Barron County, Wisconsin, United States
UTM: 608550 m E, 5028430 m N, Zone 15, NAD83 (Property Centre)

TECHNICAL REPORT, 2024 INDICATED AND INFERRED RESOURCE ESTIMATES UPDATE DUE TO CONVENTIONAL ANNUAL MINING: SOURCE ENERGY SERVICES LTD.'S SUMNER SILICA SAND MINE AND PROPERTY IN WISCONSIN, UNITED STATES

Prepared for: **Source Energy Services Ltd.**
500, 438 – 11th Avenue SE
Calgary, AB Canada T2G 0Y4

Prepared by: **APEX Geoscience Ltd.** [1]
100, 11450 - 160 Street
Edmonton, AB Canada T5M 3Y7

John T. Boyd Company [2]
4000 Town Center Boulevard, Suite 300
Canonsburg, PA, United States 15317

D. Roy Eccles, M.Sc., P. Geol. [1]
Robert J. Farmer, B.Sc., P.Eng. [2]

Effective Date: 31 December 2024
Signing Date: 25 February 2025
Edmonton, Alberta, Canada

Contents

Tables

Figures

1 Summary

1.1 Issuer and Purpose

This Technical Report was prepared for Source Energy Services Ltd. (SES), a company headquartered in Calgary, Alberta, Canada. With over a decade of frac sand supply and logistics experience, SES is an integrated supplier and distributor of high quality frac sand in Western Canada and the United States with services that cover the entire proppant supply and logistics chain. SES currently owns and operates 3 silica sand mines and 6 active (7 total) trans-loading rail terminals. The mines are in the State of Wisconsin, U.S. and include the Sumner Mine in Barron County, and the Blair and Preston mines in Trempealeau County. The comprehensive rail distribution network is designed to deliver proppant to tight oil and gas exploration plays throughout the Western Canada Sedimentary Basin.

The Sumner Property is the focus of this Technical Report with the objective to present 2024 Indicated and Inferred Silica Sand Resource estimates. The 2024 resource estimates replace and supersede all previous SES Sumner Mine and Property technical reports. The 2024 Sumner resources constitute a change to the mineral resources due to conventional mining depletion during 2024 by SES at the Sumner Property. The updated resources do not represent a 100% or greater change in the total mineral resources at Sumner, and no new scientific or technical information was provided by SES, or considered, during the preparation of the Sumner 2024 Indicated and Inferred Silica Sand Resource Estimations.

The Sumner 2024 Indicated and Inferred Silica Sand Resource estimates were prepared in accordance with the Canadian Securities Administration's National Instrument 43-101 with the mineral resource being estimated using the Canadian Institute of Mining, Metallurgy and Petroleum's "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and the "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

1.2 Authors

This Technical Report was prepared by APEX Geoscience Ltd. and John T. Boyd Company for SES. Mr. Roy Eccles, M.Sc. P. Geol. of APEX Geoscience Ltd. supervised the preparation of, and is responsible for, the publication of this Technical Report and Sumner Silica Sand Resource Estimates. Mr. Robert Farmer, B.Sc., P. Eng. of John T. Boyd Company prepared the 'mining sections' in this Technical Report (Sections 15 to 22).

Both authors are Qualified Persons as defined by the CSA's NI 43-101. Mr. Eccles has been involved in mineral exploration, and mineral resource modelling and estimations for greenfield and brownfield silica sand deposits and operations in western Canada and northeastern United States. Mr. Farmer is an experienced mining engineer with extensive knowledge in industrial and metallic mineral underground and surface mine design, production scheduling and financial modeling.

1.3 Property Location and Description

The Sumner Property is in east-central Barron County in the northwestern corner of Wisconsin and consists of 36 separate privately deeded parcels with a total land area of 1,108.8 acres (448.7 hectares). The parcels range in size from 1.6 acres to 41 acres (the majority are quarter-quarter sections or 40 acres).

The Sumner Property is accessed by driving north from the City of Eau Claire, WI to the Town of Cameron, WI, which is approximately 50 miles (80 km) on paved double lane State Highway 53.

SES opened the Sumner Mine in 2013, and current infrastructure consists of the Sumner Open Pit Mine, Sumner Mine Wet Processing Plant, and Dry Processing Plant and Trans-Loading Facility. The Sumner Mine and Sumner Mine Wet Processing Plant are in Barron County, WI, directly south of paved U.S. Highway 8. The Dry Processing Plant and Trans-Loading Facility are located approximately 8 miles (12.9 km) east of Sumner Mine in Rusk County near the village of Weyerhaeuser WI. The Dry Plant is located separately from the Sumner Property to enable access to the Wisconsin Central Railroad, a subsidiary of Canadian National Railway. The Sumner Mine, and collective SES silica sand operations, produce a consistent supply of 20/40, 30/50, 40/70 and 50/140 mesh silica proppant (and customized sand fractions if requested).

The silica sand at the Sumner Property is hosted within the Cambrian Wonewoc Formation, which is the focus of the 2024 resource estimations presented in this Technical Report. At Sumner, the Wonewoc Formation sandstone varies in thickness from 65.6 to 131.2 feet (20 to 40 m) and is principally medium to coarse grained quartzose sandstone. The Wonewoc Formation is overlain by very fine to fine grained sandstone, siltstone and mudstone of the Tunnel City Group, and thin and discontinuous Pleistocene surficial deposits (slightly gravelly sandy loam till).

The Wonewoc Formation and other Cambrian-aged silica sand units in the mid-continental United States formed during a major transgressive event where shallow ocean currents formed a texturally graded shelf. The advanced level of textural maturity in Cambrian quartz grains is thought to be related to a long history of weathering that included wind and marine shoreface abrasion and chemical weathering that preferentially dissolved plagioclase and similarly unstable minerals.

1.4 Agreements and Permits

The current ownership status of the 36 parcels is summarized as follows: 1) 33 of the 36 parcels are 100% owned by SES; and 2) 3 parcels are presently leased from the current landowners by SES with sand tonnage royalties established with the individual owners.

The purchase agreements are for 100% of the land including mineral rights, buildings, etc. and meet the standard Wisconsin real estate purchase agreements: 1) WB-11 Residential Offer to Purchase; and 2) WB-13 Vacant Land Offer to Purchase (Wisconsin Department of Regulation and Licensing, 2015). With respect to the 3 leased parcels, the landowners agreed to royalty agreements allowing SES the right to mine their properties in exchange for royalty.

The Sumner Property area was rezoned from Agriculture to Mineral Reservation, and SES has obtained all local, Barron County, and Wisconsin State permits. With respect to environmental work, an Endangered Resource Review was conducted prior to the issuance of the permits by the Wisconsin Department of Natural Resources.

The reclamation plan states that post-mining will be consistent with all applicable local, state, and federal laws.

There are no other significant factors or risks that may affect the access, land title, or the right or ability to perform work on the Sumner Property.

1.5 Property and Silica Sand Mining Uncertainties

The Sumner Property is being mined and/or assessed by SES for its silica sand proppant potential.

Like most mineral commodities, exploration and development of silica sand involves a high degree of risk. SES's mining, processing and production facilities, its logistics operations, and any future properties it develops or may acquire in the future are and will be subject to risks normally encountered in the frac sand industry.

Selected risks could include changes in the price and marketability of silica sand; availability of transportation; changes in laws and/or regulations associated with the oil and natural gas industries; changes in environmental policy; unanticipated physical impacts of climate; and/or the inability of Source's customers or distribution partners to take delivery.

1.6 History

As a current silica (frac) sand miner, processor and transporter, SES has successfully completed numerous exploration programs on the Sumner Property. The primary method of testing the Wonewoc Formation for its stratigraphic position and silica (frac) sand potential has been through auger drill testing. Between 2011 and 2018, SES drilled a total of 104 test holes throughout the Sumner Property to test the stratigraphy and the grain size composition of the Wonewoc Formation silica sand and perform groundwater monitoring.

Various third-party consulting companies conducted the auger drilling, lithological logging and sampling of the auger returns, and particle size/gradation analysis on behalf of SES. Regardless of year or contractor, the auger programs generally adopted the same auger methodology. Truck mounted air rotary auger rigs were used to drill vertical (-90º) auger holes at zero orientation. The diameter of the auger stem was generally 6 inches (15 cm). The average depth of the auger test holes is 88.5 feet (27 m); the groundwater monitoring holes have slightly deeper average depths of 134.5 feet (41 m).

Auger returns, or clippings, from the auger test hole programs, and from some of the groundwater monitoring holes, were analyzed for particle size/gradation analysis. The drill cutting samples were recovered from the auger rigs air discharge exhaust by bagging representative handfuls of auger returns for every 5 feet (1.5 m) of auger drilling. The samples were hand-mixed and split into at least two separate sample splits: one for particle size/gradation analysis; and one for archival at a dry storage facility located on the Sumner Property. In some instances, a third sample split was taken for proppant test work characterization.

Collective assessment of the drill logs and gradation analytical results enabled the authors to create robust lateral and vertical cross-sections of the Wonewoc Formation at the Sumner Property. This increased the confidence level of the 3-D geological model created for resource assessment.

1.7 Qualified Person Site Inspection

The lead author Roy Eccles, P. Geol., of APEX, visited SES's Sumner Mine Site, Processing Facilities and Trans-Loading Facility on November 5th, 2018. Robert J. Farmer, P. Eng., of John T. Boyd Company was commissioned by SES to prepare the 'mining sections' of this Technical Report (Sections 16 to 22) and conducted a site inspection of the Sumner Mine and facilities on December 5th, 2017. As per Section 6.2 of NI 43-101, the site inspections enabled Mr. Eccles and Mr. Farmer to observe the geology, mineralization, the open pit mine, mining facilities and infrastructure at the Sumner Property, and areas of mine (or resource) depletion.

The site inspection verified that the Sumner Property is underlain by, and is currently mining, the Cambrian Wonewoc Formation, and that the silica sand unit is stratigraphically uniform and dominated by white (clean) to iron-stained, medium- to coarse-grained, silica sand. The current methods of mining, and equipment size and selection are technically sound, reasonable, and achievable for their intended purpose if there are no unforeseen geological anomalies encountered, catastrophic failure of major mining equipment, and the mining operation continuing to retain good management and technical/operating staff.

1.8 Reasonable Prospects

Proppant characterization test work results show that the Wonewoc Formation silica sand from the Sumner Property meets the recommendations set forth in International Standards ISO 13503-2:2006/Amd.1:2009E for sieve size fractions, sphericity, roundness, acid solubility, turbidity, and crush classification. Accordingly, the proppant test work results show that the Wonewoc Formation silica sand from the Sumner Property has reasonable prospect of economic extraction.

In the 3rd quarter of 2024, SES reported 2 consecutive quarters with the largest volume of sand sold in the Company's history, reflecting a 28% increase in quarter-over-quarter sand volume. Increased sand sales volume was attributed to 1) strong customer activity levels, 2) increased demand for natural gas toward a less carbon intensive world, and 3) continued development of tight natural gas properties in the Montney, Duvernay and Deep Basin hydrocarbon plays in the Western Canada Sedimentary Basin.

Based on the thickness, continuity and quality of the Wonewoc Sand at the Sumner Property, and the forecasted marketability of Wisconsin sand in conjunction with Western Canada Sedimentary Basin contracts, the senior author concludes that SES's Sumner Property has continued reasonable prospects for economic extraction.

1.9 Mineral Resource Estimation

Mineral resource modelling and estimation was carried out using a three-dimensional block model based on geostatistical applications using commercial mine planning software MICROMINE (v. 20.5). The resource estimation statistical analysis and block modeling in Section 14 was completed by Mr. W. Black, P. Geo., under the direct supervision of and Mr. R. Eccles, P. Geol., who is a Qualified Person and accepts responsibility of the resource estimate presented in this Technical Report. The Sumner 2024 Indicated and Inferred Silica Sand Resource is reported in accordance with the CSA's NI 43-101 and is estimated using the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019) and CIM Definition Standards for Mineral Resources and Mineral Reserves (2014).

Information from a total of 112 auger holes was used in the geological modelling and estimation process. These include:

- 104 test auger holes drilled by SES throughout the Sumner Property between 2011 and 2018; and

- 8 historical water wells that were auger drilled outside of, but adjacent to, the Sumner Property between 1953 and 1970 by companies/farmers other than SES.

Of the 104 holes, 80 auger holes included particle size/gradation analyses and were used to guide the estimation of the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate. All 112 auger holes were used to guide the geological interpretation of the: Wonewoc Formation; the overlying Tunnel City Group and Pleistocene surficial deposits; and the underlying Eau Clair Formation. Spacing between drillholes varies from 65.6 and 2,591.8 feet (20 m to 790 m). The bulk of the drilling is concentrated with the greatest density around and directly east of the existing Sumner Open Pit Mine site (extending through the east-central portion of the Property). The remainder of the auger drill test holes are spaced relatively evenly over the remainder of the Sumner Property.

A total of 1,461 samples were analyzed for particle size/gradation analysis. Of these, 514 particle size records were discarded from the Sumner Wonewoc Formation estimation file as they: 1) relate to sample material that does not belong to the subject Wonewoc Formation; or 2) there was error associated with the data. Hence, the main 'assay' database is composed of 947 particle size/gradation analyses that are sourced from the Wonewoc Formation.

The resource has been estimated within three-dimensional solids that were created from cross sectional interpretation. The upper contact of Wonewoc Formation is either in contact with the overlying Tunnel City Group or Pleistocene surficial deposits or has been cut by the topography surface using a combination of 3.3 feet (one metre) resolution LiDar and STRM data. The lower contact between the Wonewoc Formation and the underlying Eau Claire was better defined during 2016-2018 SES drill testing in the central and southeastern parts of the Property. This work increased the certainty about the lower Wonewoc Formation contact in the project area and increased the confidence in the resource evaluation.

The project limits area is based in the UTM system relative to Zone 15 of NAD 1983. A parent block size of 164 feet x 164 feet x 10 feet (50 m x 50 m x 3 m) with sub-blocking down to 33 feet x 33 feet x 3.3 feet (10 m x 10 m x 1 m). Variography was performed on all thirteen mesh size fractions, and as expected, all the variogram's displayed the greatest range of continuity in the orientation of the stratigraphy.

A nominal loose sand bulk density of 1.57 g/cm^3 was applied to all Wonewoc Formation blocks; a value based on thirteen representative density measurements. This value was selected for use in the resource modelling because it is representative of the bulk Wonewoc material being mined. A bulk density value of 1.37 g/cm^3 was used for the Pleistocene surficial deposits (overburden; from Eccles et al., 2015).

The percent concentrations for the grain sieve size fraction estimation were performed using inverse distance squared methodology.

The Mineral Resource estimates presented in this Technical Report are classified as 'Indicated' and 'Inferred' according to the CIM definition standards, and are based on geological confidence, data quality and grade continuity. The indicated and inferred resource is constrained within the Wonewoc Formation, and to a depth of 328 feet (100 m) below surface. The indicated resource has been constrained based on 1) drill patterns and spacing; 2) the tremendous lateral consistency of the Wonewoc Formation; 3) continuity of the silica sand particle grain size distribution; 4) predictability in position and thickness of the Wonewoc Formation when drilling new infill holes; and 5) consistency in the Wonewoc geological model and expected sizing concentrations and position during 7-years of mining by SES. For the classification of indicated, the estimation runs utilized a search ellipsoid of approximately two thirds to the suggested range identified in the variographic analysis and the requirement for the highest number of drill holes and composites. As such, these blocks exhibited a high level of confidence and aided the decision to assign this area of the resource to the 'indicated' category. The remainder of the resource, or the Sumner Property area that is outside the indicated resource polygon, was classified as inferred.

As the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate is classified as an industrial mineral, it does not have a 'commodity grade' *sensu stricto* for estimation. In place of the conventional grade, the silica sand particle size/gradation analyses were chosen for estimation. These analyses utilized thirteen different mesh size fractions percentages of the sand grains: +20, 25, 30, 35, 40, 45, 50, 60, 70, 100, 140 and 200 mesh, and 'Pan' or -200 mesh. Apart from the +20 and -200 fractions, examination of the sieve size fractions shows that the individual fractions exhibit an overall normal population. The +20 and -200 size fractions have diverse source materials, which consist of Pleistocene surficial material (till) and mudstone/clay component, respectively, that cause a slightly mixed population in the respective histograms. The resource estimation is not dependent on the +20 or -200 fractions, and therefore, the size fractions being estimated exhibit normal populations.

The authors have used a lower cutoff that is consistent with the mining method used by SES at the Sumner Mine. Using a lower cutoff of the +70 sand fractions being greater than 60% in total abundance, this Sumner 2024 Indicated and Inferred Silica Sand Resource estimate predicts total (i.e., global) resources of:

- 44.19 million short tons (40.08 million metric tonnes) of silica sand of indicated.

- 44.06 million short tons (39.97 million metric tonnes) of silica sand of inferred classification is present at Sumner Property (Tables 1.1 and 1.2).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The Sumner 2024 Indicated and Inferred Silica Sand Resource, which is focused solely on the Wonewoc Formation, is overlain by, or intercalated with:

- 32.86 million short tons (29.81 million metric tonnes) of Pleistocene surficial deposits and Tunnel City Group sedimentary rock.

- 21.02 million short tons (19.07 million metric tonnes) of waste Wonewoc Formation, defined as Wonewoc sand that did not satisfy the cutoff of +70 sand fractions being greater than 60% in total abundance.

Table 1.1 The Sumner 2024 Indicated Silica Sand Resource estimate. The main indicated resource is reported from the Wonewoc Formation as a total (global) volume and tonnage using a nominal bulk density of 1.57 g/cm^3 and a lower reporting cutoff of the sum of the +70 sand fractions being greater than 60% in total abundance. The Table also presents selected proppant size distributions of 20/40, 30/50, 40/70 and 50/140.

	Total (global) resource and selected size fractions	Volume (m^3)	Tonnes (t)	Tons (t)
Wonewoc Formation Indicated Mineral Resource Estimation	**Total**	25,530,000	40,080,000	44,190,000
	20/40	6,260,000	9,830,000	10,840,000
	30/50	10,940,000	17,180,000	18,940,000
	40/70	10,940,000	17,170,000	18,930,000
	50/140	8,170,000	12,830,000	14,150,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. 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 mineral resource has omitted those areas that have been mined out by conventional mining depletion in which the Wonewoc Formation resource has been completely removed from the resource model.

Note 3: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs) and United States short tons (2,000 lbs or 907.2 kg).

Note 4: Numbers may not add up due to rounding of the resource values percentages (rounded to the nearest 10,000 units).

Note 5: The product size fractions overlap and are not cumulative.

Note 6: The 'Total' volume and weights are estimated on a global basis and represent the main Sumner 2024 Indicated Silica Sand Resource.

Note 7: The estimation of the individual sieve size fractions was completed using no cutoff, however, the Sumner indicated resource is reported using a lower reporting cutoff of the sum of the sand +70 sand fractions being greater than 60%.

Table 1.2. The Sumner 2024 Inferred Silica Sand Resource estimate. The main inferred resource is reported from the Wonewoc Formation as a total (global) volume and tonnage using a nominal bulk density of 1.57 g/cm^3 and a lower reporting cutoff of the sum of the +70 sand fractions being greater than 60% in total abundance. The Table also presents selected proppant size distributions of 20/40, 30/50, 40/70 and 50/140.

	Total (global) resource and selected size fractions	Volume (m^3)	Tonnes (t)	Tons (t)
Wonewoc Formation Inferred Mineral Resource Estimation	**Total**	25,460,000	39,970,000	44,060,000
	20/40	5,800,000	9,110,000	10,040,000
	30/50	10,490,000	16,460,000	18,150,000
	40/70	10,720,000	16,840,000	18,560,000
	50/140	8,040,000	12,620,000	13,910,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. 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: Active open pit mining has not impacted the area of Inferred Resource.

Note 3: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs) and United States short tons (2,000 lbs or 907.2 kg).

Note 4: Numbers may not add up due to rounding of the resource values percentages (rounded to the nearest 10,000 units).

Note 5: The product size fractions overlap and are not cumulative.

Note 6: The 'Total' volume and weights are estimated on a global basis and represent the main Sumner 2024 Inferred Silica Sand Resource.

Note 7: The estimation of the individual sieve size fractions was completed using no cutoff, however, the Sumner inferred resource is reported using a lower reporting cutoff of the sum of the sand +70 sand fractions being greater than 60%.

The overburden, which is typically composed of gravelly sandy loam till, is a 'legitimate' waste rock and must be removed in advance of open pit mining. The Wonewoc Formation blocks that do not satisfy the cutoff, however, are not truly waste rock *sensu stricto* because the mining process could not selectively remove those individual, random Wonewoc blocks from the run-of-mine blast and shovel mining method.

The 2024 Sumner Resource estimations constitute a change to the mineral resources due to conventional mining depletion at the Sumner Property. Reconciliation of the 2024 mineral resources included a review of the updated mineral resource in conjunction with SES Run-of-Mine production data. The Qualified Person concludes that the area of 2024 mining at the Sumner Mine, and subsequent Wonewoc Formation resource depletion, has been accurately chronicled in this Technical Report.

With respect to uncertainties in the resource estimations, additional auger drill testing to advance the understanding of the surficial deposits, which can have variable thicknesses and dimensions, will result in an improved understanding of the material overlying the Wonewoc Formation, and hence, revised, and improved resource estimations.

The collective work outlined in this Technical Report including: SES's technical applications knowledge; current capacity levels for production, processing and transportation of proppant throughout North America; positive Sumner 2024 Indicated and Inferred Silica Sand Resource estimations; market size and applicability; and high-quality (ISO 13503-2:2006/Amd.1:2009E compliant) proppant; supports the conclusion that the Wonewoc silica (frac) sand at Sumner is a Property of merit and warrants further exploration.

The authors of this Technical Report recommend that SES consider future exploration work at the Sumner Property in conjunction with the mine plan, including infill auger drilling in consideration of mine advancement and exploratory work; downhole electrical wireline logging, additional proppant characterization test work and ongoing resource estimation Technical and Annual reporting to update the mineral resources (Table 1.3). The collective estimated cost of the work recommendations, including a 10% contingency, is CDN$610,500 (USD$457,875).

Table 1.3. Estimated cost summary of exploration work recommendations at Source Energy Services Ltd.'s Sumner Property.

Item	Description	Cost Estimate CDN$	Cost Estimate USD$
Infill drilling	3,000 feet (900 m) of infill drilling within the inferred resource portion of the Sumner Property to further define the Wonewoc Formation and the overlying waste material (with particle size test work)	$350,000	$262,500
Downhole electrical wireline logging	Downhole geophysical surveying for subsurface exploration and characterization	$60,000	$45,000
Proppant characterization test work	Test work conducted at an independent ISO 13503-2 certified laboratory to define the overall quality of the Wonewoc Formation	$100,000	$75,000
Technical and Annual Reporting	Update the Sumner resource, and possibly prepare a Preliminary Economic Assessment of the Sumner Mine site.	$45,000	$33,750
Contingency on exploration work (10%)		$55,500	$41,625
	TOTAL ESTIMATED COST	**$610,500**	**$457,875**

Currency converted using a conversion of 1 CDN dollar equals 0.75 USD dollar (1 February 2023).

2 Introduction

2.1 Issuer and Purpose

This Technical Report was prepared by APEX Geoscience Ltd. (APEX) and John T. Boyd Company (BOYD) for Source Energy Services Ltd. (SES), a company headquartered in Calgary, Alberta, Canada. SES currently owns and operates 3 silica sand mines and owns 7 (and operates 6) trans-loading rail terminals. The mines are in the State of Wisconsin, U.S. and include the Sumner Mine in Barron County, and the Blair and Preston mines in Trempealeau County (Figure 2.1). The rail distribution network is designed to deliver proppant to tight oil and gas exploration plays in the Western Canada Sedimentary Basin.

The Sumner Property (Sumner Mine, or the Property) is the focus of this Technical Report and is in east-central Barron County, northwestern Wisconsin. The Sumner Property consists of 36 separate privately deeded parcels with a total land area of 1,108.8 acres (448.7 hectares). SES currently owns 100% of 33 parcels and leases the other 3 parcels with sand tonnage royalties established with the individual owners.

The Sumner Property is being mined and assessed by SES for its silica sand, or 'frac sand', or 'proppant', potential. Frac sand is used to harvest formerly inaccessible hydrocarbon through a hydraulic fracking process that liberates tight gas and petroleum. The most common proppant used to prop open the hydraulic fracture is a specific type of silica sand that is durable, rounded and has crush-resistant properties.

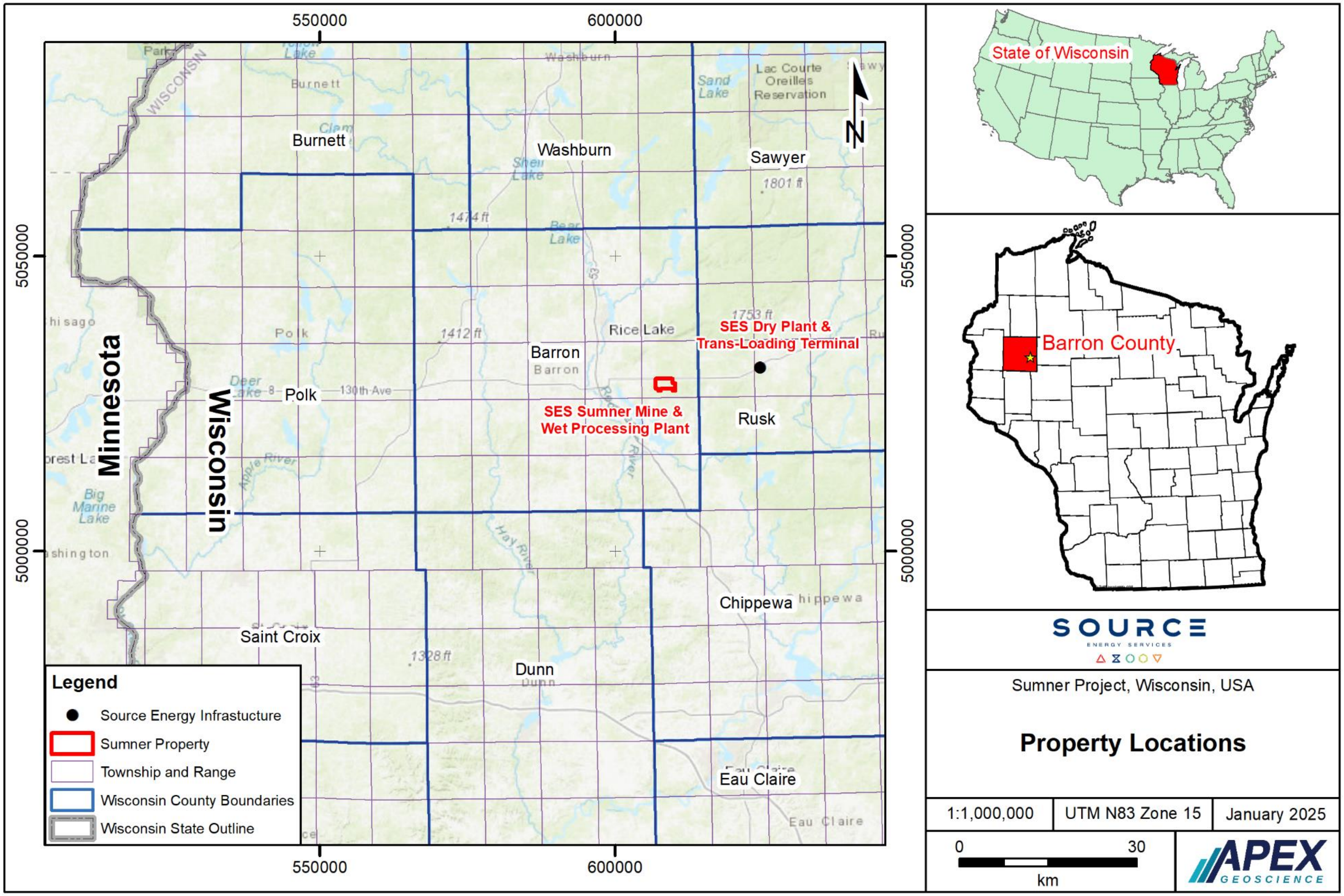
In November 2024, APEX was commissioned by SES to prepare an annual update of the silica sand resource at the Company's Sumner Mine and Property as part of the Company's Annual Information Form. The updated resources do not represent a 100% or greater change in the total mineral resources at Sumner, and no new scientific or technical information was provided by SES, or considered, during the preparation of this Technical Report. The updated resource estimations constitute a change to the mineral resources due to conventional mining depletion during 2024 by SES at the Sumner Property. The 2024 resource estimate, and this Technical Report, replaces and supersedes all previous Sumner Technical Report resource estimations.

This Technical Report was prepared in accordance with the Canadian Securities Administration's (CSA's) National Instrument 43-101 (NI 43-101) and mineral resources been estimated using the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

2.2 Authors and Site Inspection

The authors include Roy Eccles and Robert J. Farmer of John T. Boyd Company. The authors are independent of SES and are Qualified Persons as defined by the CSA's NI 43-101.

Figure 2.1 General location of Source Energy Services Sumner Property, which is in Barron County, northwestern Wisconsin.



Mr. Eccles, M.Sc. P. Geol., of APEX supervised the preparation of, and is responsible for the ultimate publication of this Technical Report and Sumner 2024 Indicated and Inferred Silica Sand Resource estimate. Mr. Eccles is a Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and has worked as a geologist for more than 35 years since his graduation from university. Mr. Eccles has been involved in all aspects of mineral exploration and mineral resource estimations for metallic and industrial mineral projects and deposits in North America. Mr. Eccles last visited the Sumner Mine Site on November 5th, 2018, as part of a site inspection for this Technical Report. The inspection verified SES's current mine plans and areas of Cambrian Wonewoc Formation resource depletion (i.e., mined-out areas).

The resource estimation statistical analysis, three-dimensional modelling, block modelling and resource estimations were prepared by Mr. Warren Black P. Geo. of APEX (under the direct supervision of Mr. Eccles, P. Geol.). Mr. Black is APEX's geostatistical specialist. Mr. Eccles takes responsibility for the resource estimation presented in this Technical Report.

Mr. Farmer, B.Sc., P. Eng., prepared the 'mining sections' in this Technical Report (Sections 16 to 22). Mr. Farmer is an experienced mining engineer with extensive knowledge in industrial and metallic mineral underground and surface mine design, production scheduling and financial modeling. Mr. Farmer conducted a site inspection of the Sumner Mine and facilities on December 5th, 2017. Contributions to this Technical Report are based on Mr. Farmer's: 1) inspection of the Sumner operations and facilities; 2) dialogue with and information requested/provided by SES; and 3) background and knowledge of frac sand mining operations throughout the U.S.

The resource estimate of the silica (frac) sand on SES's Sumner Property is classified as an "Indicated" and "Inferred" Mineral Resource and was classified in accordance with guidelines established by the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

2.3 Source of Information

This Report is a compilation of proprietary and publicly available information, as well as information obtained during SES's 2011 to 2015 auger drill test programs. 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 that are available through the Wisconsin Geological and Natural History Survey. These reports are cited in Section 27, References.

Government reports include those that depict the bedrock stratigraphy and proppant potential of Wisconsin (e.g., Thiel, 1957; Ostrom, 1966, 1967, 1971; Austin, 1969, 1970; Odom, 1975, 1978; Johnson, 1986; Mudrey et al., 1987; Clayton and Attig, 1990; Mossler, 2008; Wisconsin Department of Natural Resources, 2011, 2012; Brown, 2012, 2014; Benson and Wilson, 2015). Miscellaneous Journal articles and company news releases were used to corroborate the stratigraphy and Wisconsin frac sand potential, and to reference historical mineral exploration work in the general Sumner Property area (e.g., Dott et al., 1986; Runkel, 1994; Dott, 2003; Syverson and Colgan, 2004; Runkel, 2007; Beckwith, 2011; Runkel and Steenberg, 2012; Runkel et al., 2012; SES, 2013, 2014; Gulbranson et al., 2015).

The senior author of this Technical Report has reviewed all government and miscellaneous reports. Government reports and Journal papers were prepared by a person, or persons, holding post-secondary geology or related degrees. Based on review of these documents and/or information, the senior author has deemed that these reports and information, to the best of his knowledge, are valid contributions to this Technical Report, and therefore takes ownership of the ideas and values as they pertain to the current Technical Report.

Geochemical and geotechnical data presented in this Technical Report were analyzed at: Short Elliott Hendrickson Inc. (SEH"; Chippewa Falls, WI); Summit Envirosolutions Inc. (Summit"; St. Paul, MN); FracTAL LLC (FracTAL; Saint Paul, MN and a subsidiary of Summit); Foth Infrastructure & Environment, LLC (Foth"; Lake Elmo, MN); Barr Engineering Company (Barr Engineering"; Minneapolis, MN); Century Wireline Services Corp. (Century Wireline"; Tulsa, OK); and Stim-Lab Inc. (Stim-Lab"; Duncan, OK). SEH, Summit, FracTAL and Foth are all independent third-party laboratories that include certified Professional Engineers and cited recognized ASTM specifications for all laboratory preparation, analysis, and reporting. Stim-Lab is an independent laboratory and accredited to ISO 17025:2005 in North America offering all ISO 13503-2, ISO13503-5, API RP19C, and API RP56 tests for sand, resin-coated sand, and engineered ceramic proppants.

The senior author has reviewed the geotechnical and geochemical data and found no significant issues or inconsistencies that would cause one to question the validity of the data.

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).
- Distance and 'small' weights are presented in both imperial (and metric) units.
- 'Bulk' weight in both United States short tons (2,000 lbs or 907.2 kg) and metric tonnes (1,000 kg or 2,204.6 lbs).
- Geographic coordinates that 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).

- Standard specification for test sieves as outlined in American Society of the International Association for Testing and Materials (ASTM) E11 (ASTM, 1995).
- Proppant test work follows the specifications of ISO 13503-2:2006/ Amd.1:2009E (International Standards, 2009).
- Currency in Canadian dollars (CDN$).

The effective date of this report is 31 December 2024.

3 Reliance of Other Experts

The Sumner Property comprises 36 separate parcels with a total land area of 1,108.8 acres (448.7 hectares), of which: 1) 33 parcels are 100% owned by SES; and 2) 3 parcels are leased from the current landowners by SES with royalties established (see Section 4, Property Description and Location).

The authors are not qualified to provide an opinion or comment on issues related to legal agreements, royalties, permitting and environmental matters. Accordingly, the authors of this Technical Report disclaim portions of this Technical Report, particularly in Section 4, Property Description and Location. This limited disclaimer of responsibility includes the following.

- The Qualified Persons relied on background information and details regarding the Nature and Extent of the Land Titles (Section 4.3). This information was communicated verbally by SES during the preparation of the report, and annually, from 2015 to 2017. While the authors have not attempted to verify the legal status of the Sumner Property, the authors did research the Barron County, WI Land Records Department. The Land Records Department is the authoritative source for maintaining the Parcel Mapping System for Barron County (http://barroncowi.wgxtreme.com/) and a review by the authors shows that the 33 100%-owned parcels are in SES's name, and that these 33 parcels are active and in good standing as of 31 December 2024.

  The County land records, however, do not disclose the details of the 3 parcels that are presently being leased from the current landowners by SES with royalties established; the authors are entirely reliant on land information provided by SES pertaining to these 3 parcels. This information was provided to the authors by SES in summer 2015 and winter 2017.

- The Qualified Persons relied entirely on agreement documents provided by SES regarding surface and subsurface mineral ownership, permitting and environmental status of the Property. This information was provided by SES during the preparation of the report. The authors of this Technical Report used these reports to summarize information in Section 4.4, Permitting and Environmental Approvals.

Two agreements form the basis of the permitting for the Sumner Property: 1) A Development Agreement approved by the Town of Sumner, WI (dated 9 October 2014); and 2) Non-Metallic Mining Reclamation Permit approved by Barron County (amended on 25 October 2016). The documents were provided to the authors by SES in the summer 2015 with amendments to the agreements in fall, 2016. To the best of the knowledge of the authors, all documents are current.

4 Property Description and Location

4.1 Introduction to Source Energy Services Sumner Property

SES initiated exploration in the Sumner area in 2011 when their land position consisted of 5 parcels (CSP-1, CSP-2, CSP-3, CSP-4 and CSP-5) totalling 239.4 acres (96.9 hectares). In 2013, SES expanded the Sumner Property to its current land package, which consists of 36 separate parcels with a total land area of 1,108.8 acres (448.7 hectares; Figure 4.1; Table 4.1). The parcels range in size from 1.6 acres to 41 acres (the majority are quarter-quarter section or 40 acres). The nomenclature of the parcels has been labelled by SES based on a historical basis such that the individual private (deeded) parcels are often named after the previous landowner (e.g., Vincent parcel; Figure 4.1).

4.2 Property Location

The Sumner Property is in Barron County directly east of the village of Cameron and near the town of Sumner. The approximate center of the Sumner Property, in UTM coordinates is: 608550 m Easting, 5028430 m Northing, Zone 15, NAD83. The property is in the Public Land Survey System at Township 34, Range 10W (Sumner) and encompasses most of Section 28 and parts of sections 27, 29, 32 and 34.

The Sumner Mine and the Sumner Wet Processing Plant are located on the south side of U.S. Hwy 8 at 2595 State Highway 8, Cameron, WI USA 54822. The Dry Processing Plant and Loading Facility is located eight miles (12.9 km) east of Sumner Mine on the north side of U.S. Hwy 8 at W14251 Stiles Road, Weyerhaeuser, WI USA 54895. Access to the Sumner Property is described in detail in Section 5, Accessibility, Climate, Local Resources, Infrastructure and Physiography.

4.3 Nature and Extent of Source Energy Services Land Titles

Most of the property's parcels are owned by SES with 3 parcels currently being leased by SES with established royalties. The status of the private lands is presented in Figure 4.2 and Table 4.1, and is summarized as follows:

- 33 of the 36 parcels are 100% owned by SES (989.3 acres, 400.4 ha).
- 3 parcels (Vincent 1, Vincent 2, and Vincent 3) are presently being leased from the current landowners by SES with sand tonnage royalties established with the owners (119.5 acres, 48.4 ha).

During 2019, SES formed an agreement with a landowner directly east of Vincent 1; and this area was subsequently mined.

Figure 4.1. Source Energy Services Sumner Property land package is comprised of 36 separate parcels (to accompany Table 4.1).

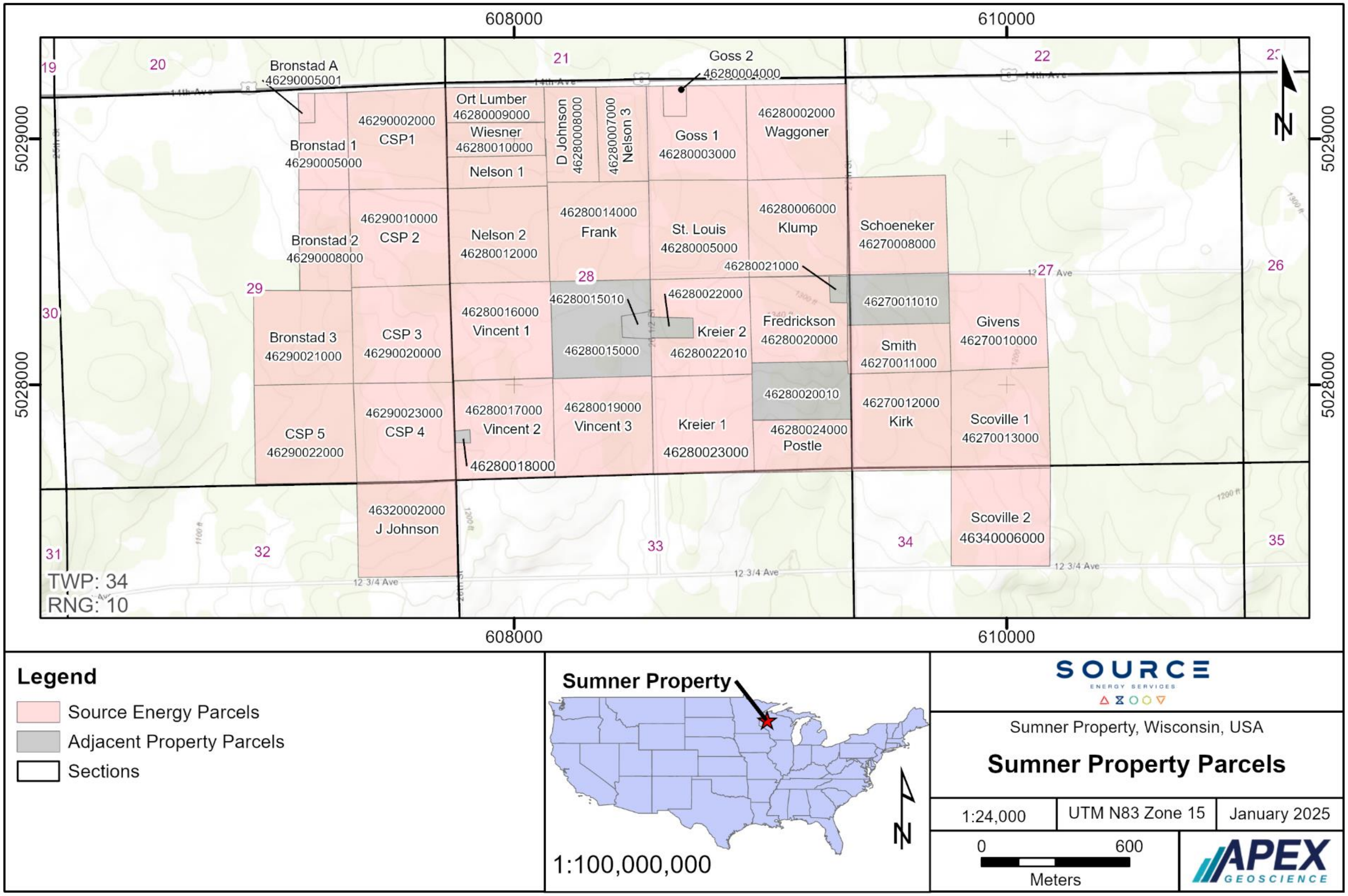
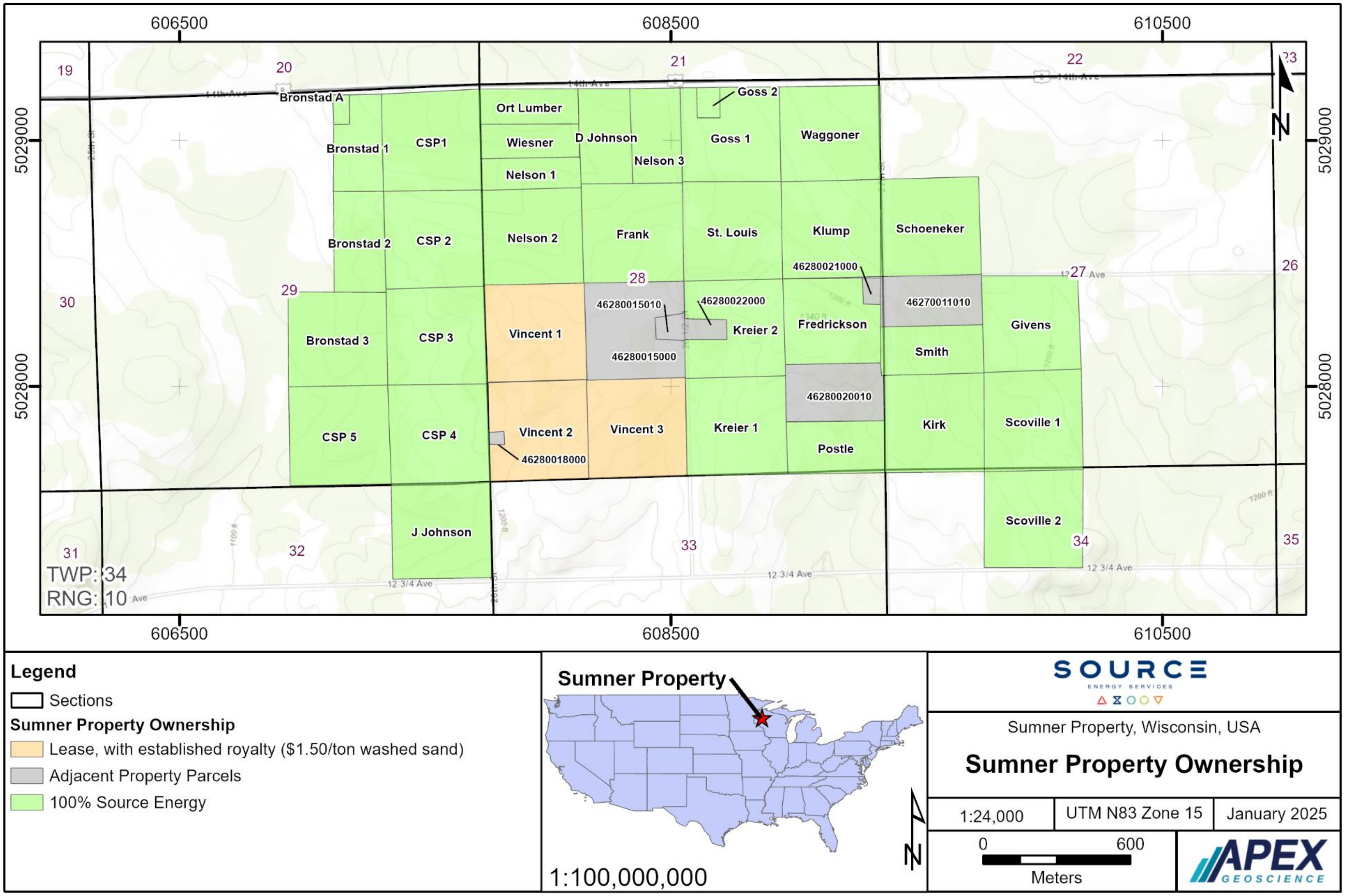


Table 4.1. Permit descriptions and status for Source Energy Services Sumner Property.

Parcel #	Sub-permit name	Public Land Survey System (section-Township-Range-quarter quarter section-Quarter section)	Area (acres)	Area (hectares)	Private (deeded) land owner [1]	Ownership status	Royalty with land owner	Activity
46290005000	Bronstad 1	29-34N-10W-NW-NE	18.00	7.28	CSP Property Holdings LLC.	Owned by SES		
46290005001	Bronstad A	29-34N-10W-NW-NE	1.28	0.52	CSP Property Holdings LLC.	Owned by SES		Office location
46290008000	Bronstad 2	29- 34N-10W	20.00	8.09	CSP Property Holdings LLC.	Owned by SES		
46290021000	Bronstad 3	29- 34N-10W	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		Scale and Wet Plant
46290002000	CSP 1	29-34N-10W-NE-NE/ 29-34N-10W-NW-NE	39.40	15.94	CSP Property Holdings LLC.	Owned by SES		
46290010000	CSP 2	29-34N-10W-SE-NE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46290020000	CSP 3	29-34N-10W-NE-SE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46290023000	CSP 4	29-34N-10W-SE-SE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46290022000	CSP 5	29-34N-10W-SW-SE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280008000	D Johnson	28-34N-10W-NE-NW	19.41	7.85	CSP Property Holdings LLC.	Owned by SES		
46280014000	Frank	28-34N-10W-SE-NW	39.00	15.78	CSP Property Holdings LLC.	Owned by SES		
46280020000	Fredrickson	28-34N-10W-NE-SE	32.31	13.08	CSP Property Holdings LLC.	Owned by SES		
46270010000	Givens	27-34N-10W-NE-SW	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280003000	Goss 1	28-34N-10W-NW-NE	38.00	15.38	CSP Property Holdings LLC.	Owned by SES		
46280004000	Goss 2	28-34N-10W-NW-NE	2.00	0.81	CSP Property Holdings LLC.	Owned by SES		
46320002000	J Johnson	32-34N-10W-NE-NE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280021000	Kingsman	PLAT 13-2 E 218 FT OF N 325 FT OF NE-SE	1.62	0.66	CSP Property Holdings LLC.	Owned by SES		
46270012000	Kirk	27-34N-10W-SW-SW	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280006000	Klump	28-34N-10W	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280022010	Kreier 2	28-34N-10W-NW-SE	37.26	15.08	CSP Property Holdings LLC.	Owned by SES		
46280023000	Kreier 1	28-34N-10W-SW-SE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280007000	Nelson 3	28-34N-10W-NE-NW	20.00	8.09	CSP Property Holdings LLC.	Owned by SES		
46280011000	Nelson 1	28-34N-10W-NW-NW	13.00	5.26	CSP Property Holdings LLC.	Owned by SES		
46280012000	Nelson 2	28-34N-10W-SW-NW	41.00	16.59	CSP Property Holdings LLC.	Owned by SES		
46280009000	Ort Lumber	28-34N-10W-NW-NW	14.50	5.87	CSP Property Holdings LLC.	Owned by SES		
46280024000	Postle	28-34N-10W-SE-SE	20.00	8.09	CSP Property Holdings LLC.	Owned by SES		
46270008000	Schoenecker	27-34N-10W-SW-NW	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46270013000	Scoville 1	27-34N-10W-SE-SW	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46340006000	Scoville 2	34-34N-10W-NE-NW	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46270011000	Smith	27-34N-10W-NW-SW	20.00	8.09	CSP Property Holdings LLC.	Owned by SES		
46280005000	St. Louis	28-34N-10W-SW-NE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280016000	Vincent 1	28-34N-10W-NW-SW	40.00	16.19	Vincent Family Trust	Leased to SES	Yes	
46280017000	Vincent 2	28-34N-10W-SW-SW	39.48	15.98	Vincent Family Trust	Leased to SES	Yes	Mining 10 acres of 39.48 acre parcel
46280019000	Vincent 3	28-34N-10W-SE-SW	40.00	16.19	Vincent Family Trust	Leased to SES	Yes	Mining 10 acres of 40 acre parcel
46280002000	Waggoner	28-34N-10W-NE-NE	40.00	16.19	CSP Property Holdings LLC.	Owned by SES		
46280010000	Wiesner	28-34N-10W	12.50	5.06	CSP Property Holdings LLC.	Owned by SES		
		100% SES owned (n=33 parcels)	**989.28**	**400.35**				
		Leased parcels (n=3 parcels)	**119.48**	**48.35**				
		Total	**1,108.8**	**448.7**				

[1] In October 2013, CSP Property Holdings LLC. and other 'Source' ventures were consolidated under the Source Energy Services brand.

Figure 4.2. Summary of land titles (to accompany Table 4.1 and text).



The purchase agreements are for 100% of the land title including mineral rights, buildings, etc. and meet the standard Wisconsin real estate purchase agreements: 1) WB-11 Residential Offer to Purchase; and 2) WB-13 Vacant Land Offer to Purchase (Wisconsin Department of Regulation and Licensing, 2015).

With respect to the 3 leased parcels (Vincent 1, Vincent 2, and Vincent 3), the landowners agreed to royalty agreements allowing SES the right to mine their properties in exchange for royalty, which is outlined in Table 4.1 and on Figure 4.2.

In the purchase and leased/royalty agreements, there is no designation between mineral and surface rights. The purchase agreements are for 100% of the land title including surface and mineral rights. The royalty agreements do not define mineral rights, and the property owner grants to SES a lease to excavate, remove, and process all marketable nonmetallic minerals including silica (frac) sand.

4.4 Permitting and Environmental Approvals

The Sumner Property was rezoned from 'Agriculture' to 'Mineral Reservation'. Two agreements form the basis of the permitting for the Sumner Property: 1) A Development Agreement approved by the Town of Sumner, WI (dated 9 October 2014); and 2) Non-Metallic Mining Reclamation Permit which includes a Reclamation Plan, approved by Barron County (amended on 25 October 2016). Selected conditions of the agreement/permit include the following:

- Surface mining is for the extraction of non-metallic material only and all activities shall be conducted in compliance with all provisions of the Barron County Non-Metallic Mining Ordinance, the Land Use Ordinance and WI Administrative Code NR 135, including specific conditions related to an approved reclamation plan.
- SES can engage in mining and processing activities 24 hours per day Monday to Sunday inclusive, and in transportation activities 24-hours a day from Monday to Saturday except at peak traffic times. Transport of products is restricted to USH 8.
- SES shall use best management practices to keep noise at or below 60 decibels at the Property boundary.
- SES shall comply with the Wisconsin Department of Natural Resources Air Permit.
- SES mining operations shall maintain a minimum of five feet (1.5 m) separation from groundwater (Barron County Zoning Committee).
- SES shall comply with the Storm Water Management and Erosion Control plan included in the Reclamation Plan.
- Blasting velocities shall not exceed those specified in NFPA 495 and Wisconsin Administrative Code SPS 307.

A stipulation of the agreements is that non-metallic mining in the Sumner wetlands area must first be approved by the Army Corps of Engineers and the Wisconsin

Department of Natural Resources. It is noted that the area of the Indicated Resource reported in this Technical Report does not include wetland regions.

There are no federal permits required. With respect to environmental work conducted to meet the criteria of the permitting, an Endangered Resource Review was conducted prior to the issuance of new or revised permits by the Wisconsin Department of Natural Resources.

The reclamation plan states that post-mining will be consistent with all applicable local, state, and federal laws. All reclaimed areas shall be planted using either seed mix two or three found in the original reclamation plan. Final reclamation grading and slopes are to mimic the natural topography and drainage patterns. Final slopes will not be greater than 3:1 and will be reconstructed with overburden material, process reject material and topsoil. Revegetation will meet the following minimum quantifiable standards including percent vegetative cover (at least 70%), vegetative density (at least 70%) and vegetative diversity (at least 70% of the selected seed mix). The operator shall request an inspection from Barron County Soil and Water Conservation Department to evaluate reclamation success.

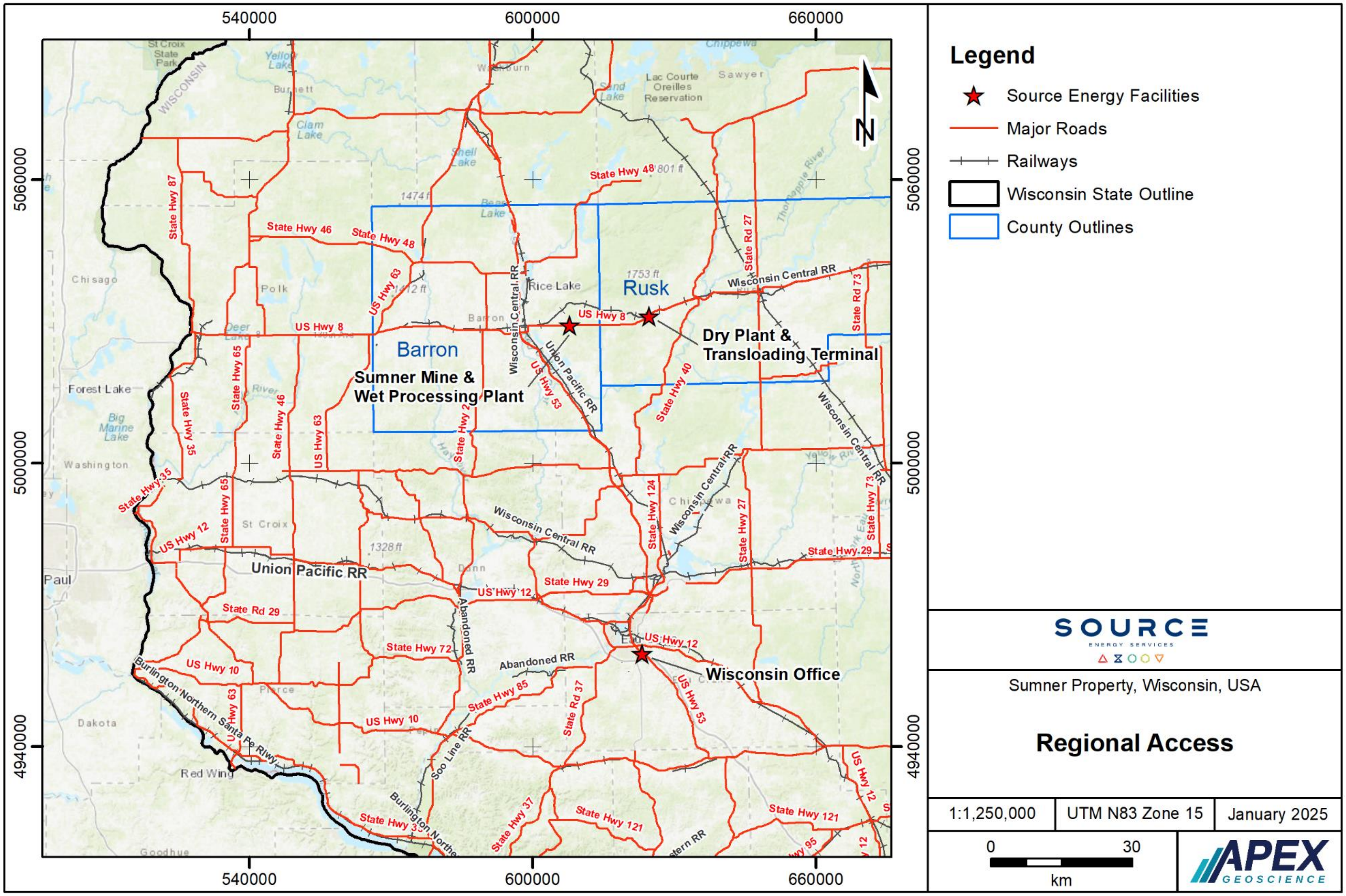
There are no other significant factors or risks that may affect the access, land title, or the right or ability to perform work on the Sumner Property.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Sumner Property, which encompasses the Sumner Open Pit Mine and Sumner Wet Processing Plant, is in east-central Barron County in the northwestern corner of Wisconsin (Figure 5.1). The Property is adjacent to United States Highway 8 (US Hwy 8), which runs primarily east–west for 280 miles (451 km), mostly within the State of Wisconsin. United States Hwy 8 connects to State Hwy 53 at Cameron, WI and to State Hwy 35 (I-35) at Forest Lake, Minnesota. Except for a short freeway segment near Forest Lake, and sections near the St. Croix River Bridge and Rhinelander, WI, US Hwy 8 is mostly undivided surface road. As a state highway running through three states, US Hwy 8 is maintained by the Minnesota, Wisconsin, and Michigan departments of transportation.

The Sumner Property is accessed by driving north from Eau Claire, WI to Cameron, WI, which is approximately 50 miles (80 km) on paved double lane State Hwy 53. The Mine Site (Open Pit Mine and Wet Processing Plant) is then located another 8 miles (12.9 km) east of Cameron on the south side of single lane, paved US Hwy 8 (Figure 5.1). SES's Dry Processing Plant and Trans-Loading Facility is located at Weyerhaeuser, WI, which is an additional 8 miles (12.9 km) east of the Sumner Mine on US Hwy 8 and is situated on the north side of the highway. The Dry Processing Plant and Trans-Loading Facility are located away from the Mine and Wet Processing Plant (and off the Sumner Property) to allow for direct access to the Wisconsin Central Railroad, a subsidiary of Canadian National Railway (CN; Figure 5.1).

Figure 5.1. Regional access to Source Energy Services Sumner Mine, Wet Processing Plant, and Dry Plant and Trans-loading Terminal.



The annual weather patterns in Cameron, WI are seasonal. The annual average temperature is 42.5º F (5.8º C), and the hottest and coolest months are typically July (80º F; 27º C) and January (21º F; -6º C), respectively. The average annual rainfall is 31 inches (79 mm) and annual snowfall is 54 inches (137 cm).

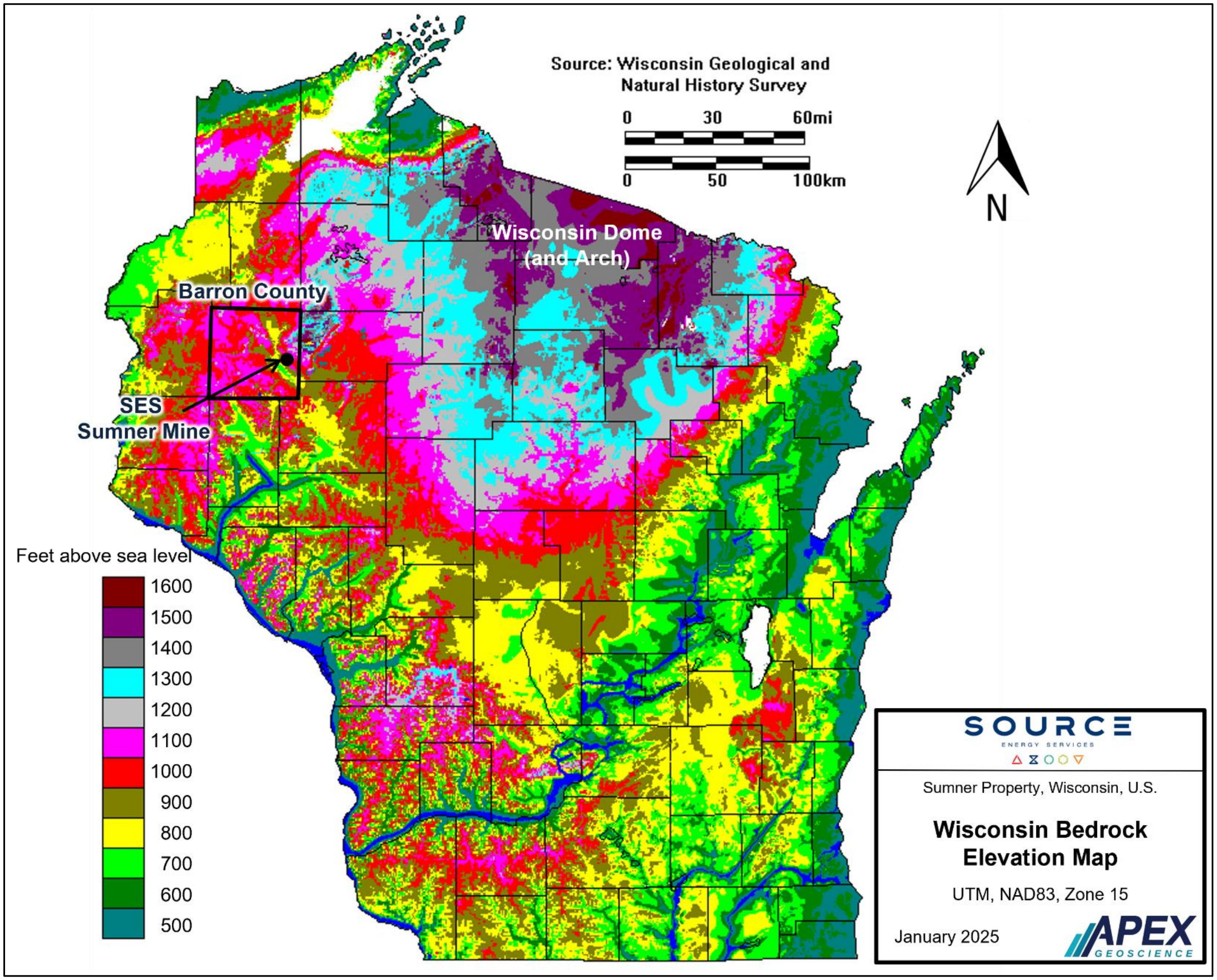
Accordingly, the Sumner Open Pit Mine is typically operational from March to November (cold freezing weather pending). The Wet- and Dry-Processing Plants and Trans-Loading Facility are not subject to seasonal conditions and operates year-round, 24 hours a day and seven days a week. Exploration activities (e.g., geophysics, auger drilling) at the Sumner Property could be conducted year-round given the ease of access and generally moderate climate.

With respect to infrastructure and resources, it is important to note that Wisconsin accounts for nearly one-half of all the frac sand capacity in the United States (Benson and White, 2015; see Section 6.1, History). It has been estimated that Wisconsin employs upwards of 3,000 people (WisconsinWatch.org; 2012). Accordingly, the State of Wisconsin has a significant infrastructure, and a knowledgeable and vibrant workforce for the development, and continuation of, silica sand mining. With respect to a local workforce, the U.S. Census Bureau (2015) shows that 45,455 people reside in Barron County for a population density of 53 people per square mile (20/km^2). With a population of 14,333, Rusk County has a lower population than Cameron. Wisconsin has a population of slightly over 5.7 million people (U.S. Census Bureau, 2015).

Regarding physiography, the Sumner Property is landlocked, but as pointed out earlier in this Section, is located adjacent to well-maintained, paved US highways. The principal landforms on the Sumner Property include the ‘sandstone uplands’ and the ‘till-covered uplands’ (Johnson, 1986). The Sumner Mine site is located on an elongated set of broad ridges (orientated roughly North-south) that are assumed to represent paleobeach deposits.

To illustrate this, the Wisconsin bedrock elevation map presented in Figure 5.2 shows the topographically elevated region of the Wisconsin Dome in the north-northeastern part of the State with a series of paleoshorelines (elevated linear ridges) that have developed on its fringe (also see Section 7.1, Regional Geology for additional information). As you travel from west to east across Barron County the landscape changes as you climb up a series of paleshorelines. On the eastern portion of Barron County, these paleoshorelines manifest themselves as a series of northerly-trending, linear, topographically elevated ridges. At the Sumner Mine site, a paleoshoreline marks the division between a western landscape dominated by forage crops, corn and other row crops that transition into a forest and shrub-dominated wetlands to the east (and where the Sumner Mine is situated). There are a few scattered farms on the Property, but it is dominated by forest. The USDA Forest Service classifies the ecoregion of east-central Barron County as the Adirondack-New England Mixed Forest-Coniferous Forest-Alpine Meadow Province (Baily, 1994).

Figure 5.2. Wisconsin bedrock elevation map. Source: Wisconsin Geological and Natural History Survey.



6 History

6.1 Historical Summary of Silica Sand Development in Wisconsin (outside the Sumner Property)

The upper mid-west United States – and the State of Wisconsin – is known as a principal supplier of “ideal frac sand” to hydraulic fracking oil and gas plays throughout North America (Zdunczyk, 2007; Runkel and Steenberg, 2012; Benson and Wilson, 2015). In 2014, approximately 70% of the silica sand used as proppant in the hydraulic fracking process was mined in the Great Lakes Region, which includes Illinois, Minnesota, Michigan, and Wisconsin. Wisconsin and, to a lesser extent, Illinois and Minnesota are the primary producers of high quality frac sand in the United States and North America.

Even though silica sand-rich bedrock layers are potentially economically extractible across a large area of Wisconsin and Minnesota, and smaller parts of Iowa and Illinois, expansion of mining has not occurred uniformly across the region. Instead, it has been most pronounced in west-central Wisconsin. This is because silica sand is particularly accessible in Wisconsin from surface accessible mines located in an unglaciated region (the ‘driftless’ area) of west-central and southwestern Wisconsin (Runkel and Steenberg, 2012; Brown, 2014).

Wisconsin accounts for nearly one-half of the silica sand capacity in the United States due to its premium quality sand, near-surface exposure, railway infrastructure, and long-term industry presence (Benson and White, 2015). The silica sand in Wisconsin goes by the moniker “Northern White”, and is characterized by near-surface, exposed, mineralogically mature Upper Cambrian to Upper Ordovician silica sand that is 99.8% pure silica.

According to the U.S. Geological Survey (USGS), Mineral Commodity Summaries, January 2016, 94.9 million metric tons of industrial sand were produced in 2015, and 110 million metric tons were produced in 2014 (USGS, 2016). Seventy-one per cent of the U.S. tonnage was used as frac sand and oil and gas well-packing and cementing sand. The 2015 numbers are an estimate from USGS, but there is a 14% decrease in sand production from 2015 to 2016; the decrease coincides with falling oil prices and a declining demand for sand at oil and gas frac sites.

Wisconsin was the leading state for industrial sand production. During 2016, 128 industrial sand mine facilities are situated within Wisconsin, of which 92 are active (Wisconsin Department of Natural Resources, 2016). Nineteen of the active facilities are stand-alone processing facilities, 4 are rail loading operations, and 69 are mine sites (Wisconsin Department of Natural Resources, 2016). Thirty-eight of the mine sites also include a processing facility on the site.

6.2 Source Energy Services: Company History

SES is an integrated supplier and distributor of high quality frac sand in Western Canada and the United States. With over a decade of proppant supply and logistics experience, SES’s services cover the entire proppant supply and logistics chain.

SES currently:

- Operates and produces silica sand from three separate Wisconsin-based operations, including: 1) Sumner Open Pit Mine and Sumner Mine Wet Processing Plant located in Barron County, WI, and the Weyerhaeuser Dry Plant and Trans-loading Terminal located in Rusk County, WI (and the subject of this Technical Report); 2) the Blair Mine in Trempealeau County; and 3) the Preston Mine in Trempealeau County.

- Operates 6 active (7 total) trans-loading terminals that collectively provide proppant trans-loading services with connectivity to large freight rail and short line rail to key oil and gas plays within the Western Canada Sedimentary Basin (Source Energy Services Ltd., 2014a,b,c; 2015; 2017a,b,c,d; Figure 6.1).

- During 2024, SES recorded elevated sand sales volumes in comparison to 2023 partially related to strong customer activity levels in the Western Canadian Sedimentary Basin (Source Energy Services Ltd., 2024a,b). In addition, the Company announced a partnership with Trican Well Service Ltd. to construct a unit train capable terminal facility located in Taylor, British Columbia, and acquired additional sand trucking assets (Source Energy Services Ltd., 2024c,d).

7 Geological Setting and Mineralization

7.1 Regional Geology

The Cambrian and Early Ordovician silica-rich sandstone bedrock layers of North America's central mid-continent region, including Minnesota, Wisconsin and Iowa, have attracted the interest of geologists for over a century because of the: 1) extensive nature of individual sedimentary sandstone units that are typically less than 150 feet (46 m) thick and yet extend for hundreds of thousands of miles/kilometres across the mid-continent; and 2) extreme textural and mineralogical maturity of the sand where most of each sandstone unit is composed of well-sorted, well-rounded and spherical quartz.

Several authors have documented the occurrence, thickness, lithology, diagenesis and stratigraphic relationship of the Cambrian and Ordovician sandstone systems (e.g., Sloss, 1963; Ostrom, 1966, 1967, 1971; Morey, 1972; Mai and Dott, 1985; Visocky et al., 1985; Dott et al., 1986; Mudrey et al., 1987; Clayton and Attig, 1990; Thomas, 1992; Young, 1992; Runkel, 1994, 1998; Johnson and Winter, 1999; Kelly, 2006; Kelly et al., 2007 Mossler, 2008; Runkel and Steenberg, 2012; Brown, 2014; Konstantinou et al., 2014; Benson and Wilson, 2015).

In the central mid-continent region, four separate silica-rich sandstone units include from stratigraphic oldest to youngest: Cambrian Mount Simon, Wonewoc and Jordan formations; and the Ordovician St. Peter Formation (Tables 7.1 and 7.2). The Cambrian silica sand units are exposed throughout large portions of Wisconsin, and across Minnesota and Iowa (Figure 7.1). This figure also shows that the surface exposures of the Ordovician silica sand are generally narrower than the combined Cambrian sand units and occur south of the Cambrian sandstone.

Figure 6.1 Source Energy Services North American operations.

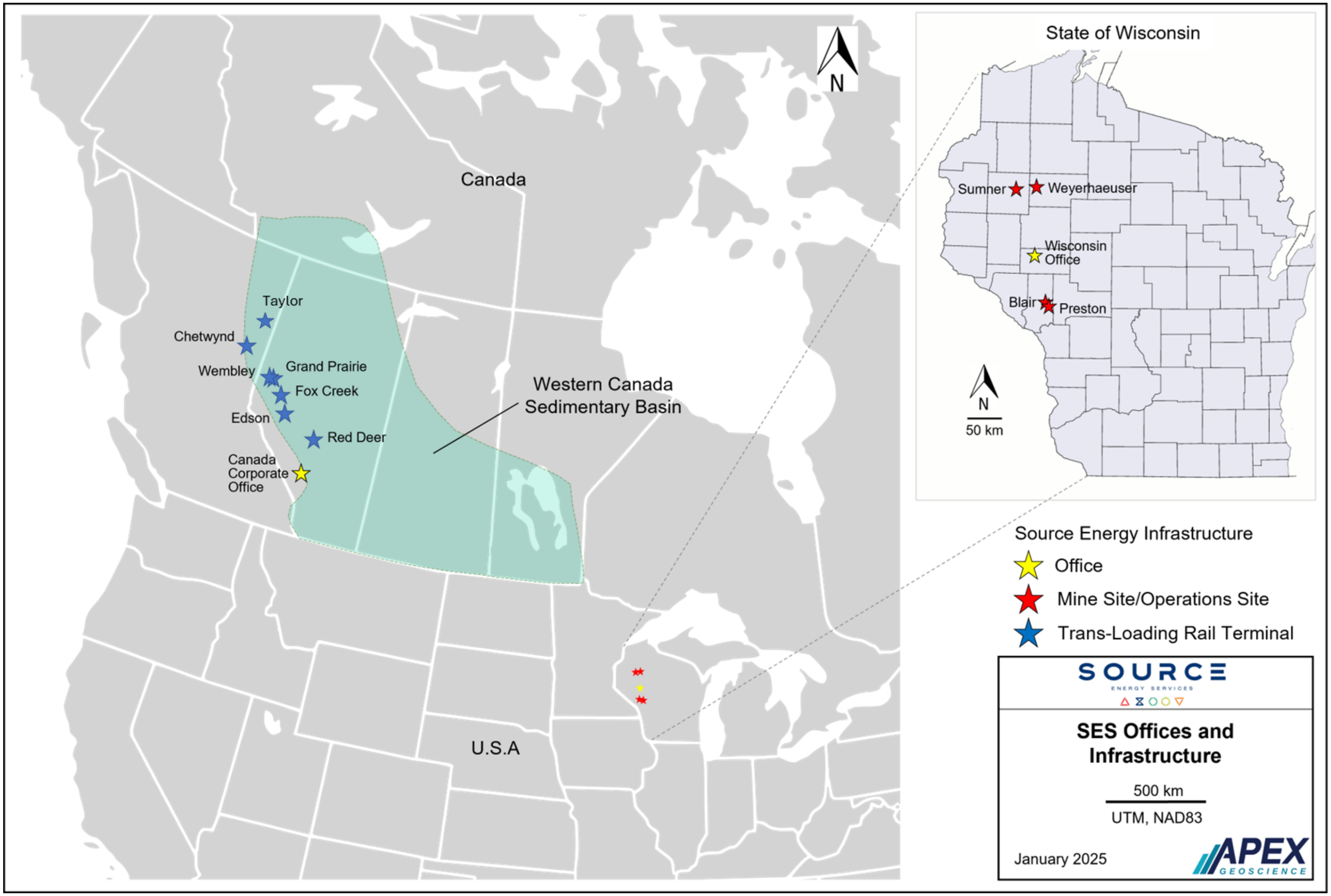


Table 7.1. Geologic column showing the lithostratigraphic units in Sauk County, Wisconsin (from Benson and Wilson, 2015; modified from Clayton and Attig, 1990). The Wonewoc Formation is the focus of this Technical Report.

Time	Lithostratigraphic units				
Pleistocene	Big Flats Formation, Horicon Formation, and unnamed units				
Tertiary to Mesozoic	Rountree Formation				
	unconformity				
	Windrow Formation				
Ordovician	unconformity				
Ordovician	Tippecanoe sequence		St. Peter Sandstone	Tonti Member	?
Ordovician	Tippecanoe sequence		St. Peter Sandstone	Readstown Member	?
Ordovician	unconformity				?
Ordovician	Sauk sequence		Prairie du Chien Group	Oneota Dolomite	?
Late Cambrian	Sauk sequence		Jordan Formation	Van Oser Member	Parfreys Glen Formation
Late Cambrian	Sauk sequence		Jordan Formation	Norwalk Member	Parfreys Glen Formation
Late Cambrian	Sauk sequence		St. Lawrence Formation	Lodi Member	Parfreys Glen Formation
Late Cambrian	Sauk sequence		St. Lawrence Formation	Black Earth Member	Parfreys Glen Formation
Late Cambrian	Sauk sequence		Tunnel City Formation	Lone Rock and Mazomanie Members	Parfreys Glen Formation
Late Cambrian	Sauk sequence	Elk Mound Group	**Wonewoc Formation**	**Ironton Member**	Parfreys Glen Formation
Late Cambrian	Sauk sequence	Elk Mound Group	**Wonewoc Formation**	**Galesville Member**	Parfreys Glen Formation
Late Cambrian	Sauk sequence	Elk Mound Group	Eau Claire Formation		Parfreys Glen Formation
Late Cambrian	Sauk sequence	Elk Mound Group	Mount Simon Formation		Parfreys Glen Formation
	unconformity				
Paleoproterozoic	Rowley Creek slate (informal)				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Dake quartzite (informal)				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	unconformity				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Freedom Formation				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Seeley Formation				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Baraboo Quartzite			upper	Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Baraboo Quartzite			middle	Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Baraboo Quartzite			lower	Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	nature of contact unknown				Granite at Baxter Hollow and diortie near Denzer (age unknown)
Paleoproterozoic	Rhyolite at Lower Narrows, Denzer, and Devil's Nose				Granite at Baxter Hollow and diortie near Denzer (age unknown)

Table 7.2. Late Cambrian bedrock stratigraphic units in northwestern Wisconsin (modified from Wisconsin Geological and Natural History Survey, 2011).

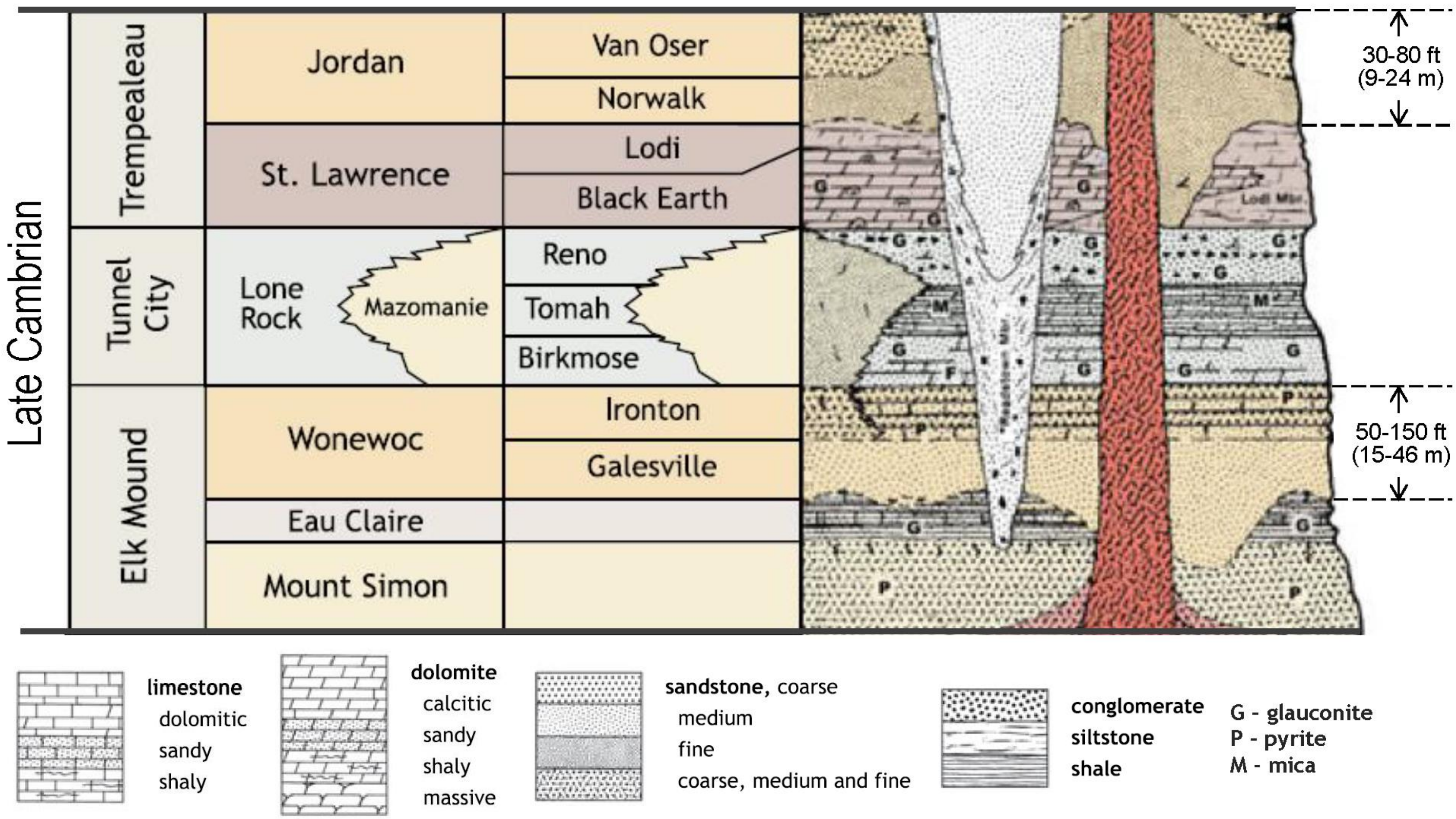
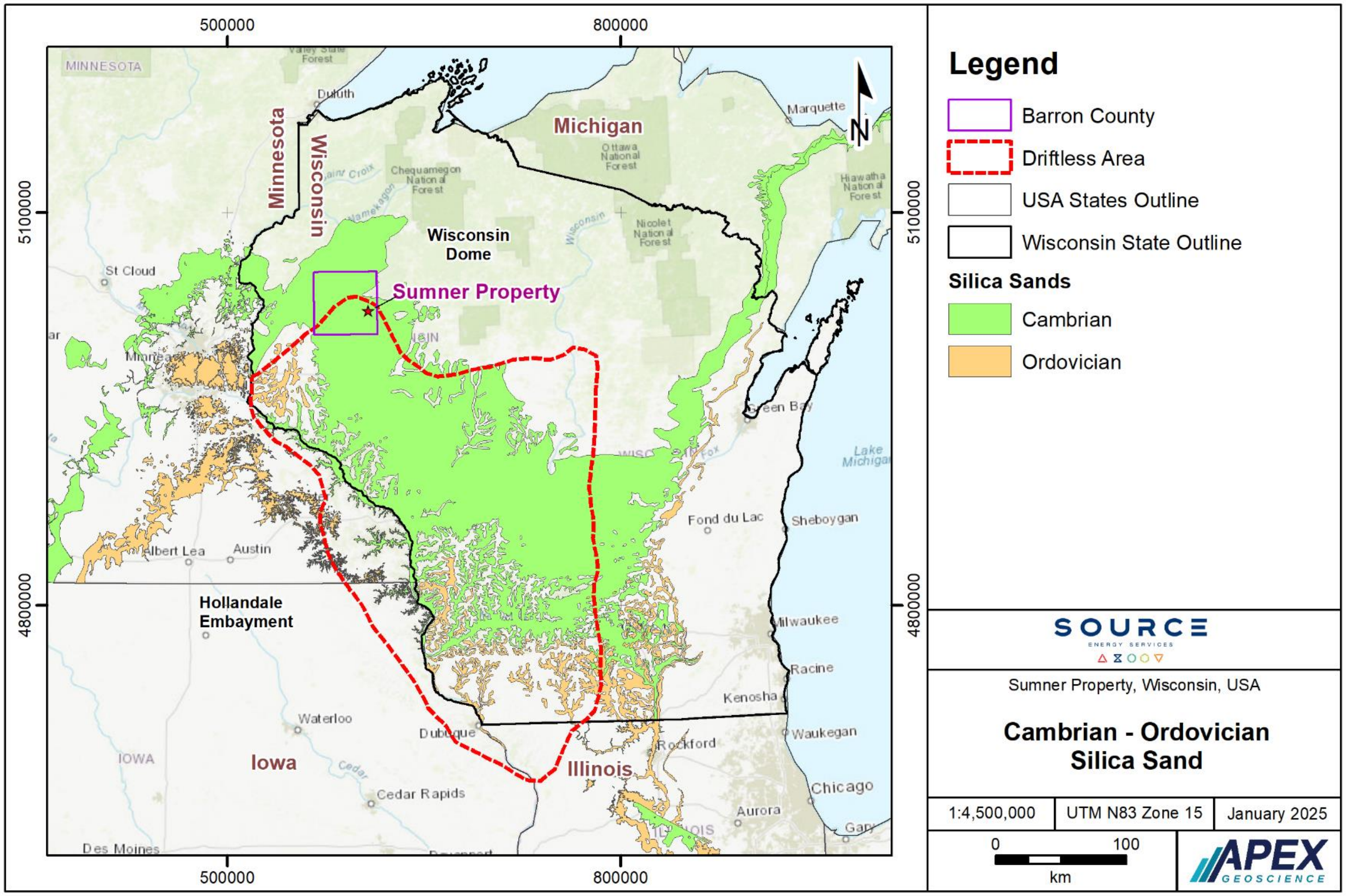


Figure 7.1 Surface exposures of silica sand source units in the upper Midwest U.S. The polygons outline the Ordovician St. Peter sandstone (light yellow) and the combined Cambrian sandstone (green), which includes the Jordan, Wonewoc, and Mount Simon formations. The approximate positions of the Wisconsin Dome, Hollandale Embayment and the Driftless Area are also shown. The map is modified from Benson and Wilson (2015).



In the general Sumner Property area, silica sand units include the Cambrian Mount Simon, Wonewoc and Jordan formations (Mudrey et al., 1987; Figure 7.2). These silica sand units are divided by the Eau Claire Formation and Tunnel City Group, which can be differentiated from the silica sand by their variable lithologies including mudstone; intercalated mudstone and sandstone; very fine- to fine-grained sandstone; and cemented sandstone.

The Cambrian silica sand units (Mount Simon, Wonewoc and Jordan formations) are summarized in the text that follows. The summary relies on the work and/or compilations completed by Mudrey et al. (1987), Ostrom (1987), Runkel (1994), Runkel et al. (1998), Runkel (2000) and Benson and Wilson (2015). Additional information from other authors is appropriately cited in the text.

7.1.1 Cambrian Mount Simon Formation

The Mount Simon Formation is the earliest representation of the Sauk sequence (Sloss, 1963), and directly overlies Proterozoic crystalline basement rocks (Morey, 1972). The Mount Simon type section is located near the city of Eau Claire, Wisconsin and comprises a 234-foot (71 m) section of mostly medium to coarse grained sandstone with high-angle cross-stratification. From its erosional boundary in northern Wisconsin and southeastern Minnesota, Mount Simon thickens southward to more than 2,000 feet (610 m) in central-northcentral Iowa and 2,600 feet (790 m) in northeastern Illinois (Young, 1992). In the northwest quadrant of Wisconsin, the Mount Simon Formation contains three informal quartzose sandstone sub-units (Mudrey et al., 1987), including:

- An uppermost sandstone that is quartzose, feldspar-bearing, white to light gray to pale brown, medium to coarse grained, angular, medium bedded, locally lenticular bedded, and at least 170 feet (52 m) thick.

- A second sandstone horizon that is quartzose, pale yellow orange to pale grey, orange, very fine grained, thin to medium bedded, angular, limonite cemented, and 125 feet (38 m) thick. This unit is underlain by a 60 foot (18 m) thick, gray to pale-orange, silty shale.

- A basal sandstone unit that is quartzose, very pale orange, very fine to fine grained, subangular to subrounded, and at least 115 feet (35 m) thick; this sub-unit is known only in the northwestern Wisconsin subsurface.

7.2 Cambrian Eau Claire Formation

The Mount Simon Formation is overlain by very fine to fine grained fossiliferous sandstone and shale of the Eau Claire Formation. Strata from this unit occurs in parts of Wisconsin, Michigan, Ohio, Kentucky, Illinois, and Indiana generally thins to the southeast. The Eau Claire Formation displays substantial regional variation in thickness and lithofacies. Regional trends include: a significant silty package in the lower half of the Eau Claire in northwest Indiana; an increase in sandy dolomite (carbonate facies) in Kentucky/Ohio; and an increase in shale content toward the center of the Michigan Basin (Lahann et al., 2012).

In Wisconsin, the Eau Claire Formation It consists primarily of very fine- to medium-grained, variably feldspathic, glauconitic, and dolomitic sandstone locally interbedded with argillaceous siltstone and silty mudstone that has a coarsening and thickening upward succession (Aswasereelert, 2008).

7.2.1 Cambrian Wonewoc Formation

The Wonewoc Formation sandstone, which is the subject of this Technical Report, overlies the Eau Claire Formation and is observed in Wisconsin, Michigan, Illinois, Indiana, Minnesota, Iowa and in northeastern Nebraska (Clayton and Attig, 1990; Runkel et al., 1998); effectively throughout the area known as the Hollandale Embayment (see Figure 7.1). The reference section for the Wonewoc Formation is near the village of Wonewoc in Juneau County, Wisconsin.

The Wonewoc Formation is characterized by a stratigraphically complex cratonic sheet of sandstone that was deposited from a continuously abundant supply of quartzose sand in a slowly and uniformly subsiding low-relief basin (Hollandale Embayment) under fluctuating sea level conditions during the Sauk II and Sauk III subsequences (Palmer, 1981; Runkel et al., 1998).

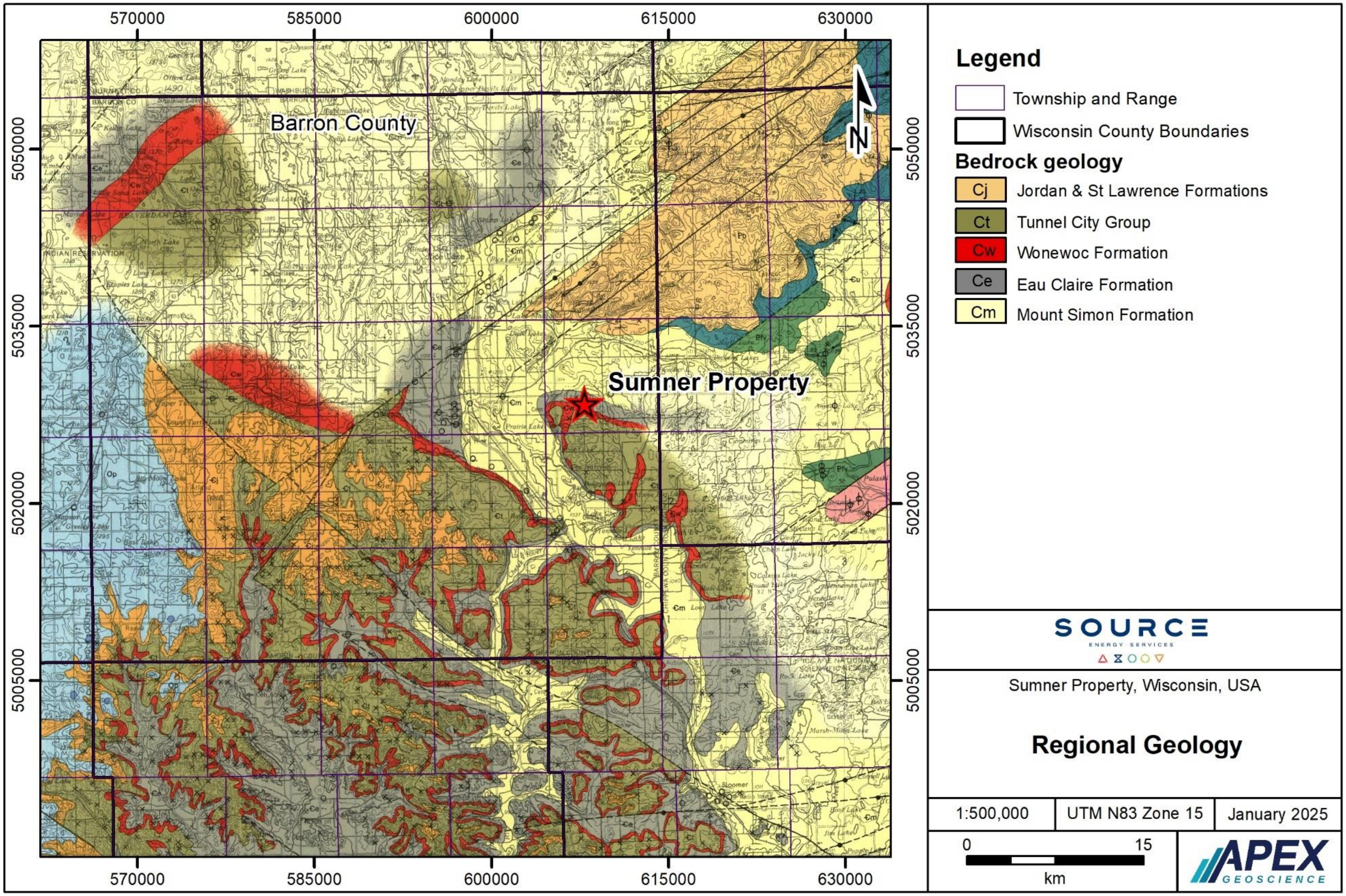
The Wonewoc Formation sandstone varies in thickness from 50 to 150 feet (15 to 46 m) and is principally medium to coarse grained quartzose sandstone with high-angle cross-stratification. It is divided into two major lithofacies – the Ironton Member and Galesville Member; however, the two members are commonly classified together as the Wonewoc Sandstone because lithostratigraphic studies have shown that it is difficult to consistently distinguish the two formations. Mudrey et al. (1987) characterized the two sub-members as the:

- Ironton Member – a quartzose, white to brown with iron staining, medium to coarse grained, subrounded, poorly sorted, wavy-bedded, vertically burrowed, calcite-cemented, 16-59 feet (5 to 18 m) thick sandstone; and the underlying,

- Galesville Member – a quartzose, white, fine to medium grained, rounded to subrounded, well-sorted, thick-bedded, cross-bedded, poorly cemented, 16-59 feet (5 to 18 m) thick sandstone with bedding units 10-16 feet (3 to 5 m) thick.

The Wonewoc Formation is overlain by the Tunnel City Group, which varies in thickness from 140-180 feet (43 to 55 m) and is divided into two sub-formations: the Mazomanie Formation and the Lone Rock Formation (Mossler, 2008). The Mazomanie Formation is dominantly white to yellowish-gray, fine- to medium-grained, cross-stratified, generally friable, quartz sandstone. The Lone Rock Formation underlies and is often inter-tongued with the Mazomanie Formation. It consists of pale yellowish green, very fine- to fine-grained glauconitic, feldspathic sandstone and siltstone, with thin greenish-gray shale partings. Thin beds with dolomitic intraclasts are common.

Figure 7.2 Regional bedrock geology (from Mudrey et al., 1987).



7.2.2 Cambrian Jordan Formation

The Jordan Formation sandstone consists of two distinct, intercalated quartzose sandstone members that are summarized by Mudrey et al. (1987) as:

- The uppermost Van Oser Member, which is a quartzose, white to brown to yellow or orange, fine to medium grained, poorly sorted, medium to thin bedded, cross bedded, with calcite-cemented nodules, is iron cemented in places and is 30-49 feet (9 to 15 m) thick; and

- The lower Norwalk Member is a quartzose, white, fine-grained, rounded, moderately sorted, medium-bedded sandstone with a trace of garnet, and a thickness of 49-59 feet (15 to 18 m). In western Wisconsin, the Norwalk is a fine- to very fine-grained feldspathic sandstone (Ostrom,1987; Runkel, 2000).

The Van Oser and Norwalk members are characterized as the 'quartzose' and 'feldspathic' lithofacies, respectively, and as such, they are interpreted as high energy, marine intertidal sand deposited as the sea shallowed, and a low energy, below wave base, marine deposits (Runkel, 1994).

7.2.3 Pleistocene Surficial Geology

The Sumner Property occurs on the approximate margin of an unglaciated region known as the 'driftless' area (see Figure 7.1). The Pleistocene surficial geology of Barron County has been mapped by Johnson (1986). The surficial geology of the Sumner Property area is predominantly comprised of Pokegama Creek of the Copper Falls Formation (unit C1tn on Figure 7.3 where t = till and n = gently rolling glacial topography). These surficial deposits consist of yellowish red, slightly gravelly sandy loam till deposited by the Chippewa Lobe (Johnson, 1986).

Generally, the Pokegama Creek till is thin and discontinuous, and outcrops of Cambrian sandstone bedrock and Precambrian Barron Quartzite are common. Johnson (1986) did not conduct a surficial auger program in the Sumner Property but generally reported that the area consists of till that is less than 50 feet thick (15 m). SES's auger test work (see Section 10, Drilling) shows that the surficial material is highly variable in the Property area with surficial deposit thicknesses of between zero and 27.9 feet (8.5 m and averaging less than 2.5 m thick).

The southeastern-most portion of the Property (Scoville sub-claim) includes undifferentiated Cambrian formations, which are comprised of Cambrian sand and sandstone exposed at the surface or capped by a thin layer of silt or till of the Pokegama Creek Member.

To the southwest of the southwestern-most sub-claims (CPS5 sub-claim) several northeast-trending 'lobes' of Chetek Member occur (C5sp – s=stream sediment; p=pitted stream plain). These surficial deposits include sand and gravelly sand deposited by melt-water streams that flowed from the Superior and Chippewa lobes (Johnson, 1986). Their orientation could indicate that the southwestern-most claims are influenced by paleochannels that would deposit this kind of surficial deposit.

7.3 Property Geology

Silica (frac) sand mining activity in the northwestern part of Wisconsin, primarily in Barron and Chippewa counties, has concentrated on mining the Wonewoc and Jordan formations from silica sand strata that is situated on lower hillsides and hilltops, respectively. At the Sumner Property, the regional geological map of Mudrey et al. (1987) effectively shows that the Wonewoc Formation is the primary silica (frac) sand mining target as the sandstone unit is generally situated right through the middle of the Property (Figure 7.4).

A personal inspection of the Property by the senior author of this Technical Report observed that the Wonewoc Formation outcropping is consistent with this unit being situated on lower hillsides. As you approach the Sumner Property from west to east, the topography rises along an elongated roughly north-south ridge, and at the Sumner Property, the lower-benched slopes are composed of Wonewoc Formation that is either exposed or overlain by variable thicknesses of Tunnel City Group and/or Pleistocene till and surficial deposits. These topographic 'benches' are thought to represent paleoshorelines formed during fluctuating sea level conditions.

During the personal inspection, the senior author observed two distinct mine faces: 1) an 'older' mine workings featuring a mine face with an 80 foot (24 m) wide stratigraphic section; and 2) a 40' section (12 m) mine face in an area of mining (Figure 7.5). The mine walls provided a visual view of the stratigraphic uniformity of the Wonewoc Formation at this locale, and of the geological contacts between the Wonewoc Formation and the overlying Pleistocene surficial deposits and/or the Tunnel City Group.

In general, the upper Wonewoc contact(s) is sharp and easily distinguished. The mine process confidently strips off the Pleistocene surficial deposits (overburden) and/or the Tunnel City Group to access the Wonewoc Formation silica sand. The overburden consists of dark grey to reddish dark grey, clay-rich sandy till with abundant pebbles and minor cobbles; a thin (<1') iron-stained regolith occurs at the base of the overburden. The basal portion of the Tunnel City Group consisted of fine-grained sandstone and siltstone with a higher component of mudstone in comparison to the underlying Wonewoc Formation. It is evident that there is 'regional', and even 'local' variation associated with the thickness of the overburden and Tunnel City Group overlying the Wonewoc Formation. Strip ratio is an important criterion for mining, and it is imperative that SES maps out local variations of thickness of the units overlying the Wonewoc Formation to direct the progressive direction of the open pit mine.

The Wonewoc Formation is dominated by white to iron-stained, medium to coarse grained quartzose sandstone. The overall observation of the mine pit face(s) is that the Wonewoc is stratigraphically continuous, and uniformly, is composed of clean, white silica sand. The stratigraphy can be traced laterally with the aid of minor, thin, continuous clay-mudstone bands that are likely associated with inter-tidal and/or transitions in marine, near-marine and non-marine deposition. In general, the mudstone and/or mudstone-sandstone intercalated horizons appear to be thin less than one foot (<31 cm) in thickness.

Figure 7.3 Quaternary geology of Barron County (from Johnson, 1986).

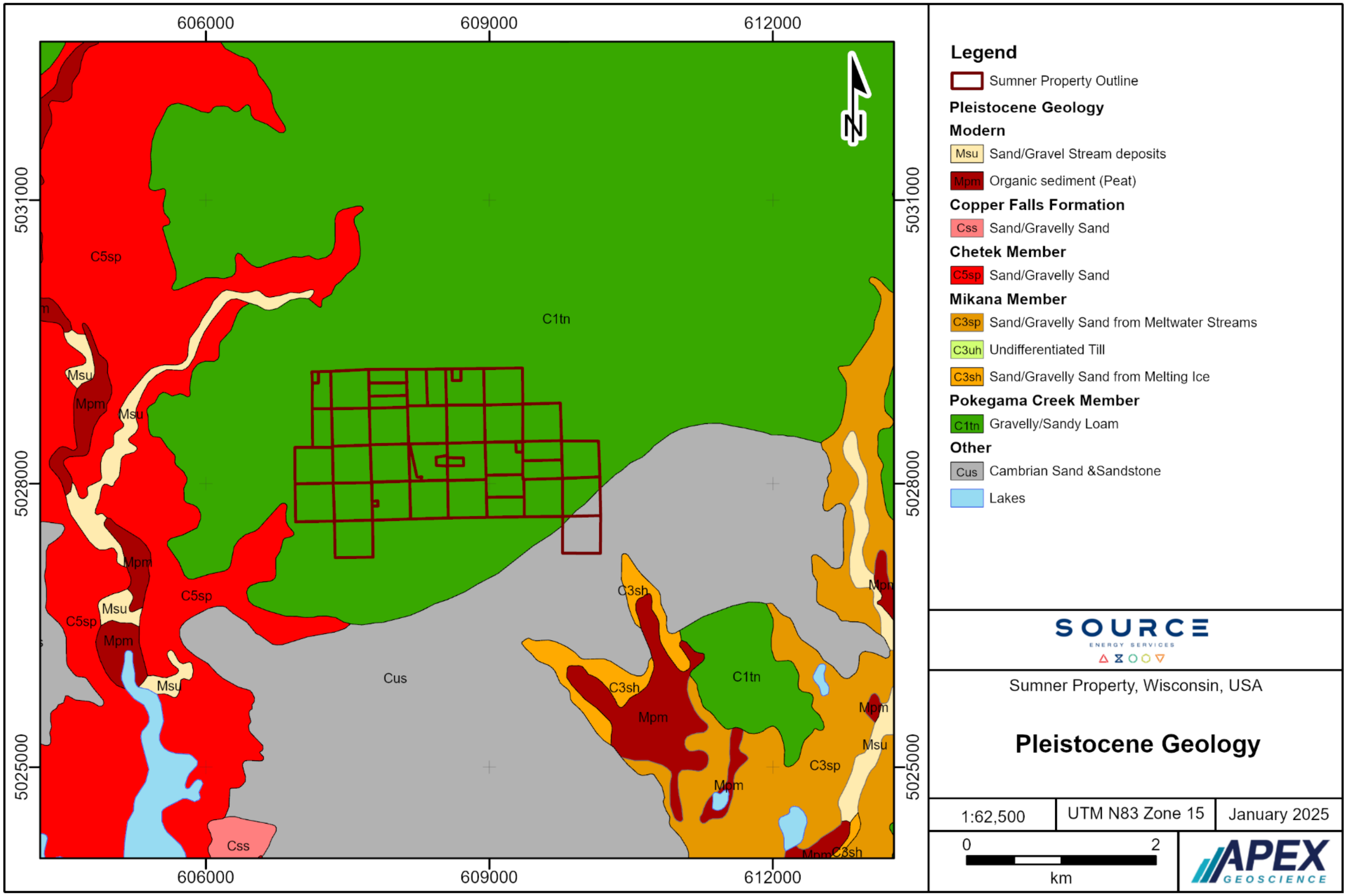
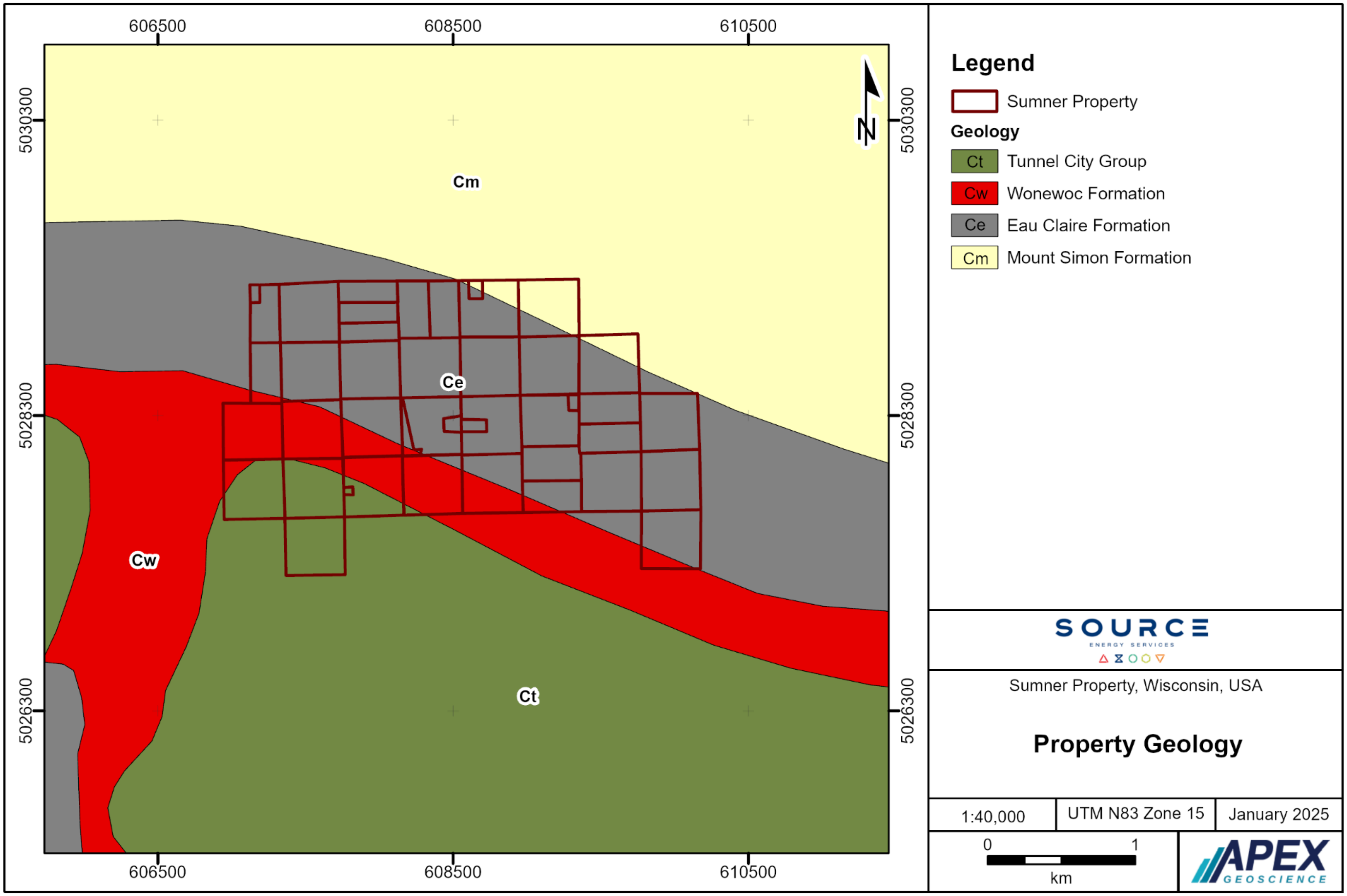


Figure 7.4 Sumner Property geology (from Mudrey et al., 1987).



Fresh Wonewoc Formation silica sand was observed from an auger that was actively drilling a blast grid adjacent to the mine face; here the auger return material was composed of white to slightly iron-stained medium to coarse grained silica sand. The driller noted that drilling was remarkably consistent apart from a narrow zone of clay about halfway through the Wonewoc section.

The basal portion and lowermost contact of the Wonewoc Formation is not as clearly understood as the upper contact. This is because most of the auger drilling to date, including deeper groundwater monitoring holes, has defined a water table elevation of approximately 1140 feet (347.5 m) above mean sea level (amsl) on the Property. This groundwater elevation establishes the lowermost mining extents as defined by the Development Agreement, which states that mining operations shall maintain a minimum of five feet (1.5 m) separation from groundwater table. Accordingly, SES has not drill tested below this depth with regularity to define the detailed extent of the lowermost Wonewoc Formation.

7.4 Mineralization

The 'quality' of the Sumner Property Wonewoc Formation silica (frac) sand is presented in Section 13, Mineral Processing and Metallurgical Testing. Alternatively, this section provides more of a regional discussion on the quality – or 'mineralization' – of the Wonewoc Formation. While the appropriate citations are provided, the senior author and Qualified Person of this Technical Report has been unable to personally verify the quality of the Wonewoc Formation silica sand throughout the State of Wisconsin, and therefore, the information presented in this section is not necessarily indicative to the mineralization on the Sumner Property that is the subject of this Technical Report.

The Paleozoic age bedrock layers of quartzose sandstone in the central mid-continent of North America are known as some of the most mineralogically pure sandstone on Earth with greater than 95% of the sand grains consisting of silicon dioxide (SiO_2). Whole rock chemical analysis (x-ray fluorescence) of the Wonewoc Formation sandstone, which was conducted by the Department of Natural Resources (Brown, 2012), shows that the Wonewoc silica sand consists of: Silicon dioxide (SiO_2; 99.20-99.70%); Aluminum oxide (Al_2O_3; 0.10-0.19%); Calcium oxide (CaO; 0.08-0.21%); Iron oxide (Fe_2O_3; 0.06-0.03%; Potassium oxide (K_2O; 0.05-0.14%); Sodium oxide (Na_2O; 0.002-0.003%); Magnesium oxide (MgO; 0.01-0.02%); and Titanium oxide (TiO_2; <0.01%).

In addition to being composed mostly of quartz, a mineral known for being of high strength and relatively inert, the grains are especially well-rounded, well-sorted, coarse-grained, and poorly cemented. The advanced level of textural maturity in Cambrian quartz grains, including the Wonewoc Formation, remains more uncertain, but is believed to be related to chemical weathering that may have preferentially dissolved plagioclase and similarly unstable minerals, and a long history of abrasion in marine conditions and wind abrasion (Morey, 1972; Odom, 1975, 1978; Dott et al., 1986; Runkel, 1998; Dott, 2003; see Section 8, Deposit Types).

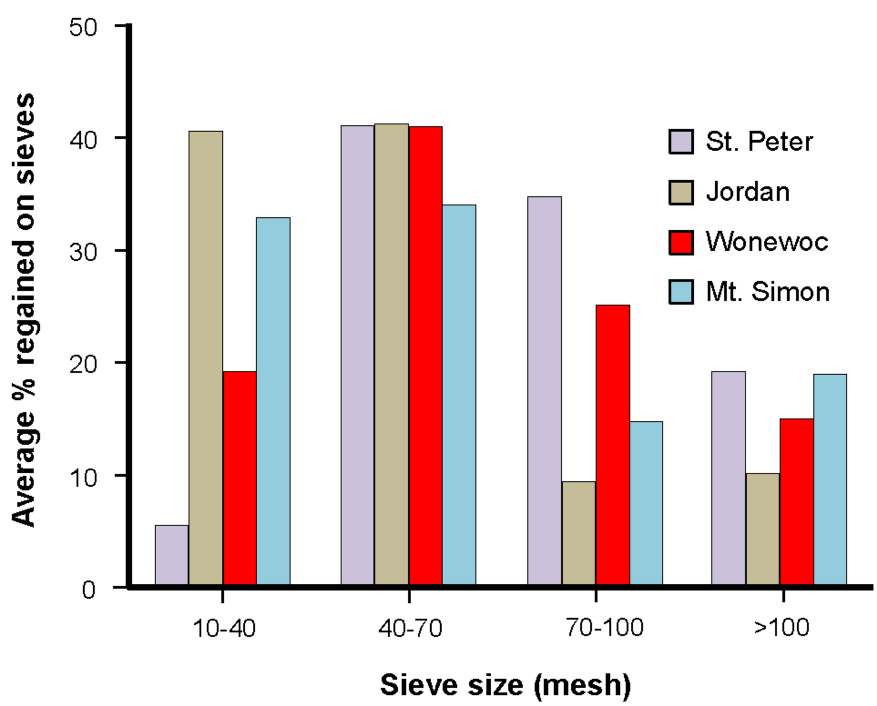
Figure 7.5 Photograph of a current open pit mine face to demonstrate the stratigraphically continuity of the Wonewoc Formation silica sand strata.

Lastly, grain size is an important factor in determining the value of a silica sand deposit because, for example, the 20/40 mesh sand fraction typically has a relatively high value because of its demand for specific hydrofracturing procedures, and the 20/40 fraction is relatively scarce in silica sand deposits elsewhere on the continent (Beckwith, 2011). Runkel and Steenberg (2012) synthesized grain size data from Ostrom (1971) and Thiel (1957) for the Jordan, Wonewoc, Mt. Simon and St. Peter formations from throughout Wisconsin (Figure 7.6); the histogram shows that:

- St. Peter sandstone has a relatively small percentage of 20-40 mesh sand and contains the highest proportion of sand finer than 100 mesh.
- The Wonewoc and Mt. Simon sandstones generally have a diminished coarser fraction compared to the Jordan.
- The St. Peter, Jordan and Wonewoc have similar 40/70 mesh contents.

Despite the relatively finer grain size in comparison to the Jordan Formation, the Wonewoc sandstone can be mined for multiple markets including those oil and gas hydrofracking plays that are asking for a smaller proportion of coarser grained silica sand (Brown, 2014).

Figure 7.6 Wisconsin grain size distributions. From Runkel and Steenberg (2012). Data originating from Ostrom (1971). St. Peter Sandstone, n = 65 samples from 56 outcrops. Jordan Sandstone, n = 15 samples from 13 exposures. Wonewoc Sandstone, n = 124 samples from 109 exposures. Mt. Simon Sandstone, n = 20 samples from 12 exposures.



8 Deposit Types

The best deposits of frac sand are characterized by super-mature marine shoreline sandstone deposits that have a long history of reworking, were never deeply buried, and underwent 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 frac 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; Hickin et al., 2010). A well-documented example of a geological setting that has produced high-quality frac sand occurred during the Cambrian in central mid-continental North America (Minnesota, Wisconsin, and Iowa). This setting coincides with the Sumner Property area, which is the focus of this Technical Report. A general summary Cambrian silica sand deposit type is presented in the following text.

The Cambrian Period was characterized by a major transgressive event that was bracketed between two ice ages, one during the late Proterozoic and the other during the Ordovician. With the retreat of Proterozoic ice, the sea level rose significantly, and extensive sequences of Cambrian marine sedimentary rocks (sandstone, shale, and fossil-bearing limestone) show that much of the world was covered by shallow epeiric seaways. The North America Craton was almost completely drowned in Late Cambrian time by what came to be known as the Sauk transgression, and subsequently, the central mid-continent is characterized by a series of sedimentary rock depositional cycles known as the Sauk sequence (Sloss, 1963; Palmer, 1981).

The Precambrian surface had significant and variable relief prior to deposition of Sauk sedimentary rocks. In northern Wisconsin, the Wisconsin Dome (with its southward extending arch) and nearby regions of the Canadian Shield represented a vast upland area composed of Precambrian igneous and metamorphic rocks (see Figure 7.1). In contrast to the Wisconsin dome upland, a broad lowland area named the Hollandale Embayment developed during the Upper Cambrian and extended across southeastern Minnesota and eastern Iowa and was situated directly southwest of the Wisconsin Dome (Austin, 1969, 1970; see Figure 7.1). For long periods of time, broad positive features such as the Wisconsin Dome were subject to weathering and shed significant volumes of detrital sediment, including eroded Precambrian granite and metamorphic rock, and Late Precambrian Keweenawan volcanic rock to the Cambrian epeiric seaway and shorelines that covered the Hollandale Embayment.

The sand, silt and clay sized particles were carried by wind and in rivers across the cratonic interior to the oceanic shoreline where shallow ocean currents formed a texturally graded shelf (Runkel, 1998, 2007). On this shelf the coarsest sand, composed mostly of quartz grains, was deposited in shoreface deposits where currents were strongest. Finer-grained, feldspathic sand, silt and clay sized particles were carried seaward to deeper water. Fluctuations in sea level caused the shoreface settings to relocate resulting in quartzose sand being deposited for hundreds of miles/kilometres.

While the shoreface setting naturally modifies the textural maturity of the quartz grains, an advanced level of the super-mature Cambrian quartz grains in central mid-continental North America remains uncertain. The physical maturity of the Cambrian sands could not be achieved solely by fluvial transport, but probably involves other factors such as:

- A long history of abrasion in marine conditions (Odom, 1975, 1978) along with wind abrasion, which is far more effective at rounding grains than abrasion in water (Dott et al., 1986); and

- Chemical weathering in the cratonic interior, which is believed to have preferentially dissolved plagioclase and similarly unstable minerals, creating a source area that is dominated mineralogically by quartz (Morey, 1972; Runkel, 1998; Dott, 2003).

Much of the silica (frac) sand mining in central mid-continental North America occurs in the "driftless area" (Syverson and Colgan, 2004), which is defined as an area of Wisconsin that was untouched by the advance of the Wisconsinan ice sheets (pre-35,000 to 10,000 years before present; Syverson and Colgan, 2004; Syverson and others, 2011; see Figure 7.1). Because the area is largely devoid of surficial deposits, the Cambrian silica sand strata is accessible to surface mining. In addition, post-glacial processes have resulted in the exposure of near-surface silica (frac) sand source units in incised terrains (e.g., rivers and hillsides) such that some silica sand deposits are amenable to surface and/or side-entry mining.

Lastly, geological models and concepts applied in the investigation of silica sand in Wisconsin generally involve: delineation of areas underlain by prospective rock units (i.e., Cambrian Mount Simon, Wonewoc and Jordan formations; and the Ordovician St. Peter Formation); auger 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 potential for use in petro hydraulic fracturing applications. General proppant test parameters include sand size fraction percentages, roundness, sphericity, crush strength, and silica content. Standard measurement properties of proppants used in hydraulic fracturing is defined in accordance with ISO 13503-2:2006/ Amd.1:2009E (International Standards, 2009).

9 Exploration

SES has been involved in the silica (frac) sand and proppant industry since 1998 when the company's primary interest, which continues today, was in the construction and operation of proppant trans-loading rail facilities. In 2008, SES expanded into frac sand mining, and in 2013 opened its Sumner Open Pit Mine and Sumner Mine Wet Processing Plant, followed by the opening of its Dry Processing Plant and Trans-Loading Weyerhaeuser facility in 2014. A summary of SES's Sumner Property facilities and operations is presented in Section 6.2, Source Energy Services: Company History.

9.1 SES Drill Testing and Gradation and Proppant Characterization Test Work

As a current silica (frac) sand miner, processor and transporter, SES has successfully completed numerous exploration programs on the Sumner Property. These auger drill programs took place between 2011 and 2018. The primary method of testing the Wonewoc Formation for its stratigraphic position and silica sand potential has been through auger drill testing.

The drilling, logging, sampling, and test work processes employed during the 2011-2018 auger test drilling and sampling programs was conducted by independent, recognized and established third-party consultants, including: SEH (2011-2013); Summit (2014, 2015); Foth (2015); SES (2016, 2017), Barr Engineering Company (2016-2019); and FracTal (2018).

A detailed summary of auger holes that have been drilled to test the stratigraphy and the grain size distribution of the Wonewoc Formation silica sand is presented in Section 10, Drilling.

The results and evaluation of analytical work conducted on the auger returns from these drillholes, which includes particle size/gradation analysis and proppant test work characterization, is presented in: Section 11, Sample Preparation, Analyses and Security; Section 13, Mineral Processing and Metallurgical Testing; and Section 14, Mineral Resource Estimates.

9.2 Bulk Density Test Work

A summary of samples collected for density analysis by the QP are presented in Table 9.1 and in Eccles et al. (2017). The results of the density analysis show that the bulk, 20/40, 40/70 and 70/140 fractions have varying densities. With respect to selecting a bulk density value for the resource estimation, the authors feel justified to use the average density value of the bulk samples (1.57 g/cm^3) in the resource modelling. Rationale for this decision includes:

1. SES is mining the entire Wonewoc sequence, which is blasted from the mine face and then mined as a bulk sample. Hence, the density of the bulk samples is the most representative density measurement of the material being mined (as opposed to using the densities of the individual size fractions).

2. The samples collected to measure the density of the 'individual size fractions' were dried prior to sieving; this drying process would create a lower density.

Accordingly, this Technical Report will convert the volumes of the various size fractions to tonnages using a bulk density of 1.57 g/cm^3.

The sampling also allowed the senior author to review complete stratigraphic sections from selected drillholes occurring throughout the Sumner Property to verify the stratigraphy, geology, and silica sand mineralization at the Sumner Property.

Table 9.1. Density measurement results for loose bulk Wonewoc Formation sand and selected size fractions.

Sample ID	SES SampleID	Unit	Elevation (top)	Elevation (bottom)	Bulk	20/40	40/70	70/140	Bulk density (g/cm3)
15RER-SES01	STB-01_60-65	Wonewoc	1185	1180	Yes				1.60
15RER-SES02	JJ-01_30-35	Wonewoc	1174	1169	Yes				1.66
15RER-SES03	HO-2_20-25	Wonewoc	1178	1173	Yes				1.64
15RER-SES04	HO-9_15-20	Wonewoc	1175	1172		Yes			1.50
15RER-SES05	HO-9_15-20	Wonewoc	1175	1172			Yes		1.48
15RER-SES06	HO-9_10-25	Wonewoc	1182	1167				Yes	1.37
15RER-SES07	K-3_30-35	Wonewoc	1220	1225	Yes				1.58
15RER-SES08	P-2_65-70	Wonewoc	1191	1186		Yes			1.52
15RER-SES09	P-2_65-70	Wonewoc	1191	1186			Yes		1.48
15RER-SES10	P-2_60-80	Wonewoc	1196	1176				Yes	1.37
15RER-SES11	STB-2	Wonewoc	1180	1175	Yes				1.67
15RER-SES12	HO-6_40-45	Wonewoc	1138	1133	Yes				1.46
15RER-SES13	HO-10_50-55	Wonewoc	1160	1155		Yes			1.54
15RER-SES14	HO-10_50-55	Wonewoc	1160	1155			Yes		1.50
15RER-SES15	HO-10_50-55	Wonewoc	1160	1155				Yes	1.42
15RER-SES16	Vincent-B-2_90-95	Wonewoc	1165	1160	Yes				1.58
15RER-SES17	LG-1_35-40	Wonewoc	1189	1184	Yes				1.54
15RER-SES18	BR-TB-1_55-60	Wonewoc	1147	1142	Yes				1.52
15RER-SES19	HO-11_45-50	Wonewoc	1160	1155		Yes			1.54
15RER-SES20	HO-11_45-50	Wonewoc	1160	1155			Yes		1.51
15RER-SES21	HO-11_45-55	Wonewoc	1160	1150				Yes	1.43
15RER-SES22	DJ-1_65-70	Wonewoc	1166	1159	yes				1.58
15RER-SES23	SL-3_30-35	Wonewoc	n/a	n/a		Yes			1.46
15RER-SES24	SL-3_30-35	Wonewoc	n/a	n/a			Yes		1.43
15RER-SES25	SL-3_30-35	Wonewoc	n/a	n/a				Yes	1.35
15RER-SES26	JW-1_0-10	Overburden	n/a	n/a	Yes				1.32
15RER-SES27	JW-1_10-20	Overburden	n/a	n/a	Yes				1.43
15RER-SES28	JW-1_20-26	Overburden	n/a	n/a	Yes				1.35
15RER-SES29	JW-1_40-45	Wonewoc	n/a	n/a	Yes				1.53
15RER-SES30	TB-1_15-20	Wonewoc	n/a	n/a	Yes				1.47
15RER-SES31	Site sample	Wonewoc	Open pit sample		Yes				1.52

9.3 Downhole Geophysical Surveying

During the 2017 and 2018 auger drill programs, SES commissioned Century Geophysical Corp. (Century) of Tulsa, OK to conduct downhole geophysical surveying of selected auger drillholes. Geophysical tools included:

- Natural Gamma – reported in calibrated API units, or raw CPS values, with response ranges of 0-150 API and 150-300 API.

- Conductivity and Apparent Conductivity – reported in mmho/m calibrated units to 0-25 mmho/m.

- Resistivity – measured in Ohm-M converted conductivity where R = 1000/C. Reported to 1-500 Ohm-M.

The calibration of the tools was initially done at Century's Tulsa facility. A bit size of 5.5 inches (14 cm) was used. The auger holes were prepared for wireline logging by inserting plastic PCV casing into the auger hole. The surveys tools were the inserted into the PCV tube and measurements were recorded from the top to the bottom of the drillholes.

The geophysical data are still in the interpretive stages; however, Figure 9.1 shows how the gamma signature as a good indicator of mineralogy and is therefore a capable tool to distinguish the upper and lower boundaries of the Wonewoc Formation from its overlying and underlying units that are composed of finer sand to clay material (e.g., overburden; Tunnel City Group and Eau Clair Formation). The shape of a gamma ray log through a sand body is often thought of as a grain size profile and the survey shows gamma ray deflections to the left that indicate horizons of clean, coarse silica sand.

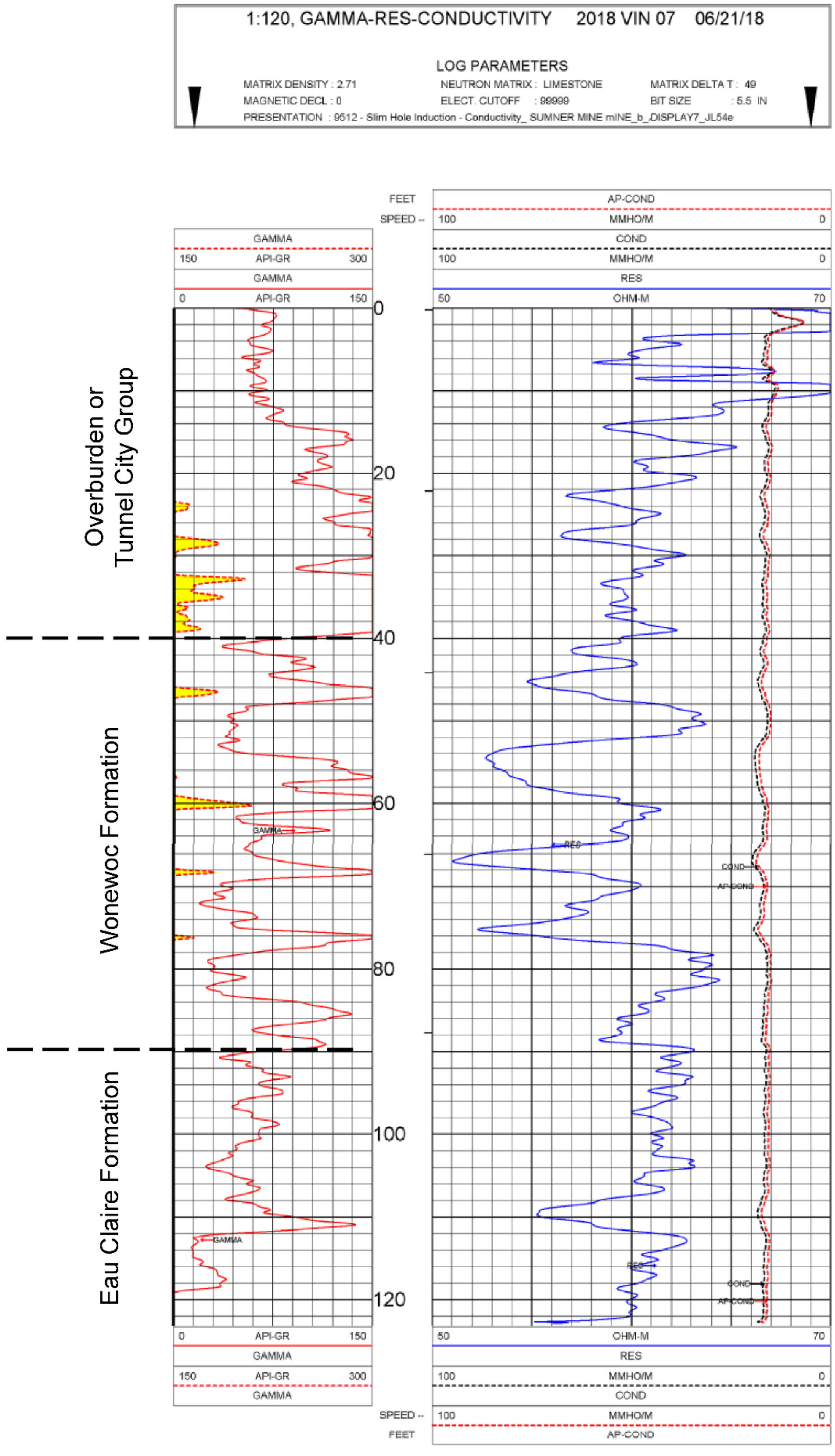
Resistivity represents another tool to assess clay content and porosity of the material where the Archie equations define the empirical relationships between water resistivity, porosity, and water saturation. In Figure 9.1, the resistivity and gamma signature correlate negatively such that resistivity can be used to check the clay content of the horizon. The resistivity in this example therefore helps to distinguish between the Wonewoc and underlying Eau Clair formations.

The thermal conductivity of silica sand can provide important criterion to assess porosity and the proportion of fine particles. In general, the example log profile shows the Wonewoc Formation has low thermal conductivity which may be a function of high porosity and a low proportion of fine particles.

9.4 Geological Modelling

The geological drill logs, gradation data and downhole geophysical wireline logs were reviewed within the 3D model to ensure formation tops/picks correlated between the three independent geological techniques. This methodology insured a robust 3D geological model, and hence, the authors consider that the 3D model and the particle size/gradation analysis are considered reliable for mineral resource estimation purposes.

Figure 9.1. Example wireline geophysical log taken during the drill program at the Sumner Property.



10 Drilling

The authors reviewed a total of 112 auger drilled test holes as part of this Technical Report. The breakdown of these wells includes:

- 77 auger wells that were drilled by SES between 2011 and 2015. Data from these drillholes was used in the Sumner Resource Estimation.

- 27 auger wells that were drilled by SES between 2016 and 2018. Data from these drillholes are combined with the previous 77 auger holes to calculate the current resource estimates presented in this Technical Report.

- 8 water wells that were drilled adjacent to the Sumner Property be independent drillers and farmers. These wells were used only to support the Sumner Property geological interpretation.

The SES auger holes were drilled in consecutive years between 2011 and 2018 and amount to 9,973 feet of drilling (3,039.76 m). A spatial depiction of the auger test hole locations throughout the Sumner Property is presented in Figure 10.1. Descriptions of the auger hole specifications, including collar locations, elevations, and general stratigraphy, is presented in Table 10.1 (2011-2015) and Table 10.2 (2016-2018), respectively. The auger programs are summarized in the text that follows.

The auger drilling generally had two primary objectives:

1. Test and obtain sub-surface geological information toward definition of the lithostratigraphic contacts between, from stratigraphic top to bottom: Pleistocene surficial deposits; Tunnel City Group; the silica sand target unit – the Cambrian aged Wonewoc Formation; and the underlying Eau Claire Formation; and

2. Investigate and characterize the lateral and vertical grain-size distribution, and proppant quality, of the silica sand within the Wonewoc Formation.

The location of the auger test holes was designed by SES. SES marked the proposed boring locations and coordinated access on to the Property for various third-party consulting companies who conducted the auger drilling, lithological logging and sampling of the auger returns on behalf of SES. Third party consultants included: SEH; Summit; Foth; and Barr Engineering Company.

Regardless of year or contractor, the auger programs generally adopted the same auger methodology. Truck mounted air rotary auger rigs were used to drill vertical (-90º) auger holes with zero orientations. The diameter of the auger stem was generally 6 inches (15 cm). The average depth of the auger test holes is 95.9 feet (29 m); the groundwater monitoring holes have slightly deeper average depths of 134.5 feet (41 m).

Figure 10.1. Location of 2011-2018 auger test holes and groundwater monitoring wells drilled by Source Energy Services. The outline of the current Sumner Open Pit Mine workings and two historical water wells that were drilled within the boundaries of the Sumner Property are also shown.

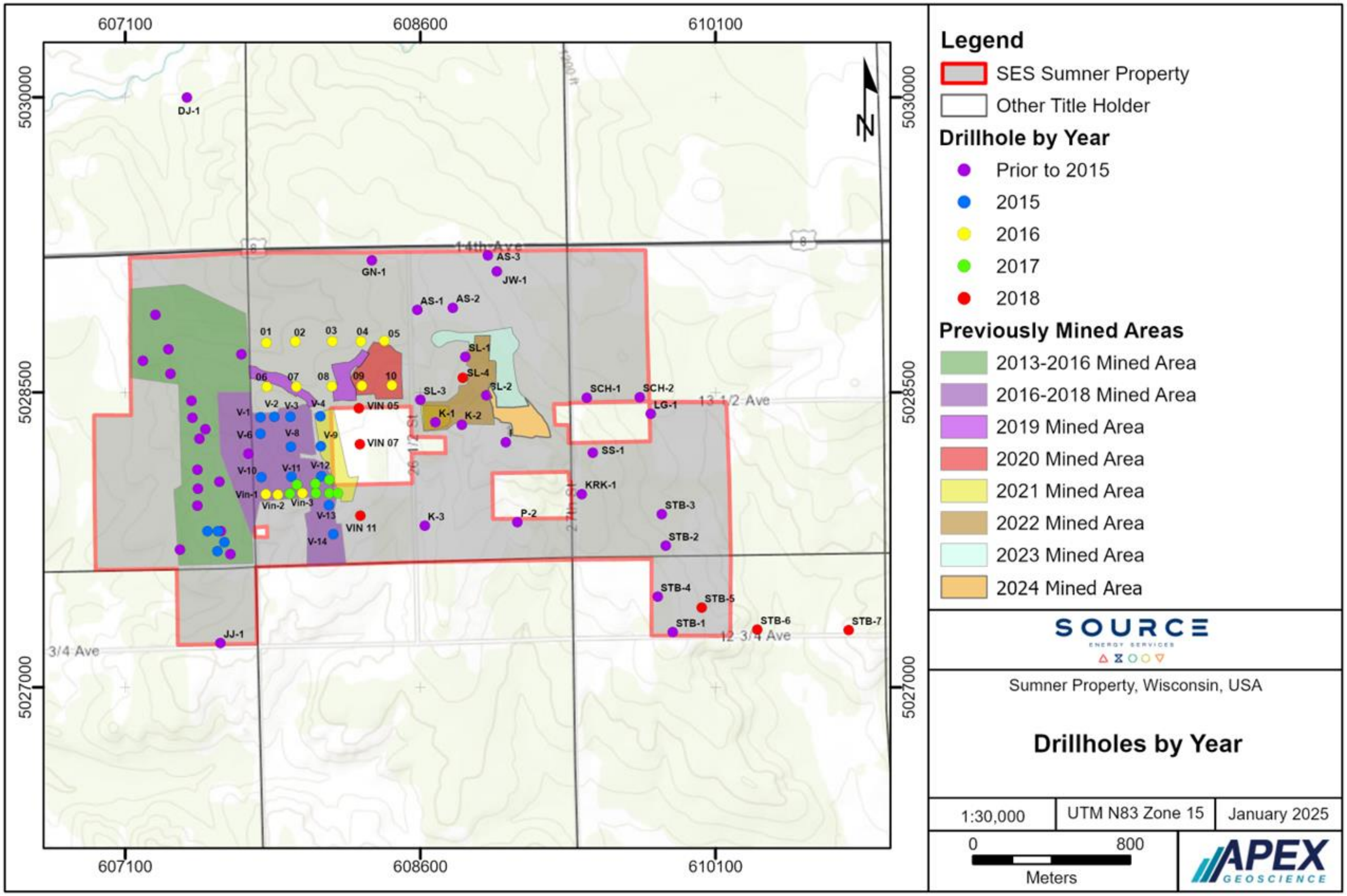


Table 10.1. Description of 2011 to 2015 auger drilling conducted by Source Energy Services at the Sumner Property.

No.	Drill Hole	Year	Easting N83 Z15	Northing N83 Z15	Adujsted elevation (m) [1]	Original elevation (m) [1]	Elevation Difference (m)	Hole type	Depth to Tunnel City (m)	Depth to Wonewoc (m)	EOH (m)	Notes on stratigraphic picks made without detailed drillhole logs
1	CSP-1	2011	607301	5028730	365.66	366.03	-0.37	Auger	N/A	<1 m	21.95	Based on seive data; area of minimal overburden
2	CSP-2	2011	607400	5028732	368.49	367.86	0.63	Auger	N/A	<1 m	25.6	Based on seive data; area of minimal overburden
3	CSP-3	2011	607516	5028702	368.11	369.29	-1.18	Auger	N/A	<1 m	27.43	Based on seive data; area of minimal overburden
4	CSP-4	2011	607534	5028595	372.36	373.09	-0.73	Auger	N/A	<1 m	26.52	Based on seive data; area of minimal overburden
5	CSP-5	2011	607674	5028429	375.3	375.38	-0.08	Auger	N/A	<1 m	15.85	Based on seive data; area of minimal overburden
6	CSP-6	2011	607662	5027972	364.92	365.14	-0.22	Auger	N/A	<1 m	19.81	Based on seive data; area of minimal overburden
7	CSP-7	2011	607488	5028026	357.45	358.34	-0.89	Auger	N/A	<1 m	22.56	Based on seive data; area of minimal overburden
8	CSP-8	2011	607286	5028271	356.34	356.48	-0.14	Auger	N/A	<1 m	21.34	Based on seive data; area of minimal overburden
9	HC-1	2011	607469	5028012	356.92	357.7	-0.78	Groundwater monitoring well	N/A	3.05	79.25	
10	71973	2012	607722	5027764	366.82	366.42	0.4	Groundwater monitoring well	N/A	0.3	34.75	Based on generalized logs (i.e., daily quick logs)
11	72508	2012	607666	5028901	356.65	355.53	1.12	Groundwater monitoring well	N/A	11.58	37.19	Based on generalized logs (i.e., daily quick logs)
12	HC-2	2012	607377	5027700	352.38	352.25	0.13	Groundwater monitoring well	N/A	4.57	85.34	
13	73745	2013	607449	5028908	355.64	357.47	-1.83	Groundwater monitoring well	N/A	0.91	85.34	Based on generalized logs (i.e., daily quick logs)
14	AS-1	2013	608581	5028920	380.11	380.33	-0.22	Auger	N/A	7.32	28.96	
15	AS-2	2013	608764	5028930	387.57	388.32	-0.75	Auger	6.1	10.66	36.58	Drill logs not available; picks based on seive data
16	AS-3	2013	608940	5029195	381.02	379.71	1.31	Auger	N/A	10.36	30.48	
17	B-1 TriWest	2013	607459	5028678	370.73	371.62	-0.89	Auger	N/A	6.1	25.91	Drill logs not available; picks based on seive data
18	B-1Vincent	2013	608367	5028067	387.31	387.83	-0.52	Auger	0	13.72	42.67	Drill logs not available; picks based on seive data
19	B-2 TriWest	2013	607604	5028212	361.16	361.9	-0.74	Auger	N/A	6.1	15.24	Drill logs not available; picks based on seive data
20	B-2Vincent	2013	608195	5028335	381.41	382.7	-1.29	Auger	0	10.66	38.1	Drill logs not available; picks based on seive data
21	B-3 TriWest	2013	607643	5027695	363.55	363.94	-0.39	Auger	N/A	1.52	18.29	Drill logs not available; picks based on seive data
22	MW-1	2013	607360	5028623	365.93	366.38	-0.45	Groundwater monitoring well	N/A	0.61	7.62	Based on generalized logs (i.e., daily quick logs)
23	MW-2	2013	607019	5027624	340.79	342.42	-1.63	Groundwater monitoring well	N/A	1.83	27.89	Based on generalized logs (i.e., daily quick logs)
24	MW-3	2013	607713	5027891	364.32	365.64	-1.32	Groundwater monitoring well	N/A	1.22	24.84	Based on generalized logs (i.e., daily quick logs)
25	SL-1	2013	608827	5028682	390.07	390.49	-0.42	Auger	3.66	8.53	35.66	
26	SL-2	2013	608930	5028486	397.46	396.83	0.63	Auger	6.71	12.5	35.66	
27	SL-3	2013	608600	5028462	390.85	390.8	0.05	Auger	N/A	6.1	35.66	
28	BR-TB1	2014	607319	5028720	366.24	366.54	-0.3	Auger	N/A	0.3	29.57	
29	BR-TB2	2014	607190	5028661	360.11	359.18	0.93	Auger	N/A	0.91	19.81	
30	BR-TB3	2014	607253	5028895	362.28	360.95	1.33	Auger	N/A	0.3	17.07	
31	BR-TB4	2014	607330	5028595	363.57	364.31	-0.74	Auger	N/A	4.88	4.88	Approximate strat depths; Wonewoc not penetrated
32	DJ-1	2014	608263	5029180	374.08	374.59	-0.51	Auger	6.4	8.84	27.43	
33	F-1	2014	609034	5028244	408.54	408.53	0.01	Auger	0.46	27.89	42.67	
34	GN-1	2014	608461	5029163	376.91	377.25	-0.34	Auger	N/A	4.42	30.48	
35	HO-1	2014	607437	5028457	366.04	366.11	-0.07	Auger	N/A	3.66	24.38	
36	HO-10	2014	607724	5028189	368.66	368.8	-0.14	Auger	N/A	2.13	21.34	
37	HO-11	2014	607690	5028694	365.76	367.74	-1.98	Auger	N/A	0.3	24.38	
38	HO-2	2014	607506	5028312	365.76	365.49	0.27	Auger	N/A	2.44	24.38	
39	HO-3	2014	607442	5028372	364.23	363.88	0.35	Auger	N/A	2.4	19.81	
40	HO-4	2014	607467	5028109	355.22	355.56	-0.34	Auger	N/A	2.13	7.62	
41	HO-5	2014	607465	5027924	355.35	355.9	-0.55	Auger	N/A	6.56	15.24	
42	HO-6	2014	607477	5028265	362.96	361.89	1.07	Auger	N/A	0.61	18.29	
43	HO-7	2014	607578	5028048	362.35	362.99	-0.64	Auger	N/A	2.5	21.34	
44	HO-8	2014	607586	5027796	363.73	363.86	-0.13	Auger	N/A	0.91	21.34	
45	HO-9	2014	607633	5027677	363.3	363.52	-0.22	Auger	N/A	0.61	19.81	
46	JJ-1	2014	607582	5027230	*366.98	366.78	0.2	Auger	N/A	0.76	21.34	
47	JW-1	2014	608992	5029119	379.65	379.34	0.31	Auger	7.77	11.9	29.57	
48	K-1	2014	608676	5028343	392.52	393.77	-1.25	Auger	0.91	25	24.99	
49	K-2	2014	608809	5028332	400.24	399.61	0.63	Auger	0.91	27.43	27.43	
50	K-3	2014	608623	5027819	378.82	379.48	-0.66	Auger	0.91	2.44	29.87	
51	KRK-1	2014	609421	5027980	394.71	394.03	0.68	Auger	3.05	17.28	48.77	
52	LG-1	2014	609768	5028412	375.31	373.16	2.15	Auger	N/A	1.68	21.03	
53	P-1	2014	609095	5027837	384.25	382.91	1.34	Auger	4.11	7.62	7.62	
54	P-2	2014	609093	5027839	384.29	383.02	1.27	Auger	4.72	5.55	36.58	
55	SCH-1	2014	609444	5028471	384.16	383	1.16	Auger	4.11	12.34	21.34	
56	SCH-2	2014	609713	5028473	377.23	375.69	1.54	Auger	3.96	9.14	9.14	Approximate strat depths; Wonewoc not penetrated
57	SS-1	2014	609475	5028189	393.23	391.22	2.01	Auger	1.07	16.15	42.67	
58	STB-1	2014	609883	5027280	*385.27	385.38	-0.11	Auger	N/A	4.27	28.96	
59	STB-2	2014	609847	5027718	382.71	379.37	3.34	Auger	2.44	12.19	27.43	
60	STB-3	2014	609827	5027879	377.25	376.15	1.1	Auger	N/A	0.46	27.43	
61	STB-4	2014	609807	5027460	387.14	386.07	1.07	Auger	1.83	12.56	22.86	
62	TB-1	2014	609580	5029168	370.28	369.26	1.02	Auger	3.51	4.72	12.19	
63	MW-4	2015	608685	5029202	386.27	384.51	1.76	Groundwater monitoring well	N/A	9.14	38.1	
64	MW-5	2015	607137	5029049	357.49	358.02	-0.53	Groundwater monitoring well	N/A	2.13	22.86	
65	MW-6	2015	609334	5027717	388.57	388.11	0.46	Groundwater monitoring well	3.35	11.64	42.67	
66	VIN-15-01	2015	607780	5028372	374.97	375.79	-0.82	Auger	0.91	1.52	30.48	
67	VIN-15-02	2015	607860	5028394	378.4	380.75	-2.35	Auger	0.61	6.1	32	
68	VIN-15-03	2015	607944	5028376	382.89	383.76	-0.87	Auger	1.22	6.1	36.58	
69	VIN-15-04	2015	608082	5028372	379.03	380.37	-1.34	Auger	1.07	7.62	32	
70	VIN-15-06	2015	607896	5028286	378.02	381.86	-3.84	Auger	8.53	15.24	26.21	
71	VIN-15-08	2015	607948	5028219	380.8	381.57	-0.77	Auger	0.91	4.57	32	
72	VIN-15-09	2015	608091	5028226	383.36	385.15	-1.79	Auger	4.57	9.14	38.1	
73	VIN-15-10	2015	607819	5028060	376.55	377.17	-0.62	Auger	0.91	7.62	30.48	
74	VIN-15-11	2015	607903	5028063	379.76	380.87	-1.11	Auger	0.91	5.18	32	
75	VIN-15-12	2015	608087	5028081	386.87	387.6	-0.73	Auger	0.91	10.67	35.05	
76	VIN-15-13	2015	608126	5027907	381.02	380.72	0.3	Auger	1.52	7.62	35.05	
77	VIN-15-14	2015	608151	5027785	383.83	384.31	-0.48	Auger	1.22	6.1	39.62	
										Auger hole	**1,752.90**	
										Ground water monitoring hole	**485.85**	
										Total	**2,238.75**	

[1] The original elevations, which were based on topographic contours, were adjusted when the LiDar data was acquired.
Two locations occur outside the Lidar coverage area (see asterisks; elevations for these two holes were sourced from SRTM data).

Table 10.2. Description of 2016 to 2018 auger drilling conducted by Source Energy Services at the Sumner Property.

No.	Drillhole	Year	Easting N83 Z15	Northing N83 Z15	Adjusted elevation (m)	Original elevation (m)	Elevation difference (m)	Hole type	Depth to Tunnel City (m)	Depth to Wonewoc (m)	EOH (m)	Notes on Stratigraphic picks made without detailed drill hole logs
1	2016-01	2016	607817.42	5028751.05	362.50	362.47	-0.03	Auger	NA	6.50	21.34	Based on generalized logs (i.e. daily quick logs)
2	2016-02	2016	607964.54	5028758.42	367.27	367.22	-0.05	Auger	4.57	7.60	21.34	Based on generalized logs (i.e. daily quick logs)
3	2016-03	2016	608152.15	5028759.82	368.91	369.14	0.23	Auger	NA	4.57	19.81	Based on generalized logs (i.e. daily quick logs)
4	2016-04	2016	608297.38	5028760.23	371.82	371.89	0.07	Auger	4.57	6.10	27.43	Based on generalized logs (i.e. daily quick logs)
5	2016-05	2016	608417.18	5028763.09	374.90	374.93	0.03	Auger	NA	10.70	27.43	Based on generalized logs (i.e. daily quick logs)
6	2016-06	2016	607819.45	5028529.25	375.11	375.15	0.04	Auger	3.05	19.81	28.96	Based on generalized logs (i.e. daily quick logs)
7	2016-07	2016	607969.72	5028528.56	371.73	377.25	5.52	Auger	0.00	7.62	28.96	Based on generalized logs (i.e. daily quick logs)
8	2016-08	2016	608150.07	5028531.50	375.50	375.51	0.01	Auger	3.66	7.62	28.96	Based on generalized logs (i.e. daily quick logs)
9	2016-09	2016	608302.47	5028533.91	381.28	381.34	0.06	Auger	4.57	7.62	19.81	Based on generalized logs (i.e. daily quick logs)
10	2016-10	2016	608455.21	5028534.69	387.38	387.25	-0.13	Auger	1.52	10.67	39.62	Based on generalized logs (i.e. daily quick logs)
11	VIN-16-01	2016	607813.59	5027981.15	374.21	373.38	-0.83	Auger	0.00	3.50	24.38	Based on generalized logs (i.e. daily quick logs)
12	VIN-16-02	2016	607874.85	5027980.51	376.42	375.82	-0.60	Auger	3.96	7.01	26.82	Based on generalized logs (i.e. daily quick logs)
13	VIN-16-03	2016	607999.39	5027987.47	382.15	381.30	-0.85	Auger	0.00	10.60	29.87	Based on generalized logs (i.e. daily quick logs)
14	VIN-17-01	2017	607971.06	5028029.51	382.53	382.22	-0.31	Auger	1.22	11.89	33.22	Based on generalized logs (i.e. daily quick logs)
15	VIN-17-02	2017	607936.93	5027984.11	379.99	379.78	-0.21	Auger	1.83	6.40	30.78	Based on generalized logs (i.e. daily quick logs)
16	VIN-17-03	2017	608066.95	5028036.28	385.69	385.27	-0.42	Auger	1.22	12.48	34.75	Based on downhole Gamma log
17	VIN-17-04	2017	608136.75	5028054.64	385.34	385.27	-0.07	Auger	1.22	11.89	34.75	Based on generalized logs (i.e. daily quick logs)
18	VIN-17-05	2017	608067.66	5027986.92	384.00	384.05	0.05	Auger	1.52	6.10	35.05	Based on generalized logs (i.e. daily quick logs)
19	VIN-17-06	2017	608137.73	5027987.92	382.01	381.91	-0.10	Auger	N/A	8.53	27.43	Based on generalized logs (i.e. daily quick logs)
20	VIN-17-07	2017	608180.42	5027986.26	383.78	382.22	-1.56	Auger	3.05	11.89	33.22	Based on generalized logs (i.e. daily quick logs)
21	2018 SL-4	2018	608815.66	5028573.72	391.57	394.32	2.75	Auger	0.00	19.76	39.62	Based on downhole Gamma log and seive data
22	STB-5	2018	610028.73	5027405.90	377.13	377.43	0.30	Auger	3.00	3.05	30.48	Based on generalized logs (i.e. daily quick logs) and seive data
23	STB-6	2018	610311.93	5027294.60	361.39	359.05	-2.34	Auger	0.00	3.05	21.34	Based on generalized logs (i.e. daily quick logs)
24	STB-7	2018	610776.23	5027290.45	366.13	366.19	0.06	Auger	0.00	7.60	27.43	Based on generalized logs (i.e. daily quick logs)
25	VIN-18-05	2018	608286.15	5028420.06	382.15	382.04	-0.11	Auger	0.00	10.97	35.05	Based on downhole Gamma log
26	VIN-18-07	2018	608292.94	5028237.37	384.98	384.90	-0.08	Auger	0.00	12.19	36.58	Based on generalized logs (i.e. daily quick logs) and seive data
27	VIN-18-11	2018	608293.93	5027871.64	382.67	382.52	-0.15	Auger	0.00	10.30	36.58	Based on downhole Gamma log
										Total	**801.01**	

To date, none of the auger collars have surveyed collar locations or elevations; rather the auger collar information was recorded by the respective drill company in either lambert conformal projection (Latitude, Longitude) or Public Land Survey System (Township, Range, and Section) land descriptions.

Auger returns, or clippings, from the 2011 to 2018 auger test hole programs (all auger holes) and from some of the groundwater monitoring holes (MW-4, MW-5 and MW-6) were analyzed for particle size/gradation analysis. The drill cutting samples were recovered from the auger rigs air discharge exhaust by bagging representative handfuls of auger returns for every 5 feet (1.5 m) of auger drilling. As the Wonewoc formation and the overlying Tunnel City group are flat lying the sampling completed from the vertical drillholes are considered to sample the true thickness of stratigraphy.

The auger drillhole collar elevations were reviewed by the authors. As part of this Technical Report, APEX acquired remote-sensing technology, Light Detection and Ranging (LiDar), from Barron County, and the high-resolution bare-earth LiDar data were used to fine-tune the collar elevations. A comparison between the original collar elevations versus the surface elevation model required some changes to the collar elevations; all changes are shown in Tables 10.1 and 10.2.

Chronologically, the auger test hole programs have generally advanced the Sumner Property as follows:

- The 2011 and 2012 programs focused on parcels CSP-1, CSP-2, CSP-3, CSP-4 and CSP-5, which defined the Sumner Property at the time (the Property was expanded to the current land position in 2013-2015).

- 2011: Initial auger drill testing on CSP-1, CSP-2, CSP-3, CSP-4 and CSP-5 parcels to ascertain the top of the Wonewoc Formation and conduct initial test work on the silica sand. These auger holes typically penetrated to depths of 52.5 to 88.5 feet (16 to 27 m).

- 2012: Minimal auger drilling to test and initiate groundwater monitoring holes on CSP-1 and CSP-4. This auger work was significantly deeper (up to 279 feet or 85 m deep) and represents the deepest sub-surface work on the Property.

- 2013: A small auger drill program (n=3 groundwater monitoring holes) tested areas northeast of the original CSP parcels coincident with an expansion of the Sumner Property (to its current land package).

- 2014: An extensive infill auger drill program was conducted to define the present Sumner Open Pit Mine area (on the CSP parcels); in addition, the program tested the Wonewoc Formation with large-scale drill-spacing in other parts of the Property.

- 2015: An infill auger drill program focused on the Vincent parcel, which is directly east of the current Sumner Open Pit Mine area.

- 2016: An auger drill program was undertaken focusing on the Nelson, Frank, and Vincent parcels.

- 2017: A small infill drill program was completed on the Vincent parcel.

- 2018: Drilling was dispersed throughout the Property, 3 of the 7 holes drilled in 2018 were on the Property. The remaining 4 fell within approximately 2000 feet (600 m) of the Property boundary in the southeast portion of the Property.

Another objective of SES’s auger work is to create groundwater monitoring wells that provide access to Cambrian aquifers for mine operations and to enable SES to monitor the groundwater table and conditions on the Property. The groundwater monitoring holes, which interactively satisfy the criteria of the auger test holes (i.e., provide additional stratigraphic information and sample material for grain-size testing), have defined a mean water table elevation of approximately 1140 feet (347.5 m) above mean sea level (amsl) on the Property. The groundwater elevation of 1140 feet (347.5 m) establishes the lowermost mining extents as defined by the Development Agreement, which states that mining operations shall maintain a minimum of five feet (1.5 m) separation from groundwater table, and accordingly, SES has not drill tested below this depth with regularity.

The groundwater monitoring holes are 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.

No diamond drillhole coring has been conducted on the Property. Alternatively, the auger returns, and clippings are extensively relied on to provide:

1. The lithological contact information; and

2. The lateral and vertical grain-size distribution of the Wonewoc Formation.

To test the viability of using auger returns to model the Sumner Property subsurface, the senior author of this Technical Report, extensively reviewed archived sample material that is stored on-site and consist of a representative archive sample for every sample that has been taken and analyzed on the Property to date. It is the opinion of Mr. Eccles, as P. Geol., and Qualified Professional of this Technical Report, that the auger program – and more specifically, the auger returns – provide sufficient material to assess the objectives of the auger program and that the results of the 2011-2018 auger programs are relevant and fitting to be used for a resource estimate that is compliant with NI 43-101 regulations and guidelines, and in compliance to Form 43-101F1 for the CSA.

The geological lithologies and contacts associated with the Pleistocene surficial deposits, Tunnel City Formation, Wonewoc Formation and Eau Claire Formation are straightforward, and hence the uppermost sub-surface at the Sumner Property is well defined at the Sumner Property. The lower contact between the Wonewoc Formation and the underlying Eau Claire was better defined during the 2016-2018 drill testing in the central and southeastern parts of the Property. This work increased the certainty about the lower Wonewoc Formation contact in the project area and increased the confidence in the resource evaluation.

Lastly, and in addition to the auger and groundwater monitoring holes that were conducted by SES, the three-dimensional geological model created as part of this Technical Report benefited from:

- eight historical water-well holes that were drilled outside the boundaries of the property (these wells were not drilled by SES). The historic water wells include: BR1953; BR1955; BR1959; BR1967; BR1968; BR1970; and BR2108. The water well logs included brief geological notes, which were helpful in extrapolating geological units outside of the Sumner Property.

- SES 2017 and 2018 downhole geophysical surveying that helped the authors interpret porosity, the proportion of fine particles (clay content) and areas of horizons of clean, coarse silica sand (see Section 9.3, Downhole Geophysical Surveying).

The inclusion of these datasets helped to clarify the stratigraphic uniformity of the Wonewoc Formation in the general Sumner Property area.

11 Sample Preparation, Analyses and Security

Auger returns, or clippings, from 80 auger drillholes completed by SES between 2011 to 2018 were analyzed for particle size/gradation analysis. The drill cutting samples were recovered from the auger rigs air discharge exhaust by bagging representative handfuls of auger returns for every 5 feet (1.5 m) of auger drilling. The samples were hand-mixed and split into at least two separate sample splits: one for particle size/gradation analysis; and one for archival at the on-site laboratory located on the Sumner Property. In some instances, a third sample split was taken for proppant test work characterization.

A total of 1,461 samples were analyzed for particle size/gradation analysis. Of these, 514 particle size records were discarded from the Sumner Wonewoc Formation estimation file as they: 1) relate to sample material that does not belong to the Wonewoc Formation (e.g., Pleistocene surficial deposits; Tunnel City Group; Eau Clair Formation); or 2) there was error associated with the data (e.g., negative value expressed in sieve data, or sieve data that does not add up to 100%).

Hence, the main ‘assay’ database is composed of 947 particle size/gradation analyses that are sourced from the Wonewoc Formation. The data form the main datafile for the resource estimation that is presented in Section 14, Mineral Resource Estimation). See this section for a statistical summary of the resulting gradation data.

Apart from 2011 and 2016-2018 auger hole samples, the particle size/gradation analyses were conducted by third-party consultants: SEH Inc., FracTal LLC (associated with Summit) and Foth; in conjunction with their respective handling of the auger drill programs. The 2011 and 2016-2018 particle size/gradation analysis were completed 'in-house' at SES's laboratory facility located on the Sumner Property. In addition, SES will ship representative sample sets to a third-party contractor for gradation analyses.

The particle size/gradation analysis followed analytical procedures that generally included: drying the sample; sieving out the >8 mesh fraction; washing and drying the sample; and sieving the resulting sample using the sieve test procedure outlined in ASTM E11 (ASTM, 1995). The resulting sieve results are reported in the following mesh size fractions: 12 (1.820 mm), 16 (1.270 mm), 18 (1.080 mm), 20 (925 µm), 25 (775 µm), 30 (660 µm), 35 (550 µm), 40 (471 µm), 45 (396 µm), 50 (337 µm), 60 (283 µm) 70 (242 µm), 100 (174 µm), 140 (126 µm), 200 (91 µm), and Pan (or <91 µm). Note that the 140-mesh fraction was not analyzed or recorded for 200 of the 947 samples from 17 auger holes (STB-, STB-22, HO-1 to HO-11, and BR-TB1 to BR-TB3).

In addition to the particle size/gradation analyses, a smaller subset of samples and their respective size fractions (n=12) was analyzed for proppant test work following the specifications of ISO 13503-2:2006/ Amd.1:2009E (International Standards, 2009). This test work is described in Section 13, Mineral Processing and Metallurgical Testing. Proppant characterization test work was completed at Stim-Lab Inc. in Duncan, OK.

The proppant test work samples were dried, weighed, and washed through a 200-mesh sieve. The sample retained on the sieve was then dried and reweighed. The percent loss was calculated from the material that washed through the sieve. The 20/40, 30/50 and 40/70 size fractions were isolated for testing, which includes:

- Bulk density: 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 mass of air occupying the interstitial spaces between proppant particles.

- Sphericity and Roundness (Krumbein Shape Factors): Sphericity is the measure of how spherical a given proppant particle is. Roundness is the measure of the lack of sharp edges or angularity. Proppants must be highly spherical and well-rounded to maximize interstitial space between adjacent proppant particles to allow passage of oil, gas, condensate, etc., through the proppant pack in the frac width.

- Acid Solubility: 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 effectively measures the resistance of proppants to acid attack, which is an indication of the presence of contaminants that may negatively affect proppant performance.

- Turbidity: 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.

- Crush Resistance: 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." For example, if Crush Resistance of a proppant yielded 9.78% fines at 10,000 psi and 10.44% fines at 11,000 psi, the K Number (K=1000) of that proppant would be "10K," because the generated fines were below 10.0% at 10,000 psi (10K psi) and exceeded 10% at 11,000 psi.

The laboratories selected by SES are independent labs. 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 International Standard ISO 13503-2.

To end, the senior author has reviewed the sample preparation, analyses and security and found no significant issues or inconsistencies that would cause one to question the validity of the data. Based on the senior author's research of silica sand sampling and analytical protocols, Mr. Eccles, P. Geol. is satisfied to include these data in resource modelling, evaluation, and estimations as part of Sumner 2024 Indicated and Inferred Silica Sand Resource estimates presented in this Technical Report.

12 Data Verification

The drilling, logging, sampling, and test work processes employed during the 2011-2018 auger test drilling and sampling programs was conducted by independent, recognized and established third-party consultants, including SEH, Summit and Foth**.** Regardless of year or contractor, the auger programs generally adopted the same auger methodology. Truck mounted air rotary auger rigs were used to drill vertical (-90º) auger holes with zero orientations.

Data verification procedures applied by the Qualified Person include reviewing the original hardcopy drillers notes, drill logs and laboratory certificates; and comparing this information against the electronic datasets. Any inconsistencies between the drill logs and analytical data were flagged and reviewed. In our review of the lithology and particle size/gradation analyses, 514 particle size records were discarded from the Sumner estimation file as they relate to: 1) sample material that does not belong to the Wonewoc Formation (or the Tunnel City Group; i.e., overburden material); or 2) data errors (e.g., negative sieve values or an incomplete set of sieve screen used to evaluate the particle size distribution). Accordingly, these 514 data records were removed from the assay dataset that was used in the resource estimations.

With respect to particle size/gradation analyses, the Lab Manager at FracTAL (subsidiary of Summit), was asked if the particle size/gradation analyses conducted at various laboratories were compatible and valid for use in NI 43-101 resource estimation. FracTAL used a 'Camsizer' to complete the gradation analysis. In contrast, the other labs (SES, SEH and Foth) used the ASTM standardized particle size distribution or gradation method using a 'sieve stack'. FracTAL feels the standardized method is not as accurate as the Camsizer but is still used widely because most labs do not have access to a Camsizer. Importantly, the resulting breakdown of the gradation analysis still follows the ASTM E11 specification. FracTAL's Lab Manager concluded that while the methodologies used to sieve-out the samples are not identical, the results are still reported using the same mesh increments, and therefore, yield a valid combined dataset that is representative of the particle size/gradation distribution at the Sumner Property (personal communication, FracTAL LLC, 2015). The senior author of this Technical Report is appreciative of FracTAL's candid response and is satisfied that the resulting combined particle size/gradation analyses dataset is valid for NI 43-101 resource estimation as conducted in this Technical Report.

The senior author also compared the drill log picks versus gradation data and geophysical wireline logs in the 3D geological model. The approach of correlating 3 separate stratigraphic measurement tools ensured that the top and bottom Wonewoc Formation picks were accurate.

A limitation of the data verification process is that the Qualified Person was not present at the time of the drilling or sample collection. However, it is the opinion of Mr. Eccles, as P. Geol., and Qualified Professional of this Technical Report, that the auger programs – and more specifically, the auger returns as collected by independent contractors provide satisfactory material to assess the Wonewoc Formation at the Sumner Property. Hence, the auger programs – and their subsequent particle size distribution results – are relevant and fitting to be used for geological and resource estimate modelling in this Technical Report.

With respect to proppant characterization, Stim-Lab Inc. is an independent laboratory and accredited to ISO 17025:2005 in North America offering all ISO 13503-2, ISO13503-5, API RP19C, and API RP56 tests for sand, resin-coated sand, and engineered ceramic proppants.

The 2011 and 2016-2018 particle size/gradation analysis were completed 'in-house' at SES's laboratory facility. The senior author has reviewed these data against independent laboratory results conducted in 2012-2015 and found the SES-generated gradation data to be reasonable and in no way, shape or form over-estimates any size fraction in the global dataset.

The senior author has reviewed all 2011-2018 geotechnical and geochemical data and found no significant issues or inconsistencies that would cause one to question the validity of the data. The hardcopy review (i.e., original source of information review) and validation of the multiple correlative datasets in the 3D model conducted by the senior author confirmed that the data was generated with proper procedures, has been accurately transcribed form the original source and is suitable for use in this Technical Report. Lastly, based on the senior author's research of silica sand sampling and analytical protocols, Mr. Eccles, P. Geol. is satisfied to include these data in resource modelling, evaluation, and estimations as part of Sumner 2024 Indicated and Inferred Silica Sand Resource estimate presented in this Technical Report.

13 Mineral Processing and Metallurgical Testing

International Standards ISO 13503-2:2006/Amd.1:2009E provides the specifications for the measurement of properties of proppants used in hydraulic fracturing operations. Major factors that determine the price for proppant include: 1) strength; 2) sphericity; 3) grain size and uniformity; and 4) overall purity (Benson and Wilson, 2015).

The Paleozoic age bedrock layers of quartzose sandstone in the central mid-continent of North America are known as some of the most mineralogically pure sandstone on Earth with greater than 95% of the sand grains consisting of silicon dioxide (SiO_2). Whole rock chemical analysis (x-ray fluorescence) of the Wonewoc Formation sandstone, which was conducted by the Department of Natural Resources (Brown, 2012), shows the Wonewoc silica sand consists of: 99.20-99.70% silicon dioxide (SiO_2). Consequently, the Wonewoc Formation is known for having few deleterious minerals.

To test this theory, the overall strength of the sand is directly related to its high SiO_2 content, and SES has conducted proppant test work on nine separate samples. The analytical test work was conducted at Stim-Lab Inc. in Duncan, OK, an independent laboratory offering ISO 13503-2 tests for sand proppant. The size fractions tested includes: 20/40, 30/50, 40/70 and 50/140. The results of the test work are presented in Table 13.1 and summarized in the following text.

13.1 Fracturing Proppant Sizes

ISO 13503-2:2006/Amd.1:2009E states that a minimum of 90% of the tested proppant sample shall pass the coarse designated (or first primary) sieve and be retained on the fine designated (or second primary) sieve (i.e., 12/20, 20/40, 40/60, etc.). For 20/40 sieve sizes, a minimum of 90% of the tested proppant sample shall pass the 20-mesh sieve and be retained on the 40-mesh sieve (e.g., Figure 13.1). Not over 0.1 % of the total tested proppant sample shall be larger than the first sieve size in the sieve stack specified in ASTM E11, and not over 1.0% of the total tested proppant sample shall be smaller than the last designated sieve size. All SES samples met the ISO 13503-2:2006 proppant size specification.

Figure 13.1. Example of a Sumner Property 20/40 sieve analysis to ensure the proppant meets ISO 13503-2:2006/Amd.1:2009E specifications prior to proppant test work. This example analysis was performed by Stim-Lab Inc.

Sample I.D.	Source Energy Services 20/40 SES Frac Sand	
US Standard Sieve No.	Weight %	
	Retained	Cumulative
8	0.0	0.0
10	0.0	0.0
12	0.0	0.0
14	0.0	0.0
16	0.0	0.0
18	1.3	1.3
20	2.6	4.0
25	23.9	27.8
30	44.5	72.4
35	23.2	95.5
40	3.8	99.4
45	0.3	99.6
50	0.3	99.9
60	0.0	99.9
70	0.0	99.9
80	0.0	99.9
100	0.0	99.9
120	0.0	99.9
140	0.0	99.9
170	0.0	99.9
200	0.0	99.9
pan	0.0	100.0
total	100.0	
in-size	95.4	% In Size as -20+40
ISO Median Diameter (mm) or d_{50}, 6.5.3	0.652	
ISO Mean Diameter (mm) 6.5.2	0.664	

Table 13.1. Summary of proppant characterization test work conducted by Source Energy Services.

Sample ID	Grain size fraction	Date Received by lab	Bulk density (g/cm^3)	Apparent density oil (g/cm3)	Krumbein shape factor (roundness)	Krumbein shape factor (sphericity)	Mean partical diameter (mm)	Crush resistance (to 10% psi) [1] 4000 (psi)	5000 (psi)	6000 (psi)	7000 (psi)	8000 (psi)	9000 (psi)	10000 (psi)	Acid solubility (12:3 HCl:HF)	Silt and fines: turbidity (NTU) [2]
SES 20/40	20/40	5-Nov-13	1.56	2.65	0.7	0.8	0.7	2.00	/	7.30	10.90	/	/	/	0.5	20
St Louis Prop 15# composite	20/40	4-Sep-13	1.54	2.63	0.7	0.7	0.6	3.90	6.80	10.60	/	/	/	/	1.2	17
SES 30/50	30/50	29-Jan-14	1.54	2.63	0.7	0.7	0.5	1.30	/	/	8.20	11.20	/	/	0.6	57
SES 30/50	30/50	5-Nov-13	1.54	2.64	0.7	0.7	0.4	0.80	/	/	8.30	12.60	/	/	0.6	21
St Louis Prop 15# composite	30/50	4-Sep-13	1.52	2.63	0.7	0.7	0.4	2.80	/	7.40	10.40	/	/	/	1.4	10
SES 40/70	40/70	22-Aug-14	/	2.63	/	/	/	/	/	/	/	/	/	/	/	52
CSP 40/70	40/70	11-Oct-13	1.52	/	0.7	0.7	0.3	/	3.90	/	/	8.70	10.70	/	1.4	/
St Louis Prop 15# composite	40/70	4-Sep-13	1.50	2.64	0.7	0.7	0.3	/	2.50	/	/	9.40	13.50	/	1.5	9
SES 50/140	50/140	29-Jan-14	1.48	2.64	0.6	0.7	0.2	/	3.40	/	/	/	9.10	11.20	3.4	41

[1] psi is pounds per square inch

[2] NTU = nephelometric turbidity unit; FTU = formazine turbidity unit

Highest stress level in which the proppant generates no more than 10% crushed material, rounded to the nearest 1,000 psi (or K-value)

International standards for proppant specification (ISO 13503-2; 2009-11-01):

- Average sphericity of 0.6 or greater
- Average roundness of 0.6 or greater
- Maximum acid solubility of grains <30/50 is 3.0% and for grains ≥30/50 is 2.0%
- Turbidity shall not exceed 250 NTU (FTU)

13.2 Sphericity and roundness

Sphericity is a measure of how close the grain is to a sphere, and roundness is a measure of the relative sharpness of grain corners. ISO 13503-2:2006/Amd.1:2009E states that sphericity and roundness for proppant is 0.6 or greater, and the recommended sphericity and roundness for high-strength proppant is 0.7 or greater.

Table 13.1 shows that all Stim-Lab samples have sphericity shapes of greater than 0.7 meeting the criteria for high-strength proppant. Except for one 50/140 size fraction all the roundness results were 0.7 meeting the criteria for high-strength proppant.

13.3 Acid Solubility

Acid Solubility provides an indication of the number of undesirable contaminants in a sand sample by determining its solubility when soaked in a hydrochloric-hydrofluoric acid (HCL-HFL) solution. ISO 13503-2:2006/Amd.1:2009E states that the acid soluble material in proppants shall not exceed 2.0 and 3.0 for proppant larger than or equal to the 30/50 and smaller than 30/50 mesh fractions, respectively.

Table 13.1 shows that all the samples measured with smaller than 30/50 size fractions (two 20/40 fractions) have acid solubility's of less than 1.2%, which is below the specification of 3.0%. With respect to the larger than or equal to 30/50, the 30/50 and 40/70 fractions have acid solubility's of less than 1.5%, which is below the specification of 2.0%. The 50/140 fraction has an acid solubility of 3.4%, which is above the specification of 2.0%.

13.4 Maximum Proppant Turbidity

Turbidity is the measurement of the amount of clay and silt sized particles contained in sand sample by placing it in water and measuring the overall turbidity of the liquid. ISO 13503-2:2006/Amd.1:2009E states that the turbidity of all fracturing proppants shall not exceed 250 nephelometric turbidity units (NTU).

All the SES samples easily satisfy this specification with turbidity's of <57 NTU (Table 13.1).

13.5 Maximum Crush Material

Crush resistance is determined by subjecting a sand sample to specific pressures for a designated amount of time and measuring the resulting number of fines (percent by weight). As per ISO 13503-2:2006/Amd.1:2009E, determination of the the highest stress level at which proppant generates no more than 10% crushed material, rounded down to the nearest 6.9 MPa (1,000 psi), represents the maximum stress that the material can withstand without exceeding 10% crush (International Standards, 2009).

The crush resistance, "k" value for the various size fractions include:

- Three 20/40 fractions resulted in 5k, 6k and 7k crush resistance.
- Four 30/50 fractions resulted in 6k, 7k (n=2) and 8k crush resistance.

- Three 40/70 fractions resulted in 7k and 8k (n=2) crush resistance.

- A single 50/140 fraction resulted in a 9k crush resistance (Table 13.1).

These "k" values are typical for Cambrian Wonewoc sandstone in western Wisconsin. For example, Brown (2012) cited 20/40, 30/50 and 40/70 crush resistance values of 6k, 7k and 10k, respectively. Because the overall strength of the sand correlates directly with high SiO_2 content, the Wonewoc Formation at the Sumner Property has a negligible amount of deleterious minerals.

To conclude, the published specifications and standards for industrial minerals should be used primarily as a screening mechanism to establish the marketability of an industrial mineral. The suitability of an industrial mineral for use in specific applications can only be determined through detailed market investigations and discussions with potential consumers. In SES's case, the proppant test work results show that the Sumner Property Wonewoc Formation silica sand meets the recommendations set forth in International Standards ISO 13503-2:2006/Amd.1:2009E for sieve size fractions, sphericity, roundness, acid solubility, turbidity, and crush classification.

Accordingly, and with respect to reporting a resource estimate that abides by NI 43-101, the SES proppant test work results show that the Wonewoc Formation silica sand from the Sumner Property has reasonable prospect of economic extraction. This fact is clearly demonstrated in the historical section (Section 6), which summarizes the Sumner open pit mine and mine facilities, including Wet and Dry Processing plants and a Trans-Loading Terminal, and SES's monthly production statistics.

Lastly, it is important to point out that SES has conducted proppant test work on only a limited number of samples (n=9, which includes derivate size fractions from individual samples). While the Wonewoc Formation is stratigraphically uniform, and it is evident that SES is producing high-quality silica sand from its Sumner Mine, additional proppant test work from throughout the Property would improve the Property-wide confidence level of the quality of the silica sand.

14 Mineral Resource Estimates

14.1 Introduction

Statistical analysis, three-dimensional (3-D) modeling and resource estimation was prepared by Mr. Black, M.Sc. P. Geo. of APEX (under the direct supervision of Mr. Eccles, who, as senior author, takes responsibility of the resource estimate). Mineral resource modelling and estimation was carried out using a three-dimensional block model based on geostatistical applications using commercial mine planning software MICROMINE (v. 21).

The project limits area is based in the UTM system relative to Zone 15 of NAD 1983. A parent block size of 164 feet x 164 feet x 10 feet (50 m x 50 m x 3 m) with sub-blocking down to 33 feet x 33 feet x 3.3 feet (10 m x 10 m x 1 m).

The Indicated and Inferred Sumner resource modeling utilized the data from a total of 112 auger holes that were drilled on, or adjacent to, the Sumner Property by SES between 2011 and 2018. Data associated with the 112 drillholes include:

- 99 auger drillholes that include stratigraphic information of the Wonewoc Formation silica sand on the Sumner Property.
- 80 auger drillholes that include grain size particle distribution analysis.
- The remaining drillholes include groundwater monitoring wells and/or 8 historical water wells that were drilled adjacent to the Sumner Property and were used only to support the geological model.

The particle size/gradation analyses, which was conducted on all 66-auger test drillholes, is used, and estimated across the resource area.

Mr. Eccles, P. Geol., completed a property visit at the Sumner Mine and operations on November 5th, 2018, to verify the sub-surface stratigraphic setting, the silica (frac) sand mineralization and the current mine plan including a yearly assessment of mined-out areas to depict resource depletion.

The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate is reported in accordance with the CSA's NI 43-101 and has been estimated using the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" dated May 14th, 2014. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

14.2 Data Summary

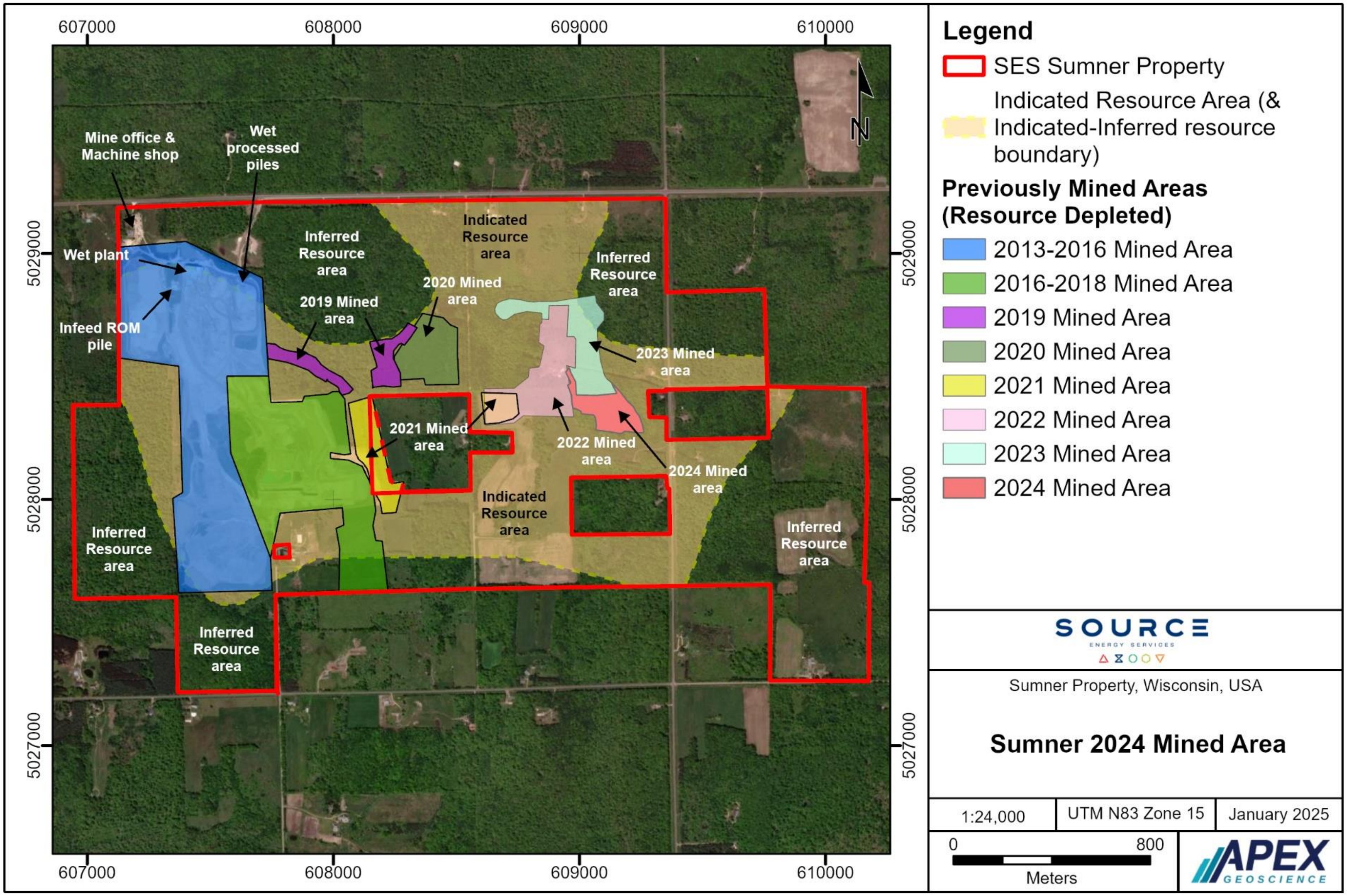
14.2.1 Overview of 2024 Sumner Mine Wonewoc Formation Resource Depletion Area

During 2024, SES open pit mined Wonewoc Formation sand resources at the Sumner Mine from within an east-west elongated rectangular block of ground that forms the central portion of the Sumner Property (Figure 14.1). The 2024 mined-out polygon was provided to APEX by SES and represents depletion of the entire Wonewoc Formation sand resource within the 2024 mined-out polygon. The 2024 mined-out polygon shown in Figure 14.1 includes the area in which SES negotiated a mine extraction agreement with the landowner in 2019.

14.2.2 Auger Drillhole Database Validation

Information from a total of 112 auger holes was used in the geological modelling and estimation process. These include: 1) test auger drillholes and groundwater monitoring wells drilled by SES throughout the Sumner Property between 2011 and 2018; and 2) 8 historical water wells that were auger drilled adjacent to the Sumner Property between 1953 and 1970 by companies/farmers other than SES. The SES drillholes are described in Section 10, Drilling.

Figure 14.1 Overview of the 2024 Sumner Mine open pit mined area.



Various third-party consulting companies (SEH, Summit, Foth and Barr Engineering Company) conducted the auger drilling, lithological logging and sampling of the auger returns on behalf of SES. The auger programs generally adopted the same auger methodology. Truck mounted air rotary auger rigs were used to drill vertical (-90º) auger holes with zero orientations. The average depth of the auger test holes is 95.9 feet (29 m); the groundwater monitoring holes have slightly deeper average depths of 134.5 feet (41 m). To date, none of the auger collars have surveyed collar locations or elevations, which were documented by the respective consultants. As part of this Technical Report, APEX acquired high-resolution bare-earth LiDar from Barron County, and these data were used to fine-tune the collar elevations. No major collar elevation concerns were identified.

In addition to drilling, Century Wireline Services Ltd. conducted downhole geophysical studies including natural gamma, apparent conductivity, and resistivity. The auger holes were prepared for wireline logging by inserting plastic PCV casing into the auger hole. The surveys tools were the inserted into the PCV tube and measurements were recorded from the top to the bottom of the drillholes.

Auger returns, or clippings, from the auger test hole programs were analyzed for particle size/gradation analysis by recovering representative handfuls of auger returns for every 5 feet (1.5 m) of auger drilling. The samples were hand-mixed and split into at least two separate sample splits: one for particle size/gradation analysis; and one for archival at a dry facility located on the Sumner Property. In some instances, a third sample split was taken for proppant test work characterization.

Upon the receiving the results of the particle size/gradation analysis, the samples were imported into MICROMINE software from the various excel spreadsheets available. Using MICROMINE's drillhole database validation function, the data was checked for overlapping sample and geological intervals, and survey, collar and drillhole length data.

The geological drill logs, gradation data and downhole geophysical wireline logs were reviewed within the 3D model to ensure formation tops/picks correlated between the three independent geological techniques. This methodology insured a robust 3D geological model, and hence, the authors consider that the 3D model and the particle size/gradation analysis are considered reliable for mineral resource estimation purposes.

14.2.3 MICROMINE Database

The drilling database used is current (February 26th, 2019). The database incorporates all available auger drillhole data. All data for the industrial resource estimation was copied from various excel spreadsheets and imported into MICROMINE software format. The main MICROMINE data files, or '.DAT' files, that were utilized in the Sumner 2024 Indicated and Inferred Silica Sand Resource estimation include:

- Collar – the drillhole collar file.

- Assay file – sieve sizes – the estimation file comprising all particle size/gradation analyses information.
- Geology file – logged position of the individual litho-units/geological units.
- LiDar survey – the bare-earth surface topography survey at 1 m resolution.
- STRM survey data – the remaining surface topography not covered by the LiDar survey (southernmost portion of the Sumner Property).

There was a total of 112 auger test holes, water monitoring wells and historical water wells within the export, of which:

- All 112 auger holes were used to guide the geological interpretation of the different geological formations and the boundaries of the Wonewoc Formation, which is the unit being assessed in the mineral resource estimations; and
- Only 80 auger holes contained particle size/gradation analysis data that were used to guide the estimation of the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate.

Spacing between drillholes varies from 65.6 and 2,591.8 feet (20 m to 790 m). The bulk of the drilling is concentrated with the greatest density around and directly east of the existing Sumner Open Pit Mine site (extending through the east-central portion of the Property). The remainder of the auger drill test holes are spaced relatively evenly over the remainder of the Sumner Property.

A total of 1,461 samples were analyzed for particle size/gradation analyses. Of these, 514 particle size records were discarded from the Sumner Wonewoc Formation estimation file as they:

1. Relate to sample material that does not belong to the Wonewoc Formation (e.g., Pleistocene surficial deposits; Tunnel City Group; Eau Clair Formation); or
2. There was error associated with the data (e.g., negative value expressed in sieve data, or sieve data that does not add up to 100%).

Accordingly, the Sumner Wonewoc Formation estimation file comprised 947 particle size/gradation analyses that are sourced from the Wonewoc Formation. The particle size/gradation file of 947 Wonewoc Formation analyses represents the main ‘assay’ file used in the Sumner Resource estimations.

It should be noted that an additional eleven drillholes (Drillholes 2016-01 to 10 and VIN17-07) had calculated aggregate size fractions calculated but no individual particle sizing data. As the estimation was calculated using the individual particle size percentages and not the aggregate these drillholes were not able to be used in the resource calculation.

It is emphasized that the Sumner 2024 Indicated and Inferred Silica Sand Resource is:

1. Hosted only within the Wonewoc Formation; and

2. Does not include any of the mine depleted areas where the Wonewoc Formation has been mined out (through to the Effective Date of this Technical Report).

The Wonewoc Formation was estimated with samples tat were composited into 10-foot (3.05 m) intervals for the estimation process.

14.2.4 Data Summary and Histograms

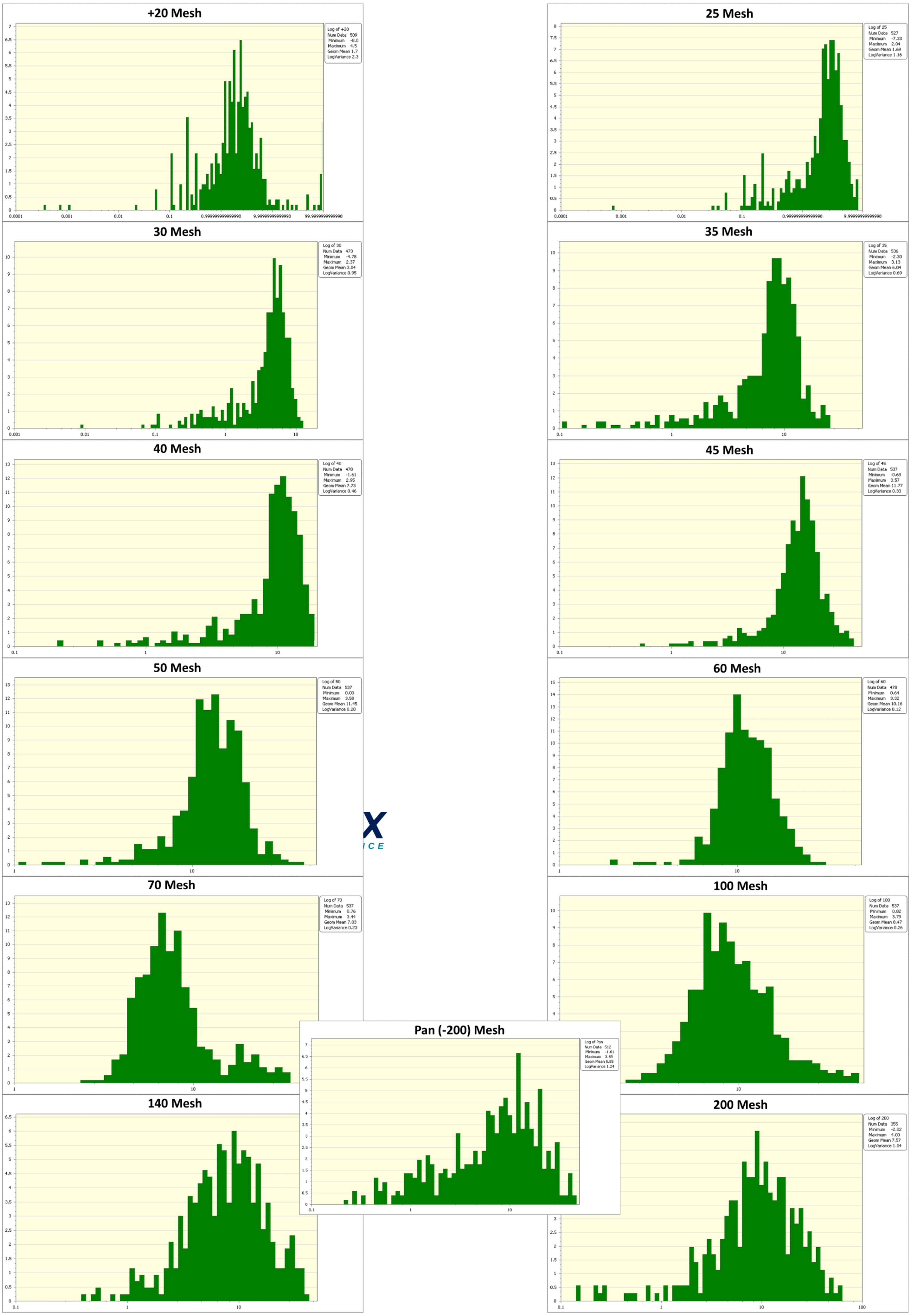
Summary statistics and histograms for the Sumner Property particle size/gradation analyses situated within the interpreted Wonewoc Formation are presented in Table 14.1 and Figure 14.2, respectively.

As the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate is classified as an industrial mineral, it does not have a 'commodity grade' *sensu stricto* for estimation. In place of the conventional 'commodity grade', the silica sand particle size/gradation analyses were chosen for estimation. These analyses utilise the different mesh size fractions percentages of the sand grains (+20, 25, 30, 35, 40, 45, 50, 60, 70, 100, 140 and 200 mesh, and 'Pan' or -200 mesh). The particle size/gradation analyses were completed by various laboratories, which include SEH (2011-2013); Summit (2014, 2015); Foth (2015); SES (2016, 2017) and FracTal (2018). The reader is referred to Sections 11 Sample Preparation, Analyses and Security, and 12 Data Verification for additional sample/analytical information).

Table 14.1. Summary statistics for sizing samples completed situated within the Wonewoc Formation.

	+20	25	30	35	40	45	50	60	70	100	140	200	Pan
Number	872	914	879	946	896	947	947	896	947	947	752	662	897
Minimum	0.00	0.00	0.00	0.00	0.10	0.40	0.70	1.00	1.20	1.30	0.09	0.00	0.00
Maximum	93.70	12.00	15.00	25.09	23.65	35.70	35.90	30.74	31.26	44.44	49.90	56.10	66.70
Mean	6.74	2.48	4.22	7.43	9.19	12.92	12.28	10.75	7.18	9.47	8.80	11.11	9.66
Median	1.60	2.10	4.00	7.40	9.40	12.50	11.60	9.94	6.20	7.90	6.67	8.10	6.92
Std Dev	19.01	1.79	2.58	4.06	4.08	5.91	5.13	4.21	4.07	6.28	7.34	10.34	9.39
Variance	361.50	3.21	6.68	16.45	16.67	34.97	26.27	17.73	16.58	39.38	53.86	106.85	88.11
Std Error	0.64	0.06	0.09	0.13	0.14	0.19	0.17	0.14	0.13	0.20	0.27	0.40	0.31
Coeff Var	2.82	0.72	0.61	0.55	0.44	0.46	0.42	0.39	0.57	0.66	0.83	0.93	0.97

Figure 14.2. Histograms of composited particle size/gradation analyses.



Apart from the -200 fraction, examination of the individual sieve size fractions shows exhibit an overall normal population (Table 14.1; Figure 14.2). Geologically, the -200 size fractions will consist of mudstone/clay component. Accordingly, as opposed to all other grain size fractions, the diversity of the source material within the -200-size fraction correlates with a mixed population in the respective histograms. The resource estimation is not dependent on the -200 fraction, and therefore, it is the author's opinion that the size fractions being estimated exhibit normal populations and as such, the linear estimation methodology is a valid estimation process.

14.3 Quality Control

With respect to quality assurance-quality control, the reader is referred to Section 12 Data Verification; a summary of which is provided in the text that follows. The drilling, logging, sampling, and test work processes employed during the 2011-2018 auger test drilling and sampling programs was conducted by independent, recognized and established third-party consultants, including SEH, Summit, Foth and Barr Engineering Company. The laboratories selected by SES are independent laboratories. The analytical methods carried out by the independent laboratories are standard and routine in the field of silica sand and proppant characterization test work and are pursuant to International Standard ISO 13503-2.

The resulting auger specifications, drill logs, sample collection and analytical test methods applied by these firms' meet industry standards for accuracy and reliability**.** The authors have reviewed all geological and geochemical data and taken the necessary steps to understand the analytical methodologies that were conducted by independent laboratories. Sub-surface stratigraphic and particle size/gradation data collected during the 2011 to 2018 auger drill testing programs were checked for veracity, were then entered in MICROMINE, and validated using the MICROMINE's drillhole validation tools.

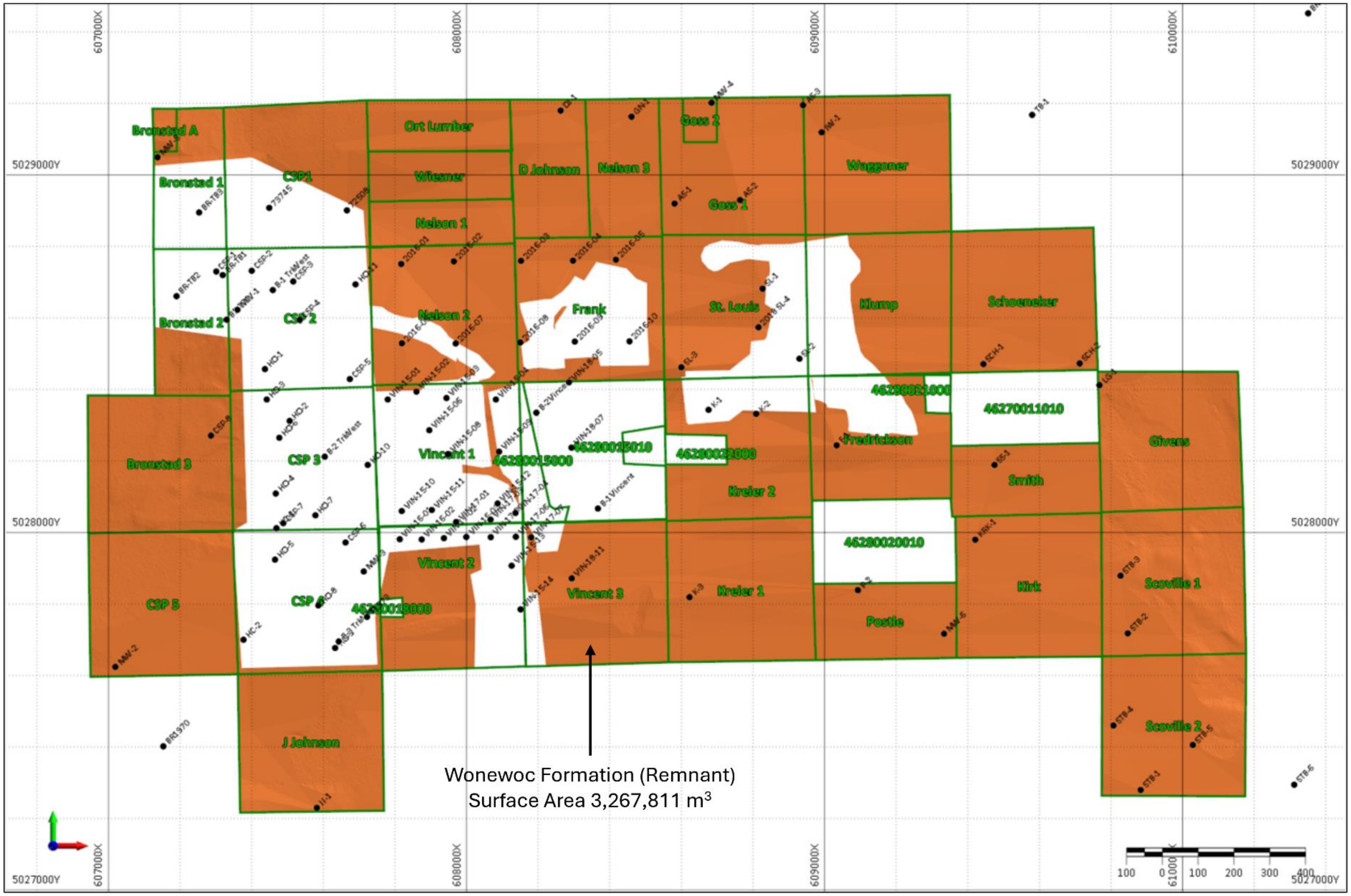
The senior author of this Technical Report Mr. Eccles, P. Geol., has found no significant issues or inconsistencies that would cause one to question the validity of the data and is satisfied to include these data in resource modelling, evaluation, and estimations as part of Sumner 2024 Indicated and Inferred Silica Sand Resource estimate presented in this Technical Report.

14.4 Lode Interpretation

A total of 112 auger test holes, water monitoring wells and historical water wells were used to guide the geological interpretation of the resource area. Although only 80 auger drillholes had sieve size data available for the estimation, the entire drillhole dataset was used to cull any geological information in the Property area such as litho-stratigraphic formation contacts.

As such the stratigraphic formation top of unit picks were used to create a computerised three-dimensional geological model within MICROMINE that incorporated all of 112 drillholes (Figure 14.3). The Wonewoc Formation was modelled and used to estimate the grain size particle gradation data. The overlying Pleistocene and Tunnel City Group was treated as waste for the purpose of this mineral resource estimation.

Figure 14.3. Plan view showing the Wonewoc Formation surface area used in the 2024 resource estimations. Blank areas show either mined out (Wonewoc depleted areas) or private property owner areas. Source Energy Services auger drillholes and the individual parcels also shown.



The three-dimensional interpretation was completed on 262.5-foot (80 m) east-west cross sections looking north with a window of +/- 131.2 feet (40 m) through the centre of the property where the drill density is the highest and 525-foot (160 m) to 755-foot (230 m) spacings to the north and south where drill density is wider spaced. Most of the auger holes failed to penetrate the entire sequence of the Wonewoc Formation, and as such previous resource interpretations were confined to the base of the auger drillholes.

SES’s 2016 to 2018 drilling campaigns in the central southeast corner of the Property depicted the lower Wonewoc Formation contact with the underlying Eau Claire Formation. As such the previous Eccles et al. (2017) interpretation of the Wonewoc Formation thickness was revised to reflect the recent drilling and the intersection of the top of Eau Claire Formation. The thickness of the Wonewoc Formation in the 3D geological model presented in this Technical Report ranges in depth from 65.6 to 131.2 feet (20 to 40 m). On a property wide basis, the average thickness of the Wonewoc Formation is 72.8 feet (22.2 m). Note: The average thickness of the Wonewoc Formation in Eccles et al. (2017) was 81.0 feet (24.7 m); and hence the 2016-2018 drilling improved the Wonewoc Formation model albeit being 8.2 feet (2.5 m) thinner.

In some instances, the Wonewoc Formation was intersected to depths of approximately 262.5 feet (80 m), and because of the uniformity of sand within the Wonewoc Formation the interpretation was dragged down to the base of these drillholes. There were only 3 of these deeper holes in the resource area. In these instances, the deeper sand thickness was isolated to these drillholes. The authors did not extrapolate thick Wonewoc sand obtained in a few drillhole to other areas of the geological model. That is, our preference was to model the Wonewoc formation based on the actual drillhole information provided.

Due to the tremendous continuity of the Wonewoc Formation silica sand, it was decided to extend the interpretation edges horizontally in which case the Wonewoc edges were clipped either to the Sumner Property boundaries or the final topographic surface.

The topographic surface was made up of a combination of a mine site detailed aerial survey, LiDAR survey and the STRM data (STRM data was only required for the southernmost Property area). Where possible the most detailed topographic survey was used as the bounding upper surface.

In addition, the authors removed the portions of the Property in which the Wonewoc Formation has been mined out such that these areas were not included in the resource estimation process.

Example cross-sections of the 3D geological model including Pleistocene overburden and Eau Clair Formation, which overlay or underlay the Wonewoc Formation, respectively, are presented in Figures 14.4 and 14.5. Only the Wonewoc Formation was included in the resource estimation presented in this Technical Report.

Figure 14.4. 5027985 m North cross-section showing the geological interpretation over SES's 2016 and 2017 VIN drillhole series. Note: this section shows the relationship of the upper and lower Wonewoc Formation contacts.

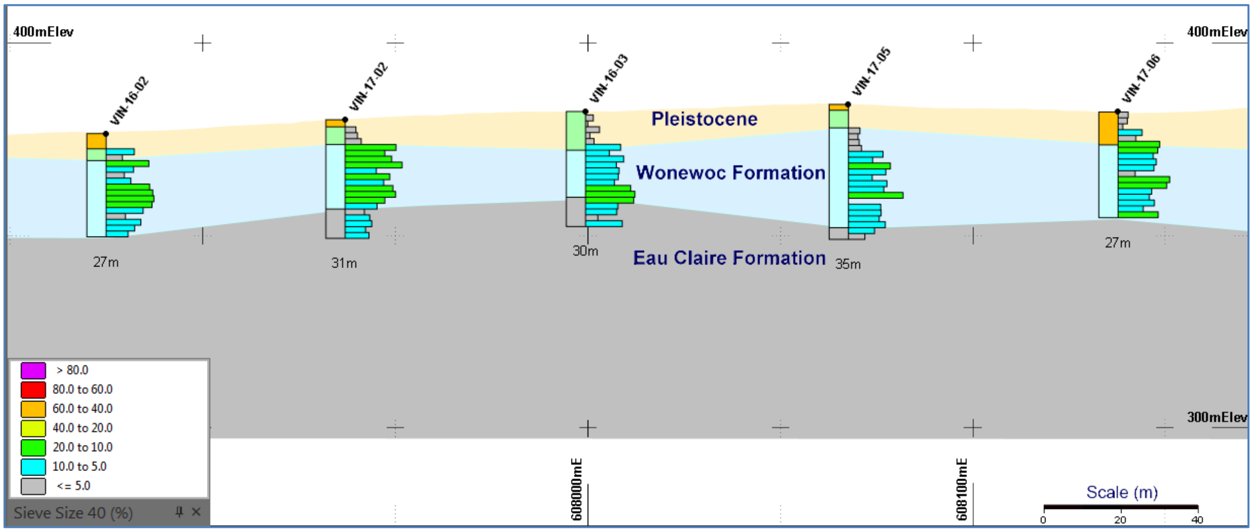
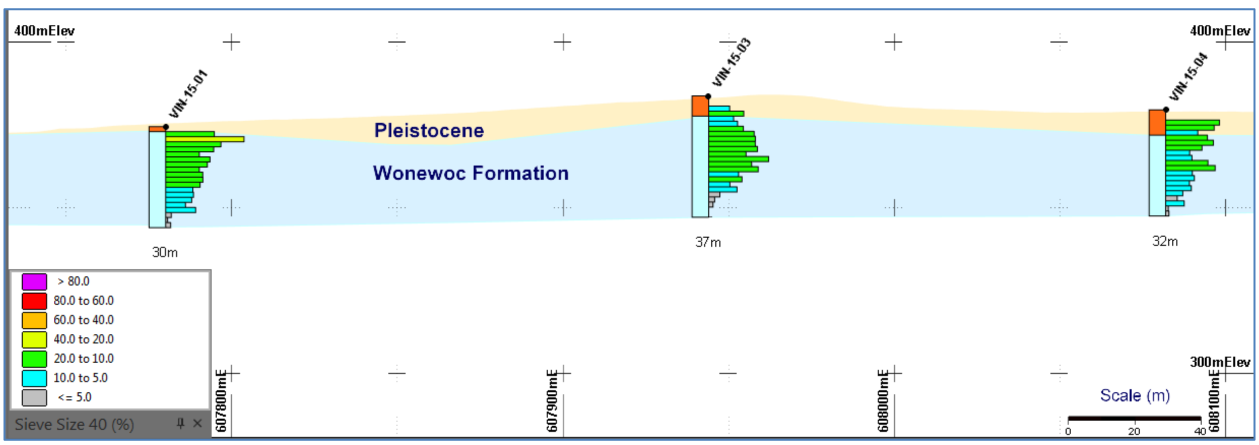


Figure 14.5. 5028375 m North cross-section showing the geological interpretation over the 2015 VIN drillhole series.



14.5 Auger Test Hole Flagging and Compositing

Auger test hole samples situated within the interpreted Wonewoc Formation were selected and flagged with the wireframe name/code. The flagged samples were checked visually next to the drillhole to check that the automatic flagging process worked correctly. All samples were correctly flagged and there was no need to manually flag or remove any samples.

The drillhole sample width analysis showed that the drillhole samples ranged from 1.0 to 20.0 feet (0.3 to 6.1 m) in length with the dominate population being 5.0 feet (1.5 m) in length (Table 14.2 and Figure 14.6). Examination of the drillhole samples indicated that 92.3% of the samples were less than 5.0 feet (1.5 m) in size and 98.3% of the samples were less than 10 feet (3.05 m) in size.

The mining at the Sumner Open Pit Mine site is performed by drilling and blasting entire benches at one time for bulk mining. It was decided that the composite interval of 5.0 feet (1.5 m) would be too small and not reflect the selective mining unit. Accordingly, a 10-foot (3.05 m) composite size was selected as it closer reflects the selective mining unit while giving the option for more selective mining of desired sized sand products.

Length weighted composites were calculated for all the Sumner assay samples. The compositing process starts from the first point of intersection between the drillhole and the mineralized wireframe and is stopped upon the end of the mineralized wireframe.

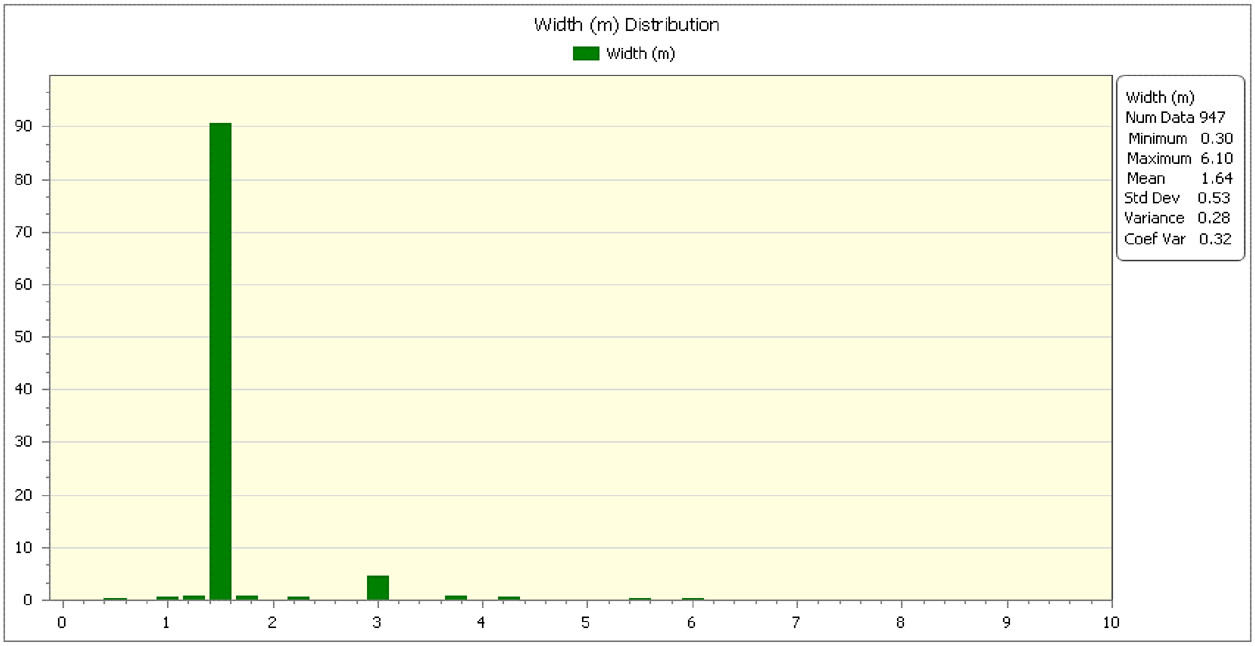
Table 14.2. Sample length statistics for the Sumner un-composited assay file.

	Width (m)
Number	947
Minimum	0.30
Maximum	6.10
Mean	1.645
Median	1.520
Std Dev	0.526
Variance	0.277
Std Error	0.017
Coeff Var	0.320

To date, none of the auger collars have surveyed collar locations or elevations; rather the auger collar information was recorded by the respective drill company in either lambert conformal projection (Latitude, Longitude) or Public Land Survey System (Township, Range, and Section) land descriptions.

Auger returns, or clippings, from the 2011 to 2018 auger test hole programs (all auger holes) and from some of the groundwater monitoring holes (MW-4, MW-5 and MW-6) were analyzed for particle size/gradation analysis. The drill cutting samples were recovered from the auger rigs air discharge exhaust by bagging representative handfuls of auger returns for every 5 feet (1.5 m) of auger drilling. As the Wonewoc formation and the overlying Tunnel City group are flat lying the sampling completed from the vertical drillholes are considered to sample the true thickness of stratigraphy.

Figure 14.6. Histogram of sample length for the Sumner un-composited assay file.



Upon completion of the 10-foot (3.05 m) compositing process, both the 10-foot (3.05 m) composites and the 10-foot (3.05 m) composites with the orphans (sub 10 foot, or 3.0 m, composites) were examined to determine if there was any noticeable bias applied to the different sizing percentages during the compositing process (Table 14.3). There was little change in the sizing percentages for the Sumner sample file. It was decided to leave the orphans in the final composite file as it better reflected the sieve size percentages of the un-composited samples. The composited samples were used for all sample statistics, capping, estimation input file and validation comparisons.

14.6 Top Cut Capping

Due to the low variability and the nature of the silica sand grain sizes, capping of the percentages passing the various mesh sizes is not necessary or appropriate. No capping was completed.

14.7 Grade Continuity

The variography utilized the composited assay data located within the Wonewoc Formation wireframe to produce spherical semi-variograms. Variography was performed on all thirteen size fractions (Table 14.3 and Appendix 1). As expected, all the variogram's displayed the greatest range of continuity in the orientation of the stratigraphy. Of the thirteen size fractions eleven show similar ranges for the three directions (around 300 m x 280 m x 20 m; Table 14.4). The pan and the +20 mesh size fractions indicate a much larger range (around 900 m x 400 m x 25 m). It should be noted that the +20-mesh size variograms were poor and not well defined.

Table 14.3. Comparison of the Sumner raw un-composited sieve size percentages versus the final composited sample file for Sumner sand project.

Sieve Size Percentages	Mean of percent passing various sieve sizes: Un-composited	Mean of percent passing various sieve sizes: 3.05 m composites and orphans
+20	6.740	6.778
25	2.482	2.407
30	4.218	4.073
35	7.43	7.575
40	9.189	9.011
45	12.921	13.391
50	12.284	12.449
60	10.753	10.762
70	7.175	8.018
100	9.474	9.787
140	8.803	8.994
200	11.111	11.246
Pan	9.663	9.381

Table 14.4. Semi-variogram parameters for the composited sizing data.

Sizing	Nugget (%)	C1 (gamma)	Direction 1 Range (m)	Direction 2 Range (m)	Direction 3 Range (m)
+20	0	324	985	1415	114
25	0	2.41	320	240	10
30	0	6.25	300	300	17
35	0	16.5	295	250	16
40	0	20.4	310	150	20
45	0	37.2	280	240	19
50	0	22.88	180	150	9
60	0	23	260	300	25
70	0	25.1	420	600	50
100	0	39	175	100	12
140	0	51.1	325	155	21
200	0	88.6	200	105	40
Pan	0	66.6	875	340	25

As such an average range of the eleven size fractions that showed similar ranges for the three directions were used as a guide for the estimation of all size fractions. The suggested ranges comprise: 919 feet (280 m) for direction 1; 787 feet (240 m) for direction 2; and 9.8 feet (3 m) for direction 3. This is in line with the geological observations of the Wonewoc Formation, which has tremendous horizontal continuity.

14.8 Bulk Density

A total of 31 bulk density loose sand measurements were collected by the senior author of this Technical Report in 2015 from both the overburden and the Wonewoc Formation (Table 14.5). No further density measurements have been collected. The density samples were collected from within the Wonewoc Formation and included a variety of size fractions: 20/40, 40/70, 70/140 and representative (of the mining process) bulk sand samples. The Sumner Mine site produces 20/40, 30/50, 40/70 and 50/140 size products. The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate has been broken down to the same proppant size products. There were five density samples collected for the 20/40 and the 40/70 size fractions, but there were no density samples collected from the 30/50 or the 50/140 size fractions.

As such due to the limited number of density samples available for some (20/40 and 40/70) of the size fractions and the lack of density samples available for the remainder it was decided to apply the density value obtained from the representative bulk sand sample (1.57 g/cm^3) to the final resource.

In addition, most of the density measurements were on representative bulk material (n=13 measurements), which is thought to correlate better with the Run of Mine mining process, which collects and processes bulk Wonewoc silica (frac) sand.

Table 14.5. Mean density of the various size fractions collected within the Sumner project area.

Formation	Size fraction	Number of samples	Average Density (kg/m^3)
Overburden material		3	1.370
Wonewoc Formation	20/40	5	1.512
	40/70	5	1.480
	70/140	5	1.388
	Bulk Sand	13	1.570

14.9 Block Model Extents and Block Size

A parent block size of 164 feet x 164 feet x 10 feet (50 m x 50 m x 3 m) was chosen for the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate. This is deemed appropriate based on the current level of auger drillhole spacing, which varies from 65.6 to 2,592 feet (20 m to 790 m). The main concentration of drilling around the Sumner mine site is typically 197 to 656 feet (60 m to 200 m) apart. The block model extents were extended far enough past the property limits to encompass the entire domain.

Table 14.6 presents the coordinate ranges and block size dimensions used to build the three-dimensional block models. Sub-blocking was used to more effectively honour the volumes and shapes created during the geological interpretation of the wireframes. The sizing data was only interpolated into parent blocks. A comparison of wireframe volume versus block model volume was performed to ensure there was no overstating of tonnages (Table 14.7). Each block was coded with the wireframe name so that sizing could be estimated as hard boundaries.

Table 14.6. Block model extents and cell dimensions for the Sumner block model.

Deposit	Block model dimensions	Easting	Northing	Elevation
Sumner	Maximum	610400	5029800	400
	Minimum	606600	5026600	250
	Parent Cell Size	50	50	3
	Sub Blocking Cell Size	10	10	1

Table 14.7. Block model versus wireframe volume comparison.

	Wireframe Volume (metric)	Block Model Volume (metric)	% Difference
Wonewoc Mined Out Final	18,706,062	18,694,500	0.06%
Wonewoc Remnant Final	72,217,139	72,204,800	0.02%
Totals	90,923,202	90,899,300	0.08%

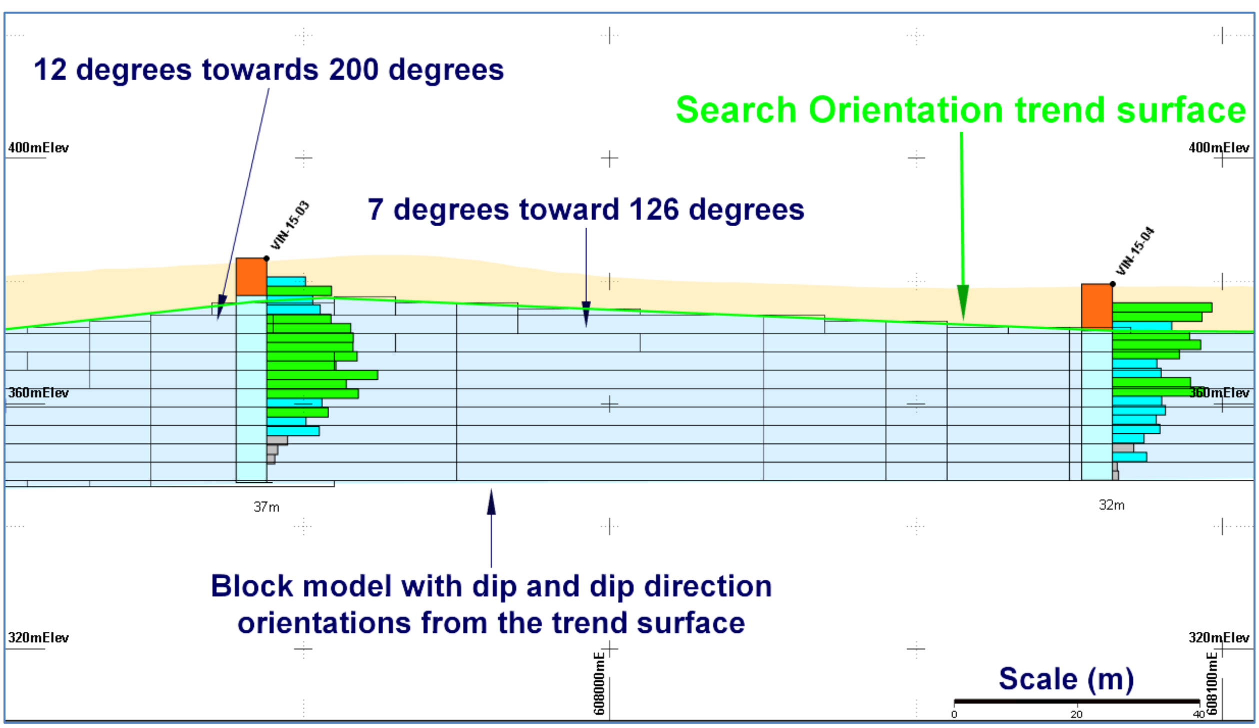
14.10 Grade Estimation and Search Ellipsoids

The search orientations size of the an-isotropic ellipsoids used in the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate were largely based on a combination of the variography and the geological interpretation of the Wonewoc Formation.

A variable search orientation approach was adopted for the orientation of the search ellipsoid during estimation. This variable search was adopted due to the slight inflections in the Wonewoc Formation. This was completed by creating a 3-dimmensional surface of the general orientation of the Wonewoc Formation across the entire deposit area. This surface showing the flexures of the formation was then used to orientate the search ellipsoid for the nearest block.

This was completed by obtaining the dip and dip direction orientation data of the individual triangles for this trend surface. This orientation data of the triangles was then used to code the blank block model using inverse distance to the power of one, which essentially coded the model with the dip and dip direction information from the trend surface. This dip and dip direction information in the block model was then used to position the search ellipsoid based upon the orientation of the Wonewoc Formation. That is, if the Wonewoc wireframe was bending slightly then the search ellipsoid would cater to this change for each block in the block model (Figure 14.7).

Figure 14.7. Example section (5028375N) showing the Wonewoc Formation, search orientation trend surface and the coded block model.



The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate of the different percentages of silica (frac) sand retained on the various screen sizes was calculated using inverse distance squared for the Wonewoc Formation. Estimation was only calculated on parent blocks. All sub-blocks within the parent block were assigned the parent block grade. A block discretization of 5 (X) x 5 (Y) x 1 (Z) was applied to all blocks during estimation. The Wonewoc Formation wireframe was estimated as hard boundary, which means that only composites located within that wireframe was used to estimate the grade of the blocks within that wireframe.

There were four passes (or runs) of estimation performed. The size of the an-isotropic search ellipsoid was based on the suggested ranges obtained from variography. The first estimation run comprised a search range of two thirds the suggested average range of the structure for all sizes (excluding +20 and Pan sizing) to determine areas of the resource that had higher levels of confidence. A minimum of four composites from two drillholes were used to constrain the first estimation run. With each of the following estimation runs, either the search ellipsoid increased in size, or the estimation criteria decreased in rigor until all blocks had a calculated value for all size fractions. The estimation criteria for each pass are provided in Table 14.8.

Table 14.8. Estimation and search ellipsoid criteria for the Sumner 2024 Indicated and Inferred Silica Sand Resource estimation.

Size Fraction	Run Number	Minimum Number of Samples	Minimum Number of Holes	Search Ellipse Range (m)
23, 25 30, 35, 40, 45, 50, 60, 70, 100, 140, 200 & Pan	1	4	2	185 x 160 x 3
23, 25 30, 35, 40, 45, 50, 60, 70, 100, 140, 200 & Pan	2	4	2	280 x 240 x 3
23, 25 30, 35, 40, 45, 50, 60, 70, 100, 140, 200 & Pan	3	2	1	280 x 240 x 6
23, 25 30, 35, 40, 45, 50, 60, 70, 100, 140, 200 & Pan	4	1	1	960 x 960 x 100

14.11 Model Validation

14.11.1 Visual Validation

The blocks were visually validated in plan view and in cross-section to compare the estimated block sizing’s versus the sample composite sizing’s. An example of this visual validation process is shown for the 20/40 fraction in Figure 14.8 and Figure 14.9. In addition, the block and sample data were compared by formation, easting, northing, and elevation. These swath plot comparisons are presented in Figure 14.10.

Overall, the model compares well with the sample data that was used to complete the estimation. There is some local over and under estimation observed. Due to the limited number of sample points available for the estimation this is an expected result. It is concluded that overall, the estimated block sizing's compare well with the input sample sizing's.

Figure 14.8. 5028925 m North cross section comparing composite 60 sizing versus estimated block model sizing's.

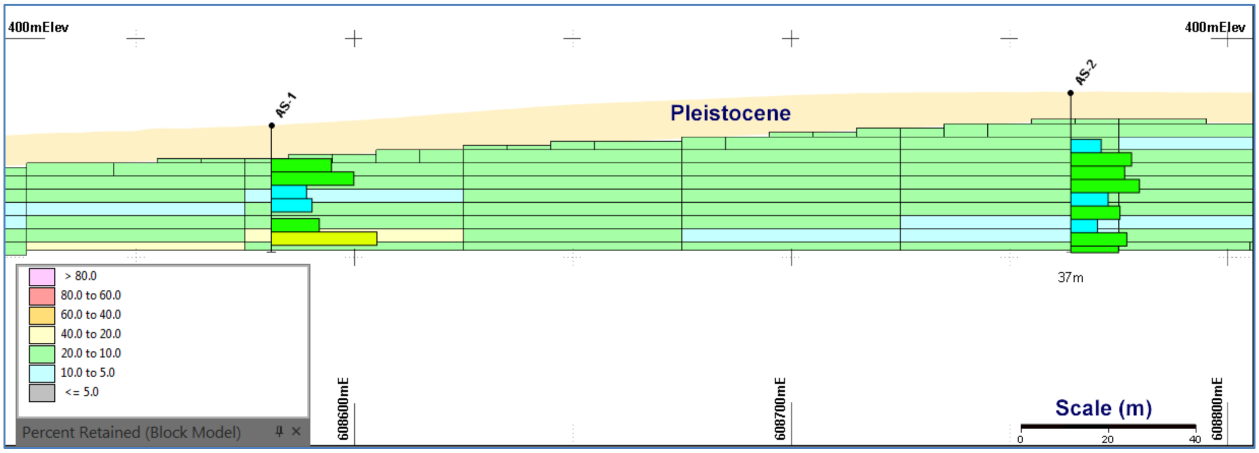
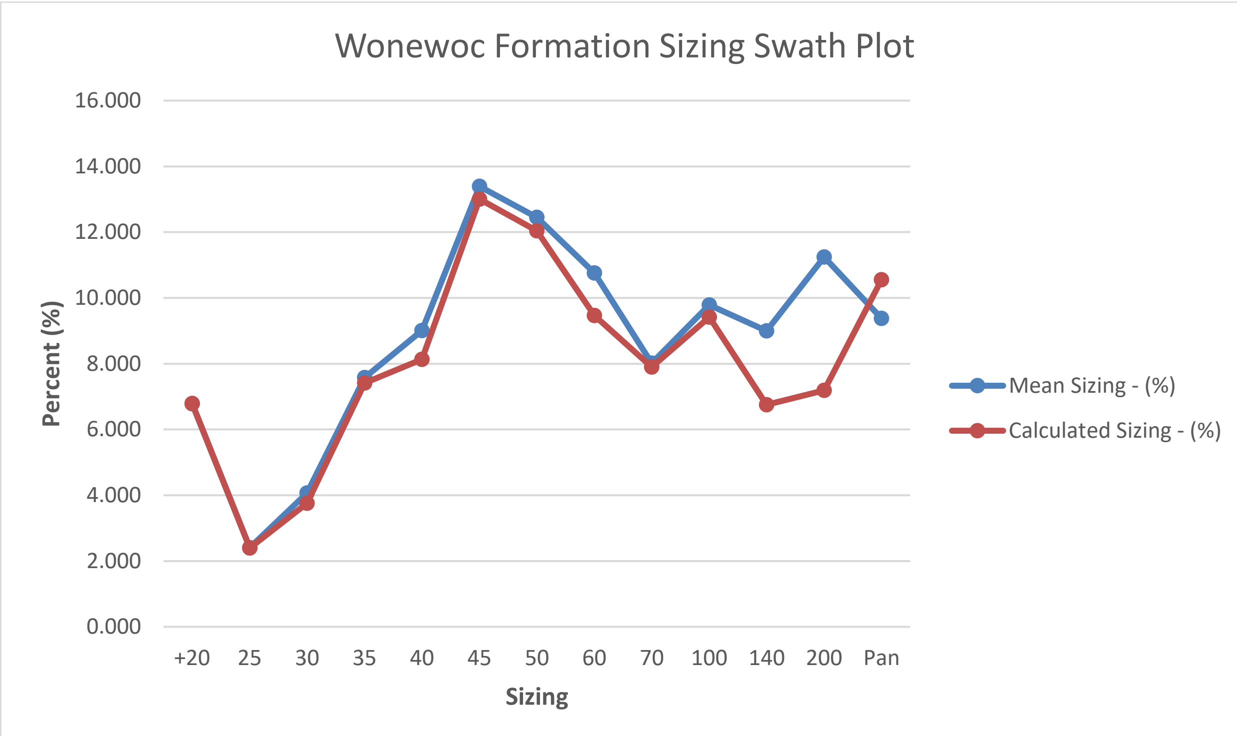


Figure 14.9. Plan view of the Sumner Property showing percent passing the 40/70 screen size. The dashed line represents the area of Indicated Resource with the remaining portion of the Property being classified as an Inferred Resource. The mined-out areas have been excluded from the resource estimations.

Figure 14.10. Swath Plots of the various screen sizes broken down by formation.



14.11.2 Statistical Validation

Table 14.9 shows the average grade of the composited sample data versus the calculated block model sizing data for the Wonewoc Formation. It can be concluded that the average/mean sizing (apart from the 140, 200 and Pan) and of the inverse-distance squared block model data is very close to the composited sample data. This is what you would expect with an estimation using hard boundaries.

In the case of the 140 and 200 there is a slight under estimation of sizing in the block model. The Pan sizing is slightly over-estimating the percentages compared to the input composite data. The 200 and Pan sizing consist of mudstone/clay component and as this resource estimation is not reliant on these sizing's the authors find these results acceptable as they in no way, shape or form influence the resource estimation presented in this Technical Report.

Table 14.9. Calculated sizing's (0% lower cut off) of block model versus composited sample sizing's for the estimation of the Wonewoc Formation at the Sumner Property.

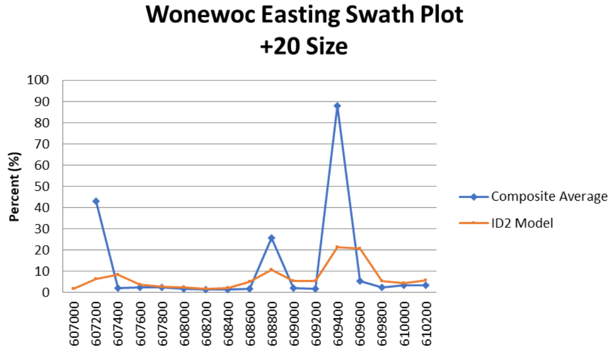
	Composites		Block Model
Sizing	Number	Mean Sizing (%)	Calculated Sizing (%)
+20	509	6.778	6.790
25	527	2.407	2.398
30	473	4.073	3.758
35	536	7.575	7.411
40	478	9.011	8.131
45	537	13.391	13.005
50	537	12.449	12.047
60	478	10.762	9.468
70	537	8.018	7.902
100	537	9.787	9.416
140	433	8.994	6.748
200	355	11.246	7.186
Pan	512	9.381	10.550

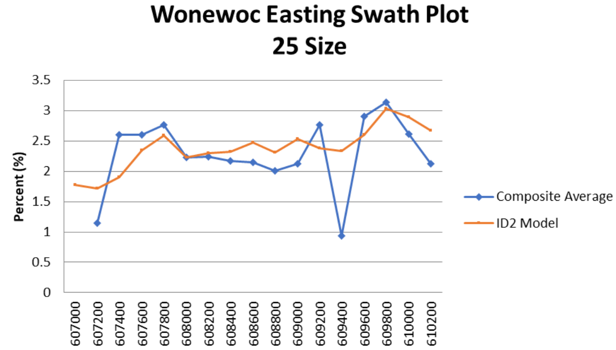
14.12 Easting, Northing and Elevation Comparisons

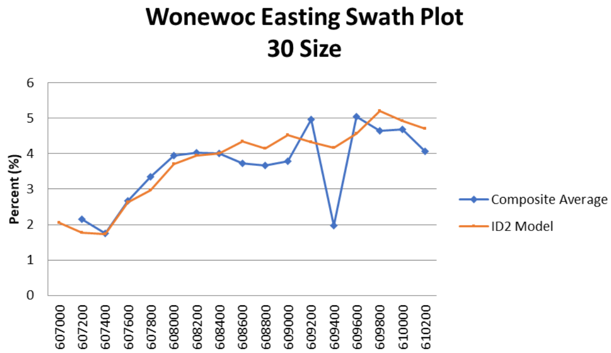
The composite sample average and the calculated grade of the block model was calculated on 656 feet (200 m) composite sections across the easting (Figure 14.11), northing (Figure 14.12) and 33 feet (10 m) composites down the elevation (Figure 14.13). The purpose is to compare the input composite sample file with the resulting block model data to make sure no gross over or under estimation occurs.

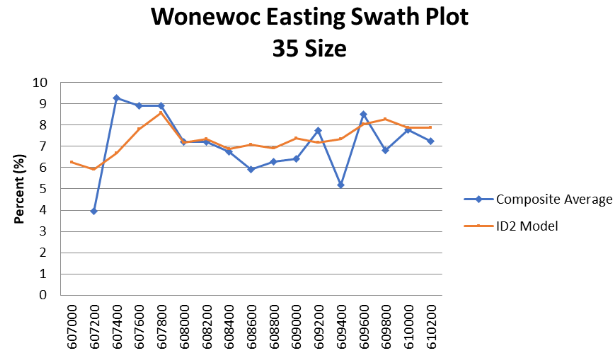
The easting, northing and elevation composites generally compare quite well. There is some local over and under estimation observed. Overall, the block average grades follow the general trend of the input sample data.

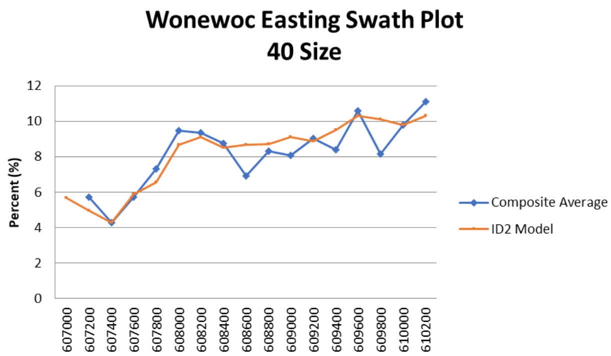
Figure 14.11. Easting SWATH plot of composite sizing (%) versus estimate sizing (%) in the block model.

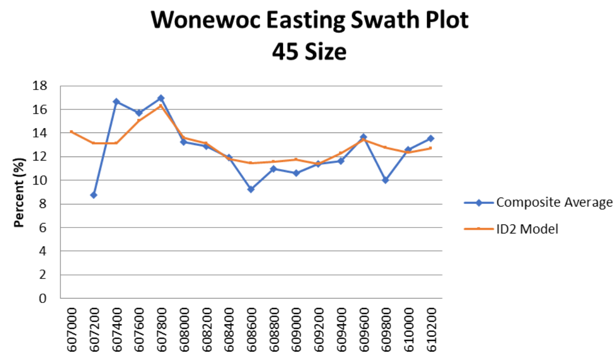


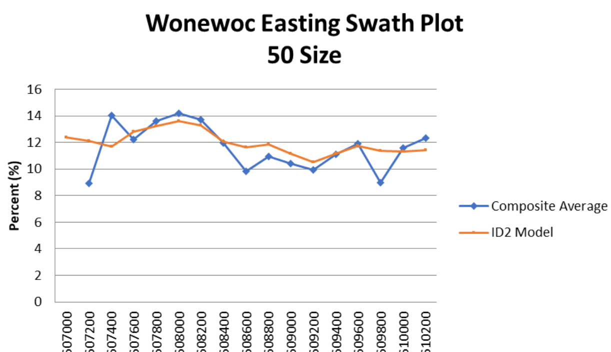












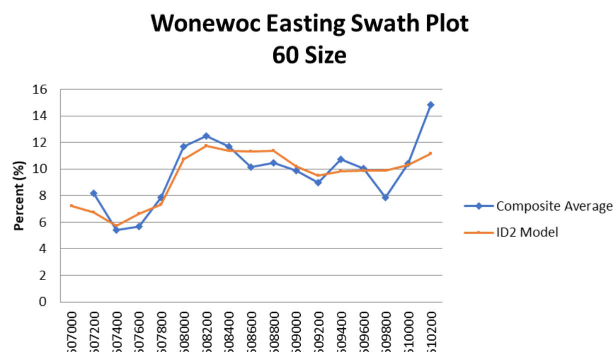
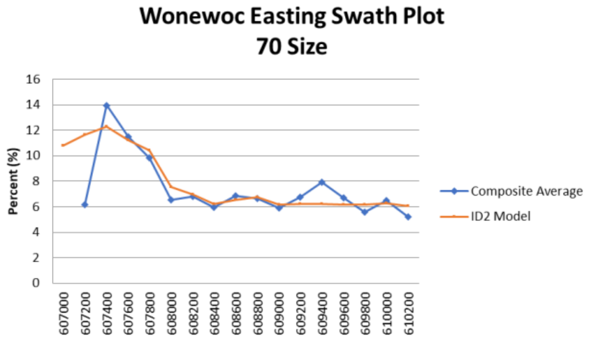
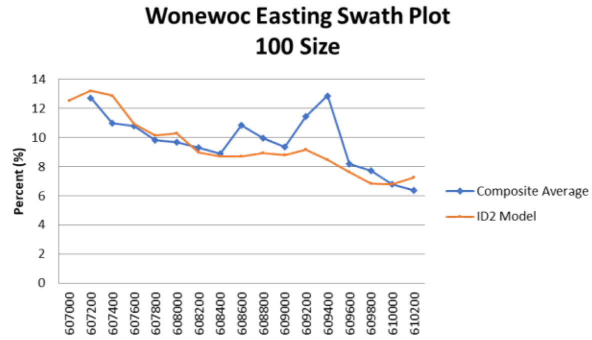
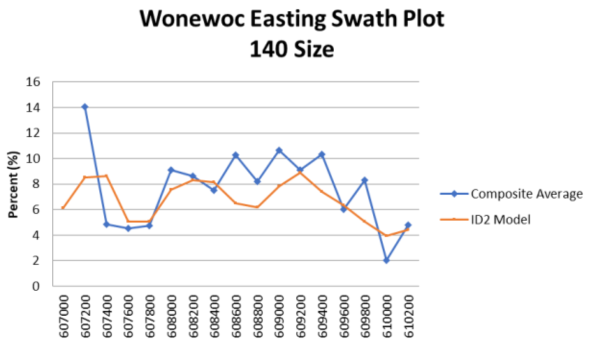
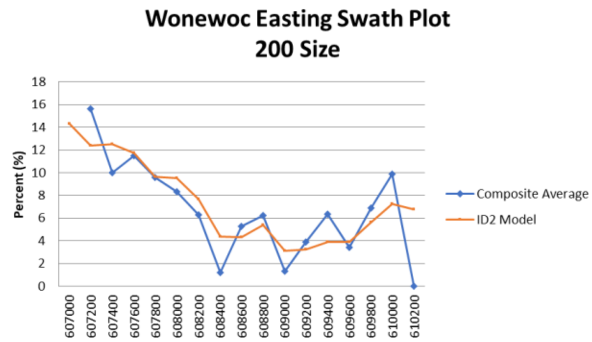


Figure 14.11, continued.









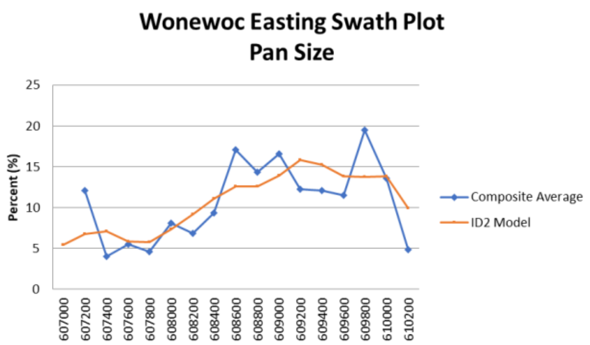


Figure 14.12. Northing SWATH plot of composite sizing (%) versus estimate sizing (%) in the block model.

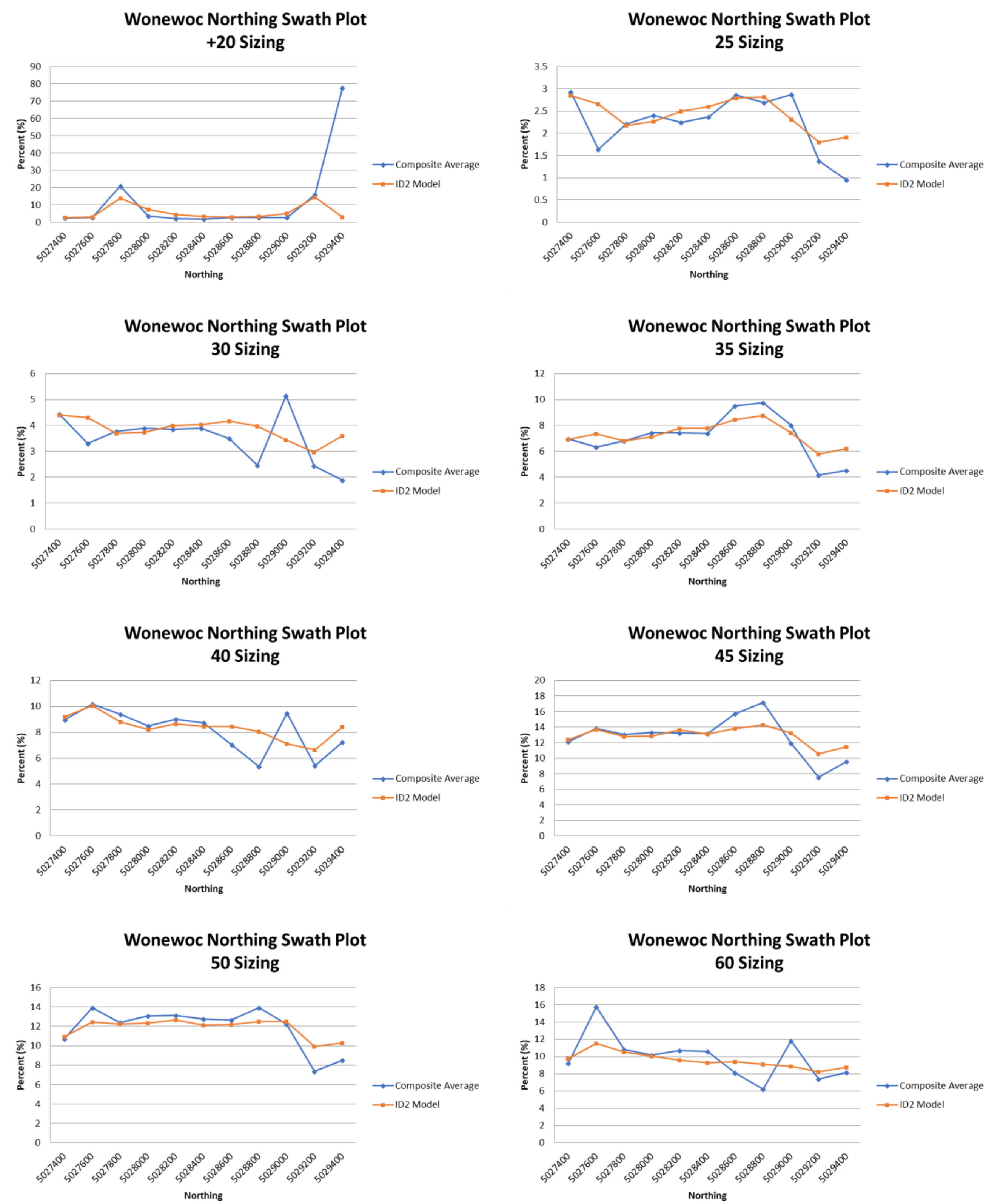
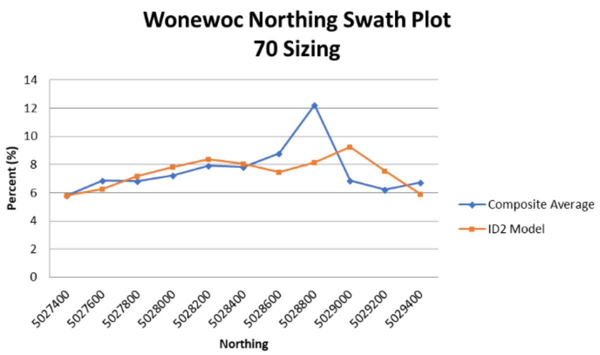
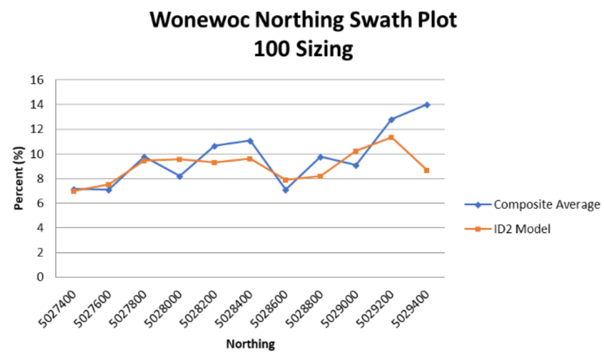
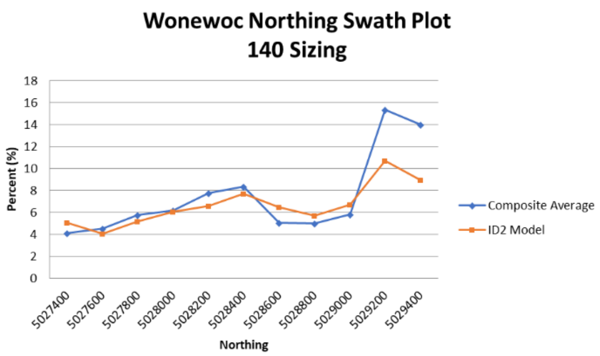
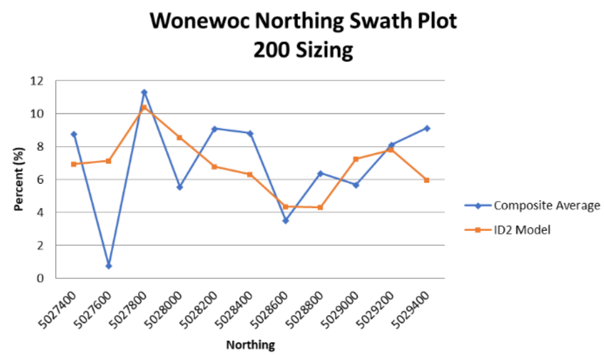


Figure 14.12, continued.









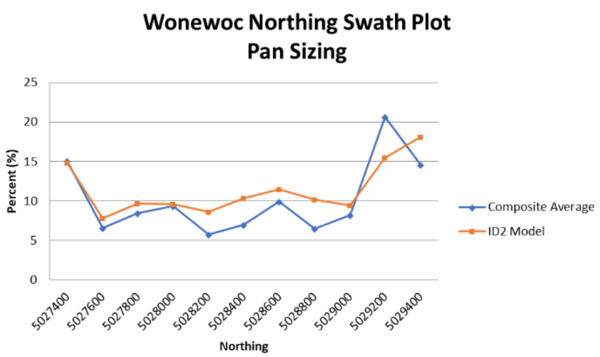


Figure 14.13. Validation SWATH plot of composite sizing (%) versus estimate sizing (%) in the block model.

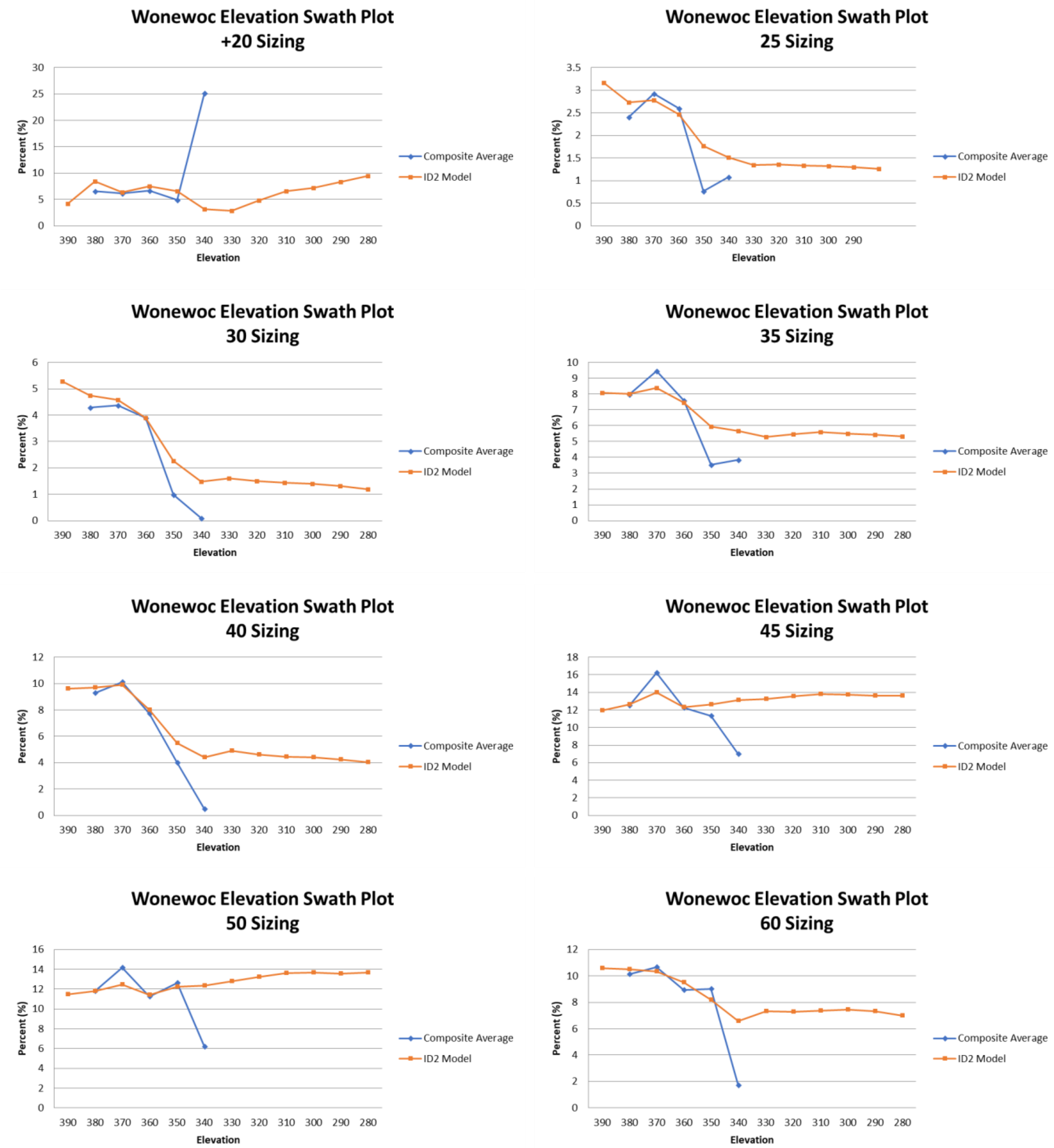
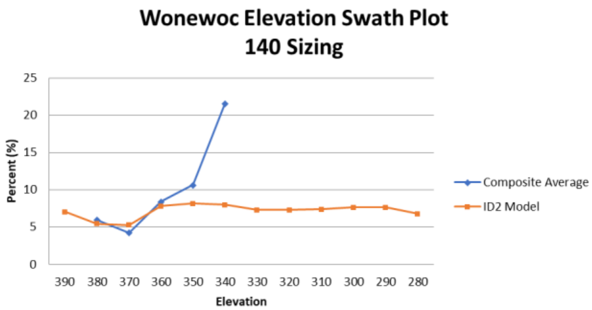
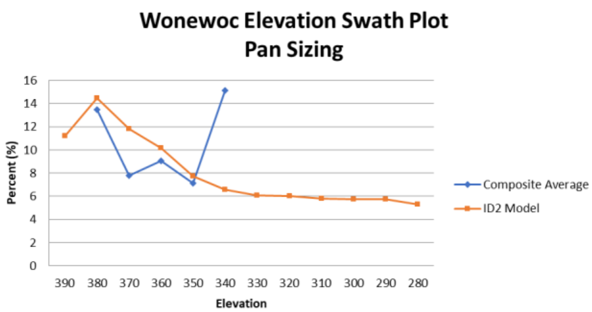


Figure 14.13, continued.





14.13 Mineral Resource Classification

The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate has been classified in accordance with guidelines established by the CIM “Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines” dated November 29, 2019, and CIM “Definition Standards for Mineral Resources and Mineral Reserves” dated May 10th, 2014.

> *“An 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.”*

> *“An 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.”*

The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate has been classified as both ‘indicated’ and ‘inferred’ according to the CIM definition standards. The classification of the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate was based on geological confidence, data quality and grade continuity (Table 14.10). The most relevant factors used in the classification process were:

- Drillhole spacing density.
- Level of confidence in the geological interpretation where the observed stratigraphic horizons are easily identifiable along strike and across the deposit, which provides confidence in the geological and mineralization/grain sizing continuity.
- Estimation parameters/run number (i.e., the continuity of silica sand sizing).
- Predictability in position and thickness of the Wonewoc Formation when drilling new infill holes.
- Consistency in the Wonewoc geological model and expected sizing concentrations and position during 7-years of mining by SES.

Table 14.10. Sumner resource estimation criteria used to guide classification.

Criteria	Indicated	Inferred
Nominal search distance	185 x 160 x 3 to 280 x 240 x 3 m	280 x 240 x 6 to 960 x 960 x 100 m
Minimum number of composites used to guide the estimation	4	1
Minimum number of holes used to guide the estimation	2	1

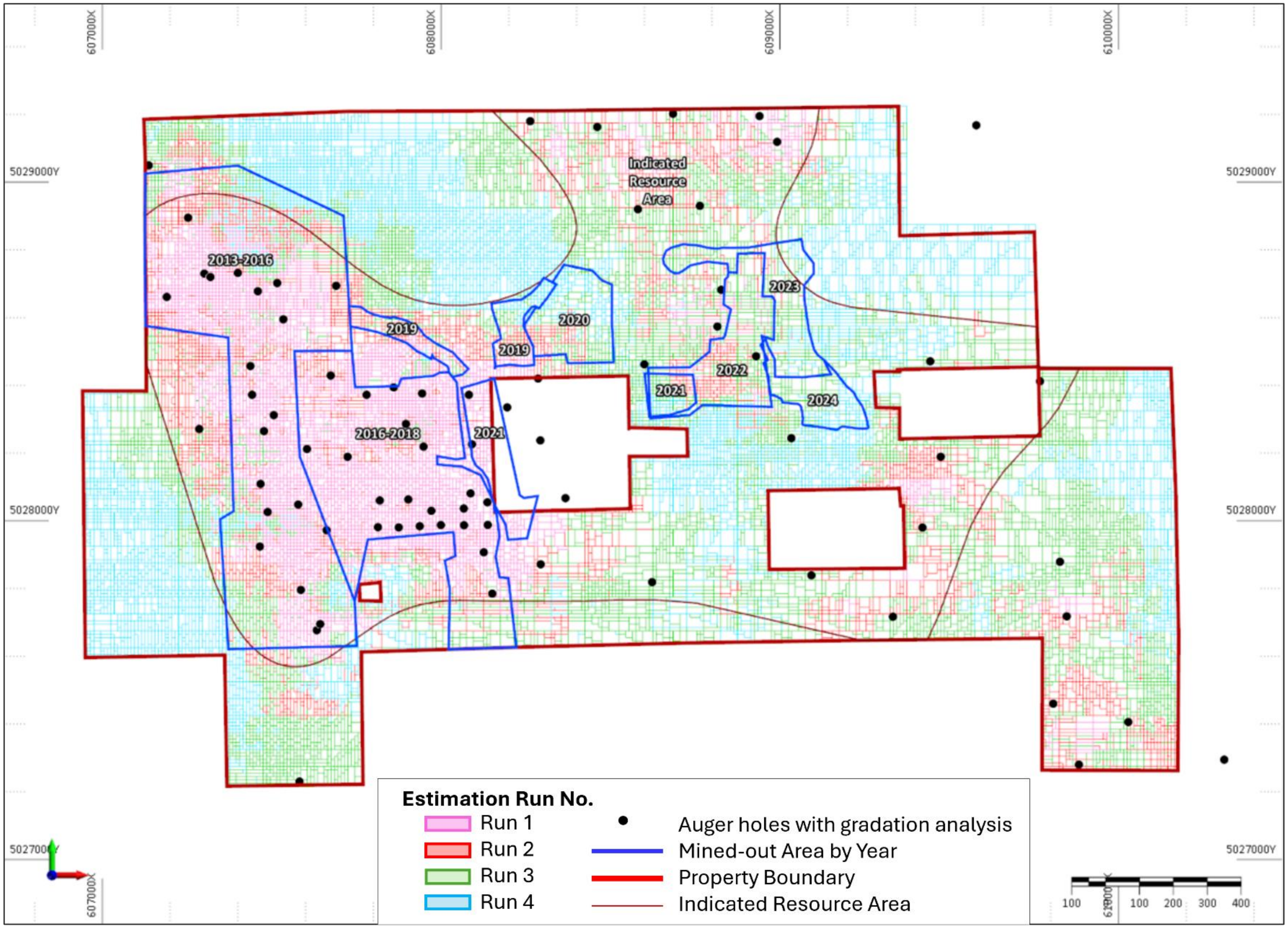
The spatial location of the: Sumner 2024 Indicated and Inferred Silica Sand Resource estimate is presented in Figure 14.14. For the classification of Indicated, the blocks that had been estimated in estimation runs 1 or 2 were used as a guide. These estimation runs utilized a search ellipsoid of approximately two thirds to a full range identified in the variographic analysis and the requirement for the highest number of drillholes and composites. This was the range identified as structure 1 in the variographic analysis. As such, these blocks exhibited a high level of confidence. This, in conjunction with the drillhole spacing, large lateral geological and sizing continuity, and 5-years of mining and reconciliation experience has provided the author’s the confidence in the Indicated classification area. All blocks with an Indicated classification were assigned with a code of two (2).

The base of the indicated area was limited to above the 1,083 feet (330 m) elevation, which corresponded to the lower limit of most of the drilling. There were three holes that had the Wonewoc Formation recorded below this elevation, but due to no sizing data available, the blocks below the 1,083 feet (330 m) elevation were assigned as inferred. The remaining resource situated within the Sumner Property, but outside the indicated area, was classified as ‘Inferred’. All blocks with an Inferred classification were assigned a code of three (3).

The collective work to date from the Sumner Property indicate that while small parts of Sumner Property is in the early stages of resource work (northwest, northeast, southeast and south parts of the Property), the fact that the silica sand is in production indicates that the size and quality of the silica sand are of high enough quality to be of economic interest.

In addition, mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

Figure 14.14. Spatial location of the Sumner 2024 Indicated and Inferred Silica Sand Resource estimations with the corresponding run number.



14.14 Evaluation of Reasonable Prospects for Economic Extraction

Mineralization associated with the Sumner 2024 Indicated and Inferred Silica Sand Resource estimate has demonstrated and defined prospects for economic extraction. To support this contention, the reader is referred to Sections 6, 16, 17 and 18 for a detailed description of SES's Sumner Property operations. In summary, the prospect for economic extraction at the Sumner Property is supported by the following points:

- SES is a knowledgeable silica sand producer in Wisconsin and throughout North America. The Company currently operates 6 active (7 total) trans-loading rail terminals that provide proppant trans-loading services to key oil and gas plays throughout the WCSB. Sumner Mine infrastructure includes open pits, Wet Processing Plant, Dry Processing Plant and Trans-Loading Facility.

- SES first produced Wisconsin silica sand from the Sumner Mine in Barron County in 2013 with finished product sales starting in 2014. SES bolstered their Wisconsin sand sales in 2017 through the acquisition of the Blair and Preston mines in Trempealeau County. SES has produced finished sand products and recorded sand sales for the entire time the Company has run the 3 Wisconsin Mines. The Run of Mine, wet sand production and finished product values generated from the Sumner Mine are presented in Sections 16 and 17.

- Between 2014 and 2018, SES's sand prices fluctuated between adjusted earnings before interest, taxes, depreciation, and amortization (EBITDA) per short ton proppant sold of USD$0.00 to approximately USD$50.00 (Capstone Headwaters Research, 2020). Since 2018, and through to present day, SES's adjusted EBITDA reflects positive sand sales volume with a continued focus on maintaining lower operating costs (Source Energy Services Ltd., 2023, 2024a,b).

- Proppant test work results show that Wonewoc Formation silica sand from the Sumner Property meets the recommendations set forth in International Standards ISO 13503-2:2006/Amd.1:2009E for sieve size fractions, sphericity, roundness, acid solubility, turbidity, and crush classification.

- The thickness and quality of the Wonewoc Formation sand at the Sumner Property is both laterally and vertical consistent.

14.15 Mineral Resource Reporting

This is the second NI 43-101 resource estimation Technical Report prepared for the Sumner Property. This Mineral Resource within the Sumner Property has been classified as an indicated and inferred resource in accordance with the CSA's NI 43-101 and has been estimated using the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019 and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014 (see Section 14.14, Mineral Resource Classification for a definition of indicated and inferred mineral resources).

The resource has been estimated within three-dimensional solids that were created from cross sectional interpretation. The upper contact of Wonewoc Formation is either in contact with the overlying Tunnel City Group or Pleistocene surficial deposits or has been cut by the topography surface using a combination of 1 m resolution LiDar survey and STRM data.

The sizing percent was estimated into a block model with parent block size of 164 feet East x 164 feet North x 10 feet Elevation (50 m x 50 m x 3 m) with sub-blocking down to 33 feet East x 33 feet North x 3.3 feet Elevation (10 m x 10 m x 1 m).

A nominal bulk density of 1.57 g/cm^3 was applied to all blocks, which was based on thirteen representative density samples. The percent concentrations for the grain sieve size fraction estimation were performed using inverse distance squared methodology.

The indicated and inferred resource is constrained within the Wonewoc Formation, and to a depth of 100 m below surface. The indicated resource has been constrained around the highest density of drilling and areas of geological and 'grade' continuity. The remainder of the resource was classified as inferred. The authors have used a lower cutoff that is consistent with the mining method adopted by SES at the Sumner Mine.

Using a lower cutoff of the sum of the +70 sand fractions are greater than 60% total abundance, this Sumner 2024 Indicated and Inferred Silica Sand Resource estimate predicts total (i.e., global) resources of:

- 44.19 million short tons (40.08 million metric tonnes) of silica sand of indicated (Table 14.11); and

- 44.06 million short tons (39.97 million metric tonnes) of silica sand of inferred classification is present at Sumner Property (Table 14.12).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The Sumner Open Pit Mine is located within the indicated resource area, which lends credibility to its economic viability. The indicated resource presented in this Technical Report has compensated for the mined-out section of Wonewoc Formation silica (frac) sand, the open pit boundaries of which were mapped by SES using an unmanned aerial vehicle (i.e., a drone).

Table 14.11. The Sumner 2024 Indicated Silica Sand Resource estimate. The bold highlighted main indicated resource is reported from the Wonewoc Formation as a total (global) volume and tonnage using a nominal bulk density of 1.57 g/cm^3 and a lower cutoff of the sum of the +70 sand fractions being greater than 60% in total abundance. The Table also presents selected proppant size distributions of 20/40, 30/50, 40/70 and 50/140.

	Total (global) resource and selected size fractions	Volume (m^3)	Tonnes (t)	Tons (t)
Wonewoc Formation Indicated Mineral Resource Estimation	**Total**	25,530,000	40,080,000	44,190,000
	20/40	6,260,000	9,830,000	10,840,000
	30/50	10,940,000	17,180,000	18,940,000
	40/70	10,940,000	17,170,000	18,930,000
	50/140	8,170,000	12,830,000	14,150,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. 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 mineral resource has omitted those areas that have been mined out by conventional mining depletion in which the Wonewoc Formation resource has been completely removed from the resource model.

Note 3: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs) and United States short tons (2,000 lbs or 907.2 kg).

Note 4: Numbers may not add up due to rounding of the resource values percentages (rounded to the nearest 10,000 units).

Note 5: The product size fractions overlap and are not cumulative.

Note 6: The ‘Total’ volume and weights are estimated on a global basis and represent the main Sumner 2024 Indicated Silica Sand Resource.

Note 7: The estimation of the individual sieve size fractions was completed using no cutoff, however, the Sumner 2024 Indicated and Inferred resource is reported using a lower cutoff of the sum of the +70 sand fractions being greater than 60%.

Table 14.12. The Sumner 2024 Inferred Silica Sand Resource estimate. The bold highlighted main inferred resource is reported from the Wonewoc Formation as a total (global) volume and tonnage using a nominal bulk density of 1.57 g/cm³ and a lower cutoff of the sum of the +70 sand fractions are greater than 60% total abundance. The Table also presents selected proppant size distributions of 20/40, 30/50, 40/70 and 50/140.

	Total (global) resource and selected size fractions	Volume (m^3)	Tonnes (t)	Tons (t)
Wonewoc Formation Inferred Mineral Resource Estimation	**Total**	25,460,000	39,970,000	44,060,000
	20/40	5,800,000	9,110,000	10,040,000
	30/50	10,490,000	16,460,000	18,150,000
	40/70	10,720,000	16,840,000	18,560,000
	50/140	8,040,000	12,620,000	13,910,000

Note 1: Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve. 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: Active open pit mining has not impacted the area of Inferred Resource.

Note 3: The weights are reported in metric tonnes (1,000 kg or 2,204.6 lbs) and United States short tons (2,000 lbs or 907.2 kg).

Note 4: Numbers may not add up due to rounding of the resource values percentages (rounded to the nearest 10,000 units).

Note 5: The product size fractions overlap and are not cumulative.

Note 6: The 'Total' volume and weights are estimated on a global basis and represent the main Sumner 2024 Inferred Silica Sand Resource.

Note 7: The estimation of the individual sieve size fractions was completed using no cutoff, however, the Sumner inferred resource is reported using a lower reporting cutoff of the sum of the sand +70 sand fractions being greater than 60%.

The Sumner 2024 Indicated and Inferred Silica Sand Resource, which is focused solely on the Wonewoc Formation, is overlain by, or intercalated with:

- 32.86 million short tons (29.81 million metric tonnes) of Pleistocene surficial deposits and Tunnel City Group sedimentary rock.
- 21.02 million short tons (19.07 million metric tonnes) of waste Wonewoc Formation, defined as Wonewoc sand that did not satisfy the cutoff of +70 sand fractions being greater than 60% in total abundance.

The overlying waste material tonnages were calculated using densities of 1.37 g/cm^3 for overburden and Tunnel City Group, and 1.57 g/cm^3 for waste Wonewoc Formation. The overburden bulk density value is based on three till samples that were analyzed for bulk density by the senior author during and Wonewoc bulk density analytical work.

The Sumner 2024 Indicated and Inferred resource in Tables 14.11 and 14.12 is also presented in selected proppant size fraction distributions of 20/40, 30/50, 40/70 and 50/140, and estimated tonnages of the individual fractions are as follows:

Indicated:

- 20/40 mesh fraction: 10,840,000 short tons (9,830,000 metric tonnes).
- 30/50 mesh fraction: 18,940,000 short tons (17,180,000 metric tonnes).
- 40/70 mesh fraction: 18,930,000 short tons (17,170,000 metric tonnes).
- 50/140 mesh fraction: 14,150,000 short tons (12,830,000 metric tonnes).

Inferred:

- 20/40 mesh fraction: 10,040,000 short tons (9,110,000 metric tonnes).
- 30/50 mesh fraction: 18,150,000 short tons (16,460,000 metric tonnes).
- 40/70 mesh fraction: 18,560,000 short tons (16,840,000 metric tonnes).
- 50/140 mesh fraction: 13,910,000 short tons (12,620,000 metric tonnes).

14.16 Reconciliation of Resource Depletion Due to Conventional Mining

Updated Sumner mineral resource estimations are presented in this Technical Report due to conventional resource depletion during 2024 mining at the Sumner Property. Reconciliation of the 2024 mineral resources included a review of the updated mineral resource in conjunction with SES corporate production data and sales.

The total amount of Wonewoc Formation sand depleted within the resource estimation model during 2024 includes Wonewoc sand that occurs both within and outside of the lower reporting cutoff, which is the sum of Wonewoc sand with +70 sand fractions being greater than 60%. There was no overlap between the 2024 mined out polygon and previous annual mined areas.

The per cent difference between SES's ROM 2024 production value (as provided by Source Energy Services Ltd., pers. comm., 2024; see Section 16) and the estimation of the 2024 mineral resource depletion at the Sumner Property is 10%. This variation is within reason given there is typically some overlap between the resource depletion area and the active mine areas (i.e., some portions of previous resource mine areas could still be mined as part of the 2024 mine plan). The QP concludes that:

- The Wonewoc Formation 2024 resource depletion mined-out area, and subsequent 2024 Wonewoc resource depletion, has been accurately chronicled.

- The updated 2024 Sumner Mine resource estimations presented in this Technical Report accurately depict the remaining indicated and inferred resources at the Sumner Property.

15 Mineral Reserve Estimates

There are currently no Mineral Reserves declared for the Sumner Property based on the current level of study. There is a commercial operation in place at the Sumner Mine site. The production decisions and ongoing mine production has not been based on Mineral Reserve estimates, Preliminary Economic Assessments, Pre-Feasibility Studies, or Feasibility Studies.

As a result, there may be an increased uncertainty of achieving any level of recovery of minerals or the cost of such recovery. That is, historically, projects without Mineral Reserves have increased uncertainty and risk of failure. These risks may adversely impact SES's future probability.

The 2024 Sumner Mineral Resource estimates include Indicated and Inferred Mineral Resources only and no assurance can be given that any level of recovery of silica sand minerals from mineralized material will in fact be realized or that an identified mineralized deposit will ever qualify as a commercially mineable (or viable) Mineral Reserve. Inferred Mineral Resources have a greater amount of uncertainty as to their existence, and greater uncertainty as to their economic and legal feasibility.

16 Mining Methods

16.1 Introduction

The Sumner Mine is an existing surface mine operation that has been operated continuously by SES since July 2013. The reader is directed to Section 14 to review the estimated areas of the Indicated and Inferred Resources that are presented in this Technical Report. Figure 16.1 shows the mine infrastructure including processing facilities, storage areas, waste areas and other significant infrastructure features discussed in this section. The current future Sumner mine plan is presented in Figure 16.2.

Sand is liberated from the Wonewoc Formation to the extent practical using medium-sized earthmoving equipment and conventional surface mining techniques. Historical (2013 to 2024) production of ROM sand from the Sumner Mine site is reported at approximately 30.59 million short tons (approximately 27.76 million metric tonnes; Table 16.1). During the same period, the Sumner operation produced over 12.17 million short tons (approximately 11.04 million metric tonnes) of finished product, consisting of 20/40, 30/50, 40/70, and 100 (70/140) mesh silica sand.

Table 16.1. Historical 2013-2024 production of run-of-mine (ROM) sand from the Sumner Mine. Source: Source Energy Services Ltd.

	Short Tons ('000)		Metric Tonnes ('000)	
Year	ROM Production	Finished Product	ROM Production	Finished Product
2013	352	/	319	/
2014	1,879	740	1,705	672
2015	2,867	829	2,602	752
2016	2,483	927	2,253	841
2017	3,614	1,492	3,279	1,354
2018	2,622	1,192	2,379	1,082
2019	2,745	1,052	2,491	955
2020	2,754	1,134	2,499	1,029
2021	2,963	1,088	2,689	987
2022	2,476	1,097	2,247	995
2023	3,156	1,277	2,864	1,159
2024	2,677	1,340	2,429	1,216
Total	30,587	12,168	27,756	11,042

As SES has not provided a life-of-mine plan for the Sumner Mine, it is not possible to provide a definitive statement on expected mine life for the operation. Based on the estimates of mineral resources reported herein, it is possible that the Sumner Mine could continue to operate at full operational capacity (limited by the throughput capacity of the processing facilities) for over 30 years; however, mineral resources are not mineral reserves and do not have demonstrated economic viability.

There is no guarantee that all or any part of the mineral resource will be extracted by SES.

Figure 16.1. Overview of significant infrastructure at the Sumner Mine site. The illustration includes the location of: A) current open pit, infeed ROM pile, wet-plant, wet processed piles, mine office, reclamation areas and proposed direction of future surface mining at the Sumner Mine site; and B) dry-plant, storage piles and silo's, rail-loading terminal and rail car holding yard at the Weyerhaeuser site (located east of the Sumner Mine).

A)

B)

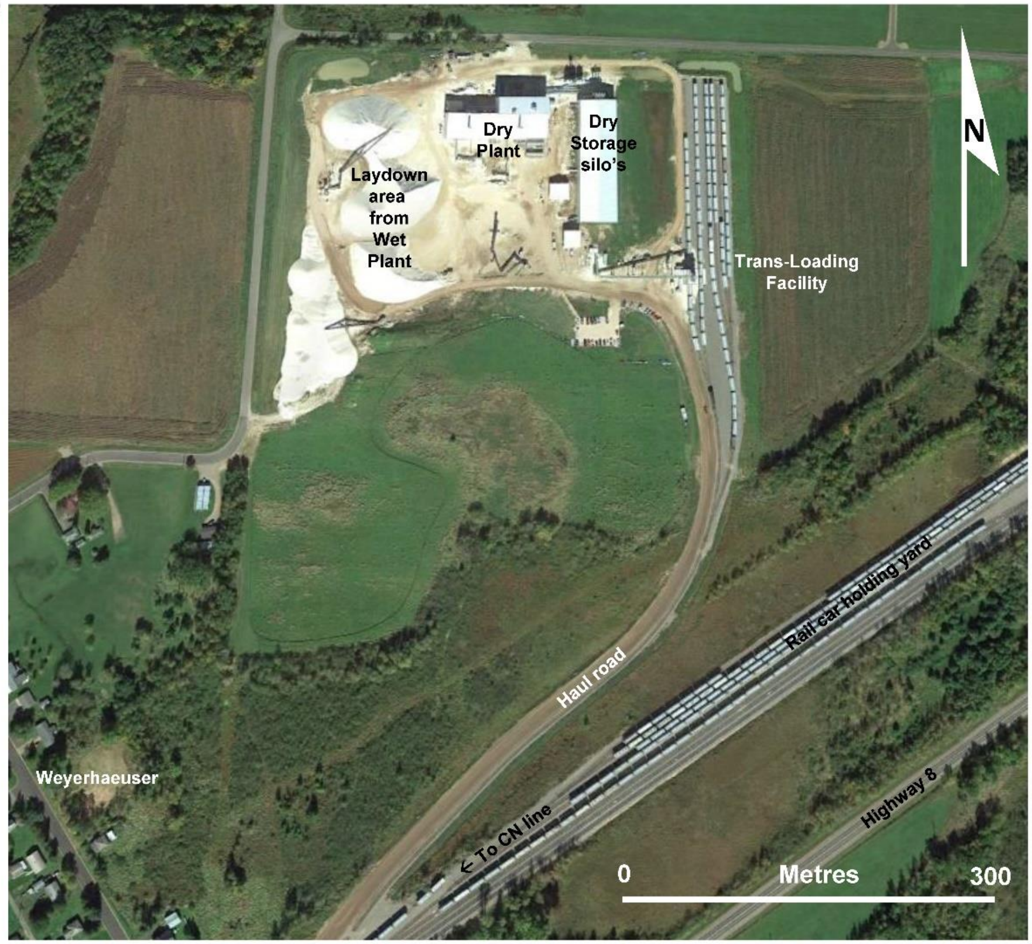
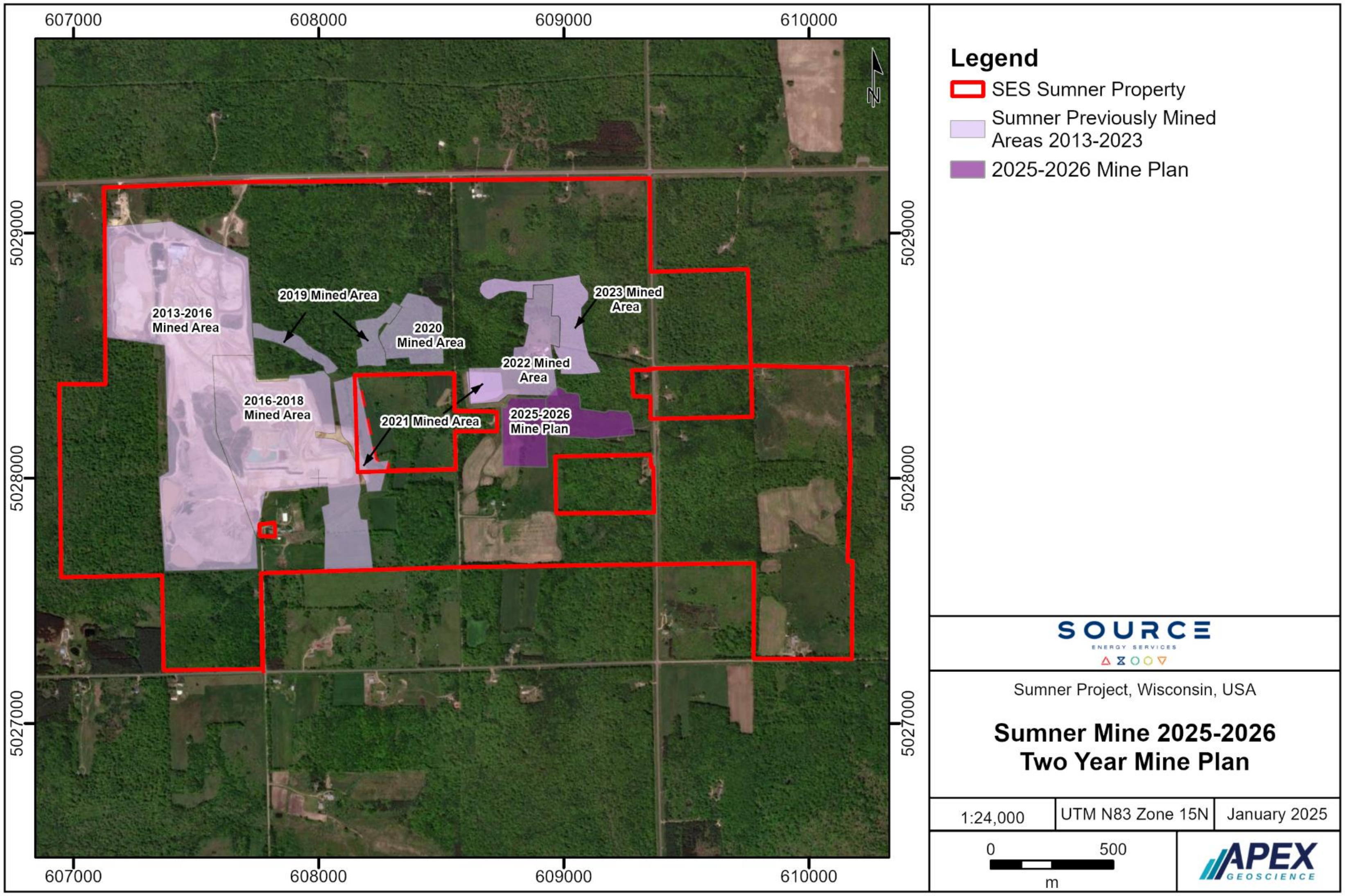


Figure 16.2 Two-year mine plan at the Sumner Mine.



16.2 Mining Operations

Within the boundaries of the Sumner Property, the Wonewoc Formation generally exhibits a shallow depth, flat attitude, and consistent thickness. These characteristics favour conventional surface mining techniques. Since the target sandstone formation does not extend below the water table, the quarry is 'dry-mined' using truck and shovel/excavator mining methods. Mining occurs in a stair-like fashion to recover sand from the top of the formation (in elevation) down to the lowest practical elevation (generally the bottom of the Wonewoc Formation).

The SES Sumner mines major mobile equipment fleet consists of 1 Caterpillar 395 excavator, 1 Caterpillar 374 excavator, 1 Caterpillar D6 dozer, 1 Komatsu D65 dozer, 8 Komatsu HM400-5 articulated dump trucks and 1 Caterpillar 150 motor grader.

The Sumner wet plants major fleet consists of 3 Komatsu WA500 wheeled loaders and 1 Komatsu PC490 excavator.

Auxiliary mining and wet plant equipment telehandlers, skid steers, light duty trucks, water truck, JLG man lift, portable generators, scissor lift and a street sweeper.

SES is assisted with overburden removal from Stout Construction, who is a 3rd party contractor that owns and operates their own fleet. Stout Construction's major mobile equipment include: 1 Caterpillar 374 excavator; 4 Caterpillar 745 articulated dump trucks; and 1 John Deere 850 dozer.

Surface mining operations at the Sumner Mine generally consist of the following steps:

1. **Overburden/Waste Removal** – The target Wonewoc Formation is generally overlain by a thin layer of overburden material generally consisting of soils – topsoil (A-horizon) and subsoil (B-horizon) – which must be removed prior to excavation of the sand. In elevated portions of the Sumner Property, the Tunnel City Group overlies the Wonewoc Formation and must also be removed prior to excavation of the sand. The overburden is generally left in place to minimize soil erosion and contain potential storm water run-off. The soil A- and B-horizons are stripped separately and stored in areas of future mining for use in final reclamation. Once the soils are removed, any remaining overburden is excavated and used for mine reclamation and pit backfilling.

2. **Sandstone Excavation** – Once the overburden has been removed, the sand can be excavated. At the Sumner Mine, the Wonewoc Formation is cemented (sandstone); therefore, drilling and blasting is required to liberate the sand for removal and processing. Drilling, loading, and detonation of the blast holes is performed by certified outside contractors. The blasted material is bulk loaded onto haul trucks and transported to the nearby crusher plant for further processing.

3. **Reclamation** – Post-mining rehabilitation of the disturbed land is required under Wisconsin Administration Code NR 135 (see Section 4.4). The reclamation

procedure at the Sumner Mine occurs concurrently with mining (as space allows) and adheres to the following general plan:

a. Earthwork moving and grading of finer sand, silt, and mudstone that has been separated during the washing process is conducted to mimic the original topography of the land.

b. This base is followed by placement of B-horizon subsoil.

c. The B-horizon subsoil is overlain by the A-Horizon topsoil.

d. Following site grading, fertilizer, and seed mix are sown in accordance with the: State of Wisconsin Department of Transportation Standards Specifications 630.3.2, 630.3.3.1: Method A; and 630.3.2. planning, installation, maintenance and inspection of erosion control and storm water management. The steps are to follow Best Management Practices and technical standards as specified by the Wisconsin Department of Natural Resources.

The mine is typically operational from March to November (weather pending). The open pit mine operation run 2 12hr shifts per day, 7 days a week, the Wet processing plant runs 4 12 hr shifts per day, 7 days a week, and the dry plant running 2 12hr shifts 5 days a week.

Based upon BOYD's site visit observations and the information provided to us, it is our opinion that the current methods of mining, and equipment size and selection are suitable for their intended purpose.

16.3 Engineering and Planning

In commercial mining terms, the quantities of overburden waste and sand mined each year at the Sumner Mine operation are considered modest. Mine engineering and planning requirements for the chosen mining method, under expected operating conditions, should not prove overly onerous.

The primary mine planning consideration is the safe, economical, and regular supply of raw sand feed to the wet-processing plant during its operating season. Overburden removal and reclamation activities are accomplished as required and do not appear to hinder sand mining to any appreciable degree. Large stockpiling capacity at the crushing plant can help alleviate ROM sand supply fluctuations caused by minor disruptions in mining activities. Additional stockpiling in-pit may also be available.

Market conditions pending, SES envisions a potential increase of finished product to approximately 3.5 million short tons per year (3.2 million metric tonnes per year). For planning purposes, the mineral resource area is divided into irregularly shaped regions, or mining phases, with each containing approximately one year's worth of ROM sand production. The mining phases are sequenced such that concurrent reclamation can be completed as soon as mining of the previous adjacent phase is completed. In general, the desired sequence is to mine a given phase in one year, backfill in second year, and reclaimed in the third year.

Currently, the target sand formation is bulk loaded; as such, inherent deleterious materials (generally mudstone) and very fine sand (-140 mesh) are not excluded from the processing feed. While this dilution material is removed during processing, it reduces the overall process yield and increases the unit cost of producing the finished goods. Where feasible, material with expected low product yields should be excluded for the mine plan.

Geotechnically, the Wonewoc Formation sandstone is relatively competent such that slumping, or collapsing, has not been a detriment to the mining process. Due to its proximity to the water table, the target sandstone stratum must be mined in two benches. The lower mining bench is typically comprised of the bottom 7 feet (2.1 m) of the formation, while the upper bench encompasses the remainder of the sandstone thickness. The lower bench is left in place until backfilling space is required to reduce buckling and water seepage caused by the hydrostatic pressure exerted by the water table. Haul roads are designed with a 60-foot (18.3 m) travel width and ramps slopes are less than 12%.

Excessive inflow of water into the pit is not expected. As such, dewatering before or during mining activities should be manageable with drainage ditches and sumps. On-site water ponds can be used to hold any excessive storm water.

17 Recovery Methods

Processing operations are in two locations. As shown in Figure 16.1, the wet-processing plant is located on the property adjacent to the mining operations. The dry-processing plant is in Weyerhaeuser, WI, approximately 8 miles (12.9 km) east on U.S. Highway 8. The Weyerhaeuser Plant began operation in December 2013. Combined these operations wash, dry, and sort/size the ROM sand to yield a product that is of sufficient quality for hydraulic fracturing (i.e., frac sand). Generally, this process includes:

1. Crushing the ROM sandstone to manageable sizes for the wet-processing plant, without causing damage to the individual grains within the rock.

2. Separating the crushed ROM material by size, shape, and density – thereby removing contaminants – in the wet-processing plant. The wet-processing plant generally produces 8/50 and 30/70 sized work-in-process (WIP) material.

3. Trucking the WIP material to the dry-processing facilities by a third-party contractor, Antczak Trucking.

4. Drying and further sorting the wet plant WIP material in the dry-processing plant. The dry-processing plant typically produces 20/40, 30/70, and 100 Mesh (50/140 mesh) products.

To accomplish these tasks at the Sumner Mine, the major processing assets consist of the following:

- Wet-processing plant with a nameplate capacity of 500 short tons per hour (tph"; approximately 454 metric tonnes per hour), with
    - 60,000 short ton (approximately 54,000 metric tonnes) ROM stockpile
    - In-line crusher and scalping screeners
    - 10x10 and 8x8 density separators
    - Attrition scrubbers
    - Cyclones
    - Belt presses
    - Dewatering beds
    - Clarifier and process water tanks

- Dry-processing plant with a nameplate capacity of 375 tph (340 metric tonnes per hour), with
    - 300,000 short ton WIP stockpile (approximately 272,000 metric tonnes)
    - Three fluid bed dryers
    - Rotex mineral separators

The crushing/wet-processing plant at the Sumner Mine is enclosed and generally runs year-round (with downtime for scheduled and unscheduled maintenance). The dry-processing plant at Weyerhaeuser also operates year-round. The Mining and Wet processing facilities employee approximately 50 employees, with an additional 20 employees at the dry processing plant.

Quality control measures, including laboratory sampling, are in place at various stages throughout the wet- and dry-processing operations.

Historical (2013 to 2024) production from the Sumner and Weyerhaeuser processing plants is reported to include about 12.17 million short tons of finished product (11.04 million metric tonnes; Table 17.1). During 2024, SES produced 1.34 million short tons (1.22 million metric tonnes) of finished product, consisting of 20/40, 30/70, and 100 (50/140) mesh silica sand (SES, personal communication, 2024).

Based upon BOYD's site visit observations and the information provided to us, it is our opinion that the current processing operations and equipment are suitable for their intended purpose.

18 Project Infrastructure

Being an existing mine and processing operation, all project infrastructure is in place at the Sumner Mine and Weyerhaeuser Plant including, utilities, pipelines, crushing and conveying facilities, wet- and dry-processing facilities, office and maintenance facilities, and roads. Beyond the processing facilities, which are described in Section 17, other key infrastructure at the Weyerhaeuser Plant include:

- Storage barn capable of storing 40,000 short tons of product (approximately 36,000 metric tonnes).
- The rail-loading facility, which has the capacity to load 45 rail cars per day.

Table 18.1. Historical 2013-2024 production from the Sumner and Weyerhaeuser processing plants. Source: Source Energy Services Ltd.

	Short Tons ('000)			Short Tons ('000)		
Year	Wet Plant Feed	WIP Product	Wet Plant Yield (%)	Dry Plant Feed	Finished Product	Dry Plant Yield (%)
2013	352	217	62%	/	/	/
2014	1,879	1,426	76%	1,049	740	71%
2015	2,867	1,684	59%	1,121	829	74%
2016	2,483	1,494	60%	1,218	927	76%
2017	3,614	2,003	55%	1,872	1,492	80%
2018	2,565	1,732	68%	1,612	1,192	74%
2019	2,708	1,622	60%	1,364	1,052	77%
2020	2,712	1,440	53%	1,419	1,134	80%
2021	2,914	1,309	45%	1,442	1,088	75%
2022	2,534	1,329	52%	1,252	1,097	88%
2023	3,082	1,720	56%	1,527	1,277	84%
2024	2,623	1,635	62%	1,553	1,340	86%
Total	30,334	17,610	58%	15,428	12,168	79%

	Metric Tonnes ('000)			Metric Tonnes ('000)		
Year	Wet Plant Feed	WIP Product	Wet Plant Yield (%)	Dry Plant Feed	Finished Product	Dry Plant Yield (%)
2013	319	197	0%	/	/	0%
2014	1,705	1,294	76%	952	672	71%
2015	2,602	1,528	59%	1,017	752	74%
2016	2,253	1,356	60%	1,105	841	76%
2017	3,279	1,818	55%	1,699	1,354	80%
2018	2,328	1,572	68%	1,463	1,082	74%
2019	2,458	1,472	60%	1,238	955	77%
2020	2,461	1,306	53%	1,287	1,029	80%
2021	2,644	1,188	45%	1,309	987	75%
2022	2,299	1,206	52%	1,136	995	88%
2023	2,797	1,561	56%	1,386	1,159	84%
2024	2,380	1,484	62%	1,409	1,216	86%
Total	27,526	15,980	58%	14,000	11,042	79%

Three-phase power to the site is supplied by Exel Energy and Barron Electric. Fuel for the operation of the dry-processing plant is natural gas supplied by Constellation WE Energies. Process water for the operation is sourced from drilled wells on the Sumner Property. Most of the process water is recycled in the plants. Well water is also utilized for makeup water and other tasks such as fugitive dust control on the roadways and other operational needs.

19 Market Studies and Contracts

19.1 Market Overview

The price of frac sand, or proppant, is closely associated with the price of oil and natural gas, and hence, the intensity of energy exploratory and production drilling. During 2024, the Crude Oil West Texas Intermediate (WTI) price ranged between USD$66 (September 11, 2024) and USD$87 (April 5, 2024) per barrel. At the Effective Date of this report, the WTI price was approximately USD$73 per barrel (Trading Economics, 2025a). During 2024, the price of natural gas increased from USD$2.3131 on January 1, 2024, to USD$3.7273 per million British thermal units (MMBtu) at the Effective Date of this report (Trading Economics, 2025b).

Proppant pricing is consumer-based. Supply and demand dynamics determine the cost of silica sand for hydraulic fracturing in the energy industry. When demand for proppant is high, producers can charge higher prices due to limited availability. When demand drops, proppant producers are often forced to reduce their prices to be competitive.

Rystad Energy (2024) compiled regional proppant prices for June 2024 that included 1) in-basin Permian sand in the low USD$20's per short ton, 2) in-basin Eagle Ford sand in the in the USD$25 to USD$30 per short ton, and 3) Northern White Sand (NWS) in the USD$25 to USD$30 per short ton (NWS is equivalent to SES's Wisconsin Wonewoc Formation sand). Import silica sand prices into Canada are higher (e.g., CDN$46 per short ton; IndexBox, 2025). Rystad Energy (2024) also provided a 2024 to 2027 forecast in which they state there are no anticipated major changes to the supply and demand outlook for NWS. Rystad Energy also noted that Canada frac sand demand remains strong, and hence, mines that support Duvernay and Montney oil and gas plays in the Western Canada Sedimentary Basin (WCSB) will see strong demand due to limited supply of domestic sand.

In Canada, most of the well drilling through to 2036 is anticipated to occur in the Montney, Duvernay, Bakken, and Deep Basin tight oil and gas plays, particularly in relation to economically viable natural gas well development and production (Canadian Energy Research Institute, 2016). SES continues to transport silica sand from its Wisconsin mines to the WCSB. The Company believes the increased demand for natural gas, driven by liquefied natural gas exports, increased natural gas pipeline export capabilities and power generation facilities, will drive sustained and incremental demand for NWS silica sand (Source Energy Services Ltd., 2024a).

During the third quarter of 2024, SES disclosed that sand volumes from mine gate sales lowered the average realized sand price by CDN$1.33 per metric tonne; however, the sale of lower value mine gate sales had a favorable impact on production costs by creating sand processing efficiencies and increasing production yields (Source Energy Services Ltd., 2024a).

With respect to forecasting, building on the modest but steady growth of 2024, the Canadian Association of Energy Contractors (CAOEC) is optimistic that oil and gas drilling rig growth will continue through 2025 (Canadian Association of Energy Contractors, 2025). Hence, the global proppant market, silica sand sales are expected to grow at a compounded annual growth rate (CAGR) of between 5% and 10%, the latter could reach a market size of USD$14.3 billion in 2030 from USD$8.9 billion in 2025 (Global Information, 2025; MMR, 2025; Research and Markets, 2025). Some factors fuelling proppant market growth include:

- Increased global demand for energy and growing need for hydraulic fracturing for unconventional natural gas and oil development, particularly in Asia Pacific and North America regions.

- The combination of horizontal drilling and multistage fracturing technology has fundamentally transformed the oil and gas production landscape across the globe. According to the U.S. Energy Information Administration (EIA, 2016), hydraulic fracturing is used in 95% of wells drilled (MMR, 2025).

- Increased shale gas production: The EIA (2016) expects shale natural gas and oil production to double by 2040. According to EIA, shale gas and tight oil production will increase from about 14 trillion cubic feet (Tcf) in 2015 to 29 Tcf in 2040, enhancing proppant market demand.

Risks and uncertainties that could influence the price of proppant could include, for example, 1) environmental concerns and regulations that could hinder proppant market growth, 2) increases in ceramic proppant supply that could provide alternative proppant opportunities, 3) fluctuations in the WTI crude oil and natural gas prices, and 4) changes in the technologies used to drill for and produce oil and natural gas.

19.2 Contracts

Primarily, SES sells frac sand from its Wisconsin operations to E&P companies and pressure pumping companies operating in the WCSB. SES has structured contracts with some customers outlining volume commitments and, in some cases, fixed pricing, the terms of which vary from one to three years. SES also services customers on a spot basis where volume thresholds are not set, and orders are serviced on an as-available basis at prevailing market prices. SES provides further disclosures on their contracts in Quarterly and Annual Management’s Discussion and Analysis (MD&A) filings, available at SEDAR (https://www.sedarplus.ca/landingpage/).

The Sumner Mine will employ local contractors to assist with drilling and blasting, mining, and trucking of WIP material. No detailed information was provided to BOYD regarding these contracts.

20 Environmental Studies, Permitting and Social or Community Impact

20.1 Permitting and Environmental Studies

The Sumner Mine and Weyerhaeuser Plant are fully permitted for on-going mining and sand processing operations. A complete discussion of permitting and environmental approvals is presented in Section 4.4 and summarized in point form in the text that follows.

- The Sumner Property consists of 36 separate parcels with a total land area of 1,108.8 acres (448.7 hectares). Most of the parcels within the Sumner Property are either: owned 100% by SES (33 parcels); or are leased by SES with established royalty (3 parcels).

- The purchased parcels are for 100% of the land title including mineral rights, buildings, etc. The purchase agreements do not include any additional payouts or percentages. With respect to the 3 leased parcels (Vincent 1, Vincent 2, and Vincent 3), the landowners agreed to royalty agreements allowing SES the right to mine their properties in exchange for royalty, which is outlined in Section 4.

- Permitting includes a Development Agreement, Non-metallic Mining Reclamation Permit, Air Pollution Control Permit, Non-metallic Mining Operations General Permit (for storm water), and a High Capacity Well Permit. There are no Federal permits required.

To the best of the author's knowledge, there are no other factors or risks that affect access, land title, or the right or ability to perform work on the Sumner Property.

20.2 Social and Community Plans

SES has established effective relationships with the communities surrounding the Sumner Mine. The operations have a positive effect on local employment and economy. In addition to the payment of income taxes and other local community taxes such as property taxes and royalties, SES supports, financially and otherwise, local community endeavors.

20.3 Mine Closure Requirements

Once the supply of sand at the Sumner Mine site has been exhausted, the mine owner/permittee is required to reclaim the mined area. Mine reclamation is administered by the county regulatory authorities and complies with uniform statewide reclamation standards in NR 135, the county reclamation ordinance, and the approved reclamation plan. The Sumner Mine reclaims previously mined areas as outlined in Section 16. On-going reclamation activities should minimize any mining-related closure costs.

21 Capital and Operating Costs

21.1 Capital Costs

The Sumner Mine and related facilities are fully developed and should require no near-term major capital investment to maintain full commercial production. SES intends to keep near-term capital expenditures at a minimum; however, the timing and amount of capital expenditures are largely discretionary and within SES's control.

21.2 Operating Costs

SES considers projected operating costs at their Wisconsin silica sand mines to be confidential and commercially sensitive. BOYD has previously reviewed historical operating cost data provided by SES and found the costs to be reasonable and within industry norms. SES reports a positive Gross Margin for frac sand sales from their Wisconsin operations in their MD&A for the year ending December 31, 2023 (Source Energy Services Ltd., 2023) available on www.sedarplus.ca/landingpage/), as well as for the three and nine months ended September 30, 2024 (Source Energy Services Ltd., 2024a; available on www.sedarplus.ca/landingpage/). As such, it is BOYD's opinion that SES's financial data support the requirement that the mineral resource reported herein have reasonable prospects for economic extraction.

22 Economic Analysis

The Issuer falls under the producing issuer category. That is, SES generates: 1) gross revenue, derived from mining operations, of at least CDN$30 million for the issuers most recently completed financial year; and 2) gross revenue, derived from mining operations, of at least CDN$90 million in aggregate for the issuers three most recently completed financial years. Producing issuers may exclude the information required under Item 22 for Technical Reports on properties currently in production unless the Technical Report includes a material expansion of the current production. If the latter occurs, SES will present an Economic Analysis in future and more detailed reports.

23 Adjacent Properties

There are six small parcels located within the Sumner Property boundaries which are, at present, not owned by SES (Table 23.1 and shown on the SES Sumner Property Figure 4.1 and Figure 4.2 as 'adjacent properties'). While these parcels are underlain by Wonewoc Formation silica sand, they do not have an important bearing on the overall silica (frac) sand potential of the subject Sumner Property.

Table 23.1. Summary of 'adjacent property' parcels within the main boundary of the Sumner Property, for which Source Energy Services has no invested interest. See Figures 4.1 and 4.2 for the location of the of 'adjacent property' parcels.

Parcel No.	Corresponding Source Energy parcel name	Public Land Survey System (section-Township-Range-quarter quarter section-Quarter section)	Area (acres)	Area (hectares)	Private (deeded) land owner
46280022000	Kreier	28-34N-10W-NW-SE	2.74	1.11	Kreier, Roxie J
46280015000	Vincent	28-34N-10W-NE-SW	38.00	15.38	Vincent Family Trust
46280015010	Vincent	28-34N-10W-NE-SW	2.00	0.81	Vincent, James R & Stephanie L
46280018000	Vincent	28-34N-10W-SW-SW	0.52	0.21	Vincent Family Trust
46280020010	Hegna	28-34N-10W-NE-SE; 28-34N-10W-SE-SE	26.06	10.52	Hegna, Thomas A
46270011010	Titera	27-34N-10W-NW-SW	20.00	8.09	Titera, Christopher B
		Totals	**90.94**	**36.80**	

With respect to adjacent properties, a graphical summary of the nearby frac sand-related operations is presented in Figure 23.1. A summary of the nearby operations by other companies includes:

- Blue Diamond Proppants LLC: Is an integrated producer, supplier, and distributor of frac sand with access to Class 1 rail. Blue Diamond Proppants LLC acquired Superior Silica Sands frac sand mine and closed-loop wet processing plant, dry processing plant, storage, loadout facility, and unit train capable yard in April 2022 (Barron News-Shield, 2023).

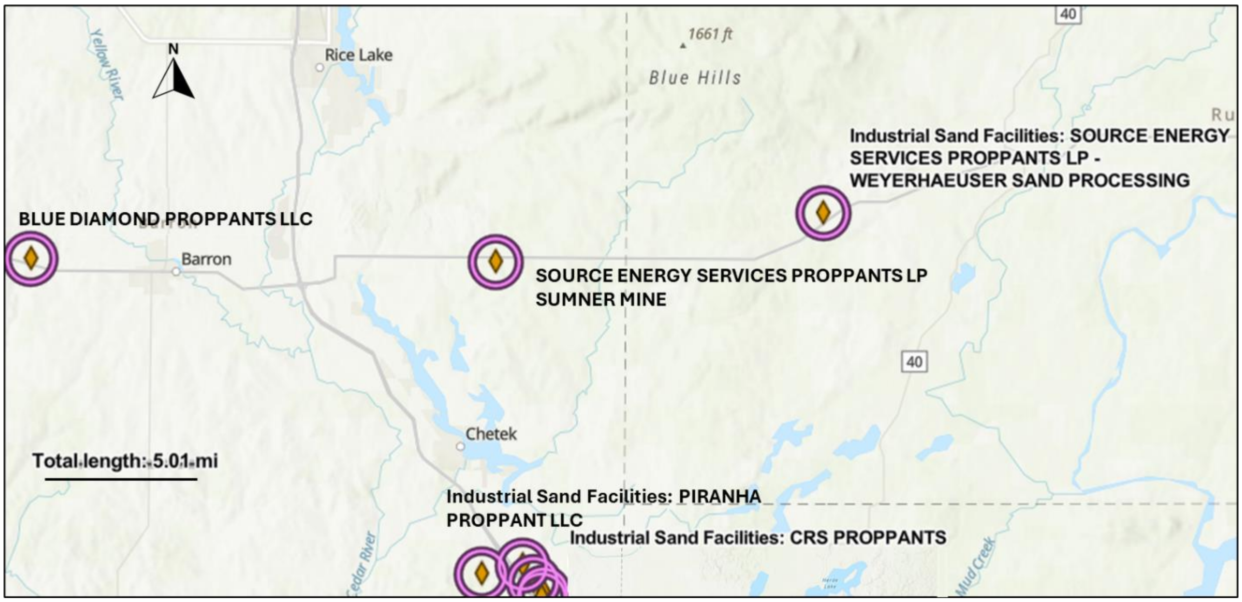
- CRS Proppants: According to the Barron News-Shield (2014), CRS Proppants, and its subsidiary Great Northern Sand, was sold to the Texas-based Eagle Materials Inc. for $225 million. The acquisition included a northern-white frac-sand mine and processing facility in Wisconsin that is currently being expanded from approximately one million to two million tons per year capacity, and a Union Pacific rail-based trans-load network from the mine into the Permian and other target basins. Eagle Materials uses the sand for hydraulic fracturing in the energy industry.

- Piranha Proppant LLC: In 2022, Mammoth Energy Services Inc., and subsidiaries, Piranha Proppant LLC and Taylor Frac, LLC, entered into two sand supply agreements with terms of 12 months and 21 months, respectively, beginning on January 1, 2023 (Mammoth Energy Services Inc., 2022). Under the terms of the agreements, the Company's subsidiaries have agreed to supply, in aggregate, approximately 1.75 million tons of sand across multiple grades (20/40, 30/50, and 40/70) over the contract periods. Mammoth Energy Services, through its subsidiaries, provides high quality Jordan Substrate and Wonewoc Sandstone frac sand from our Wisconsin mines with effective processing capacity of approximately 4.4 million tons per annum (Mammoth Energy Services Inc., 2025a).

The Piranha operation is located approximately five miles northwest of the town of New Auburn, in Baron County, Wisconsin, encompasses a total of approximately 608 acres, and has transportation access via the Union Pacific rail network. Approximately 696,000 tons of sand was mined at the Piranha Plant in Barron County, WI during 2023 (Mammoth Energy Services, 2025b).

The reader is also referred to the individual company websites and/or the Wisconsin Department of Natural Resources for further information on the adjacent properties (at https://dnr.wisconsin.gov/topic/AirQuality/ISMMap.html).

Figure 23.1. Summary of active sand operations in the vicinity of Source Energy Services Sumner Mine and facilities. Source: Wisconsin Department of Natural Resources (2025) Air Management Data Viewer at: https://dnrmaps.wi.gov/H5/?viewer=AMDV.



24 Other Relevant Data and Information

None to report at the Effective Date of this Technical Report, 31 December 2024.

25 Interpretation and Conclusions

25.1 Summary of Source Energy Services and the Sumner Property

SES is an integrated supplier and distributor of high quality frac sand in Western Canada and the United States. With over a decade of proppant supply and logistics experience, SES's services cover the entire proppant supply and logistics chain. SES currently:

- Operates and produces silica sand from three separate Wisconsin-based operations, including: 1) Sumner Open Pit Mine and Sumner Mine Wet Processing

Plant located in Barron County, WI, and the Weyerhaeuser Dry Plant and Trans-loading Terminal located in Rusk County, WI; 2) the Blair Mine in Trempealeau County; and 3) the Preston Mine in Trempealeau County.

- Operates 6 trans-loading terminals (owns 7 total) that collectively provide proppant trans-loading services with connectivity to large freight rail and short line rail to key oil and gas plays throughout the Western Canada Sedimentary Basin.

The Sumner Mine site and Property is situated on 36 privately deeded parcels with a total land area of 1,108.8 acres (448.7 hectares). The Property is in east-central Barron County, WI, and is accessible via U.S. Highway 8. Of the 36 parcels: 33 are 100% owned by SES; and 3 parcels are presently being leased from the current landowners by SES with sand tonnage royalties established with the individual owners.

The Sumner Property is underlain by the Wonewoc Formation, which is the subject of this mineral resource estimation and NI 43-101 Technical Report. The Wonewoc is composed of super-mature, medium to coarse grained, quartzose, marine shoreline sandstone that has a long history of reworking. With respect to proppant quality, the Wonewoc Formation at the Sumner Property contains:

1. The Sumner silica sand sieve size distributions are dominated by the 40/70 and 30/50 fractions followed by the 50/140, and finally, 20/40 size fractions.

2. High-quality silica sand that is compliant with ISO 13503-2:2006/Amd.1:2009E specifications for proppant sieve size fractions, sphericity, roundness, acid solubility, turbidity, and crush classification.

3. An extensive source geological unit, the Wonewoc Formation, which underlies the entire Property and has proven stratigraphic uniformity as depicted by the results of 2011-2015 auger drill testing.

Accordingly, the Wonewoc Formation has reasonable prospect of economic extraction; a fact clearly demonstrated in that SES is currently mining, processing, transporting, and selling Wonewoc Formation silica sand to North America markets.

25.2 Indicated and Inferred Resource Summary

Mineral resource modelling and estimation was carried out using a 3-dimensional block model based on geostatistical applications using commercial mine planning software MICROMINE (v14.0.6). The Sumner 2024 Indicated and Inferred Silica Sand Resource estimate is reported in accordance with the CSA's NI 43-101 and has been estimated using the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 29, 2019, and CIM "Definition Standards for Mineral Resources and Mineral Reserves" amended and adopted May 10th, 2014.

Sumner mineral resource estimations were originally presented in Eccles et al. (2017). The Sumner resources presented in this Technical Report constitute a change to the mineral resources due to conventional mining depletion by SES at the Sumner Property.

The lower contact between the Wonewoc Formation and the underlying Eau Claire was better defined during the 2016-2018 drill testing in the central and southeastern parts of the Property. This work increased the certainty about the lower Wonewoc Formation contact in the project area and increased the confidence in the resource evaluation.

The Sumner resource modelling utilized:

- A total of 112 auger holes in the geological modelling process, which included: 104 test auger holes drilled by SES; and eight historical (1953 and 1970) water wells that were drilled outside of, but adjacent to, the Sumner Property by companies/farmers other than SES.

- The average depth of the auger test holes is 88.5 feet (27 m). Spacing between drillholes varies from 65.6 and 2,591.8 feet (20 m to 790 m). The bulk of the drilling is concentrated with the greatest density around and directly east of the existing Sumner Open Pit Mine site (extending through the east-central portion of the Property). The remainder of the auger drill test holes are spaced relatively evenly over the remainder of the Sumner Property.

- A three-dimensional geological model focused on wireframing the Wonewoc Formation, which is the focus of this resource estimate.

- A Sumner estimation file comprised of 1,461 particle size/gradation analyses, the majority of which are sourced from the Wonewoc Formation (n=947).

- A parent block size of 164 feet x 164 feet x 10 feet (50 m x 50 m x 3 m) with sub-blocking down to 33 feet x 33 feet x 3.3 feet (10 m x 10 m x 1 m).

- A total of 31 bulk density measurements were collected by the senior author of this Technical Report from both the overburden and the Wonewoc Formation; the average density value of 1.57 g/cm^3 was selected for use in the resource modelling because it is believed to the most representative density measurement of the material being mined. A bulk density value of 1.37 g/cm^3 was selected for the Pleistocene surficial deposits (overburden).

- Due to the low variability and the nature of the silica sand grain sizes, capping of the percentages passing the various mesh sizes is not necessary or appropriate.

- The inverse distance squared methodology was used to estimate the different sieve size percentages within the Sumner resource areas.

- A lower reporting cutoff of the sum of the +70 sand fractions being greater than 60% in total abundance, which mimics SES' mining methodology at Sumner.

The Mineral Resource estimates presented in this Technical Report are classified as 'Indicated' and 'Inferred' according to the CIM definition standards, and are based on geological confidence, data quality and grade continuity. In addition, mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the inferred mineral resource will be converted into a mineral reserve.

Using a lower cutoff of the sum of the +70 sand fractions are greater than 60% total abundance, this Sumner 2024 Indicated and Inferred Silica Sand Resource estimate predicts total (i.e., global) resources of:

- 44.19 million short tons (40.08 million metric tonnes) of silica sand of indicated; and

- 44.06 million short tons (39.97 million metric tonnes) of silica sand of inferred classification is present at Sumner Property (Tables 14.11 and 14.12).

Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the mineral resource will be converted into a mineral reserve.

The Sumner 2024 Indicated and Inferred Silica Sand Resource, which is focused solely on the Wonewoc Formation, is overlain by, or intercalated with:

- 32.86 million short tons (29.81 million metric tonnes) of Pleistocene surficial deposits and Tunnel City Group sedimentary rock.

- 21.02 million short tons (19.07 million metric tonnes) of waste Wonewoc Formation, defined as Wonewoc sand that did not satisfy the cutoff of +70 sand fractions being greater than 60% in total abundance.

The waste material tonnages were calculated using densities of 1.37 g/cm^3 for the overburden and Tunnel City Group, and 1.57 g/cm^3 for the waste Wonewoc Formation. The overburden bulk density value of 1.37 g/cm^3 is based on three till samples that were analyzed for bulk density by the senior author during and Wonewoc bulk density analytical work. There is currently no known density information for the Tunnel City Group; hence, we used the same bulk density value as the Wonewoc Formation.

25.3 Other Considerations and Uncertainties

There is some local variation in the thickness of Pleistocene surficial material and Tunnel City Group strata that overly the Wonewoc Formation at the Sumner Property. Accordingly, the authors note that additional auger drill testing to advance the understanding of the surficial deposits will result in an improved understanding of the material overlying the Wonewoc Formation, and hence, revised, and improved resource estimations. It is possible that additional overburden data, particularly in the Inferred portion of the Sumner Property, would increase in overall waste rock volume in comparison to the estimate provided in this Technical Report. In lieu of mine planning, it is recommended that SES continue to conduct grid infill drilling to better assess the detailed stratigraphic position of the top of the Wonewoc Formation silica sand.

The lowermost Wonewoc Formation geological contact is significantly better defined in this Technical Report (versus Eccles et al., 2015). It is worth pointing out, however, that SES has essentially drilled to the groundwater table. If SES drill tested and mapped the basal Wonewoc Formation contact below the groundwater table, it is more than likely that the overall volume and tonnage of the Wonewoc Formation silica (frac) sand would increase.

Lastly, not all the 'waste' Wonewoc Formation, or Wonewoc sand that does not meet the resource cutoff, might end up being waste rock *sensu stricto*. That is, some of Wonewoc sandstone that does not make the cutoff may end up being mined; for example, 'islands' of below cutoff Wonewoc may be mined based on the type of potential future mining method employed by SES.

26 Recommendations

The collective work outlined in this Technical Report including: SES's technical applications knowledge; current capacity levels for production, processing and transportation of proppant throughout North America; positive Sumner 2024 Indicated and Inferred Silica Sand Resource estimation; frac sand market size and applicability; and high-quality (ISO 13503-2:2006/Amd.1:2009E compliant) Wonewoc Formation proppant; supports the conclusion that the Wonewoc silica (frac) sand at the Sumner Property is a 'property of merit' and warrants further exploration.

The authors of this Technical Report recommend that SES consider future exploration work at the Property, including infill auger drilling; downhole electrical wireline logging, additional proppant characterization test work and ongoing resource estimation Technical and Annual reporting to update the mineral resources.

The collective estimated cost of this work recommendation, including a 10% contingency, is CDN$610,500 (USD$457,875). Additional detail on the work recommendations and cost breakdown is provided in the text that follows and Table 26.1.

26.1 Infill Auger Testing of the Wonewoc Formation and its Overlying Material

The authors recommend that SES continues to use a grid-based infill auger drill testing programs to delineate the top of the Wonewoc Formation as the mine plan progresses. In addition, SES should continue to explore the marginal boundaries of Property defined by Inferred Resources. A 30-hole auger program should be considered with each hole drilled to an approximate depth of 100 feet (30 m) for a total program of about 3,000 feet (900 m).

The estimated cost of infill drill program is CDN$350,000 (USD$262,500), which includes: mob and demob; third-party drill contracts; lithological logging; sampling; and particle size/gradation analysis. The collar locations should be surveyed for accurate positioning in three dimensions (e.g., using differential GPS or total station).

Table 26.1. Estimated cost summary of the exploration work recommendations at Source Energy Services Sumner Property.

Item	Description	Cost Estimate CDN$	Cost Estimate USD$
Infill drilling	3,000 feet (900 m) of infill drilling within the inferred resource portion of the Sumner Property to further define the Wonewoc Formation and the overlying waste material (with particle size test work)	$350,000	$262,500
Downhole electrical wireline logging	Downhole geophysical surveying for subsurface exploration and characterization	$60,000	$45,000
Proppant characterization test work	Test work conducted at an independent ISO 13503-2 certified laboratory to define the overall quality of the Wonewoc Formation	$100,000	$75,000
Technical and Annual Reporting	Update the Sumner resource, and possibly prepare a Preliminary Economic Assessment of the Sumner Mine site.	$45,000	$33,750
Contingency on exploration work (10%)		$55,500	$41,625
	TOTAL ESTIMATED COST	**$610,500**	**$457,875**

Currency converted using a conversion of 1 CDN dollar equals 0.75 USD dollar (1 February 2023).

26.2 Downhole Log Responses to Define Subsurface Stratigraphy

Critical criteria on depicting the future direction of the open pit mining relies on 1) depth of overburden to the target Wonewoc Formation; and 2) the quality of the Wonewoc with respect to the amount of clay material intermixed with the silica sand. Borehole logging provides local validation of these criteria, and it is recommended that SES consider wireline logging of the boreholes to provide a means of evaluating various properties of subsurface strata between drillholes.

The electrical log has been used extensively in a qualitative way in the exploitation of oil and gas reservoirs to provide some indication of reservoir content and to correlate subsurface geological formations. Downhole log responses from a combination of downhole tools such as gamma-ray, conductivity and resistivity, density and neutron porosity logs can be used to distinguish electrofacies and formulate a high-resolution subsurface sequence stratigraphic model.

In SES's case, the results of a properly organized, calibrated, and interpreted downhole electrical wireline surveys can be used to determine:

- Overburden thickness profiling that can help to determine areas of low strip ratio within the Sumner Property.
- Silica sand unit thickness and interpretive profiling that can help target anomalous areas of thick, clean sand and to interpret the internal geometry and facies architecture of the sandstone.
- Three-Dimensional geological modelling of the subterranean features that, in conjunction with borehole data, can enhance the overall mineral resource estimation and potential economic studies of the Sumner Property.
- The profile of the groundwater table, which is applicable from the environmental and mine pumping/de-watering perspectives.

The downhole surveying is estimated to cost CDN$60,000 (USD$45,000).

26.3 Proppant Characterization Test Work.

As additional samples are collected coincident with the infill and exploratory drill programs, a representative number of samples from throughout the Sumner Property should be subjected to additional proppant characterization test work to define the overall quality and confidence of the Wonewoc Formation, the results of which may influence future work programs at the Sumner Property. The proppant characterization work should be conducted on proppant size fraction distributions of 20/40, 30/50, 40/70 and 50/140 (or '100') mesh, which mimics SES's current production and sales strategy.

The proppant test work would include bulk density measurements as additional bulk density measurements are required to better define the *in-situ* tonnage of the overlying material at the Sumner Property.

The test work must be conducted at an independent ISO 13503-2 certified laboratory. The estimated cost of the test work is CDN$100,000 (USD$75,000).

26.4 Technical and Annual Reporting

The purpose of NI 43-101 is to ensure that misleading, erroneous or fraudulent information relating to mineral properties is not published and promoted to investors on stock exchanges overseen by the CSA. Disclosures covered by NI 43-101 code include press releases of mineral exploration reports, reporting of resources and reserves, presentations, oral comments, and websites. With respect to resource/reserve reporting, most start-up companies progress through a logical sequence of Technical Reports that inevitably provide higher levels of confidence to their shareholders and potential investors.

As SES continues to develop the Sumner Property, the company should prepare revised Technical Reports, including updated mineral resource estimates. The estimated cost of a revised NI 43-101 Technical Report is CDN$45,000 (USD$33,750). In addition, as SES continues to develop the Sumner Property, the company could consider reserve estimation and economic analysis, which would provide additional confidence to the net worth of the deposit.

27 References

Ailworth, E. (2017): Latest Threat to U.S. Oil Drillers: The Rocketing Price of Sand; Wall Street Journal, March 23, 2017.

Aswasereelert, W. (2008): Deposition of the Cambrian Eau Claire Formation, Wisconsin: Hydrostratigraphic implications of fine-grained cratonic sandstones; Geoscience Wisconsin, v. 19, p. 1-21.

ASTM (1995): ASTM Designation E11: Standard specification for wire clothes and sieves for testing purposes, 5 p.

Austin, G.S. (1969): Paleozoic lithostratigraphic nomenclature for southeastern Minnesota; Minnesota Geological Survey Information Circular 6, 11 p.

Austin, G.S. (1970): Deep stratigraphic test well near Hollandale, Minnesota; Minnesota Geological Survey Report of Investigations 12, 52 p.

Bailey, R.G. (1994): Ecoregions of the United States, USDA Forest Service (scale 1:7 500 000, revised 1994).

Barron News-Shield (2014): CRS Proppants assets sold for $225 million; News article dated November 5, 2024, < Available on February 5, 2025, at: CRS Proppants assets sold for $225 million | News | news-shield.com >

Barron News-Shield (2023): Local sand producer, Blue Diamond, is on the rise; News article dated January 4, 2023, > Available on February 12, 2025, at: https://www.news-shield.com/news/top_stories/article_66d9dff8-8c39-11ed-a451-6770fcfbedc3.html >.

Beckwith, R. (2011): Proppants: Where in the World: Journal of Petroleum Technology, April 2011, p. 36- 41.

Berkman, D. A. (1995): 9.2 Gravity survey methods and tables. *In:* D. A., Berkman (Ed.), Field geologist's manual; 3rd edition, Australian Institute of Mining and Metallurgy Monograph 9, 324 p.

Bristow, C.S., Bailey, S.D. and Lancaster, N. (2000): The sedimentary structure of linear sand dunes, Nature, 406(6791), p. 56–59.

Bristow, C. (2009): Ground penetrating radar in aeolian dune sands. *In*: Harry M. Jol (editor), Ground Penetrating Radar Theory and Applications. Elsevier Science, Oxford, p. 273-297.

Brown, B.A. (2012): Hydrofrac sand mining in Wisconsin: The resource and the issues; Wisconsin Geological and Natural History Survey, PowerPoint Presentation, 9 February 2012, < available on 20 September, 2015 at https://wiswcsdotorg.files.wordpress.com/2012/11/brown.pdf >.

Brown, B.A. (2014): Hydrofrac sand in Wisconsin: Wisconsin Geological and Natural History Survey, accessed January 30, 2014, at http://monroe.uwex.edu/files/2012/02/Frac_sand_in_Wisconsin1.pdf.

Benson, M.E. and Wilson, A.B. (2015): Frac sand in the United States – A geological and industry overview; U.S. Department of the Interior, U.S. Geological Survey, Open-File Report 2015–1107, 88 p.

Canadian Association of Energy Contractors (2025): CAOEC 2024/25 Drilling and Service Rig Forecast, November 2024, < Available on January 30, 2025, at: https://caoec.ca/rig_forecast >.

Canadian Energy Research Institute (2016): Canadian crude oil and natural gas production and supply costs outlook (2016-2036); Study No. 159, September, 2016, < Available on January 29, 2025 at: https://natural-resources.canada.ca/sites/nrcan/files/energy/energy-resources/CERI_Study_159_Full_Report.pdf >.

Capstone Headwaters Research (2020): Q1 2020 Frac sand industry financials, July 3, 2020, < Available on 16 December 2020 at: https://www.linkedin.com/pulse/q1-2020-frac-sand-industry-financials-day-reckoning-has-joel-schneyer/?trackingId=QTmeoJJ2Slez9dNhWOlG8Q%3D%3D >.

Clayton, L. and Attig, J.W. (1990): Geology of Sauk County, Wisconsin; Wisconsin Geological and Natural History Survey Information Circular 67, 68 p.

Eccles, D.R., Nicholls, S. and Hough, R. (2015): Technical Report, Indicated and Inferred Resource Estimate for Source Energy Services Silica sand Sumner Deposit in Wisconsin, U.S.; Technical Report prepared for Source Energy Services, effectively dated of 16 December 2015, 145 p.

Eccles, D.R., Nicholls, S. and Farmer, R. (2017): Technical Report, Indicated and Inferred Resource Estimates for Source Energy Services Ltd.'s Sumner Silica Sand Mine and Property in Wisconsin, United States; Technical Report prepared for Source Energy Services, effectively dated 1 December 2017, 157 p.

Eccles, D.R., Nicholls, S. and Farmer, R. (2018): Technical Report, 2018 Indicated and Inferred Resource Estimates for Source Energy Services Ltd.'s Sumner Silica Sand Mine and Property in Wisconsin, United States; Technical Report prepared for Source Energy Services, effectively dated 1 December 2018, 150 p.

Dott, R.H., Jr. (2003): The importance of eolian abrasion in supermature quartz sandstones and the paradox of weathering on vegetation-free landscapes; Journal of Geology, v. 111, p. 387–405.

Dott, R.H., Jr., Byers, C.W., Fielder, G.W., Stenzel, S.R., and Winfree, K.E. (1986): Aeolian to marine transition in Cambro-Ordovician cratonic sheet sandstones of the northern Mississippi Valley, U.S.A.; Sedimentology, v. 33, p. 345–367.

Gapinske, T. (2015): 2015 Drilling observations and borehole logging, Vincent Property; Memorandum prepared for Source Energy Services by Foth Infrastructure & Environment, LLC, 4 p.

Global Information (2025): Proppants - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030); Published January 5, 2025, < Available on January 23, 2025 at: https://www.giiresearch.com/report/moi1629774-proppants-market-share-analysis-industry-trends.html >.

Grandjean, G., Paillou, P., Dubois, P., August, T., Baghdadi, N. and Achache, J. (2001): Subsurface structures detection by combining L-band polarimetric SAR and GPR data: example of the Pyla dune (France), IEEE Trans. Geosci. Remote Sens., 39(6), p. 1245–1258.

Gulbranson, B., Anderson, R. and Johnson, B. (2015): Expansion update summary of November 2014 drilling, Sumner Township, Barron County Wisconsin, Summit Project #2217-0001; Report prepared by Summit Envirosolutions Inc. for Source Energy Services, 70 p.

Hickin, A.S., Ferri, Fil, Ferbey, Travis, and Smith, I.R. (2010): Preliminary assessment of potential hydraulic fracture sand sources and their depositional origin, northeast British Columbia; British Columbia Ministry of Energy, Mines and Petroleum Resources Geoscience Reports 2010, p. 35–91.

IndexBox (2025): Canada – Silica sands (quartz sands or industrial sands) – Market analysis, forecast, size, trends, and insights; < Available on January 29, 2025 at: https://www.indexbox.io/search/silica-sand-price-canada/ >.

International Bureau of Weights and Measures (2006): The International System of Units (SI) (8th ed.), ISBN 92-822-2213-6.

International Standards (2009): ISO 13503-2:2006/Amd.1:2009E: Petroleum and natural gas industries -- Completion fluids and materials -- Part 2: Measurement of properties of proppants used in hydraulic fracturing and gravel-packing operations, 7 p.

Johnson, M.D. (1986): Pleistocene geology of Barron County, Wisconsin; Wisconsin Geological and Natural History Survey, Information Circular 55, 47 p.

Johnson, C.M. and Winter, B.L. (1999): Provenance analysis of lower Paleozoic cratonic quartz arenites of the North American mid-continent region—U-Pb and Sm-Nd isotope geochemistry; Geological Society of America Bulletin, v. 111, no. 11, p. 1723–1738.

Kelly, J.L. (2006): Silcrete in the St. Peter Sandstone; Madison, University of Wisconsin, M.S. thesis, 124 p.

Kelly, J.L., Fu, Bin, Kita, N.T., and Valley, J.W. (2007): Optically continuous silcrete quartz cements of the St. Peter Sandstone—High precision oxygen isotope analysis by ion microprobe; Geochimica et Cosmochimica Acta, no. 71, p. 3812–3832.

Ketner, K.B. (1979): High-purity silica sand of Middle Ordovician age in the Midwestern states; Department of the Interior, United States Geological Survey, Miscellaneous Field Studies Map 1097, Scale 1:1 000 000.

Konstantinou, Alexandros, Wirth, K.R., Vervoort, J.D., Malone, D.H., Davidson, Cameron, and Craddock, J.P. (2014): Provenance of quartz arenites of the early Paleozoic Mid-continent region, USA; Journal of Geology, v. 122, p. 201–216.

Lahann, R., Medina, C., Rupp, J., Lovell, R., Bowen, B., Barnes, D., Hickman, J., Bandy, R. and Sminchak, J. (2012): A Regional Lithostratigraphic Model of the Eau Claire Formation (Cambrian): How Much Shale is in the Confining Unit?; Adapted from poster presentation given at AAPG Eastern Section meeting, Cleveland, Ohio, 22-26 September 2012.

Mai, H, and Dott, R.H., Jr. (1985): A subsurface study of the St. Peter Sandstone in southern and eastern Wisconsin; Wisconsin Geological and Natural History Survey Information Circular 47, 26 p.

Mammoth Energy Services Inc. (2022): Mammoth Energy announces two sand supply agreements; News Release, dated November 1, 2022, < Available on February 4, 2025 at: https://ir.mammothenergy.com/news-events/press-releases/detail/102/mammoth-energy-announces-two-sand-supply-agreements >.

Mammoth Energy Services Inc. (2025a): Company website home page, < Available on February 4, 2025, at: https://www.mammothenergy.com/oilfield-services/natural-sand-proppant/ >.

Mammoth Energy Services Inc. (2025b): Mammoth Energy Services Inc. 2023 Annual Report, Form 10-K, December 31, 2023, < Available on February 5, 2025, at: https://ir.mammothenergy.com/sec-filings/annual-reports/content/0001679268-24-000021/0001679268-24-000021.pdf >. Morey, G.B. (1972): Pre-Mount Simon regolith, In: Sims, P.K., and Morey, G.B. (eds.), Geology of Minnesota—A centennial volume: Minnesota Geological Survey, p. 506–508.

Mossler, J.H. (2008): Paleozoic stratigraphic nomenclature for Minnesota; Minnesota Geological Survey Report of Investigations 65, 76 p.

MMR (2025): Proppant Market – Global Industry Analysis and Forecast (2024-2030); Report ID 14899 published June 2024, < Available on January 24, 2025 at: https://www.maximizemarketresearch.com/market-report/global-proppant-market/14899/ >.

Mudrey, M.G., Jr., LaBerge, P.E., Myers, P.E., and Cordua, W.S. (1987): Bedrock geology of Wisconsin, northwest sheet; Wisconsin Geological and Natural History Survey Map 87-11a, scale 1:250,000.

Odom, I.E. (1975): Feldspar—grain size relations in Cambrian arenites, Upper Mississippi Valley; Journal of Sedimentary Petrology, v. 45, no. 3, p. 636–650.

Odom, I.E. (1978): Mineralogy of Cambrian sandstones, upper Mississippi Valley: Wisconsin Geological and Natural History Survey Field Trip Guidebook 3, p. 23–45.

Ostrom, M.E. (1966): Cambrian stratigraphy in western Wisconsin; Wisconsin Geological and Natural History Survey, Information Circular 7, 79 p.

Ostrom, M.E. (1967): Paleozoic stratigraphic nomenclature for Wisconsin; Wisconsin Geological and Natural History, Survey Information Circular 8, 1 sheet.

Ostrom, M.E. (1971): Preliminary report on results of physical and chemical tests of Wisconsin silica sandstones; Wisconsin Geological and Natural History Survey Information Circular 18, 61 p.

PacWest Consulting Partners (2014): Proppant market analysis, First quarter 2014 release: PacWest Consulting Partners, Houston, Tex., 105 p.

PacWest Consulting Partners (2015): ProppantIQ Market Outlook, Third quarter 2015: PacWest Consulting Partners, Houston, TX, < available 8 October 2015 at http://pacwestcp.com/market-outlook/proppantiq/ >.

Palmer, A.R. (1981): Subdivision of the Sauk sequence. In: M. E. Taylor, (ed.), Short papers for the 2nd International Symposium on the Cambrian System; U.S. Geologica.

PanXchange (2022): Sand market analysis; PanXchange benchmarks and analysis, Available on January 15, 2022 at: https://panxchange.com/panxchange-sand-benchmarks-analysis/ >.

Rapier, R. (2022): An expert's take on energy markets in 2022; Oil Price.com, < Available on January 15, 2022 at: https://oilprice.com/Energy/Energy-General/An-Experts-Take-On-Energy-Markets-In-2022.html >.

Research and Markets (2025): Proppants Market - Forecasts from 2025 to 2030; Report No. 4849684 published December 2024, < Available on January 23, 2025 at: https://www.researchandmarkets.com/reports/4849684/proppants-market-forecasts-from-2025-to-2030?srsltid=AfmBOorW6dB7ldeanh28nZ00JfuodI0lS7n5D7BnyRT1lnFCQA9B8Wvi >.

Runkel, A.C. (1994): Deposition of the uppermost Cambrian (Croixan) Jordan Sandstone, and the nature of the Cambrian–Ordovician boundary in the upper Mississippi Valley; Geological Society of America Bulletin v. 106, p. 492–506.

Runkel, A.C. (1998): Paleozoic rocks in the northern part of the central mid-continent of North America, (extended abs.); Institute on Lake Superior Geology Proceedings, 44th Annual Meeting, Minneapolis, Minnesota, 1998, v. 44, p. 25–32.

Runkel, A.C. (2007) High-resolution sequence stratigraphy of lower Paleozoic sheet sandstones in central North America: The role of special conditions of cratonic interiors in development of stratal architecture. Geological Society of America Bulletin, 119(7-8), 860-881.

Runkel, T. and Steenberg. (2012): Silica sand-rich bedrock layers in the Minnesota, Wisconsin and Iowa Region of the central Mid-continent: Overview. In: Field guidebook on the silica sand resources of western Wisconsin, Conference on the silica sand resources of Minnesota and Wisconsin, October 1-3, 2012, 46 p.

Runkel, A.C., McKay, R.M., Cowan, C.A., Miller, J.F. and Taylor, J.F. (2012): The Saulk megasequence in the cratonic interior of North America: Interplay between a fully developed inner detrital belt and the central great carbonate bank; In: J.R. Derby, R.D Fritz, S.A. Longacre, W.A. Morgan and C.A. Sternbach (eds), The Great American Carbonate Bank: The geology and economic resources of the Cambrian-Ordovician Saulk megasequence of Laurentia; AAPG Memoir 98, p. 1001-1011.

Rystad Energy (2024): US L48 – Frac sand market trends; Barite & oilfield mineral conference, June 2024, < Available on January 29, 2025 at: https://imformed.com/wp-content/uploads/2024/06/JACOB-Barite-Oilfield-Minerals-Forum-2024-IMFORMED.pdf >.

Schenk, C.J., Gautier, D.L., Olhoeft, G.R. and Lucius, J.E. (1993): Internal structure of an aeolian dune using ground-penetrating radar, Int. Assoc. Sedimentologists (Spec. Publ. no. 16), 16, p. 61–69.

Schneyer, J. (2019): Q3 2019 Frac Sand Financials – industry facing continued headwinds with too much installed capacity and shale drilling slowdown; Capstone Headwaters, < Available on 23 November 2019 at: https://www.linkedin.com/pulse/q3-2019-frac-sand-financials-industry-facing-too-much-joel-schneyer/ >.

Source Energy Services Ltd. (2014a): Source Energy Services Opens Weyerhaeuser Frac Sand Facility; Source Energy Services News Release, June 2, 2014, < Available on 2 October 2015 at: http://sourceenergyservices.com/news/ >.

Source Energy Services Ltd. (2014b): First Unit Train of Sand Received in the WCSB; Source Energy Services News Release, June 4, 2014, < available on 2 October 2015 at: http://sourceenergyservices.com/news/ >.

Source Energy Services Ltd. (2014b): Source Energy Services continuing to expand its WCSB frac sand distribution network; Source Energy Services News Release, February 17, 2015, < Available on 2 October 2015 at: http://sourceenergyservices.com/news/ >.

Source Energy Services Ltd. (2014c): Source Energy Services continuing to expand its WCSB frac sand distribution network; Source Energy Services News Release, February 17, 2015, < Available on 2 October 2015 at: http://sourceenergyservices.com/news/ >.

Source Energy Services Ltd. (2015): Source Energy Services announces new Fox Creek Terminal; Source Energy Services News Release, October 27, 2015, < Available on 27 October 2015 at: http://sourceenergyservices.com/press/source-energy-services-announces-new-fox-creek-terminal/>.

Source Energy Services Ltd. (2017a): Source Energy Services Ltd. files Preliminary Prospectus for initial public offering of common shares; Source Energy Services News Release, February 13, 2017, < Available on 15 July 2017 at: http://sourceenergyservices.com/press/source-energy-services-ltd-files-preliminary-prospectus-initial-public-offering-common-shares/>.

Source Energy Services Ltd. (2017b): Source Energy Services Ltd. prices initial public offering and files final prospectus, April 7, 2017, < Available on 15 July 2017 at:

http://sourceenergyservices.com/press/source-energy-services-prices-initial-public-offering-files-final-prospectus/>.

Source Energy Services Ltd. (2017c): Source Energy Services Ltd. completes acquisition of Sand Products; Source Energy Services News Release, April 18, 2017, < Available on 15 July 2017 at: http://sourceenergyservices.com/press/source-energy-services-ltd-completes-acquisition-sand-products/>.

Source Energy Services Ltd. (2017d): Source Energy Services Ltd. provides an update and announces upcoming earnings release; Source Energy Services News Release, July 11, 2017, < Available on 20 July 2017 at: http://sourceenergyservices.com/press/source-energy-services-provides-update-announces-upcoming-earnings-release/ >.

Source Energy Services Ltd. (2023): Management Discussion and Analysis for the 3 and 12 months ended December 31, 2022; 27 p., < Available at www.sedarplus.ca/landingpage/ >

Source Energy Services Ltd. (2024a): Q3 2024 Management's Discussion & Analysis for the three and nine months ended September 30, 2024, 21 p. < Available on January 24, 2025, at www.sedar.com >.

Source Energy Services Ltd. (2024b): Source Energy Services Reports Q3 2024 Results; News Release dated November 6, 2024, < Available on January 24, 2025 at: https://www.sourceenergyservices.com/news-releases/source-energy-services-reports-q3-2024-results >.

Source Energy Services Ltd. (2024c): Source Energy Services Announces a Partnership with Trican Well Service Ltd. to Develop a Terminal in Taylor, BC; News Release dated July 25, 2024, < Available on January 24, 2025 at: https://www.sourceenergyservices.com/news-releases/source-energy-services-announces-a-partnership-with-trican-well-service-ltd-to-develop-a-terminal-in-taylor-bc >.

Source Energy Services Ltd. (2024d): Source Energy Services Announces Acquisition of Sand Trucking Assets; News Release dated March 13, 2024, < Available on January 24, 2025 at: https://www.sourceenergyservices.com/news-releases/source-energy-services-announces-acquisition-of-sand-trucking-assets >.

Sloss, L.L. (1963): Sequences in the cratonic interior of North America; Geological Society of America Bulletin, v. 74, p. 93–113.

Syverson, K.M., and Colgan, P.M. (2004): The Quaternary of Wisconsin—A review of stratigraphy and glaciation history, In: Ehlers, J., and Gibbard, P.L. (eds)., Quaternary glaciations— Extent and chronology, Part II, North America, Developments in Quaternary science, 2; Amsterdam, The Netherlands, Elsevier B.V., p. 295–310.

Syverson, K.M., Clayton, Lee, Attig, J.W., and Mickelson, D.M., Editors. (2011): Lexicon of Pleistocene stratigraphic units of Wisconsin; Wisconsin Geological and Natural History Survey Technical Report 1, 180 p.

Thiel, G.A. (1957): High-Silica Sands of Minnesota: Minnesota Geological Survey Summary Report No. 9, 33 p.

Thomas, D.A. (1992): Lithostratigraphy, petrology, diagenesis, and environments of deposition of the Upper Cambrian Jordan Sandstone: Duluth, Minnesota, University of Minnesota, M.S. thesis, 206 p.

Trading Economics (2025a): Crude oil; < Available on January 29, 2025, at: https://tradingeconomics.com/commodity/crude-oil >.

Trading Economics (2025b): Natural gas; < Available on January 29, 2025, at: https://tradingeconomics.com/commodity/natural-gas >. TriWest Capital Partners (2013): Triwest Capital Partners announces investment in Source Energy Services; Triwest Capital Partners Press Release, December 5, 2013 < Available 2 October 2015 at: http://triwest.ca/triwest-capital-partners-announces-investment-in-source-energy-services/ >.

U.S. Census Bureau (2015): State and County Quick Facts. Data derived from Population Estimates, American Community Survey, Census of Population and Housing, State and County Housing Unit Estimates, County Business Patterns, Non-employer Statistics, Economic Census, Survey of Business Owners, Building Permits Last Revised: Wednesday, 05-Aug-2015 09:17:01 EDT.

U.S. Energy Information Administration (2016): Crude Oil, WTI Spot Price FOB, Monthly, June 29, 2016, < Available on January 23, 2025 at: http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rwtc&f=m >.

Visocky, A.P., Sherrill, M.G., and Cartwright, K. (1985): Geology, hydrology, and water quality of the Cambrian and Ordovician Systems in northern Illinois: Illinois State Geological Survey and Illinois State Water Survey Cooperative Groundwater Report 10, 136 p.

Vriend, N.M., Hunt, M.L., Clayton, R.W., Brennen, C.E., Brantley, K.S. and Ruiz-Angulo, A. (2007): Solving the mystery of booming sand dunes, Geophysical Research Letters, v. 34(16), p. 1-6.

Winfree, K.E. (1983): Depositional environments of the St. Peter Sandstone of the upper Midwest; Madison, University of Wisconsin, M.S. thesis, 114 p.

Wisconsin Department of Natural Resources (2012): Silica Sand Mining in Wisconsin; Wisconsin Depart of Natural Resources, 43 p.

Wisconsin Department of Natural Resources (2025): Air Management Data Viewer, https://dnr.wisconsin.gov/topic/AirPermits/AMDV.html.

Wisconsin Department of Natural Resources (2025): Air Management Data Viewer (2025), Facility Information for 627007260 BADGER MINING CORP-TAYLOR PLANT, < Available on February 4, 2025, at: Permit Tracking >.

Wisconsin Department of Regulation and Licensing (2015): Real Estate Contractual Forms: WB-11 Residential Offer to Purchase; WB-13 Vacant Land Offer to Purchase, < Available 13 October 2015 at: http://drl.wisconsin.gov/LicensesPermitsRegistrations/Credentialing-Division-Home-Page/Business-Professions/Real-Estate-Home/Real-Estate-Broker/Real-Estate-Contractual-Forms >.

Wisconsin Geological and Natural History Survey (2011): Bedrock stratigraphic units in Wisconsin; Educational Series 51, 2 p.

WisconsinWatch.org (2012): Frac sand boom creates thousands of jobs, < Available 9 October 2015 at: http://wisconsinwatch.org/2012/08/sand-boom-creates-jobs/ >.

Young, H.L. (1992): Summary of ground-water hydrology of the Cambrian-Ordovician aquifer system in the northern Midwest, United States; U.S. Geological Survey Professional Paper 1405–A, 55 p.

Zdunczyk, M. (2007): The facts of frac: Industrial Minerals Journal, no. 1, p. 58–61.

28 Certificate of Author

I, D. Roy Eccles, P. Geol., do hereby certify that:

1. I am a Senior Consulting Geologist and Operations Manager of APEX Geoscience Ltd., 110, 8429-24 Street, Edmonton, Alberta T6P 1L3.
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 (APEGA) of Alberta since 2003.
4. I have worked as a geologist for more than 30 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, specialty and rare-earth element mineral projects and deposits in Canada. This experience includes silica sand exploration and resource estimations in western Canada and northeastern United States.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I am responsible for and have supervised the preparation of the "*Technical Report, 2024 Indicated and Inferred Resource Estimates update due to conventional annual mining: Source Energy Services Ltd.'s Sumner Silica Sand Mine and Property in Wisconsin, United States"*, with an effective date of 31 December 2024 (the "Technical Report). I last visited the Sumner Property on November 5th, 2018, and can verify the silica sand mineralization, and operations at the Sumner Mine.
7. To the best of my knowledge, information and belief, the Technical 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 issuer, the vendor and the Property applying to all the tests in section 1.5 of both NI 43-101 and 43-101CP.
10. I have prepared annual mineral resource updates (and associated Technical Reports) as part of the producing Issuers Annual Information Form.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective Date: 31 December 2024
Signing Date: 25 February 2025
Edmonton, Alberta, Canada

74150
PROFESSIONAL GEOLOGIST ALBERTA
D. ROY ECCLES
25 FEB 2025

PERMIT TO PRACTICE
APEX GEOSCIENCE LTD.
RM SIGNATURE:
RM APEGA ID #: 74150
DATE: 25 FEB 2025
PERMIT NUMBER: P005824
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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

I, Robert J. Farmer, P. Eng., do hereby certify that:

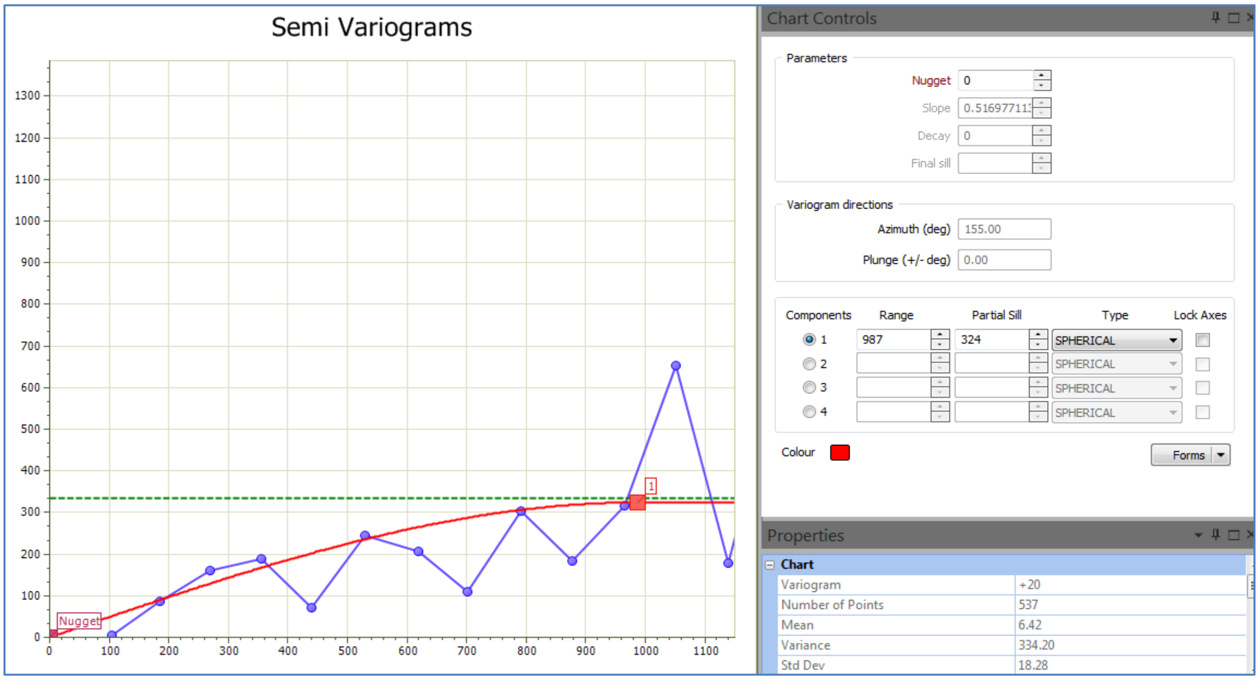
1. I am a Vice President of John T. Boyd Company, 4000 Town Center Boulevard, Suite 300 Canonsburg, PA, United States 15317.
2. I graduated in 1994 with a B.Sc. in Mining Engineering from Queen's University, Kingston, Ontario.
3. I am and have been registered with Professional Engineers Ontario since 2000. I am and have been a Registered Member of the Society for Mining, Metallurgy, and Exploration (SME) since 2007.
4. I have worked as a Mining Engineer for more than 30 years since my graduation from university and have extensive knowledge of computerized geologic modeling, mineral resource, and reserve estimation, underground and surface mine design and operations, production scheduling, and financial modeling. Deposit and mine commodity expertise includes coal, industrial minerals, base metals, and gold.
5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 16-21 of the "*Technical Report, 2024 Indicated and Inferred Resource Estimates update due to conventional annual mining: Source Energy Services Ltd.'s Sumner Silica Sand Mine and Property in Wisconsin, United States"*, with an effective date of 31 December 2024 (the "Technical Report). I visited the Sumner Property on December 5th, 2017.
7. To the best of my knowledge, information and belief, the Technical 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 issuer, the vendor and the Property applying to all the tests in section 1.5 of both NI 43-101 and 43-101CP.
10. I have not had any prior involvement with the Property that is the subject of the Technical Report.
11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files or their websites.

Effective Date: 31 December 2024
Signing Date: 25 February 2025
Canonsburg, Pennsylvania, United States of America

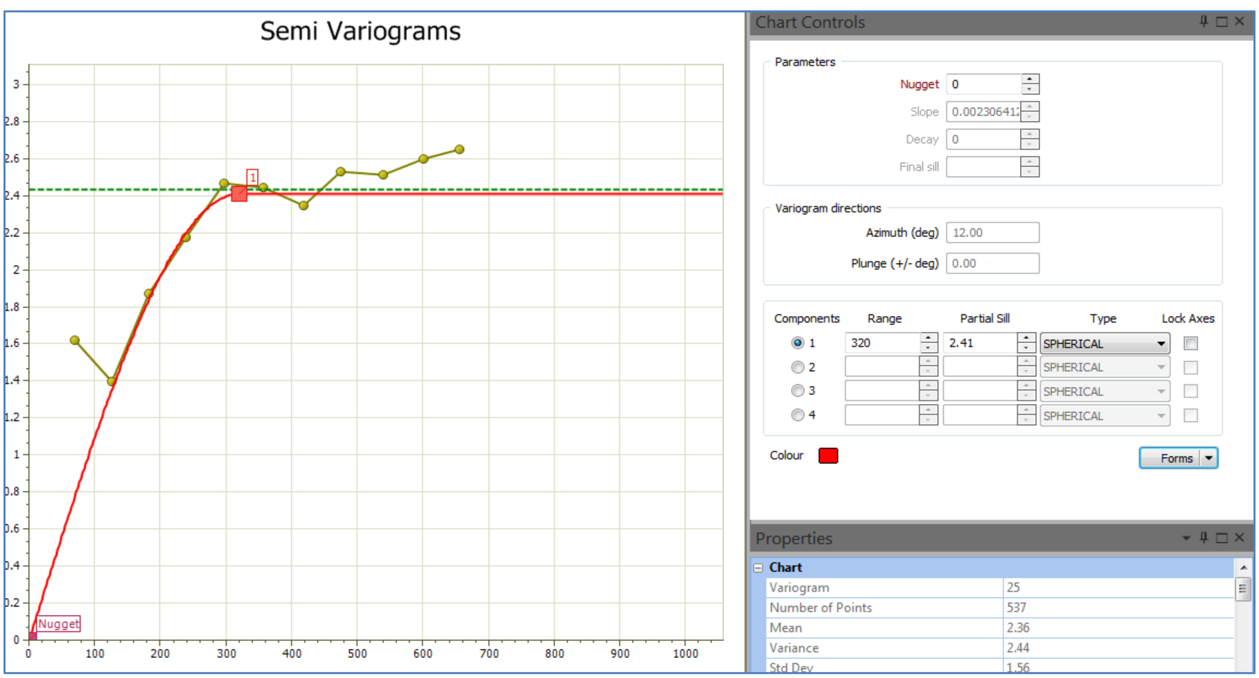
Robert J. Farmer, B.Sc., P. Eng.

Appendix 1. Wonewoc Formation Variography.

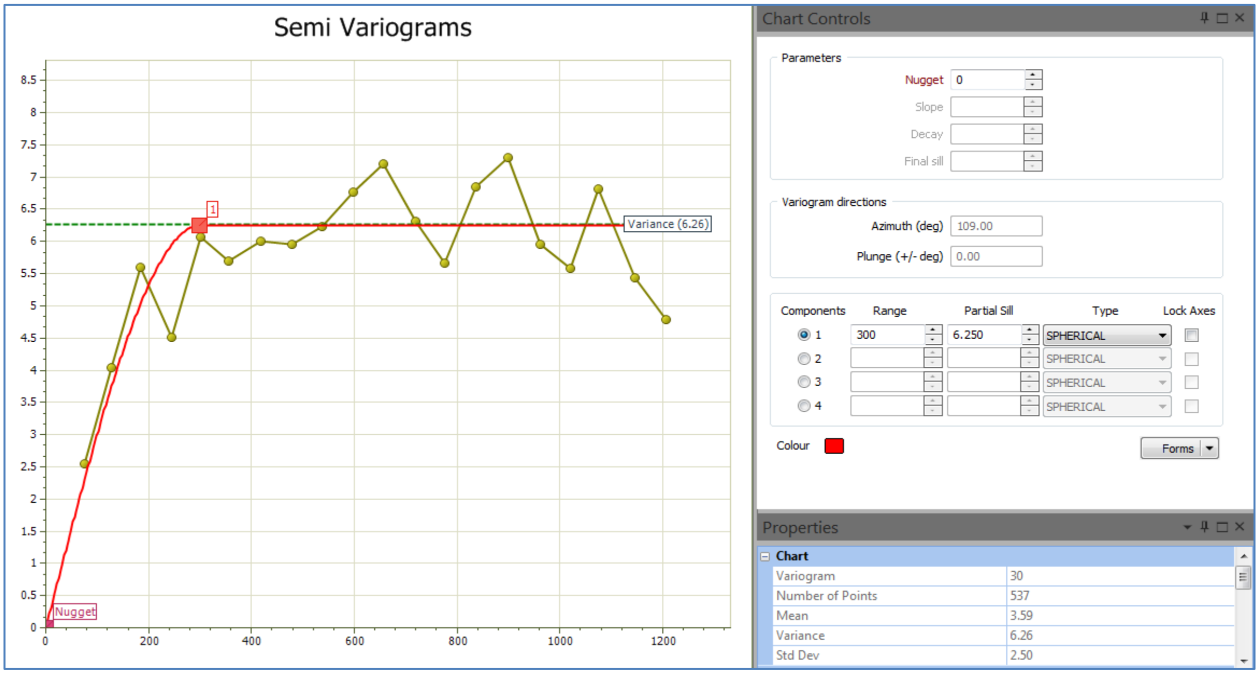
Direction 1, +20 mesh size fraction.



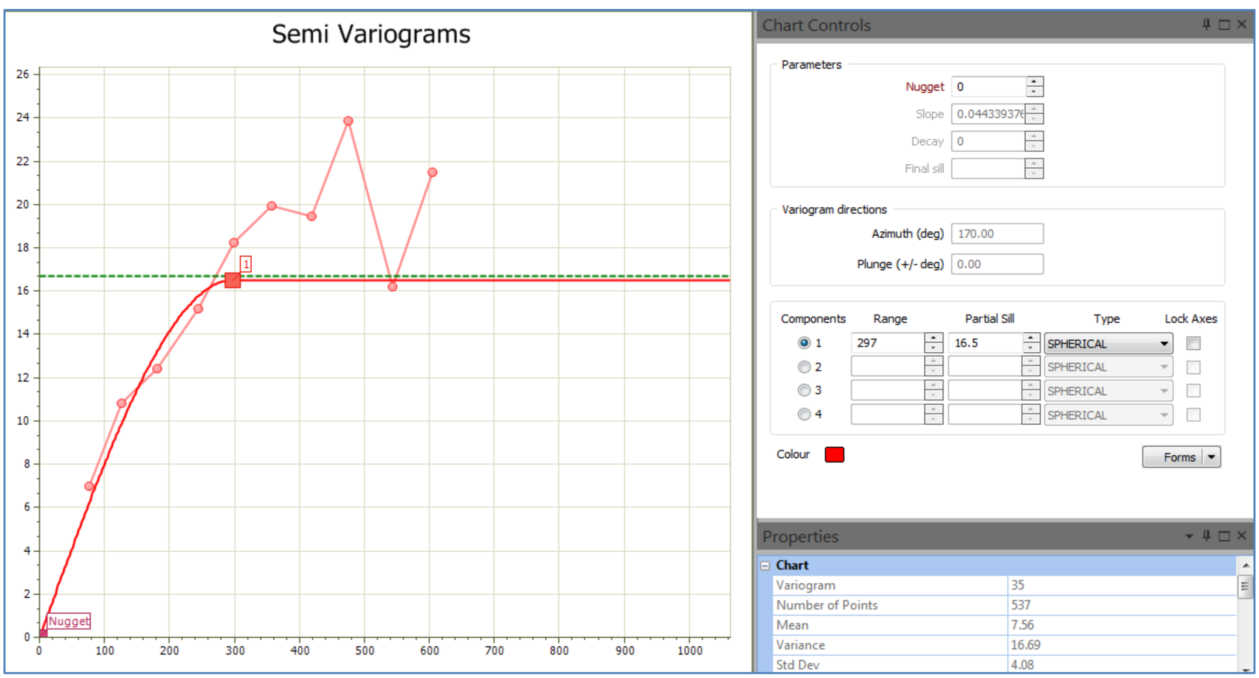
Direction 1, 25 mesh size fraction.



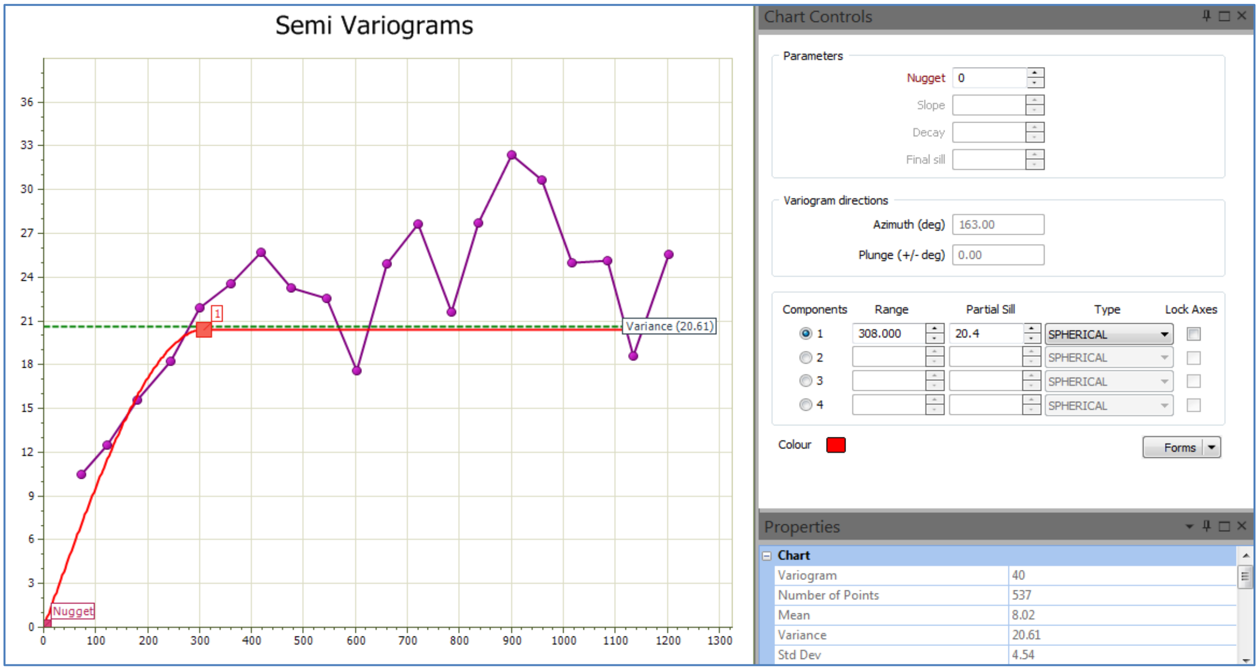
Direction 1, 30 mesh size fraction.



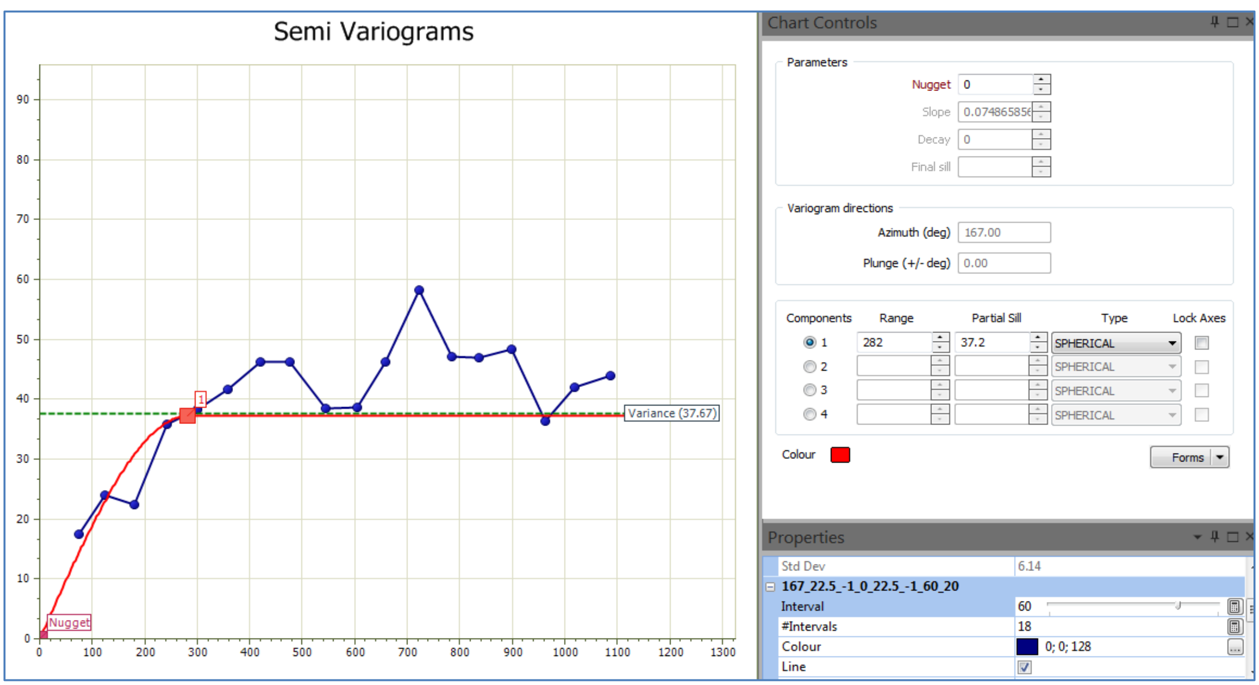
Direction 1, 35 mesh size fraction.



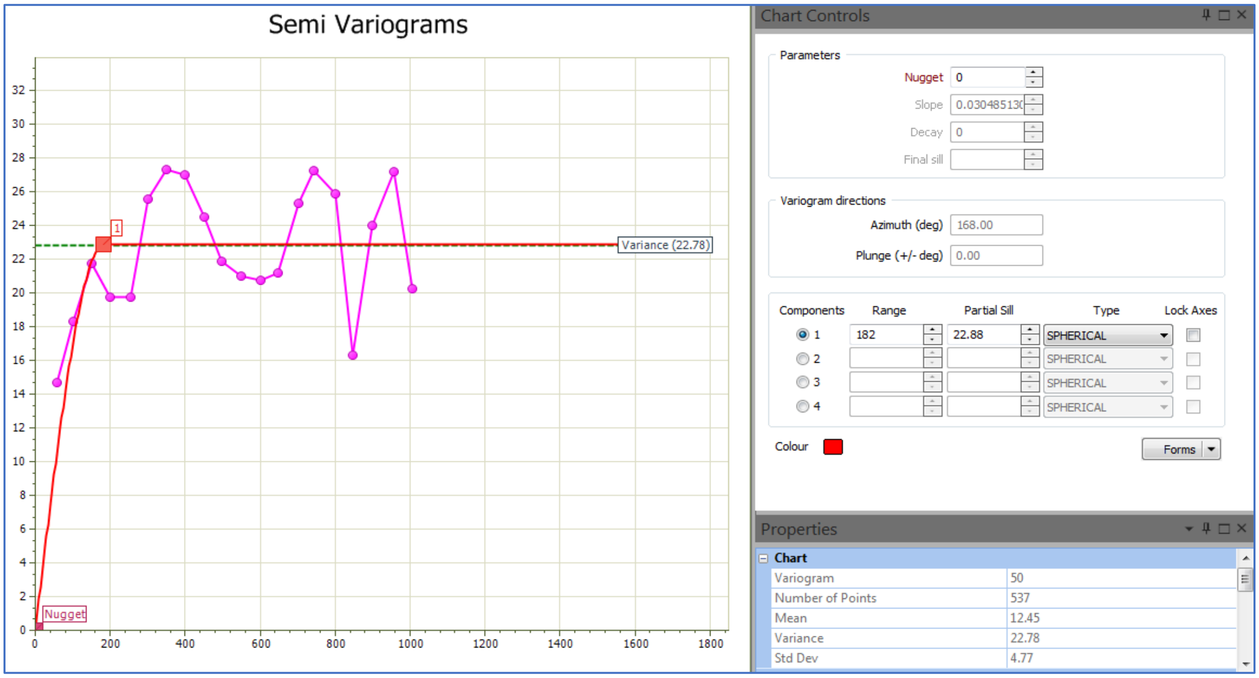
Direction 1, 40 mesh size fraction.



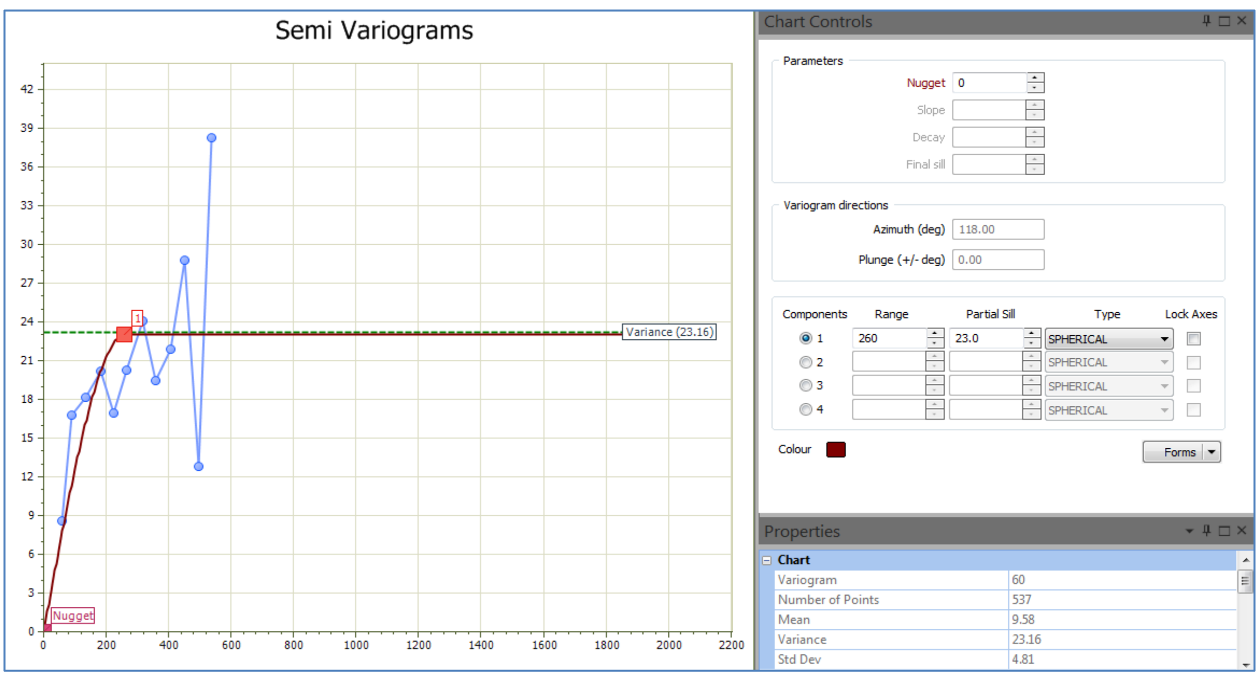
Direction 1, 45 mesh size fraction.



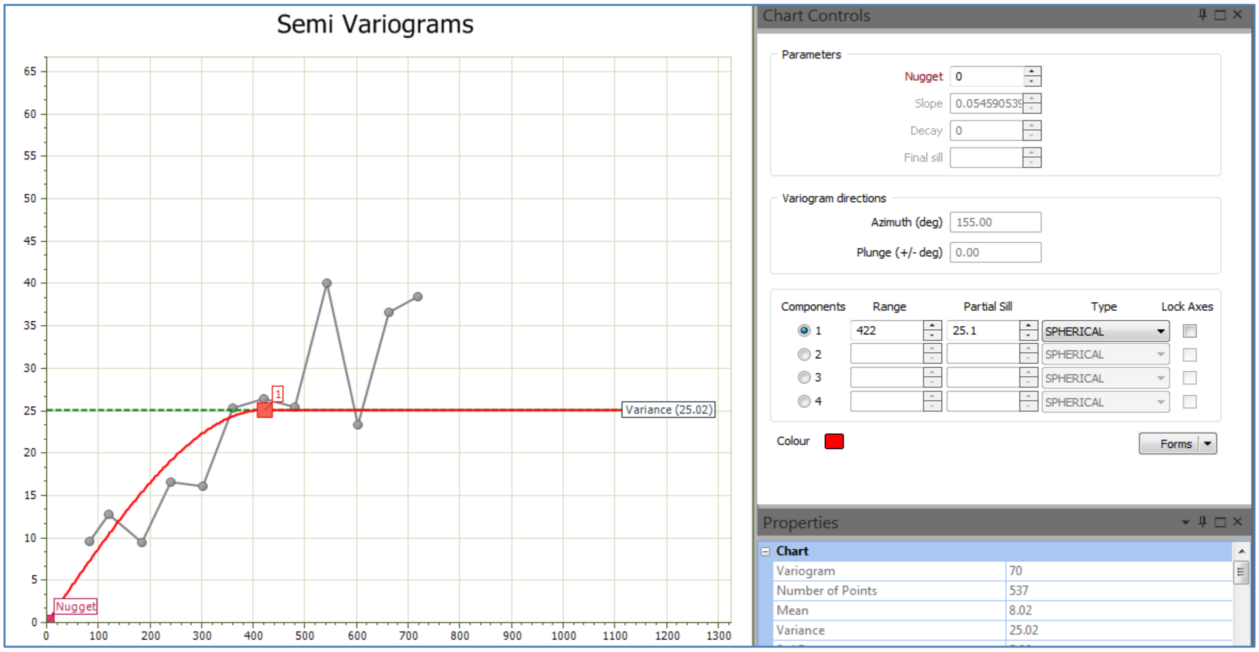
Direction 1, 50 mesh size fraction.



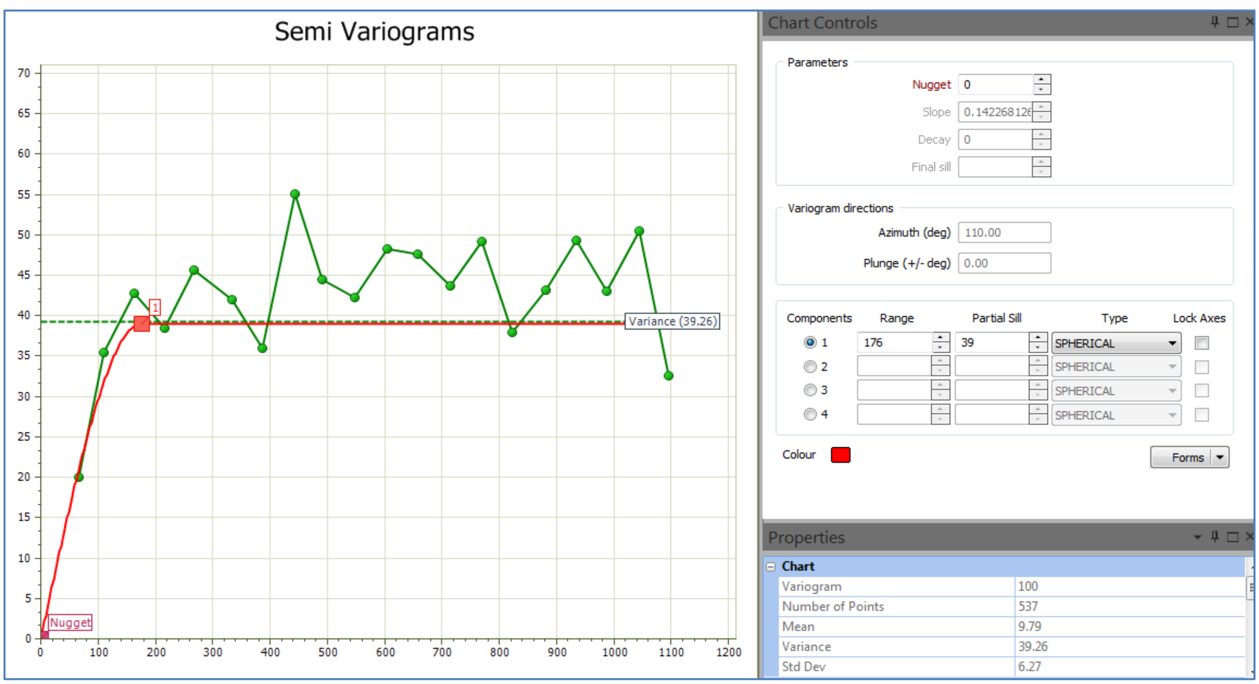
Direction 1, 60 mesh size fraction.



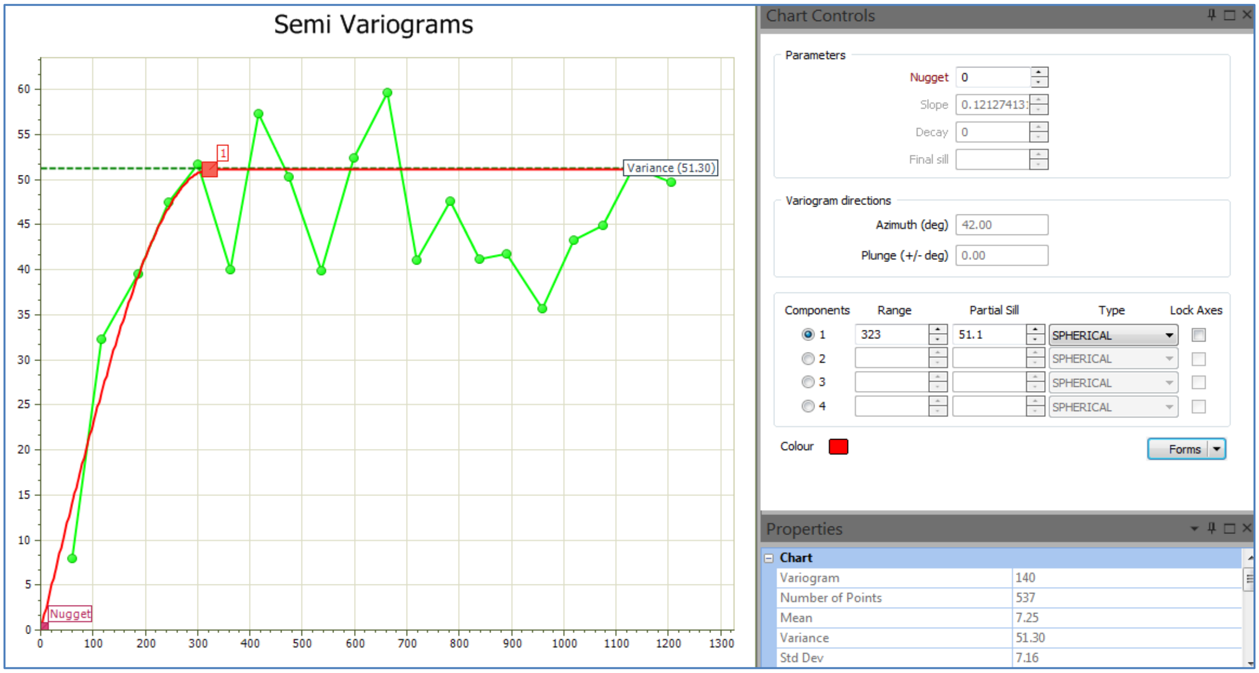
Direction 1, 70 mesh size fraction.



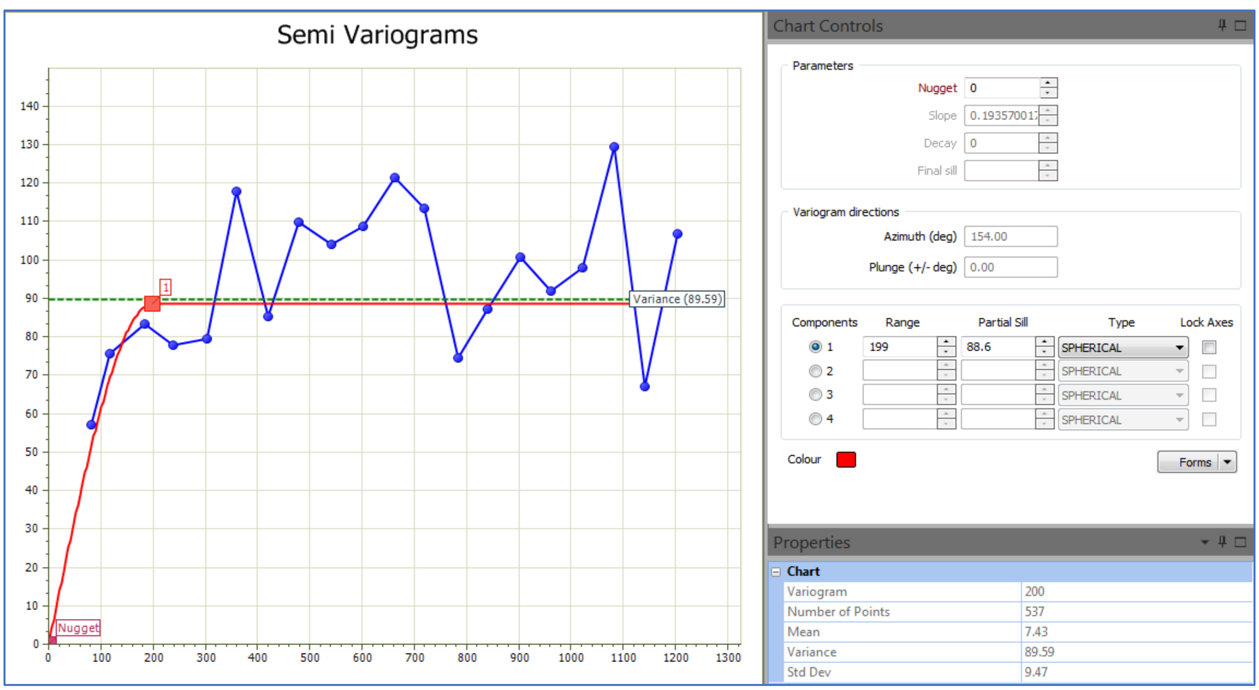
Direction 1, 100 mesh size fraction.



Direction 1, 140 mesh size fraction.



Direction 1, 200 mesh size fraction.



Direction 1, Pan size fraction.