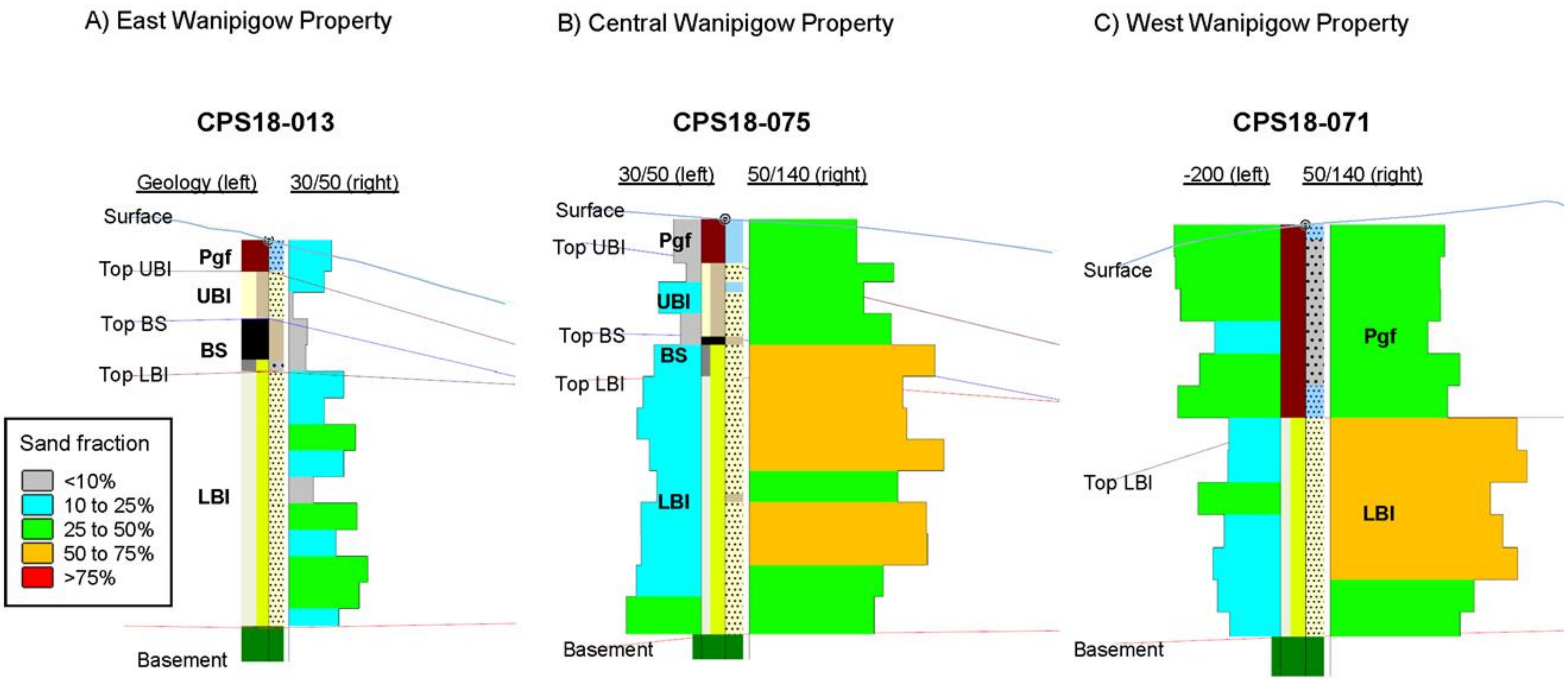
The average ‘loose’ sand bulk density of the LBI sand ranges between 1.320 and 1.550 g/cm^3 and has an average of 1.444 g/cm^3. The average ‘loose’ sand bulk density of the waste material overlying the LBI ranges between 1.230 and 1.590 g/cm^3 and has an average of 1.463 g/cm^3.

Obtaining an *in-situ* bulk density of the Winnipeg Formation sand was not possible. Alternatively, the QP converts the loose bulk density to a ‘compacted’, or *in-situ*, bulk density by utilizing a 30% bulk factor. The 30% bulking factor is appropriate when converting loose clean sand to an in-place sand and/or sandstone bedrock (with gravel and/or clay components) (e.g., Church, 1981; Hartman, 1992; Wilkinson, 1997; Ofoegbu et al., 2008; The Engineering ToolBox, 2009; Mr. R. Farmer, pers. comm., 2019).

Utilizing the loose densities with a 30% bulking factor, *in-situ* compacted bulk densities are presented in Table 10.6 and include:

1. Lower Black Island sand has an average *in-situ* compacted bulk density of 1.877 g/cm^3 (n=36 density measurements).
2. Waste material overlying the LBI sand, which includes Pleistocene glaciofluvial and/or reworked UBI sand, has an average *in-situ* compacted bulk density of 1.902 g/cm^3 (n=16 density measurements).

Figure 10.5 Graphical representation of selected drillholes and size fractions in the eastern, central and western parts of the Wanipigow Property.



Unit thicknesses (m)

Pleistocene glaciofluvial	1.8
Upper Black Island	2.7
Black Shale	3.0
Lower Black Island	14.5
Precambrian	2.0
End of Hole (m)	24.0

Unit thicknesses (m)

Pleistocene glaciofluvial	2.1
Upper Black Island	3.5
Black Shale	1.9
Lower Black Island	12.3
Precambrian	1.2
End of Hole (m)	21.0

Unit thicknesses (m)

Pleistocene glaciofluvial	9.0
Upper Black Island	0.0
Black Shale	0.0
Lower Black Island	10.2
Precambrian	1.9
End of Hole (m)	21.0

Figure 10.6 Location of drillholes in which selected samples were collected for loose bulk density measurements.

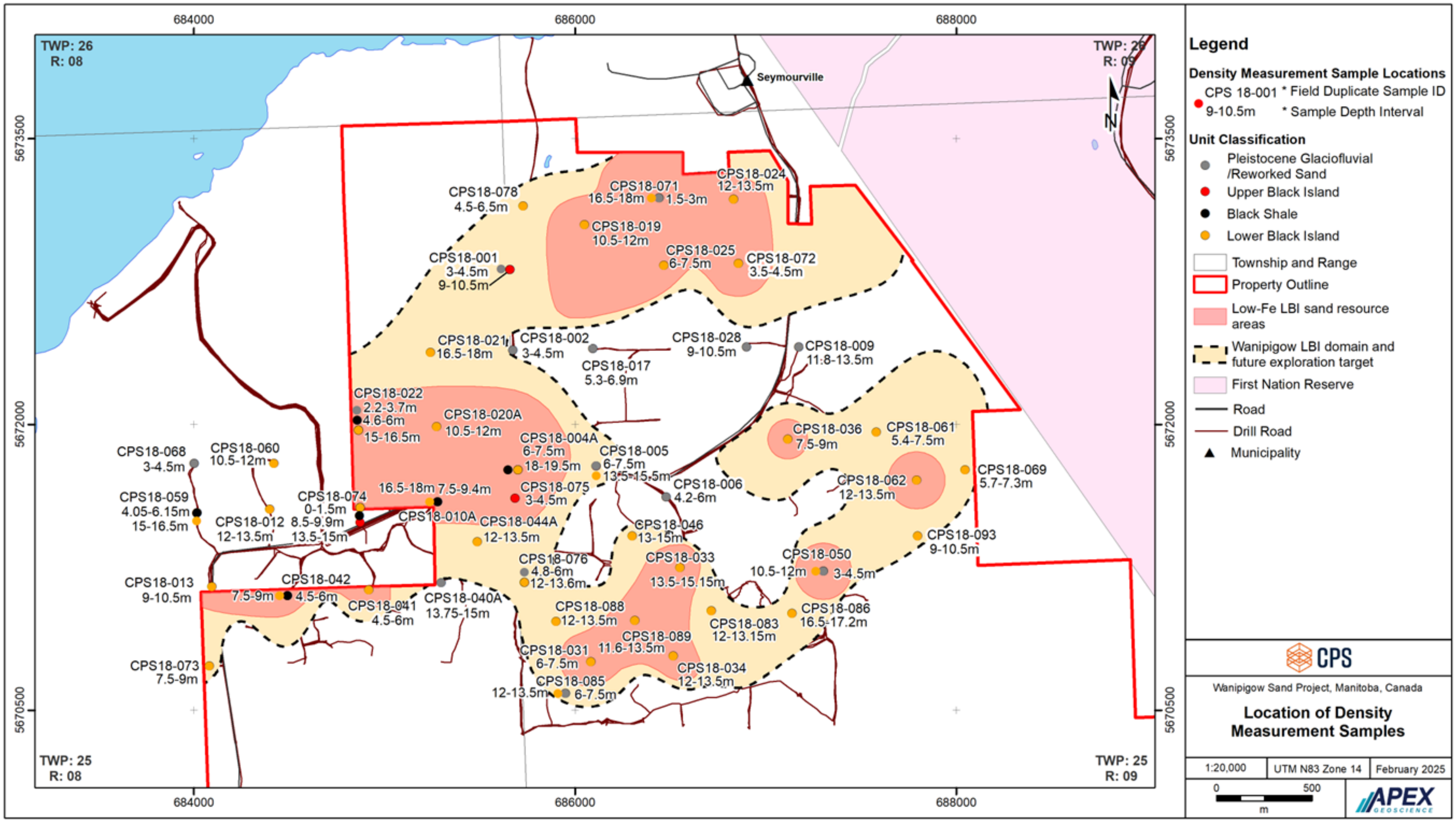


Table 10.4 Lower Black Island sand loose bulk density results (n=36 measurements).

Original Sample ID	Hole ID	From (m)	To (m)	Interval (m)	Lithology	Bulk loose density (g/cm^3)
573191	CPS18-004A	18.00	19.50	1.50	LBI	1.510
576519	CPS18-005	13.50	15.50	2.00	LBI	1.400
573205	CPS18-010A	16.50	18.00	1.50	LBI	1.350
725138	CPS18-012	12.00	13.50	1.50	LBI	1.430
725102	CPS18-013	9.00	10.50	1.50	LBI	1.390
576682	CPS18-019	10.50	12.00	1.50	LBI	1.320
576669	CPS18-020A	10.50	12.00	1.50	LBI	1.460
576641	CPS18-021	16.50	18.00	1.50	LBI	1.520
576660	CPS18-022	15.00	16.50	1.50	LBI	1.380
725196	CPS18-024	12.00	13.50	1.50	LBI	1.410
576692	CPS18-025	6.00	7.50	1.50	LBI	1.330
573291	CPS18-031	6.00	7.50	1.50	LBI	1.360
573360	CPS18-033	13.50	15.15	1.65	LBI	1.470
573305	CPS18-034	12.00	13.50	1.50	LBI	1.450
576770	CPS18-036	7.50	9.00	1.50	LBI	1.410
576588	CPS18-041	4.50	6.00	1.50	LBI	1.420
573486	CPS18-042	7.50	9.00	1.50	LBI	1.460
573436	CPS18-044A	12.00	13.50	1.50	LBI	1.390
573448	CPS18-046	13.00	15.00	2.00	LBI	1.390
573257	CPS18-050	10.50	12.00	1.50	LBI	1.530
725162	CPS18-059	15.00	16.50	1.50	LBI	1.380
725124	CPS18-060	10.50	12.00	1.50	LBI	1.460
573268	CPS18-061	5.40	7.50	2.10	LBI	1.470
573262	CPS18-062	12.00	13.50	1.50	LBI	1.510
573266	CPS18-069	5.70	7.30	1.60	LBI	1.460
725176	CPS18-071	16.50	18.00	1.50	LBI	1.480
725180	CPS18-072	3.50	4.50	1.00	LBI	1.450
573495	CPS18-073	7.50	9.00	1.50	LBI	1.480
556608	CPS18-074	13.50	15.00	1.50	LBI	1.460
573218	CPS18-076	12.00	13.60	1.60	LBI	1.460
573140	CPS18-078	4.50	6.50	2.00	LBI	1.500
573348	CPS18-083	12.00	13.15	1.15	LBI	1.510
576555	CPS18-085	12.00	13.50	1.50	LBI	1.490
573465	CPS18-088	12.00	13.50	1.50	LBI	1.520
573457	CPS18-089	11.60	13.50	1.90	LBI	1.440
576764	CPS18-093	9.00	10.50	1.50	LBI	1.550

Table 10.5 Pleistocene glaciofluvial and Upper Black Island sand (collectively, overlying waste material) loose bulk density results (n=16 measurements).

Original Sample ID	Hole ID	From (m)	To (m)	Interval (m)	Lithology	Bulk loose density (g/cm^3)	Lithological description
573120	CPS18-002	3.00	4.50	1.50	Pgf	1.530	Pgf Reworked Sand
576513	CPS18-005	6.00	7.50	1.50	Pgf	1.420	Pgf Reworked Sand
573375	CPS18-006	4.20	6.00	1.80	Pgf	1.490	Pgf Reworked Sand
573411	CPS18-009	11.80	13.50	1.70	Pgf	1.430	Pgf Reworked Sand
576726	CPS18-017	5.30	6.90	1.60	Pgf	1.550	Pgf Sand/gravel
576651	CPS18-022	2.20	3.70	1.50	Pgf	1.540	Pgf-Clay
576741	CPS18-028	9.00	10.50	1.50	Pgf	1.490	Pgf Reworked Sand
573469	CPS18-040A	13.75	15.00	1.25	Pgf	1.590	Pgf Sand
573254	CPS18-050	3.00	4.50	1.50	Pgf	1.500	Pgf Clay+Gravel
725144	CPS18-068	3.00	4.50	1.50	Pgf	1.390	Pgf Reworked Sand
725166	CPS18-071	1.50	3.00	1.50	Pgf	1.440	Pgf Silty Sand
573213	CPS18-076	4.80	6.00	1.20	Pgf	1.230	Pgf Sand+Clay
576551	CPS18-085	6.00	7.50	1.50	Pgf	1.370	Pgf Sand+Clay
573132	CPS18-001	9.00	10.50	1.50	UBI	1.510	UBI-Sand
556599	CPS18-074	0.00	1.50	1.50	UBI	1.500	UBI-Sand
573168	CPS18-075	3.00	4.50	1.50	UBI	1.400	UBI-Sand

Table 10.6 Summary of loose and compacted length-weighted average bulk densities. The grey shaded average *in situ* compacted bulk density measurements are used in the mineral resource estimations.

				Sample length-weighted averages	
Lithology	Count	Min. (g/cm^3)	Max. (g/cm^3)	Average loose bulk density (g/cm^3)	Average compacted bulk density (g/cm^3) [2]
Overlying waste material [1]	16	1.230	1.590	1.463	1.902
Lower Black Island	36	1.320	1.550	1.444	1.877

[1] Combined Pleistocene glaciofluvial, Upper Black Island, and Black Shale

[2] Compacting using a 30% bulking factor (see text for references).

11 Sample Preparation, Analyses, and Security

11.1 Sample Collection, Preparation and Security

11.1.1 CPS Drill Program Sample Collection

Core samples were collected from all sonic drillholes that recovered subsurface geological material, including 3 subunits of the Winnipeg Formation (LBI, BS, and UBI) and the overlying Pleistocene glaciofluvial (Pgf). The primary sampling objective for the Wanipigow Sand Project was to collect a sample from all subsurface lithological materials that had a sand content of greater than 30%, omitting visual geological horizons that had a high modal abundance of clay, mudstone, or shale.

All core logging data including collar location, geological observations and sample information was captured on paper logs and then transferred to a digital format by APEX geologists under the supervision of Ms. Hough. The digital logs were checked for accuracy before being imported into the MicroMine drill database, which was then re-validated in MicroMine to be used in the resource.

The Pleistocene glaciofluvial and sandstone samples were collected in 1.5 m increments; occasionally, it was necessary to shorten or lengthen the channel sample length based on lithological changes (i.e., geological contacts). In instances were geological contacts influenced the sample length; shorter sample increments were collected up to the contact (if necessary) at which point a new 1.5 m sample run was initiated downhole from the new lithological unit. Of the sample lengths that do not conform to the standard 1.5 m sample length standard, the minimum and maximum sample lengths were 0.40 m and 2.60 m.

The initial core geotechnical work included 1) Removing the core sample from the sonic core barrel in its plastic ‘sleeve’ and lay the core out on a flat surface, 2) Cut and remove the plastic sleeve in a manner that did not degrade the integrity of the drill core, 3) Photograph the core in its ‘original’ state, 4) Measure the core and document any areas of lost core, 5) Log the core using the lithological units described in Section 7.2, Property Geology, and 6) Prepare the core for sampling by splitting the core along the length of the sample with a putty knife into 3 representative ‘channel’ samples or splits.

The 1.5 m composite channel samples for each of the core splits (n=3 samples/1.5 m core length) were placed into separate plastic bags labelled with: 1) sample ID; 2) drill hole ID; and 3) sample interval. The sample interval included the sample designation; that is, the 3 splits were designated as 1) ‘TPS Lab samples’, which were shipped to TPS for gradation and/or proppant characterization testing, 2) ‘Archive samples’ to be archived internally by CPS, and 3) ‘Internal samples’ to be archived internally by CPS for future check-work or QA-QC work.

Sample IDs were recorded on the outside and inside of the sample bag. Inside sample IDs were done inserting a waterproof sample ID tag into each bag. Internal and external sample IDs were constructed at the same time to ensure both tags were given identical sample IDs. All 3 sample bags (representing lab, internal and reference samples from a single sample site) were sealed with a cable tie.

Samples designated as lab samples were loaded into plywood shipping crates by the on-site geologists who maintained the chain of custody from the core sample site to camp to the laboratory (TPS). The crate was then sealed, and tamper evident security tape was affixed to four sides. The crate seals were then photographed. The shipping crate was picked up from the core shack by Gardewine Transport from Winnipeg, MB and delivered to TPS to undergo laboratory test work (gradation and proppant characterization testing). CPS's geological contractors managed the entire sample collection process including logging and sampling, onsite sample management, and either overseeing loading of the samples on a transport truck to be sent to the laboratory (TPS) or transporting the samples to CPS's storage facility located at the Wanipigow Sand Project.

In addition to these 3 sample splits collected for every approximately 1.5 m of core, a 4th sample called a 'reference sample' was collected randomly approximately every 50 samples to serve as a representative field duplicate. In total 15 field duplicates were taken during the 2018 drill program. Samples designated as reference samples were placed into labelled plastic crates and stored onsite in a locked sea can at CPS's onsite storage facility.

11.1.2 Sample Collection for Gradation Analysis

A total of 761 samples from the 2018 drilling program were collected and delivered to Turnkey Processing Solutions (TPS) in Ottawa, IL for gradation analysis, including:

- 450 of Pleistocene glaciofluvial or surficial deposits consisting of glaciofluvial, glaciolacustrine and re-worked UBI material.
- 57 from Upper Black Island or UBI.
- 17 from Black Shale or BS.
- 237 from Lower Black Island or LBI.

In addition, Quality Assurance – Quality Control (QA-QC) samples were collected and analyzed to test precision and accuracy of duplicate sample pairs for gradation and crush resistance (and at multiple labs: TPS, Stim-Lab and Lonquist). The objective of this section is to describe the sample collection, preparation, chain-of-custody, analytical procedures, and results of the QA-QC work.

None of the samples collected from the 2022 program were analyzed for gradation analysis.

11.1.3 Sample Collection for Geochemical Analysis

In 2021, 18 composite LBI sand samples were re-sampled from archived core samples based on physical and textural variations of the LBI sand. A representative portion of each sample was collected by 1) shaking the archive sample bags, 2) shoving a 50 mm PVC pipe (outside diameter) into the bag and right to the bottom of the bag, 3) covering the PVC pipe end and removing from the archive bag, and 4) adding the representative sample to the new composite sample.

11.1.4 Samples Collection for Mineral Processing Test Work.

In 2021, CPS collected LBI sand material from drillholes CPS18-018, CPS18-019, CPS18-024, CPS18-025, and CPS18-071, which is defined as the resource area being estimated in this Technical Report. A total of 30 samples were collected representing a 44.55 m interval of LBI sand. The samples were collected using the same methodology described in the geochemical analysis sampling program in the previous sub-section. The samples were shipped directly from the Wanipigow Property site to CM.Project.Ing GmbH and Industrial Minerals International in Germany for beneficiation test work.

During 2022-2023, CPS commissioned Hazen Analytical Laboratory (Hazen) to conduct a Phase 1 variability study to evaluate the potential to produce low-iron glass sand from the Wanipigow Property LBI sand. Representative LBI sand samples were collected from archived 2018 drill core and 2022 drilling material representing 64 core interval samples from 23 separate drillholes. The 64 sand samples, which weighed up to 10 kg, were provided to Hazen by CPS.

During 2022, CPS obtained Government of Manitoba Work Permit 2020-05-66-012 to collect a representative bulk sample of LBI silica sand using an excavator. An approximately 3 tonne sample of LBI sand was collected at Drillhole CPS18-018 at UTM coordinates 686073 m Easting, 5672819 m Northing (see Section 10). The sand was placed into a series of super sacks and amalgamated into a single composite sample by CPS for shipping. The bulk sand sample was used during 2023 Phase 2 beneficiation test work with the objective to produce 800 kg of Wanipigow glass sand with an iron grade of less than 100 ppm for glass melt tests. The bulk sample was shipped to Hazen, who in turn, shipped the sample to Northern Analytical Laboratory LLC (Northern Analytical).

11.2 Analytical Procedures

11.2.1 Laboratory Accreditations

Turnkey Processing Solutions is a third-party independent lab that provides mineral processing solutions for the mining, sand, aggregate, and bulk material handling industries. The analytical work is reviewed and approved by a Professional Engineer and the analytical methods carried out by the laboratory is standard and routine in the field of silica sand and proppant characterization test work and are pursuant to ISO 13503-2.

Stim-Lab is a third-party independent lab that has certified Professional Engineers and cite recognized ASTM specification for laboratory preparation, analysis, and reporting (i.e., ISO 17025:2005 in North America offering ISO 13503-2, ISO 13503-5, API RP19C and API RP56 tests for sand resin coated sand and engineered ceramic proppants).

Lonquist Frac Sand Services is a third-party independent lab with offices throughout North America that have been providing testing services to the sand, aggregate, and evaporite mining industries since 2011 and frac sand testing services meet API and ISO standards.

Glass sand geochemical and/or beneficiation studies were conducted by laboratories with experience in mineral sands metallurgical test work and include 1) the Institut für Glas- und Rohstofftechnologie (IGR) in Göttingen, Germany, 2) IHC Robbins (IHC) in Yatala, Australia, 3) Saskatchewan Research Council (SRC) in Saskatoon, SK, 4) cm.project.ing GmbH (CMP) in Jülich, Germany and Industrial Mineral international (I.M.I.) in Aachen, Germany, 5) Northern Analytical Laboratory LLC (Northern Analytical) in Londonderry New Hampshire, U.S., and 6) Hazen Analytical Laboratory in Golden, Colorado, U.S.

IGR is accredited to DIN EN ISO / IEC 17025: 2018. IHC is accredited with ISO 45001 and ISO 9001 Quality Management System. The SRC is accredited in accordance with ISO/IEC 17025:2017. CMP is an independent, international holistic glass plant engineering company. Northern Analytical is accredited to ISO/IEC 17025:2017 by the ANSI National Accreditation Board and Nadcap Audit Criteria for Materials Testing Laboratories. Hazen Analytical Laboratory holds certifications from various state regulatory agencies and from the US Environmental Protection Agency (EPA).

A glass melt test was conducted by IGR Institut für Glas- und Rohstofftechnologie GmbH (IGR) in Düsseldorf, Germany. IGR is accredited to DIN EN ISO/IEC 17025:2005 (General requirements for the quality management system and the operation of testing and calibration laboratories).

Pellucere Technologies (Pellucere) of Springdale, Arkansas, U.S. conducted optical transmission and comparative reference measurements on coated glass samples. Pellucere specializes in nano-scale glass coating solutions that enhance performance, durability, and efficiency across a wide range of industries including solar, automotive, architectural, and aerospace.

11.2.2 Gradation Analysis

At TPS, the 761 samples were washed and dried. A subset of the sample was analyzed using a Camsizer P4 Particle analyzer. The Camsizer uses dynamic image analysis to conform to ISO 13322-2 and characterize dry free-flowing bulk materials. The Camsizer P4 simultaneously measures particle size and shape at high resolution. The resulting TPS Camsizer sieve results are reported in mesh size fractions: 16 (1.180 mm), 20 (850 µm), 25 (710 µm), 30 (600 µm), 35 (500 µm), 40 (425 µm), 45 (355 µm), 50 (300 µm), 60 (250 µm), 67.5 (221 µm), 70 (212 µm), 80 (180 µm), 100 (150 µm), 120 (125 µm), 137.5 (108 µm), 140 (106 µm), 200 (74 µm) and Pan (< 74 µm).

In addition to the 761 lab samples, a total of 33 field duplicate samples were analyzed at TPS using ‘anonymous’ sample IDs. The analyses were conducted using the identical analytical procedure as the 761-sample stream. The test work was conducted to test the precision of the gradation work conducted at TPS on duplicate, but anonymous, samples.

Lastly, 14 duplicate samples were sent to Stim-Lab for both gradation analysis and proppant characterization test work. The objective of this test work is QA-QC on proppant characterization between laboratories.

11.2.3 Geochemical Analyses

At the SRC, the composite LBI sand samples were homogenized, sieved to produce an analytical fraction of the fraction (20-140 mesh), and analyzed by: 1) whole rock SiO_2 by lithium borate fusion by ICP-OES, and 2) trace elements by ICP-MS.

The whole rock SiO_2 by lithium borate fusion by ICP-OES utilized the following procedure:

- The sand samples were dried in their original plastic bags and then jaw crushed. A subsample was split out using a riffler. The subsample was pulverized using a grinding mill (puck and ring or agate, depending on the sample). The grinding mills were, at minimum, cleaned between samples, silica sand cleaning was employed in between groups. The pulp was transferred to a barcode labeled plastic snap top vial.

- An aliquot of sample was combined with flux and fused in the Claisse Ox Automatic Fusion Machine. The Ox places the sample and flux in the oven, mixes the sample, then pours the molten material into dilute HNO3. The solution was then topped up and analyzed by ICP-OES.

- Instruments were calibrated using certified commercial solutions. The instruments used were Optima 5300DV or Optima 8300DV.

The multi-element determination of sandstone samples by ICP-MS utilized the following procedure:

- The sand samples were dried in their original plastic bags overnight and then jaw crushed. A subsample was split out using a sample riffler. The subsample was pulverized using an agate grinding mill. The pulp was transferred to a barcode labeled plastic snap top vial.
- An aliquot of pulp was digested to dryness in a hot block digesting system using a mixture of ultra-pure concentrated acids HF:HNO3:HClO4. The residue was dissolved and made to volume using deionized water prior to analysis.

- The ICP-MS1 total digestion package detection limits are listed on the next page. Elements highlighted in blue are by ICP-OES, while the remaining elements are by ICP-MS. Instruments were calibrated using certified commercial solutions. The instrument used was Optima 5300DV and Perkin Elmer NEXION 2000.

11.2.4 Sand Beneficiation to Lower Iron Content

Between 2020 and 2024, CPS submitted numerous samples to various laboratories to conduct independent beneficiation test work on UBI and LBI sand (dominantly LBI sand) from the Wanipigow Sand Project. The laboratories included: Institut für Glas- und Rohstofftechnologie (IGR), CM.Project.Ing GmbH (CMP), Industrial Mineral international (I.M.I.), Hazen Research Inc. (Hazen), and Mineral Technologies Inc. (Mineral Technologies).

The beneficiation test work typically involved, thorough mixing of the sand sample, drying the sand, sieving to obtain 125 µm to 500 µm (i.e., 35 to 120 mesh) fraction for the test work, attrition scrubbing (e.g., consecutive washing and desliming or an attrition scrubber), shaking or bumping table, heavy mineral liquid separation (e.g., using acetylene tetrabromide–kerosene at 2.70 specific gravity), spiral concentrator gravity separation, and magnetic separator tests (e.g., Rare Earth Roll, Induced Roll Magnet).

During 2020-2021 (only), chemical treatment tests were conducted to further beneficiate the sand and included acid attrition (AA), hot acid leach (HAL), and numerous chemical reagents (oxalic, phosphoric, hydrochloric, sulfuric, and hydrofluoric acids).

Other lab work included Scanning Electron Microscopy - Energy-Dispersive X-ray Spectroscopy (SEM-EDX) analysis was performed on the heavy mineral grains at IGR.

Because the 2022-2023 beneficiation work is reported for the first time, the associated beneficiation test work analytical procedures are presented in the following text.

In 2021, the CMP and I.M.I test work process included: 1) treating the feed with an attrition machine to clean the quartz surfaces, 2) removal of the oversize +630 µm and the fines -125 µm fractions, such that the 125 µm to 500 µm (i.e., 35 to 120 mesh) fraction was used in the CMP and I.M.I. test work 3) density separation to separate heavy mineral particles (like Fe_2O_3, TiO_2 etc.), and 4) magnetic separation(s) to reduce the iron content.

The sand was analyzed for iron content in between each beneficiation test. Assay splits were pulverized in a ceramic (zirconia) mill. Each pulverized sample was analyzed for iron by AA using hydrofluoric acid digestion. Select samples were re-assayed using longer digestion times to ensure that all silica was dissolved into solutions which resulted in lower iron content. In cases where samples were re-assayed, the repeat results were used to determine if the sample met the less than 100 ppm iron specifications after processing.

During 2022-2023, the objective of the Phase 1 beneficiation LBI sand interval test work at Hazen was to determine if a target iron grade of less than 100 ppm could be achieved at bench-scale using various methods that included attrition scrubbing, sizing, gravity separation, and magnetic separation.

In August 2022 and as part of Phase 2 beneficiation work, CPS shipped a super sack of 3,084 kg of sand to Hazen in Golden, CO, USA. The initial screening and attrition scrubbing was completed by Hazen. During sample preparation, Hazen approached Mineral Technologies Inc. in St. Augustine, FL, USA to complete spiral release curve testing, IRM processing, IRM mass split testing, and IRM bulk processing on the representative Wanipigow LBI sand. The metallurgical labs used Northern Analytical Laboratories Inc. in Londonderry, NH, USA to validate the iron content of select final products.

A total of 1,752 kg of sand was processed using a combination of screening, attrition scrubbing, gravity separation, and magnetic separation. Assay splits of the bulk sample were pulverized in a ceramic (zirconia) mill and analyzed for iron by AA after a combination of hydrofluoric acid digestion and a four-acid digestion. The feed sand assayed 930 ppm iron. Selected samples were also sent to Northern Analytical Laboratories, Inc. (Londonderry, New Hampshire) for iron analysis by inductively coupled plasma - mass spectrometry (ICP-MS) after a combination of a hydrofluoric acid digestion and a four-acid digestion.

The bulk sample was wet screened at 500 x 125 µm in preparation for attrition scrubbing. The 500 by 125 µm fraction was dried, weighed, and a 100 g split was taken for AA analysis. Approximately 1,200 kg of 500 x 125 µm screened material was attrition scrubbed using a Quinn Process Equipment Co. one cubic foot attrition scrubber in 40–50 kg batches. Each batch was attrition scrubbed for 15 minutes at 60–70% solids. After attrition scrubbing, the material was screened at 125 µm to remove slimes. The 500 x 125 µm material was dried, weighed, and blended for subsequent gravity separation.

11.2.5 Glass Melt Test

Using the beneficiated bulk low-iron sand, a glass melt test was conducted by IGR, who produced CPS test flat glass samples as discussed in Section 13.

At Pellucere, a MoreSun® anti-reflective solar coating solution was applied on the CPS flat glass samples generated by IGR. The uncoated and coated CPS flat glass was subsequently tested for colour, physical properties, and Solar Weighted Transmittance as discussed in Section 13.

11.2.6 QEMSCAN Analyses

The QEMSCAN at the SRC Advanced Microanalysis Centre is built on an FEI Quanta 650 scanning electron microscope fitted with a field emission gun (10nm resolution) and dual Bruker XFlash 5030 energy dispersive spectrometers with a maximum throughput of 1.5Mcps. Operating conditions were set to 25Kv and 10nA beam current, measured in a Faraday cup at the sample surface. Data were collected in Particle Mineral Analysis mode with a point spacing of 4.76 µm. Raw X-ray energy spectra were compared to a mineral composition database customized for this project.

The modal mineralogy is calculated from the combined analysis of the back-scattered electron images and the mineral identification is from semi-quantitative point chemical analyses (EDS). The volumetric abundance of the minerals is converted to mass percent from density data for typical mineral compositions.

11.2.7 Proppant Characterization

TPS conducted Krumbein shape factor (roundness and sphericity) measurements and crush resistance tests on 40/70 and 70/140 fractions. In total, 665 Krumbein shape factor and crush resistance tests were conducted on: 1) single 1.5 m samples (i.e., the lab samples); and/or 2) on composite groupings of samples. Crush test work conducted to date at TPS includes 1) 263 tests were performed on LBI sand, 2) 2 on the BS unit, 3) 8 on UBI sand, 4) 209 on Pgf, or Pleistocene glaciofluvial, and 5) 173 on multi-unit composite samples.

In addition to crush test analysis, the 14 duplicate samples were sent to Stim-Lab and a set of 16 samples were sent to Lonquist for proppant characterization test work. The analytical procedure is described in the following text. Where applicable, QA-QC analytical results are discussed in Section 11.3.

Sphericity is the measure of how spherical a given proppant particle is. Roundness is the measure of the lack of sharp edges or angularity.

Crush Resistance is a measurement of the strength of a mass of screened, fines-free dry proppant to force applied over a fixed cross-sectional area, providing an equivalent stress to the proppant under test. The mass of proppant introduced to the crush cylinder is a function of its bulk density and the specified loading of 4.0 pounds per cubic foot. The load is applied in a controlled rate and held at the final test stress level for 2.0 minutes. The mass is re-screened to determine the number of fines generated by the applied stress, and the highest stress attained without producing more than 10.0% fines is the "K Number". As a QA-QC measure on the crush resistance test work, additional proppant characterization test work was conducted at Stim-Lab. This work included further testing on two separate split sets of 14 samples as described below:

1. A crush resistance laboratory check (n=14 sample fraction splits) in which Stim-Lab analyzed pre-washed 40/70 and 50/140 crush tests that were originally separated and analyzed for crush strength at TPS.

2. An identical set (i.e., same sample ID's) of 14 bulk samples for independent crush resistance test work at Stim-Lab. I.e., this sample set was not pre-washed and/or

sieve separated at TPS. The crush tests were also conducted on the 40/70 and 50/140 fractions.

Acid Solubility is a mass loss (gravimetric) test method that determines the degree of solubility of natural sand in a 12:3 blend of Hydrochloric and Hydrofluoric acids. The technique measures the resistance of potential proppant contaminants to acid attack, which may negatively affect proppant performance.

Turbidity is a method using transmittance or reflectance of light to measure the number of fines that are <200 mesh in diameter, including clay, silt, proppant fines, etc. A fixed mass of proppant is added to a fixed mass of deionized water, agitated, and the water is drawn off and measured in a turbidity meter.

11.2.8 Long-Term Conductivity and Permeability

A subset 40/70 and 50/140 fraction sample split of LBI sand was analyzed at Stim-Lab for long-term conductivity and permeability. The measurements were conducted in compliance with APIRP19D, which is the guideline procedure used for testing the long-term conductivity of proppant.

The conductivity and permeability data were acquired using the following specifications:

1. Conductivity was measured at pressures of 2000, 4000, 6000, 8000, and 10,000 psi closure stress and at 150 °F.

2. The test fluid for the conductivity testing was 2% KCl. Flow rates are controlled with a Bronkhorst Liqui-Flow® mass flow meter/controller. The test flow rates were cycled at ~2 mL/min, ~3 mL/min, ~3 mL/min, ~3 mL/min, and ~2 mL/min or to maintain a ΔP of at least a minimum of 0.002 psi. Each rate was maintained for 3 minutes. After the 15-minute cycle, the cell is switched to the next cell in the test series and the cycle repeated. During the non-monitoring time, the other cells are held at a constant flow of ~2 mL/min. Once data is collected on all cells, the cycle returns to the first cell in the test series and the above protocol continued. This schedule is maintained throughout the 50 hours of data collection at each stress.

3. Pack widths are measured every 5 hours and recorded as described in the 'Width Measurement' section.

4. The transducer zero is checked every 5 hours and if necessary is re-zeroed with a HART 475 Field Communicator.

5. The raw data is monitored in real time saving one point every 10 seconds. The relevant data collected is as followed: Flow rate (mL/min), ΔP (psi), and Temperature (°F). These are used with the Conductivity Equation ("Data Processing to Arrive at Conductivity and Permeability Values") to arrive at the calculated conductivity value.

To correct for the temperature effect on viscosity of 2% KCl, the Laliberté (2007) equation was utilized.

11.3 Quality Assurance – Quality Control

11.3.1 Field Duplicate Gradation QA-QC

The field duplicate test work was conducted to test the gradation analytical work conducted at TPS (n=33 field duplicates). The original lab samples were analyzed at TPS. Ms. Hough then collected an additional 33 field duplicates,15 of which included material from the reference sample splits plus an additional 18 samples from the internal samples (or CPS archive material). The duplicate samples were collected on January 22, 2019, by Ms. Hough, placed in a plastic bag labelled with a unique sample ID (i.e., other than the original sample ID) and shipped via FEDEX to TPS for gradation testing.

The field duplicate samples included: 11 Pleistocene glaciofluvial and reworked sand samples; 1 UBI sample; and 21 samples of LBI. An example of the original gradation analyses versus the field duplicate gradation analyses is presented in Figures 11.1. The comparison between the original and duplicate gradation analyses shows good to excellent correlation. Two of the 33 QA-QC gradation comparisons yield poor correlation results:

- CPS18-017 versus F-Dup-029 (Figure 11.1.AC), which may be attributed to Pleistocene glaciofluvial unpredictability.

- CPS18-063 versus F-Dup-033 (Figure 11.1.AG), which is an excellent sample of LBI and therefore the poor correlation may be attributed to analytical or data entry errors.

Nevertheless, this QA-QC test enables the QP to have a high level of confidence in the gradation data.

11.3.2 Multi-Lab Crush Strength QA-QC

A crush resistance laboratory check (n=12 samples) compared pre-washed 40/70 and 50/140 crush test fractions that were prepared at TPS – with a sample fraction split then crushed again at Stim-Lab. The results are presented in Table 11.1. Unfortunately, the 40/70 and 50/140 pre-prepared sample fractions had a limited amount of material such that incrementally higher crush tests at Stim-Lab were not possible. However, the results show there is general agreement in the crush test values. Several crush test measurements are close and demonstrate that the inter-lab crush test results are similar and hence there is no apparent concern with the crush test data generated by either lab.

Figure 11.1 Comparison of original gradation analyses versus field duplicate gradation analyses. Presented as size fractions.

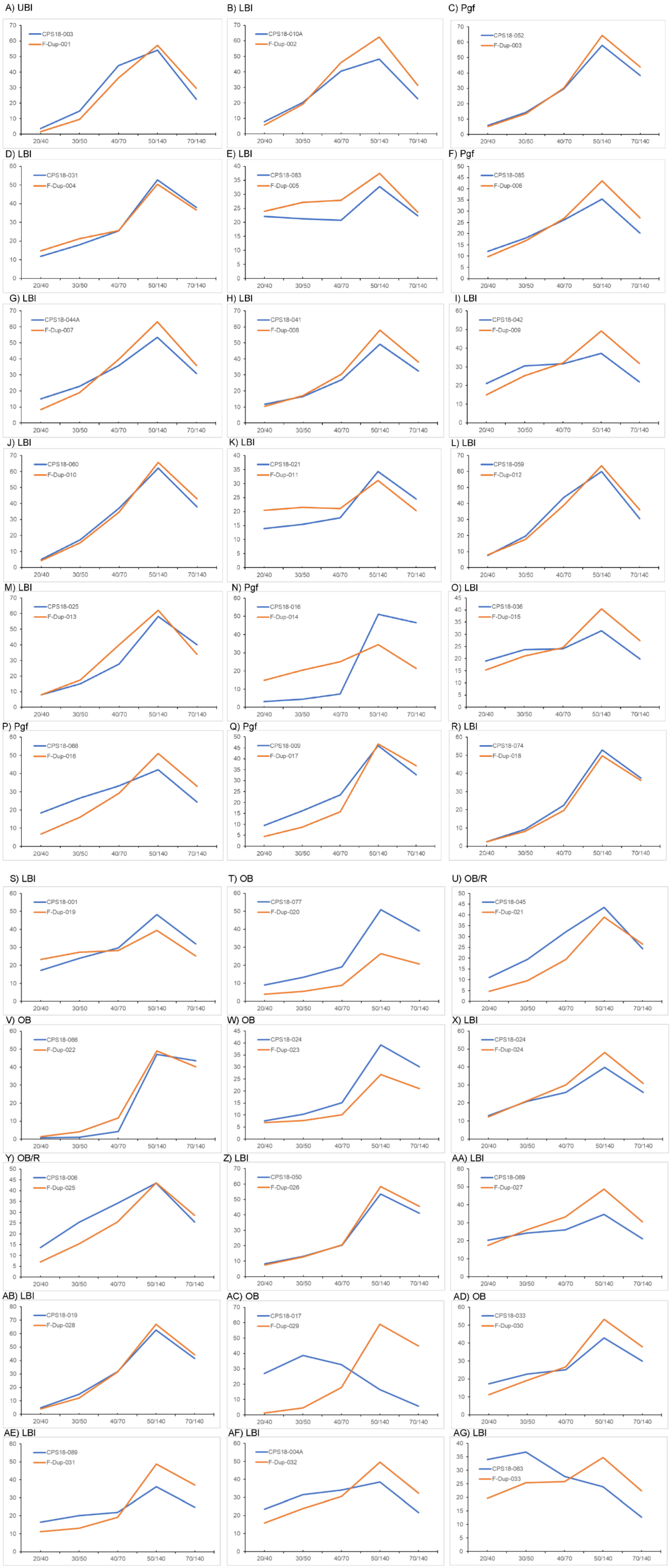


Table 11.1 Comparison of crush resistance test work that was conducted on 40/70 and 50/140 fractions that were pre-washed, sieved and split at Turnkey Processing Solutions LLC.

				Crush resistance (to 10% psi) [1]							
Sample ID	**Fraction**	**Geo-unit**	**Lab**	**4000 (psi)**	**5000 (psi)**	**6000 (psi)**	**7000 (psi)**	**8000 (psi)**	**9000 (psi)**	**10000 (psi)**	**11000 (psi)**
CPS18-002	40/70	Pfg	TPS	<------	11.0	18.3					
			Stim-Lab	<------	<------	18.1					
CPS18-010A	40/70	LBI	TPS			7.0	------>	------>			
			Stim-Lab			7.4	------>	------>			
CPS18-013	40/70	LBI	TPS			6.3	------>				
			Stim-Lab				<------	14.3			
CPS18-044	40/70	Pfg	TPS	<------	<------	13.5					
			Stim-Lab	<------	<------	19.0					
CPS18-045	40/70	Pfg	TPS	<------	14.3						
			Stim-Lab	<------	16.1						
CPS18-050	40/70	LBI	TPS			<------	11.3				
			Stim-Lab			<------	12.4				
CPS18-062	40/70	LBI	TPS			6.3	------>				
			Stim-Lab			9.9	----->				
CPS18-001	100-mesh	Pfg	TPS			<------	11.3				
			Stim-Lab			<------	13.1				
CPS18-004A	100-mesh	LBI	TPS						9.0	------>	
			Stim-Lab						7.0	----->	----->
CPS18-005	100-mesh	LBI	TPS						9.0	------>	
			Stim-Lab					6.6	----->	----->	
CPS18-012	100-mesh	UBI	TPS						9.8		
			Stim-Lab						7.8	----->	
CPS18-042	100-mesh	LBI	TPS					7.8	------>	------>	
			Stim-Lab					8.0	----->	----->	

[1] psi is pounds per square inch

▨ Highest stress level in which the proppant generates no more than 10% crushed material.

11.3.3 Independent Laboratory Check

In addition to the ‘multi-lab crush strength QA-QC’, the QP selected an identical set of bulk sample material for independent proppant characterization work at Stim-Lab. That is, the bulk sample material was collected on January 22, 2019, by R. Hough and was completed independent of the work conducted at TPS. Stim-Lab was then instructed to conduct proppant characterization test work on the exact same 40/70 and 50/140 splits as the material analyzed at TPS.

The details of the proppant test work are presented in Section 13, Mineral Processing and Metallurgical Testing, but a comparison of the compatible analysis conducted by TPS and Stim-Lab is discussed as part of QA-QC work. The results are presented in Table 11.2 and show good to excellent correlation. Despite TPS having fewer crush tests per sample because of sample amounts, the crush tests performed at TPS and Stim-Lab still correlate. Overall, this QA-QC test gives a high degree of confidence in the crush test work conducted.

11.4 Adequacy of Sampling and Analytical Procedures

The sample collection, preparation and security were conducted independently by APEX geologists under the supervision of Ms. Hough P. Geo. who was onsite for the drill program and ensured that sampling and chain of custody consistency and protocols were maintained during the entire 2018 Wanipigow silica sand drill program.

Table 11.2 Comparison of TPS and Stim-Lab crush resistance test work that was conducted on 40/70 and 50/140 fractions with both labs using original bulk sample material.

			Crush resistance (to 10% psi)[2]								
Sample ID[1]	Fraction	Geo-unit	4000 (psi)	5000 (psi)	6000 (psi)	7000 (psi)	8000 (psi)	9000 (psi)	10000 (psi)	11000 (psi)	12000 (psi)
CPS18-002	40/70	Pfg	<------	11.0	18.3						
L-Dup-002			<------	10.6	14.5						
CPS18-010A	40/70	LBI			7.0	------>					
L-Dup-005				4.5		8.4	12.3				
CPS18-013	40/70	LBI			6.3	------>					
L-Dup-007				3.0			9.7	12.3			
CPS18-044	40/70	Pfg		<------	13.5						
L-Dup-010				8.1	12.8						
CPS18-045	40/70	Pfg	<------	14.3							
L-Dup-011			7.7	12.3							
CPS18-050	40/70	LBI			<------	11.3					
L-Dup-012				3.9		8.9	12.3				
CPS18-062	40/70	LBI			6.3	------>					
L-Dup-013				3.5	5.8	Ran out of material					
CPS18-001	100-mesh	Pfg			<------	11.3					
L-Dup-001				5.1	7.7	11.1					
CPS18-004A	100-mesh	LBI						9.0	------>		
L-Dup-003				1.6						9.3	13.5
CPS18-005	100-mesh	LBI						9.0	------>		
L-Dup-004				1.6					9.8	12.3	
CPS18-012	100-mesh	UBI						9.8			
L-Dup-006				1.9				8.8	10.2		
CPS18-031	100-mesh	LBI				<------	<------	16.3			
L-Dup-008				4.9		9.9	11.0				
CPS18-042	100-mesh	LBI					7.8	------>	------>		
L-Dup-009				2.5				9.9	12.5		

[1] 'CPS' samples analyzed at Turnkey Processing Solutions; 'L-Dup' samples analyzed at Stim-Lab.

[2] psi is pounds per square inch

▨ Highest stress level in which the proppant generates no more than 10% crushed material.

In addition, the QP has reviewed the adequacy of the sample collection, preparation and security and found no significant issues or inconsistencies that would cause one to question the validity of the data.

The laboratories that carried out the test work are independent laboratories. The analytical methods carried out by the laboratory is standard and routine in the field of silica sand and proppant characterization test work. The QA-QC tests conducted on the gradation data and crush tests enabled the QP to have a high level of confidence in the laboratories, and precision and accuracy of the gradation data and crush resistance of sand from the Wanipigow Sand Project. In turn, the QA-QC provides confidence of the dataset used in the resource estimation presented in this Technical Report and in assessing the quality of the Winnipeg Formation silica sand.

12 Data Verification

12.1 Drilling Validation and Verification

CPS's 2018 and 2022 drill programs were managed by independent geological consulting company's, APEX Geoscience Ltd. and Edge Engineering and Geoscience Ltd. The QP reviewed all drill-related reports to validate the drilling programs. The sonic drill rig is the appropriate drill and industry standard practice for recovering unconsolidated clastic material that includes silica sand deposits. The resulting core recovery captured between 78% and 100%, and generally 94% of the downhole sand for most holes.

All data pertaining to the drill programs, including drilling notes, geotechnical work, photographs, drill logs, samples, and chain of custody notes, were documented by independent geologists. The associated drill information and reports were observed by the QP either in hard copy or electronic formats by the QP. Drill information such as the drill collars, drill log lithological contacts, and sample locations were entered into Micromine.

The QP verified the 2018 and 2022 drill collars by comparing the collar elevations recorded in the drill logs to the LiDar-generated bare-earth surface topography survey. In instances where there were minor elevation discrepancies, the QP deferred to the LiDar survey, which has 1 m resolution. Only minimal elevation changes were observed.

The drill log lithological contacts and the gradation data were entered into Micromine and used in tandem to wireframe the boundaries of the LBI sand and UBI sand units. In instances where the contacts and gradation data did not match, the QP reviewed the mis-match and made contact corrections as necessary and only in defendable instances.

An example of re-orientating the LBI sand contact is presented in Figure 12.1. In this example, the stratigraphic review made some minor adjustments to the LBI tops and bottoms within one of the glass sand resource areas. These adjustments were later verified based on aligning the revised stratigraphic contacts with the gradation information.

12.2 Analytical Data Validation and Verification

The analytical laboratory data was reviewed by the QP who compared electronic gradation, proppant characterization, bulk density, and other measured data against the original laboratory files or reports. Any inconsistencies between the analytical data were flagged and reviewed. The QP discussed analytical protocols and analytical work with TPS and Stim-Lab laboratory managers. No issues in the analytical results were noted.

With respect to mineral processing information, the QP received internal reports that were prepared on behalf of CPS by the various laboratories. The QPs verification procedure included reviewing, and in most instances, manually transferring the beneficiation studies methodology and analytical results, glass melt test results, and anti-reflectance solar glass test results into electronic form. The QP further reviewed the data transfer values and found minor errors which were corrected to values presented in the original internal reports. The glass melt test analytical results and analytical calculations were presented as raw values in the internal report; however, the resulting values were not discussed in the context of an evaluation of the results. In these instances, the QP researched test glass information and provided some context on the quality of the results in this technical report.

12.3 Verification Limitations

A limitation of the drill program resulted from localized difficulties in drilling through Pleistocene glaciofluvial material, and occasionally obtaining complete, continuous cored intervals of Winnipeg Formation sand. To remedy this, the on-site independent geologists re-drilled logistically challenged drillholes to obtain a complete interval of the Winnipeg Formation sand. In these instances, the drill was collared directly adjacent to the original drillhole and re-drilled. This approach was successful, and overall, the drill program sampling achieved a 94% core recovery rate.

12.4 Adequacy of the Data

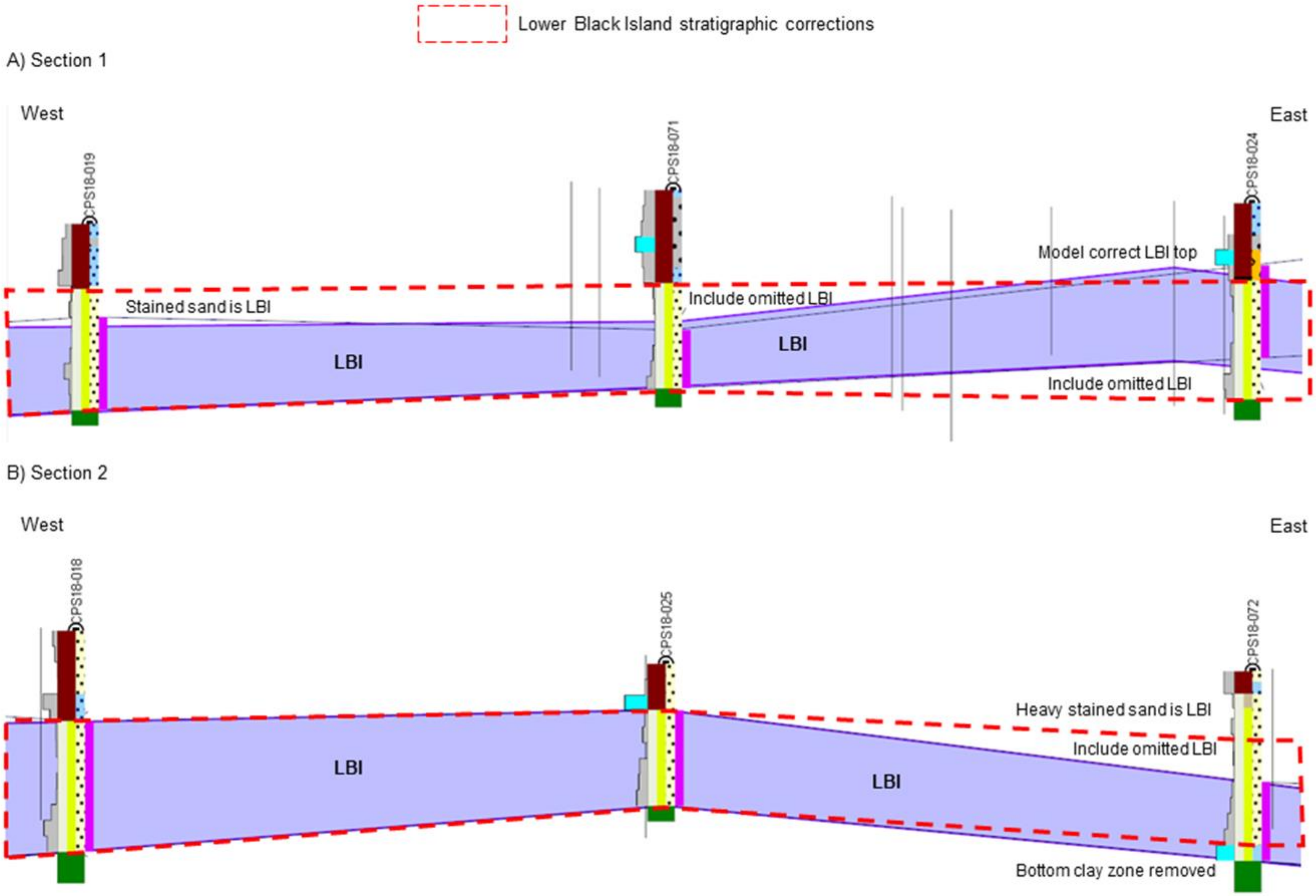
To conclude, it is the opinion of the QP that all activities relating to the 2018 and 2022 drill programs at the Wanipigow Sand Project, including drill documentation, sample collection and sample preparation procedures, analytical methods, and chain of custody, were conducted using proper methods and industry standard practices. Hence, the QP has found no significant issues or inconsistencies that would cause one to question the validity of the data.

The mineral processing analytical results and data were prepared by independent laboratories that specialize in beneficiation testing, glass melt tests, and anti-reflective solar coatings. The information and data presented in internal reports to CPS has been accurately transcribed from the original source by the QP and is suitable for use in this technical report.

It is the opinion of the QP that the core recovery limitation was largely resolved by independent geologists overseeing the drill programs. The overall influence of the non-core-recoverable samples (only 6%; see text above) was minimal on the resulting gradation dataset. None of the lost core occurred at significant lithological contacts and the drill density was enough that limitations to the development of the three-dimensional geological model and resource estimation lodes (wireframes) were insignificant and in no way influence the resource estimation process.

To conclude, the QP is satisfied to include all data generated into the delineation of the Wanipigow Sand Project mineral resource areas, and the resource modelling, evaluation, and estimations presented in this technical report.

Figure 12.1 Revised cross-section in the main glass sand resource area based on a review of the 2018 drill logs and core photos.



13 Mineral Processing and Metallurgical Testing

CPS has conducted numerous tests on the Wanipigow LBI sand to assess its potential for use in the solar glass manufacturing industry. The test work has generally been conducted over a period of 5 years from 2020 to 2024 and included numerous laboratories and/or third-party contractors.

Hence, this Section contains 3 separate sub-sections that include,

1. Section 13.1 – CPS's designation of low-iron sand for glass manufacturing (including solar glass).
2. Section 13.2 – CPS's 2020 to 2021 sand and sand beneficiation test work, which includes a general summary of the mineral processing test work included in CPS's previous technical report (Eccles and Hough, 2021).
3. Sections 13.3 – CPS's 2022-2024 LBI sand test work, which includes CPS's advanced sand beneficiation test work, bulk low-iron sample preparation, and glass melt test and anti-reflective solar coating glass test.

13.1 CPS' Designation of Low Iron Sand as an Assessment of Quality

High-silica-purity sand is imperative to the production of clear glass, and critical to the manufacturing of solar glass products. Low iron content is essential to produce clear glass and to ensure maximum light transmission. Iron oxides in the sand can discolor the glass and reduce its transparency and solar glass needs to transmit more than 91% of light in the visible and near-infrared spectrums.

Hence, low iron content in the silica sand feed source is imperative to ensure maximum light transmission, and low-iron specifications – as an assessment of quality – apply to both the original sand source and the iron content of the resulting melted glass.

In the glass industry, iron is specified as Iron (III) oxide, or ferric oxide, the inorganic compound with the formula Fe_2O_3.

CPS has selected minimum and desirable LBI sand iron levels that include:

- ≤100 ppm iron for the silica sand source feed, and
- ≤120 ppm iron within glass melt test samples.

CPS's minimum iron contents are based on the Company's discussions with independent third-party contractors and by acquiring global sand source specifications, which in the glass manufacturing industry, are often proprietary (Table 13.1).

Table 13.1 Select examples of silica sand and glass melt iron content.

Business	Company, Country	Silca sand (final) iron content for solar glass manufacturing	Source
Silica sand supplier	Radhey Shyam Group, India	Approx. 100 ppm	Radhey Shyam Group (2025)
	Metallica Minerals Limited, Australia	70 ppm	Metallica Minerals Limited (2021)
	Sinonine Co. Ltd., China	100 ppm	Made-in-China (2025)
	Sio Silica Corp., Canada	<100 ppm	Sio Silica Corporation (2025)

Business	Glass Manufacturer	Melt glass iron content for solar glass manufacturing	Source [1]
Solar glass manu-facturer	Company A	≤120 ppm	Canadian Premium Sand Inc. (pers. comm., 2025)
	Company B	<150 ppm	
	Company C	<120 ppm	
	Company D	≤120 ppm	

[1] The QP obtained proprietary competitor company information from CPS as part of due diligence to evaluate the quality of the Wanipigow Sand Project LBI Formation sand.

With respect to source silica sand feed, specific publicly-available information related to the iron content of the in-place, un-processed, source sand is not common. In the QPs opinion, this is largely due to knowledge that 1) most sand deposits must be beneficiated to remove iron grains and particles to achieve low-iron sand that is sufficient for glass manufacturing, and especially for solar glass products, and 2) most sand producers disclose the beneficiated low-iron sand iron value(s).

Hence, the iron content of silica sand feed product in solar glass manufacturing is generally stated as sand that contains less than 0.01% iron, or 100 ppm iron (e.g., Nandaniya, 2024). Select comparative sand deposit examples of companies that provide low-iron silica sand for solar glass manufacturing have iron values that range between 70 ppm and 100 ppm iron (Table 13.1).

Select company comparative glass melt iron content examples range between <120 ppm and <150 ppm iron for glass incorporated in the solar industry (Table 13.1).

CPS’s determination of target low-iron silica sand and glass melt correlates with the public and proprietary iron values presented in Table 13.1. Accordingly, CPS’s mineral processing objectives were to meet these low-iron levels for the Wanipigow LBI silica sand during the Company’s beneficiation test work and in an initial glass melt test.

Iron values of ≤100 ppm and ≤120 ppm iron for the silica sand source feed and glass melt test samples, respectively, also provide the QP with low-iron values as an assessment of quality, and hence, reasonable prospects of eventual economic extraction.

13.2 2020-2021 Sand Mineralogy and Sand Beneficiation Test Work

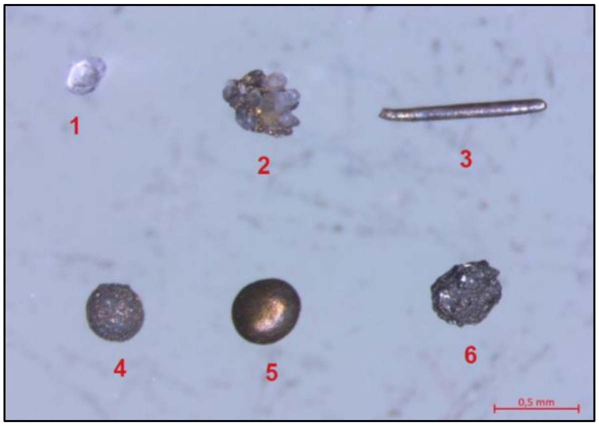
13.2.1 IGR Beneficiation Test Study #1

During 2020, CPS commissioned the Institut für Glas- und Rohstofftechnologie (IGR) to conduct independent beneficiation test work on the Wanipigow LBI sand. This sub-section describes the IGR work as reported by Thies (2020). IGR received a 13.75 kg sample of LBI sand as a composite sample from CPS.

The LBI sand was sieved with to <0.71 mm fraction (20-mesh) and subjected to a magnetic separator, to eliminate magnetic particles. This procedure was performed 3 times, and a mass of 280.9 g was removed from the overall sample. Geochemical analyses of the resulting sample yielded 185 ppm Fe_2O_3.

A 4.9 kg subset sample was subjected to an attrition exercise using a modified bumping table with a pore size of >40 µm. The resulting fraction was dried and enriched a second time using a gravity separation solution (sodium polytungstate (SPT), $\rho = 2.8$ g/cm^3). The sedimented heavy mineral fraction was washed and dried (0.1943 g) with all heavy minerals being non-magnetic. A separation of the heavy minerals showed that the sample contained at least 6 different particles (Figure 13.1). SEM-EDX analyses was performed on the heavy mineral grains, which yielded copper, zinc, sulphur, and iron chemical compositions. The heavy minerals occur with titanium and adherent areas with the element silicon or wires with the elements copper and zinc. Brass could could related to the processing equipment.

Figure 13.1 Six particle groups of typical heavy minerals. Magnified at 7.5x.



The test work showed that the heavy minerals could be alleviated by using the bumping table. The isolated particles with a high zirconium and silicon content could possibly lead to inclusions in a glass melt. Sulphur/iron compounds, possibly pyrite, could be removed by a further wet treatment by using a jet scrubber. The magnetic separation method can remove a moderate mass of magnetic particles (in combination with sand) from the sample.

In addition to preliminary beneficiation test work, the Wanipigow sand was used to create a typical soda-lime flint glass batch for a melting test. To compare the results, a second batch was created using an IGR internal sand (with 0.014 wt. % Fe_2O_3). The melting test was performed with 1250° C for 24 hours. The melting test sample was visually compared at the beginning of the melting process and again at the end of the process as a cold glass.

In the first part of the melting process, the Wanipigow sand showed no differences in comparison to the IGR internal sand. The resulting molten glass samples were visually very similar; both showed a comparable number of bubbles on the surface with no inclusions. The colour of both samples was largely identical with the Wanipigow sand having a slightly more yellowish shade.

To conclude, the melting test with a batch with the Wanipigow sand showed no remarkable differences to a typical soda-lime flint glass batch. Slight differences in the shading of the molten glass could be detected, as well as an increased number of seeds and cords in the glass. These differences were only very weakly pronounced and can be seen as typical differences for different sands used in soda-lime batches.

13.2.2 IGR Beneficiation Test Study #2

A second test study was performed at IGR using Wanipigow LBI sand from 3 drillholes that were drilled within the main glass sand resource area. The information in this sub-section is from an IGR report prepared by Günther (2020). The 3 sand samples include:

- A 13.80 kg composite sample of LBI sand from drillhole CPS 18-18 collected between depths of 10.5 m and 19.5 m.

- A 14.00 kg composite sample of LBI sand from drillhole CPS-18-19 collected between depths of 10.5 m and 18 m.

- A 13.85 kg composite sample of LBI sand from drillhole CPS 18-24 collected between depths of 10.5 m to 15 m and 16.5 m to 19.5 m.

The samples were thoroughly mixed, run through a bumping table, and a magnetic separator. The sand was dried and the >0.71 mm fraction was separated by sieving. The <0.71 mm fraction was then subjected to 3 runs over the magnetic separator. Only the 0.125 mm to 0.71 mm (120-mesh to 20-mesh) sand fraction was analyzed. Using this methodology, the iron content of the CPS-18-024 sample was reduced to a value of 130 ppm Fe_2O_3. Sample CPS-18-024, which underwent additional magnet separation, further reduced the iron to -91%.

A second melting test was conducted by IGR using 0.01 g of the original grains from all 3 samples. A typical soda-lime-white glass mixture was used as the base and an internal IGR reference sand was used in each test for comparison. The test was carried out for 6 hours at 1300 °C. When the results were examined under the microscope, no relics of un-melted grains were observed.

13.2.3 IHC Robbins Beneficiation Test Study

CPS commissioned IHC Robbins (IHC) to complete metallurgical development test work on a representative bulk sample derived from the Wanipigow silica sand deposit. This sub-section includes data and analytical results of this work as prepared by Verburg (2020). CPS provided IHC Robbins with a 200 kg bulk composite sample deemed to be representative of the Wanipigow silica sand deposit. The sample was collected using an excavator near drillhole CPS-18-072 at depth of approximately 2.7 m below ground surface.

IHC conducted gravity separation and magnetic separation test work and concluded that the contaminants (Fe_2O_3, Al_2O_3, CaO+MgO) are probably chemically bound to SiO_2. Small scale Acid Attrition (AA) and Hot Acid Leach (HAL) tests were conducted to determine if a sand product with lower Fe_2O_3 contamination was achievable. The AA was conducted at 75 kg/t H_2SO_4 at 75% solids with a 10-minute retention time. The HAL was conducted at 30 kg/t H_2SO_4 at 75% solids and a 90-minute retention time at 180°C.

The small-scale AA and HAL analytical results demonstrated the AA and HAL methods effectively removed Fe_2O_3 along with some Al_2O_3:

- The AA method increased silica to 99.31% SiO_2 and decreased iron and aluminum to 0.0295% (295 ppm) Fe_2O_3 and 0.3125% (3,125 ppm) Al_2O_3.

- The HAL method increased silica to 99.43% SiO_2 and decreased iron and aluminum to 0.0167% (167 ppm) Fe_2O_3 and 0.2733% (2,733 ppm) Al_2O_3 (Table 13.2).

Table 13.2 Small-scale chemical beneficiation test work.

A) Chemical beneficiation by Acid Attrition

SiO_2 (%)	Fe_2O_3 (%)	Al_2O_3 (%)	Cao (%)	K_2O (%)	MgO (%)	TiO_2 (%)
99.305	0.0295	0.3125	0.0205	0.188	0.0055	0.016

B) Chemical beneficiation by Hot Acid Leach

SiO_2 (%)	Fe_2O_3 (%)	Al_2O_3 (%)	Cao (%)	K_2O (%)	MgO (%)	TiO_2 (%)
99.43	0.0167	0.2733	0.02	0.1837	0.004	0.013

13.2.4 CMP and IMI Beneficiation Test Study

During July-August 2021, CPS commissioned CM.Project.Ing GmbH (CMP) and Industrial Mineral international (I.M.I.) in Aachen, Germany to conduct further beneficiation testing (cm.project.ing GmbH, 2021). The test work was conducted on 30 LBI sand samples representing a 44.55 m interval of LBI sand collected from archive samples from 5 drillholes within the glass sand resource area, which included CPS18-018, CPS18-019, CPS18-024, CPS18-025, and CPS18-071.

The test work process included: 1) treating the feed with an attrition machine to clean the quartz surfaces, 2) removal of the oversize +630 µm and the fines -125 µm fractions, such that the 125 µm to 500 µm (i.e., 35 to 120 mesh) fraction was used in the CMP and I.M.I. test work 3) density separation to separate heavy mineral particles (like Fe_2O_3, TiO_2 etc.), and 4) magnetic separation(s) to reduce the iron content.

The mechanical beneficiation results performed by CMP and I.M.I. show that the Wanipigow sand can be reduced to 100 ppm Fe_2O_3 and increased to 99.5% SiO_2 through the simulation of a continuous beneficiation process using attrition, grain size classification, density separation, and magnetic separation (Table 13.3). The Al_2O_3 content was reduced by attrition with consecutive washing and desliming. The TiO_2 content was reduced through attrition, but all processing steps helped to reduce titaniferous particles. The K_2O content is well below critical values for quality glass, as are Na_2O, MgO, CaO and BaO, which were below the detection limit in all sand analyses.

The mechanically treated sand sample was further subjected to chemical treatment using numerous chemical reagents (oxalic, phosphoric, hydrochloric, sulfuric, and hydrofluoric acids). The sand-acid suspension was at a constant mixing rate of 800 rpm. All experiments, except for Test 10, were conducted at atmospheric pressure and a temperature of 85 °C. Test 10 was conducted at 25 °C with hydrofluoric acid. After leaching, the leach solution was decanted from the leach residues (the purified quartz product). The quartz product was washed multiple times, dried overnight at 80° C, weighed, and analyzed.

The analytical results of the mechanical plus chemical test programs are presented in Table 13.4. The content of Fe_2O_3 was reduced to 60 ppm with an extraction efficiency of 40% in the oxalic (0.1M; 0.3M), sulfuric (0.5M; 2.5M), phosphoric (0.5M; 2.5M), hydrochloric (2.5M) and hydrofluoric acids (0.5M) test. Hence, the oxalic, sulfuric, and phosphoric acid at the concentration of 0.5M could be selected for the further leaching experiments that involve further study of leaching temperature, acid concentration, mixing rate and L/S ratio. A maximum silica content of 99.7% SiO_2 was attained using phosphoric (0.5M; 2.5M) and oxalic acids (0.3M).

CMP and I.M.I. concluded that chemical treatment of the Wanipigow sand is recommended to ensure an iron content ≤120 ppm, which could beneficiate the sand to high-quality and for potential use in the solar glass industry.

Table 13.3 Summary of analytical results through the continuous mechanical test program.

Element	Feed sand (Ma. %)	After attrition 125-500 µm (Ma. %)	After density separation (Ma. %)	After magnetic separation 1st step (Ma. %)	After magnetic separation 2nd step (Ma. %)
SiO_2	96.3	99.4	99.5	99.5	99.5
Al_2O_3	1.44	0.13	0.1	0.11	0.09
Fe_2O_3	0.130	0.020	0.016	0.011	0.010
TiO_2	0.1	0.01	<0.01	<0.01	<0.01
K_2O	0.19	0.03	0.03	0.02	0.02
Na_2O	0.01	<0.01	<0.01	<0.01	<0.01
CaO	0.45	0.05	0.05	0.04	0.03
MgO	0.07	<0.01	<0.01	<0.01	<0.01
BaO	<0.01	<0.01	<0.01	<0.01	<0.01
P_2O_5	<0.01	<0.01	<0.01	<0.01	<0.01
L.O.I. 1025°C	1.2	0.2	0.2	0.2	0.2

Table 13.4 Summary of analytical results (Ma. %): Final mechanical result feed with additional chemical testing.

Test	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Acid	Oxalic	Oxalic	Sulfuric	Sulfuric	Phosphoric	Phosphoric	Hydro-chloric	Hydro-chloric	Sulfuric and Oxalic	Hydro-fluoric
Concentration [M]	0.1	0.3	0.5	2.5	0.5	2.5	0.5	2.5	2.5	0.5
Consumption [kg/t]	40.8	122.4	204.2	1,020.8	230.6	1,152.9	197.1	985.4	1,020.8	50.0
SiO_2	99.6	99.7	99.6	99.6	99.7	99.7	99.6	99.5	99.5	99.4
Al_2O_3	0.07	0.1	0.11	0.09	0.08	0.07	0.07	0.07	0.07	0.03
Fe_2O_3	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.006	0.007	0.006
TiO_2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
K_2O	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	<0.01
Na_2O	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CaO	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
MgO	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BaO	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
P_2O_5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
L.O.I. 1025°c	0.2	<0.1	0.1	0.2	0.1	<0.1	0.2	0.3	0.3	0.4

13.2.5 CMP Theoretical Batch Calculations

During October 2021, CM.Project.Ing GmbH (CMP) completed a batch calculation to simulate a solar glass melting furnace (Polishchuk, 2021). The calculation utilized a furnace batch mixture that included a 60% portion of Wanipigow LBI sand. Additional furnace batch raw materials included dolomite, limestone, and aragonite as varying sources of oxides (e.g., dolomite for MgO).

CMP reported that a theoretical calculation using 1) the mechanically treated Wanipigow Lower Black Island sand from within the glass sand resource area (i.e., 100 ppm Fe_2O_3, in conjunction with 2) aragonite, which is used as a substitute of limestone due to its clean Fe_2O_3 resulted in a theoretically calculated glass composition that comprised 98 ppm Fe_2O_3.

CMP concluded that the mechanical treatment of the Wanipigow LBI sand meet the specifications required to manufacture specialty solar glass products based on a sand glass feed iron market value of 120 ppm Fe_2O_3. CMP noted that the batch calculation result is 1) preliminary, 2) based on the chemical composition of theoretical materials being added to the Wanipigow feed sand, and 3) describes expected oxide concentration levels in the final glass product.

Additional, detailed test sets are required on a bulk sand sample (e.g., 500 kg) with the actual raw materials. These tests will include sand analyses after the industrial treatment tests, glass melting tests that include optimization phases, and chemical composition analyses of the final glass product.

13.3 2022-2024 Beneficiation and Glass Test Work

13.3.1 Introduction

During 2022-2024, CPS conducted a series of tests on sand from the Wanipigow Sand Project to assess its applicability for use in solar glass manufacturing and products. The mineral processing work included beneficiation of LBI sand to lower iron content, glass melt tests, and evaluation of the CPS flat glass in anti-reflective solar coating applications.

Two separate phases of beneficiation were conducted by Hazen Research Inc. (Hazen) and Mineral Technologies Inc. (Mineral Technologies).

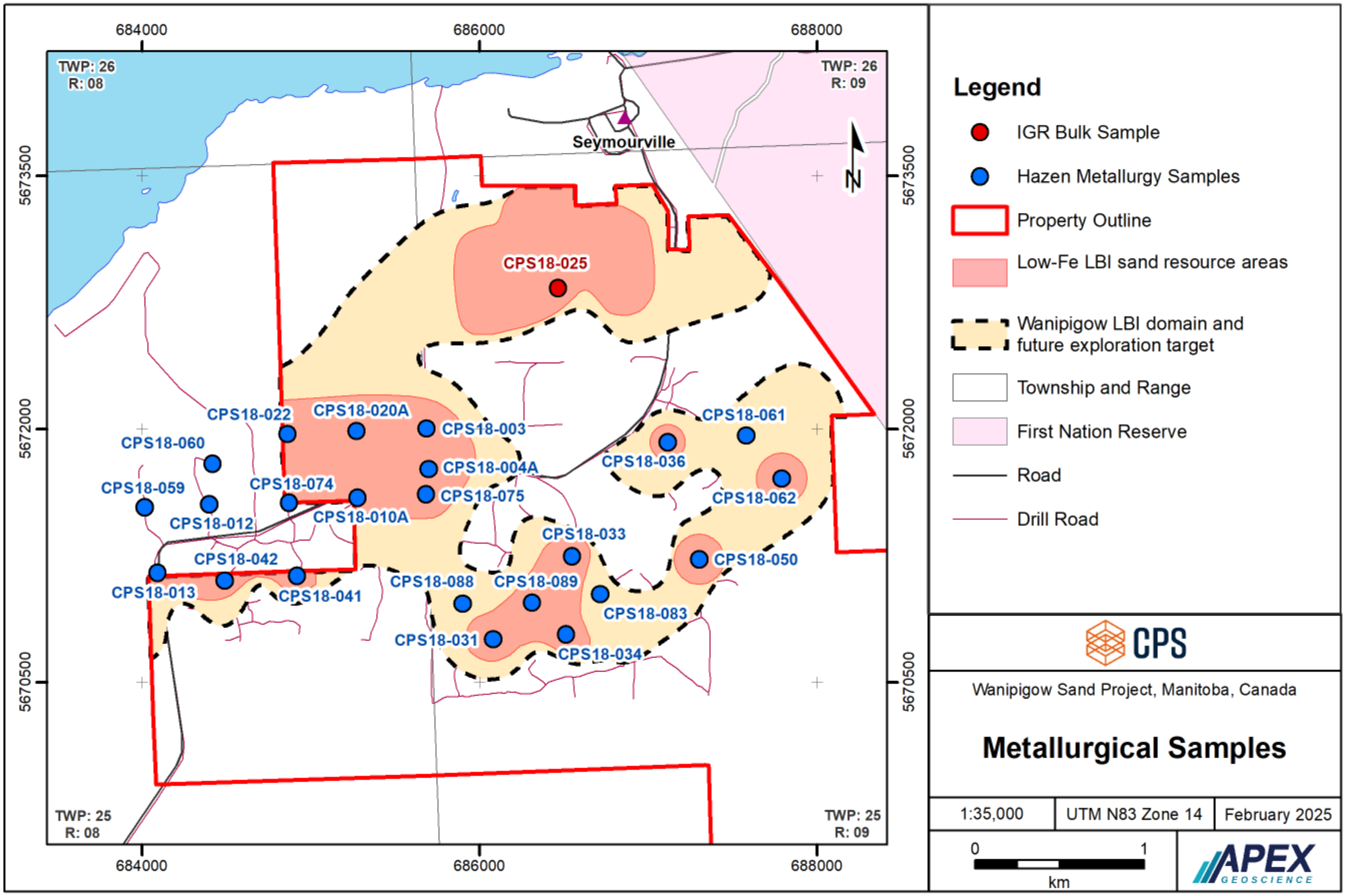
- Phase 1 beneficiation test work was conducted by Hazen on 64 select sand intervals collected from CPS’s 2018 and 2022 drill programs (n=23 separate drillholes, Figure 13.2).

- Based on the results of Phase 1 beneficiation testing, the objective of the Phase 2 work conducted by Hazen and Mineral Technologies was to prepare a beneficiated bulk sand composite sample of low-iron glass sand for further glass testing.

Using the resulting bulk low-iron sand, a glass melt test was conducted by IGR Institut für Glas- und Rohstofftechnologie GmbH (IGR) in Düsseldorf, Germany, which produced CPS flat glass samples.

At Pellucere Technologies (Pellucere) in Springdale, Arkansas, U.S., a MoreSun® anti-reflective solar coating solution was applied on the CPS flat glass samples generated by IGR. The uncoated and coated CPS flat glass was subsequently tested for Solar Weighted Transmittance (SWT) and SWT comparisons were made with standard industry glass reference types in accordance with iron absorption levels.

Figure 13.2 Location of drillholes where Upper Black Island sand and Lower Black Island sand was used in Phase 1 beneficiation testing.



Intermittent chemical analysis during beneficiation test work was conducted by Northern Analytical Laboratory LLC (Northern Analytical) in Londonderry New Hampshire, U.S. and Hazen. Northern Analytical is accredited to ISO/IEC 17025:2017 by the ANSI National Accreditation Board and Nadcap Audit Criteria for Materials Testing Laboratories. Hazen Analytical Laboratory holds certifications from various state regulatory agencies and from the US Environmental Protection Agency (EPA).

IGR is accredited to DIN EN ISO/IEC 17025:2005 (General requirements for the quality management system and the operation of testing and calibration laboratories). Pellucere specializes in nano-scale glass coating solutions that enhance performance, durability, and efficiency across a wide range of industries including solar, automotive, architectural, and aerospace.

The beneficiation, glass melt, and glass coating test methodologies and results are presented in the text that follows.

13.3.2 Phase 1: Interval Sand Samples Beneficiation Study

During 2022-2023, CPS submitted 64 Wanipigow Sand Project samples to Hazen for beneficiation test work toward achieving CPS's low-iron sand criteria of ≤100 ppm Fe_2O_3. Representative UBI and LBI sand samples were collected from archived 2018 drill core and from 2022 drill core (Table 13.5). The samples included UBI and LBI sand intervals totaling 285.05 m from 23 separate drillholes (14 UBI sand samples totaling 41.10 m and 50 LBI sand samples totaling 243.95 m).

The objective of the Phase 1 LBI sand interval test work was to determine if a target iron grade of ≤100 ppm could be achieved at bench-scale using various methods that included attrition scrubbing, sizing, gravity separation, and magnetic separation.

The mineral processing follows the flowsheet developed for CPS by Hazen (Figure 13.3; Hammand, 2023). The results of the Phase 1 beneficiation work were presented in Hazen Research Inc. (2023).

Iron assay summaries were conducted by Hazen on the feed sand and after each stage of beneficiation (Table 13.5).

13.3.2.1 Sample Preparation

The samples were dried and dry screened at 500 µm. The minus 500 µm fraction was blended and split into 1 kg charges. A 50 g split was collected from each 1 kg charge for atomic absorption (AA) analysis. The remaining minus 500 µm material was wet screened at 125 µm, and the 500 by 125 µm fraction was used for subsequent work.

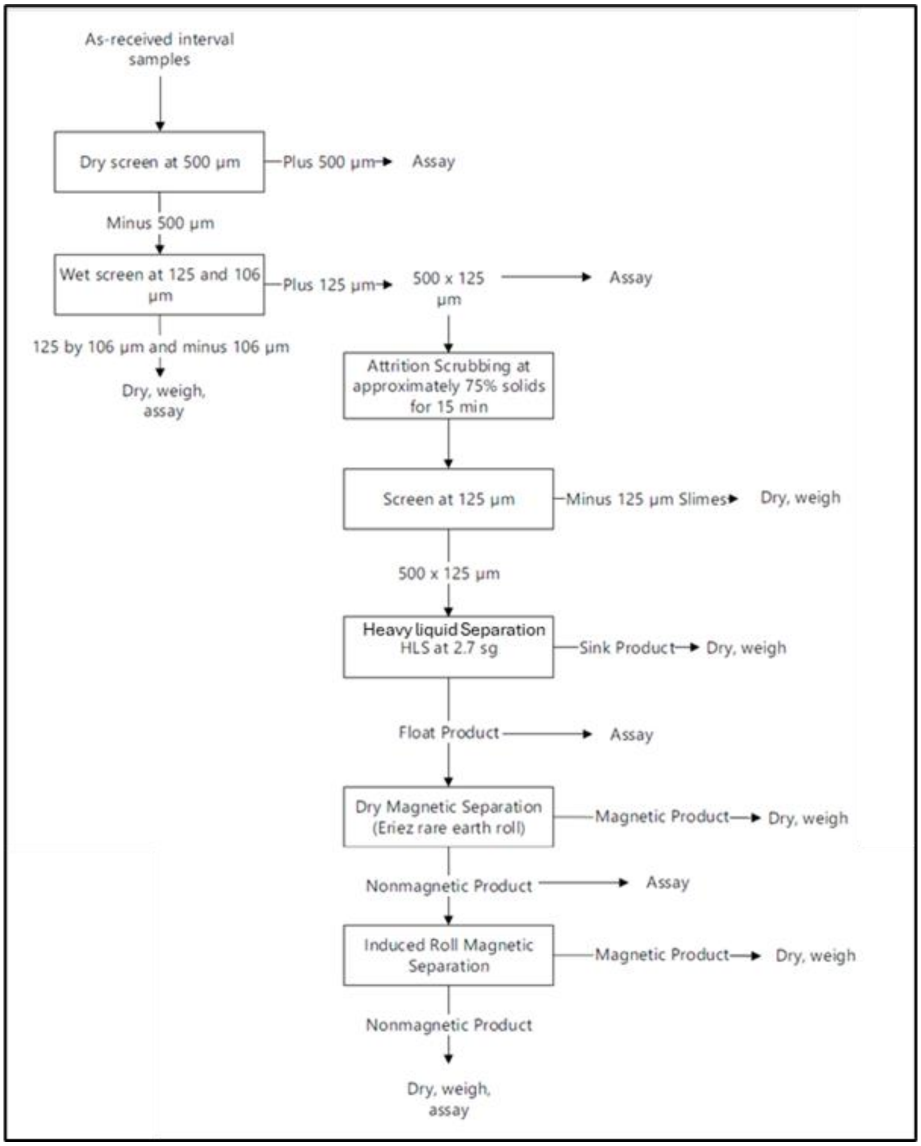
Table 13.5 Lower Black Island Formation interval samples with staged Phase 1 beneficiation iron assays. Based on CPS's low-iron sand criteria of ≤100 ppm iron, a pass or fail rank is assigned. Red highlights indicated drillholes that are not included in the resource areas outlined in this report. Source: CPS (2025) Hazen Research Inc. (2023).

Hazen sample IDs		CPS sample information							Iron assays (ppm)							
Hazen Reference ID	Sample No.	Drillhole	CPS sample ID	From depth (m)	To depth (m)	Inter-val (m)	Form-ation	Calc. dry net weight (g)	Original (minus 500 µm)	Attrition scrubbing (500 x 125 µm)	Heavy liquid separation	Rougher non-mag separation	Induced roll non-mag separation	UBI Sand ≤100 ppm Fe_2O_3 (Pass or Fail)	LBI Sand ≤100 ppm Fe_2O_3 (Pass or Fail)	
55826-1	1 (1/2)	CPS 18-013	573498	3.00	4.50	1.50	UBI	4,555	2,698	423	160	143	150	Fail	/	
55826-2	1 (2/2)	CPS 18-013	725101	7.50	9.00	1.50	LBI	4,520	1,770	420	114	115	110	/	Fail	
55826-3	2 (1/2)	CPS 18-013	725102	9.00	12.00	3.00	LBI	4,239	883	311	75			/	Pass	
55826-4	2 (2/2)	CPS 18-013	725103	10.50	12.00	1.50	LBI	4,366	588	193	128	137	120	/	Fail	
55826-5	3 (1/2)	CPS 18-013	725104, 725105, 725106	12.00	16.50	4.50	LBI	4,343	978	268	191	146	150	/	Fail	
55826-6	3 (2/2)	CPS 18-013	725107, 725108, 725109	16.50	21.00	4.50	LBI	4,530	1,260	206	123	100	120	/	Pass	
55826-7	4 (1/2)	CPS 18-041	576593, 576594, 576595, 576596	10.80	18.00	7.20	LBI	4,496	840	309	152	131	160	/	Fail	
55826-8	4 (2/2)	CPS 18-041	576588, 576589, 576590, 576591	4.50	10.80	6.30	LBI	4,458	892	173	96			/	Pass	
55826-9	5 (1/2)	CPS 18-042	573485, 573486, 573487, 573488	6.00	12.00	6.00	LBI	4,440	616	277	62			/	Pass	
55826-10	5 (2/2)	CPS 18-042	573489, 573490, 573491, 573492, 573493	12.00	18.10	6.10	LBI	4,695	949	145	71			/	Pass	
55826-11	6 (1/2)	CPS 18-012	725132	4.50	7.50	3.00	UBI	4,578	2,020	250	78			Pass	/	
55826-12	6 (2/2)	CPS 18-012	725133, 725134	4.50	7.50	3.00	UBI	4,402	2,050	283	138	141	140	Fail	/	
55826-13	7 (1/2)	CPS 18-012	725137, 725138, 725139, 725140	10.50	18.00	7.50	LBI	4,361	1,060	151	68			/	Pass	
55826-14	7 (2/2)	CPS 18-012	725141	10.50	18.00	7.50	LBI	4,270	1,050	160	77			/	Pass	
55826-15	8 (1/2)	CPS 18-059	725158, 725159, 725160, 725161, 725162, 725163	7.50	18.00	10.50	LBI	4,240	686	162	69			/	Pass	
55826-16	8 (2/2)	CPS 18-059	725158, 725159, 725160, 725161, 725162, 725163	7.50	18.00	10.50	LBI	4,374	799	176	63			/	Pass	
55826-17	9 (1/2)	CPS 18-060	725122, 725123, 725124, 725125	7.50	13.50	6.00	LBI	4,500	768	136	60			/	Pass	
55826-18	9 (2/2)	CPS 18-060	725126, 725127, 725128, 725129	13.50	19.50	6.00	LBI	3,960	956	159	75			/	Pass	
55826-19	10 (1/2)	CPS 18-022	576654, 576655, 576656, 576657	6.00	12.00	6.00	LBI	4,467	1,230	148	81			/	Pass	
55826-20	10 (2/2)	CPS 18-022	576658, 576659, 576660, 576661	12.00	18.30	6.30	LBI	4,160	1,060	334	107	98	110	/	Pass	
55826-21	11 (1/2)	CPS 18-010A	573193, 573194, 573195, 573196	0.00	6.00	6.00	UBI	4,345	2,380	163	159	133	110	Fail	/	
55826-22	11 (2/2)	CPS 18-010A	573193, 573194, 573195, 573196	0.00	6.00	6.00	UBI	4,360	2,360	140	134	124	140	Fail	/	
55826-23	12 (1/2)	CPS 18-010A	573200, 573201, 573202, 573203, 573204	10.50	16.50	6.00	LBI	4,392	695	113	89			/	Pass	
55826-24	12 (2/2)	CPS 18-010A	573205, 573206, 573207, 573208	16.50	24.00	7.50	LBI	4,360	1,500	312	162	94	140	/	Pass	
55826-25	13 (1/2)	CPS 18-074	576601	3.00	4.50	1.50	UBI	4,141	2,530	139 / 168	162 / 162	142	140	Fail	/	
55826-26	13 (2/2)	CPS 18-074	576602	4.50	6.00	1.50	UBI	4,108	3,510	158	153	149	130	Fail	/	
55826-27	14 (1/2)	CPS 18-074	576606, 576607, 576608, 576609	9.90	16.50	6.60	LBI	4,591	1,410	215	103	95	80	/	Pass	
55826-28	14 (2/2)	CPS 18-074	576611, 576612, 576613	18.00	22.50	4.50	LBI	4,293	1,450	141	130	86	100	/	Pass	
55826-29	15 (int)	CPS 18-075	573168	3.00	4.50	1.50	UBI	4,040	19,700	9,050	3970			Fail	/	
55826-30	15 (ref)	CPS 18-075	573167	2.10	3.00	0.90	UBI	2,210	18,200	6,610	2750			Fail	/	
55826-31	16 (1/2)	CPS 18-075	573170, 573171, 573172, 573173	6.00	12.00	6.00	LBI	4,472	4,930	487	201	168	140	/	Fail	
55826-32	16 (2/2)	CPS 18-075	573174, 573175, 573176, 573177, 573178	12.00	19.50	7.50	LBI	4,431	2,040	188	95			/	Pass	
55826-33	17 (1/2)	CPS 18-003	573149	3.00	4.50	1.50	UBI	3,430	2,170	100	80			Pass	/	
55826-34	17 (2/2)	CPS 18-003	573150	4.50	6.00	1.50	UBI	2,611	7,850	715	588			Fail	/	
55826-35	18 (1/2)	CPS 18-003	573154, 573155, 573156, 573157	9.00	15.00	6.00	LBI	4,442	748	144	130	96	90	/	Pass	
55826-36	18 (2/2)	CPS 18-003	573158, 573159, 573160, 573161	15.00	20.90	5.90	LBI	4,336	1,260	231	103	105	90	/	Pass	
55826-37	19 (1/2)	CPS 18-004A	573179, 573180	0.00	3.00	3.00	UBI	4,440	3,910	334	199	144	110	Fail	/	
55826-38	19 (2/2)	CPS 18-004A	573181, 573182	3.00	6.00	3.00	UBI	4,306	2,500	300	150	167	140	Fail	/	
55826-39	20 (1/2)	CPS 18-004A	573185, 573186, 573187, 573188	7.50	14.70	7.20	BS/LBI	4,074	1,490	250	107	128	110	Fail	/	
55826-40	20 (2/2)	CPS 18-004A	573184, 573185, 573186, 573187 ,573188	7.50	14.70	7.20	LBI	4,455	972	128	89			/	Pass	
55826-41	21 (1/2)	CPS 18-004A	573189, 573190	15.00	18.00	3.00	LBI	4,516	1,310	142	79			/	Pass	
55826-42	21 (2/2)	CPS 18-004A	573191,573192	18.00	21.00	3.00	LBI	4,500	747	108	104	81	50	/	Pass	
55826-43	22 (1/2)	CPS 18-020A	576669, 576670	8.80	13.50	4.70	LBI	4,276	1,340	311	100	83	60	/	Pass	
55826-44	22 (2/2)	CPS 18-020A	576671, 576672, 576673, 576674	13.50	19.60	6.10	LBI	4,400	1,550	247	126	86	80	/	Pass	
55826-45	23 (1/2)	CPS 18-088	573464, 573465, 573466	10.85	15.00	4.15	LBI	4,240	1,600	466	156	126	110	/	Fail	
55826-46	23 (2/2)	CPS 18-088	573464, 573465, 573466	10.85	15.00	4.15	LBI	4,260	1,620	505	145	131	120	/	Fail	
55826-47	24 (1/2)	CPS 18-031	573289, 573290, 573291, 573292 ,573293	3.00	9.70	6.70	LBI	4,368	7,210	170	133	131	100	/	Pass	
55826-48	24 (1/2)	CPS 18-031	573294, 573295, 573296, 573296A, 573297, 573298	9.70	16.50	6.80	LBI	4,360	1,890	557	523			/	Fail	
55826-49	25 (1/2)	CPS 18-033	573357, 573358	9.00	12.00	3.00	LBI	4,420	1,080	112	94			/	Pass	
55826-50	25 (2/2)	CPS 18-033	573359, 573360	12.00	15.15	3.15	LBI	4,300	1,960	526	163	130	110	/	Fail	
55826-51	26 (1/2)	CPS 18-034	573305, 573306	12.00	15.00	3.00	LBI	4,496	1,390	124	81			/	Pass	
55826-52	26 (2/2)	CPS 18-034	573307, 573308	15.00	18.00	3.00	LBI	4,348	1,730	453	109	101	100	/	Pass	
55826-53	27 (1/2)	CPS 18-089	573457	11.60	13.50	1.90	LBI	4,517	1,460	225	113	98	100	/	Pass	
55826-54	27 (2/2)	CPS 18-089	573458	13.50	15.00	1.50	LBI	4,480	1,780	349	112	99	100	/	Pass	
55826-55	28 (1/2)	CPS 18-083	573346, 573347	10.05	12.00	1.95	LBI	3,307	5,300	2,000	845			/	Fail	
55826-56	28 (2/2)	CPS 18-083	573348, 573349	12.00	14.95	2.95	LBI	4,280	2,700	554	255	155	140	/	Fail	
55826-57	29 (1/2)	CPS 18-036	576769, 576770, 576771	6.00	10.50	4.50	LBI	4,920	1,040	56	75			/	Pass	
55826-58	29 (2/2)	CPS 18-036	576772, 576773, 576774	10.50	15.00	4.50	LBI	4,420	781	109	73			/	Pass	
55826-59	30 (1/2)	CPS 18-061	573268, 573269, 573270	5.40	10.20	4.80	LBI	4,660	1,990	606	231	159	170	/	Fail	
55826-60	30 (2/2)	CPS 18-061	573268, 573269, 573270	5.40	10.20	4.80	LBI	4,221	1,790	439	199	130	120	/	Fail	
55826-61	31 (1/2)	CPS 18-062	573261	10.30	12.00	1.70	LBI	4,740	1,220	148	81			/	Pass	
55826-62	31 (2/2)	CPS 18-062	573262	12.00	13.50	1.50	LBI	4,448	616	125	81			/	Pass	
55826-63	34 (ref)	CPS 18-050	573257, 573258	10.00	13.50	3.50	LBI	6,221	1,400	193	88			/	Pass	
55826-64	34 (int)	CPS 18-050	573256	9.00	10.50	1.50	LBI	2,440	847	167	75			/	Pass	
			Number and total interval length of UBI or BS samples	14		41.10		Count (LBI)	50	50	50	25	25	**14**	**50**	**Count**
			Number and total interval length of LBI samples	50		243.95		Minimum (LBI)	588	56	60	81	50	**2**	**37**	**Pass**
			Totals	64		285.05		Maximum (LBI)	7,210	2,000	845	168	170	**12**	**13**	**Fail**
								Average (LBI)	**1,515**	**288**	**135**	**115**	**111**	**14**	**74**	**Pass %**
								Standard deviation (LBI)	1,212	286	126	25	29			
								%RSD (LBI)	80	99	93	22	26			
								Count (LBI) ≤100 ppm Fe_2O_3 -->	**0**	**2**	**24**	**11**	**11**			

▨ Achieved CPS's low-iron sand criteria of ≤100 ppm Fe_2O_3

🟥 Did not achieve CPS's LBI low-iron sand criteria (dillhole not used to define resource areas)

Figure 13.3 Flowsheet for Heavy Liquid Separation and Magnetic Separation of Attrition Scrubbed Sand. Source Hammand (2023).



13.3.2.2 Atomic Absorption Analysis

Assay splits were pulverized in a ceramic (zirconia) mill. Each pulverized sample was analyzed for iron by AA using hydrofluoric acid digestion.

Select samples were re-assayed using longer digestion times to ensure that all silica was dissolved into solutions which resulted in lower iron content. In cases where samples were re-assayed, the repeat results were used to determine if the sample met the less than 100 ppm iron specifications after processing.

13.3.2.3 Attrition Scrubbing

Approximately 900 g batches of the 500 by 125 µm fraction were attrition scrubbed using a Denver 1 L attrition scrubber for 15 minutes at 75% solids. After attrition scrubbing, the material was wet screened at 125 µm. The 500 by 125 µm fraction was assayed for iron by AA.

13.3.2.4 Heavy Liquid Separation

Heavy liquid separation using acetylene tetrabromide–kerosene at 2.70 specific gravity was performed to determine whether iron-bearing heavy minerals could be removed by gravity separation. The analysis was performed on a 400 g split of 500 by 125 µm attrition scrubbed material. The 500 by 125 µm fraction was stirred into the heavy liquid, and then stirred every 30 minutes to minimize entrainment, for a period of 6 hours. Both the sink and float products were washed with acetone to remove the residual heavy liquid, and then they were dried, weighed, and assayed for iron by AA.

13.3.2.5 Magnetic Separation

For samples that did not achieve <100 ppm Fe after heavy liquid separation, magnetic separation was performed using a high intensity Eriez rare earth roll magnetic separator. After this first stage of magnetic separation, the samples were assayed for iron by AA.

A second stage of magnetic separation was performed using a Carpco MIH Induced Roll magnetic (IRM) to further remove iron impurities. After the combination of rare earth roll magnetic separation and IRM separation, the samples were assayed for iron by AA.

13.3.2.6 Analytical Results

The results of the Phase 1 beneficiation test work conducted at Hazen are presented in Table 13.5. Of the 64 samples, 39 samples (61%) achieved an acceptable iron grade of less than 100 ppm Fe after the Phase 1 beneficiation testing, including:

- All 64 samples yielded higher than 100 ppm Fe after attrition scrubbing.
- 25 of the 64 samples (39%) measured less than 100 ppm Fe after heavy liquid separation.
- 10 of the 64 samples (16%) measured less than 100 ppm Fe after magnetic separation experiments to further reject iron impurities using an Eriez Rare Earth Roll magnetic separator
- 4 of the 64 samples (6%) measured less than 100 ppm Fe after 1) magnetic separation experiments to further reject iron impurities using an Eriez Rare Earth Roll and Carpco MIH Induced Roll magnetic (IRM) separators, and 2) re-assayed using longer digestion times to ensure that all silica was dissolved into solution.

13.3.3 Phase 2: Bulk Sand Beneficiation Study

A second Phase of beneficiation testing had the objective to produce 800 kg of Wanipigow glass sand with an iron grade of less than 100 ppm Fe_2O_3. CPS obtained Government of Manitoba Work Permit 2020-05-66-012 to collect a representative bulk sample of LBI silica sand using an excavator (Figure 13.4). An approximately 3 tonne sample of LBI sand was collected at Drillhole CPS18-018 at UTM coordinates 686073 m Easting, 5672819 m Northing (see Section 10). The sand was placed into a series of super sacks and amalgamated into a single composite sample by CPS.

In August 2022, CPS shipped a super sack of 3,084 kg of LBI sand to Hazen in Golden, CO, USA. The initial screening and attrition scrubbing was completed by Hazen During sample preparation, Hazen approached Mineral Technologies Inc. in St. Augustine, FL, USA to complete spiral release curve testing, IRM processing, IRM mass split testing, and IRM bulk processing on the representative Wanipigow LBI sand. The metallurgical labs used Northern Analytical Laboratories Inc. in Londonderry, NH, USA to validate the iron content of select final products.

A summary of the overall Phase 2 beneficiation process and results were presented to CPS in an internal report (Hazen Research Inc., 2024) with appendices of the individual Mineral Technologies test results as prepared by Kuhn (2023a,b,c) and Sadeghi (2024). An overview of the Phase 2 beneficiation work is discussed in the text that follows.

13.3.3.1 Hazen Bulk Sample Preparation

A total of 1,752 kg of sand was processed using a combination of screening, attrition scrubbing, gravity separation, and magnetic separation in accordance with the flowchart presented in Figure 13.2 (Hammand, 2023). Assay splits of the bulk sample were pulverized in a ceramic (zirconia) mill and analyzed for iron by AA after a combination of hydrofluoric acid digestion and a four-acid digestion. The feed sand assayed 930 ppm iron. Selected samples were also sent to Northern Analytical Laboratories, Inc. (Londonderry, New Hampshire) for iron analysis by inductively coupled plasma - mass spectrometry (ICP-MS) after a combination of a hydrofluoric acid digestion and a four-acid digestion.

The bulk sample was wet screened at 125 µm to 500 µm (i.e., 35 to 120 mesh) in preparation for attrition scrubbing. The 125 µm to 500 µm fraction was dried, weighed, and a 100 g split was taken for AA analysis. Approximately 1,200 kg of 125 µm to 500 µm screened material was attrition scrubbed using a Quinn Process Equipment Co. one cubic foot attrition scrubber in 40–50 kg batches. Each batch was attrition scrubbed for 15 minutes at 60–70% solids. After attrition scrubbing, the material was screened at 125 µm to remove slimes. The 125 µm to 500 µm material was dried, weighed, and blended for subsequent gravity separation.

Figure 13.4 Excavation of the bulk Lower Black Island Formation sand sample at Drillhole CPS18-018.

13.3.3.2 Hazen Spiral Gravity Separation

Approximately 1,050 kg of 500 x 125 µm attrition scrubbed and screened material was used as feed for gravity separation using a Mineral Technologies HG10 Spiral concentrator. The spirals were initially fed at 30% solids using a centrifugal pump and a diaphragm pump to feed the 500 x 125 µm material. The spiral tails recovered 99.5% of the weight of the sample to the test and 60.3% of the weight of the sample to the head.

The spiral tails and middlings were combined as feed to magnetic separation. The products from gravity separation experiments were not assayed because they were deemed intermediate products.

13.3.3.3 Mineral Technologies Spiral Gravity Separation

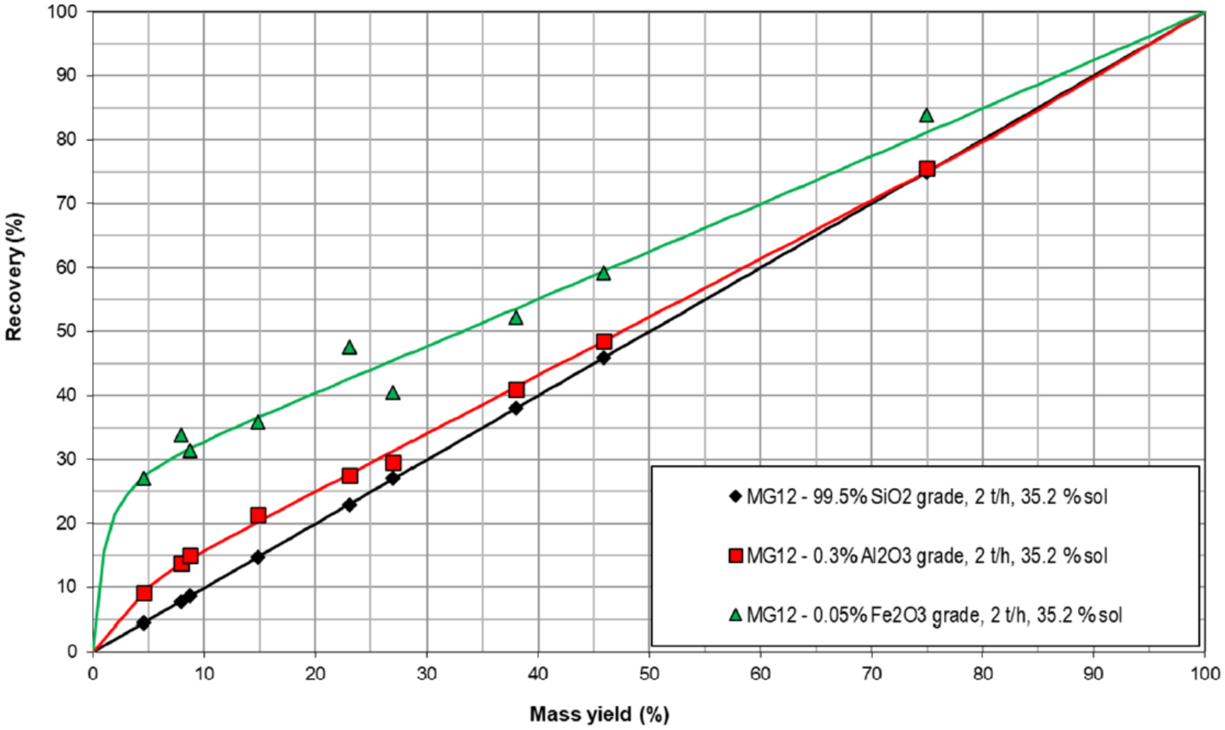
Due to issues pumping to the spiral, an additional 150 kg of feed was screened at 500 and 125 µm, attrition scrubbed and screened at 125 µm. The material was sent to Mineral Technologies for spiral optimization work using an MG12 Spiral Separator. Spiral release curve testing was conducted on the MG12 at the following conditions 1) 2.0 mtph loading, 2) 35.2% solids, and 3) 3 sets of samples at increasing mass to generate release curves.

The curve presented in Figure 13.5 shows that the spiral separator experiments can remove 25–30% of the iron content of the material and recover approximately 95% of the weight of the product on a single spiral pass (Kuhn, 2023a).

Splits of the feed and the spiral tails (sand product) were analyzed at SGS in Denver, Colorado, U.S. by X-Ray Fluorescence and contained 0.04% and 0.03% Fe_2O_3 (400 and 300 ppm), respectively (Kuhn, 2023a).

Because of pumping issues and having to use a pulp density lower than recommended by the manufacturer, the resulting spiral concentrate material was tabled on a shaking table to further separate heavy minerals from the sand product. The table middlings and tails were dried, blended, and combined with the tails (sand product) from spiral concentration.

Figure 13.5 Recovery curves produced during the MG12 Rougher Stage. Source: Kuhn (2023a).



13.3.3.4 Hazen Eriez Rare Earth Roll Magnetic Separation

Dry magnetic separation was performed on approximately 988 kg of the spiral concentrator tails using a high-intensity Eriez rare earth roll magnetic separator fed at 60 kg/h to remove paramagnetic heavy minerals and quartz grains locked with heavy minerals. To evaluate the separation, interval splits were collected every 30 minutes and assayed for iron by AA. The nonmagnetic product contained on average 134 ppm Fe and represented 98.5% of the weight to the test and 31.6% of the weight to the head.

To remove additional iron contaminants, a scavenger stage of magnetic separation was performed using the rare earth roll on approximately 974 kg of nonmagnetic sample from the first rougher stage of magnetic separation. The feed rate was reduced to 30 kg/h to pull more middlings. The scavenger nonmagnetic product contained on average 119 ppm Fe and represented 98.2% of the weight to the test and 31.1% of the weight to the head.

13.3.3.5 Hazen Induced Roll Magnetic Separation

Because an iron content of less than 100 ppm was not achieved after rougher and scavenger magnetic separation using the Eriez rare earth roll, approximately 200 g of the scavenger nonmagnetic product was subjected to magnetic separation using a Carpco MIH Induced Roll Magnet (IRM) at Hazen. Magnetic separation was performed at approximately 20,000 G with a roll speed of 125 rpm. The nonmagnetic product from the IRM contained 94 ppm Fe and represented approximately 96% of the weight to the test (Table 13.6).

Table 13.6 Bench-scale induced roll magnetic separation weights. Source: Hazen Research Inc. (2024).

	Weight		
Procedure	(g)	(%)	Fe (ppm)
Magnetic	7.78	3.9	
Nonmagnetic	190.98	96.1	94
Calculated head	198.76	100	

13.3.4 Mineral Technologies Induced Roll Magnetic Separation

Approximately 200 g of the Eriez rare earth roll nonmagnetic product was sent to Mineral Technologies for scoping IRM experiments to determine how many passes through the IRM were required to reach a less than 100 ppm Fe content in the nonmagnetic product.

The Mineral Technologies IRM test was completed on a Readings IRM using the following conditions, 1) 4-Pass and 6-Pass Non-mag retreat orientation, 2) high magnetic intensity (9.0 A), and 3) 150 RPM roll speed.

The sample was subjected to 4 and 6 passes through the IRM to determine the number of passes to be used for bulk processing. Due to insufficient sample mass for analysis, the nonmagnetic fraction from the 4 and 6 pass IRM was combined and contained 81 ppm Fe (Kuhn, 2023b).

The total magnetic fraction mass only resulted in 1.66 g, less than 1% of the initial starting weight.

13.3.4.1 Mineral Technologies Mass Split Determinations

Two 40 kg buckets of spiral lights from the Eriez rare earth roll scavenger nonmagnetic material were sent from Hazen to Mineral Technologies for IRM mass split determination experiments. The objective is to determine the minimum mass loss of the magnetic fraction that is required to achieve a nonmagnetic fraction sand product with <100 ppm Fe.

A total of six tests were conducted at an increasing mass takes to the magnetic fraction (Table 13.7). T100 represents the natural separation of the magnetic and nonmagnetic fractions. Subsequent fractions increased the mass distribution to the magnetic fraction such that the mass splits of the magnetic fraction ranged from 2–25% (Kuhn, 2023c).

Apart from test T110, which yielded 124 ppm Fe at Northern Analytical, the results show that less than 100 ppm Fe (71 ppm to 88 ppm Fe) is achievable by mass takes as high as 98% to the non-magnetic material (Table 13.7). It was noted in Kuhn (2023c) that the re-analysis of test T110 at Hazen yielded <100 ppm Fe for T110 nonmagnetic material.

Importantly, for a magnetic fraction mass split of approximately 20% (T120 and T140), the associated non-magnetic fraction yielded 71 ppm Fe (as determined by Northern Analytical). This mass split setting was targeted for subsequent bulk IRM processing.

13.3.4.2 Mineral Technologies Bulk Sample Magnetic Separation

The remaining 880 kg of scavenger nonmagnetic sample from the Eriez rare earth roll magnetic separation was run through the Reading IRM at Mineral Technologies using the same conditions used in the earlier test (see previous text).

The feed was processed through an initial ‘rougher stage’ IRM separation with the non-magnetic fraction being repassed. Rougher magnetic, middlings and non-magnetic fractions were generated within the 2-passes. The rougher non-magnetic fraction yielded most of the feed mass at 80.9% and yielded a high silica purity fraction with 87 ppm Fe_2O_3 (Sadeghi, 2024; Table 13.8).

Table 13.7 Analysis of Mineral Technologies Inc. Induced Roll Magnetic separation fractions for different non-magnetic mass split settings.

		Fe (ppm)	
Fraction	**Mass split (%)**	**Hazen**	**Northern analytical**
T100F		140	
T100 Magnetic		840	
T100 Nonmagnetic	98.0	90	88
T110 Magnetic		350	
T110 Nonmagnetic	92.9	100	124
T150 Magnetic		260	
T150 Nonmagnetic	88.7	80	71
T130 Magnetic		240	
T130 Nonmagnetic	87.3	90	78
T120 Magnetic		200	
T120 Nonmagnetic	81.3	130	71
T140 Magnetic		190	
T140 Nonmagnetic	74.8	90	71

Table 13.8 Weights of the bulk induced roll magnetic separation.

		Weight (%)					
Procedure	**Initial feed (kg)**	**To screening**	**To HG10 spiral concen-trator**	**To Eriez rare earth roll magnetic separator**	**To IRM magnetic separation**	**Resulting feed**	**Iron (ppm)**
Unprocessed Feed	1,325.0					43.0	
Plus 800 µm	545.6	33.7				17.7	
Calculated Minus 500 µm	1,074.2					34.8	
Attrition Scrubbed 500 × 125 µm	1,005.4	62.1				32.6	
Gravity Separation Concentrate	20.2		2.0			0.7	
Gravity Separation Tails	985.1		98.0			31.9	
First Run Magnetic	14.5			1.5		0.5	
First Run Nonmagnetic	970.6					31.5	134
Second Run Magnetic	17.4			1.8		0.6	
Second Run Nonmagnetic	953.2			96.8		30.9	117
IRM Magnetic 37.19	37.2				4.2	1.2	
IRM Rougher Nonmagnetic	698.4				79.1	22.6	87 [1]
IRM Scavenger Nonmagnetic	90.7				10.3	2.9	95 [1]
IRM Scavenger Middling	52.6				6.0	1.7	
IRM Scavenger Mag	4.5				0.5	0.1	
Minus 125 µm	68.8	4.2				2.2	
Material Loss 209.04	209.0					6.8	
Calculated head	3,084.0	100	100	100	100	100	

[1] Analyzed for iron at Northern Analytical

The middlings from the rougher stage were processed through the secondary 'scavenger stage' IRM separation. The mass split to the scavenger IRM was 17.1% of the feed. This scavenger stage used the same operating conditions as the rougher stage, but with adjusted splitter settings. The scavenger stage mass yield to the non-magnetic fraction was 60.6%, or 10.4% of the feed mass. The scavenger non-magnetic fraction assayed an average of 95 ppm Fe_2O_3 (Sadeghi, 2024; Table 13.8).

The final combined non-magnetic product was 789 kg that included 698 kg of the rougher nonmagnetic product (88.5%) and 91 kg of the scavenger nonmagnetic product (11.5%). The combined mass yield to non-magnetic fractions was 91.3%, at an estimated iron content of 88 ppm Fe_2O_3.

13.3.5 Glass Melt Test

The 789 kg low-iron glass, bulk sand sample prepared by Hazen and Mineral Technologies (described in the text above) was shipped to IGR Institut für Glas- und Rohstofftechnologie GmbH (IGR) in Düsseldorf, Germany to conduct a glass melt test.

To develop and produce glass, and in addition to LBI processed low-iron sand, IGR also received feldspar limestone from CPS. All other used raw materials were provided to IGR from Glashütte Lamberts Waldsassen GmbH. The glass making process involved,

- Heating the batch recipe components in a gas heated furnace. The batch was molten for approximately 15 hours at a temperature of approx. 1440 °C. After this, the temperature was reduced to approximately 1200 °C. No issues occurred, or were observed, during the melting procedure.

- After two hours at a temperature of 1200°C, the forming process was initiated by collecting molten glass with a blowpipe and inflating the molten glass in a wooden carved mold. New molten glass was continually collected with the blowpipe and blown up until there was enough glass to build a final product.

- During the forming process, glass from the blowpipe is reheated and blown under rotation to create a long-shaped glass body. The glass body is constantly reheated until the final shape of the cylindrical glass body is formed.

- The end of the body (on the opposite side of the blowpipe) is opened by reheating the glass body forming a one-sided open cylinder. The glass body is cooled down and then the end of the glass body, which is still in contact with the blowpipe, is cut off to create open glass cylinder.

- The cooled glass cylinder is cut lengthwise with a diamond tool. The cut cylinder is reheated and flattened using a wooden tool and further flattened to a final shape using a wood flattening tool.

The resulting glass sample underwent a series of tests at IGR including visual analysis and interpretations, microscopic examination, chemical analysis, and calculated physical glass properties. The results of these tests are described in the text that follows.

13.3.5.1 Glass Melt Test Colour Values

The determination of colour characteristics values CIELab and Helmholtz were developed in accordance with DIN 6174 (1979-01) and DIN 5033 (1979-03). QP note: DIN 5033 is superseded by DIN EN ISO/CIE 11664-4:2020-03. The glass sample was examined in a band width from 330 nm to 1100 nm in immersion fluid DMP with a reflection of 7.84%, light source C, and viewing angle of 2°, with surface treatment and calculated to a standard thickness of 2 mm. The analyses were performed in multiple determinations and the results are presented as the arithmetic mean in Table 13.9.

Table 13.9 Determination of colour characteristic values in the CIELAB system and Helmholtz trichromatic theory of color.

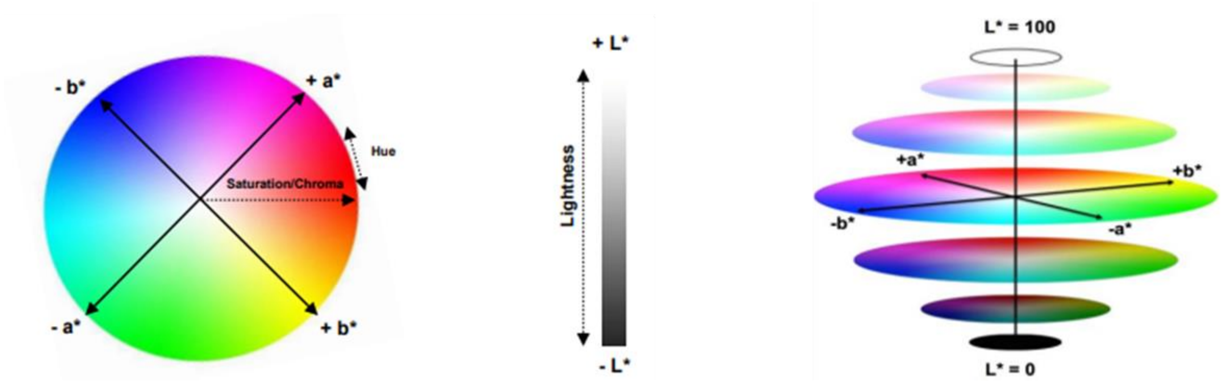
				CIE LAB [1]			
Description criteria	**Wavelength determination (DWL, nm)**	**S (%)**	**A (%)**	**L***	**a***	**b***	**Fe^{2+} (%)**
Glass melt test sample	565.8	0.08	91.9	96.78	-0.06	0.09	4.6

[1] CIE - Commission Internationale d'Eclairage
LAB - L* = CIE 1976 lightness
a* = red to green (+a is redder, -a is greener)
b* = yellow to blue (+b is yellower, -b is bluer)

Color differences can be computed as the relative distance between two reference points within a color space. Using the CIELAB system (see Table 13.9 for an explanation of the acronym), the difference is calculated by comparing reference and sample L*a*b* values to pinpoint how far apart two colors reside within a color space (e.g., Figure 13.6). In the CPS Wanipigow glass melt test sample demonstrates very clear colour differences with a lightness (L*) of 97, and a* and b* colours very close to the center of the axis (-0.06 and 0.09, respectively).

With respect to the spectrum of visible light, a wavelength determination of 566 nm occurs between two wavelength ranges of visible light, green (495 nm to 566 nm) and yellow (566 to 589 nm). These values correspond with the CIELAB system colour determination associated with excellent transparency such that a significant amount of solar energy would pass through the glass.

Figure 13.6 Quantifying colour differences using the CIELAB method.



13.3.5.2 Glass Melt Test Physical Properties

The physical properties of the glass melt test work are presented in Table 13.10. Utilizing the chemical compositions of the glass melt sample, essential viscosity points in degrees Celsius, such as working point (WP), softening point (SP), and annealing point (AP), are modeled using the Lakatos model (Lakatos et al., 1972; Table 13.10). Observations on the physical property calculations are discussed in the text that follows.

The Working Range Index (WRI) and Devitrification Index (DI) are related to the temperature at which the glass can be effective worked or formed without undergoing devitrification (the process where glass crystallizes and loses its amorphous structure). Glass manufacturers use WRI and DI to select glass that is suitable for specific applications, such as solar glass where high thermal stability is required.

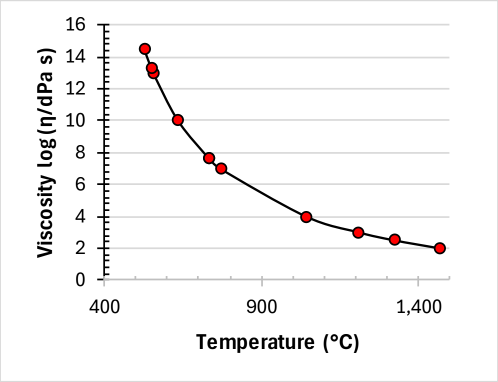
The WRI is defined as the temperature difference between the Softening Point (SP) and the Annealing Point (AP). WRI serves as an indicator of the working range and should not be confused with the actual working range. For most commercial soda–lime–silica container glasses, WRI exceeds 160° C. The Wanipigow glass melt has a WRI of 185.6° C, which means the glass has a wide working range, and can be worked effectively at high temperatures while minimizing the risk of devitrification.

Devitrification is the process by which glass becomes crystalline over time. The DI is defined by WRI minus 160° C and gauges the potential occurrence of devitrification issues (e.g., Zhernovaya et al., 2001; Deng et al., 2020). A positive DI value signifies a state of reduced susceptibility to devitrification, while a negative value implies a growing probability of devitrification. While values of DI can differ, a consensus of +15° C is widespread in the global container glass industry (Wallenberger and Bingham, 2009). The Wanipigow glass melt sample has a high DI of 25.6, which means there is a moderate tendency for devitrification, or the glass becoming crystalline. I.e., the CPS glass can be processed and used effectively, but there is some uncertainly/risk of crystallization under specific conditions.

Table 13.10 Physical glass melt test sample properties.

A) Viscosity by Lakatos viscosity modelling.

Viscosisty log (n/dPa s) [1]	Temp. (°C)
2.00	1,465.5
2.50	1,321.6
3.00	1,208.0
4.00 WP	1,040.2
7.00	766.9
7.60	733.3
7.65 SP	730.6
10.00	633.2
13.00	553.9
13.3 AP	547.7
14.5 SP	525.2



[1] Abbreviations: AP - Annealing point, SP - Softening point, WP - Working point

B) Additional values.

Devitrification Index	Working Range Index	Coeff. of expansion (x $10^{-6}K^{-1}$)	Liquidus temp. (°C)	Sum RO (wt. %)	Sum R2O (wt. %)	Density (g/cm^3)	Cooling time (sec.)	Resistance (ml 0.01 N HCl/g glass)	Relative Machine Speed (n/min)
25.6	185.59	8.75	1,016.0	11.99	13.63	2.5022	101.7	0.66	106.65

Relative Machine Speed (RMS) is a common term in glass manufacturing and represents the relative average speed at which articles can be produced using a specific glass composition. The Wanipigow glass melt sample has an RMS of 106.7 number of operations per minute (n/min). An RMS above the baseline speed of 100 n/min is considered efficient and capable of processing glass at a relatively high rate.

The liquidus point characterizes the maximum temperature allowing for the coexistence of the glass melt and the primary crystalline phase in equilibrium (Hrma et al., 1998). A higher liquidus temperature indicates greater thermal stability, meaning the glass can withstand higher temperatures before crystallizing, which is essential for applications where the glass may be exposed to intense solar radiation. The CPS glass melt sample has a liquidus temperature of 1,016° C. Hence, the CPS glass must be heated to this temperature or higher to remain in a fully liquid state during processing to enable proper shaping and forming without the risk of crystallization.

The test glass melt sample contains an RO alkaline earth oxides of 11.99 wt. % and an R2O alkali oxide of 13.63 wt. % with a Dietzel RO+R2O of 25.6 wt. %. This glass may result in enhanced durability and chemical resistance, improved thermal stability, and may potentially have better optical clarity and mechanical strength depending on the specific ratios of elements (e.g., RO elements such as calcium, barium, and magnesium; and R2O elements such as sodium, potassium, and lithium; Wallenberger and Bingham, 2009).

13.3.5.3 Glass Melt Test Chemical Analysis

The glass sample was dried at 115 °C in accordance with DIN 52331 (1995-05). The glass was pulverized, digested in accordance with DIN 52340-3 (1990-07) method C, and the analyzed by ICP-OES in accordance with DIN 51086-2 (2004-07 AB), which is specific to trace element analysis for oxidic raw materials including glass, ceramics, and glazes.

The chemical analysis of the glass melt test sample is presented in Table 13.11. The level of color in industrial glasses is chiefly affected by their iron content. Individual glass types typically contain the following levels of iron:

- Top quality crystal glass 100 ppm Fe_2O_3.
- Common pressed crystal glass 250 ppm Fe_2O_3.
- White container glass 400 ppm Fe_2O_3.
- Decolorization limit 1,000 ppm Fe_2O_3. (Wallenberger and Bingham, 2009).

The higher the iron content the more difficult it is to decolorize the glass. The iron content CPS's glass melt sample is 110 ppm Fe_2O_3, which is lower than CPS's baseline goal of 120 ppm (see Table 13.1) and is approaching the top-quality crystal glass iron specification of 100 ppm Fe_2O_3 as documented by Wallenberger and Bingham (2009).

Table 13.11 Glass melt test chemical analytical results.

A) Analytical results (wt. %)				**B) Calcuated heavy metals (in ppm)**	
Al_2O_3	0.96	Cr_2O_3	0.0003	Pb	6
Fe_2O_3	0.011	Mn_2O_3	0.000	Cd	0
CaO	8.96	NiO	0.0000		
MgO	2.94	CuO	0.000		
SrO	0.088	V_2O_5	0.000		
Na_2O	12.62	Er_2O_3	0.000		
K_2O	1.01	Ce_2O_3	0.003		
Li_2O	0.001	Bi_2O_3	0.000		
BaO	0.000	MoO_3	0.000		
PbO	0.0006	SnO_2	0.000		
As_2O_3	0.0000	ZnO	0.000		
CdO	0.000	ZrO_2	0.00		
Sb_2O_3	0.450	SO_3	0.4550		
TiO_2	0.011	Balance	72.5000		

Element concentrations stated as zero are below the minimum limit of detection represented by the given number of decimal places.

Other elemental observations include,

- The sodium oxide value of 12.62 wt. % could help to lower the melting point of glass and enhance the glass's workability; however, excessive amounts of sodium can affect the glass chemical durability making it susceptible to leaching.

- The test glass sample also yields 8.96 wt. % calcium oxide which can enhance glass chemical durability.

- The alumina value of 0.96 wt. % is relatively low within glass classifications and could suggest that alumina is present in minor amounts compared to other elements that were not measured by IGR such as silica and boron oxide.

- Glass with a chemical balance of 72.5 wt. % can generally be used in container glass (e.g., jars), flat glass (e.g., windows), and specialty glass (e.g., electronics or optics).

IGR summarized the elemental analysis by stating the analytical results correlated with the calculated chemistry of the glass batch recipe. According to IGR, the evaporation of the alkali metals, antimony, and sulphur requires further review.

13.3.6 Anti-Reflective Solar Glass Coating Test

The transmittance of low-iron glass can be further increased by an anti-reflectance treated for reduction of absorptive and reflective losses (Brogren, 2004).

Samples of CPS's Wanipigow flat glass test results were sent to Pellucere Technologies (Pellucere) in Springdale, Arkansas, U.S., who applied a coating solution and conducted optical transmission and comparative reference measurements on the coated glass samples. Pellucere MoreSun® solar coating produces industry-leading optical gains plus anti-reflective and anti-soiling shields for Original Equipment Manufacturer's (Pellucere Technologies, 2025).

The Pellucere MoreSun® Sol OneCoat solar coating solution was applied to CPS flat glass samples that were approximately 2.5 mm thick. Optical transmission measurements were conducted by Pellucere on both uncoated and coated CPS samples using Pellucere's custom large-diameter integrating sphere transmission spectrometer; a monochromator Shimadzu UV 2600 spectrophotometer that enables measurements to be performed at ultraviolet, visible, and near-infrared wavelengths up to 1,400 nanometres (nm).

Solar Weighted Transmittance (SWT) refers to the percentage of solar radiation that passes through a specific type of coated glass that is designed to maximize light transmission while maintaining thermal efficiency. The measurement essentially measures how much sunlight is allowed to pass through the glass compared to the total amount hitting the glass. A higher transmission percentage means more light comes through the coated glass.

At 2.5 mm, the glass sample is relatively thin, which could help maintain high transmittance while still providing structural integrity.

The uncoated CPS glass yielded 91.81% SWT, which means that 91.81% of the solar energy that hits the surface of the glass is transmitted through it. Typical solar transmittance values for standard bare glass substrate range from 70% to 90% (e.g., Brogren, 2004; Shanmugam et al., 2020; All Weather at Home, 2025; Cardinal Glass Industries, 2025). A SWT value of 91.81% would have above average performance to allow solar energy to pass through the test glass sample.

The coated CPS glass test sample yielded a SWT value of 95.07% (Figure 13.7a). To illustrate the effectiveness of the CPS SWT measurements, Figure 13.7b includes comparative reference SWT measurements of standard industry glass types including prismatic matte rolled solar glass (PM Solar), standard architectural grade low iron float glass (LIFG), and 1 mm thick UV fused silica (UVFS).

The SWT value of 95.07% means exceptional transparency such that a significant amount of solar energy would pass through the glass making the coated glass a good choice for solar applications and energy-efficient designs. Potential applications could include enhancing solar concentrators by increasing light absorption, architectural glazing to enhance energy efficiency, and greenhouses to maximize sunlight for plant growth while controlling heat.

Pellucere concluded that the test results (e.g., Figure 13.7a,b) demonstrate that,

- The Pellucere MoreSun® Sol OneCoat anti-reflective coating successfully spun-coated on to the CPS glass samples and demonstrated higher than 3.2% SWT gain. Based on the SWT measurements, the CPS glass yielded an uncoated glass SWT of 91.81% and a coated glass SWT of 95.07% (a 3.6% SWT gain).

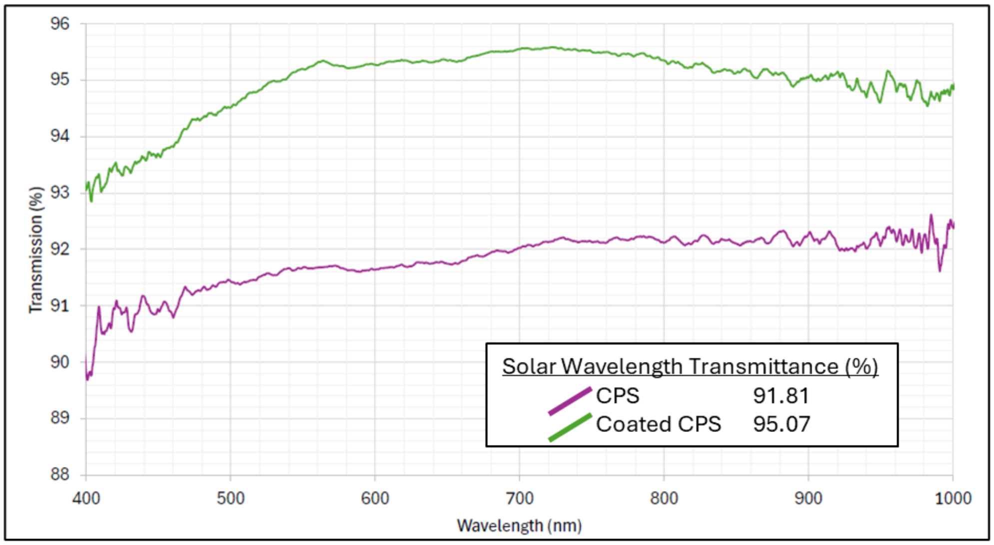
- Compared to reference samples, the CPS glass transmission is indicative of extremely low iron content.

- An absorption band occurring at between 550-650 nm indicates the presence of an unknown impurity in the CPS sample that is not typically present in low iron solar glass.

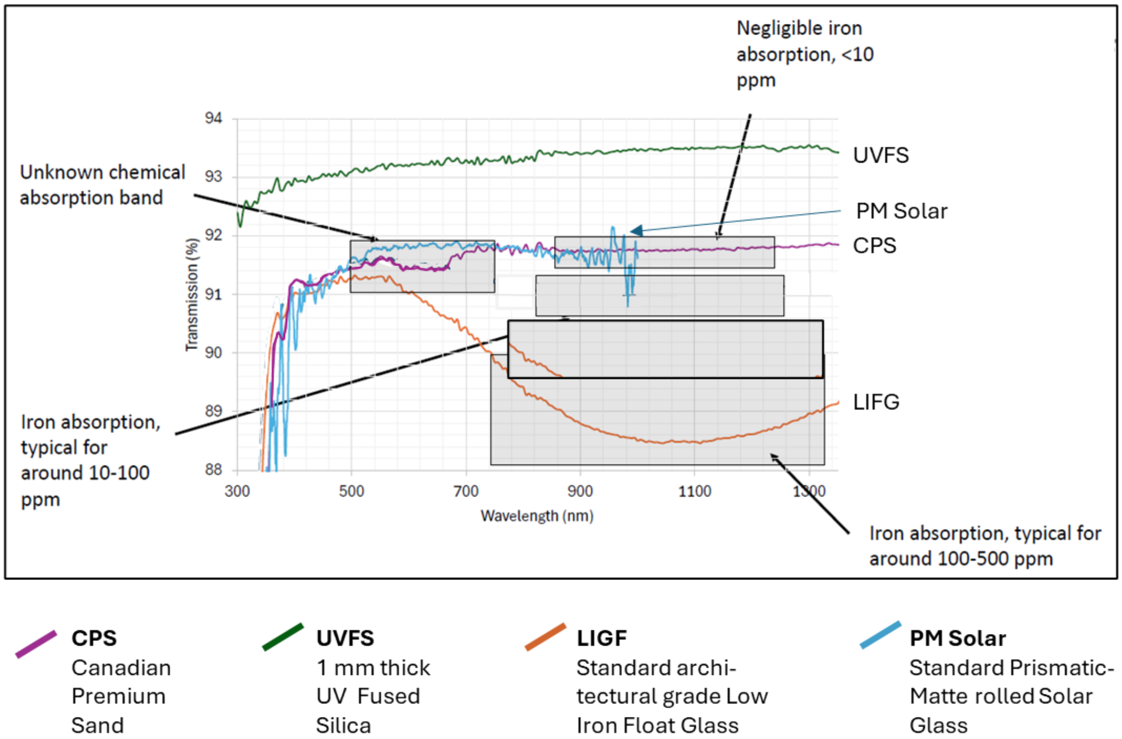
- The CPS test glass sample outperforms referenced low iron solar glass at wavelengths above 660 nm.

Figure 13.7 Solar wavelength transmission integrated sphere. Source: Pellucere Technologies (2025).

A) Solar wavelength transmission integrated sphere (used in 48 °C application).



B) Solar wavelength transmission comparisons with industry standard glass types and iron absorption windows.



13.4 Mineral Processing Qualified Person's Opinion

Between 2020 and 2024, CPS has conducted several sequential beneficiation test studies on Wanipigow Sand Project LBI sand, including studies that included both physical removal, and physical and chemical removal, of iron from the sand. Each test tweaked the methodology and/or the equipment used, and as result, the beneficiation of the LBI sand to low-iron improved over time.

Initial low-iron (≤100 ppm Fe_2O_3) objectives were achieved during 2020-2021 studies on LBI sand collected and beneficiated from the north-central portion of the Wanipigow Sand Project property. Accordingly, CPS disclosed an inferred mineral resource estimate on a 0.74 km^2 portion of the Wanipigow LBI sand domain (Eccles and Hough, 2021), which is now superseded and replaced by the mineral resources presented in this technical report.

During 2022-2024, CPS expanded its LBI sand test samples to other portions of the LBI sand domain within the Wanipigow Sand Project and continued to improve the beneficiation process to achieve additional low-iron sand results. The beneficiation studies conducted at Hazen and Mineral Technologies showed that conventional wet gravity processing and dry IRM processing can be utilized to achieve a Wanipigow LBI sand product with ≤100 ppm Fe_2O_3.

Consequently, CPS has demonstrated that low-iron LBI sand can be produced in other portions of the Wanipigow Sand Project property that were formerly classified as an exploration target. It is the QPs opinion therefore that the beneficiation test work conducted by CPS during 2022-2024, and demonstration of LBI low-iron sand with ≤100 ppm Fe_2O_3, is reasonable and sufficient mineral processing evidence to advance the project.

Hence, the mineral processing work discussed in this Section provides the appropriate levels of evidence for the QP to:

- Define mineral resources within those areas where beneficiation testing successfully attained LBI sand with ≤100 ppm Fe_2O_3, and
- Develop either updated mineral resources (i.e., in the resource area initially outlined in 2021) or initial mineral resources in those areas where the LBI sand was successfully beneficiated to low-iron LBI sand.

In 2022, CPS shipped a 3,084 kg sample of excavated LBI sand to Hazen with the objective of producing an 800 kg sand sample with ≤100 ppm Fe_2O_3. A total of 1,752 kg of sand was processed using a combination of screening, attrition scrubbing, gravity separation, and magnetic separation. The final combined non-magnetic product was 789 kg that included 698 kg of the rougher nonmagnetic product (88.5%) and 91 kg of the scavenger nonmagnetic product (11.5%). The rougher non-magnetic fraction yielded the high silica purity fraction with 87 ppm Fe_2O_3. The scavenger non-magnetic fraction assayed an average of 95 ppm Fe_2O_3. The combined mass yield to non-magnetic fractions was 91.3%, at an estimated iron content of 88 ppm Fe_2O_3.

The resulting low-iron LBI sand bulk sample was used to formulate glass melt test samples. Subsequent glass tests yielded high quality glass that is characterized by low-iron (110 ppm Fe_2O_3), high colour transparencies, a liquidus temperature of 1,016° C, capability for relatively high processing rates, and physical properties (WRI, DI, RO, R2O) that indicate the CPS test glass sample is suitable for specific glass applications, such as solar glass where high thermal stability and workability is required.

The Wanipigow glass melt sample has a high DI of 25.6, which means there is a moderate tendency for devitrification, or the glass becoming crystalline. Hence, the CPS glass can be processed and used effectively, but there is some uncertainly/risk of crystallization under specific conditions.

The Pellucere anti-reflective coating test results demonstrate that the uncoated and coated CPS glass samples had solar weighted transmittance results of 91.81% and 95.07%, respectively (3.6% SWT gain). Hence, a significant amount of solar energy can pass through the CPS test glass sample, particularly at wavelengths above 660 nm. making the coated glass a good choice for solar applications and energy-efficient designs.

The beneficiation, melt test, and coated glass test show that the LBI sand can meet low-iron and glass specifications for solar glass applications. Accordingly, and with respect to reporting a resource estimate that abides by NI 43-101, it is the opinion of the QP that the Wanipigow LBI sand within the glass sand resource area demonstrates reasonable prospects of eventual economic extraction.

13.5 Risks and Uncertainties

There is no current standard, or industry-wide specifications, for the quality of silica sand with respect to glass manufacturing. Hence, the quality of the raw sand feed is dependent on several factors that can include, for example, 1) market conditions, 2) buyer need, and 3) chemical composition of materials other than silica sand that are used in the batch glass manufacturing process.

With respect to the latter point, silica sand comprises 60% to 70% of the furnace batch. Other materials typically include, for example, calcium carbonate, sodium carbonate, and waste recycled glass. Hence the silica and iron composition of co-flux materials other than silica sand (e.g., limestone, or lime) can also influence the final glass product type.

14 Mineral Resource Estimates

14.1 Previous Mineral Resource Estimates

The Wanipigow Sand Project was previously evaluated by the Issuer for its frac sand, or proppant, hydraulic fracturing potential. The Issuer completed a Preliminary Feasibility Study (PFS) with an effective date of March 19, 2020. Because the frac sand/proppant information is still material to the Company, pertinent information is summarized in Section 24.2.

The updated LBI glass sand mineral resources presented in this, CPS's current technical report, remain the focus of CPS's current focus in the Wanipigow Sand Project.

CPS disclosed an initial Wanipigow glass sand inferred mineral resource estimate in a NI 43-101 report dated October 14, 2021. This LBI sand estimate was contained within a single, focused resource area that encompassed 0.74 km^2. Additionally, a portion of the Wanipigow LBI sand domain (2.75 km^2) was assessed as an exploration target.

14.2 Introduction

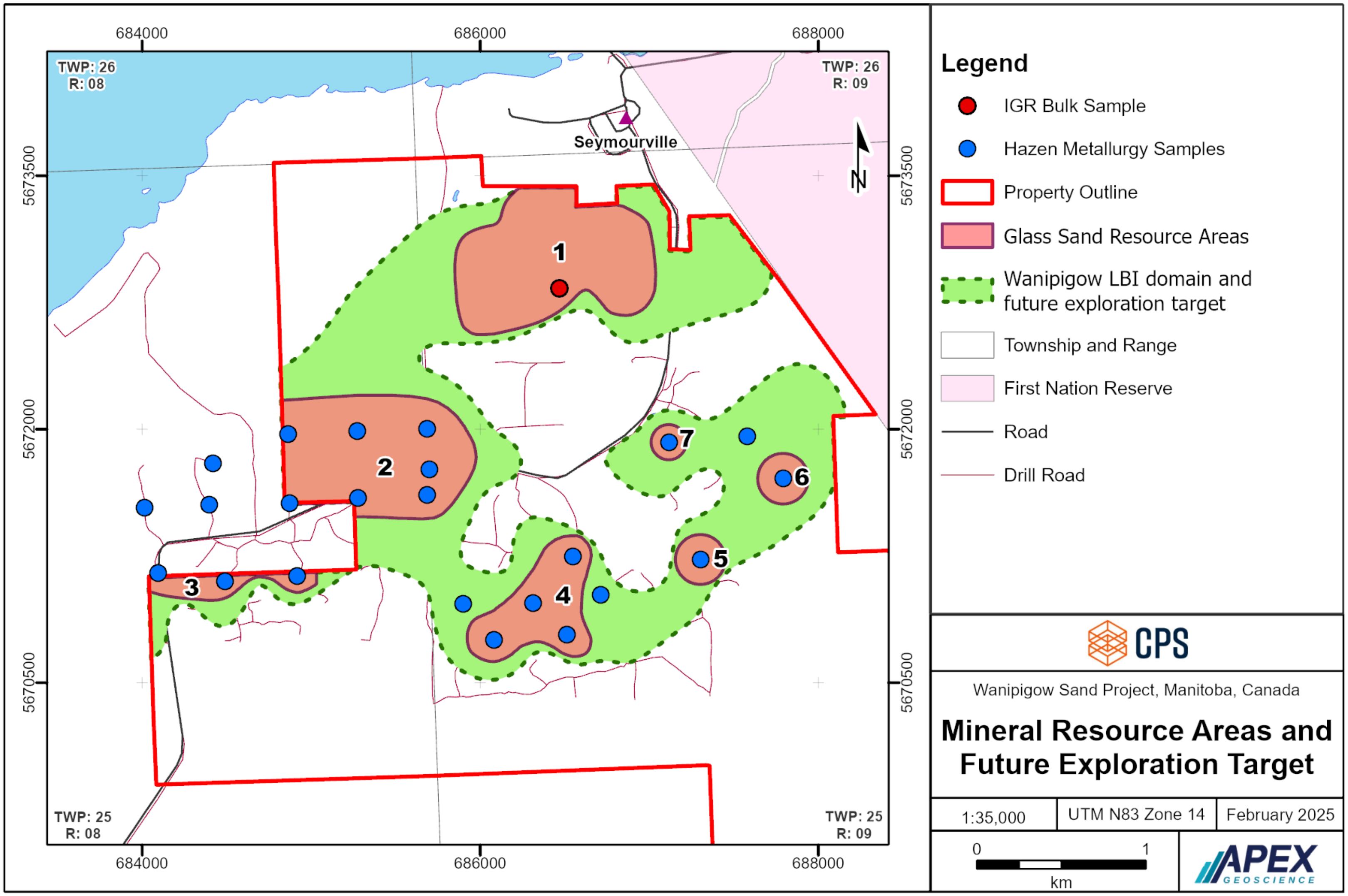
The mineral resource estimations presented in this technical report were prepared in accordance with CIM definition standards and best practice guidelines (2014, 2019) and the disclosure rule NI 43-101. The updated mineral resources effective date is 9 April 2025 and replace and supersede the previous glass sand resource estimate.

The mineral resources are defined within the Wanipigow LBI sand domain and are contained within 7 separate resource areas that collectively total an area of 2.06 km^2 (Figure 14.1) Justification of the expanded mineral resource areas is based on the positive results of CPS's 2022-2024 mineral processing test work that includes beneficiation studies, glass melt tests, and an anti-reflective solar glass coating test (see Section 13.3). The definition of the mineral resource areas is presented in Section 14.4.

Additionally, a conceptual exploration target area is presented in Section 24.1. The target area is based on drill-defined LBI subsurface intersections that occur within the Wanipigow LBI sand domain but are outside of the glass sand mineral resource areas (Figure 14.1).

The 3-D geological modelling and resource estimation were prepared by Mr. K. Hon P. Geo. and Ms. C. McEachern P. Geo. under the direct supervision of Mr. Eccles P. Geol. P. Geo. The workflow implemented for the calculation of the Wanipigow LBI glass sand resource estimations and supplemental data analysis was completed using the commercial mine planning software Micromine (v 25) and Resource Modelling Solutions Platform^{TM} (RMSP; v1.15.1). Supplementary data analysis was completed using the Anaconda Python^{TM} distribution and a custom Python package developed by APEX Geoscience Ltd. Mr. Eccles takes responsibility for the mineral resource estimate presented in this Technical Report.

Figure 14.1 Wanipigow Sand Project Lower Black Island sand domain, resource areas, and exploration target.



14.3 Data

14.3.1 Drillhole Lithological Summary and Gradation Processing

CPS has conducted 2 separate drill programs within the Wanipigow Sand Project as discussed in Section 10 and include,

- A 2018 sonic drillhole program that drilled 93 holes totaling 1,574 m and was logged and sampled by APEX geologists.
- In 2022 sonic drillhole program that drilled 17 holes totaling 283.5 m and was logged and sampled by geologists with Edge Engineering and Geoscience Ltd.

Lithological information from both drill programs was used to construct the 3D geological model used in the mineral resource estimations.

Samples collected during the 2018 drill program were analyzed by CPS for their particle size distribution analysis (gradation analysis). CPS has yet to conduct gradation analytical work on the 2022 drill program sand samples.

In 2018, a total of 761 samples and 15 field duplicate samples were collected. The samples were collected approximately every 1.5 m, which correlates to the length of the core barrel. A summary of the number of samples collected from each of the formations of interest is presented in Table 14.1 and includes 1) 451 Pleistocene glaciofluvial samples, 2) 57 Upper Black Island sand or UBI sand samples, 3) 17 Black Shale or BS samples, and 4) 236 Lower Black Island sand or LBI sand samples (Table 14.1).

The 761 samples were analyzed at Turnkey Processing Solutions (TPS) in Ottawa, IL (see Section 11). The field duplicate samples were sent to Stim-Lab in Houston, TX, who completed gradation analysis and proppant characterization test work. The U.S. Standard mesh sizes measured in the gradation analysis include 16, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 100, 120, 140, and 200 mesh, and Pan (or -200 mesh). The LBI sand gradation analyses were used to estimate the 3D block model.

Table 14.1 Summary of interval types from the CPS 2018 drill program.

Lithology sub-member	Total samples collected	No recovery	No sample (lithological reason) (Clay)	(Gravel)
Pleistocene glaciofluvial	451	22	75	22
Upper Black Island sand	57	0	0	0
Black Shale	17	0	0	0
Lower Black Island sand	236	4	1	0

14.3.2 Data QA/QC

APEX geologists, on behalf of CPS, completed the logging and sampling programs associated with the CPS 2018 drilling program.

A QP site inspection was completed on March 4-6, 2019, which enabled the QP to observe the UBI and LBI sand units, active drill sites, a bulk sample excavation site near drillhole CPS18-018, and collect archived sand samples to verify the gradation analysis of the LBI sand that is the focus of this technical report.

The gradation analytical work conducted at TPS was completed by an independent laboratory and are standard and routine in the field of sand and proppant characterization test work pursuant to International Standard ISO 13503-2.

The 2022-2024 beneficiation test work and low-iron sand bulk sample preparation was conducted by Northern Analytical and Hazen. Northern Analytical is accredited to ISO/IEC 17025:2017 by the ANSI National Accreditation Board and Nadcap Audit Criteria for Materials Testing Laboratories. Hazen Analytical Laboratory holds certifications from various state regulatory agencies and from the US EPA.

The glass melt test was conducted by IGR Institut für Glas- und Rohstofftechnologie GmbH (IGR) who is independent and accredited to DIN EN ISO/IEC 17025:2005.

Pellucere conducted optical transmission and comparative reference measurements on coated glass samples. Pellucere is independent of CPS and specializes in nano-scale glass coating solutions across a range of glass industries including solar and architectural glass.

14.3.3 Micromine Database

The following datasets were imported into Micromine:

- Drillholes – the 2018 and 2022 drillhole collars.
- Assay file –comprising all gradation analyses.
- Geology file – logged position of the individual litho-units/geological units.
- LiDAR survey – the bare-earth surface topography survey at 1 m resolution.

A drillhole database was validated within Micromine to identify omissions and discrepancies in the data. No validation errors were encountered. The assay file contained 18 individual sand mesh size measurements ranging from 16-mesh to pan size (or -200 mesh), which collectively account for 100% of the sand content. Using all gradation mesh sizes, and for the purposes of resource estimation process, 3 individual mesh size fractions were created for the purpose of the mineral resource estimation process. These include the ≤35 mesh to ≥120 mesh fraction consistent with the cutoff and main mineral resource, and those fractions that don't meet the cutoff criteria (i.e., the >35 mesh fraction and <120 mesh fraction).

High-resolution bare-earth LiDAR was used as the most reliable surface model and was used to validate the collar elevations. No major collar elevation concerns were identified.

14.4 Definition of Mineral Resource Areas

As discussed in Section 13.4.3, 2022-2024 Phase 1 beneficiation test work was conducted by Hazen on representative UBI and LBI sand intervals that were collected during CPS's 2018 and 2022 drill programs (n=23 separate drillholes). The samples included UBI and LBI sand intervals totaling 285.05 m including 14 UBI sand samples totaling 41.10 m and 50 LBI sand samples totaling 243.95 m. The objective of the Phase 1 LBI sand interval test work was to determine if a target iron grade of ≤100 ppm could be achieved at bench-scale using various methods that included attrition scrubbing, sizing, gravity separation, and magnetic separation. The QP evaluated the Phase 1 interval core sample beneficiation tests as the best approach to validate the revised resource areas used in this technical report.

Iron assay summaries were conducted by Hazen on the feed sand and after each stage of beneficiation (see Table 13.5). With emphasis on the LBI sand, the iron assays at progressive beneficiation stages are as follows,

- The original -500 µm feed LBI sand had between 588 ppm and 7,210 Fe_2O_3 with an average of 1,515 ppm Fe_2O_3 (n=50 sample analyses). None of the samples achieved ≤100 ppm Fe_2O_3.

- Post attrition-scrubbing 500 x 125 µm LBI sand had between 56 ppm and 2,000 Fe_2O_3 with an average of 288 ppm Fe_2O_3 (n=50 sample analyses). After this stage, 2 LBI samples achieved ≤100 ppm Fe_2O_3.

- Post heavy liquid separation LBI sand had between 60 ppm and 845 Fe_2O_3 with an average of 135 ppm Fe_2O_3 (n=50 sample analyses). After this stage, 24 LBI samples achieved ≤100 ppm Fe_2O_3.

- Post rougher non-magnetic separation LBI sand had between 81 ppm and 168 Fe_2O_3 with an average of 115 ppm Fe_2O_3 (n=25 sample analyses). After this stage, 11 LBI samples achieved ≤100 ppm Fe_2O_3. Note: Some samples that achieved low-iron sand after the heavy liquid separation test were not subjected to non-magnetic separation testing.

- Post induced roll non-magnetic separation LBI sand had between 50 ppm and 170 Fe_2O_3 with an average of 111 ppm Fe_2O_3 (n=25 sample analyses). After this stage, 1 LBI samples achieved ≤100 ppm Fe_2O_3. Note: Some samples that achieved low-iron sand after the heavy liquid separation test were not subjected to non-magnetic separation testing.

The QP used the staged analytical assay results and CPS's low-iron criteria of ≤100 ppm Fe_2O_3 to assign a "Pass" or "Fail" to each sample (see Table 13.5).

- The UBI sand samples had poor beneficiation results with 2 of the 14 samples passing or achieving Fe_2O_3 (14%).

- The LBI samples had a significantly higher pass rate with 37 of the 50 samples passing or achieving Fe_2O_3 (74%).

Hence, the Phase 1 beneficiation work conducted by Hazen demonstrates that the Wanipigow Sand Project LBI Formation sand can be beneficiated to acceptable levels of low-iron sand in 20 of the 23 drillholes tested toward the manufacturing of flat solar glass with anti-reflective coating.

Lower Black Island sand from 3 of the 23 drillholes did not achieve the low-iron LBI sand objective through the beneficiation testing, drillholes CPS18-061, CPS18-083, and CPS18-088. The LBI sand samples from the 3 holes are highlighted (in red) in Table 13.5. Because the LBI sand from these holes could not be beneficiated to ≤100 ppm Fe_2O_3, the QP did not use these drillholes to define the mineral resource areas used in this technical report.

The resulting 7 LBI glass sand resource areas are presented in Figure 14.2 and are described as follows,

- Drillholes with LBI samples that passed CPS's low-iron beneficiation objectives of ≤100 ppm iron includes CPS 18-003, CPS 18-004A, CPS 18-010A, CPS 18-012, CPS 18-013, CPS 18-020A, CPS 18-022, CPS 18-031, CPS 18-033, CPS 18-034, CPS 18-036, CPS 18-041, CPS 18-042, CPS 18-050, CPS 18-059, CPS 18-060, CPS 18-062, CPS 18-074, CPS 18-075, and CPS 18-089 (n=20 of 23 wells).

- Drillhole CPS-18-018 is the site of the bulk LBI sample excavation. The final 789 kg bulk sample non-magnetic product included 698 kg of the rougher nonmagnetic product and 91 kg of the scavenger nonmagnetic product at a combined estimated iron content of 88 ppm Fe_2O_3.

- Drillholes with LBI samples that failed CPS's low-iron beneficiation objectives of ≤100 ppm iron includes CPS 18-061, CPS 18-083, and CPS 18-088 (n=3 of 23 wells). Accordingly, drillholes CPS18-061, CPS18-083, and CPS18-088 were not included in any glass sand resource area.

Note 1: The LBI glass sand mineral resource areas assigned in this resource evaluation satisfy those areas 1) that are within the boundaries of the property, 2) where drilling penetrated LBI sand (see note 2), 3) that occur within the LBI wireframe/domain, and 4) where drillhole LBI samples were selected for beneficiation test work and the results met CPS's low-iron sand level objectives of ≤100 ppm iron.

Note 2: The QP was careful to not extend the resource areas to those drillholes that did not contain LBI sand. Apart from resource area 1 (see next point), the QP limited the resource areas to those areas with drillhole control. This was done to reduce concerns of overextending the resource areas, and hence, overestimating the mineral resources.

Note 3: With respect to mineral resource area 1, 2022-2024 beneficiation test work was conducted on a single drillhole. The resource area is expanded beyond this drillhole because:

1) LBI sand geochemical work was conducted throughout resource area 1 defining a zone of high silica-low iron LBI sand (see Section 9.2).

2) Initial 2020-2021 beneficiation work was conducted on LBI sand from this area (see Section 13.2).

3) LBI sand for the bulk sample was excavated from drillhole CPS18-018 within resource area 1 and subject to 2022-2024 beneficiation work that resulting in a low-iron bulk sample (see Section 13.3).

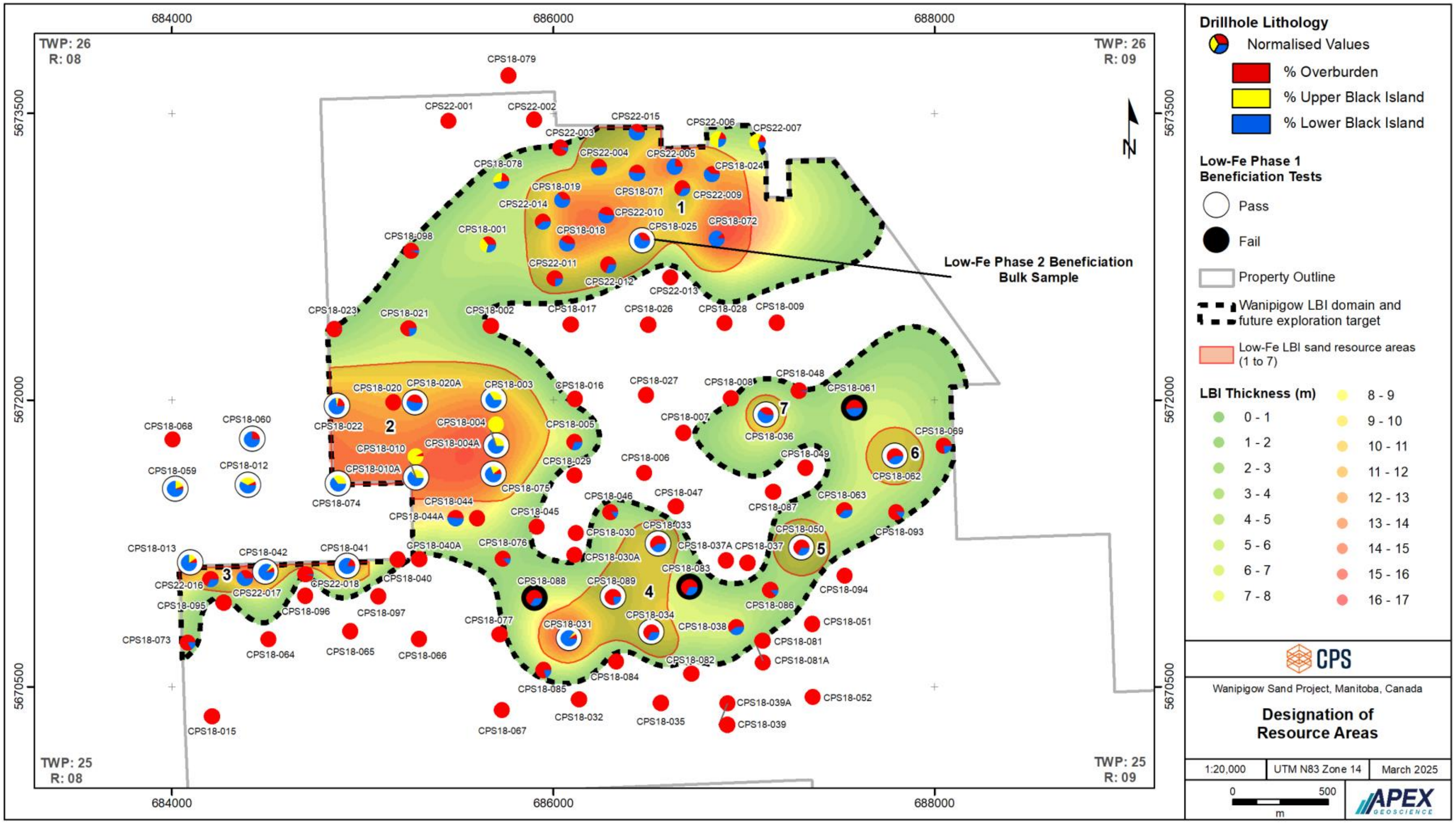
4) Lastly, the resource area 1 was initially defined in CPS's previous glass sand resource estimate (October 14, 2021).

Note 4: With respect to mineral resource area 2, the lithology symbols associated with 3 drillholes (CPS-18-004, CPS18-010, and CPS18-020) show the holes intersected overburden and/or Upper Black Island sand only (UBI, i.e., and no LBI sand).

However, these holes were terminated early due to drilling issues, and consequently, the 3 holes were redrilled by CPS (as CPS-18-004A, CPS18-010A, and CPS18-020A) to deeper stratigraphic levels and did penetrate LBI sand below the UBI sand unit.

The LBI sand from the re-drilled holes was included in the beneficiation test program and met CPS's low-iron sand level objectives of ≤100 ppm iron.

Figure 14.2 Depiction of mineral resource areas 1) within the property, 2) in areas where Lower Black Island sand is present, 3) in drillholes where Lower Black Island sand was beneficiated to low-iron sand of ≤100 ppm iron.



14.5 Lower Black Island Sand Domain Definition

The Wanipigow LBI sand domain refers to the drill-defined areas within the Wanipigow Sand Project property that contain subsurface LBI sand. The LBI sand resource areas refer to those areas within the Wanipigow LBI sand domain that are being evaluated for mineral resources in this technical report.

14.5.1 Geological Interpretation and Modeling

All 110 sonic drillholes totaling 1,857.4 m completed by CPS in 2018 and 2022 contain geological information such as subsurface litho-stratigraphic formation contacts and were used to model the geology at the Wanipigow Property. Stratigraphic formation tops were used to create a 3-D geological model within Micromine. Stratigraphic horizons that were modelled within the Wanipigow Sand Project include:

- Lower Black Island sand, which defines the Wanipigow LBI sand domain, has global sand domain thicknesses of between 0 m to 16.5 m with an average thickness of 5.8 m.

- An overlying waste domain was constructed within the Wanipigow Property that combines 1) the Pleistocene glaciofluvial material (0.1 to 23.6 m thick, averages 10.7 m), Upper Black Island sand (0.22 m to 19.0 m thick, averages 4.6 m), and Black Shale unit (0.60 m to 3.5 m thick, averages 2.0 m).

The base of the Pgf, UBI, and/or BS units form the top contact with the LBI sand with the BS unit being the most predominant and easily identifiable marker horizon. Most drillholes (95%) penetrate the underlying Precambrian basement which defines the LBI basal contact.

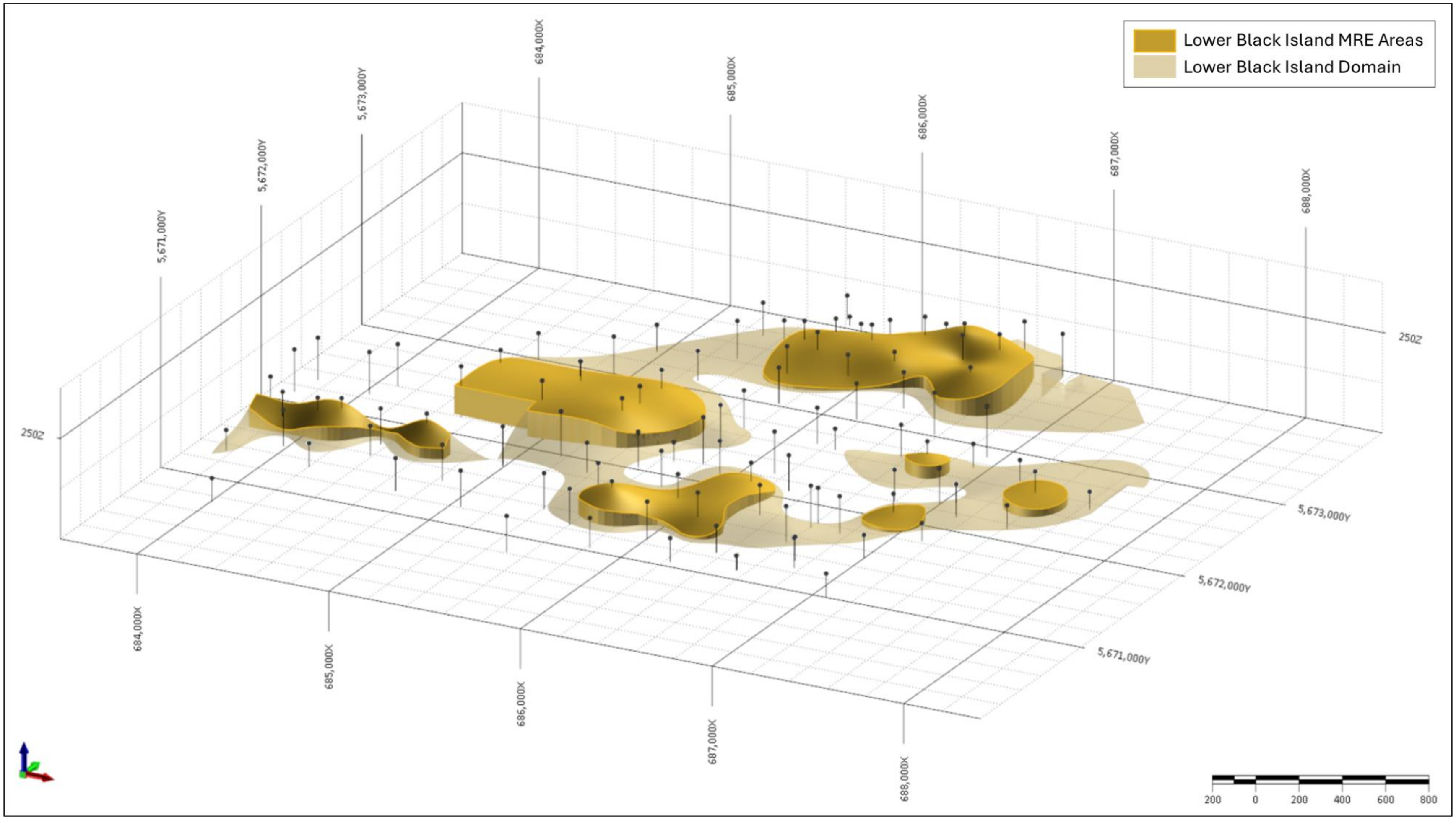
There are rare LBI sampling intervals with poor core recovery (n=4 intervals; see Table 14.1). If the intervals of poor core recovery are bounded within the logged LBI domain, the QP assumed the missing interval is within the respective LBI sand. The 3-D geological LBI domain wireframe was created by utilizing Micromine's implicit surface modeller and these modelling boundaries to form a solid 3-D LBI interpretation. Within the Wanipigow Sand Project property, the Wanipigow LBI sand domain encompasses 5.18 km^2.

The Wanipigow LBI glass sand resource estimate focuses on the Wanipigow LBI sand domain, and more specifically, defined resource area polygons within the domain.

Of the 110 drillholes and 761 gradation measurements that define the Wanipigow Sand Project geological model, the mineral resource areas collectively comprise 35 drillholes and 161 LBI gradation results.

The LBI sand resource domain was clipped to 1) the property boundary, 2) the LiDAR DEM surface, and 3) the 7 defined mineral resource area polygons (Figure 14.3). The collective surface area of all 7 LBI glass sand resource areas is 2.06 km^2 (Table 14.2).

Figure 14.3 Oblique view of modelled Lower Black Island sand unit (vertical exaggeration of 10:1).



The Wanipigow LBI sand domain has an average LBI sand thickness of 5.9 m. The thicknesses of LBI sand within the 7 resource areas is presented in Table 14.2. The combined resource areas have a minimum and maximum thickness of between 0.04 and 16.53 m with an average thickness of between 3.13 m and 11.99 m. Collectively, the LBI sand within the resource areas has an average normalized thickness of 9.4 m.

The Pleistocene glaciofluvial, Upper Black Island sand and Black Shale units, represent waste material overlying the LBI sand, and have been modelled within a single wireframe. The waste material is ubiquitous throughout the Wanipigow glass sand resource areas and extends from the surface to depths of between 0.7 and 15.1 m and averages 8.7 m.

Table 14.2 Thickness of the Lower Black Island sand within the mineral resource areas.

		Lower Black Island sand thickness		
	Lower Black Island sand area (m^2)	**Minimum (m)**	**Maximum (m)**	**Average (m)**
Resource area 1	757,905	0.04	16.53	9.21
Resource area 2	719,814	5.09	16.11	11.99
Resource area 3	95,104	2.31	14.97	8.98
Resource area 4	317,829	1.19	15.94	6.71
Resource area 5	68,427	0.79	4.58	3.13
Resource area 6	70,449	3.66	6.99	5.95
Resource area 7	34,053	4.34	9.05	7.06
Total	**2,063,580**		**Normalized average [1]**	**9.4**

[1] Normalized average means normalizing individual resource areas to the total resource area

14.5.2 Lower Black Island Sand Gradation Summary

A total of 209 samples were collected within the Wanipigow LBI domain, including 161 LBI gradation records within the 7 LBI glass sand mineral resource areas.

One of the samples within the LBI domain had poor auger return material rates that did not allow sampling. This sample contained >30% clay. As this interval was within the glass sand resource area, a value for the estimated fraction portions in Table 14.3 was assigned to the interval prior to compositing rather than assign a value of zero. The value assigned to the clay interval was devised manually by reviewing the surrounding geology and sample information.

Table 14.3 Assigned 'clay' combined fraction values to missing sample intervals that were no sampled due to >30% clay.

No Sample Type	+35 (%)	35/120 (%)	-120 (%)
Clay	0.50	9.18	90.32

The 35/120-mesh fraction is reported in Wanipigow LBI glass sand resource estimate because this size fraction has been assessed, and successfully beneficiated, to higher level of quality defined as low-iron glass sand with ≤100 ppm Fe_2O_3. The 35/120-mesh size fractions were combined reducing the number of variables estimated. While the +35 and -120 size fractions are not required to calculate the size fractions of economic importance, they were modeled to ensure all material is accounted for in the final block model.

Table 14.4 and Figure 14.4 show the distribution and statistics of the size fractions used during the estimation of the Wanipigow LBI glass sand resource estimate.

Table 14.4 Summary statistics for the Wanipigow Lower Black Island sand domain using the amalgamated size fractions from the gradation analyses. Abbreviations: std – standard deviation, var – variance, CV – coefficient of variation, 25% – 25-percentile, 50% – 50-perceitnile or median, 75% – 75-percentile.

Unit	Size Fraction	count	mean	std	var	CV	min	25%	50%	75%	max
LBI	+35	209	8.64	6.80	46.18	0.79	0.4	2.96	6.56	13.03	29.76
	35/120	209	65.82	10.37	107.63	0.16	9.2	59.87	66.78	73.41	83.74
	-120	209	25.54	8.75	76.54	0.34	9.17	19.88	24.63	29.66	90.5

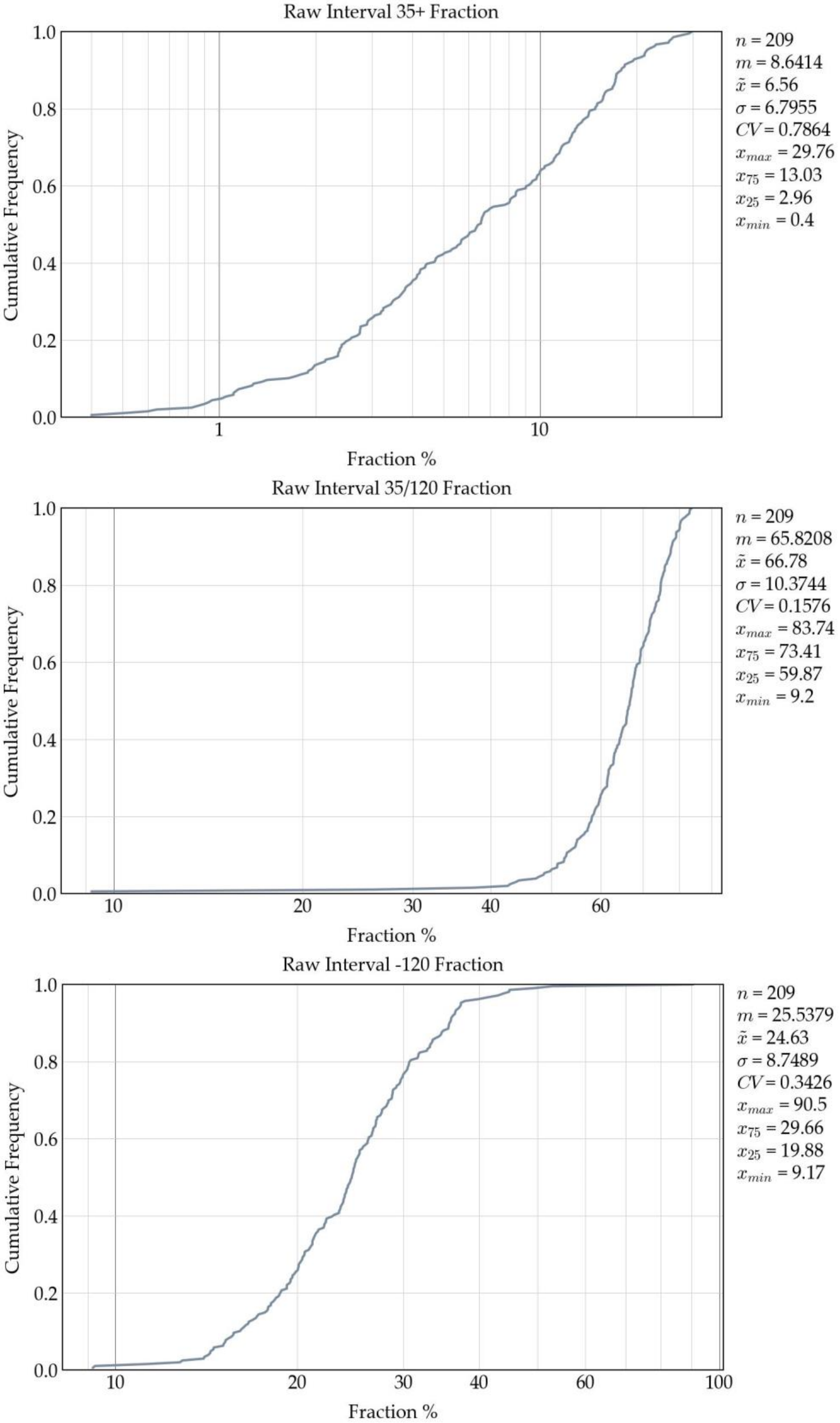
14.5.3 Block Model Parameters

The block model used for the calculation of the Wanipigow LBI glass sand resource estimate fully encapsulates the Wanipigow LBI sand domain, and hence, the 7 LBI glass sand resource areas. Data spacing is the primary consideration in determination of the block model parameters in addition to ensuring the volume of the 3-D geological model is adequately captured.

The drillhole spacing within the LBI glass sand resource areas vary from 149.7 m to 551.0 m with an average drillhole spacing of 303.5 m.

The data spacing of irregularly spaced drilling can be approximated using a block model and calculating the 90-percentile of the distance from each block's centroid to the nearest sample. Estimation errors are introduced when kriging is used to estimate grade for blocks with a size greater than 25% of the data spacing. As illustrated in Figure 14.5, the 90-percentile distance from each block's centroid to the nearest composite sample is 317.0 m.

Figure 14.4 Histograms of Estimated Lower Black Island sand size fractions from the gradation analyses.

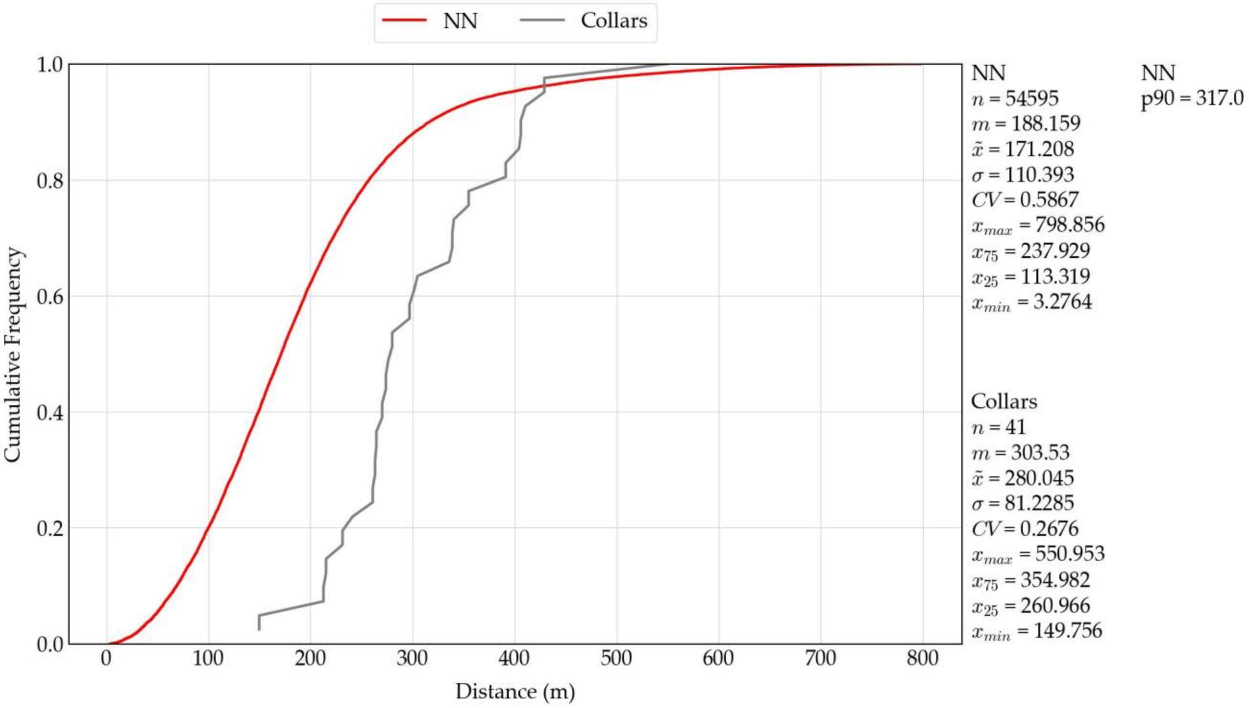


Based on the data spacing and the detail of the 3-D geological models, a block model with a block size of 20 m x 20 m in the horizontal directions and 2 m in the vertical direction is generated. The final block model is 4060 m long in the east-west direction, 2920 m long in the north-south direction and 20 m deep (Table 14.5). A block factor (BF) is calculated for each of the formations that represents the percentage of the block volume that lies within each formation. The block model is validated in the report sub-sections that follow.

Table 14.5 Lower Black Island sand block model size and extent.

Axis	Number of Blocks	Parent Block Size (m)	Minimum Extent (m)	Maximum Extent (m)
X (Easting)	204	20	684036	688096
Y (Northing)	147	20	5670518	5673438
Z (Elevation)	11	2	226	246

Figure 14.5 Histogram illustrating the distance from each block's centroid to the nearest composite sample (NN, red line) and the distance between each drillholes nearest neighbour (collars, blue line). Abbreviations: n – number of observations; m – mean; σ – standard deviation; CV – coefficient of variation; x_{max} – maximum value; x_{75} – 75-percentile; x_{50} – 50-percentile or median; x_{25} – 25-percentile; x_{min} – minimum value; NN – nearest neighbour; x_{90} – 90-percentile.



14.5.4 Volumetric Checks

A comparison of wireframe volume versus block model volume is performed to ensure there is no considerable over- or under-stating of tonnage (Table 14.6). The calculated block factor for each block is used to scale its volume when calculating the total volume of the block model. No volume difference present,

Table 14.6 Wireframe versus block-model volume comparison.

Unit	Wireframe Volume (m^3)	Block Model Volume (m^3)	Volume Difference (%)
LBI Resource Areas	19,474,766	19,474,766	0.0%

14.6 Grade Estimation

14.6.1 Introduction

The block model was used to calculate the Wanipigow LBI glass sand resource estimate based on the different percentages of LBI sand retained in the 35/120-mesh fraction. The mineral resources were estimated using the ordinary kriging technique. Only the composites located within the LBI wireframe was used to condition the grade estimate of each block located within the LBI wireframe.

14.6.2 Compositing

Downhole sample length analysis shows that the drillhole samples range from 0.3 m to 2.2 m with a dominant sample length of 1.5 m. Subsequently, a composite length of 2 m was selected as it provides adequate resolution for mining purposes and is equal to, or larger in length than 97.6% of the drillhole samples (Figure 14.6).

Length-weighted composites are calculated for all samples within the LBI sand. The compositing process starts from the first point of intersection between the drillhole and the LBI wireframe and is stopped upon intersection with the bottom of the LBI wireframe. No composites are calculated that straddle the contacts between the LBI sand and the overlying waste material or underlying crystalline basement.

Instead of enforcing a maximum composite length of 2 m, compositing is completed in a manner that redistributes the composite interval to minimize the number of composites that are less than 1 m in length, also known as orphans. This compositing method does cause some composites with lengths greater than 2 m. However, it is believed that maximizing the number of composites that are approximately 2 m, in favour of maintaining a strict maximum composite length of 2 m, mitigates error introduced to the model.

The final lengths of the calculated composites are illustrated in Figure 14.7. It is common practice to use only composites with lengths equal to or greater than half of the selected composite length (2 m) for resource estimation. There are 4 composites with lengths less than 1 m; however, as there are so few and that they represent the units in areas where they pinch out, they are not removed.

Figure 14.8 and Table 14.7 detail the composted distribution and statistics of each size fraction used during the estimation of the Wanipigow LBI glass sand resource estimate. The composited samples were used for all sample statistics, capping, estimation input file and validation comparisons.

Figure 14.6 Histogram of raw drillhole sample lengths within the LBI sand. Abbreviations: n – number of observations; m – mean; σ – standard deviation; CV – coefficient of variation; x_{max} – maximum value; x_{75} – 75-percentile; x_{50} – 50-percentile or median; x_{25} – 25-percentile; x_{min} – minimum value.

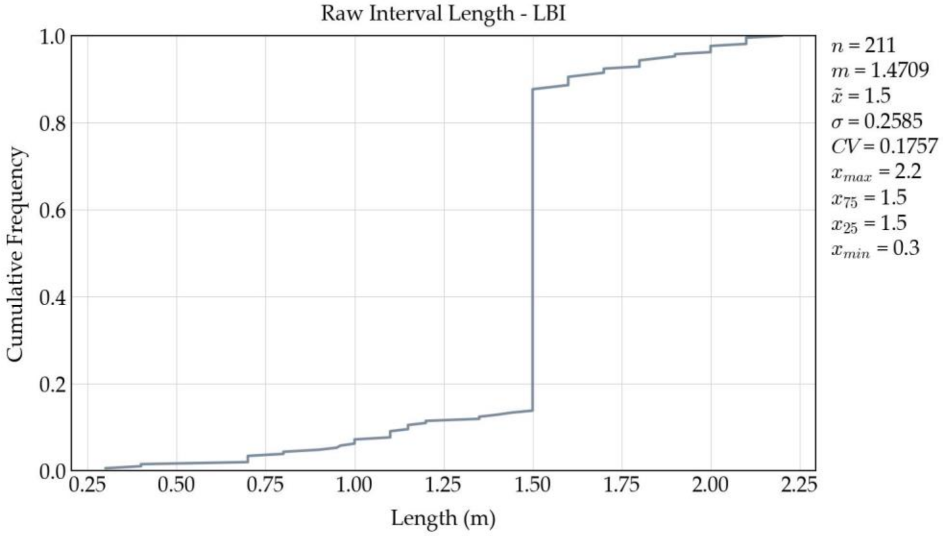


Figure 14.7 Histogram of composite sample lengths within the LBI sand.

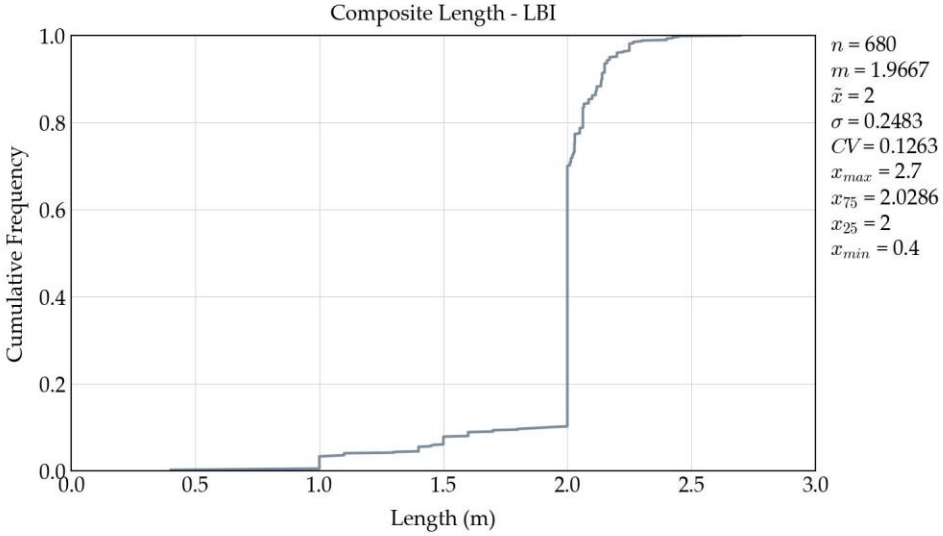


Figure 14.8 Histograms of the composited size fractions analyses completed on samples collected from the LBI sand.

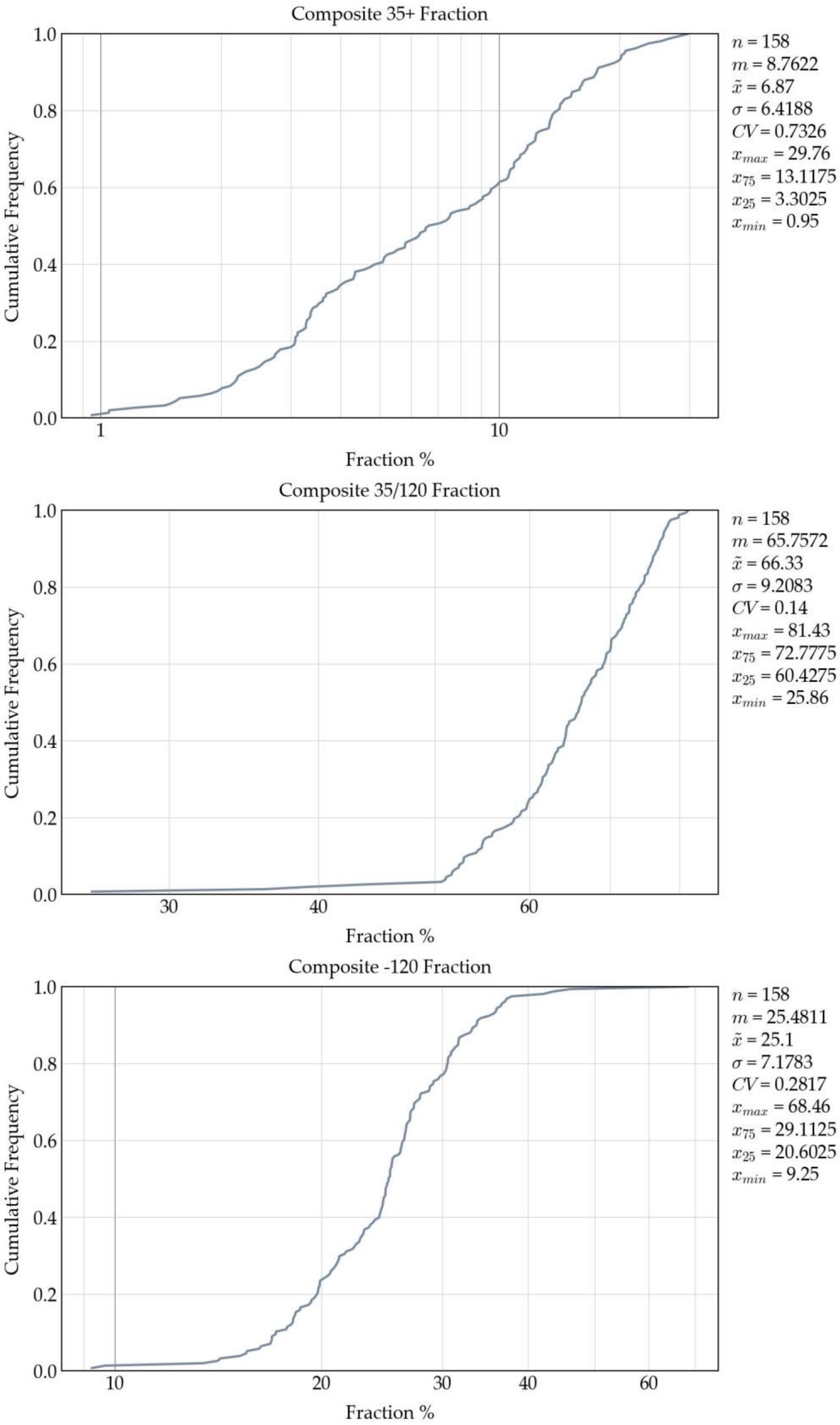


Table 14.7 Summary statistics of composited size fractions analyses completed on samples collected from the LBI sand. Abbreviations: std – standard deviation, var – variance, CV – coefficient of variation, 25% – 25-percentile, 50% – 50-perceitnile or median, 75% – 75-percentile.

Unit	Size Fraction	count	mean	median	std	var	CV	min	25%	50%	75%	max
LBI	**+35**	157	8.81	7.09	6.41	41.13	0.73	0.95	3.34	7.09	13.27	29.76
	35/120	157	65.77	66.36	9.24	85.32	0.14	25.86	60.41	66.36	72.8	81.43
	-120	157	25.43	25.04	7.17	51.38	0.28	9.25	20.59	25.04	29.09	68.46

14.6.3 Capping

A probability plot illustrating all raw sieve measurements is used to identify outlier values. Figure 14.9 illustrates a probability plot for each of the size fractions being estimated. Each sample is displayed as a single point with outliers being those that breakaway at the high end of the distribution from the low angle (toward higher values) relative to the denser points. No extreme values that require treatment were identified; therefore, no capping was applied.

14.6.4 Variography

The QP calculated and modelled semi-variograms for the selected size fractions using the 2 m composites flagged within the LBI wireframe~~s~~. Given the flat lying nature each unit and the lack of horizontal anisotropy, the variograms for all size fractions are modeled using an omnidirectional horizontal semi-variogram and a vertical semi-variogram.

Experimental semi-variograms were calculated along the horizonal plane and vertical principal directions of continuity as defined by three Euler angles. Euler angles describe the orientation of anisotropy as a series of rotations (using a left-hand rule) that are as follows:

1. A rotation about the Z-axis (azimuth) with positive angles being clockwise rotation and negative representing counterclockwise rotation.

2. A rotation about the X-axis (dip) with positive angles being counterclockwise rotation and negative representing clockwise rotation.

3. A rotation about the Y-axis (tilt) with positive angles being clockwise rotation and negative representing counterclockwise rotation.

Parameters of the modeled variograms are documented in Table 14.8 and the calculated semi-variogram and models for each size fraction are illustrated in Figure 14.10.

Figure 14.9 Probability plots of the composited size fractions analyses completed on samples collected from the LBI (dots) units.

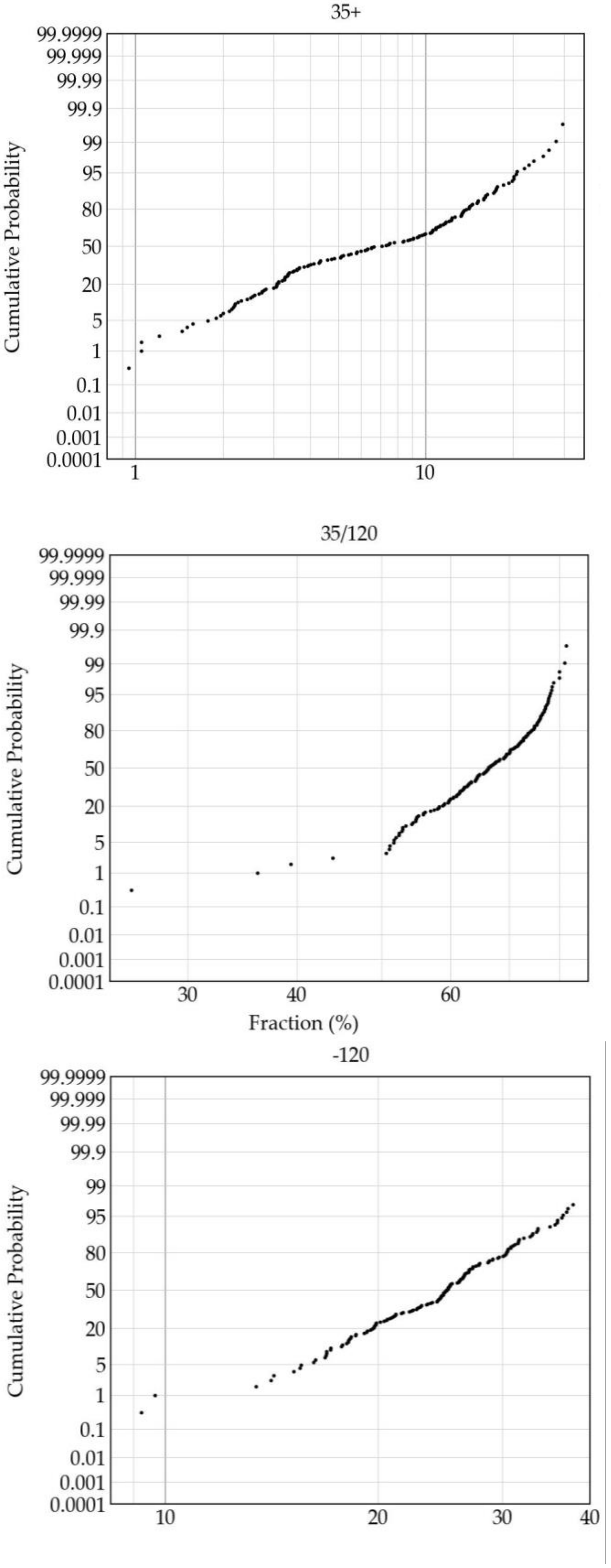
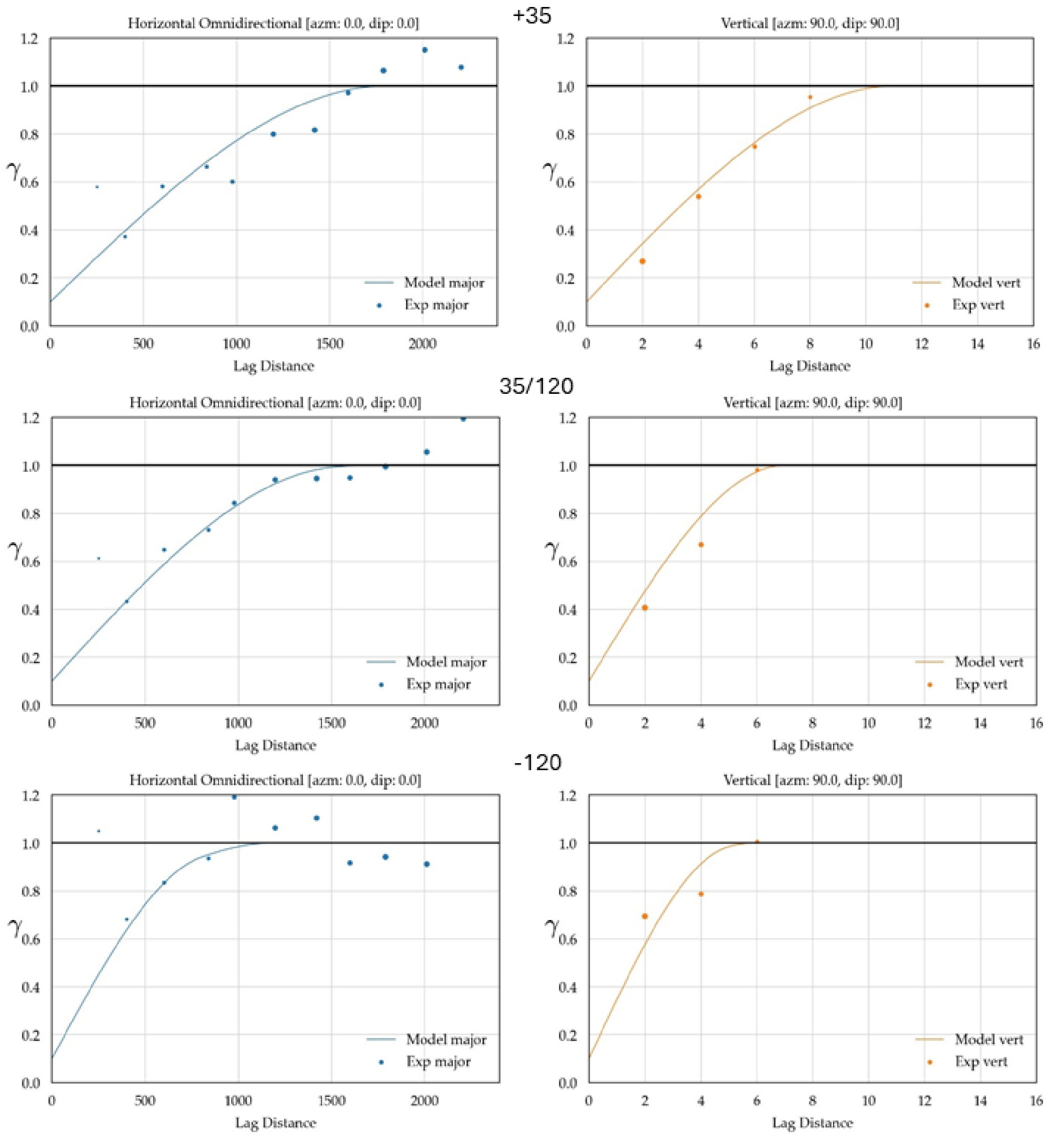


Table 14.8 Variogram model parameters of size fractions estimated within the LBI unit.

Variable	Azm	Dip	Tilt	Nugget Effect	Sill	Structure 1				Structure 2			
						Type	CC	Ranges		Type	CC	Ranges	
								Omni Horizontal	Vertical			Omni Horizontal	Vertical
+35	0	0	0	3.93	41.1	Exp	20.6	1800	11	Sph	16.5	1800	11
35/120	0	0	0	8.54	85.3	Exp	42.7	1500	7	Sph	34.2	1700	7
-120	0	0	0	5.16	51.4	Exp	25.7	800	5	Sph	20.6	1200	6

Abbreviations: CC – covariance contributions for the given structure.

Figure 14.10 Calculated and modeled semi-variograms (horizontal omnidirectional and vertical) for each sand fraction of interest within the LBI unit.



14.6.5 Bulk Density

A total of 52 sample splits were collected from drillhole samples to determine the loose bulk density of the LBI sand (n=36 samples) and the waste material overlying the LBI sand (n=16 samples including 13 and 3 samples glaciofluvial and UBI sand, respectively).

The loose bulk densities were converted to an *in-situ* bulk sand density by utilizing a bulking factor of 30% (see section 10.5). This was done to best replicate the *in-situ* resource of the Winnipeg Formation and overlying waste surficial material. The bulk density correlates with any potential future mining process that would sample entire sections of bedrock material.

Utilizing the loose densities with a 30% bulking factor, the *in-situ* compacted bulk densities of the LBI sand is 1.877 g/cm^3 and the overlying waste material is 1.902 g/cm^3 (Table 14.9).

Table 14.9 Summary of density analysis from samples collected during CPS' 2018 drillhole program. The grey-shaded average compacted densities were used in the resource estimations presented in this technical report.

				Sample length-weighted averages	
Lithology	**Count**	**Min. (g/cm^3)**	**Max. (g/cm^3)**	**Average loose bulk density (g/cm^3)**	**Average compacted bulk density (g/cm^3)** [2]
Overlying waste material [1]	16	1.230	1.590	1.463	1.902
Lower Black Island	36	1.320	1.550	1.444	1.877

[1] Combined Pleistocene glaciofluvial, Upper Black Island, and Black Shale

[2] Compacting using a 30% bulking factor (see text for references).

14.6.6 Estimation Methodology

Ordinary Kriging (OK) was used to estimate the size fraction values at each parent block that lies within the LBI wireframe. Blocks within each formation are conditioned using only composites within the same formation. The search ellipse orientation and ranges are defined by the variography described in Section 14.4.2.

Volume-variance corrections are enforced by 1) restricting the maximum number of conditioning values to 15; and 2) restricting the maximum number of conditioning values from each drill hole by 3 (for all size fractions). These restrictions are implemented to ensure the estimated models are not over-smoothed, which would lead to inaccurate estimation of global tonnage and grade.

These corrections can cause local conditional bias, but the technique is implemented to ensure that the global estimate of grade and tonnes in the Wanipigow LBI glass sand resource estimate is accurate.

14.7 Block Model Validation

14.7.1 Visual Validation

The blocks are visually validated in plan view and in cross-section to compare the estimated block size fractions versus the sample composite size fractions. Example cross-sections of this visual validation process – for both the geological wireframing (LBI and overlying waste rock) and composited and estimated size fractions – is presented in Figure 14.11. Overall, the estimated block size fractions compare well with the composite size fractions.

14.7.2 Statistical Validation

Swath plots are used to verify that directional trends are honoured in the estimated model and identify potential areas of over- or under-estimation. They are generated by calculating the average size fraction between the composites and estimated models within east-west, north-south and vertical slices. The averages are calculated within directional slices: a window of 100 m is used in the east-west and north-south, and 10 m for the vertical slices. These figures are presented as east-west, north-south and vertical swath plots for LBI (Figures 14.12 to 14.14).

Figure 14.12 East-west swath plots comparing composite versus estimated size fractions within the LBI unit for +35, 35/120, and -200 fractions, respectively.

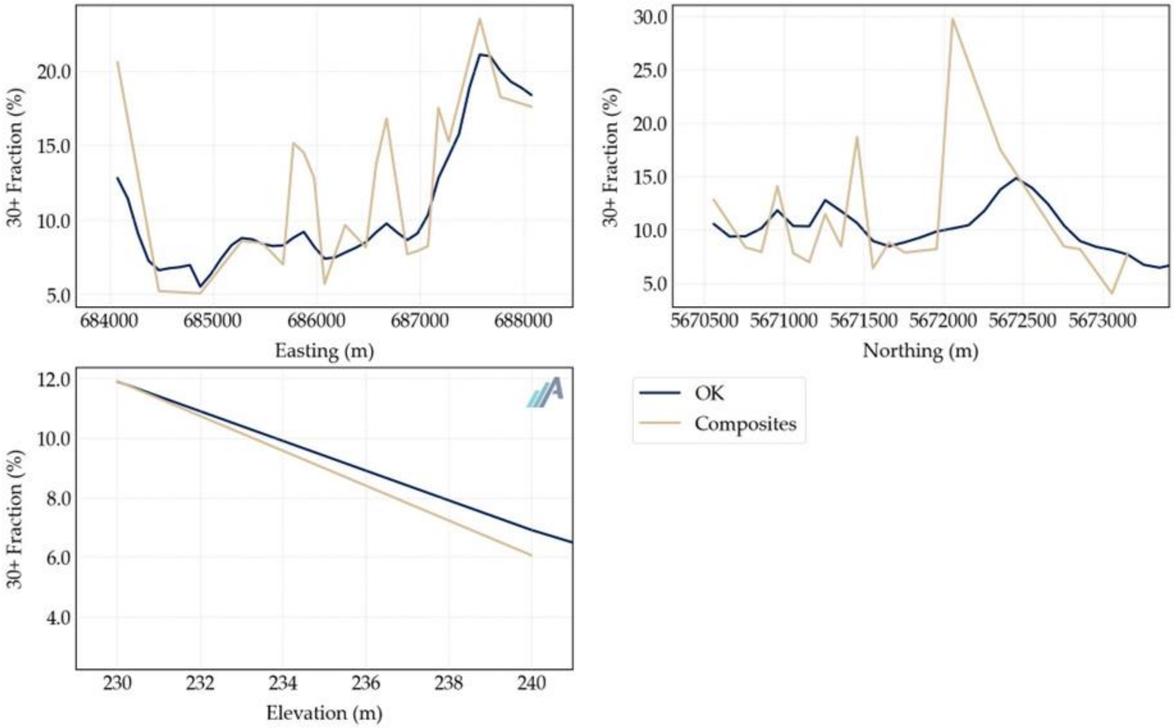


Figure 14.11 North-looking cross-sections demonstrating an example of the 3-D geological and block model. Vertical exaggeration of 10:1. The upper cross-section illustrates the overlying units (grey), which include Pgf, UBI, and BS, and the LBI (yellow). Lower image illustrates the estimated 35/120 values compared to the 35/120 composited data.

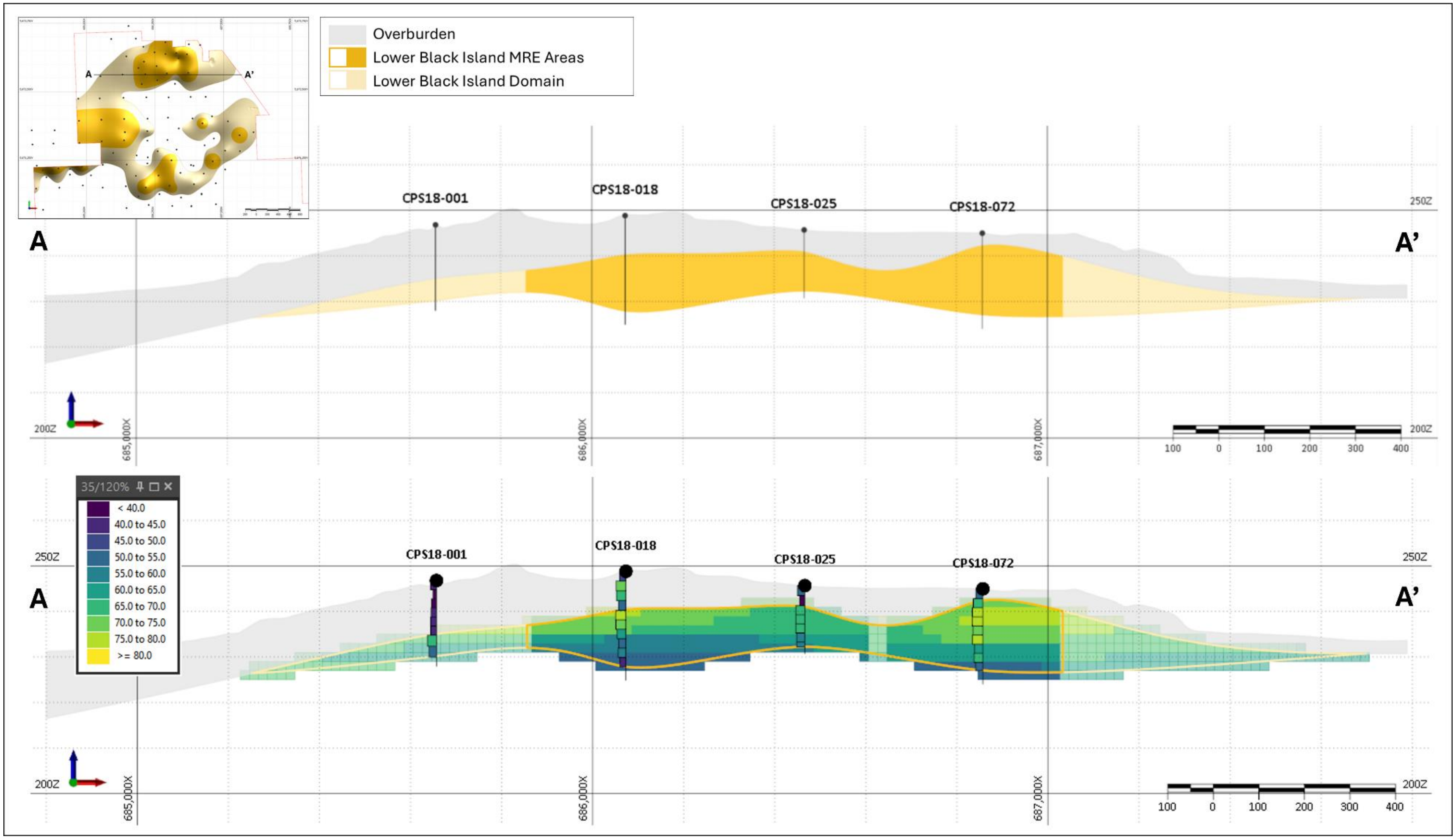


Figure 14.13 North-south swath plots comparing composite versus estimated size fractions within the LBI unit for +35, 35/120, and -120 fractions, respectively.

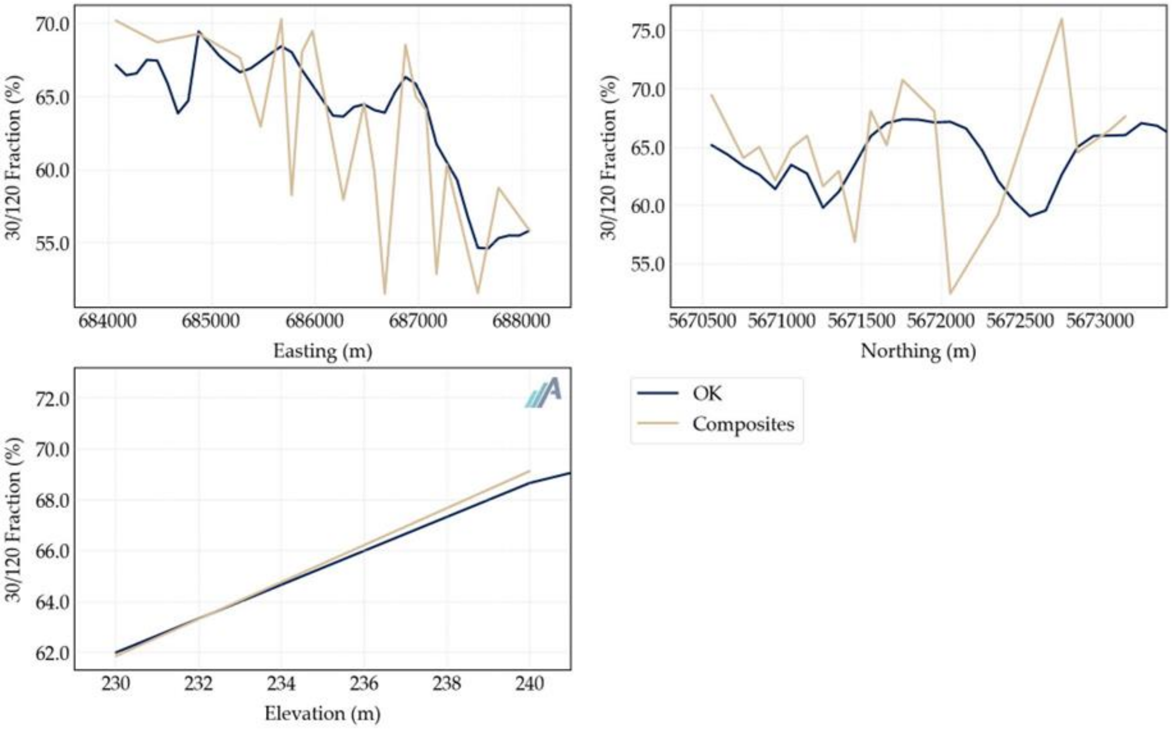
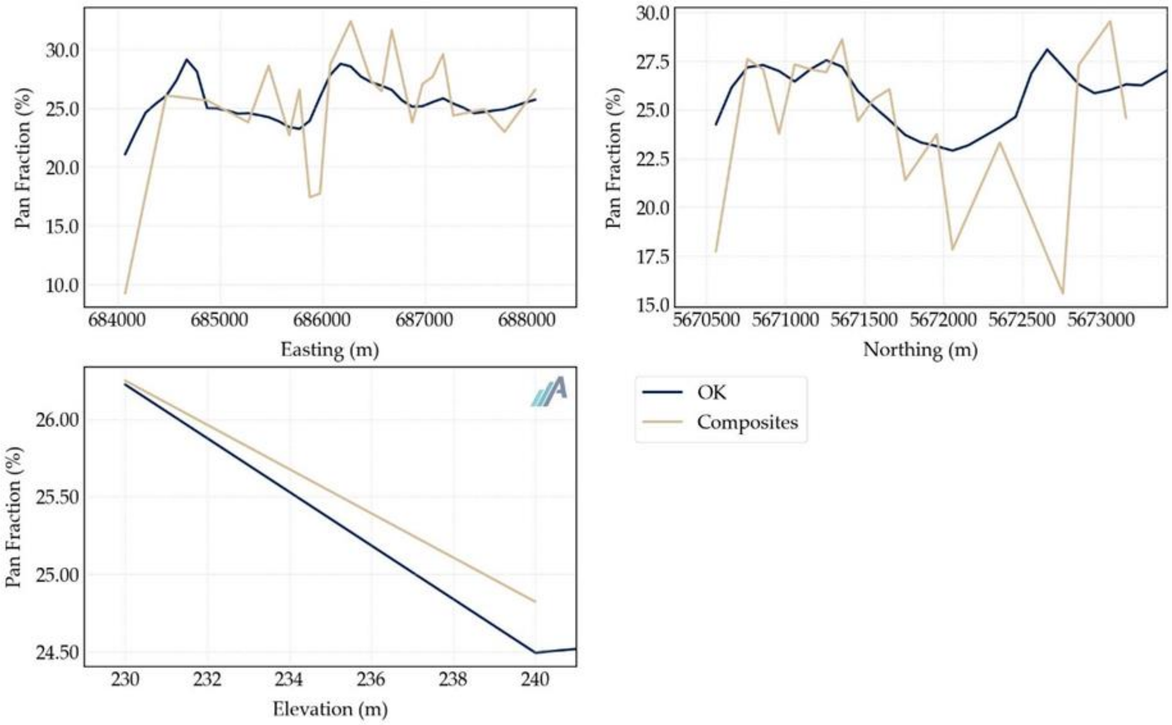


Figure 14.14 Vertical swath plots comparing composite versus estimated size fractions within the LBI unit for +35, 35/120, and -120 fractions, respectively.



Overall, the trend observed in the composite data for the LBI sand is reasonably reproduced – particularly in the vertical direction. While the block model trend in the east-west and north-south is relatively flat, the QP suspects variation in the vertical trend essentially models cyclicity within the depositional environment.

Histograms of the LBI size fractions from the composites and the estimated block model are plotted to ensure the final model is not over- or under-smoothed and to check that the histogram of the block model compares well to the input data (Figure 14.15)

All size fractions appear to show good correlation between the block model and the input data. Some smoothing, as designated by the slope of the curve, is associated with, for example, the LBI Pan.

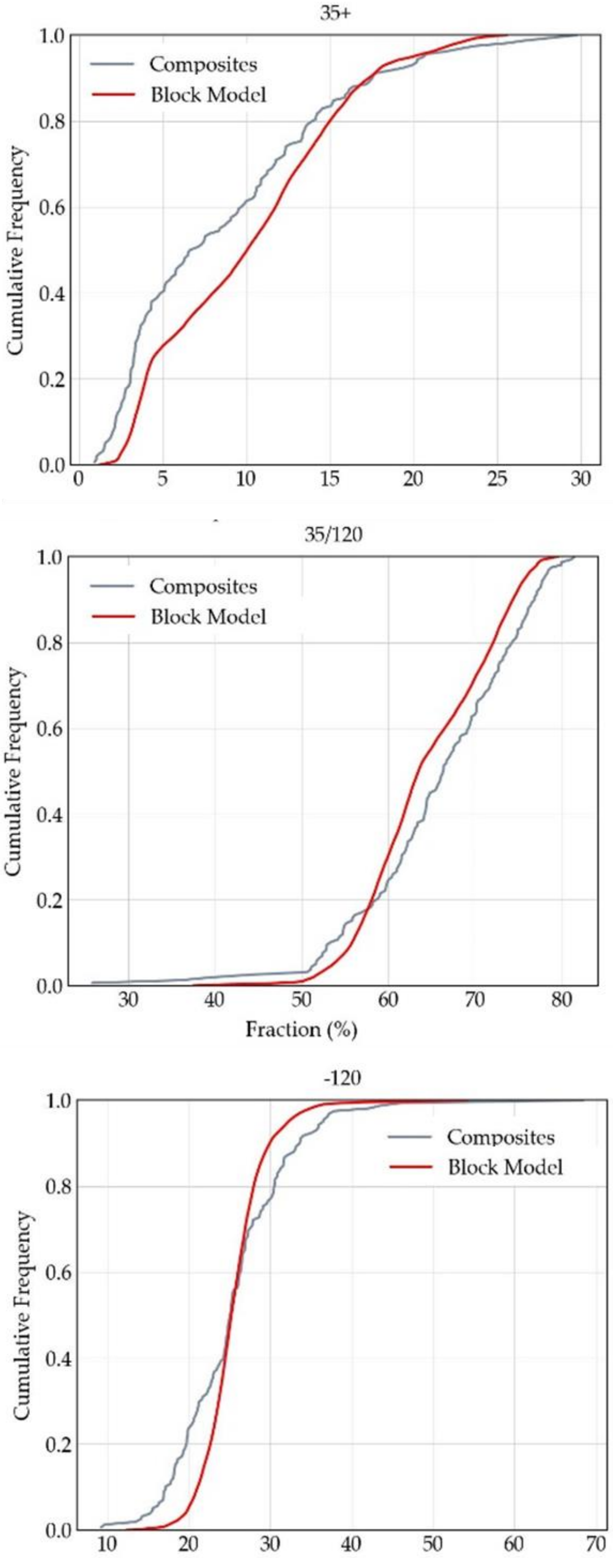
14.8 Mineral Resource Estimate

14.8.1 Definition of Mineral Resource

A mineral resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The Wanipigow LBI glass sand resource estimate has been classified in accordance with guidelines established by CIM definition standards and best practice guidelines (2014, 2019). Select resource classifications include:

> ***"Inferred Mineral Resource*** *is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.*
>
> ***Indicated Mineral Resource*** *is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve."*

Figure 14.15 Histograms of each size fraction comparing composite versus block model distributions within the LBI unit.



14.8.2 Resource Classification Methodology

The LBI sand mineral resources within the LBI glass sand resource areas are classified as inferred mineral resources.

The QP has a high level of confidence in the stratigraphy of the Winnipeg Formation and geological contacts associated with the LBI sand based on CPS's 2018 and 2022 drill programs and gradation analysis. In addition, the 2020-2024 beneficiation tests conducted by CPS has shown that portions of the LBI sand within the Wanipigow LBI domain can be processed to achieve low-iron sand levels that are required to produce high quality sand for glass making. Accordingly, the LBI sand resource areas were expanded in this technical report to include those areas where beneficiation testing transformed the LBI sand to low-iron sand levels of ≤100 ppm Fe_2O_3.

However, and to expand on the inferred resource classification, some of the LBI sand samples submitted for beneficiation testing were not able to achieve CPS's low-iron specification levels. For example, Table 13.5 shows,

- Of the 50 LBI sand samples processed for beneficiation testing, the original -500 µm LBI sand size fraction yielded initial feed iron contents of between 588 ppm and 7,210 ppm Fe_2O_3 with an average of 1,515 ppm Fe_2O_3. The combined original iron analyses have a %RSD of 80%.

- LBI sand collected from drillholes CPS18-061, CPS18-083, and CPS18-088 were beneficiated and did not meet low-iron sand criteria. However, LBI sand from other, proximal, drillholes located 275 m to 330 m away from the 3 low-iron sand holes, and subjected to the same beneficiation methods, were able to meet the ≤100 ppm Fe_2O_3 criteria.

- In the beneficiation assessment of low-iron LBI sand, some LBI intersections within the same drillhole (but at different stratigraphic depths) yielded both positive (pass) and negative (fail) low-iron results. For example, fully beneficiated LBI sand from drillhole CPS18-013, either,
    - passed for low-iron sand at sample intervals of 9.0-12.0 m and 16.5-21.0 m, or
    - failed for low-iron sand at sample intervals 7.5-9.0 m and 12.0-16.5 m.

Hence, the variation in the LBI sand's iron content, or iron-bearing mineral properties, is not consistent within the Wanipigow LBI sand domain. As per the examples above, this is evident both laterally and vertically, and in both pre- and post-beneficiation analytical evaluations.

The QP hypothesizes that the lower silica values may occur because of localized mixing between 1) the LBI sand and the overlying UBI sand, and/or 2) at the basal portions of the LBI where mixing occurs with iron-bearing minerals associated with the underlying Precambrian basement. The Winnipeg Formation is essentially reworked surficial material, and as such, there is likely chemical ambiguity associated with the depositional nature and history of the sand units.

Hence, the inferred resource estimate implies a level of confidence that correlates with the applicability of the Wanipigow LBI sand to, on a consistent basis, meet the high-quality, beneficiated, low-iron sand levels required for a commercial-scale solar glass operation.

14.8.3 Evaluation of Reasonable Prospects

Rationale for why the Wanipigow Sand Project has demonstrated and defined criteria for reasonable prospects of eventual economic extraction include,

- Solar panels and windows are becoming a large part of the Canadian energy solution as evidenced by solar rebate and incentives being implemented by Canada's Federal Government. This identifies as a significant factor that can influence the specialty glass market demand and the potential success of marketing the Wanipigow LBI sand from within the LBI glass sand resource areas.

- The LBI sand domain at the Wanipigow Sand Project property encompasses an area of 5.18 km^2. Within the LBI domain, the collective LBI resource areas outlined in this technical report encompass 2.06 km^2. Within the resource areas, the thickness of the LBI sand has a normalized average thickness of 9.4 m.

- CPS's exploration programs and beneficiation processing, glass melt test, and coating test work has enabled the QP's to develop a higher level of confidence in the project via drill and data density, and the positive results of the analytical test work to meet the specifications of low-iron sand glass product.

- The project is situated in southern, central Canada where product distribution could meet demands in eastern and western Canada. The deposit is road accessible and is approximately 160 km northeast of the City of Winnipeg, MB.

To conclude, CPS's Wanipigow Sand Project has the potential to manufacture high quality sand feed (ultra high silica and ≤100 ppm Fe_2O_3) for use in specialty glass products such as solar panels or ultra-clear energy efficient architectural float glass for energy efficient buildings/homes. It is the QPs opinion that the Wanipigow Sand Project's LBI sand has reasonable prospects of eventual economic extraction and utilization in the glass manufacturing market.

14.8.4 Cutoff

A lower cutoff of greater than or equal to 35-mesh (>500 µm) and less than or equal to 120-mesh (<125 µm) fraction is used in the Wanipigow glass sand resource estimate. This cutoff is believed to represent the fraction of mineralized material that qualifies as being economically mineable and is justified by the results of the individual fraction chemical evaluation and metallurgical test work discussed in Section 13.

14.8.5 Mineral Resources Reporting

The LBI glass sand mineral resource within the Wanipigow Sand Property has been prepared in accordance with CIM (2014, 2019) and the disclosure rule NI 43-101, and is classified as an inferred mineral resources.

A Wanipigow Sand Project 3D subsurface geological model was created using a total of 110 sonic drillholes (totaling 1,857.4 m). The resource modelling focuses on the LBI sand domain within the Wanipigow Sand Project, which is overlain by defined waste material that consists of Pleistocene glaciofluvial, Upper Black Island sand member, and Black Shale. The Wanipigow LBI sand domain has been block modelled using the results of 236 LBI sand gradation data.

Seven individual LBI glass sand resource areas have been defined and are fully contained within the Wanipigow LBI sand domain. A total of 35 drillholes and 161 gradation data occur within 7 LBI glass sand resource areas. Collectively, the LBI glass sand resource areas encompass a total area of 2.06 km^2 and have LBI sand thicknesses of between 0 m to 16.5 m thick and has a normalized average thickness of 9.4 m.

The resource areas have been clipped to the property boundary, the limits of the Wanipigow LBI domain, and the uppermost topographic surface defined by 1 m resolution LiDAR data.

The resources are calculated using a block model with a size of 20 by 20 m in the horizontal directions and 2 m in the vertical direction. A block factor is calculated for each of the units that represents the percentage of the block volume that lies within each unit. The size fractions of interest are estimated at each parent block using ordinary kriging. The mineral resources were estimated using the ordinary kriging technique for the LBI sand. Only those composites located within the LBI wireframe were used to condition the grade estimate of each block located with the LBI wireframe.

In-situ compacted sand bulk densities of 1.877 g/cm^3 and 1.902 g/cm^3 were applied to LBI sand, and overlying waste material, respectively.

The Wanipigow Property estimation of the individual size fractions is completed and reported using a lower cutoff of mesh-sizes that are greater than or equal to 35-mesh and less than or equal to 120-mesh fraction (i.e., the +35 and -120 size fractions are discarded from the estimation process).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. This inferred Wanipigow glass sand resource estimate predicts the following total (i.e., global) Lower Black Island glass sand inferred resources of 24.386 million metric tonnes (Table 14.10).

Table 14.10 The Wanipigow Sand Project inferred glass sand resource estimate reported for the Lower Black Island sand as a total (global) volume and tonnage (grey highlight).

Inferred Lower Black Island Sand Resource

Mineral resource area	**Volume (m^3)**	**Tonnage (metric tonnes)**
Total in situ (global) [1]	12,992,000	24,386,000
Resource area 1	4,618,000	8,668,000
Resource area 2	5,982,000	11,229,000
Resource area 3	549,000	1,030,000
Resource area 4	1,331,000	2,499,000
Resource area 5	127,000	238,000
Resource area 6	232,000	436,000
Resource area 7	153,000	286,000

[1] The main total in situ (global) LBI sand inferred resource estimate.

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by geology, environment, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

Note 2: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs).

Note 3: The 'Total' (global) volume and weights highlighted in grey are estimated on a global basis and represent the main Wanipigow Sand Project inferred LBI glass sand resource estimate.

Note 4: The Wanipigow estimation of the individual sieve size fractions was completed and reported using a lower cutoff of mesh-sizes that are greater than or equal to 35-mesh and less than or equal to 120-mesh fraction.

Note 5: *In-situ* compacted bulk densities used to convert volume (cubic metres) to tonnage and include a Lower Black Island sand density of 1.877 g/cm^3 and an overlying waste material density of 1.902 g/cm^3.

The main This inferred Wanipigow glass sand resource estimate is reported as a single total inferred mineral resource (highlighted in Table 14.10). With respect to LBI sand tonnages within the individual mineral resource areas, resource area 2 has the large tonnage (11.229 million metric tonnes), followed by resource area 1 (8.668 million metric tonnes), resource area 4 (2.499 million metric tonnes), resource area 3 (1.030 million metric tonnes), and resource areas 5, 6, and 7 have between 238,000 and 436,000 tonnes.

With respect to the overlying waste rock, and using a 1.902 g/cm^3, the combined glaciofluvial, UBI sand, and Black Shale units overlying the 7 LBI sand resource areas have an estimated volume of 17.877 million m^3 and 34.002 million metric tonnes.

14.9 Reconciliation of Lower Black Island Glass Sand Resources

With respect to mineral resource reconciliation, this technical report has been prepared by an independent QP because there is a greater than 100% change in CPS's mineral resource. The Wanipigow LBI glass sand mineral resource disclosed in the current technical report is 3.4 times larger than the resource reported in CPS's initial LBI glass sand resource (dated October 14, 2021). More specifically, the LBI glass sand tonnage has increased from 7.250 million metric tonnes to 24.386 million metric tonnes.

The increase in LBI glass sand mineral resource estimate is directly related to:

1. An expanded mineral resource area from 0.738 km^2 in a single 2021 resource polygon to an area of 2.060 km^2 that is collectively defined within 7 separate 2025 resource polygons. Hence, the current resource area is 2.8 times larger than the initial 2021 resource area.

   CPS's initial 2020-2021 glass sand test work achieved low-iron sand capability within a single mineral resource area in the northern part of the Wanipigow Sand Project property. During 2022-2024, CPS's beneficiation work was conducted on larger portion of the LBI sand domain within the Wanipigow Sand Project. Low-iron sand was achieved via beneficiation of LBI sand samples from 20 of 23 drillholes.

   In the QPs opinion, achieving LBI sand with ≤100 ppm Fe_2O_3 provided justification for reasonable prospects of eventual economic extraction and the expanded mineral resource areas presented in this report.

2. The increase in the size of the mineral resource areas is a significant reason for the increase in tonnage. However, the mineral resource area size increase is not directly proportional to the increase in tonnage. This is because the new mineral resource areas utilize some of the thickest sections of LBI sand within the Wanipigow LBI sand domain. The average LBI sand thickness in the resource areas is 9.4 m thick; in contrast, the average LBI sand thickness of the entire Wanipigow LBI domain is 5.8 m.

23 Adjacent Properties

An adjacent property means a property: 1) in which the issuer does not have an interest; 2) that has a boundary reasonably proximate to the property being reported on; and 3) that has similar geological characteristics to those of the property being reported on. This section contains references to silica sand and silica sand mining that has taken place off the Wanipigow Property. The QP has been unable to verify this information and therefore the information is not necessarily indicative to the mineralization on the Wanipigow Property.

23.1 Other Quarry Interests

23.1.1 Casual Quarry Permits

There are several active Casual Quarry Permits in property area (Figure 23.1). A casual Quarry permit on designated land survey NE/NW-25-025-008-E1 are surrounded by CPS Quarry leases (1693, 1682, 1680 and1679). Casual quarry permits as described in the Quarry Minerals Regulation, 1992 of the *Mines and Mineral Act*, authorizes the holder to produce a specified quantity of the quarry mineral as listed in their permit for a selected duration of time. A permit may be issued to multiple parties for the same quarry mineral and the same area of land at the same time. Causal Quarry permits adjacent to the property are presently for aggregate sand and gravel only.

23.1.2 Quarry Withdrawals

Several areas adjacent to the property have been withdrawn from quarry staking by the Crown and are currently reserved for use by Manitoba Infrastructure.

23.1.3 Other Quarry Leases

As presented in Figure 23.1, there are adjacent-property active Quarry Leases in CPS's Wanipigow Sand Project property area that include:

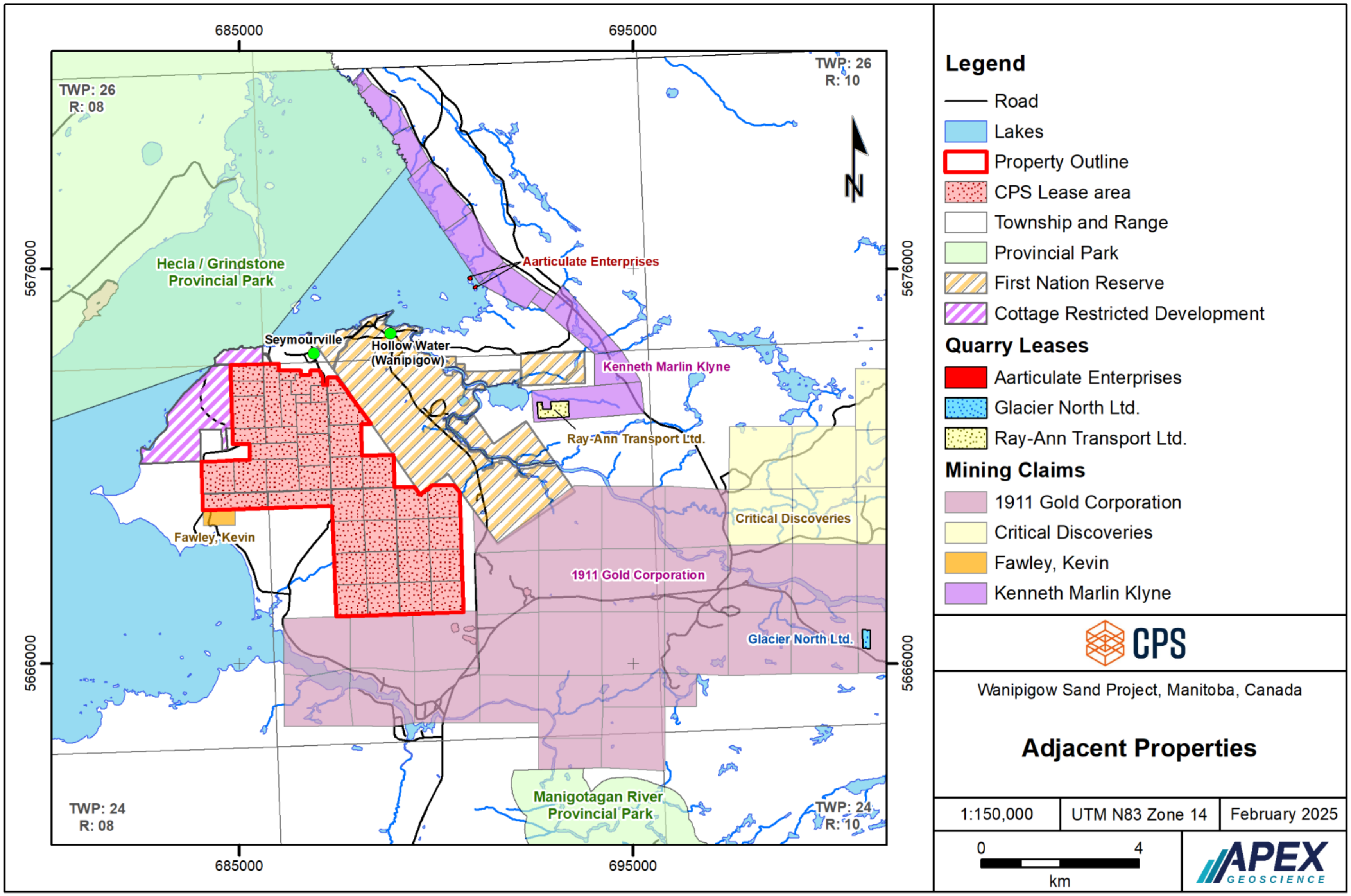
- Aarticulate Enterprises has the Rock and Stone rights to QL-3563 and QL-3564 located on Storey and Lewis islands approximately 4 km northeast of CPS's Wanipigow Property.

- Ray-Anne Transport Ltd. has the Rock/Stone and Shale rights to QL-2685. The lease is located approximately 5 km east of CPS's Wanipigow Property.

- Glacier North Limited has rights to QL-2736, which is approximately 10.2 km east of the southeast portion of CPS's Wanipigow Property.

A QP search was not able to find if these companies are extracting rock, stone, or shale from their Quarry Leases.

Figure 23.1 Adjacent properties to the Wanipigow Sand Project.



23.2 Mineral Mining claims

Mineral Mining Claims grant the owner the exclusive right to explore for and develop the Crown minerals located on or underneath the claim except for Quarry minerals. The spatial distribution of Mining Claims is presented in Figure 23.1.

There is a large active contiguous block of 33 Mineral Mining Claims held by 1911 Gold Corporation that is directly adjacent to the southern border, and to the southeast, of the Wanipigow Sand Project. 1911 Gold Corporation is a junior gold producer located in the Rice Lake gold district within the West Uchi greenstone belt. The Company holds a dominant land position with over 53,000 ha, an operating milling facility, an underground mine with one million ounces in resources, and significant upside surface exploration potential (1911 Gold Corporation, 2025a). 1911 Gold Corporation announced an updated underground mineral resource estimate for the True North Gold Project on November 20, 2024 (1911 Gold Corporation, 2025b).

Critical Discoveries has a large contiguous block of 46 Mining Claims located approximately 6.7 km east of CPS's Wanipigow Property. Critical Discoveries is an early-stage explorer focused on critical minerals and offer consulting services to related clients searching for critical minerals in Canada (Critical Discoveries, 2025).

Kevin Fawley has a single Mineral Claim (MB15219) is directly adjacent to the east-central part of CPS's Wanipigow Property. Kenneth Marlin Klyne has a contiguous series of 11 northwest-orientated Mineral Claims located 4.8 km to 8.3 km northeast of CPS's Wanipigow Property. A QP search was not able to find if these individuals are currently prospecting or for what type of commodity.

23.3 Private Property

The eastern side of the property borders the private cottage divisions of Ayers Cove and Pelican Harbour. It is a cottage restricted development area. The village of Seymourville and the First Nations community of Hollow Water are the two larger private communities to the west of the property.

24 Other Relevant Data and Information

24.1 Lower Black Island Sand Exploration Target

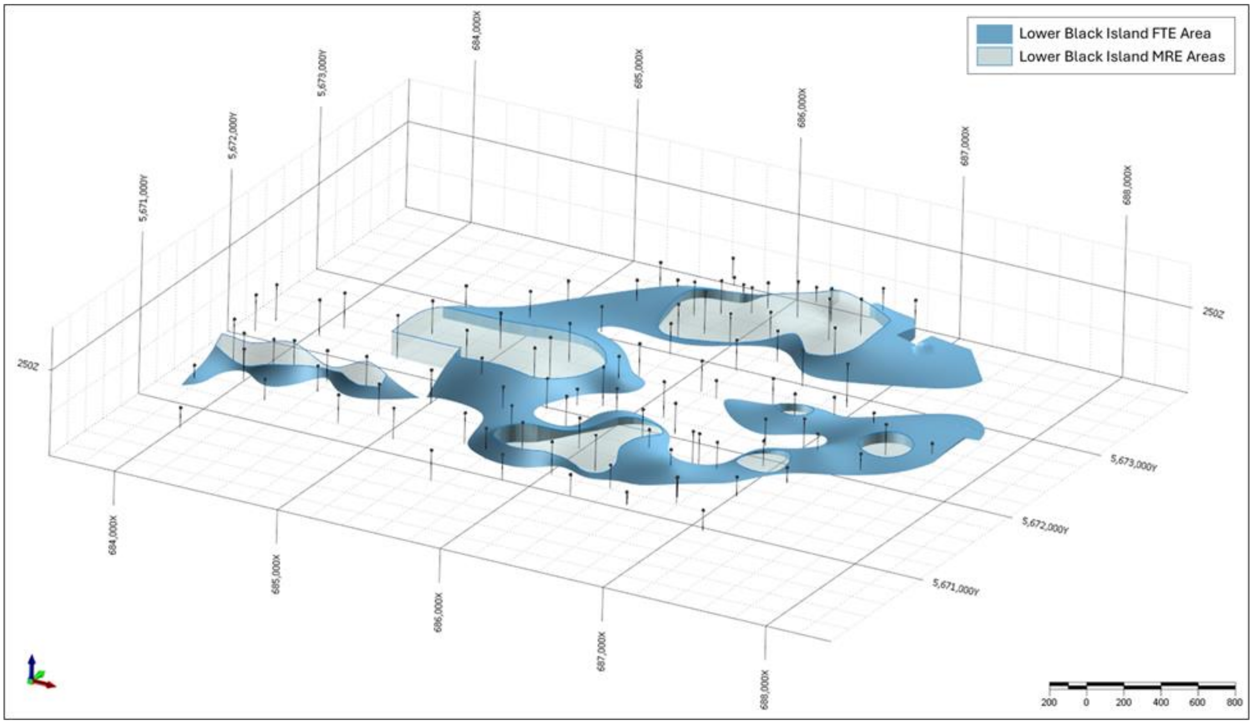
In addition to the updated mineral resource estimate for the Wanipigow LBI glass sand, a conceptual exploration target is presented and incorporates the LBI sand that is not included within the mineral resource areas (Figure 14.1). More specifically, the conceptual exploration target includes those areas where LBI sand has not undergone beneficiation testing, or requires further beneficiation work, to achieve low-iron LBI sand.

The exploration target has an area of 3.12 km^2 and was calculated in the same way the inferred mineral resource estimate was calculated, and additionally, by applying a plus or minus percentage of 20% to define a conceptual exploration target range of between 11.944 million metric tonnes and 12.431 million metric tonnes.

An exploration target has less confidence than an inferred mineral resource. The potential quantity is conceptual in nature as there has been insufficient work to define a mineral resource. It is uncertain if further test work and/or marketing will result in the exploration target being delineated as a mineral resource.

With respect to the waste rock overlying the LBI exploration target and using a waste rock density of 1.902 g/cm^3, the combined estimated tonnage of the glaciofluvial, UBI sand, and Black Shale units is 58.100 million metric tonnes.

Figure 24.1 Area of the conceptual Exploration Target within the Wanipigow Lower Black Island sand domain.



24.2 Summary of Wanipigow Hydraulic Frac Sand/Proppant PFS Reporting

The QP, and the Issuer, state that the updated glass sand mineral resources presented in this, CPS's current technical report, remain the focus of the Company' interest in the Wanipigow Sand Project.

CPS wishes to state that the Wanipigow Sand Project was previously evaluated by the Issuer for its frac sand, or proppant, hydraulic fracturing potential. The Issuer completed a Preliminary Feasibility Study (PFS) with an effective date of March 19, 2020.

While the proppant-based mineral resources and economic study no longer relate to the glass sand potential at the project and glass sand mineral resources presented herein, CPS has asked the QP to summarize CPS's 2020 PFS report and News Release dated March 20, 2020 (Canadian Premium Sand Inc., 2020) with the intent of acknowledging this previous work under the category of other relevant data and information.

The 2020 frac sand/proppant-based resource surface area was 9.75 km^2 and utilized lithological information from 93 sonic drillholes and 744 gradation analyses to define 3 domains including (with the bulk density values): Pleistocene glaciofluvial (1.897 g/cm^3), Upper Black Island sand (1.911 g/cm^3), and Lower Black Island sand (1.878 g/cm^3). Using a lower cutoff of mesh-sizes that are greater than or equal to 20-mesh and less than or equal to 140-mesh fraction, the Wanipigow frac sand/proppant resource estimate predicts the following total (i.e., global) resources:

- Lower Black Island Measured & Indicated Resources of 39.2 million metric tonnes.
- Upper Black Island Indicated Resource of 3.1 million metric tonnes and Inferred Resource of 1.7 million metric tonnes.
- Pleistocene glaciofluvial Inferred Resource of 93.0 million metric tonnes.

Mineral resources are not mineral reserves and do not have demonstrated economic viability. The sand/proppant resource estimate has an effective date of March 19, 2020, and was prepared in accordance with CIM definition standards and best practice guidelines (2014, 2019) and the disclosure rule, NI 43-101.

Mineral reserves were derived from the measured and indicated mineral resource estimates and represent the portion of the mineral resource that has been converted to a mineral reserve through the application of appropriate modifying factors to potential mining volumes created during the mine design and planning process.

The mineral reserves are expressed as saleable product tonnage estimates of proven & probable reserves totalling 24.1 million metric tonnes comprised of: 21.3 million metric tonnes of Low Black Island sand and 2.8 million metric tonnes of Upper Black Island sand.

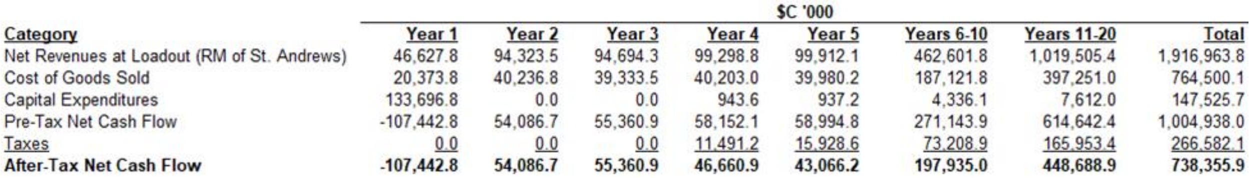
Given the data available at the time the 2020 PFS was prepared, the estimate presented is considered reasonable. However, the mineral reserve estimate should be accepted with the understanding that additional data and analysis available after the effective date of the estimate may necessitate revision. These revisions may be material. There is no guarantee that all or any part of the estimated mineral resource or mineral reserve will be recoverable.

The results of the economic analysis to support mineral reserves represent forward looking information that is subject to several known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. The mineral reserves estimated for the Wanipigow Silica Sand Project are subject to the types of risks common to most silica sand quarry operations that exist in Canada.

The capital expenditure estimate for the CPS fully enclosed wet and dry plant, loadout and related infrastructure is approximately CDN$124 million, with a contingency of approximately CDN$10 million. The total capital expenditure and lease-related costs are estimated at CDN$250 to CDN$255 million for life-of-mine plan. Operating costs are discussed for the first five years and are found to be reasonable and appropriate for a Preliminary Feasibility Study.

The CPS Hydraulic Frac Sand/Proppant Project has an after-tax Net Present Value (NPV) of CDN$290.7 million, discounted at an 8% discount rate (Table 24.1). The after-tax Internal Rate of Return (IRR) is 46.0%. Taxes include federal (15%) and provincial (12%; Manitoba) and assume capital loss carry forward and a tax loss carry forward related to capital expenditures from development of the mine previously incurred and treated as sunk capital for modelling purposes.

Table 24.1 Cash flow analyses



	$C '000							
Category	Year 1	Year 2	Year 3	Year 4	Year 5	Years 6-10	Years 11-20	Total
Net Revenues at Loadout (RM of St. Andrews)	46,627.8	94,323.5	94,694.3	99,298.8	99,912.1	462,601.8	1,019,505.4	1,916,963.8
Cost of Goods Sold	20,373.8	40,236.8	39,333.5	40,203.0	39,980.2	187,121.8	397,251.0	764,500.1
Capital Expenditures	133,696.8	0.0	0.0	943.6	937.2	4,336.1	7,612.0	147,525.7
Pre-Tax Net Cash Flow	-107,442.8	54,086.7	55,360.9	58,152.1	58,994.8	271,143.9	614,642.4	1,004,938.0
Taxes	0.0	0.0	0.0	11,491.2	15,928.6	73,208.9	165,953.4	266,582.1
After-Tax Net Cash Flow	**-107,442.8**	**54,086.7**	**55,360.9**	**46,660.9**	**43,066.2**	**197,935.0**	**448,688.9**	**738,355.9**

Uncertainty that may materially impact mineral resource and reserve estimations include but are not limited to site-specific mining and geological conditions, management and personnel capabilities, availability of funding to properly operate and capitalise the operation, variations in cost elements and market conditions, developing and operating the mine in an efficient manner, unforeseen changes in legislation and new industry developments.

25 Interpretation and Conclusions

This technical report and updated glass sand resource estimate was prepared independently by the QP on behalf of CPS. The Company is currently focused on, and evaluating, the Wanipigow LBI sand as a primary, high-silica-purity, low-iron source feed sand for the glass manufacturing industry. Prolific beneficiation test work and initial glass melt and anti-reflective solar coating solution glass tests demonstrate the CPS Wanipigow LBI feed sand and resulting coated glass samples has reasonable potential for solar and energy-efficient glass applications.

25.1 CPS Exploration Programs

In 2018, CPS completed a 93-hole (1,574 m) sonic drill program over an area of approximately 10 km^2. The program achieved a 94% core recovery rate in which 763 core samples were collected at 1.5 m intervals. Based on drill logs, lithological observations and grain size particle distributions, this study subdivides the Winnipeg Formation into four distinguishable subunits that include from bottom to top (along with their average thicknesses): Lower Black Island (LBI; average 7.9 m thick); Black Shale (BS; average 2.0 m thick); Upper Black Island (UBI; average 4.6 m thick); and Pleistocene glaciofluvial (Pgf; average 10.7 m thick). The strata are generally flat-lying, and hence, this thickness can be considered to represent the true thickness of the formation.

The 2018 samples were shipped to independent laboratories who conducted gradation and proppant characterization analytical methods that are standard and routine in the field of silica sand and proppant characterization test work. The proppant test work results show the Wanipigow Sand Project, Black Island Member silica sand generally satisfies the recommendations set forth in International Standards ISO 13503-2:2006/Amd.1:2009E for sieve size fractions, sphericity, roundness, acid solubility and turbidity and crush classification. Field duplicate samples were collected and subjected to gradation and crush strength analysis using multiple laboratories. The results had good to excellent correlation.

In 2022, CPS completed a 17-hole (283.5 m) sonic drill program. Overall core recovery was about 93%. The program drilled 14 infill holes and 3 infill holes in the in the northern part and southwestern most part of the property, respectively. A total of 183 samples were collected using the same sample collection protocol as used in the 2018 drill program.

The QP has reviewed the adequacy of the sample collection, preparation, and security, and QA-QC work and found no significant issues or inconsistencies that would cause one to question the validity of the data.

25.2 CPS Beneficiation Programs

CPS has conducted numerous tests on the Wanipigow LBI sand to assess its potential for use in the solar glass manufacturing industry. The test work was conducted over a period of 5 years from 2020 to 2024 and included numerous independent laboratories and/or third-party contractors. Each test tweaked the methodology and/or the equipment used, and as result, the beneficiation of the LBI sand to low-iron improved over time.

Initial low-iron (≤100 ppm Fe_2O_3) objectives were achieved during 2020-2021 studies on LBI sand collected and beneficiated from the north-central portion of the Wanipigow Sand Project property. Accordingly, CPS disclosed an inferred mineral resource estimate on a 0.74 km^2 portion of the Wanipigow LBI sand domain (Eccles and Hough, 2021), which is now superseded and replaced by the mineral resources presented in this technical report.

During 2022-2024, CPS expanded its LBI sand beneficiation test work to other portions of the Wanipigow Sand Project property and continued to improve the beneficiation process. The beneficiation test work provided justification to expand the initial 2021 mineral resource to include those areas where the LBI sand was successfully beneficiated to low-iron (≤100 ppm Fe_2O_3 LBI sand.

A bulk LBI sand sample (3,084 kg) was acquired by CPS and shipped to Hazen and Mineral Technologies. A total of 1,752 kg of sand was processed using a combination of screening, attrition scrubbing, gravity separation, and magnetic separation. A final bulk sample product (789 kg) was composed of a rougher non-magnetic fraction (88.5%) with 87 ppm Fe_2O_3 and a scavenger non-magnetic fraction (11.5%) with 95 ppm Fe_2O_3. Collectively, the bulk sample had an estimated iron content of 88 ppm Fe_2O_3.

In the QPs opinion, CPS has demonstrated that low-iron LBI sand can be produced in other portions of the Wanipigow Sand Project property that were formerly classified as an exploration target. The beneficiation test work conducted by CPS during 2022-2024 achieved multiple areas of LBI low-iron sand with ≤100 ppm Fe_2O_3, demonstrates reasonable prospects of eventual economic extraction, and is reasonable and sufficient mineral processing evidence to expand the mineral resource estimate areas.

25.3 Glass melt and Anti-Reflective Coated-Glass Tests

To further assess the Wanipigow LBI sand source feed quality, CPS used the low-iron LBI sand bulk sample to conduct glass melt tests that enables chemical, physical, and transmissivity assessments of the resulting glass for use in solar glass applications. The resulting glass melt test sample yielded high quality glass that is characterized by low-iron (110 ppm Fe_2O_3), high colour transparencies, a liquidus temperature of 1,016° C, capability for relatively high processing rates, and physical properties (WRI, DI, RO, R2O) that indicate the CPS test glass sample is suitable for specific glass applications, such as solar glass where high thermal stability and workability is required.

The Wanipigow glass melt test sample has a DI of 25.6, which means there is a moderate tendency for devitrification, or the glass becoming crystalline. Hence, the CPS glass can be processed and used effectively, but there is some uncertainly/risk of crystallization under specific conditions.

The Pellucere anti-reflective coating test results demonstrate that the uncoated and coated CPS glass samples achieved a SWT gain of 3.6% from 91.81% (uncoated) to 95.07% (coated). This means that 95.07% of the incoming solar radiation is transmitted through the glass, while only 4.93% is reflected or absorbed. This high level of transmittance is an excellent performance indicator for solar applications, ensuring that most of the solar energy is effectively utilized.

It is the opinion of the QP the CPS glass test work provides evidence that the LBI sand can meet low-iron and glass specifications for solar glass applications and further demonstrates reasonable prospects of eventual economic extraction.

25.4 Mineral Resource Estimations

The Wanipigow glass sand resource estimate was prepared in accordance with the CIM definition standards and best practice guidelines (CIM, 2014, 2019) and the disclosure rule NI 43-101. The Effective Date of the mineral resource estimate is 9 April 2025.

Based on the positive beneficiation, glass melt, and coated glass testing the mineral resource area was expanded from CPS's 2021 single 0.74 km^2 portion of the Wanipigow LBI sand domain to 7 separate resource areas that encompass a surface area of 2.06 km^2. A 3-D geological model utilized information from 110 vertical drillholes and 761 gradation measurements to define the LBI sand wireframe and a single waste material wireframe composed of the combined Pgf, UBI, and BS units that overlie the LBI sand.

The LBI sand resource domain was clipped to 1) the property boundary, 2) the LiDAR DEM surface, and 3) the 7 defined mineral resource area polygons. The mineral resource areas collectively comprise 35 drillholes and 161 LBI sand gradation results. The combined resource areas have a minimum and maximum LBI sand thickness of between 0.04 and 16.5 m with an average normalized thickness of 9.4 m.

The glass sand mineral resource is calculated using a block model with a size of 20 by 20 m in the horizontal directions and 2 m in the vertical direction. The block model was used to calculate the resource estimate of the different percentages of silica sand retained on the various screen sizes. Ordinary Kriging (OK) was used to estimate the size fraction values at each parent block that lies within the LBI sand wireframe. The resource estimation of the individual LBI sand size fractions was completed and reported using a lower cutoff of mesh-sizes that are greater than or equal to 35-mesh (<500 µm) and less than or equal to 120-mesh (<125 µm). I.e., the +35 and -120 mesh size fractions are discarded from the estimation process. A nominal *in-situ*, or compacted, sand bulk density of 1.877 g/cm^3 was applied to the LBI sand unit. The density is based on 36 representative loose bulk LBI sand density samples and the loose bulk densities were converted to an *in-situ* bulk density by using a bulking factor of 30%.

The Qualified Person has a satisfactory level of confidence in, and understanding of, the geology and controls of the LBI sand, but a lower level of confidence in the applicability of the sand unit, on a consistent basis, to meet the high-quality, beneficiated, low-iron sand levels required for a commercial-scale solar glass operation. Based on this criterion, the LBI glass sand resource is classified as an inferred mineral resource.

The inferred Wanipigow glass sand resource estimate predicts a total (i.e., global) LBI glass sand inferred resource of 24.386 million metric tonnes. Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The Wanipigow LBI glass sand mineral resource disclosed in the current technical report is 3.4 times larger than CPS's initial 2021 mineral resource. The increase is directly related to the expanded mineral resource areas and because the mineral resource areas utilize some of the thickest sections of LBI sand within the Wanipigow Sand Project.

With respect to the overlying waste rock and using a compacted bulk density of 1.902 g/cm^3, the combined glaciofluvial, UBI sand, and BS units overlying the 7 LBI sand resource areas have an estimated volume of 17.877 million m^3 and 34.002 million metric tonnes.

25.5 Exploration Target

The remaining LBI sand area (3.12 km^2) that was not included in the mineral resource estimate was assessed as a conceptual exploration target and contains between 11.944 million metric tonnes and 12.431 million metric tonnes of LBI sand. An exploration target has less confidence than an inferred mineral resource. The potential quantity is conceptual in nature as there has been insufficient exploration to define a mineral resource and it is uncertain if further test work and/or marketing will result in the exploration target being delineated as a mineral resource.

25.6 Risks and Uncertainties

As with any development project there exists potential risks and uncertainties. CPS will attempt to reduce risk/uncertainty through effective project management, engaging technical experts and developing contingency plans. The business of exploration for, and development of, silica sand involves a high degree of risk and there can be no assurance that the current program will result in a future profitable operation.

With respect to the mineral resources, mineral resources are not mineral reserves and do not have demonstrated economic viability. Transported surficial deposits are by nature complex, and therefore, silica sand resource estimates can be imprecise and depend to some extent on statistical inferences drawn from available data. Uncertainties could therefore include,

- While the QP has used beneficiation studies conducted on drillhole interval samples to depict LBI low-iron sand resource areas and to demonstrate reasonable prospects of eventual economic extraction, it is not currently possible to model the LBI sand domain to depth using a statistically acceptable composite length. If this information were possible, the mineral resource estimate might be subject to change.

- There is some local variation in the thickness of waste material strata (Pleistocene surficial material and UBI sand) that overly the LBI sand at the Wanipigow Sand Project property. Accordingly, the QP notes that additional auger drill testing to advance the understanding of the surficial deposits will result in an improved understanding of the material overlying the LBI sand, and hence, a revised, and improved mineral resource estimation.

- Lastly, not all the LBI sand satisfies the minimum mineral resource cutoff and therefore specific ‘horizons’ or ‘islands’ of below cutoff LBI sand could be mined as part of any potential future mining method employed by CPS.

Other risks and uncertainties that could reasonably be expected to affect the projected outcomes of the Wanipigow Sand Project could include 1) affects of fluctuations in the price of glass products and raw materials input costs, 2) the Company's ability to obtain, maintain and renew required permits, licenses and approvals from regulatory authorities, and potential changes to applicable legislation, regulations and standards, 3) general risks associated with the pattern solar glass manufacturing and sand quarry industries, loss of markets, consumer and business spending and borrowing trends, and 4) uncertainties inherent in estimating quantities of products and uncertainties related to problems associated with large scale processing.

26 Recommendations

A two-phase work approach is recommended to advance the Wanipigow Glass Sand Project with the objectives to:

1. Phase 1: Improve the geological confidence of the current resource areas and expand/reclassify the mineral resource and/or convert parts of the exploration target to mineral resources via infill and exploratory drilling. Additional geochemical, beneficiation, and glass melt test work to assess the scalability of the project toward potential commercialization.

2. Phase 2: Conduct mine planning and glass-manufacturing facility design that include modifying factor studies such as detailed mine design, product distribution, marketing studies, groundwater monitoring, environmental management planning, permitting, and social and local community engagement. The Phase 2 work recommendations are subject to the positive results of the Phase 1 work.

The collective estimated cost of the work recommendations, including a 10% contingency, is CDN$1,331,000. Additional discussion on the cost estimates and work recommendations are provided in Table 26.1 and the text that follows.

26.1 Phase 1 Work Recommendations

The estimated cost of the combined Phase 1 work recommendations is estimated at CDN$550,000 with a 10% contingency.

The beneficiation work has shown the iron content in the LBI sand is variable. For example, Figure 14.2 shows the proximity between LBI sand samples that passed or failed to achieve ≤100 ppm Fe_2O_3. Accordingly, additional infill drilling and a tightly-spaced drill grid is required to 1) substantiate low-iron sand certainty within potential run-of-mine (ROM) production areas, and 2) delineate the shallow subsurface waste material overlying the LBI sand in preparation of any future mine-planning.

A series of drillholes is recommended to penetrate through the entire LBI sand unit within those areas that may require better delineation of the low-iron LBI sand including the current resource areas, proposed mine plan areas, and within the exploration target LBI sand domain. This program would also enable the mining team to better delineate the upper surface of the LBI sand for stripping during the mine process planning.

The QP estimates an infill drilling total of approximately 700 m be conducted with vertical drillholes that penetrate to depths of 20 to 25 m (i.e., 25 to 30 holes). A sonic drill rig is recommended to maximize sand recovery. Approximately 75 to 100 m of LBI sand could be intersected and sampled in consecutive 1.5 m intervals (e.g., 50 to 65 samples).

A geochemical program to evaluate initial LBI sand silica and iron content should be conducted on archival LBI sand samples and new LBI sand interval samples acquired during the recommended infill drill program. In concert with ongoing beneficiation test work, the initial geochemical analytical results may serve as a proxy for low-iron LBI sand quality potential, and hence, act as a general guide for any future mining program.

The total cost of the infill drill program(s) in the current resource areas and LBI sand domain exploration target area, and silica and iron content geochemical program, is estimated at CDN$385,000.

Table 26.1 Future Lower Black Island glass sand work recommendations.

Phase	Objective	Item	Description	Cost Estimate (CDN$)	Totals (CDN$)
Phase 1	Improve the geological confidence of the mineral resource and exploration target areas and test the scalability of the project	Infill drilling within the current resource areas	Approximate 350 m of sonic drilling to improve geology/resource certainty and to better delineate waste material	$165,000	
		Exploration target area drill testing	Approximately 350 m of sonic drilling to assess conversion of exploration targets to mineral resources	$165,000	
		Geochemical test work	Ongoing geochemical assaying to further evaluate LBI sand quality.	$55,000	
		Beneficiation test work	Ongoing beneficiation test work to improve the workflow methodology	$40,000	
		Glass melt tests	Additional glass melt recipe testing to maximize the resulting glass chemnical and physical characteristics	$75,000	**$500,000**
Phase 2	Mine-planning and glass-manufacturing facility design with modifying factor studies	Detailed mine planning	Detailed mine design/plan; dewatering plan; productivity analysis; and operating costs estimates	$50,000	
		Processing facility design	Initiate processing facility design/plan	$250,000	
		Marketing studies	Market analyses including an assessment of market size, product demand, market concentration, and market volume.	$35,000	
		Groundwater monitoring	Ongoing hydrogeological studies and pump tests to assess groundwater conditions	$150,000	
		Environmental-planning and continued community consultation	Development of a Closure Plan, environmental plans, permitting, and continued social and local community engagement	$150,000	
		Technical reporting	Ongoing technical reporting in accordance with CIM (2014, 2019) and the disclosure rule NI 43-191	$75,000	**$710,000**
				Subtotal	**$1,210,000**
				10% Contingency	**$121,000**
				Total recommendations cost estimate	**$1,331,000**

Ongoing LBI sand beneficiation, furnace batch recipes, and glass chemical composition and physical characteristics test work is required to continue to assess and advance the quality of the LBI sand to higher levels of glass manufacturing standards in concert with CPS's marketing studies. The beneficiation testwork should be implemented to fine-tune the practical/optimized operating conditions and orientations to achieved similar results with fewer non-magnetic repasses, lower practical magnetic intensity, and/or higher mass yield to non-magnetics. Additional, detailed glass melting test sets are required that include recipe adjustments, optimization phases, and additional physical and chemical composition analyses of the test glass product. The cost of the continuing LBI sand beneficiation and glass test work is estimated at CDN$115,000.

26.2 Phase 2 Work Recommendations

The Phase 2 work recommendations are based on the positive results of the Phase 1 test work.

The QP recommends that CPS conduct modifying factor studies with ongoing technical reporting that include detailed mine-design/plan; productivity distribution analysis; marketing studies, groundwater analysis; environmental planning; and continued community consultation. The estimated cost of the combined Phase 2 modifying factor programs is estimated at CDN$781,000 with a 10% contingency; the activities and estimate of costs are described in the text that follows.

The mine-plan could benefit from previous PFS technical work conducted on the Wanipigow Sand Project (albeit in relation to sand products for hydraulic fracturing, see Section 24.2). The planning should include overburden removal and placement, run-of-mine sand removal, and ongoing concurrent reclamation. Product distribution work should study transport, product storage, and distribution from the proposed on-site processing to the glass manufacturing facility in Selkirk, MB.

The proposed processing plant requires input from CPS's various mineral processing contractors with respect to equipment and the processing workflow. It is recommended that the detailed facility program be developed in advance of startup sample selection, in and consultation with the selected laboratories and with one or more specialist metallurgical consultant(s) to resolve flowsheet uncertainties.

The Market analyses should include an assessment of the market size, product demand, market concentration, and market volume of a variety of glass products.

The cost of the mine-planning, processing plant design and marketing activities is estimated at approximately CDN$335,000.

Groundwater monitoring will include ongoing hydrogeological studies and pump tests to assess groundwater conditions. The groundwater monitoring holes are typically constructed by drilling enlarged (upper) and reduced (lower) hole diameters of 12" and 8" (30 and 20 cm), respectively, and then securing access to the well with 8" (20 cm) steel pipe casing and screens. The monitoring holes are measured regularly (once a month) to record the depth to the groundwater table. The cost of preparing the groundwater monitoring wells and/or continued monitoring of the wells associated with ongoing hydrogeological studies is estimated at CDN$150,000.

Environmental planning should include preparation of a Closure Plan, finalize environmental plans, finalize permitting and licencing, and ongoing continued social and local community engagement. The cost of these ongoing activities is estimated at approximately CDN$150,000.

As CPS continues to develop the Wanipigow Sand Project, the Company should continue to disclose material information through revised technical and annual reports. The purpose of NI 43-101 is to ensure that misleading, erroneous, or fraudulent information related to mineral properties is not published and promoted to investors on stock exchanges overseen by the CSA. Technical reports should contain increasing levels of technical content from ‘resource’ reports through to ‘reserve’ reports, PFS, and FS reports. The estimated cost of CPS’s future NI 43-101 technical reporting is estimated at CDN$75,000.

Lastly, the Issuer should be aware that the decision to put an industrial mineral project into production is the responsibility of the Issuer. To reduce this risk and uncertainty, the Issuer typically makes its production decision based on economic valuation through a PFS or a comprehensive FS. Having said this, the ultimate demonstration of economic viability of an industrial mineral deposit may be satisfied by actual profitable production as a function of market conditions such as product specification and demand. If CPS puts the Wanipigow Sand Project into production, and to avoid making misleading disclosure, it is recommended that the Issuer discloses that the Company has not based its production decision on a PFS, or a FS of mineral reserves, demonstrating economic and technical viability. In addition, the Company should provide adequate disclosure of the increased uncertainty, and the specific economic and technical risks of failure associated with its production decision.

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28 Certificate of Author

I, D. Roy Eccles, P. Geol. P. Geo., do hereby certify that:

1. I am Vice-President (Corporate Compliance) and a Senior Consulting Geologist with APEX Geoscience Ltd., 100, 11450 – 160 Street, Edmonton, Alberta T5M 3Y7, Canada.
2. I graduated with a B.Sc. in Geology from the University of Manitoba in Winnipeg, Manitoba in 1986 and with a M.Sc. in Geology from the University of Alberta in Edmonton, Alberta in 2004.
3. I am and have been registered as a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA; Membership Number 74150) since 2003, and Newfoundland and Labrador Professional Engineers and Geoscientists (PEGNL, Membership Number 08287) since 2015.
4. I have worked as a geologist for more than 35 years since my graduation from university and have been involved in all aspects of mineral exploration, mineral research, and mineral resource estimations for metallic, industrial, and specialty mineral projects and deposits.
5. I have read the definition of "Qualified Person", as set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). By reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101. My technical experience includes exploration and preparation of mineral resource estimates for greenfield and brownfield silica sand projects throughout North America.
6. I prepared and am responsible for Items 1-14 and 15-27 of the "***NI 43-101 Technical Report, Updated low-iron glass sand resource estimate for Canadian Premium Sand Inc.'s Wanipigow Sand Project in Manitoba, Canada***", with an effective date of 9 April 2025 (the Technical Report). I performed a site inspection at the Wanipigow Sand Project property on March 4-6th 2019 and can verify the geological setting, access, drillhole locations, excavation bulk sample area, and the silica sand mineralization.
7. To the best of my knowledge, information and belief, the report contains all relevant scientific and technical information that is required to be disclosed, to make the technical report not misleading.
8. I have read National Instrument 43-101 and Form 43-101F1, and the technical report has been prepared in compliance with that instrument and form.
9. I am independent of the Canadian Premium Sand Inc. and the Wanipigow Sand Project property applying all the tests in section 1.5 of Companion Policy 43-101CP.
10. My prior involvement with the Wanipigow Sand Project includes preparation of the following technical report geological and mineral resource sections for Canadian Premium Sand Inc. for both frac sand and glass sand. These reports were prepared in my capacity as an independent geological consultant and Qualified Person. I have no other prior involvement with the Property that is the subject of this Technical Report.

    Eccles, D.R., Farmer, R.J., Wick, M. and Hough, R. (2019): Technical Report, Preliminary Feasibility Study on Canadian Premium Sand Inc.'s Wanipigow Silica Sand Deposit in Manitoba, Canada; National Instrument 43-101 Technical Report prepared for Canadian Premium Services Inc., 210 p.

    Eccles, D.R., Farmer, R.J., Wick, M. and Hough, R. (2020): Technical Report, Updated 2020 Preliminary Feasibility Study on Canadian Premium Sand Inc.'s Wanipigow Silica Sand Deposit in Manitoba, Canada; National Instrument 43-101 Technical Report prepared for Canadian Premium Services Inc., 220 p.

    Eccles, D.R. and Hough, R. (2021): Technical Report, Inferred mineral resource estimate on Canadian Premium Sand Inc.'s Wanipigow Silica Sand Glass Project in Manitoba, Canada; National Instrument 43-101 Technical Report prepared for Canadian Premium Services Inc., 170 p.

Effective date: 9 April 2025
Signing Date: 9 April 2025

D. Roy Eccles, M.Sc., P. Geol. P. Geo.
Edmonton, Alberta, Canada

D. ROY ECCLES
9 APR 2025

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