National Instrument 43-101 Technical Report, Updated Mineral Resource and Mineral Reserve Estimate for the Timmins West Mine Property, Bristol Township, Timmins, Ontario, Canada

NTS: 42-A-05

Longitude: 81.55° West, Latitude: 48.32° North

UTM (NAD 83, Zone17): 458,915m East, 5,359,043m North

Effective date: June 30, 2021

Prepared by:

Eric Lachapelle, P. Eng., Manager, Technical Services

Al Mainville, P. Geo., Geology Manager

Dave Felsher, , P. Eng., Mill Manager

Table of Contents

Figures

Tables

1 Summary

Pan American Silver Corp. ("Pan American" or the "Company"), through its wholly owned subsidiary, Lake Shore Gold Corporation ("LSG"), owns and operates the Timmins West Mine ("TWM") in Ontario, Canada. The TWM is comprised of three deposits: the Timmins Deposit, Thunder Creek Deposit, and 144 Gap Deposit which are Archean-age gold deposits within the Abitibi subprovince of Canada.

1.1 Property Description and Ownership

This technical report (the "Report" or "Technical Report") refers to the TWM, an underground gold mine located in Bristol Township, Timmins, Ontario, Canada. Pan American is the 100% owner of the property (the "Property" as outlined in Figure 4.1) through its wholly owned subsidiary, LSG.

1.2 Geology and Mineralization

The TWM includes the Timmins, Thunder Creek, and 144 Gap Deposits, all of which occur along the 144 Trend, a broad structural corridor that extends to the southwest from the Timmins Deposit area. This corridor generally coincides with the northeast trending contact zone between southeast facing mafic metavolcanic rocks of the Tisdale Assemblage (to the northwest) and dominantly southeasterly facing metasedimentary rocks of the Porcupine Assemblage (to the southeast). The contact dips steeply to the northwest and is modified, and locally deflected by folds and shear zones that are associated with gold mineralization.

Gold mineralization occurs in steep north-northwest plunging zones which occur within, or along favorable lithostructural settings in proximity (within hundreds of metres ("m")) to the 144 Trend and related structures (i.e. Holmer and Rusk Shear Zones). Mineralization comprises multiple generations of quartz-carbonate-tourmaline ± albite veins, associated pyrite alteration envelopes, and disseminated pyrite mineralization. Textural evidence suggests that veining formed progressively through D3 and D4 deformation events. All phases of gold-bearing veins cut and post-date the Alkalic Intrusive Complex ("AIC") and syenitic to monzonitic intrusions, although mineralization is often spatially associated with, and ore preferentially developed within, these intrusive suites (Rhys, 2010).

1.3 Status of Exploration, Development, and Operations

Near mine exploration takes place annually and includes testing undrilled areas of the deposit at depth and along strike, as well as infill drilling to upgrade the confidence categories assigned to the mineral resource and mineral reserve estimates. Drilling at the Timmins Deposit involved testing from both surface and underground locations to evaluate its extensions below the 1,315 metre Level ("L"). Exploration along the 144 Trend included drilling designed to continue testing of the 144 Southwest target, approximately 1.6 kilometre (“km”) southwest of the 144 Gap Deposit, as well as new areas over 1km to the southwest along the 144 Offset target trend. Work on these targets is now complete for 2021 but information is currently being reviewed for possible follow-up drilling in 2022.

The existing infrastructure includes the typical components of an operating underground mine, including the mine workings, shaft, hoist room, compressors, workshops, warehouse, offices, water and power lines, access roads, and water storage and treatment facilities.

Mining at TWM utilizes underground longhole stoping methods. Ore from the TWM is processed at the Company’s Bell Creek mill facility (the “Bell Creek Mill”) at a rate of approximately 3,300 tonnes per day (“tpd”) to produce gold-rich doré for sale to bullion banks and metal traders.

LSG reached commercial production at the Timmins and Thunder Creek deposits in January 2011 and January 2012, respectively. In October 2014, LSG announced the discovery of the 144 Gap Deposit, followed by an initial mineral resource estimate in February 2016 and the commencement of production. Through June 30th, 2021, the TWM had produced 1,128,795 ounces of gold from approximately 9.4 million tonnes of ore with an average gold grade of 3.74 grams per tonne (“g/t”).

This Technical Report provides an update of the TWM operations, supports the declaration of mineral resources and mineral reserves, and provides economic parameters from June 30, 2021 onwards.

Highlights of this Report for the TWM include:

- Measured and indicated mineral resources of 0.25 million tonnes at an average gold grade of 3.73 g/t containing 30,100 ounces of gold and 0.97 million tonnes at an average gold grade of 3.32 g/t containing 103,100 ounces of gold, respectively.
- inferred mineral resources of 174,000 tonnes at an average gold grade of 4.36 g/t containing 24,300 ounces of gold.
- Proven and probable mineral reserves of 1.52 million tonnes at an average gold grade of 3.03 g/t containing 148,000 ounces of gold and 4.17 million tonnes at an average gold grade of 2.94 g/t containing 393,400 ounces of gold, respectively.

Mineral resources and mineral reserves stated in this Report have an effective date of June 30, 2021. Unless noted otherwise, mineral resources are reported exclusive of mineral reserves. All currency used is in United States dollars.

1.4 Mineral Resource and Reserve Statements

Mineral Resources

Pan American has prepared an updated mineral resource estimate for the TWM which includes mineralized zones from the Timmins, Thunder Creek and 144 Gap Deposits. The mineral resource estimate for the TWM is based on historical diamond drilling dating back to March 1984 and drilling completed by LSG between July 2003 and April 19, 2021. The database used to estimate the mineral resources at TWM includes data from 9,177 diamond drill holes totaling 1,718 km. The drill hole database has been subjected to verification and is considered to be robust and of adequate quality for the estimation of mineral resources.

The mineral resource estimate for the TWM contains 30,100 ounces of gold classified as measured resources, 103,100 ounces of gold classified as indicated resources, and 24,300 ounces of gold classified as inferred resources. The mineral resource has been depleted for mining up to the effective date of this Report (June 30, 2021). The TWM mineral resource statements is summarized in Table 1.1.

Table 1.1: Timmins West Mine Mineral Resources

In-Situ Resources Above 1.5 g/t Gold Cut-Off Grade				
Deposit	**Classification**	**Tonnes('000)**	**Gold Grade (g/t)**	**Gold Ounces**
Timmins	Indicated	551	3.46	61,200
	Inferred	122	4.92	19,300
Thunder Creek	Indicated	13	4.08	1,700
	Inferred	21	3.21	2,100
144 Gap	Measured	252	3.73	30,100
	Indicated	403	3.10	40,200
	Measured & Indicated	*655*	*3.34*	*70,300*
	Inferred	31	2.93	3,000
Total Timmins West Mine	Measured	252	3.73	30,100
	Indicated	967	3.32	103,100
	Measured & Indicated	*1,219*	*3.40*	*133,200*
	Inferred	174	4.36	24,300

1. The effective date of the mineral resource estimate is June 30, 2021.

2. Mineral resource estimates have been classified according to the Canadian Institute of Mining Metallurgy and Petroleum's "CIM Standards on Mineral Resources and Reserves, Definition and Guidelines" (the "CIM Definitions and Guidelines"), as per Canadian Securities Administrator's NI 43-101 requirements.

3. Mineral resources are reported exclusive of mineral reserves.

4. The mineral resource estimate as at June 30, 2021 was calculated using a block model that was estimated in May 2021 and depleted for mining to April 2021 and from month-end production for May and June 2021.

5. Tonnage information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.

6. The mineral resource estimate was prepared under the supervision of, and verified by, Al Mainville, P. Geo., Geology Manager, LSG, who is a qualified person under NI 43-101.

The mineral resource for the Timmins Deposit is modeled as 88 sub-zones which define the broader mineralized Ultramafic, Footwall and Vein Zones. The Thunder Creek Deposit is divided into 25 sub-zones which define the broader Rusk and Porphyry Zones, while the 144 Gap Deposit is divided into 38 zones comprising the larger East Porphyry and West Porphyry bodies and Mafic Volcanic inclusions.

Estimation was completed using the inverse distance squared (“ID^2”) interpolation method with an anisotropic search. All gold assays were capped with capping limits varying by zone between 10 and 120 g/t. A minimum width of 2.0 m was used for modeling mineralized zones. Only samples within a mineralized zone were used for estimation of the zone.

Several steps were taken in order to review and validate the current block model and reported results which included: comparison of solid and block model volumes, comparison of the block model against diamond drill results, and comparisons with recent production data. No significant issues were identified.

Mineral Reserves

The estimated proven and probable mineral reserves (diluted and recovered) for TWM are summarized in Table 1.2.

Table 1.2: Timmins West Mine Proven and Probable Mineral Reserves

Deposit	Classification	Tonnes(‘000)	Gold Grade (g/t)	Gold Ounces
Timmins	Probable	806	2.90	75,200
Thunder Creek	Probable	22	2.69	1,800
144 Gap	Proven	1,518	3.03	148,000
	Probable	3,345	2.94	316,400
	Proven & Probable	*4,862*	*2.97*	*464,300*
Total Timmins West Mine	Proven	1,518	3.03	148,000
	Probable	4,172	2.94	393,400
	Proven & Probable	*5,690*	*2.96*	*541,300*

1. *The effective date of this report is June 30, 2021. The mineral reserves as at June 30, 2021 were calculated using a block model that was estimated in May 2021 and depleted for mining to April 2021 and from month-end production for May and June 2021.*
2. *The mineral reserve estimates are classified in accordance with the CIM Definitions and Guidelines as per Canadian Securities Administrator's NI 43-101 requirements.*
3. *Mineral reserves are based on a long-term gold price of US$1,450 per ounce and an exchange rate of 1.3 $CAD/$US.*
4. *Mineral reserves are supported by a mine plan that features stope thicknesses that vary per zone, and expected cost levels which change based on the mining methods utilized.*
5. *Mineral reserves incorporate a minimum cut-off grade of 2.0 g/t at 144 and Thunder Creek and 2.2 g/t at Timmins Mine. The cut-off grade includes estimated mining and site G&A costs of US$62.27 per tonne for 144/Thunder Creek and US$71.58 per tonne for Timmins Mine, milling costs of US$19.09 per tonne, trucking costs of US$6.80 per tonne for both deposits, mining recovery of 95%, external dilution of 22% at Timmins Deposit, 15% at Thunder Creek Deposit and 9% at 144 Gap Deposit, and a metallurgical recovery rate of 97.0%.*
6. *Tonnes information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.*
7. *The mineral reserve estimate was prepared under the supervision of, and verified by, Eric Lachapelle, Manager of Technical Services, LSG, who is a qualified person under NI 43-101.*

To estimate the mineral reserves, the measured and indicated mineral resources were isolated from inferred mineral resources and assessments were made of the geometry and continuity of each of the mineralized zones. Geotechnical evaluations were taken into account in the assessment and appropriate mining methods and stope sizes were assigned. Individual stope designs (wireframes) were then created in three dimensions. These stope wireframes were queried against the block models to determine the in-situ mineral resource. This allowed for fair inclusion of internal dilution from both low grade and barren material. Additional factors were assigned for external dilution (with or without grade) depending on the specific mining method and geometry of each stoping unit being evaluated. Finally, a recovery factor was assigned to the overall mineral reserves to allow for in-stope and mining process losses. Stope cut-off grades were estimated to determine which stopes to include in the mineral reserves. Detailed mine development layouts and construction activities were assigned to provide access to each of the stoping units. A detailed life of mine ("LOM") development and production schedule was prepared to estimate the annual tonnes, average grade, and ounces mined to surface. Development, construction, and production costs were estimated and an economic assessment was made comparing the capital and operating expenses required for each area to the expected revenue stream to ensure economic viability.

1.5 Mineral Tenure, Surface Rights, and Royalties

The TWM as defined by the current Timmins West Mine Closure Plan (the "Closure Plan") as of the date of this Report is approximately 1548 hectares ("ha"). The TWM is situated in the south-central portion of Bristol Township stretching southwestwards into the northwestern portion of Thorneloe Township and includes the Timmins, Thunder Creek, and 144 Gap Zone Deposits.

Through patented and leased land, LSG owns 100% of the surface and mining rights of the entire 1548 ha, subject to underlying royalties. The TWM currently consists of 5 leases and 18 patents with a combination of mining and surface rights collectively (Table 4.1).

Over the history of the TWM multiple patents and mining claims have been acquired with several consolidated into leases to facilitate the mining process. Figure 4.3 shows the ownership of royalties relative to underlying agreements on the TWM as of the date of this Report.

1.6 Permits

All of the required provincial, federal and municipal permits, approvals and authorizations have been obtained (and amended from time to time) for the TWM to allow for operations and project development. Closure Plan amendments are ongoing relating to changes in the site's infrastructure. All permits are in good standing.

1.7 Environmental Considerations

LSG has implemented a comprehensive environmental management plan to regularly and systematically monitor surface and groundwater quality, air quality, stream sediment geochemistry, waste rock and tailings geochemistry (ARD monitoring and mitigation), waste disposal practices, reagent handling and storage and reclamation and reforestation progress. As of January 2021, the operations have attained a level A as per the Mining Association of Canada's Towards Sustainable Mining program.

1.8 Mining Operations

The TWM is accessed by a production shaft and portal/ramp system from the surface. Access ramps are driven from the main ramp system to establish sublevels on 20m vertical intervals at the Timmins Deposit and 35m intervals at the Thunder Creek and 144 Gap Deposit. Primary and secondary development headings are generally mined 5m wide by 5m high. Primary ramps are typically driven at a maximum incline or decline of 15 percent. Mining is currently being conducted by longhole stoping methods.

Ore is hoisted to the surface via the shaft and by truck to the ore stockpile, where it is loaded into over-the-road trucks for haulage to the Bell Creek mill, located approximately 56km from the TWM. Development waste that is not used for backfill underground is hauled to the surface waste rock facility.

Tailings from the Bell Creek Mill are back-hauled to the TWM where they are combined with cement and water to make a structural fill for use as backfill underground. A paste backfill plant located on the surface produces paste backfill for delivery via piping into the mine for placement in the mined out stopes.

Mining at the TWM was initiated in the second half of 2009. From 2009 to June 30th, 2021 9.38 million tonnes at an average grade of 3.7 g/t gold (1.09 million ounces) have been mined.

1.9 Processing

All ore mined from the TWM is processed at the Company's Bell Creek Mill. The Bell Creek Mill is located approximately 6.5 km north of Highway 101 in South Porcupine, Ontario and approximately 56 km from the TWM. The Bell Creek Mill is a conventional gold processing plant utilizing cyanidation with gravity and carbon-in-pulp ("CIP") recovery. Current mill throughput is approximately 4,500 tpd (max capacity of 5,359 tpd) and recovery is approximately 97.2% for the TWM ore.

1.10 Capital and Operating Costs

Several years of operating experience provides a solid basis for estimating the capital and operating costs for the TWM. Each year the operating costs are budgeted based on actual costs and by using first principles to help determine mining costs. Sustaining capital costs are also reviewed on an annual basis and are determined based on equipment rebuild and purchase requirements, as well as other sustaining requirements based on infrastructure upkeep. The capital cost review includes all capital required for surface and underground facilities at TWM and relevant capital costs at the Bell Creek Mill facility.

1.11 Conclusions and Recommendations

Proven and probable mineral reserves for the TWM are supported by the actual operating results and the LOM financial model. The costs and productivities used to estimate the mineral reserves and formulate the LOM plan are based on the performance metrics of the operation as experienced between 2011 and 2021. These factors are considered low risk to the mineral reserve estimate. In addition, social, political, and environmental factors appropriately managed are all considered to be low risk factors for the continued operation of TWM and the mineral reserves.

Recommendations for development of the mineral resource are:

1. Implement definition drilling to refine shapes and grades for existing mineral resources and exploration drilling to expand the overall mineral resource base. Review these programs annually.
2. Complete the suggested surface and underground diamond drilling programs for 2022:
    - Underground drilling: approximately 21,300m of combined operating, capital and exploration drilling.
    - Of this total, approximately 11,700m are for operations and capital drilling to support the 2022 Mine Plan and infill drilling to support future mining. The remaining 9,600m are planned for near mine exploration, primarily testing the down plunge extents of both the Timmins Deposit and the 144 Gap Deposit as well as targeting the South-West Zone.
    - Surface exploration: 8,000m drilled to test regional targets along the main 144 Trend and along the HWY 144 Offset trend.

2 Introduction

This Technical Report has been prepared by LSG for and on behalf of Pan American in compliance with the disclosure requirements of National Instrument 43-101 – *Standards of Disclosure for Mineral Projects of the Canadian Securities Administrators* ("NI 43-101"), to disclose current information about the TWM.

The effective date of this Technical Report is June 30, 2021. No new material information has become available between this date and the signature date given on the certificate of the qualified persons ("Qualified Persons" or "QPs").

Pan American is a silver mining and exploration company listed on the Toronto and NASDAQ stock exchanges under the ticker "PAAS".

This Technical Report has been prepared under the supervision of Al Mainville (P. Geo.) and Eric Lachapelle (P. Eng.) on behalf of LSG and complies with the requirements of NI 43-101. These individuals are employees of LSG and are QPs as defined by NI 43-101.

The purpose of this Report is to provide a summary of the TWM mineral resources (comprised of the Timmins Deposit, Thunder Creek Deposit, and 144 Gap Deposit), current mine infrastructure, and estimated mine operating costs to substantiate an updated mineral reserve and mineral resource statement for TWM. The work completed to support the updated mineral reserve and mineral resource statement has been conducted on the measured and indicated mineral resources contained in the Timmins Deposit, Thunder Creek Deposit, and 144 Gap Deposit with mining parameters, metallurgical recovery, and cost estimation based on operating experience at TWM and the Bell Creek mill.

Historical work in the TWM area was reviewed by referencing assessment reports filed at the Ministry of Northern Development and Mines' office at the Ontario Government Complex, Highway 101 East, Timmins (Porcupine), Ontario; and the online Assessment File Research Imaging. Option and legal agreements were reviewed at LSG's exploration office.

2.1 List and Responsibilities of Qualified Persons

This Technical Report has been prepared by Al Mainville (P. Geo), Eric Lachapelle (P. Eng.), and Dave Felsher (P. Eng.) on behalf of LSG and complies with the requirements of NI 43-101. These individuals are employees of LSG and are QPs as defined by NI 43-101. They are intimately aware of the work going on at the TWM and have visited the TWM on numerous occasions both prior to and after the effective date of this Technical Report.

Mr. Mainville works full time at LSG's Exploration office and core shack located at 1515 Government Rd South. in Timmins where he reviews and inspects exploration drilling, sampling, and sample security protocols, drill core and the core cutting and storage facilities, the geochemical laboratory performance on a regular (almost daily) basis. He is involved with regular meetings and reviews (weekly, monthly) of operational mine plan, actual mine operation data, operating costs, reconciliation, mining parameters, interpretations of the veins and mineralized structures and the mineral resource estimation process. Mr. Mainville most recently visited and toured TWM on January 17, 2022 and inspected operational and general business performance.

Mr. Lachapelle works full time at LSG. He is involved with regular meetings and reviews (weekly, monthly) of operational mine plan, actual mine operation data, operating costs, reconciliation, mining parameters, budgeting plans and reviews the mineral reserves estimation process. Mr. Lachapelle most recently visited and toured the Timmins West Mine on January 17th, 2022 and the Bell Creek Mill on December 21, 2021 and inspected operational and general business performance.

Mr. Felsher most recently visited TWM on December 8, 2021 and the Bell Creek Mill on February 9, 2022 and inspected operational and general business performance.

Al Mainville (P. Geo), Geology Manager for LSG is responsible for Sections 7, 8, 9, 10, 11, 12, 14, and 23 and parts of Sections 1, 2, 3, 4, 5, 6, 20, 25, 26, and 27.

Eric Lachapelle (P. Eng.), Manager, Technical Services for LSG is responsible for Sections 15, 16, 22 and 23 and parts of Sections 1, 2, 3, 4, 5, 6, 13, 17, 18, 19, 20, 21, 24, 25, 26, and 27.

Dave Felsher (P. Eng.), Mill Manager for LSG is responsible for Sections 13, and 17 and parts of Sections 1, 2, 18, 19, and 21.

3 Reliance on Other Experts

The Qualified Persons responsible for this Technical Report have relied on the following internal expert within the organization for input to certain sections of this report for which they do not have specific expertise and have taken appropriate steps, in their professional judgement, to ensure that the work, information, or advice that they have relied upon is sound:

Marcel Cardinal, Director of Environmental and Sustainability at LSG leads the environmental, permitting and sustainability matters at the TWM and has contributed to Sections 1, 4 and 20 by providing information and opinions relating to environmental, permitting and community or social impact details that are described in those sections. The information and opinions are believed to be current, accurate and complete as of the effective date of this Technical Report.

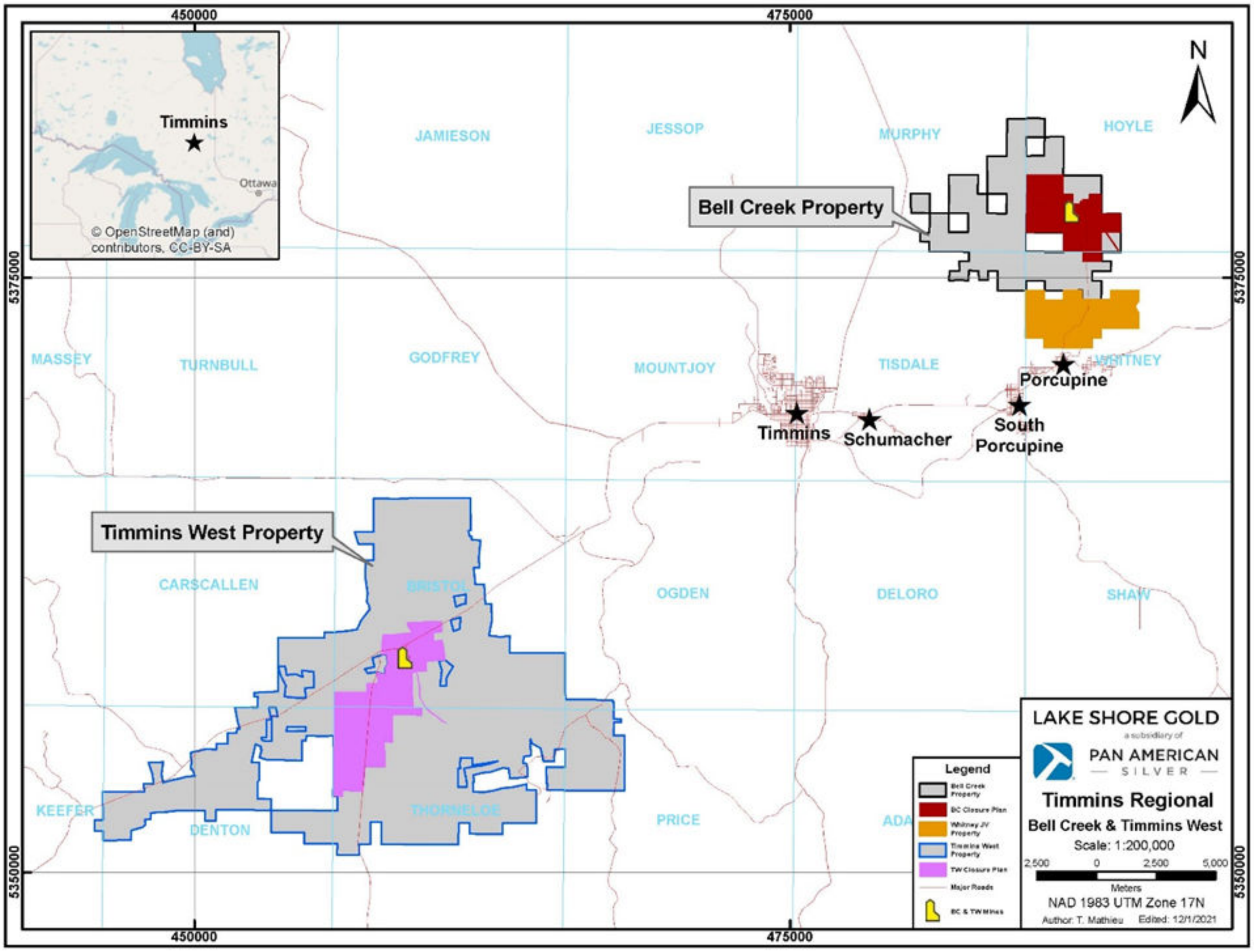
4 Property Description and Location

4.1 Location, Description, Issuer’s Interest, Mineral Tenure, and Surface Rights

Timmins West Property

The Property is located 14km southwest of the City of Timmins, and 544km north-northwest of Toronto, Ontario, Canada. The Property consists of a combination of crown patents and 21-year term leases containing mining rights, surface rights or both, and cell or boundary cell claims containing mining rights for a combined area of approximately 14,010 ha. Although the Property is centered on Bristol and Thorneloe townships, the Property stretches eastward into Ogden and Price townships, and as far west as Carscallen, Denton, and Keefer townships (Figure 4.1).

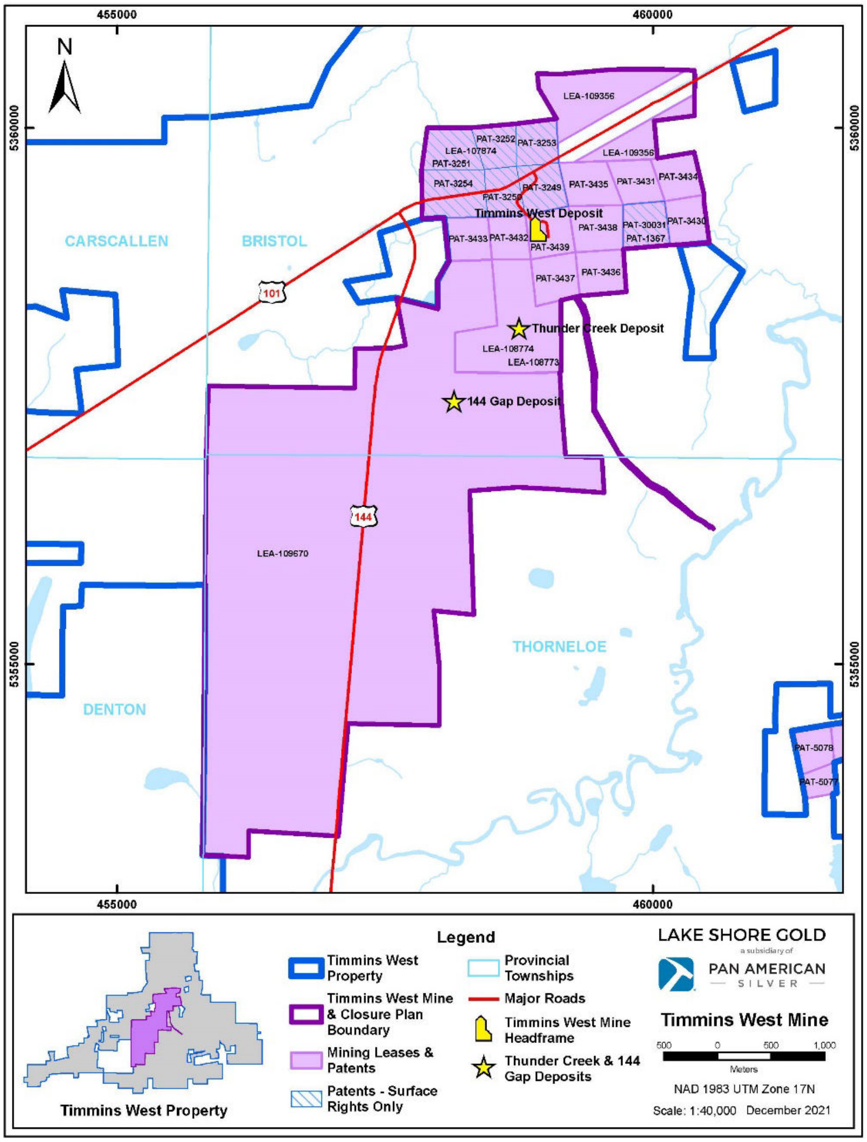
Figure 4.1 – Regional Timmins West Property Location



Timmins West Mine

The TWM as defined by the current TWM Closure Plan as of the date of this Report is approximately 1548 ha. Through patented and leased land, LSG owns 100% of the surface and mining rights of the entire 1548 ha, subject to underlying royalties. The TWM is situated in the south-central portion of Bristol Township stretching southwestwards into the northwestern portion of Thorneloe Township. Highway 101 west and highway 144 crosscut the TWM in a northeast/southwest and a north/south direction respectively providing excellent access to most portions of the Property (Figure 4.2).

Figure 4.2 – Timmins West Mine



The TWM currently consists of 5 leases and 18 patents with a combination of mining and surface rights collectively (Table 4.1).

Table 4.1 – Timmins West Mine Land Tenure

Timmins West Mine - Land Tenure								
Lease or Patent Number	**Ownership**	**Township**	**Rights**	**Roll Number**	**PIN Number**	**Parcel Number**	**Hectares**	**Renewal Date**
LEA-107874	LSG 100%	Bristol	MRO	N/A	65440-0118	1420LC	108.792	31-Jul-27
LEA-108773	LSG 100%	Bristol	MRO	N/A	65440-0120	1604LC	68.898	30-Jun-32
LEA-108774	LSG 100%	Bristol	SRO	5627 010 05007250	65440-0132		68.898	30-Jun-32
LEA-109356	LSG 100%	Bristol	MR & SR	5627 010 05006800	65440-0052	492LC	99.779	31-Jul-34
				5627 010 05007000				
				5627 010 05011500				
				5627 010 05011700				
				5627 010 05011900				
				5627 010 05012200				
LEA-109670	LSG 100%	Bristol and Thornloe	MR & SR	5627 010 02009100	65440-0137 to		1083.32	31-May-37
				5627 010 05002600	65440-0140			
PAT-1367	LSG 100%	Bristol	SRO	5627 010 05005800	65440-0054	19126SEC	16.673	N/A
PAT-30031	LSG 100%	Bristol	MRO	N/A	65440-0086	1714SEC	16.673	N/A
PAT-3249	LSG 100%	Bristol	SRO	5627 010 05007600	65440-0045	19145SEC	17.43	N/A
PAT-3250	LSG 100%	Bristol	SRO	5627 010 05007800	65440-0042	19146SEC	14.836	N/A
PAT-3251	LSG 100%	Bristol	SRO	5627 010 05008700	65440-0038	19147SEC	19.336	N/A
PAT-3252	LSG 100%	Bristol	SRO	5627 010 05008200	65440-0041	19148SEC	14.544	N/A
PAT-3253	LSG 100%	Bristol	SRO	5627 010 05008000	65440-0044	19149SEC	15.52	N/A
PAT-3254	LSG 100%	Bristol	SRO	5627 010 05008400	65440-0039	19150SEC	27.126	N/A
PAT-3430	LSG 100%	Bristol	MR & SR	5627 010 05005700	65440-0060	7058SEC	15.499	N/A
PAT-3431	LSG 100%	Bristol	MR & SR	5627 010 05006600	65440-0053	7059SEC	15.742	N/A
PAT-3432	LSG 100%	Bristol	MR & SR	5627 010 05007400	65440-0043	4407SEC	14.326	N/A
PAT-3433	LSG 100%	Bristol	MR & SR	5627 010 05007500	65440-0040	4408SEC	16.228	N/A
PAT-3434	LSG 100%	Bristol	MR & SR	5627 010 05006000	65440-0059	4534SEC	15.338	N/A
PAT-3435	LSG 100%	Bristol	MR & SR	5627 010 05006700	65440-0051	7060SEC	19.344	N/A
PAT-3436	LSG 100%	Bristol	MR & SR	5627 010 05006300	65440-0049	4404SEC	17.968	N/A
PAT-3437	LSG 100%	Bristol	MR & SR	5627 010 05006400	65440-0047	5788SEC	18.737	N/A
PAT-3438	LSG 100%	Bristol	MR & SR	5627 010 05006500	65440-0050	1694SEC	19.627	N/A
PAT-3439	LSG 100%	Bristol	MR & SR	5627 010 05007300	65440-0046	1695SEC	17.28	N/A

The TWM headframe resides 19km southwest of the City of Timmins and 552km north northwest of Toronto, Ontario, Canada. The TWM headframe is situated within NTS 42-A-05 at UTM NAD83, Zone 17N, at approximately 458915E, 5359043N, on patent PAT-3439. The TWM site is accessed via highway 101 west, 1.3km east northeast of the highway 101 west and the highway 144 intersection. The TWM contains the Timmins Deposit, Thunder Creek Deposit, and the 144 Gap Zone Deposit as depicted in Figure 4.2.

4.2 Ownership History and Underlying Agreements

In May 2003, LSG and Holmer Gold Mines Limited ("Holmer") entered into an option agreement (the "Holmer Agreement") pursuant to which LSG was granted an option to earn a 50% interest in the Holmer property (the present Timmins Deposit property) by March 24, 2006.

This portion of the property consists of 11 Freehold Patents with surface and mining rights; Lease 109356 (formerly lease 106534 and 102611), a group of six Leasehold Patents with surface and mining rights; and Lease 107874 (formerly Lease 104075), a group of six Freehold Patents with mining rights, as well as six Leasehold Patents of surface rights for the same area.

LSG completed the requirements to earn 50% of the Holmer property in September 2004. On December 31, 2004, a business combination agreement between LSG, its wholly owned subsidiary LSG Holdings Corp. and Holmer came into effect, pursuant to which Holmer became a wholly owned subsidiary of LSG. A 1.5% Net Smelter Return ("NSR") royalty is assigned to patent PAT-30031 (claim P4227) payable to Mr. Lorne Labrash. This royalty may be purchased for $1 million. The current mineralization model does not extend to PAT-30031.

LSG optioned a 60% interest in the Thunder Creek property from Band-Ore Resources Limited ("Band-Ore") in November 2003 pursuant to an option agreement dated November 7, 2003 (the "Band-Ore Agreement"). Under the terms of the Band-Ore Agreement, LSG could earn a 60% interest in the Thunder Creek property by completing in excess of $1,705,000 in expenditures, $370,000 in cash payments and issuing 100,000 shares within a four-year period. In September 2006, Band-Ore and Sydney Resources Corporation merged to form a new company, West Timmins Mining Inc. ("WTM"). The rights and obligations of Band-Ore under the Band-Ore Agreement were assigned to and assumed by WTM. In May 2008, LSG informed WTM that the obligations to earn a 60% interest in the Thunder Creek property had been fulfilled. On November 6, 2009, LSG and WTM completed a business combination agreement resulting in WTM becoming a wholly owned subsidiary of LSG. On January 1, 2012, WTM was amalgamated into LSG, which now holds a 100% interest in the Thunder Creek property.

Brief summaries of the underlying agreements and royalties are stated below. Figure 4.3 illustrates the applicable royalties.

Mineral claims 4211037, 4211038, 4211039, and 4211040 were staked by LSG and have no underlying royalties, but, because the claims were within the area of influence outlined in the Band-Ore Agreement, they became subject to the agreement.

Claims 1189528, 1193477, 1203840, and 1217601 were staked by Band-Ore and are not subject to any underlying royalty agreements.

Mineral claims optioned originally from Mr. Jim Croxall were subject to a 2% NSR royalty. These claims were also subject to an advanced annual royalty payment of $5,000 until commercial production begins. LSG purchased 1% of the NSR in November 2010 in exchange for approximately $1,500,000 equivalent in LSG stock. The other 1% NSR was purchased from Jim Croxall by Premier Royalty Corp. in 2012. Sandstorm Gold Ltd. has since acquired Premier Royalty Corp as of October 2013. The surface rights for leased claims P495307, P495308, and P495309 (mineral rights only lease number 108773) have been acquired by LSG (surface lease number 108774), with both leases to remain in good standing until June 30, 2032. The claim with number 1189886 was optioned from Mr. Bruce Durham and has a 3.0% NSR royalty attached.

Eight claims optioned from the late Mr. Matt Kangas and Mr. Jim Croxall (1177807, 1177808, 1177809, 1177811, 1181410, 1181413, 1198803, and 1198804) are subject to a 2% NSR royalty of which 1% may be purchased for $1,000,000. An advanced royalty payment of $5,000 (indexed for inflation) is paid annually to the estate of Mr. Kangas and to Mr. Croxall in equal portions. After the signing of the original agreement, mineral claims came open and were re-staked: claim 1181410 was formerly claim 1177813, claim 1181413 was formerly claim 1177810, claim 1198803 was formerly claim 1177812, and claim 1198804 was formerly claim 1177806.

Four claims (1189593, 1181995, 1189580, and 1189592) were purchased by Bruce Durham, Robert Duess, Ken Krug, and Henry Hutteri from Ray Meikle and Steve Anderson and then optioned to Band-Ore. A 3% NSR royalty is payable, 1.5% to Durham et al., and 1.5% to Meikle and Anderson. There is no buy down of this royalty.

Claims 1189552 and 1189553 were optioned from Mr. Bruce Durham and partners ("Durham") and has a 3.0% NSR royalty attached.

Claims 923646 and 923647 are subject to a 3% NSR, payable to Royal Gold Inc. and Torogold Resources Inc.

As of March 1 2012, Franco-Nevada Corporation ("Franco-Nevada") entered into an agreement with LSG through which Franco-Nevada paid LSG US$35M for a 2.25% NSR royalty on the sale of minerals from the TWM.

The surface and mining rights for claims P26392, P26393, P26394, P26395, P26396, P26397, P26398, P26399, P26400, P26403, known as the Meunier 144 Property, are currently held by LSG and Adventure Gold Inc. (each with a 50% interest). There is a 2.5% NSR royalty payable to David Meunier, with an option to purchase 1%.

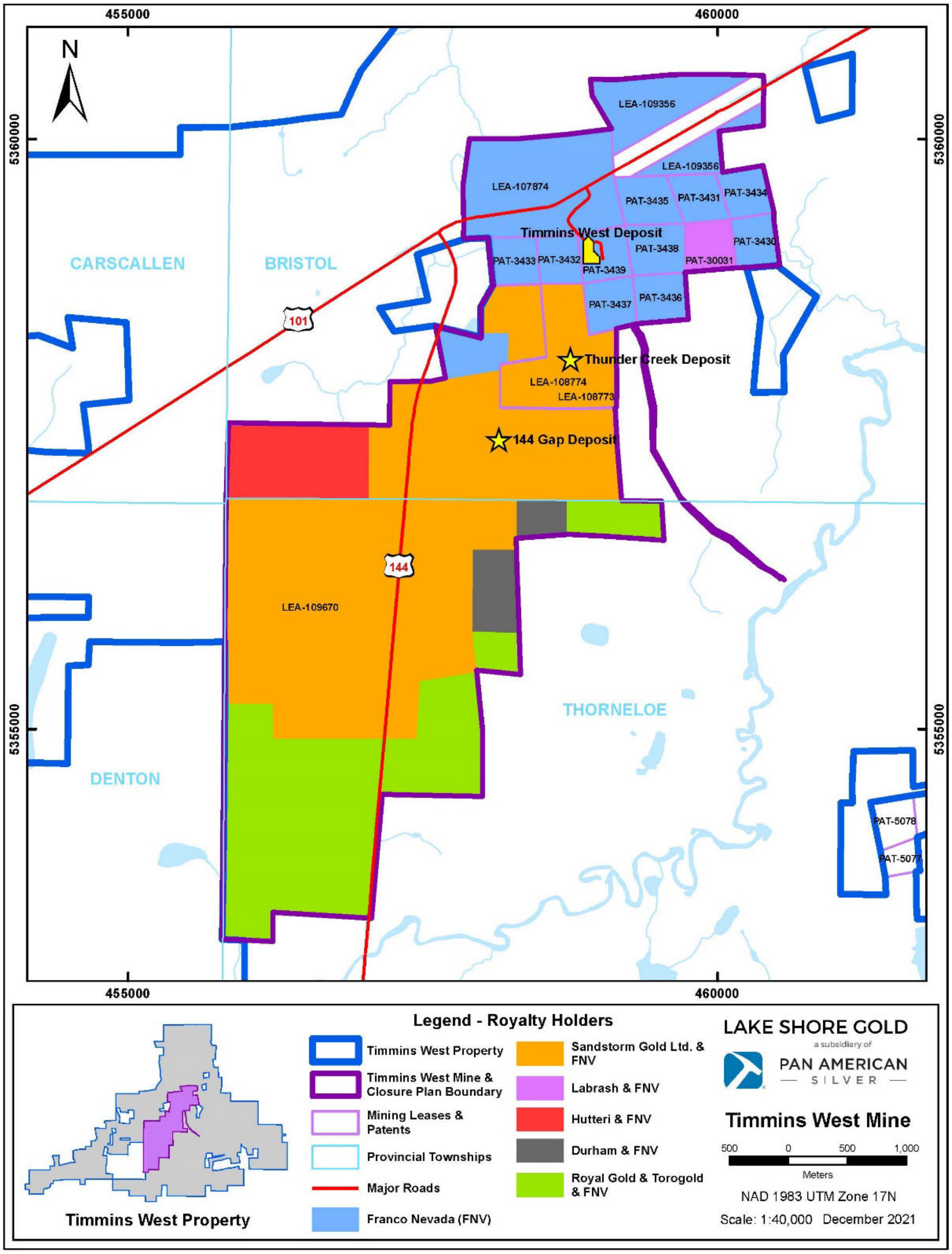
All patents, leases and mining claims are in good standing as of the effective date of this Report.

In addition to the royalties, the properties comprising TWM were temporarily pledged as security against the outstanding debt obligations of LSG under an agreement with Sprott Resource Lending Partnership for a credit facility totaling up to $70M. The obligations for this senior secured facility, first arranged in the summer of 2012 to help finance the expansion of the Bell Creek mill, were met in full with the final payment made by LSG in May 2015.

A land survey was completed in late 2015 in order to bring a boundary of 56 mining claims to lease (Figure 4.2). The lease was issued by the Ministry of Northern Development and Mines (“MNDM”) in June 2016 (Mining Lease No. 109670) for surface and mining rights.

Over the history of the TWM multiple patents and mining claims have been acquired with several consolidated into leases to facilitate the mining process. Based on the TWM as of the date of this Report, Figure 4.3 represents the ownership of royalties related to underlying agreements.

Figure 4.3: Timmins West Mine Royalties Map



4.3 Past Mining, Environmental Liabilities and Permitting

Prior to the commencement of mining operations at TWM in 2009, there were no large-scale mining conducted on the property.

As outlined in Table 6.1 below, several historic, shallow pits, trenches and prospecting shafts were done on the property. Most of these known historic excavations have been reclaimed and filled in with only a few, more remote shallow shafts left to do.

In the opinion of the authors, there are no significant environmental liabilities associated with past mining activities.

All current infrastructure and liabilities are listed on Figure 18.1 of this document.

4.4 Significant Factors and Risks

To the best of the author's knowledge there is no significant factor or risk that may affect access, title, or the right or ability to perform work on the Property.

4.5 Consultation

Consultation is being undertaken with regulatory agencies, the general public, the Métis Nation of Ontario, Wabun Tribal Council who represent many indigenous communities as well as the Indigenous communities of Flying Post First Nation and Mattagami First Nation. Consultation provides an opportunity to identify and address the impacts of LSG's activities on external stakeholders and to expedite the authorization process with the government agencies.

The consultations have been held in order to comply with LSG corporate policy, the provincial requirements of Ontario Regulation 240/00 and the Environmental Bill of Rights.

An Impact and Benefits Agreement ("IBA") was finalized in 2011 with an amendment in 2019. The IBA outlines how the company and the Indigenous communities will work together in the following areas: education/training of Indigenous community members, employment, business and contracting opportunities, financial considerations and environmental provisions.

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

5.1 Physiography, Vegetation, and Climate

The TWM area and the City of Timmins experience a continental climate with an average mean temperature range of -16.8°C (January) to +17.5°C (July) and an annual precipitation of approximately 835 mm. Table 5.1 summarizes the average temperatures and precipitation values at the Timmins Victor M. Power Airport for the 30-year period between 1981 and 2010.

Table 5.1: Average Temperature, Precipitation and Snowfall Depths for the Timmins Area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature													
Daily Average (°C)	-16.8	-14.0	-7.4	1.8	9.6	14.9	17.5	16.0	11.1	4.4	-3.4	-11.9	1.8
Daily Max. (°C)	-10.6	-7.2	-0.6	8.0	16.6	21.9	24.2	22.5	17.1	9.0	0.6	-6.9	7.9
Daily Min. (°C)	-23.0	-20.7	-14.2	-4.5	2.5	7.8	10.7	9.4	5.2	-0.3	-7.4	-17.0	-4.3
Precipitation													
Rainfall (mm)	3.2	1.7	14.1	30.1	62.3	83.2	90.9	81.6	83.7	68.1	30.9	8.5	558.3
Snowfall (cm)	58	46	45	27	5	0	0	0	1	15	49	65	311
Precipitation (mm)	51.8	41.3	54.5	56.2	67.4	83.4	90.9	81.6	84.7	82.5	78.9	64.5	834.6
Snow Depth (cm)	53	64	54	18	1	0	0	0	0	0	7	28	19
Wind													
Speed (km/h)	12.3	12.3	13.4	13.5	12.4	11.5	10.3	9.8	11.2	12.3	12.5	11.8	

Data from Environment Canada: http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?stnID=4180&autofwd=1

Local lakes typically will begin to freeze over in mid-November, and breakup typically takes place in late April to early May. Work can be carried out on the Property year-round.

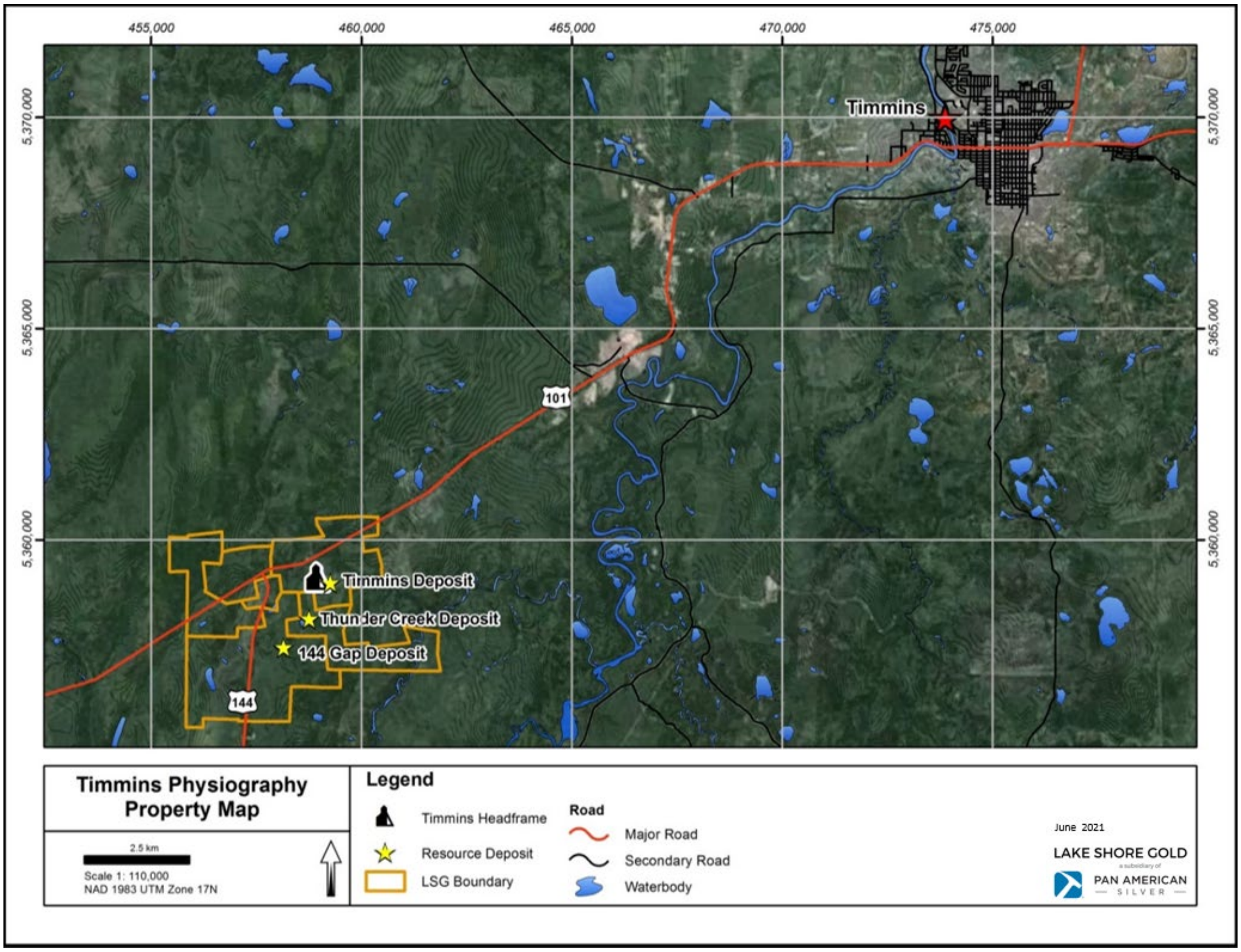
The Property generally exhibits low to moderate relief. The elevation of Highway 101 as it traverses the Property varies from 308m above sea level in the east to 320m in the west. At the junction of Highways 144 and 101, the elevation is approximately 312m. The highest point on the Property is 353m and is located at UTM co-ordinate 458,879.9m east and 5,357,321.5m north. The elevation of the Tatachikapika River (historically known as the Lost and/or Redsucker River) ranges from 300m to 292m as it flows east-northeast to the northerly flowing Mattagami River. Outcrop exposure varies between 5 and 15%. Figure 5.1 illustrates the claim boundary of the Pproperty relative to the City of Timmins and draped over a Landsat panchromatic image of the area.

The continental climate and the location on the Canadian Shield give rise to a plant hardiness zone 2a which supports the following boreal forest tree species and a timber, pulp and paper industry. In no particular order of significance local trees species include: American Mountain-Ash (Sorbus Americana), Balsam Fir (Abies Balsamea), Black Spruce (Pincea Mariana), Eastern White Cedar (Thuja Occidentalis), Eastern White Pine (Pinus Strobus), Jack Pine (Pinus Banksiana), Pin Cherry (Prunus Pensylvanica), Red

Pine (Pinus Resinosa), Tamarack (Larix Laricina), Trembling Aspen (Populus Tremuloides), White Birch (Betula Papyrifera) and White Spruce (Pincea Glauca).

Hawley, J.E. (1926) reports that part of Ogden, Bristol and Carscallen Townships were swept by several forest fires dating back to 1911. Darling et al. (2007) state the Provincial Forest Resources Inventory stand numbers provided by TEMBEC indicated that most of the forestry related disturbance to the Property occurred approximately 25 years ago, and that the forest communities are composed of poplar, jack pine, white birch, black spruce, and white spruce.

Figure 5.1: Physiography



5.2 Accessibility, Local Resources, Population Centres, and Transport

The City of Timmins, with an area of approximately 2,979 km^2 and a population of 43,165 (2011 Census), has an economic base dominated by the mining and logging industries. The area is serviced from Toronto via Highways 400/69 to Sudbury and Highway 144 from Sudbury to Timmins, or Highway 400/11 to Matheson and Highway 101 westward to Timmins. The Timmins Victor M. Power Airport has scheduled service provided by Air Canada Jazz, Bearskin Airlines, and Air Creebec. Porter Airways also provides air service between Timmins and the Toronto Billy Bishop Airport. The Timmins and District Hospital is a major regional health care center for northeastern Ontario.

The Property is accessible by Highways 101 and 144 and is in close proximity to the main hydro grid transmission line. An experienced mining labour pool is accessible in the Timmins area.

To the best of the authors' knowledge, there are sufficient surface rights, a willing and skilled labour pool, and readily available infrastructure to carry on a mining operation.

5.3 Surface Rights

The mine workings and infrastructure, water storage facilities, waste disposal areas, effluent management and treatment facilities, roads, and power lines are located within the boundaries of the mining leases and patented claims illustrated in Figure 4.2 for which the surface rights are controlled by LSG.

The authors believe that the Property has sufficient surface rights to carry out mining operations.

5.4 Power and Water

All-weather road access and electrical power transmission lines are established and operational to the TWM. Water for mining operations is supplied from the underground mine dewatering systems and wells located on the Property, and is adequate for the existing and planned future requirements of the mine.

5.5 Infrastructure

Material from TWM is processed at the Bell Creek Mill. All tailings storage areas are located on that site.

At the effective date of this Report, the surface and underground infrastructure at the TWM included the following:

- portable trailers that serve as administrative buildings and dry facility with office space, including a conference room, and infirmary;
- a main garage, a millwright shop and an electrical shop;
- a warehouse;
- water treatment and supply facilities;
- a hoist room, a headframe, and a 710m deep shaft;
- a portal, ramp, paste backfill plant, ventilation raises and a series of ramp-connected underground sublevels;
- a fleet of underground mobile mine equipment; and
- site power supply provided by a 115 kV power line from Hydro One.

6 History

LSG acquired the Property by fulfilling the earn-in requirements as set out in option agreements with Holmer and WTM and by completing business combination agreements with those companies. Holmer became a wholly-owned subsidiary of LSG in December 2004, and WTM became a wholly-owned subsidiary in November 2009.

The discovery of gold in Bristol Township on the McAuley-Brydge property (currently LSG's TWM) occurred in 1911. At the time, only a few claims were staked within the Bristol Township area

Fires in 1911 swept across large parts of Carscallen, Bristol and Ogden Townships. The surface infrastructure at the Hollinger, Dome, West Dome, Vipond, Standard, Preston, East Dome, and North Dome mines were completely destroyed. The town of South Porcupine, parts of Pottsville and the north part of Porcupine were also destroyed (Burrows, A.G., 1915, Hawley, J.E., 1926).

The following table (Table 6.1) highlights the chronology of significant exploration, surveys, and reports carried out over and surrounding the TWM area.

Table 6.1: Chronology of Events for the Timmins West Mine Area

Date	Description
1911 – 1914	Gold was discovered on the McAuley-Brydge property and two shafts were sunk; the deepest was 12 metres deep (Timmins Mine original surface showing - Main Zone and Hanging-wall Veins).
1938 – 1944	Orpit Mines Limited acquired the claims and completed 7,620m of diamond drilling.
1941	Rusk Porcupine Mines excavated several pits and trenches across a 150m to 200m area of the Thunder Creek portion of the property. The gold discovery pit was 1.2m x 1.2m and returned values of $24.85 over 121.9 cm, $15.05 over 76.2 cm and $8.41 over 91.4 cm (T-File 542). The 1941 London Fix average price for gold was $33.85 (US) an ounce. Eighteen diamond drill holes totaling 1,981m were also completed.
1945	Piccadilly Porcupine Mines acquired the property and completed 4,983m of diamond drilling.
1946	Gold is reported from a diamond drill hole to the northwest of the TWM on the O'Shea claim group (now referred to as the Meunier-144 property).
1953	Standwell Oil and Gas Ltd. acquired the property.
1958	Hollinger Mines Ltd. completed seven diamond drill holes in the northern portion of the Thunder Creek property area. No assays were reported.
1959	Paul Meredith purchased the "Standwell Oil" property.
1963	The property is transferred to Holmer.
1964	United Buffadison Mines Limited optioned the property from Holmer; constructed a road from Highway 101 to the Main Showing, and completed ten boreholes (2,116m). United Buffadison Mines Limited interpreted the gold mineralization to be associated with stacked north dipping en-echelon quartz veins. The property was returned to Holmer.
1968 – 1981	Holmer diamond drilled 45 boreholes totaling 10,512m. The geological interpretation of the day indicated two mineralized zones: the "Main" Zone (also referred to as the "Western Zone") and the "Shaft" Zone (also referred to as the "Eastern Zone"). A historically significant, but non 43-101 compliant "Probable Mineral Reserve" of 720,000 tons grading 0.124 oz. per

Date	Description
	ton gold (653,000 tonnes grading 4.25 grams per tonne gold) was estimated. Additional surface exploration included ground geophysical surveys (magnetometer and VLF) and limited diamond drilling.
1980	Falconbridge Nickel Mines Ltd. carried out metallurgical analysis of samples provided by Jim Croxall for the Thunder Creek property.
1981	Preussag Canada Limited completed geophysical surveys in Bristol and Thorneloe Townships including magnetometer, VLF-EM, HLEM and Induced Polarization ("IP"). Ten diamond drill holes (613.9m) were bored. Adjacent holes, 64m apart, intersected 2.57 g/t over 2.43m, and 4.46 g/t gold over 4.6m in an area of the Rusk Showing.
1984	Noranda Exploration Company Limited ("N.P.L."), ("Norex") optioned the Holmer property and completed a "regional" airborne magnetic and electromagnetic survey, follow-up ground geophysics, and drilled four boreholes totaling 1,465m. Norex interpreted a historically significant, non 43-101 compliant, mineral resource estimate of 785,000 tonnes grading 2.4 g/t gold. This included a core of better grade mineralized material estimated to be 159,000 tonnes grading 4.46 g/t gold. The property was returned to Holmer.
1984 – 1985	N.P.L. also completed geological mapping, humus geochemical sampling, and outcrop mechanical stripping and trenching in the Thunder Creek property area. The best assays returned in the trenching were 2.86 g/t gold and 5.54 g/t gold. Nine overburden, reverse circulation drilling and three diamond drill holes (332.3 metres) were also completed with no assay results reported.
1987	Chevron Minerals Ltd. optioned the Holmer property and completed line cutting, ground geophysics (magnetic, VLF, IP surveys), and geological mapping. A large area of the Main Zone and Hanging-wall Veins was stripped, channel sampled and mapped. Twenty-nine (29) diamond drill holes (totaling 6,115m) were completed, testing the mineralization to a vertical depth of 360m. The property was subsequently returned to Holmer.
1987	Highwood Resources Ltd. optioned a portion of the Thunder Creek property from J. Croxall. Four diamond drill holes (400m) testing geophysical targets were bored. No assay results are reported.
1994	N.P.L. carried-out line cutting, IP and ground magnetometer surveys in the Thunder Creek and Highway-144 property areas. A single diamond drill hole (totaling 302m) was completed with no assay results reported.
1995	Hemlo Gold Mines Inc. funded work carried out by Norex on the Thunder Creek and Highway-144 project areas. Surveys include line cutting, magnetometer and IP. Seven diamond drill holes (95-2 to 95-8; 1,581m) were drilled with no significant assays reported.
1996	Band-Ore makes gold discoveries on their Thorneloe property and renewed gold exploration in Bristol and Thorneloe Townships.
1996 – 1997	Holmer carried out an exploration program which included ground geophysics (VLF, magnetometer, and IP), humus sampling, geological mapping and rock sampling. A total of 66 drill holes (25,380m) were completed, 54 of which were directed to expand "resources" in the "Main" Zone area; 12 holes were drilled to test geophysical anomalies elsewhere on the property.
1997	Battle Mountain Canada Limited continued to explore the Thunder Creek – Mahoney Creek area. Fourteen diamond drill holes (3,547m) tested stratigraphy and geophysical targets. Drill hole MC 97-20 returned an assay value of 5.9 g/t gold over 1m. Hole MC 97-26 intersected a few anomalies, including 1.28 g/t gold over 2m. The property was returned to Band-Ore.
1998	Holmer drilled 22 boreholes (3,923m) to test the continuity of mineralization at shallow depths.

Date	Description
1999	St. Andrew Goldfields Ltd. ("St. Andrew") drilled ten boreholes (1,341m) exploring the potential for an open pit deposit.
2002	Holmer completed a closely spaced (25m centers) 22 hole diamond drill program totaling 5,220m. A mineral resource estimate was produced which was audited and revisited by Watts, Griffis and McOuat as 422,000 tonnes grading 13.68 g/t gold in the indicated category and 270,000 tonnes grading 9.0 g/t gold in the inferred category.
2003	LSG entered into an option agreement with Holmer that allows LSG to earn 50% of the Holmer property by May 26, 2006. In November 2003 LSG enters into an agreement with Band-Ore to earn a 60% interest in the Thunder Creek property.
2003	Fugro completed an airborne magnetic survey (237km) over the Timmins Mine claims for LSG (Soltanzadeh & Griffith, 2003).
2004	LSG completed outcrop stripping, geological mapping, and grab/channel sampling (103 samples collected) on the Thunder Creek property (Hocking and Marsden, 2004).
2004	LSG completed Mobile-Metal-Ion ("MMI") soil geochemical survey (830 samples collected) on the Thunder Creek property (Hocking and Marsden, 2004).
2004	In September, LSG released an updated mineral resource estimate (see Item 6.3) and thereby completed its earn-in option agreement with Holmer. In December, LSG acquired all outstanding shares of Holmer, giving it 100% ownership of the property, then referred to as the Timmins Gold Project (currently hosting the "Timmins Deposit").
2005	Abitibi Geophysics completed airborne magnetic (60km) and IP (45km) geophysical surveys over the Thorneloe, Denton and Carscallen Townships for the Porcupine Joint Venture. A few diamond drill holes containing values between 0.5-3.0 g/t over narrow intervals were completed.
2006	LSG completed outcrop stripping, geological mapping, and grab/channel sampling (135 samples collected) in three target areas on the Thunder Creek property (J. Samson, 2008).
2006	In May, LSG initiated the application permit process for advanced underground exploration programs. In December, LSG released another updated mineral resource estimate for the Timmins Gold Project (see Item 6.3).
2007	In April 2007, LSG received government approval of the closure plan application and receipt of related permits required to proceed with the program. In August, LSG reported mineral reserves and a positive pre-feasibility study for the Timmins West Project (formerly named the "Timmins Gold Project"). In December, LSG also completed the requirements to vest a 60% interest in the Thunder Creek property from WTM.
2008 - 2013	Lithogeochemical and stable isotope study (with emphasis on correlation to gold mineralization) initiated in Bristol and Thorneloe Townships as part of M.Sc. thesis (Z. Stevenson and Dr. E.H. van Hees, Wayne State University, 2013) on behalf of LSG.
2009	Adventure Gold Inc. completed three shallow drill holes (1,229m) on the Meunier-144 property. No significant results were reported.
2009	LSG completed geological mapping over a 5km^2 area surrounding the Rusk surface showing on the Thunder Creek property (Internal memorandum and maps; Camier, 2009).
2009	In November, LSG acquired the outstanding shares of WTM, thereby acquiring 100% of the Thunder Creek property. This business combination triggered an update to the mineral resource and mineral reserve for the Timmins Deposit. The exploration emphasis of the Thunder Creek project changed from anomaly testing to systematic definition drilling.
2010	In-depth regional compilation (including analysis and interpretation of available government and private geophysical surveys) for project generation and targeting initiatives completed by

Date	Description
	consultants on behalf of LSG (Internal memorandum and catalog of occurrences; L. Reed and D. Power, June 2010).
2010	Abitibi Geophysics completed resistivity/pole-dipole IP (45 km), and ground magnetic (82 km) surveys over the Thunder Creek area for LSG as part of the Tailings Site condemnation program.
2010	JVX Geophysics completed 3-D downhole spectral IP survey in 9 drill holes on the Timmins Mine and Thunder Creek properties for LSG (Internal report, 2010).
2010	LSG and RT Minerals Corp. entered into an option agreement with Adventure Gold Inc. for each to earn-in 25% interest in the Meunier-144 property. A "deep drilling exploration program" targeting the extension at depth of the Timmins Deposit was completed (4,038m). Mineralization was weak and most significant results included 1.46 g/t gold over 1.60m, 2.26 g/t gold over 0.60m, and 1.34 g/t gold over 1.00m (see Item 9). Through some business arrangements in 2013, LSG now has a 50% vested interest in the property (see Item 4). LSG also has an option to increase its interest to 60% by completing a Preliminary Economic Assessment ("PEA").
2011	In January, commercial production was declared for the Timmins Deposit. In November, LSG released an initial mineral resource estimate for the Thunder Creek Deposit.
2012	In January, commercial production was declared for the Thunder Creek Deposit. Subsequently, the Timmins and Thunder Creek Deposits were combined into a single operation called the TWM. In March, LSG filed an updated mineral resource estimate for the Timmins Deposit, including a PEA for the TWM. In May, LSG released a Pre-feasibility Study and Mineral Reserves (see Item 6.3).
2012	JVX Geophysics completed Clarity3D DSIP/Resistivity survey in 6 drill holes on the Thunder Creek and Highway-144 properties for LSG (Internal report, 2012).
2013	In March, LSG reported updated mineral reserve and mineral resource estimates for the TWM (see Item 6.3).
2013	Updated compilation, re-processing, and interpretation of regional and property-scale geophysical data completed by consultant on behalf of LSG (Internal memorandum; L. Reed, 2013).
2014	In March, LSG reported updated mineral reserve and mineral resource estimates for the Timmins West Mine (see Item 6.3).
2014	LSG announced the discovery of the 144 Gap Deposit with the intersection of wide, high-grade gold mineralization (HWY-14-48: 5.37 g/t over 46.0m) confirming anomalous results from earlier (2012) diamond drilling at the Highway-144 property (Press Release dated October 07, 2014).
2015	LSG reported significant expansion of the 144 Gap Deposit through continued surface diamond drilling. With the completion of an underground exploration drift driven to the southwest from the Thunder Creek Deposit, the focus of exploration efforts at the Highway-144 property was changed to systematic definition drilling of the new 144 Gap Deposit.
2016	LSG announced an initial mineral resource using a 2.6 g/t cut-off grade of 301,700 ounces in indicated category (1,734,000 tonnes at average grade of 5.41 g/t) and 319,200 ounces in inferred category (1,914,000 tonnes at average grade of 5.19 g/t) at the 144 Gap Deposit (Press Release dated February 08, 2016).
2016	In March, LSG reported updated mineral resource and mineral reserve estimates for the TWM (see Item 6.3).
2016	Tahoe Resources Inc. ("Tahoe") acquired LSG in April, with LSG *dba* Tahoe Canada becoming a wholly-owned subsidiary of Tahoe.

Date	Description
2019	Pan American acquired Tahoe in February, with LSG becoming a wholly-owned subsidiary of Pan American.

6.1 Historical Resource Estimates

6.1.1 Historically Significant Non-Compliant NI 43-101 Resource Estimates

The following mineralization estimates were not reported in accordance with NI 43-101 nor estimated by a QP, but are considered historically significant in keeping exploration interest active and continuing to entice companies to explore, better define, and outline the gold bearing system at TWM. A QP has not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves. These estimates are not considered to be current, and are quoted from the documents referenced.

1946: The earliest record found to attempt a mineralization estimate is stated in Ontario Department of Mines, Mineral Resource Circular No. 13, p. 50, which references Survey of mines 1946, p 152 and describes the Orpit property: "Results of drill holes 32, 41, 42, 45, and 46 indicated a zone of 200 feet in length, 50 feet in width, which averaged 0.16 ounces of gold per ton. Indicated mineral reserves were estimated at 300,000 tons between a depth of 400 feet and 800 feet."

1968-1981: Holmer estimated a "Probable Mineral Reserve" of 720,000 tons at a grade of 0.124 oz. per ton gold (653,000 tonnes at 4.25 g/t gold) (WGM, 2004).

1984: Norex estimated a mineral resource of 785,000 tonnes at a grade of 2.4 g/t gold. This includes a core of better grade mineralized material estimated to be 159,000 tonnes at 4.46 g/t gold (WGM, 2004).

6.1.2 NI 43-101 Compliant Mineral Reserve and Mineral Resource Estimates

In 2002 a mineral resource estimate completed by Holmer and audited and revised by Watts, Griffis and McOuat Limited ("WGM") included 422,000 with an average grade of 13.7 g/t classified as indicated and 207,000 tonnes at 9.0 g/t classified as inferred (WGM, 2004)

In 2004 WGM audited a mineral resource estimate prepared by LSG. WGM revised the estimate by lowering the cap on high assays in the Footwall Zone and transferring some indicated resource blocks into the inferred category. The estimate used a 6.0 g/t gold cut-off, and a 50 g/t cap (except in the Footwall Zone where a 30 g/t gold cap was used). The estimate included an indicated resource of 1,369,000 tonnes at an average grade of 10.9 g/t gold (capped grade) or 16.5 g/t gold (uncapped grade), with an inferred resource of 200,000 tonnes at a grade of 8.7 g/t gold (capped grade) or 12.4 g/t gold (uncapped grade).

Total contained ounces with a cut grade of 6.0 g/t gold in the inferred and indicated categories was estimated to be 538,000 ounces gold (WGM, 2004).

In November 2006 WGM audited an updated mineral resource estimate prepared by LSG. The audit validated the assay data, the construction of polygons, and the resulting tonnages and grade. The estimated indicated and inferred mineral resources for the TWM on October 31, 2006, are summarized in Table 6.2

Table 6.2: WGM polygonal Mineral Resource October 31 2006 for TWM

Classification / Zone	Grade Cut to 3.0 g/t Gold		Contained Gold (ounces)	Uncut Grade (g/t)	Top Cut Grade (g/t)
	Tonnes	Grade (g/t)			
Indicated					
Vein Zone	346,000	9.9	110,000	17.6	50
Footwall Zone	1,185,000	7.3	277,100	7.6	30
Ultramafic Zone	1,737,000	9.3	517,600	14.5	50
Total Indicated	3,268,000	8.6	905,000	12.3	
Inferred					
Vein Zone	543,000	5.7	99,100	7.3	50
Footwall Zone	340,000	5.9	65,000	6.3	50
Ultramafic Zone	85,000	3.9	10,600	3.9	50
Total Inferred	968,000	5.5	174,700	5.8	

In 2007, SRK Consulting Canada Inc. estimated the probable mineral reserve at 3,387,000 tonnes with an average grade of 7.6 g/t gold, for a content of 826,000 ounces of gold.

In August 2009 LSG and WTM updated a NI 43-101 Technical Report for TWM. The 2009 update is summarized in Table 6.3.

Table 6.3: LSG Updated Mineral Resource based on SRK Polygonal Resource and Stantec Mineral Reserve, August 2009 (Darling et al., 2009) for TWM

Classification	Grade Cut to 3.0 g/t Gold		Contained Gold (ounces)
	Tonnes	Grade (g/t)	
Indicated Resource	3,200,000	8.6	893,000
Inferred Resource	890,000	5.7	165,000
Probable Mineral Reserve	3,358,000	7.5	812,006

In November 2011, LSG completed the first mineral resource estimate for the Thunder Creek Deposit of the TWM. The associated mineral resource statement is summarized in Table 6.4.

Table 6.4: LSG Initial Mineral Resource for the Thunder Creek Deposit (Crick et al., 2011)

Deposit	Resource Classification	Grade Cut to 2.0 g/t Gold		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Thunder Creek	Indicated	2,877,000	5.6	521,600
	Inferred	2,693,000	5.9	510,000

In February 2012, LSG released a PEA and updated mineral resource for the TWM, combining the Timmins and Thunder Creek Deposits as summarized in Table 6.5.

Table 6.5: LSG Updated Mineral Resource for Timmins West Mine (Crick et al., 2012A)

Deposit	Resource Classification	Capped Grade		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Timmins	Indicated	2,949,000	6.3	600,900
	Inferred	1,579,000	5.5	281,500
Thunder Creek	Indicated	2,877,000	5.6	521,600
	Inferred	2,693,000	5.9	510,000
Total Timmins West Mine	Total Indicated	5,826,000	6.0	1,122,500
	Total Inferred	4,272,000	5.8	791,500

**Notes:*

1. *The mineral resources were reported above a cut-off grade of 1.5 g/t gold for the Timmins Deposit, and 2.0 g/t gold for the Thunder Creek Deposit.*
2. *Effective Date of October 28, 2011 for Thunder Creek Deposit, and January 31, 2012 for the Timmins Deposit.*

In May 2012, a Pre-feasibility Study and mineral reserve statement were released. The mineral reserves were based on indicated mineral resources included in revised block models prepared by LSG and validated by SGS Geostat. The mineral resource and mineral reserve statement is summarized in Table 6.6.

Table 6.6: LSG Mineral Reserve and Indicated Mineral Resource for Timmins West Mine (Crick et al., 2012B)

Deposit	Classification	Capped Grade		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Timmins Deposit	Probable Mineral Reserve	2,250,000	5.6	405,900
Thunder Creek	Probable Mineral Reserve	2,673,000	4.9	418,000
Total Timmins West Mine	Total Probable Mineral Reserve	4,922,000	5.2	823,800
Timmins Deposit	Indicated Mineral Resource	2,124,000	7.9	541,700
Thunder Creek	Indicated Mineral Resource	2,053,000	7.0	463,000
Total Timmins West Mine	Total Indicated Mineral Resource	4,177,000	7.5	1,004,700

**Notes:*

1. *Mineral reserves and mineral resources were reported above a cut-off grade of 3.0 g/t gold.*
2. *Effective Date of October 28, 2011 for Thunder Creek Deposit, and January 31, 2012 for the Timmins Deposit.*
3. *Indicated mineral resources are inclusive of mineral reserves.*

4. *Numbers may not add up due to rounding.*

In March 2013, LSG published another updated mineral resource and mineral reserve statement in connection with the filing of its 2012 Annual Information Form. The results are summarized in Table 6.7.

Table 6.7: LSG Mineral Reserve and Mineral Resource Timmins West Mine, at Year-End 2012 (AIF 2012; Press Release Dated March 18, 2013)

Deposit	Classification	Capped Grade		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Total Timmins West Mine	Probable Mineral Reserve	4,811,000	5.2	798,000
	Indicated Mineral Resource	5,978,000	5.5	1,061,000
	Inferred Mineral Resource	3,549,000	5.4	615,000

**Notes:*

1. *Mineral reserves were reported above cut-off grade of 3.0 g/t gold.*
2. *Mineral resources were reported above a cut-off grade of 1.5 g/t gold.*
3. *Indicated mineral resources are inclusive of mineral reserves.*
4. *Mineral reserves accounted for a depletion of 64,177 ounces in 2012.*

In March 2014, LSG released an updated mineral resource and mineral reserve statement in conjunction with the filing of an updated NI 43-101 technical report for the TWM. The results are summarized in Table 6.8.

Table 6.8: Timmins West Mine Mineral Resource and Mineral Reserve Estimates, March 2014

Deposit	Classification	Capped Grade		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Timmins Deposit	Probable Reserve	1,540,000	4.6	227,700
	Indicated Resource	1,893,000	5.2	314,200
	Inferred Resource	2,075,000	5.7	378,500
Thunder Creek	Probable Reserve	1,792,000	4.6	264,500
	Indicated Resource	2,471,000	5.0	400,500
	Inferred Resource	864,000	5.0	137,800
Total Timmins West Mine	Probable Reserve	3,332,000	4.6	492,200
	Indicated Resource	4,364,000	5.1	714,600
	Inferred Resource	2,939,000	5.5	516,300

**Notes:*

1. *CIM Definitions and Guidelines were followed when classifying the mineral resources.*
3. *Capped gold values were used for grade estimation.*
4. *The estimate includes low grade material which is not included in the mine plan.*
5. *Mineral reserves were reported above a cut-off grade of 2.8 g/t gold.*
6. *Mineral resources were reported above a cut-off grade of 1.5 g/t gold and include internal dilution to maintain zone continuity.*

7. *Indicated mineral resources are inclusive of mineral reserves.*
8. *Weighted average gold price was assumed to be US$1,000 per ounce (approx. CAD$1,150).*
9. *Metallurgical recoveries are assumed to average 96%.*

In February 2016, LSG released an updated mineral resource and mineral reserve in conjunction with the filing of an updated NI 43-101 technical report for the TWM. The results are summarized in Table 6.9.

Table 6.9: Timmins West Mine Mineral Resource and Mineral Reserve Statements, February 2016

Deposit	Classification	Capped Grade		Contained Gold (ounces)
		Tonnes	Grade (g/t)	
Timmins Deposit	Probable Reserve	1,397,000	4.4	195,500
	Indicated Resource	1,816,000	5.1	296,000
	Inferred Resource	606,000	4.8	92,600
Thunder Creek	Probable Reserve	1,498,000	4.1	196,300
	Indicated Resource	2,225,000	4.3	305,700
	Inferred Resource	151,000	3.6	17,500
144 Gap	Indicated Resource	1,734,000	5.4	301,700
	Inferred Resource	1,914,000	5.2	319,200
Total Timmins West Mine	Probable Reserve	2,895,000	4.2	391,800
	Indicated Resource	5,775,000	4.9	903,400
	Inferred Resource	2,671,000	5.0	429,300

**Notes:*

1. *Numbers may not add up due to rounding.*
2. *CIM Definitions and Guidelines were followed when classifying the mineral resource.*
3. *Capped gold values were used for grade estimation.*
4. *The estimate includes low grade material which is not included in the mine plan.*
5. *Mineral reserves were reported above a cut-off grade of 2.3 g/t gold*
6. *Mineral resources were reported above a cut-off grade of 1.5 g/t gold for Timmins and Thunder Creek Deposits and 2.6 g/t gold for Highway – 144 Deposit and include internal dilution to maintain zone continuity.*
7. *Indicated resources were inclusive of mineral reserves.*
8. *Mineral reserves were based on a long-term gold price of US$1,000 per ounce and an exchange rate of 0.80 $US/$CAD.*
9. *Metallurgical recoveries were assumed to average 97%.*

On January 1, 2017, LSG released an updated mineral resource and mineral reserve statement in conjunction with the filing of an updated NI 43-101 technical report for the TWM. The results are summarized in Table 6.10.

Table 6.10 Timmins West Mineral Resource and Mineral Reserve Statement, January 2017

Indicated Mineral Resources

Deposit	Tonnes (M)	Gold (g/t)	Gold (koz)
Timmins	1.3	4.8	200
Thunder Creek	1.3	3.8	163
144 Gap	5.3	3.9	661
Total Indicated	7.9	4.0	1,023

Inferred Mineral Resources

Deposit	Tonnes (M)	Gold (g/t)	Gold (koz)
Timmins	0.5	4.7	83
Thunder Creek	0.1	4.0	17
144 Gap	0.7	3.7	80
Total Indicated	1.3	4.2	179

Probable Mineral Reserves

Deposit	Tonnes (M)	Gold (g/t)	Gold (koz)
Timmins	1.2	3.9	145
Thunder Creek	0.8	3.4	88
144 Gap	-	-	-
Total Indicated	2.0	4.2	233

1. *The mineral resource and mineral reserve statement is based on an estimate dated February 29, 2016*
2. *Mineral resources and mineral reserves as at January 1, 2017 were calculated by subtracting June through October 2016 mine depletion*

volumes and November through December 2016 forecasted production based on an updated mineral resource estimate effective June 1, 2016

3. *Mineral resources were reported using a lower cut-off grade of 1.5 g/t gold.*
4. *Mineral reserves were reported using a lower cut-off grade of 2.0 g/t gold and a gold price of $1250/oz.*
5. *Mineral resources were inclusive of mineral reserves.*

In May 2017, the mineral resource for the TWM was updated for the previous NI 43-101 technical report. The mineral resource was depleted for mining up to the effective date of May 15, 2017.

Table 6.11 details the mineral resource and Table 6.12 the mineral reserve statements for this update.

Table 6.11 Timmins West Mineral Resource Statement, May 15, 2017

In-Situ Resources Above 1.5 g/t Gold Cut-Off Grade				
Deposit	**Classification**	**Tonnes**	**Gold Grade (g/t)**	**Gold Ounces**
Timmins	Indicated	1,428,000	4.7	213,800
	Inferred	358,000	4.3	49,700
Thunder Creek	Indicated	1,249,000	3.7	149,800
	Inferred	39,000	2.6	3,300
144 Gap	Measured	361,000	5.0	57,500
	Indicated	4,862,000	3.9	602,900
	Measured & Indicated	*5,223,000*	*3.9*	*660,400*
	Inferred	695,000	3.6	80,500
Total Timmins West Mine	Measured	361,000	5.0	57,500
	Indicated	7,539,000	4.0	966,500
	Measured & Indicated	*7,900,000*	*4.0*	*1,024,000*
	Inferred	1,092,000	3.8	133,400

1. The effective date of the mineral resource estimate was May 15, 2017.

2. Mineral resource estimates had been classified according to CIM Definitions and Guidelines.

3. Mineral resources were reported inclusive of mineral reserves.

4. Mineral resources had been estimated using ID^2 interpolation technique and gold grades which have been capped between 15 and 120 g/t based on statistical analysis of each zone.

5. Domain were modeled assuming a minimum mining width between two and ten metres depending on the zone.

6. Tonnage information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.

7. The mineral resource estimate was prepared under the supervision of, and verified by, Kara Byrnes, P. Geo., Director of Technical Services, LSG, who is a QP under NI 43-101.

Table 6.12: Timmins West Mineral Reserve Statement, May 15, 2017

Deposit	Classification	Tonnes	Gold Grade (g/t)	Gold Ounces
Timmins	Probable	1,247,000	3.6	145,100
Thunder Creek	Probable	668,000	3.1	67,200
144 Gap	Proven	407,000	3.6	47,200
	Probable	4,830,000	3.1	478,300
	Proven & Probable	*5,237,000*	*3.1*	*525,500*
Total Timmins West Mine	Proven	407,000	3.6	47,200
	Probable	6,745,000	3.2	690,600
	Proven & Probable	*7,152,000*	*3.2*	*737,800*

1. *The effective date of this mineral reserve estimate was May 15, 2017.*
2. *The mineral reserve estimates were classified in accordance with the CIM Definitions and Guidelines, as per Canadian Securities Administrator's National Instrument 43-101 requirements.*
3. *Mineral reserves were based on a long-term gold price of US$1,250 per ounce and an exchange rate of 1.3 $CAD/$US.*
4. *Mineral reserves were supported by a mine plan that features variable stope thicknesses, depending on zone, and expected cost levels, depending on the mining methods utilized.*
5. *Mineral reserves incorporate a minimum cut-off grade of 2.0 g/t. The cut-off grade includes estimated mining and site G&A costs of $US50.38 per tonne, surface haulage costs of $US5.97 per tonne, milling costs of $US16.23 per tonne, mining recovery of 95%, external dilution of 15.0% for TD, 13.0% for TC, and 9.0% for 144 Gap and a metallurgical recovery rate of 97%.*
6. *The mineral reserve estimate was prepared under the supervision of, and verified by, Kara Byrnes, P. Geo., Director of Technical Services, LSG, who is a QP under NI 43-101.*

A QP has not done sufficient work to classify the historical estimates described in this section as current mineral resources or mineral reserves. These estimates are not considered to be current, and are quoted from the documents referenced.

6.2 Historic Production

Prior to March 2009 there was no production activity at the TWM. Annual production figures for the TWM from March 2009 to June 30, 2021 (including the Timmins, Thunder Creek and 144 Gap Deposits) are summarized in Table 6.13. Production from the 144 Gap Deposit began in April 2016.

Table 6.13: Timmins West Mine Annual Production Figures

Year	Milled Tonnes	Grade (g/t)	Recovered Ounces
2009	72,899	3.3	7,745
2010	258,067	5.5	44,485
2011	491,723	3.7	58,839

2012	536,947	3.8	64,175
2013	747,489	4.6	106,905
2014	971,231	4.8	144,043
2015	1,010,956	4.4	139,050
2016	924,506	4.1	114,875
2017	1,008,311	3.8	119,075
2018	956,267	2.9	87,500
2019	941,189	3.0	86,609
2020	944,865	2.7	79,115
Jan 1-Jun 30, 2021	515,852	2.4	38,673
Totals	**9,380,302**	**3.7**	**1,091,089**

7 Geological Setting and Mineralization

7.1 Regional Geology

In 1991, Jackson and Fyon defined a lithostratigraphic association of rock units in the Western Abitibi Subprovince within the boundaries of 55 tectonic assemblages. An assemblage is defined as stratified volcanic and/or sedimentary rock units built during a discrete interval of time in a common depositional or volcanic setting. Jackson and Fyon (1991) suggest a four stage evolutionary model for the Southern Abitibi Greenstone Belt:

- Formation of submarine oceanic assemblages in regional-scale, complex micro-plate interactions perhaps caught between two larger converging plates located north and south of the micro-plate region;
- Termination of submarine volcanism by collision of a large continental mass to the south at ~2700 Ma. The collision may have been oblique, involving the 2800 to 3000 Ma Minnesota River Valley gneiss terrane.
- Tectonic thickening during collision led to emergent sediment source area(s) for post ~2700 Ma turbidite deposits, including both local deposits and a massive sedimentary accretionary wedge. As collision continued, previously formed volcanic and turbidite deposits, including the Pontiac Subprovince, were deformed;
- Terminal subduction, possibly involving complex plate interactions at 2685 to 2675 Ma, generated alkalic volcanic rocks and alluvial–fluvial sediments in proximity to crustal–scale shear zones.

Most of the gold produced in the Abitibi Subprovince were from deposits formed proximal to two major regional structures. The major gold deposits in the Kirkland Lake and Rouyn-Noranda camps are located along the Cadillac-Larder Lake Fault ("CLLF") and those in the Timmins camp are located along the Destor-Porcupine Fault ("DPF").

Supracrustal rocks in the Timmins region are assigned as members of nine tectonic assemblages within the Western Abitibi Subprovince of the Superior Province. The seven volcanic and two sedimentary assemblages are of Archean age. Intrusions were emplaced during Archean and Proterozoic times and are associated with various mineralization styles and deposits. Tectonic assemblages of the Abitibi Subprovince, east of the Kapuskasing Structural Zone, are illustrated in Figure 7.1 (after Ayer J.A., Dubé, B., and Trowell, N.F., 2009). Table 7.1 is modified after Ayer (1999, 2000, 2003, 2005, 2011) and summarizes the characteristics of the assemblages from youngest to oldest.

Figure 7.1: Tectonic Assemblages of the Abitibi Subprovince East of the Kapuskasing Structural Zone (After Ayer, J.A., Dubé, B., Trowell, N.F.; NE Ontario Mines and Minerals Symposium, April 16, 2009)

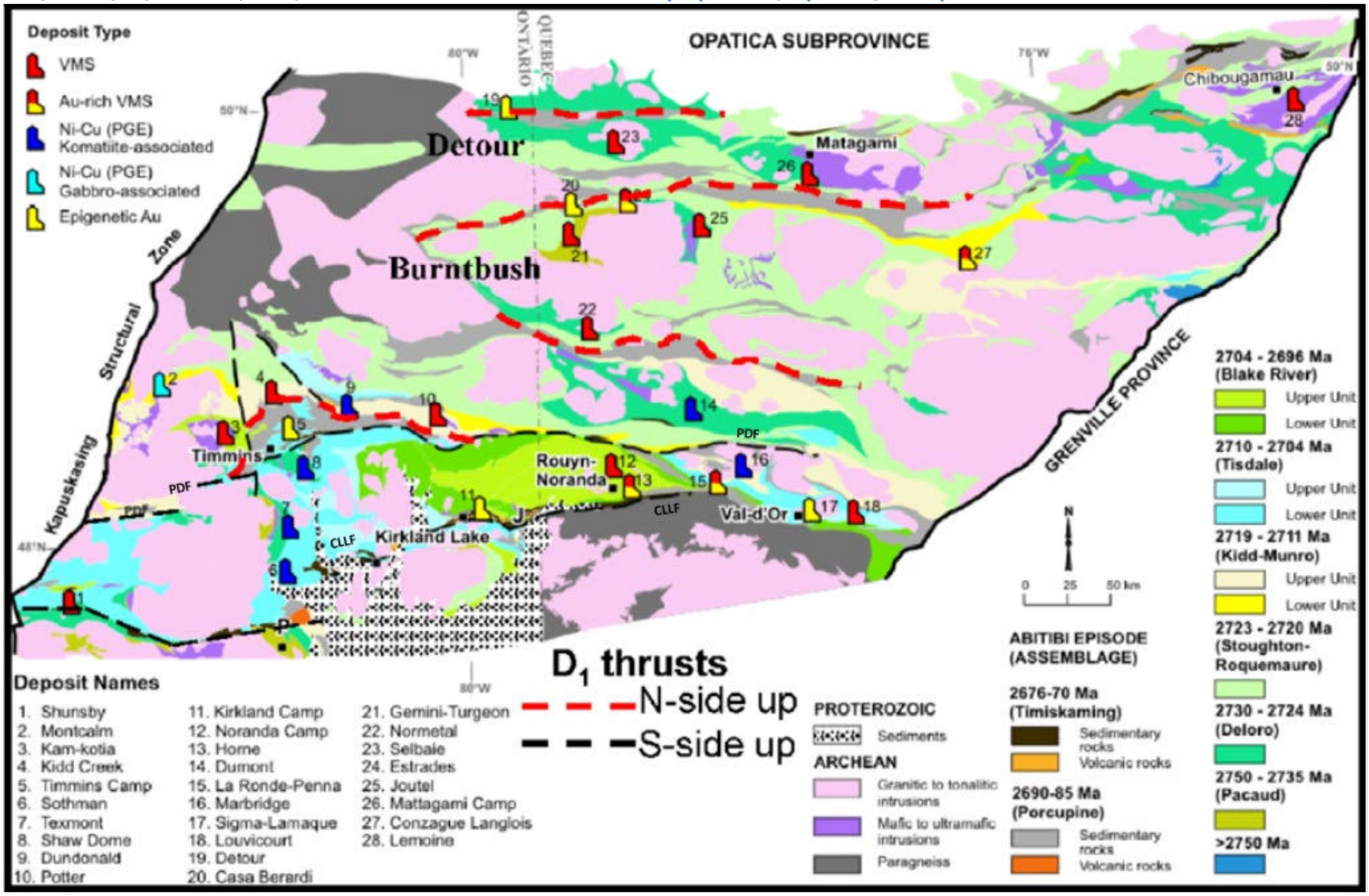


Table 7.1: Tectonic Assemblages

<table>
<tr><th>Assemblages</th><th>Description</th></tr>
<tr><td>Timiskaming Assemblage

Unconformably deposited from 2676-2670 Ma (6 Ma time span)</td><td>Consists of conglomerate, sandstone and alkalic volcanics
Coeval Gold mineralization occurs near regional fault zones (PDF & CLLF)
Mineralised deposits associated with this assemblage occur include:
Quartz veins (e.g. Timmins & Val d'Or deposits)
Sulphide rich Stockworks (e.g. Holloway Twp., Kirkland Lake, Matachewan)
AIC (Thunder Creek) 2687 ±3Ma (Barrie, 1992)</td></tr>
<tr><td>Porcupine Assemblage

Deposited from 2690 – 2685 Ma (5 Ma time span)</td><td>Lithologies found are turbidites with minor conglomerates & iron formation locally.
The Krist Formation forms part of the Porcupine assemblage and is coeval with calc-alkalic felsic porphyries (2691 ±3 to 2688 ±2 Ma).</td></tr>
<tr><td>Blake River Assemblage

Deposited from 2703 – 2696 Ma (7 Ma time span)</td><td>Upper and Lower Units composed of Tholeiitic volcanics and Calc-alkaline mafic to felsic volcanics.
Mineralised deposits associated with this assemblage occur as:
Volcanogenic Massive Sulphide (VMS) deposits associated with F3 felsic volcanics (Noranda deposit)
Syngenetic gold & base metals (Horne, Thompson Bousquet deposits)</td></tr>
<tr><td>Tisdale Assemblage

Deposited from 2710 – 2704 Ma (6 Ma time span)</td><td>Upper and Lower Units composed a tholeiitic to komatiite suite and a calc-alkaline suite.
Mineralised deposits associated with this assemblage include:
VMS Deposits:
Kamiskotia – contained in tholeiitic volcanics, gabbros & F3 felsics
Val d'Or – contained in calc-alkaline volcanics & F2 felsics
Sheraton Township area – contained in intermediate-felsic calc-alkaline volcanics
Ni-Cu-PGE: Shaw Dome, Texmont, and Bannockburn</td></tr>
<tr><td>Kidd-Munro Assemblage

Deposited from 2719 – 2711 Ma (8 Ma time span)</td><td>Consists of two units:
Tholeiitic to komatiitic volcanics.
Calc-alkaline suite.
Several different minerlised styles are found:
VMS deposits:
mineralisation associated with F3 felsic volcanics & komatiites (Kidd Creek deposit)
mineralisation associated with tholeiitic-Komatiitic volcanism (Potter deposit)
Ni-Cu-PGE (Alexo deposit)</td></tr>
<tr><td>Stoughton-Roquemaure Assemblage

Deposited from about 2723 – 2720 Ma (3 Ma time span)</td><td>Composed primarily of magnesium and iron rich tholeiitic basalts with localized komatiites and felsic volcanics.
PGE mineralization occurs in mafic-ultramafic intrusions and komatiites (Mann & Boston Townships)</td></tr>
<tr><td>Deloro Assemblage

Deposited from about 2730 – 2724 Ma (6 Ma time span)</td><td>A single unit composed of mafic to felsic calc-alkaline volcanics which is commonly capped by regionally extensive chemical sediments.
Two different types of VMS deposits generally associated with this assemblage:
F2 felsic volcanics and synvolcanic intrusion (e.g. Normetal)
Localized sulphide-rich facies in regional oxide facies iron formations (e.g. Shunsby)</td></tr>
<tr><td>Pacaud Assemblage

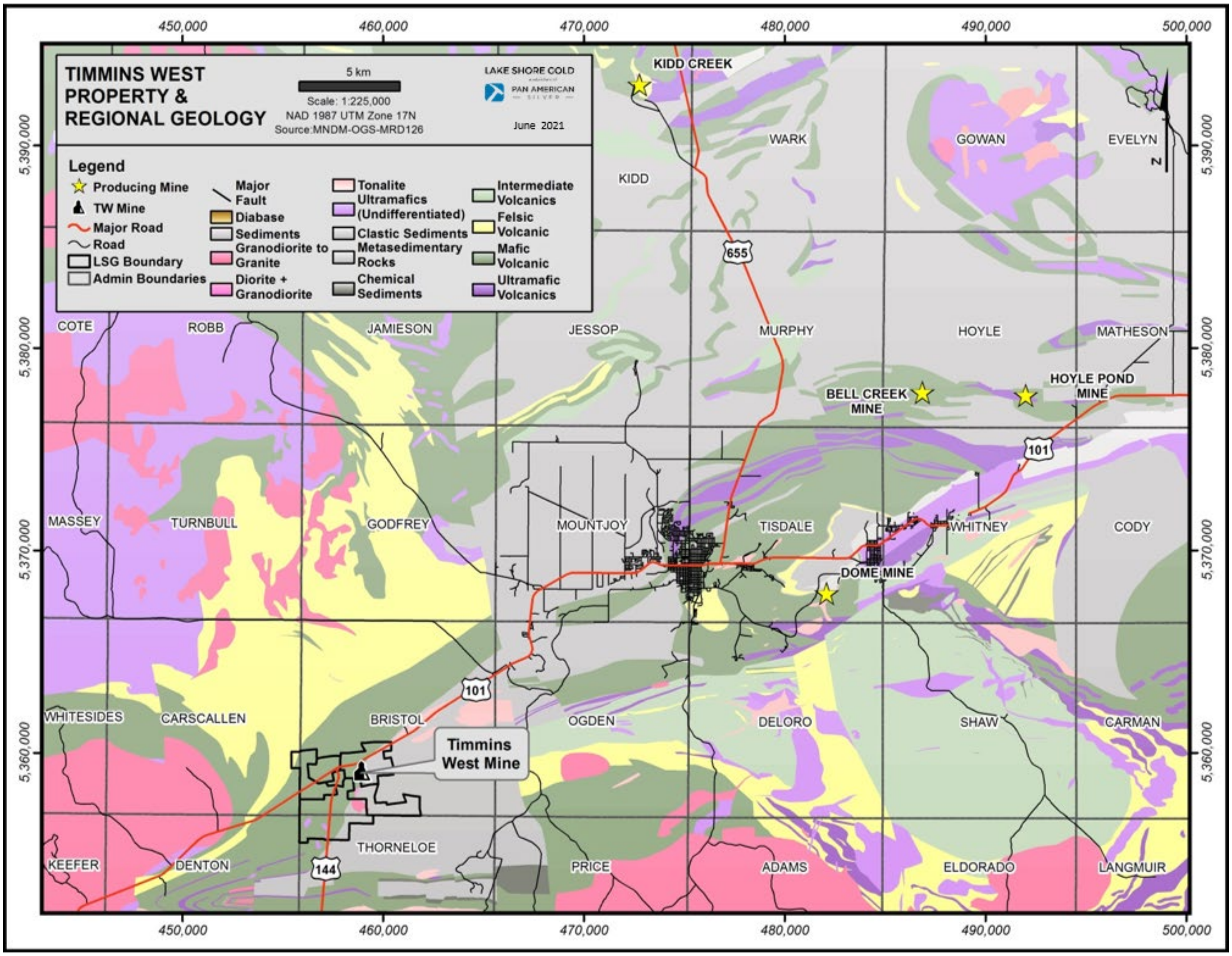
Deposited from 2750 – 2735 Ma (15 Ma time span)</td><td>A single unit composed of magnesium and iron rich tholeiitic basalt with localized komatiites and felsic volcanics.</td></tr>
</table>

There is a time span of 80 Ma between the volcanic eruption of the lower Pacaud assemblage (2750 Ma) and the sedimentation and volcanism of the upper Timiskaming Assemblage (2670 Ma). Each of the assemblages demonstrates a melt evolution from komatiitic or tholeiitic basalt, to felsic or calc-alkaline volcanics. In the TWM area, only the Deloro [2730 – 2724 Ma (6 Ma)], Kidd-Munro [2719 – 2711 Ma (8 Ma)], Tisdale [2710 – 2704 Ma (6 Ma)], Porcupine [2690 – 2685 Ma (5 Ma)], and Timiskaming Assemblages [2676 – 2670 Ma (6 Ma)] are present. The Krist Formation is comprised of calc-alkaline felsic pyroclastic rocks with minor amounts of carbonaceous argillite. Revised age dates for the Porcupine Assemblage indicate that the Krist Formation is coeval with emplacement of calc-alkalic felsic porphyries in Timmins (2692 ±3 to 2688 ±2 Ma).

Figure 7.2 shows the location of the Property relative to the regional geology.

Regionally, deformation in the Timmins area is characterized by a sequence of early, pre-metamorphic folds lacking axial planar cleavage (D1 and D2) to a series of syn-metamorphic, fabric–forming events, which overprint the earlier folds (D3 and D4 events) and a later crenulation cleavage (D5) (Rhys, 2010). The multi-phase Destor-Porcupine fault system passes approximately 5km to the south of the Property. The fault system is a composite corridor of shear zones and faults that records at least two main stages of displacement: syn-Timiskaming (2680-2677 Ma) brittle faulting associated with truncation of early D1 and D2 folds, apparent sinistral displacement, and formation of half grabens that are locally filled with Timiskaming clastic sedimentary rocks; and the formation of syn-metamorphic D3-D4 high strain zones over a broad corridor generally several hundred metres wide. These shear zones record variable kinematic increments but sinistral with north side up displacement are regionally dominant (Rhys, 2010).

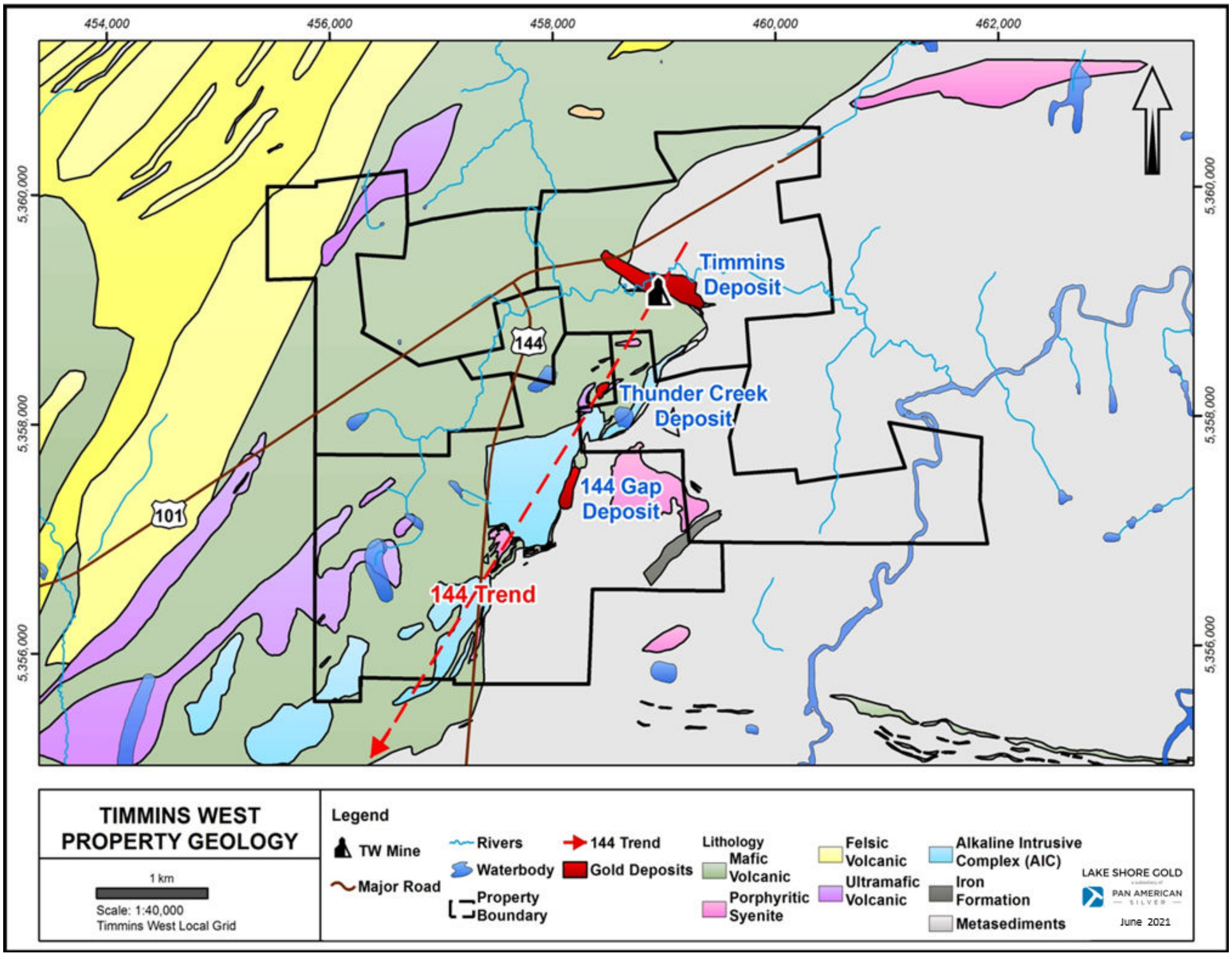
Figure 7.2: Regional Geology Map



7.2 Local and Property Geology

The Property is dominated by mafic volcanic and sedimentary rocks which are interpreted to be from the Tisdale, Deloro and Porcupine Groups and occurring within a broad basin like feature which opens to the east (Figure 7.3). Rocks within the basin generally strike in an easterly direction and dip moderately to steeply northwards. Crosscutting the earlier rock units are a series of ultramafic to felsic intrusions including diabase dykes of several orientations. The most prominent are a northeasterly set of alkaline intrusives located on the north side of the metavolcanic-metasedimentary contact which are collectively termed the AIC. Key structural features of the property include the Destor Porcupine Fault Zone ("DPFZ") which passes through the south portion of the interpreted basin and as well as the 144 and Gold River Trends which occur on the north and south limbs. These two trends represent intense zones of alteration and deformation and are the host to all of the main gold occurrences identified on the Property to date including the Timmins Deposit, Thunder Creek Deposit and 144 Gap Deposit.

Figure 7.3: Property Geology



Timmins Deposit Portion of the Timmins West Mine

The Timmins Deposit occurs at the northeast tip of the 144 Trend and is interpreted to overlie an overturned fold nose which formed at the contact between mafic metavolcanic rocks of the Tisdale assemblage and metasedimentary rocks of the Porcupine assemblage (Figure 7.3 and Figure 7.4). The fold nose has a steep northwesterly plunge and has been defined by drilling from surface to a minimum depth of 1,475m below surface. All gold mineralization identified and mined to date at the Timmins Deposit is located within or immediately adjacent to this structure.

The mafic volcanic rocks underlie the western portion of the mine area and include mainly fine-grained extrusive rocks which are massive in nature, but with local pillowed, vesicular, and flow breccia textures. Composed mainly of chlorite-feldspar ± calcite assemblages, these rocks are commonly dark green in color, except where affected (bleached) by sericite-Fe-carbonate ± albite alteration and veining (e.g. mineralized footwall-style zones proximal to the AIC). It is notable that these mafic volcanic rocks are often strongly magnetic, which has significant implications on tracking of drill hole orientations (see Items 11 and 12).

The metasedimentary rocks occur in the easterly portions of the deposit and in the core of the Timmins Deposit Fold Nose ("TDFN"). The main sedimentary sequence is generally comprised of thinly to thickly bedded turbiditic greywacke, siltstone, and mudstone.

Poorly exposed at surface, the multi-phase AIC intrudes the Timmins Deposit stratigraphy at depth near the core of the TDFN (Figure 7.4). The most common and texturally/mineralogically distinct phases include: 1) a fine- to coarse-grained pyroxenite; 2) a biotite-rich pyroxenite; 3) a porphyritic garnet-rich pyroxenite; 4) a fine-grained calcareous syenite; 5) fine-grained dykes with disseminated mafic minerals in a pinkish-brown matrix, often termed hornblende syenite, and; 6) a fine- to medium-grained equigranular monzonitic phase which appears to cut earlier phases. It is unclear whether these various phases are co-magmatic or form suites of significantly different ages. The main pyroxenite body is largely massive and only weakly foliated, but is cut locally by high strain zones up to several metres wide. Within and in proximity to mineralized veins and structures (i.e. Ultramafic Zones ("UM"-style zones) of the Timmins Deposit), the various phases of pyroxenite are frequently bleached to greyish and/or buff (tan) brown colors with pervasive fine-grained iron ("Fe")-carbonate and sericite (+ albite) alteration and abundant disseminated magnetite. In areas of moderate to high strain, finely laminated biotite-(chlorite)-calcite and selective hematite are the dominant alteration assemblage. The AIC in the Timmins Deposit is commonly intermingled with a highly deformed, fine-grained talc-chlorite altered komatiite in the fold closure area. At depth, this komatiitic unit separates the AIC into two predominantly pyroxenitic lobes, referred to as the western and eastern lobes. The UM Zones are hosted in the western lobe and a series of smaller UM-style zones ("Sediment Sub-Zones" prefixed by the letter "S") are located in the eastern lobe (Figure 7.4 and Figure 7.5). Zones of high strain in the relatively incompetent komatiite unit, coupled with similar shear sense indicators in proximal sediments to the east within the "core" of the fold nose, are interpreted as defining the down-plunge position of the Holmer Shear Zone (Rhys, 2015; Figure 7.4). The Holmer Shear Zone is an important set of gold-related structures visible in both surface exposures and shallow mine levels.

Figure 7.4: Timmins Deposit Underground Geology at 790L (Lower Mine)

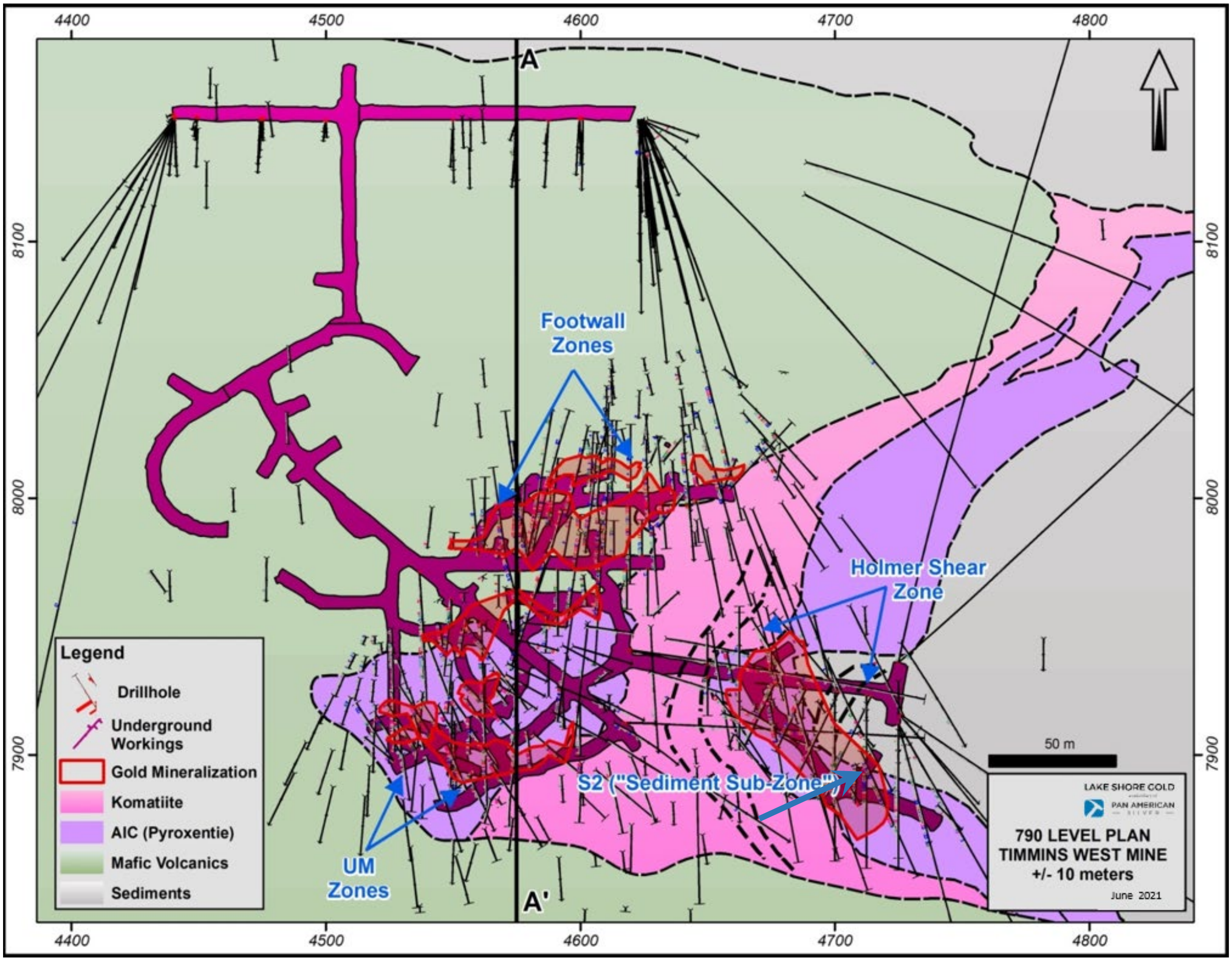
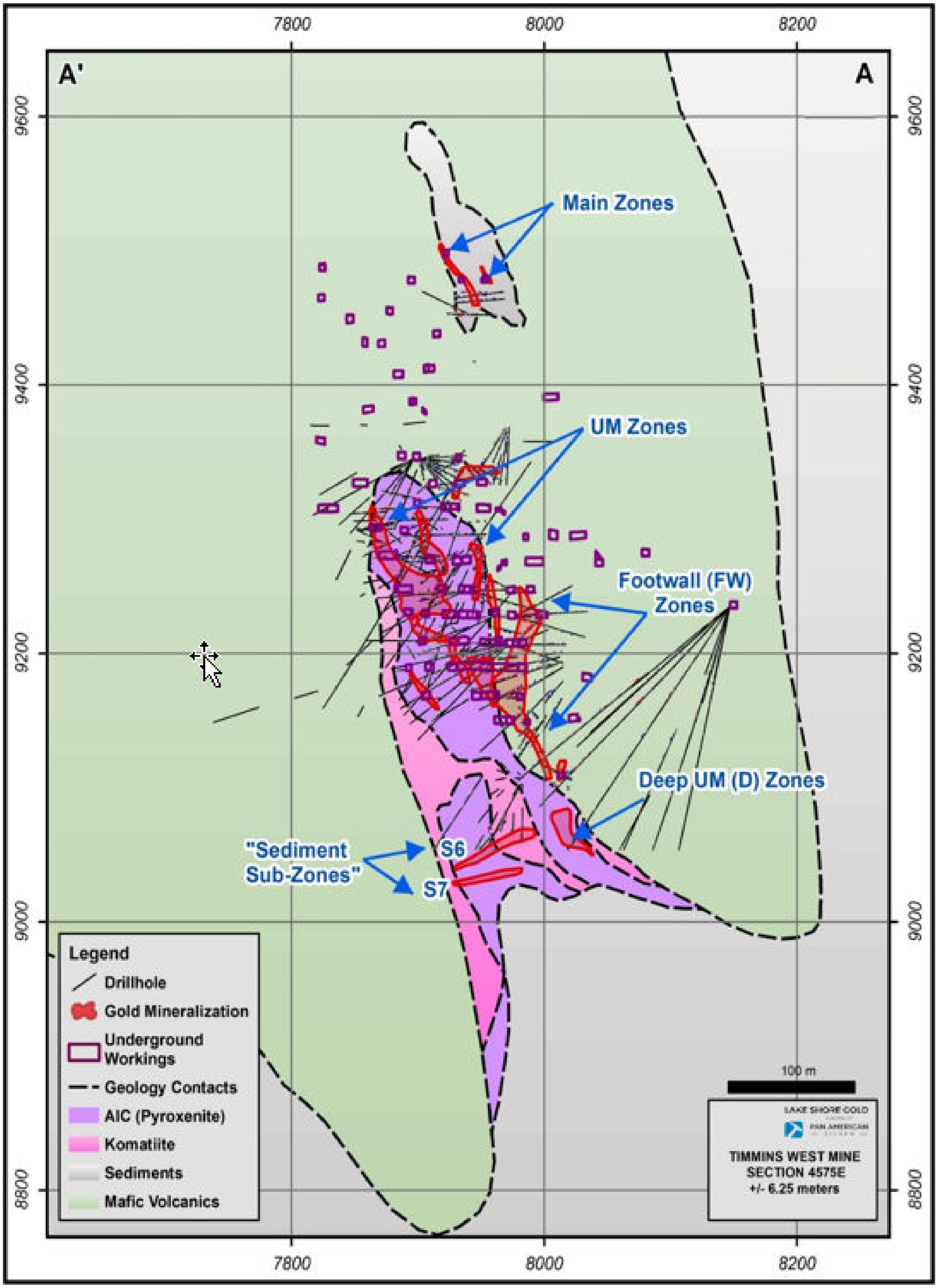


Figure 7.5: Timmins Deposit Generalized Cross-Section 4575E (Timmins West Mine Grid – looking West)



Thunder Creek Portion of the Timmins West Mine

The Thunder Creek Deposit lies approximately 800m to 900m south-southwest of the Timmins Deposit (Figure 7.3). It occurs along the same mafic metavolcanic metasedimentary contact hosting the Timmins Deposit, in an area where the contact has been intruded by a syenite unit and is transected by the northeast trending Rusk Shear Zone.

The western portion of the deposit is underlain by mafic metavolcanic rocks interpreted to belong to the Tisdale Assemblage. These rocks are fine-grained, green in color and exhibit massive, pillowed or flow breccia textures locally. Metamorphism varies from mid-greenschist to lower-amphibolite facies. In proximity to the AIC, pervasive chlorite, abundant disseminated fine-grained magnetite, and localized hematite alterations are also common (Camier, 2009).

The eastern portion of the deposit is overlain, perhaps uncomformably, by a succession of metasedimentary rocks belonging to the Porcupine Assemblage. In the Thunder Creek area, this unit presents as a discontinuous sequence of biotite-rich meta-greywacke, metamorphosed siltstones, metamorphosed argillite, fine- to medium-grained clastic tuff, and laminated chemical metasediments containing magnetite (Camier, 2009; Samson, 2008). These metasedimentary units occur in the footwall to the AIC and along the Rusk Shear Zone. Within the shear zone, sediments are strongly deformed to a quartz-sericite-carbonate (± hematite) mylonite. The most common alteration assemblage comprises sericite, weak hematite and silicification.

Cutting through the metavolcanics and metasediments are a northeast trending set of intrusions with the most significant being the Thunder Creek Porphyry which is a 200m long monzonitic body which hosts the Porphyry Zone in the Thunder Creek Deposit. The top of the main Thunder Creek Porphyry occurs approximately 400m below surface, immediately northwest of the key volcanic-sediment contact. It intrudes the mafic volcanic rocks in the AIC footwall and the Rusk Shear Zone (Figure 7.6 and Figure 7.7).

Occurring in the central to southern portion of the property is the Thunder Creek Stock. It is a nearly circular intrusion with a diameter greater than 500m which forms an area of high topographic relief on surface (Figure 7.3). The composition of the intrusion varies with 10-40% quartz eyes and 10-20% tabular feldspars contained within a fine-grained pinkish-grey groundmass. Owing to significant variation in quartz and feldspar content, multiple names have been used to describe this rock type, including quartz monzonite, monzonite, syenite, and peralkaline syenite. The characteristic pink to brick-red color is interpreted as the result of variable albitic, potassic, and hematitic alteration intensities. Camier (2009) noted the presence of riebeckite in the eastern half of the intrusive, which may suggest an alkaline magmatic source. Although no age dating has been completed, it is speculated that the intrusions at Thunder Creek may be part of the Timiskaming Assemblage (2676-2670 Ma).

Figure 7.6: Thunder Creek Underground Geology at 765L (Lower Mine)

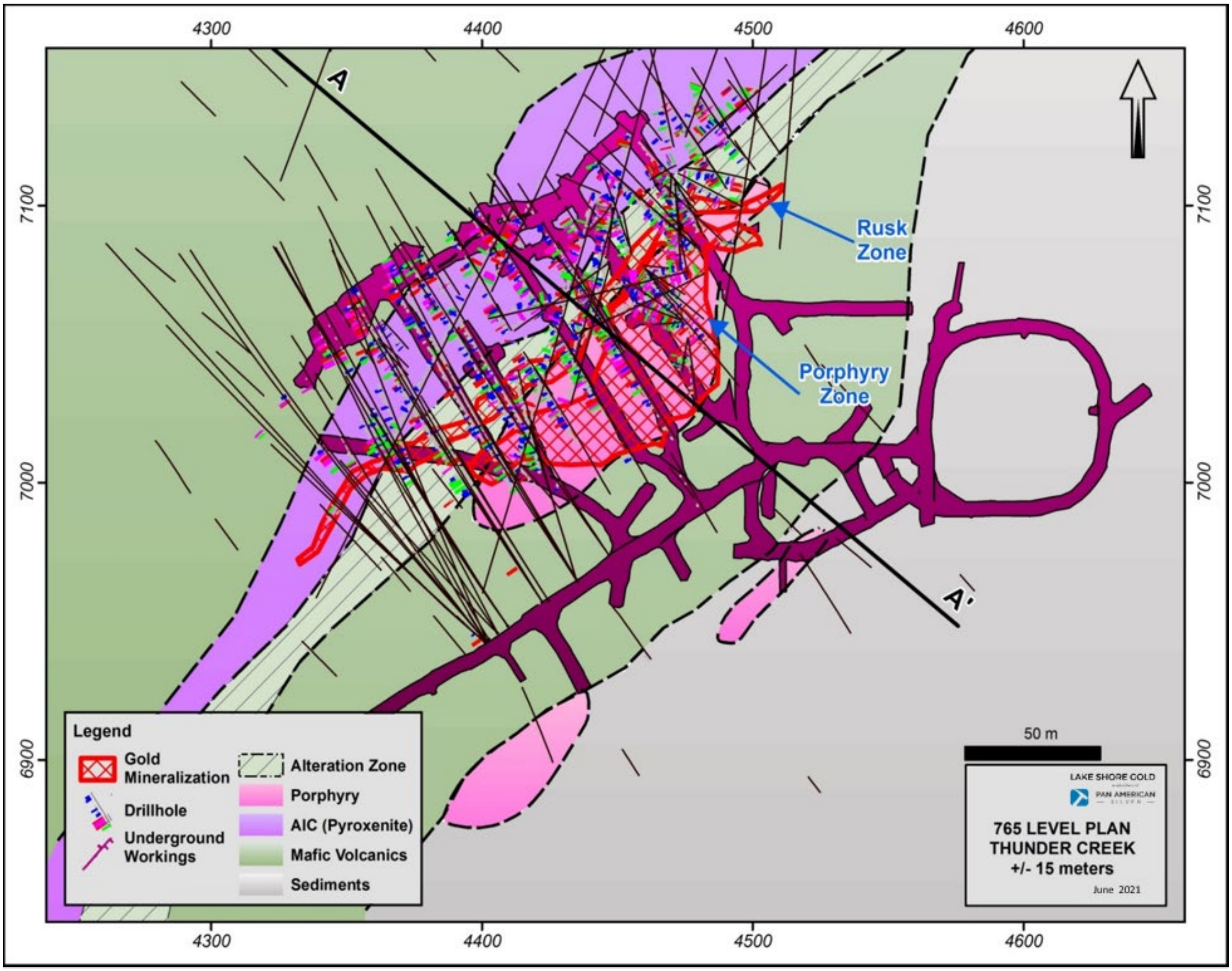
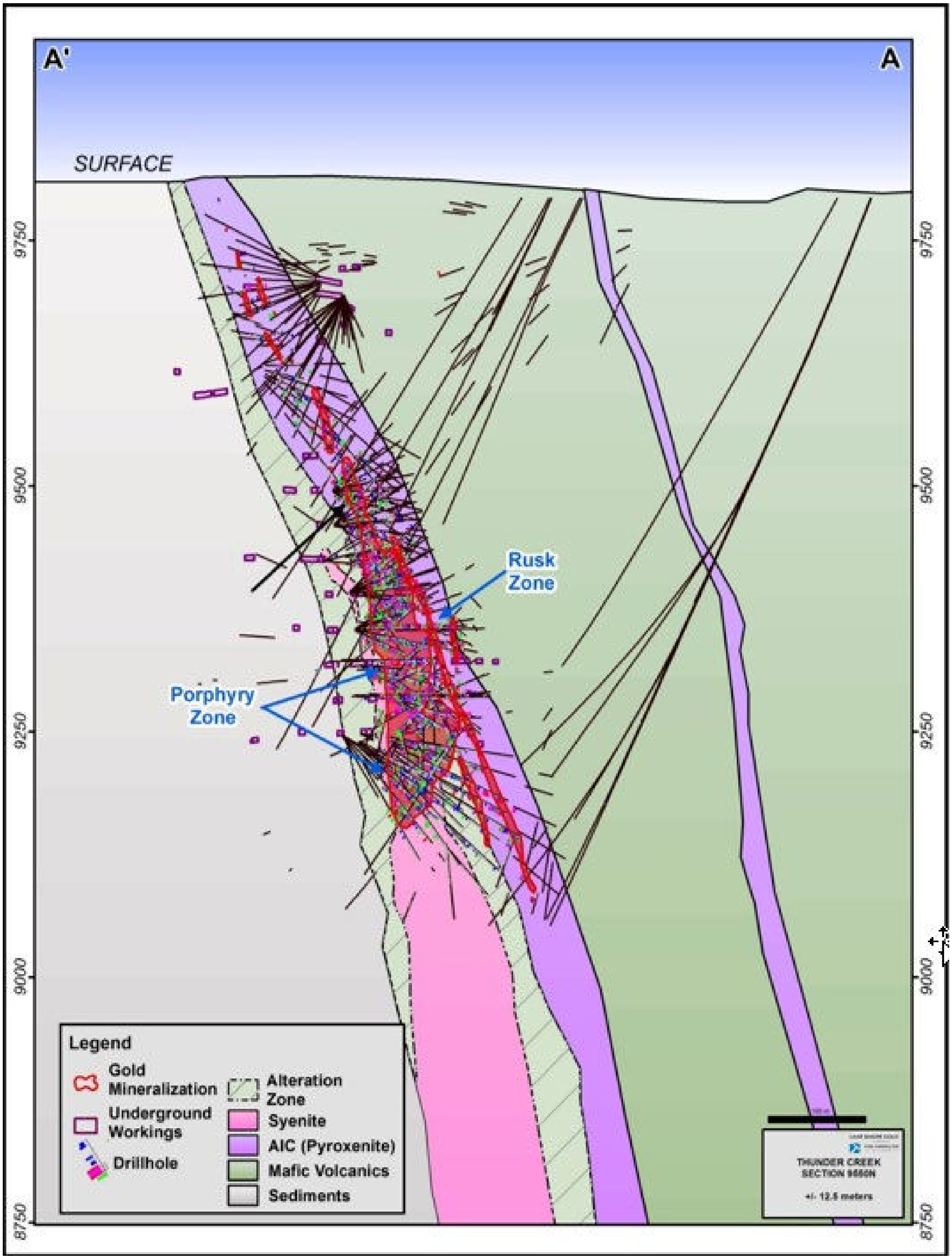


Figure 7.7: Thunder Creek Generalized Cross-Section, 9550N (Thunder Creek Rotated Surface Grid looking Southwest)



144 Gap Deposit Portion of the Timmins West Mine

The 144 Gap Deposit occurs along the 144 Trend, approximately 750m to the southwest of the Thunder Creek Deposit and between 600m and 1,000m below surface. Continued drilling following the 2014 discovery hole (HWY-14-48: 5.37 g/t over 46.0 metres including 21.87 g/t over 6.0m and 12.54 g/t over 4.4m (*Press Release dated October 07, 2014*) has outlined a mineral deposit similar in style and setting to the nearby Thunder Creek Deposit. Multiple internal studies, combined with the expertise of external consultants have helped to better understand the geological, structural, and geochemical controls on the new deposit. The interpreted results and supporting observations of these studies are summarized in the following deposit description.

Similar to the Thunder Creek Deposit, the 144 Gap Deposit is located immediately northwest of the northeast trending contact between the metavolcanic and metasedimentary rocks where it has been cut by a prominent northeast trending high strain zone (Figure 7.8). This high strain zone comprises an intense northeast trending, steep northwest dipping mylonitic to phyllonitic shear zone that varies between 5m and 20m thick (Rhys, 2015). The high strain zone varies in alteration style and intensity from hanging-wall to footwall primarily in response to variations in host-rock unit across its width. In the hanging-wall where it is generally developed within the mafic volcanic-pyroxenite sequence, the structure is a dark grey laminated biotite-magnetite-chlorite-calcite shear zone with intense phyllonitic foliation, and which may contain variable amounts of apatite and K-feldspar (Ross and Rhys, 2015). The shear zone typically grades into more sericite (-carbonate)-rich components in its footwall, likely denoting a change in primary protolith and overprinting alteration from the mafic volcanic-pyroxenite sequence to altered Porcupine sediments. Carbonate in the contact zone is appreciably more Fe-rich (dolomite-ankerite) and indicates a younger alteration phase that overprints the biotite-magnetite-calcite portions of the shear zone (Ross and Rhys, 2015). Highly deformed, boudinaged, and folded pink syenite dykelets are also spatially associated with the sericite-rich portions of the structure. Lithological contacts are highly obscured (and considered gradational) due to the intense nature of alteration and deformation in this central part of the shear zone. In the footwall to the structure, sediments exhibit strong sericite-carbonate (dolomite) alteration and may be intensely foliated up to tens of metres away (Ross and Rhys, 2015).

Work to date suggests that gold mineralization at the 144 Gap Deposit is concentrated dominantly in the footwall to the high strain zone where mineralized syenite bodies intrude an upward-tapering lobe of mafic volcanic rocks (Figure 7.8 and Figure 7.9). The mafic volcanic lobe extends upward to elevations of approximately 500m to 700m below surface with an approximate thickness of 150m in its upper portions and greater than 300m at the lower limits of current drilling. This mafic lobe is separated in its upper portions from the high strain zone and the hanging-wall volcanic sequence by a wedge of altered Porcupine sediments as depicted in Figure 7.9. This wedge appears to extend from the main body of sediments that occur to the southeast and tapers downward along the immediate footwall of the high strain zone. At depth, these highly strained and altered sediments are intercalated with and increasingly difficult to distinguish from the adjacent altered mafic volcanic rocks. The lack of a clearly identifiable structure at the contact between the mafic lobe and the adjacent sediment wedge, coupled with the southeasterly orientation of the bedded sediments, suggests this may be a primary basal contact of the unconformity between the Tisdale volcanic sequence and overlying Porcupine sediments (Rhys, 2015). Rhys (2015) also suggests that the wrapping of sediments around the top of the mafic lobe may represent the hinge zone of an antiformal fold which has been truncated along its northwestern limb by the high strain zone (Figure 7.9).

Syenite intrusions account for approximately 15% to 25% of the mafic lobe (by volume) and are most abundant within 50m to 200m of the footwall to the high strain zone as lenticular sill-like bodies that locally exceed 100m in thickness within and below the main mineralized areas (Rhys, 2015). Smaller/thinner syenite dykes and sills are also noted locally in the hanging-wall. Syenite in the 144 Gap Deposit area is typically K-feldspar porphyritic, with blocky to tabular phenocrysts and megacrysts (often exhibiting oscillatory zoning) set in a fine-grained matrix. Multiple phases of syenite are evident with early K-feldspar megacrystic varieties cut by later finely porphyritic varieties that resemble the monzonitic intrusion which is host to the Porphyry Zone at the Thunder Creek Deposit. Matrices range in color from dark grey or grey-brown in least-altered syenite to salmon pink, reddish-orange, or brick-red in phases affected by a combination of K-feldspar-quartz-albite-hematite alterations (Ross and Rhys, 2015; Linnen and Campbell, 2015).

Hanging-wall rocks to the deposit include mafic volcanics of the Tisdale Assemblage similar in nature to those described above for the Timmins and Thunder Creek portions of the TWM. These rocks, as well as those within the mafic volcanic lobe that hosts the 144 Gap Deposit mineralization, are generally massive and dark green-grey in color with pillowed and vesicular textures locally. Patchy selective epidote-calcite-magnetite are the main alteration phases present with pinkish-brown biotite (phlogopite) appearing in proximity to syenite dykes, possibly the result of contact metamorphism. Though typically massive to weakly foliated, strong fabrics are observed within narrow intervals associated with the high strain zone and related structures.

Figure 7.8: 144 Gap Deposit Geological Level Plan, 820L (Exploration Drift)

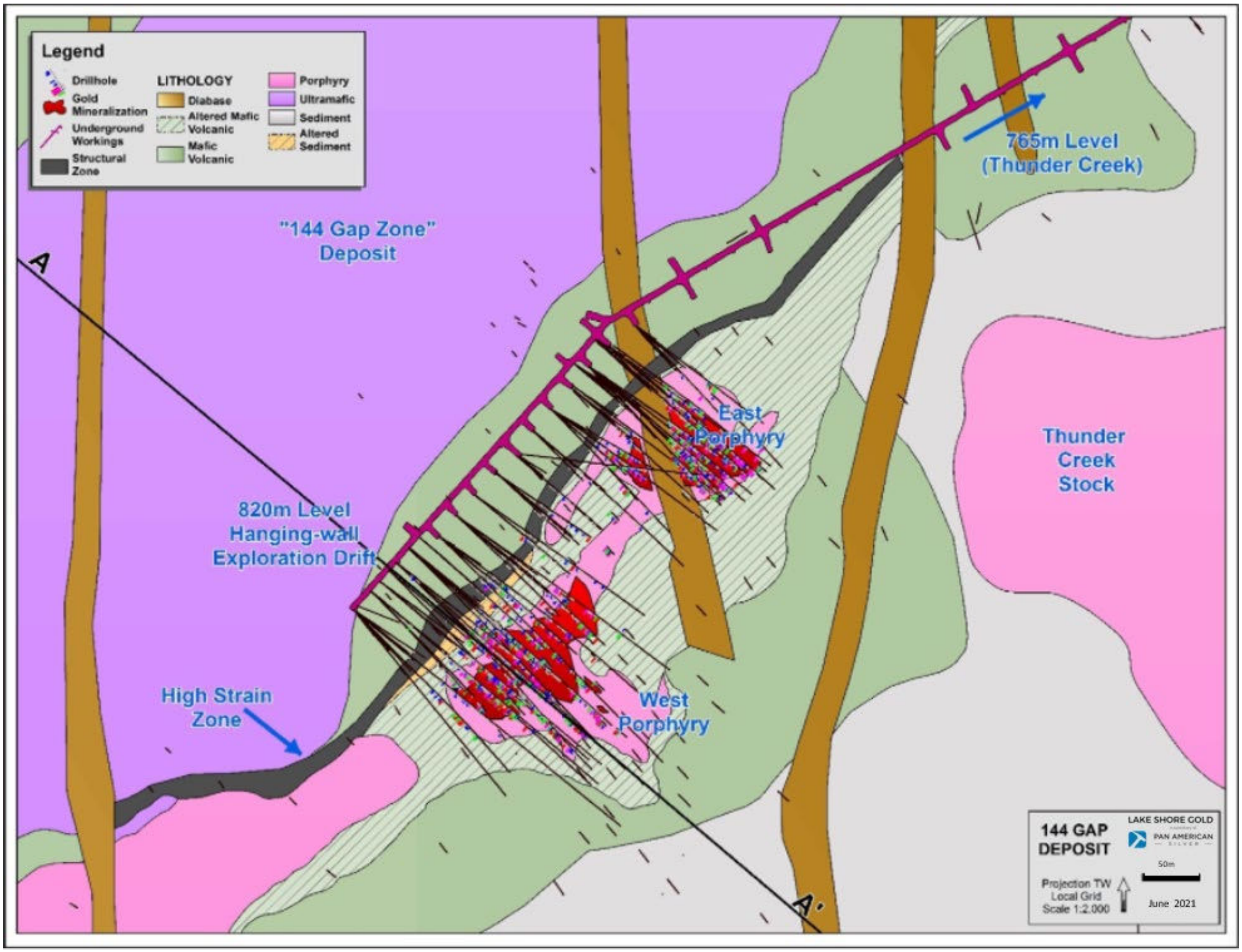
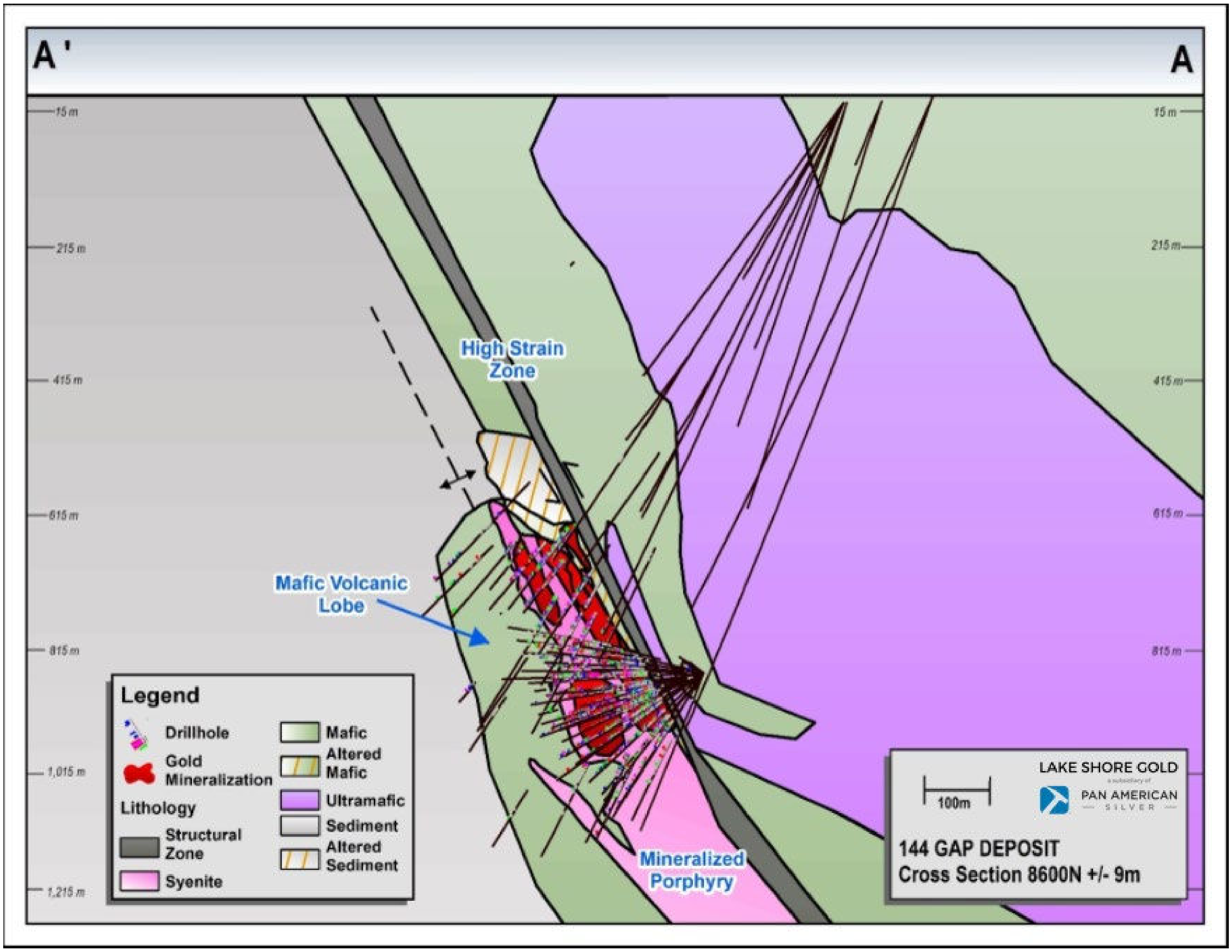


Figure 7.9: 144 GAP Deposit Generalized Cross-Section, 8600N (Highway 144 Rotated Surface Grid, Looking Southwest)



7.3 Structural Geology

Regionally, deformation in the Timmins area is characterized by three major deformation sequences (split into five major events):

- a sequence of early, pre-metamorphic folds lacking axial planar cleavage (D_1 and D_2 events)
- a series of syn-metamorphic, fabric–forming events which overprint the earlier folds (D_3 and D_4 events)
- a later crenulation cleavage (D_5) (Rhys, 2010).

The multi-phase Destor-Porcupine fault system passes approximately 5km to the south of the Property. This fault system is a composite corridor of shear zones and faults that record at least two main stages of displacement: 1) syn-Timiskaming (2680-2677 Ma) brittle faulting associated with truncation of early D_1 and D_2 folds, apparent sinistral displacement, and formation of half grabens that are locally filled with Timiskaming clastic sedimentary rocks, and; 2) syn-metamorphic D_3-D_4 formation of high strain zones over a broad corridor generally several hundred meters wide and corresponding with, or developed south of, the trace of the older faults. These shear zones record variable kinematic increments but are regionally dominated by sinistral, north side up displacements (Rhys, 2010).

At least three areas of high strain, reflecting probable intense S_3 shear zones, have been recognized in the Timmins Deposit, Thunder Creek, and 144 Gap Deposit areas:

- the west-northwest trending, but significantly folded Holmer Shear Zone (Timmins Deposit);
- the northeast trending Rusk Shear Zone (Thunder Creek), and;
- the high strain zone in the 144 Gap Deposit area, interpreted as a possible southwest extension of the Rusk Shear Zone, or related structure.

Shear zones may also be significantly folded, as occurs in the Main Zone in upper portions of the Timmins Deposit. These closures have localized gold mineralization which plunge parallel to them, suggesting the definition of additional F_4 fold closures (Rhys, 2010).

Shear sense indicators in the Holmer Shear Zone surface outcrops, coupled with the oblique (clockwise) nature of the S_3 foliation in the Rusk Shear Zone, suggest that both of these dominant structures in the TWM area accommodated sinistral displacement during D_3. Subsequent D_4 shear zone development in narrower, generally east-west trending and steeply dipping structures with dominantly reverse kinematic indicators in the Timmins Deposit would then imply a change in kinematics later in the deformation history to a more contractional setting associated with development of the stretching lineation. Such variations in kinematics are also suggested in other deposits in the Timmins area and imply changing patterns of far field stress and regional transpression between D_3 and D_4 (Rhys, 2010).

A post-mineral deformation event (D_5) has also been recorded at the Timmins Deposit, evidenced by the folding of shear zones (F_5 folds) in the upper parts of the deposit, particularly near surface, thereby causing variation in dip of the sequence and associated mineralization.

7.4 Mineralization

Gold mineralization in the Timmins, Thunder Creek, and 144 Gap Deposits occurs in steep north-northwest plunging mineralized zones which plunge parallel to the local orientations of the L_4 lineation. Features including folds and elongated lithologies also plunge parallel to this lineation. Mineralization occurs within, or along favorable lithostructural settings within 100m of the Holmer and Rusk Shear Zones. Mineralization comprises multiple generations of quartz-carbonate-tourmaline ±albite veins, associated pyrite alteration envelopes, and disseminated pyrite mineralization. Textural evidence suggests that veining formed progressively through D_3 and D_4 deformation. All phases of gold-bearing veins cut and postdate the AIC and syenitic to monzonitic intrusions, although mineralization is often spatially associated with ore preferentially developed within these intrusive suites (Rhys, 2010).

Timmins Deposit

At the Timmins Deposit, the character and sequence of veining in the Main, V1 and V2 veins is similar in all exposures. Four phases of veining have been recognized in the Timmins Deposit (Rhys 2003, 2010 and 2011). The sequence of veining observed is as follows, with most veins in the upper Timmins Deposit mineralization forming composite veins which have this paragenetic sequence.

1. 1. Early tourmaline-rich phase: early, tourmaline-quartz vein material forms the earliest veining phase. It comprises both dilation veins and tabular vein-style wall rock replacement zones along strike from, or parallel to dilation veins. The veins have tan carbonate ±sericite alteration envelopes. Tourmaline can comprise the majority of the vein material in these veins, forming a black matrix cross cut by later phases of veining. These veins vary from a few centimetres to more than 2 meters wide, and may be significantly boudinaged or folded, with S4 axial planar to the folds. Boudins, where developed, are linear and shallow plunging and at a high angle to the L4 stretching lineation. Dilational veins have sharp contacts and massive central fill consistent with formation as void fill. Replacement tourmaline comprises 5cm to 40cm wide replacement veins which, unlike the dilational veins, have gradational contacts over 0.5cm to 2cm. Relic textures of the wallrock, including fragmental textures in deformed potential clastic sedimentary or fragmental tuffaceous units which occur in the Holmer Shear Zone are preserved. These may laterally grade into more dilational quartz-tourmaline veins which have sharp contacts. Both vein styles are spatially associated and close in timing with the replacement style locally enveloping the dilational style veins. Dilational tourmaline-rich veins locally form en-echelon, moderate to steeply north dipping extension veins separate from the main veins. Broad zones of veining with multiple dilational and parallel, sheeted replacement tourmaline veins may alternate with slivers of carbonate-quartz-sericite altered wall rock. Tourmaline veins may contain disseminated pyrite and arsenopyrite.

2. Quartz-rich second phase: exploiting the earlier tourmaline-rich veins, this phase of veining forms white quartz ± tourmaline ± sericite ± pyrite ± arsenopyrite vein material which overprints, but occurs along and parallel to the earlier tourmaline vein material. This, combined with wallrock slivers, creates a banded appearance to the quartz-tourmaline veins. Tourmaline coeval with this phase may occur with sulphides and carbonate as stylolites in the vein material. Earlier tourmaline may occur as slivers,

lenses and fragments in the younger white quartz, or the younger white quartz may occur on the margins of earlier tourmaline veins. This style of quartz may also occur independent of the tourmaline veins as a separate vein generation and locally occupies minor reverse, north-side up D4 Shear Zones. Sampling and locally occurring visible gold in this vein phase indicates that it is auriferous. This veining is the intermediate stage of veining discussed by Rhys (2003). When occurring as independent shear veins, it may be joined by quartz-carbonate extension veins which are variably deformed. Like the tourmaline veins, this stage of veining is affected by folding. This generation of quartz also occurs with early tourmaline as composite folded veins which trend northwest along the southwestern margins of the Main Zone.

3. Variably deformed Quartz extension veins: shallow to moderate southeast dipping quartz greater than tourmaline + carbonate extension veinlets form ladder-like stacked arrays which preferentially occur in, and cut across the earlier quartz-tourmaline and banded quartz-rich vein phases. The extension veins may either terminate at the margins of the older veins, or nucleate in the early tourmaline and extend outward into surrounding wallrock. The extension veins are often closely spaced and may occur at intervals of a few centimeters to tens of centimeters apart. They range from hairline up to 10cm thick. This set of extension veins locally occurs as en echelon, locally sigmoidal arrays which record apparent northwest side up displacement internal to the older quartz-tourmaline veining, and which also record reverse north side up displacements. Where not folded in sigmoidal sets, these extension veins are developed approximately orthogonal to the steep northwest plunging L4 stretching/intersection lineation, suggesting that they formed during stretching of the lithology sequence parallel to L4 in response to north-south D4 shortening. This is consistent with the relatively late structural timing as suggested by the generally low strain state.

4. Late quartz extension veinlets: a late set of shallow dipping (generally to the southeast) quartz extension veinlets frequently occurs within the quartz-tourmaline veins, and cuts at low angles across the earlier set of extension veinlets described above, especially where they are folded into sigmoidal sets. These late veinlets are typically narrow (1mm to 10mm thick) and are volumetrically minor, although they can be locally very abundant. Their similar orientation with respect to L4 as the preceding extension veins set, but generally undeformed state suggest that they represent a second, structurally late increment of extension veining late during D4.

Textural and timing relationships of the different, but spatially related veining generations listed above suggest that they formed incrementally spanning deformation during D3 and D4. The early quartz-tourmaline veins, including the second phase quartz greater than tourmaline vein phase, are affected by all D4 strains. Folding has occurred when vein development is oblique to or at high angles to S4 foliation, and boudinaged in response to the stretching parallel to L4. However, these veins also cross S3 foliation as planar veins where they trend northeast at high angles to S3, suggesting that they were affected by only minor D3 strain. In addition, tourmaline replacement veins, where they overprint potential fragmental units, contain less strain relic fragments than the surrounding wallrock. This suggests that they formed part way through D3 when the wallrock were already deformed, but prior to the accommodation of all strains in the rocks. These field relationships are consistent with the quartz-tourmaline veins and the next generation of banded quartz, which is parallel to them, forming extensional veins and shear veins during D3 in response to sinistral displacement along, and shortening across, the Holmer Shear Zone. During later potentially progressive D4 deformation, additional phases of veining, mainly as quartz extension vein arrays, have formed exploiting the earlier rheologically competent quartz-tourmaline. These are at a high angle to the L4 lineation which suggests vein formation in response to the stretching parallel to L4. These extension veins and the very late set of extension veinlets may also form along the adjacent to minor east-west trending D4 shear zones which accommodate north side up displacement, and overprint the transposed fabrics associated with D3 (S3), (Rhys, 2010).

Systematic underground drilling and mapping have led to an improved interpretation of the internal lithological correlations within the AIC, which hosts the Ultramafic Zone in proximity to the "fold nose" (Rhys, 2012, J. Samson, personal communication). Figure 7.4 is a geological level plan on the 790L and illustrates a core of dominantly serpentinized, chloritized and locally talc-altered komatiite ultramafic unit that lies in the center of the "fold nose" in the AIC (dominantly pyroxenite). Mineralization in the altered pyroxenite in the Ultramafic Zone terminates against the altered komatiitic unit, with non-mineralized quartz-tourmaline veining extending into the komatiitic unit. Recognition of this allows for limiting the projection of the mineralization away from drillholes towards holes that intersected the komatiite, thus tightening up the mineralization shapes. This komatiitic unit also separates the AIC into two lobes of dominantly pyroxenite with the main part of the Ultramafic Zone being hosted within the western lobe and a series of smaller, generally shallow-dipping Ultramafic Zones, termed here as "Sediment Sub-Zones" (e.g. S2, S6, S7), being located in the eastern lobe (Figure 7.4). Here these zones are folded within the eastern pyroxenite around the core of the pyroxenite / sediment contact (Figure 7-5). Recent underground drill hole intersections show the potential for additional zones of mineralization within this eastern lobe of pyroxenite at depth.

Thunder Creek Deposit

In the Thunder Creek area, there are two main styles of mineralization:

1) the Rusk Shear Zone adjacent to and in the footwall of the pyroxenite unit,

2) the Porphyry Zone which is hosted by the quartz monzonite intrusion which lies to the southeast below an elevation of approximately 500m below surface in the immediate footwall to the Rusk Shear Zone (Figure 7.6 and Figure 7.7).

Both of these zones are spatially related and occur in the same steep north-northwest plunging mineralization area which has been traced over a vertical dip length of more than 1km to date, and within which better intercepts occur along a strike length of 100m to 600m (Rhys, 2010).

Mineralization in the Rusk Shear Zone comprises areas of either higher quartz-carbonate-pyrite vein density, and/or areas of elevated medium- to coarse-grained disseminated pyrite and associated pyrite-quartz veinlets. Both of these styles were observed to occur in the intensely foliated, often compositionally laminated carbonate-albite-quartz-magnetite portions of the shear zone. Mineralization also locally preferentially overprints pink, K-feldspar-rich syenite dykes and local plagioclase-dominant probable diorite dykes in the shear zone, with clots and aggregates of coarse pyrite, often associated with quartz-albite-carbonate veinlets. Areas of gold mineralization occur in portions of the Rusk Shear Zone in which the shear zone matrix is variably Fe-carbonate altered.

The most common style of veining comprises deformed quartz-pink carbonate/albite veins with varying pyrite content and coarse-grained pyrite envelopes/selvages, which correspond generally with higher and more continuous grade. These early deformed veins are very similar in style and texture to the earliest phases of veining seen underground in the 650L Ultramafic Zone which are also deformed and could be coeval with the set (Rhys, 2010). Veins in the Rusk Shear Zone also include a younger phase of quartz-pyrite veins that cut the deformed veins and which have carbonate-pyrite envelopes that overprint the shear zone matrix. The coarse pyrite in vein envelopes also overprints the dominant shear zone foliation, which is preserved texturally as inclusion trails in the pyrite (Ross, 2010). This younger set of veinlets is likely coeval with the main stage extension vein sets on the 650L (Rhys, 2010). Both of these veining phases are auriferous and contain high gold grades. Gold in both phases was observed in a petrographic study in association with pyrite. Gold was present as inclusions in pyrite, associated with chalcopyrite and galena, on fractures in pyrite, and free in gangue minerals adjacent to pyrite grains (Ross, 2010).

“Porphyry Zone” mineralization is developed in the quartz monzonite intrusion that occurs at depth in the footwall to the Rusk Shear Zone immediately adjacent to mineralized areas in the shear zone. Mineralization is associated with sheeted sets of quartz extension veins which occur in abundance of up to several veins per metre within the intrusion. Most veins are less than 3cm thick and comprise white quartz with pyrite. Disseminated pyrite also occurs locally in the wall rock adjacent to the veins. Free visible gold can be locally observed in association with pyrite both in veins and disseminated in the host rock. The intrusion is generally massive in areas of veining. Veins have variable core axis angles, but angles are most commonly high (>70 degrees to core axis) which is consistent with a shallow dip to extension veinlets and is supported by geological underground mapping in development headings. Local irregularities in vein shapes and orientations, particularly in areas of the highest vein abundance, suggests some degree of deformation, possibly in the cores of sigmoidal vein arrays. These veins are of compatible style and probable orientation as the main stage Ultramafic Zone veins in the Timmins Deposit which they may be coeval with, and consequently they may also form areas of higher grade continuity which are dictated by the morphology of the extension vein arrays. These veins may have formed preferentially in the upper, thinner portions of the intrusion, in response to brittle behavior of the intrusive body during shear zone deformation. More isolated narrower intercepts deeper in the intrusion where it is thicker may reflect more rigid behavior, as is seen in many other Timmins area deposits, where an optimal thickness of the host unit is common for most abundant vein development. Modeling of the morphology and thickness of the host intrusion may as a result aid in definition of the distribution of best developed mineralization (Rhys, 2010).

Areas of veining are frequently associated with more intensely altered wallrock, obscuring the primary igneous textures. A systematic series of samples from drill hole TC09-69a across the host monzonite intrusion was stained using Na-cobaltinitrate. Intense yellow staining proximal to quartz veining confirmed that the reddish-orange alteration commonly observed adjacent to quartz veins is secondary k-feldspar (Rhys, 2010). Within the Porphyry Zone, systematic sampling of different vein generations confirms that there is a positive correlation between gold grade and quartz vein density (Campbell, 2014).

144 Gap Deposit

Gold mineralization in the 144 Gap Deposit occurs generally between 600m and 1,000m below surface in the footwall of the high strain zone within and adjacent to syenite bodies in the footwall mafic volcanic lobe (Figure 7.8 and Figure 7.9). The main mineralized areas occur between approximately 20m to 120m into the footwall of the high strain zone; however, mineralization also occurs locally within the shear zone itself. There are two main styles of mineralization identified in the 144 Gap Deposit area:

1) syenite-hosted quartz-pyrite extension vein sets and associated mineralization, and;

2) disseminated and vein-controlled pyrite in carbonate-sericite altered areas of higher strain in the shear zone and in altered mafic units along and within dyke margins.

The highest syenite-hosted gold grades in the 144 Gap Deposit are associated with areas of quartz extension vein development. These extensional quartz veinlets are typically 2mm to 30mm in diameter (although locally can reach up to greater than 15cm in width), exhibit sharp unfoliated margins, and are filled with blocky to prismatic quartz (Ross and Rhys, 2015). Vein densities seldom comprise more than 5% of the host syenite by volume. Though there is no apparent direct relationship between gold grade and quartz vein abundance, areas lacking quartz vein development altogether also typically lack significant gold grades. Instead, the highest gold grades are more directly linked to development of coarse-grained, often cubic pyrite occurring as individual grains, or locally as grain aggregates, along quartz veinlets and sometimes in wallrock within vein halos (Rhys, 2015). Vein-hosted pyrite is poly-generational and overgrows early gold-poor cores, which may suggest multiple incremental gold depositional pulses within an ongoing mineralizing event (Linnen and Campbell, 2015). Areas of gold-rich veining in syenite occur both with and without the reddish K-feldspar-albite-quartz (-hematite) alteration and associated local fine-grained in-situ brecciation which often affect the syenite matrix. Consistent with this alteration being earlier than main-stage mineralization, these gold-bearing veinlets also clearly cut the altered areas and breccia zones (Rhys, 2015). Despite this relationship, mineralized areas are seldom unaltered and typically exhibit pale orange-reddish colors in proximity to gold-bearing vein arrays, which may suggest a lower intensity, feldspar-stable alteration accompanies vein development (Rhys, 2015). Extensional quartz veins in the 144 Gap Deposit area are preferentially developed in the syenite and typically terminate at dyke/sill margins. Similar to Thunder Creek, this vein distribution highlights the importance of rheologically more competent units (i.e. syenite or monzonite) which can accommodate brittle fracturing and subsequent vein development. Extensional quartz veinlets in mineralized areas of the 144 Gap Deposit area exhibit variable, but generally moderate core axis angles, consistent with shallow, often southeasterly dipping extension vein sets. Veinlets with different orientations, as well as localized areas of more abundant and thicker quartz veining may suggest the development of sigmoidal quartz extension vein arrays and local shear veins, similar to the Porphyry Zone at Thunder Creek (Rhys, 2015). Although multiple vein generations may be present, most veins are likely the result of one protracted veining event during which veins formed in multiple pulses as sigmoidal vein arrays developed, with earlier veins progressively deformed and overprinted by younger vein generations (Rhys, 2015). Late steeply dipping veinlets occur locally and are interpreted to post-date the mineralized extension vein sets.

Despite a clear spatial relationship with syenite in the 144 Gap Deposit, gold mineralization also occurs outside of the syenite bodies in three general settings, each of which is associated with disseminated pyrite in dominantly carbonate (dolomite-ankerite; Ross and Rhys, 2015) altered mafic, pyroxenite, and locally sediment host-rocks:

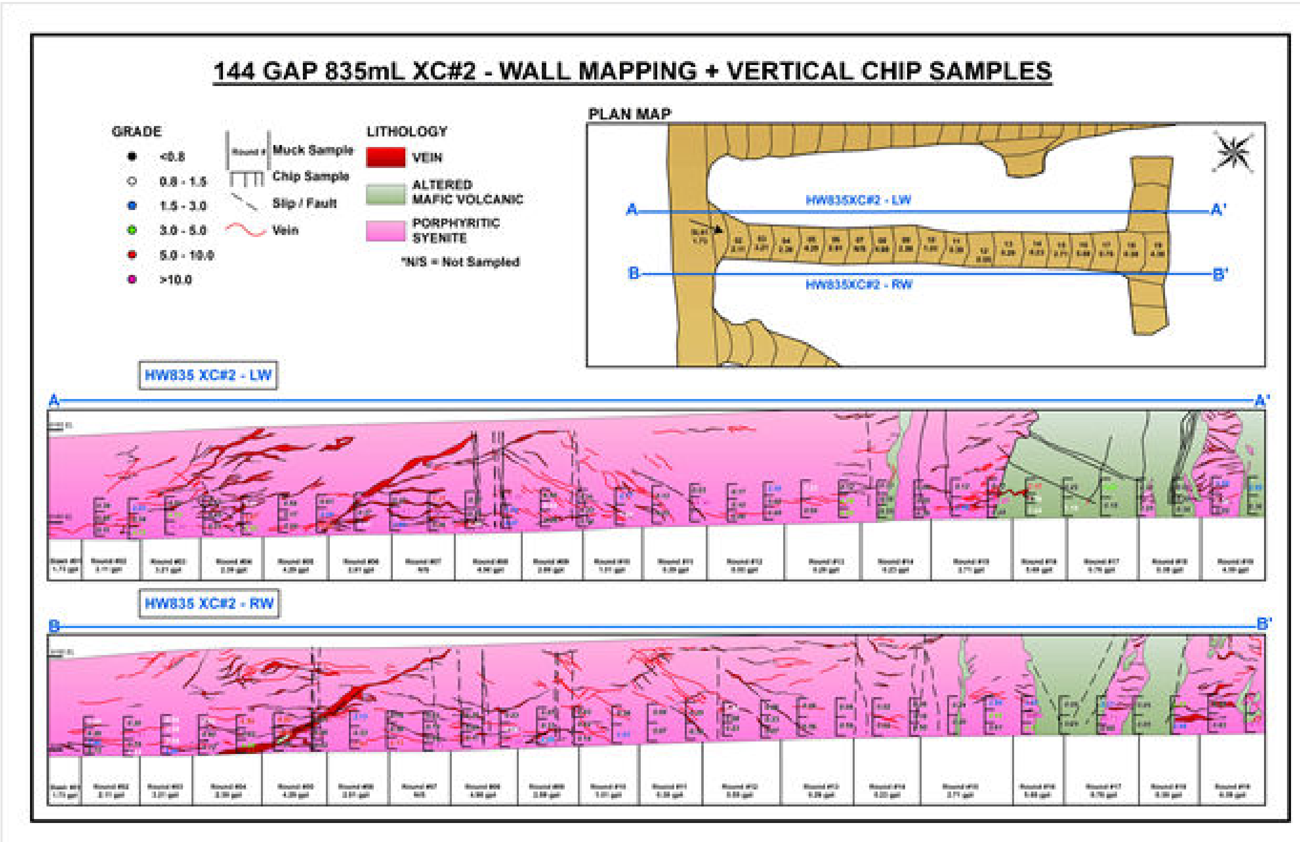
1. In footwall portions of the high strain zone, where intercalated altered mafic volcanic rocks and sediments occur with deformed syenite dyke lenses, disseminated medium- to coarse-grained pyrite and local deformed quartz veinlets are developed in association with tan-brown carbonate-sericite alteration of mafic domains and reddish-orange syenite dykelets. Unlike at Thunder Creek, these mineralized areas are not continuous but do indicate the potential for steeply plunging mineralized zones localized along the shear (Rhys, 2015).

2. In the mafic volcanic lobe, disseminated fine- to medium-grained pyrite occurs in association with brown to tan carbonate altered mafic volcanics in areas of increased foliation between and proximal (typically within 3m) to syenite bodies. This style of mineralization is estimated to contribute up to 30% of the gold content in the main mineralized areas of the 144 Gap Deposit. The disseminated pyrite and associated carbonate alteration are shown to overgrow the foliation commonly developed in these disseminated zones, consistent with a structurally late timing for gold mineralization. Earlier biotite-calcite-magnetite-K-feldspar-albite alteration is also overprinted by the gold-related pyritic carbonate assemblage adjacent to syenite dykes, although K-feldspar appears to remain stable in these areas (Ross and Rhys, 2015).
3. Patchy disseminated pyrite associated with varying intensities of carbonate-sericite alteration of mafic volcanic rocks and turbiditic sediments also occurs along or proximal to the southeastern contact between the volcanic lobe and the Porcupine Assemblage (Rhys, 2015).

The close spatial association of the different alteration styles with mineralization in the syenite bodies suggests that all mineralization styles are linked to the same event and simply reflect different manifestations of gold deposition related to contrasting host-rock composition and rheology (Rhys, 2015).

Some of the most detailed information regarding mineralization at the 144 Gap Deposit is from mapping and sampling of new crosscuts developed on the 835L (Figure 7.10). Results of the work confirm previous observations from drilling and indicate complex patterns in geology and gold distribution with the bulk of gold being hosted by syenite and closely associated with narrow extensional veins with relatively short strike length or coarse cubic pyrite surrounding the veins. Locally truncating mineralization are narrow lenses of mafic metavolcanic rocks.

Figure 7.10: 144 GAP 835L Crosscut Sampling and Wall Mapping Showing Different Generations and Density of Veining relative to Gold Grades



8 Deposit types

The Porcupine area is well known for hosting several types of mineral deposit types including:

- base metal deposits such as Glencore's Kidd Creek Mine, which is a volcanogenic massive sulphide deposit;
- industrial mineral deposits such as the Penhorwood talc deposit; and
- most notably numerous mesothermal Archean shear-hosted gold deposits.

Gold production to the end of 2020, from some 62 operational and historical sites is reported to be 2,412,123 kilograms of gold (77,551,574 ounces of gold). Table 8.1 highlights the 26 locations that exceeded production of 3,110 kilograms of gold (100,000 ounces of gold).

The setting of the TWM is characteristic of mesothermal Archean shear-hosted gold deposits. Dube and Gosselin (2007) have summarized the general consensus that greenstone-hosted quartz-carbonate vein deposits are related to metamorphism, partial melting, and thermal re-equilibration of subducted volcano-sedimentary terrains. Deep-seated, gold-transporting fluids were channeled to higher crustal levels through major crustal faults or deformation zones, similar to the Destor-Porcupine Fault Zone located about 5km south of the TWM. Enrichment of these mineralizing hydrothermal fluids was likely derived from the leaching of various components, most notably gold, from the volcano-sedimentary country rocks during fluid transport and ascension. The fluids then precipitated as vein material or wall-rock replacement in second and third order structures at higher crustal levels through fluid-pressure cycling processes and other physicochemical reactions (temperature, pH, fS2, and fO2 changes).

Mineralization style at the TWM is typical of the Timmins and Kirkland Lake gold camps. There are detailed differences for each deposit with respect to individual structural controls, vein density, gold tenor, gold/silver ratio, and size, but they still maintain commonalities. In his 1997 PhD thesis titled "Geological Setting of Gold Deposits in the Porcupine Gold Camp, Timmins, Ontario", Brisbin generalizes the ore bodies as typified by single or multiple quartz-carbonate veins with or without albite, tourmaline, sericite, pyrite + various sulphides, and native gold hosted in carbonatized, sericitized, albitized and pyritized host wallrock. Gold occurs both in the veins and the wallrock. The most significant gold deposits are spatially associated with quartz-feldspar porphyry stocks and dykes and with albitite dykes, both of which intrude the folded Archean supracrustal rocks. The supracrustal rocks, porphyry intrusions, albitite dykes, and gold mineralization were affected by metamorphism and penetrative deformation during the Kenoran Orogeny (Brisbin, 1997). Brisbin further compares gold production with lithology.

Over 75% of gold production from the Porcupine Camp (1997) was mined from orebodies in the Tisdale Group rocks (which are thus considered the most important rocks in the camp). Approximately 15% of the gold from the Porcupine Camp has been hosted by Timiskaming Group rocks, making them the second most important host. Porphyritic intrusions, heterolithic breccia bodies, and albitite dykes host nearly 10% of the gold produced in the camp.

Gold mineralization in the TWM occurs in steep north-northwest plunging mineralized zones which are also parallel to the local L4 stretching lineation. Mineralization occurs within, or adjacent to zones of strong deformation such as the Holmer and Rusk Shear Zones. Mineralization at the Timmins Deposit is hosted in multiple generations of quartz-carbonate-tourmaline (± albite) veins, associated pyrite alteration envelopes, and disseminated pyrite mineralization. Textural evidence suggests that veining formed progressively through D3 and D4 deformation events. Mineralization at the Thunder Creek and 144 Gap Deposits postdates the AIC, with two main generations of quartz-pyrite (± scheelite, galena, and molybdenite) veins. Veining is almost exclusively hosted in syenite-monzonite intrusions adjacent to the Rusk Shear Zone and related structures (Rhys, 2010).

Table 8.1: Operations with Greater than 100,000 Ounces of Gold Production in the Porcupine Gold Camp (as of 2020)

Mine	Total milled (Tonnes)	Production (oz. Gold)	Grade (g/t)
Hollinger	76,612,773	20,013,316	7.41
Dome (incl. stockpile)	108,014,169	16,655,432	4.38
McIntyre	36,454,203	10,770,201	8.38
Detour Lake	170,499,376	5,825,016	1.07
Pamour	59,552,869	4,820,068	2.29
Hoyle Pond	10,748,864	4,196,462	10.94
Aunor (Pamour #3)	7,694,899	2,502,214	9.06
Hallnor (Pamour #2)	3,834,143	1,645,892	12.19
Preston	5,701,116	1,539,355	7.50
Paymaster	5,086,950	1,192,206	6.56
Coniarum (Carium)	4,049,678	1,109,574	7.81
Timmins West (incl. 144 Gap + Thunder Creek)	8,918,581	1,107,504	3.44
Buffalo Ankerite	4,530,416	957,292	5.94
Delnite	3,541,133	924,006	7.40
Pamour (other sources)	6,728,257	676,645	2.81
Bell Creek	4,456,690	593,394	3.77
Broulan Reef Mine	1,945,464	498,932	7.19
Vipond (Anglo–Huronian)	1,419,942	414,367	8.13
Broulan Porcupine	1,039,687	243,757	6.56
Owl Creek	1,800,217	236,880	3.75
Nighthawk	1,342,277	175,803	3.75
Borden	968,168	175,003	5.94

Moneta	285,608	149,250	14.69
Crown (Hollinger)	205,187	138,330	19.06
Stock	745,074	129,856	5.00
Hugh–Pam	577,651	119,604	5.94
Total (26 mines > 100,000 ounces)	**526,753,392**	**76,810,359**	**4.54**
Total (all 62 mines)	**530,871,076**	**77,551,574**	**4.27**
(source: http://http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=OFR6374)			

9 Exploration

Prior to 2003, all exploration on the TWM area was carried-out by previous operators (as summarized in Item 6). Since then, exploration on the Timmins, Thunder Creek, and 144 Gap Deposits by LSG and Pan American has consisted primarily of diamond drilling (refer to Item 10).

Other exploration activities from 2003 to present include basic geological and structural mapping, prospecting, outcrop stripping, lithogeochemical sampling, and MMI soil geochemical surveys. Geophysical surveys including airborne magnetics as well as surface and downhole IP were also completed, along with various research projects. The most recent of these exploration activities (2013 to present) are summarized in Table 9.1. Some of the work has been contracted out to consultants, while other work has been done in tandem with universities in the form of sponsored academic studies.

Although exploration has been focused on diamond drilling at TWM, these campaigns have helped solidify the current level of geological understanding away from the main deposits and have provided the necessary framework in order to generate useful drill targets for advanced exploration of the TWM area.

Table 9.1: Summary of Significant Exploration Activities Conducted by LSG at the Timmins West Mine, 2013 – Present (Excludes Drilling)

Year	Activity	Description	Comments
2013-2014	Sponsorship of MSc Thesis Work: Characteristics of Syenite-Hosted Gold Mineralization in the Western Timmins Camp	Analysis of ~200 core & grab samples (Thunder Creek and Highway-144 Projects)	Completed thesis (R. Campbell, University of Western Ontario, 2014)
2015	High-Resolution Aerial Survey over the Thunder Creek/Highway-144 Trend	10 flights by UAV (drone) over 7.8km^2 survey block.	Geo-referenced TIFF & JPEG digital ortho-photographs, 8cm resolution (Terrane Aerial Surveys, July 2015)

Year	Activity	Description	Comments
2015	Petrographic Study of the Highway-144 Gap Deposit: *Petrography of Representative Samples of Mineralization, Alteration and Shear Zones in the 144-Gap Deposit, Exclusive of Syenites, with Comparison to the Thunder Creek Rusk Zone*	On-site core examinations. Thin section microscopy and analysis of ~30 core and underground grab samples.	Highway-144 Gap Deposit and Thunder Creek Deposits Finalized internal report received Dec/15 (K. Ross and D. Rhys, 2015)
2015	Mapping & Drill Core Study of the Highway-144 Gap Deposit: *Structural Setting and Style of the 144 Gap Deposit and Other Areas: Observations from Drill Core, and Underground Exposures with Exploration Recommendations*	On-site core examinations & underground mapping.	Highway-144 Gap Deposit, Thunder Creek, and Timmins Deposits Finalized internal report received Dec/15 (D. Rhys, 2015)
2015-2016	Geophysical Surveys (Thunder Creek/Highway-144 Trend)	185km line-cutting 184km MAG 169km *IPower* 3D IP 8km Gravity 15 core samples for baseline signatures	Internal reports and maps-sections for each of the work phases (Abitibi Geophysics, Initial Report 15N037, 2015, Finalized report 15N049, 2016.)
2015-2016	Lithogeochemical Investigation of the Highway-144 Gap Deposit: *Report on the Alteration and Geochemistry of the Gap Deposit, Timmins West Mine, Timmins, Ontario*	On-site core examinations. Thin-section microscopy & major/trace element geochemistry for ~100 core samples from 8 drill holes	Progress report (Dr. R. Linnen and R. Campbell, Oct/2015) Finalized internal report received Jan/16 (Dr. R. Linnen, 2016)
2016	SGS Corescan Analysis of the 144 Gap Deposit	Hyperspectral mineralogical analysis of 2 representative sections of core from the 144 Gap Deposit	Highway-144 Gap Deposit Finalized internal report received Sep/16 (Brian Bennett, SGS and Ronell Carey, Corescan)
2016-2017	Sponsorship of M.Sc. Thesis Work: Mineralogical and Geochemical Characterization of Gold Mineralization at the Highway-144 Gap Deposit	Petrographic and SEM microscopic studies on a suite of samples collected from 20 drill holes from 5 representative sections through the 144 Gap	In progress (L. Howitt, University of Western Ontario) Internal progress presentation received Jul/16 (Dr. R. Linnen)
2017-2018	Sponsorship of M.Sc. Thesis Work: Trace Element Geochemistry and Nd-Sr Isotope Systematics of Scheelite from the Thunder Creek and 144 Gap Deposits, Timmins, Ontario: Implications for Timing and Genesis of Gold	29 scheelite samples collected from the Thunder Creek and 144 Gap Deposits	Completed thesis (A. van Kessel, University of Western Ontario, 2018)

Year	Activity	Description	Comments
2018	Steinert Ore Sorting Test Work of the 144 Gap	Dual energy X-ray transmission and laser/3D camera sorting of 3 representative samples at 144 Gap	144 Gap Finalized internal report received Feb/18 (Steinert)
2020-2021	Geophysical Surveys (Timmins West Complex)	17 AMT stations placed in 2 lines from N-S through the TWC	Preliminary Internal Report and Presentation received Dec/20 (Quantec/MERC Partnership) Internal progress presentation received Sept/21 (J. Ayer)

Note: All drilling activities and relevant statistics are summarized in Item 10-Drilling.

10 Drilling

10.1 Historic Drilling Summary

Between 1938 and 1980, 145 diamond drill holes totaling 27,622m were drilled on the Property. The information from this work is either missing, incomplete or unreliable and has not been used in the current LSG mineral resource estimate.

Between 1984 and 2002, diamond drilling on the Property was carried out by four operators, including Norex, Chevron, St. Andrew and Holmer. A total of 47,420 meters in 159 holes were completed during this period. All holes were drilled from surface and in reference to the same cut grid, oriented north-south, which was refurbished as required. Bradley Bros. Limited of Timmins contracted most of the drilling, using a variety of drill rigs. Most holes were NQ-size (47.6mm diameter core), except for 37 holes which were drilled using BQ rods (36.5mm diameter core). Core recoveries were consistently excellent and close to 100%. Drill hole direction and dips were monitored at regular intervals (mostly 50m spacing) using Sperry-Sun and EZ-Shot Reflex instruments. Casings were generally left in place and capped. The hole number was stamped on the cap or indicated by a labeled steel bar emplaced at the collar. All collars were subsequently surveyed by a qualified surveyor.

The majority of this drilling was directed towards initial mineral resource definition of the Timmins Deposit and is considered to be of sufficient quality to be used in the mineral resource estimates for the TWM. Details regarding collar and downhole surveys, core handling and logging protocols for the historical drill programs are noted in Item 11 and are further discussed in previous NI 43-101 technical reports (Darling et al, 2009; Powers, 2009). These reports are referenced in Item 27 and are filed on SEDAR.

Drilling on the Thunder Creek Deposit portion of the Property by previous operators (1942 to 1996) was sparse and very limited in nature. With missing, incomplete or unreliable information detailing the scope of work, these drill programs are considered insignificant and was not used in the current mineral resource estimate.

The drilling completed between 1984 and 2002 is summarized in Table 10.1. The table only includes drilling by previous operators which has been considered in the mineral resource estimates.

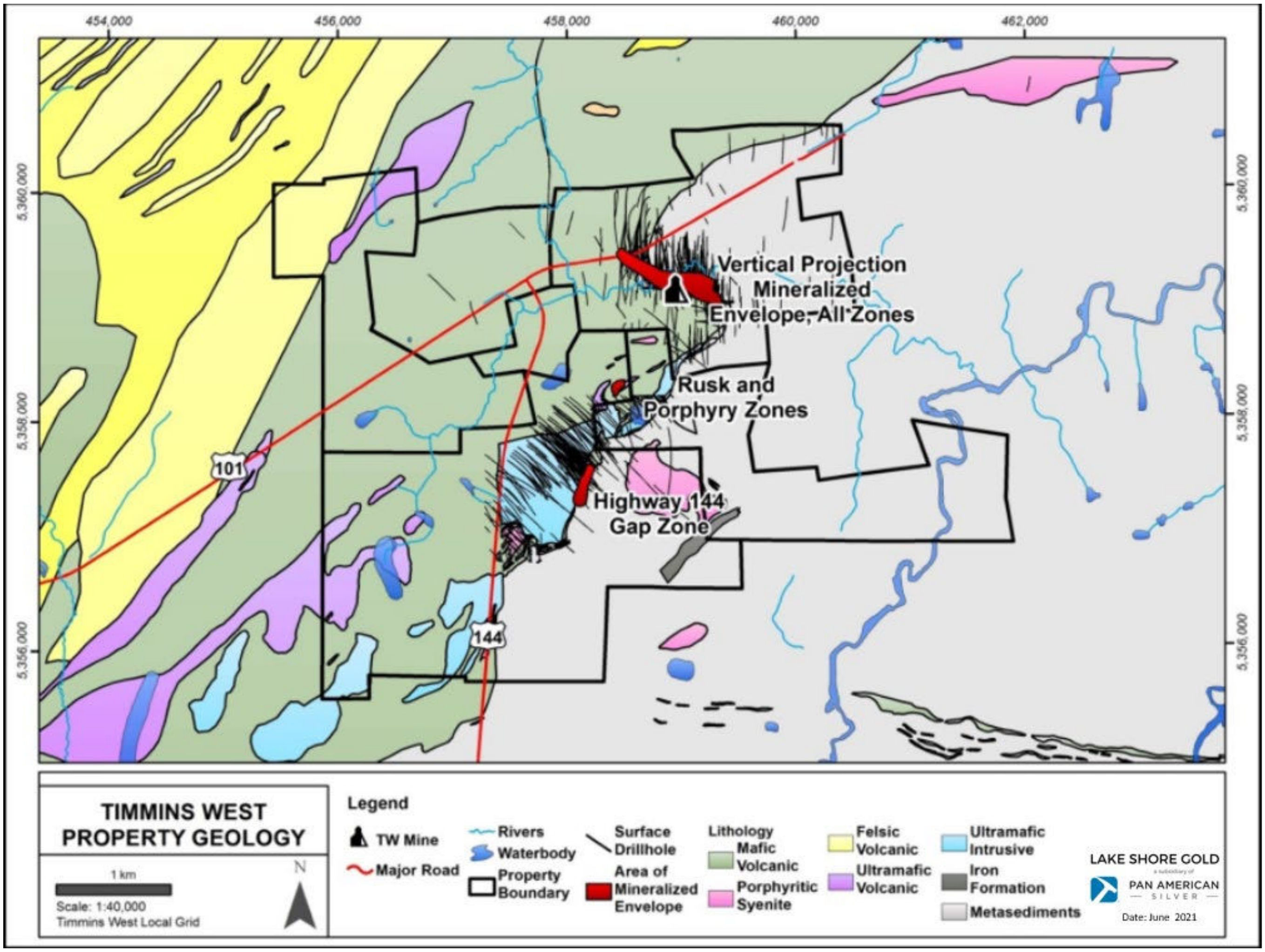
Table 10.1: Diamond Drilling by Previous Operators on the Timmins West Mine Property (1984-2002)

Company	Year	Holes	Metres	# Samples
Norex	1984	4	1,465	644
Chevron	1987 – 1989	31	7,870	3,620
Holmer	1996 – 2002	114	36,745	13,679
St. Andrew	1999	10	1,340	667
Total:		**159**	**47,420**	**18,610**

Note: Table only includes drilling by previous operators which has been considered in the LSG mineral resource estimates.

Refer to Figure 10.1 for surface diamond drill hole collar locations and traces plotted with respect to the surface projection of lithology and mineralization shapes.

Figure 10.1: Surface Diamond Drilling relative to Vertical Projection of Generalized Resource Envelopes



10.2 Drilling on the Timmins Deposit Property by Lake Shore Gold

Procedures for surface diamond drill holes completed by LSG are similar to those described above for previous operators. Drilling was mostly contracted to Bradley Bros. Limited, and a minor portion was contracted to Orbit Garant Drilling Services of Val-d'Or. NQ-size holes were standard, except where it was necessary to reduce to BQ rods due to difficult ground conditions. Drill core recoveries were consistently excellent. For deep drilling, numerous branches off the pilot holes were completed using steel wedges. Drill hole orientations were closely monitored using EZ-Shot tests at 30m to 50m intervals, and downhole gyro surveys were regularly done for deep holes. Most of the holes were initially not cemented, but in 2007 and 2008, cement grout was pumped down all of the casings which were relatively easy to access. Further details are discussed in Item 11.

Underground diamond drilling on the Timmins Deposit started in October 2008, and was initially carried out by Forage Azimuth Inc. of Rouyn-Noranda, followed by Boart-Longyear from April 2009 to April 2013, and has since been contracted to Orbit Garant of Val-d'Or. Various electric drills are being used and the majority of underground holes are BQ in diameter (36.5 mm diameter core), NQ-sized rods are occasionally used on deeper holes, and HQ-sized rods are typically used for service holes. LTK-48 and AQTK core is provided when air-powered drills are used. Further details are discussed in Item 11.

When LSG optioned the property from Holmer in 2003, the initial main focus of the surface exploration program was diamond drilling the down-plunge and along-strike extensions of the Footwall and Ultramafic Zones. As underground access became available (starting in 2008), the priorities gradually shifted towards infill drilling and stope definition drilling. This work led to the preparation of a mineral resource estimate in 2004, reported in accordance with NI 43-101 standards for disclosure, followed by updates in 2006, 2009, 2011, 2012, and 2014 (also NI 43-101 compliant).

For highlights of prior (2003 – 2013) surface and underground drill programs completed by LSG on the Timmins Deposit portion of the Property please refer to LSG's previous technical report dated March 31, 2014. Recent drill campaigns are summarized as follows:

2014 to November 20, 2015: No surface exploration drilling was carried out on the Property during this period. The primary focus of all underground drilling during this span (846 holes totaling 115,780m) remained directed towards upgrading the mineral resource base and stope definition. 502m of development was completed to establish a two-phase (Phase 1 = 271m, Phase 2 = 231m) drill platform on the 910L to allow for infill drilling of the Timmins Deposit down to approximately the 1,310L. Some holes drilled from this key platform extend beyond or outside of the current mineralization model to test for new mineralized zones. An important drill drift was also developed in the upper part of the Timmins Deposit on the 480L in order to complete stope definition drilling and improve confidence in large mineral reserve blocks that reside in footwall-style mineralized zones (e.g. FW2A) for future detailed mine planning. A small number of holes were also collared from this platform and directed to the north to test the down-plunge projection of vein-style zones from the Upper Mine. By the end of 2015, the ramp in the lower part of the mine was advancing towards the 1000L.

Of the total underground drilling, a modest portion (17,036m) was allocated to test several exploration targets, including:

1) the up- and down-plunge extensions of the “Sediment Sub-Zones” (e.g. S1 and S2) as well as new targets along the northern limb of the TDFN structure at depth from the 790L East Exploration Drift (5,181m);

2) the down-plunge projection of the Main Zone from the 790L West Exploration Drift (4,167m);

3) east-west trending structures to the north, similar and sub-parallel to the gold-bearing Holmer Shear from the 790L S2 Access (1,848m); and

4) the key volcanic-sediment contact and associated structures between, and host to, the Timmins and Thunder Creek Deposits from the 830L Exploration Drift (5,840m).

Results of the underground exploration program were mixed with important alteration types and/or structures intersected in proximity to all intended targets, but few significant assays were returned. The most successful of these brief programs included the identification of several stacked shallow-dipping “Sediment Sub-Zones” (e.g. S6 and S7; refer to Figure 7.5) to the east of the main UM mineralized zones and immediately above the ultramafic-sediment contact in the TDFN structure (refer to Figure 7.4). These zones are interpreted to represent the down-plunge extension of the S1 and S2 type zones between the 890L and 970L, and are included in the current mineral resource estimate.

November 21, 2015 to April 19, 2021: The underground drilling conducted at the Timmins Deposit during this period continued to focus on upgrading the current mineral resources while concurrently completing stope definition drilling in support of the short and long term mine plan. The second objective was to test the down-plunge projection of the TDFN mineralized structure to the west and beneath the current mineral resources. The bulk of this drilling was completed with two electric drills. Infill and definition drilling was completed by one drill which operated from various drill platforms as level development was established while the second drill remained stationary on the 910L Exploration Drift targeting the lower D7, D8 and D9 mineralized zones. The D-Zones are interpreted as a series of mineralized extensional lenses offset from the main UM mineralized Zones at approximately the 930L. They occur along the north side of the ultramafic/pyroxenite contact and wraps around the limbs of the fold nose. This program was completed in July of 2017.

Key platforms for the infill drilling included diamond drill bays positioned at regular intervals off the west and east sides of the main ramp at the 950L, 970L, 1030L, 1070L, 1090L, 1110L, 1130L, 1150L, 1170L and 1210L. The main objective of these infill programs was to achieve a tight drill hole spacing sufficient for stope definition to support future mine planning.

Extensive drilling from the 910L Exploration Drift continued through to August of 2017 targeting:

1) inferred mineral resources within various FW, UM and D Zones down to the 1350L; and

2) the down plunge projection of the main TDFN structure to the west and beneath the current mineral resource.

Another 2 holes plus 2 wedge holes from 910-242 (W1 and W2) were completed after May 15, 2017 for an additional 2,550m from the 910L platform. The total program once completed was 20 holes for 8,515m. Some of the holes drilled from this platform were also extended beyond the projected lithological models to test for new mineralized zones along trend.

Several smaller scale on-level programs were also completed during this period. While the majority of this drilling focused on infill and definition of stope blocks, programs were also implemented to evaluate and upgrade more recently identified styles and zones of mineralization (e.g. the S4 "Sediment Sub-Zone"). The S4 Zone is interpreted as part of a series of stacked shallow-dipping mineralized lenses which occur east of the main UM mineralized zones in close proximity to the ultramafic-sediment contact in the TDFN structure. Drilling completed from platforms on the 910L and 950L greatly improved definition of the S4 Zone and provided additional lithological information to help support the mine plan into 2017 and beyond.

A short program was also completed in the upper portion of the Timmins Deposit to evaluate the V3BL/V3BU Zones. The V3 Zones are interpreted as a series of sub-parallel, sediment hosted mineralized lenses that contain gold-bearing quartz + tourmaline stock work veining. They occur predominantly within and along the main contact between the mafic volcanic and sediment lithologic units in the upper Timmins Mine Deposit from 480L to 420L. Two platforms were utilized on the 450L and 420L. Short holes oriented north into the sediment contact generated encouraging results improving the overall grade and confidence in the V3 series of zones in the upper mine.

By November of 2018 the lower mine ramp had advanced to the 1170L where the main access drift and a 110m long hangingwall exploration drift were cut. These platforms were well suited for both infill and exploration drilling at this horizon. Infill drilling from the 1170L access drift targeted the D2 and D2_D blocks for short, medium and longer term mining plans. The hangingwall exploration drift provided a good platform for drilling of the D3, D7 and FW_8 zones down to the 1410L (top of the FW_8 zone) with a view to increasing the confidence in these areas. The decision was made to drive another exploration drift at the 1250L, approximately 80 vertical metres below the 1170L.

By mid-April 2021 the lower mine ramp had advanced down to the ventilation access drift between the 1230L and 1250L. Once the ramp is driven down to the 1250L, diamond drilling plans include both level infill drilling targeting the D3, D10, and D2 zone stope blocks similar to the above mentioned 1170L drilling, as well as an extensive exploration program targeting the D7, D8 and D9 zones at depth from a planned 228m exploration drift platform.

Additional surface exploration on the Timmins Deposit property included a total of 3,839m (4 holes) of drilling targeting the down-plunge extension of the TDFN where prior results from underground proved mineralization extending at least 150m below the prior mineralization limit (LSG Press Release dated January 9, 2017). One deep master (parent) surface hole and one up-dip wedge (daughter) hole were successfully completed with a second up-dip wedge in progress to test the structure located near the 1,850L. One failed down-dip wedge was abandoned due to technical difficulties. Results to date from this program indicate significant alteration, local veining and sulphides on both the north and south limbs of the fold but with mostly low grade gold values. Additional possible follow-up drilling is being planned to improve the geological model and better constrain mineralization potential at depth.

Since the database cutoff date of the last technical report on the Timmins Deposit (May 15, 2017), a total of 750 new holes (86,819m) have been drilled and 51,184 assays have been received as of the effective date of this Report.

An annual breakdown of the number of diamond drill holes and metres drilled is provided in Table 10.2 and additional drilling statistics are included in Table 10.3.

10.3 Drilling on the Thunder Creek Property by Lake Shore Gold

Diamond drilling on the Thunder Creek Deposit initially focused on testing a historic surface exposure of the mineralized zone and various structures interpreted from geophysics, as well as following up on MMI and grab sample anomalies. This led to the discovery of the Rusk and Porphyry Zones, which quickly became the main focus of all diamond drilling on the Thunder Creek property.

Surface drilling on the Thunder Creek Deposit by LSG began in 2003 and amounts to a total of 115,837m completed in 209 holes to date. This figure includes pastefill holes, service holes, and ten grout holes completed in order to minimize underground water infiltration. The work was mostly contracted to Bradley Bros. Ltd. (Timmins), with shorter stints also contracted to Norex Drilling (Porcupine) and Orbit Garant (Val d'Or). All drilling protocols were the same as those implemented by LSG and described for the Timmins Deposit property (see Item 10.2). The only difference is that the cut grid lines are rotated, with the predominant drilling direction at an azimuth of 130 degrees. Further details are included in Item 11.

Underground drilling on the Thunder Creek Deposit began in 2010 and remains ongoing. Access is provided via ramp as well as the TWM shaft and by connecting ramps on two separate levels. Operations are combined with the TWM, and drilling contractors, drill specifications, and protocols are therefore the same at both locations.

For highlights of prior (2003-2013) surface and underground drill programs completed by LSG on the Thunder Creek Deposit portion of the TWM, please refer to the previous technical report dated March 31, 2014. Recent drill campaigns are summarized as follows:

2014 to November 23, 2015: No surface exploration drilling has been carried out on the Thunder Creek property since late 2012. The main focus of all underground drilling during this period (466 holes totaling 49,454m) was aimed towards stope definition and upgrading the mineral resource classification. Drill holes are occasionally extended beyond and outside of the mineral resource envelopes in order to test for new mineralization. Because platforms for infill and stope definition drilling at Thunder Creek are highly dependent on level access development in order to achieve appropriate drill densities (~10m to 12m centers), the majority of this drilling is intimately linked with the mine operations. By the end of 2015, the ramp in the lower part of the mine had advanced down to the 785L; meanwhile the ramp in the upper mine had reached the 485L.

Of the total underground drilling, a minor portion (5,350m) was allocated to test two main exploration targets, including:

1) the potential expansion of the Porphyry Zone mineral resource to depth (below the 815L) from the 765L Main Access and 710L Exploration Drift (2,891m); and

2) the key volcanic-sedimentary contact and Rusk Shear Zone structure to the southwest of the Thunder Creek Deposit from the 710L Exploration Drift (2,459m).

The former program returned favorable results but drill angles limited the depth to which drilling could reach, and only short expansion of the mineralization along the southern margin of the Porphyry Zone was possible. The latter program identified intermittent areas of intense alteration with localized pyrite mineralization associated with sporadic syenite dykes and quartz-carbonate veining, but did not return any significant assays.

November 24, 2015 to April 19, 2021: The primary focus of underground drilling at Thunder Creek during this period was directed towards stope definition drilling down to the 850L and up to the 370L. The second objective was to test the Porphyry and Rusk Zones below the 850L.

Drilling at Thunder Creek in early 2016 focused on testing the potential down-dip extensions of both the Porphyry and Rusk Zones, from various crosscuts on the 785L. This drill campaign confirmed the continuity of the Rusk Shear Zone down to the 850L, and based upon these results, supplemental programs were initiated out of the 850L Ramp and the 850L in 2017. The objective of this additional drilling was to further investigate the potential for down-dip extensions below the 850L. Select drill holes were extended beyond and outside of current mineralization shapes in an effort to test for ancillary ore along the margins of the deposit and to identify potential new gold bearing structures. The 850L program indicated the potential for small lenses of gold mineralization within the Rusk Shear Zone down to the 970L.

An exploration drift in the hangingwall of the Thunder Creek Deposit was completed in July of 2017. This platform was centrally located within the Thunder Creek Deposit off the 850L and 100m to the north of the Rusk hangingwall structure. This platform provided favorable drill angles and allowed drilling down to approximately the 1250L targeting the down-dip extensions of the Rusk and Porphyry Zones, as well as exploring for any potential new mineralized structures at depth. Overall, drilling from this exploration drift did not return any significant assays; only occasional narrow, sporadic mineralized lenses. A total of 4,277m were completed over 7 drill holes targeting the deep Rusk and Porphyry extensions. One flat hole (TC850-119) was drilled to the south at 334 degrees azimuth testing for new zones. Only narrow 2m-10m pillowed and massive mafic volcanic flows were intersected throughout the length of the hole with local fault zones and structural shear zones marking the contacts of certain units. This hole also did not return any significant values.

Three large infill programs were initiated from the 450L, 415L and 395L during the November 24, 2015 to May 15, 2017 reporting period. Using various level accesses and crosscuts as drill platforms, these programs were designed to infill and define the Rusk and Porphyry mineralization shapes between the 485L and 370L and test the potential for extensions along the eastern and western flanks. A total of 234 holes (13,098m) were drilled during these campaigns to improve drill density and better define potential mining blocks up to the 370L.

Since the database cutoff date of the last technical report on the Thunder Creek Deposit (May 16, 2017), A total of 215 holes were drilled over 24,832m. These were completed in the remainder of 2017, intermittently throughout 2018 and concluding with a small program of 642m over 7 drill holes targeting short term planned stopes on the 625L and 730L. Of this total, 21,571 assays have been received as of the effective date of this Report.

An annual breakdown of the number of surface and underground diamond drill holes and metres drilled is provided in Table 10.2, and additional statistics are compiled in Table 10.3.

10.4 Drilling on the 144 Gap Property by Lake Shore Gold

Diamond drilling on the 144 Trend initially focused on testing the southwestern strike extension of the Thunder Creek Rusk Zone, interpreted from regional geology and geophysical signatures. This led to the discovery of the 144 Gap Deposit, which quickly became the central focus of all diamond drilling efforts on the Property.

Surface drilling on the 144 Trend by LSG began in 2010 and amounts to a total of 248,284m completed in 306 holes to date. The work was largely contracted to Bradley Bros. Ltd. (eventually Major Drilling, Timmins) and Norex Drilling (Porcupine). All drilling protocols were the same as those implemented by LSG and described for the Timmins Deposit property (see Item 10.2). Similar to Thunder Creek, the only difference is that the cut grid lines are rotated, with the predominant drilling direction at an azimuth of 130 degrees. Further details are included in Item 11.

Underground drilling at the 144 Gap Deposit began in 2015 and remains ongoing. Access is provided from a 1,317m ramp and exploration drift developed to the southwest from the 765L at Thunder Creek. The exploration drift is established in the hanging wall to the Gap Deposit mineralization at an approximate elevation of 820m below surface (820L). Operations are combined with the Timmins and Thunder Creek Deposits, and drilling contractors, drill specifications, and protocols are therefore consistent with these locations.

Highlights of the various surface and underground drill programs completed on the 144 Gap property by LSG are summarized as follows:

2010: Nine surface diamond drill holes (totaling 4,693m) were completed, targeting a 500m southwestern strike extension of the Thunder Creek Rusk Zone. A broad ‘step-out’ hole (TC10-85A) intersected a 20m alteration zone containing porphyry dykes, quartz veining, and increased pyrite mineralization similar in nature to the Thunder Creek Deposit. Favorable assay results were returned, including 8.07 g/t over 2.0m (LSG Press Release dated July 26, 2011), affirming the possibility of continued gold mineralization along the interpreted southwest extension of the Rusk Shear Zone along the Thunder Creek-144 Trend.

2011-12: LSG initiated a surface exploration program in 2011 to continue assessing the mineralization potential of the southwestern strike extension to the Thunder Creek Deposit. Three prospective targets (144 Gap, 144 North, and 144 South areas) were selected within a broad alteration/deformation corridor that is traceable by interpreted regional geophysical surveys over approximately 6km to the south-southwest from Thunder Creek. A total of 39 holes including wedges and extensions of previously drilled holes (totaling 28,929m) were completed in these areas by the end of 2012. Six of these holes (including 1 extension) were collared within 1.6km of the Thunder Creek Deposit. Drill hole HWY-12-40 returned significant gold intercepts, including 13.54 g/t over 2.0m and 6.07 g/t over 3.0m (LSG Press Release dated January 21, 2013). This intersection, coupled with earlier hole TC10-85A, illustrated the potential extension of the favorable volcanic-sedimentary contact and associated structures through the largely unexplored 144 Gap area.

2013: No surface exploration drilling was carried out during this period.

2014-15: Surface drilling resumed in early September with the primary intention of following up on the encouraging results from the 2012 campaign. The first hole in the program (HWY-14-48), designed as a 125m undercut (down-dip) to drill hole HWY-12-40, intersected 5.37 g/t over 46.0m (LSG Press Release dated October 7, 2014) and became known as the discovery hole to the 144 Gap Deposit. A total of 158 holes and wedges (totaling 149,841m) were completed by the end of 2015 with up to 6 to 7 drills operating for much of the period. This drilling quickly extended the 144 Gap Deposit dimensions to a minimum of 400m along strike and 400m of vertical height (LSG Press Release dated April 27, 2015). In addition, drilling up to 250m further southwest along the Thunder Creek-144 Trend identified another mineralized zone, here termed the 144 Gap Southwest ("144 SW") Zone (HWY-15-116: 3.30 g/t over 40.8m, including 6.12 g/t over 9.5m; LSG Press Release dated June 25, 2015). More work is required to better constrain this new discovery, which could be easily accessible by extending the 144 underground exploration drift. Late in the year, surface drilling in the 144 Gap area focused on assisting with the mineral resource definition portion of the program, targeting the upper parts of the 144 Gap Deposit which could not be properly tested from the underground drift due to poor drilling angles.

New gold mineralization was also identified with surface drilling in the 144 South target area, which occurs approximately 1.6km to the southwest of the 144 Gap Deposit (HWY-15-142: 3.11 g/t over 19.1m and 5.38 g/t over 3.6m; HWY-15-142W2: 4.27 g/t over 7.3m; HWY-15-148: 9.59 g/t over 3.0m; LSG Press Release dated October 28, 2015). These key intercepts are located approximately 100m to 200m northeast and 450m below previously reported results from HWY-12-45 and HWY-11-28 (LSG Press Release dated January 21, 2013).

An underground exploration program was initiated in late May 2015 from drill cutouts in the 144 Ramp, driven to the southwest from the 765L at Thunder Creek. A total of 3,033m were completed in 3 drill holes, targeting the largely untested "Thunder Creek Stock", which lies between the Thunder Creek and 144 Gap Deposits, to the southeast of the main mineralized trend. Each of the holes intersected varying widths of the thick porphyry unit with localized zones of increased alteration, veining, and mineralization. A follow-up program was highly recommended in order to complete a fourth planned flat hole extending across the eastern portion of the syenite intrusion towards a possible iron formation (projected from surface magnetic data) and test for mineralized flat-lying to shallow vein sets in proximity to anomalous assay results returned during the 2015 campaign.

The 144 underground drilling quickly shifted focus to the mineral resource definition portion of the program as soon as platforms became available in the hanging-wall drift (820L) in mid to late July 2015. With the exploration drift completed in early October, a total of 40,488m of infill drilling was completed by year end, towards an initial mineral resource estimate for the 144 Gap Deposit released by LSG in a previous technical report filed on SEDAR as of March 9, 2016.

January 11, 2016 to April 19, 2021: Drilling at the 144 Gap Deposit continued throughout 2016 and early 2017 from both surface and the 144 underground drill drift on the 820L with the key objective of converting a portion of the inferred mineral resources to an indicated category.

Surface drilling at the 144 Gap Deposit included a total of 14,935m of infill drilling (26 holes) and 1,907m of extensional drilling (2 holes). The infill program was focused on upgrading the confidence classification mainly in the upper parts of the deposit that could not be reached from the underground drill platform with a few holes testing the bottom of zones to the east. Exploration drilling tested a potential easterly mineralized plunge with wide step out holes targeting approximately 50m to 100m to the east and to depth.

Underground drilling at the 144 Gap Deposit carried into 2016 with six electric drills operating from various drill cutouts along the 144 Exploration Drift on the 820L. The majority of drilling targeted the East Porphyry Zone, where the first production stopes were planned, and was designed to achieve a minimum drill spacing of 7-15m. The remainder of drilling was completed in the west and central areas of the deposit at 12.5m to 25m centers. The 2017 program was reduced to 1-2 drills and focused mainly on upgrading the confidence classification in the western portion of the deposit as well as definition of stope blocks within the East Porphyry Zone that were included in the 2017-2018 mine plan.

2017-18: Underground drilling in years 2017 and 2018 continued targeting the 144 Gap Zone primarily from the established 820L drill drift, as well as platforms on the 805L, 835L and 890L. Generally these drill programs were short, 2-4 drill hole programs designed to infill at adequate spacing for mineralization modelling and grade estimation of the deposit. They were designed to cover both the East and West Porphyry Zones to a much tighter 5-10m spacing on oriented sections at an azimuth of 130 degrees. This was done to provide tighter data on the highly variable north - south trending bands and inclusions of mafic volcanics within the 144 Gap Deposit.

2019: Drilling in 2019 followed similar strategies than the drill programs in 2017 and 2018. They were designed as infill drilling from the 775L, 925L and 960L. One major change in 2019 was the development of a drill bay in the footwall of the East Porphyry Zone on the 890L that allowed both infill and extensional drilling of the East Porphyry Zone laterally and at depth. Prior to this, drilling from the drill drift on the

820L could not intersect the lower extents of the East Porphyry Zone at proper angles between the 960 and 995L.

2020-21: Drilling continued to focus on infill and expansion of both the East and West Zones of the deposit using 2 to 3 electric drills. Drilling was conducted from several platforms on the 995L and tested the lower extents East Porphyry mineral resource. In late in 2020, a drill platform was established from the 715L ramp and provided drill coverage for most of the upper extents of the East and West Porphyry Zones above the 745L. Another platform was established on the 925L that allowed infill drilling of the West Zone down to below the 995L.

Infill and definition drilling completed at the 144 Gap Deposit during this period generally conformed to previous results but indicated a high degree of variability in gold grades over short distances. This variability is due to the gold being hosted within multiple small scale structures with varying orientation, limited continuity and with local nuggety coarse free gold.

Underground exploration drilling was also executed from the 820L Exploration Drift with a total of 4,269m (7 holes) completed during the period. Three holes (totaling 1,752m) were drilled to follow-up on anomalous results in the Thunder Creek Stock target area from the 2015 campaign. Varying widths of porphyry were intersected with localized alteration, veining and sulphides but mainly low gold values. Four holes (totaling 2,517m) were also completed to test stratigraphic contacts and structural features between the 144 Gap and South West Zones. The overall program was highly beneficial in terms of advancing the geological model near the 820L but returned mostly low grade assay values.

Since the database cutoff date of the last technical report on the 144 Gap Deposit (January 11, 2016), a total of 1,108 new holes (132,203m) have been drilled and 184,102 assays have been received as of the effective date of this report.

Additional surface exploration on the property included a total of 17,202m (24 holes). Of this total, 13,638m (20 holes) targeted the 144 South Zone, located approximately 1.6km southwest of the 144 Gap Deposit, with exploration designed to extend mineralization surrounding a syenite porphyry previously identified from drilling in 2015 (described above). This campaign was successful in extending mineralization approximately 65m to the east and to depth as well as 50m to 150m to the west. Significant drill results reported at depth include 5.87 g/t over 8.6m (incl. 10.78 g/t over 4.0m) near the 875L and new intercepts defining extensions of mineralization to the west include 7.1 g/t over 2.0m, 3.5 g/t over 3.2m, 27.53 g/t over 1.8m and 4.06 g/t over 7.7m (LSG Press Release dated January 9, 2017). Four additional wide step out holes (including 1 re-start) for 3,564m were also completed to test regional trends towards the new 144 Offset target area which is located up to 1km to the west-northwest of the 144 South

Zone. Results to date indicate broad zones of intermittent deformation with locally intense alteration, veining and sulphides but low gold values.

An annual breakdown of the number of surface and underground diamond drill holes and metres drilled is provided in Table 10.2 and additional drilling statistics are compiled in Table 10.3.

Table 10.2: Statistics on Diamond Drilling for Timmins West Mine Area by LSG (2003 - April 19, 2021)

PROPERTY	YEAR	SURFACE HOLES	METRES (m)	U/G HOLES	METRES (m)
TIMMINS DEPOSIT	2003	52	17,145	0	0
	2004	37	17,959	0	0
	2005	58	28,876	0	0
	2006	54	28,099	0	0
	2007	18	11,493	0	0
	2008	68	7,729	67	5,496
	2009	12	9,829	296	26,006
	2010	3	1,737	350	46,315
	2011	3	1,022	295	40,878
	2012	0	0	455	64,134
	2013	0	0	462	47,677
	2014	0	0	379	50,729
	2015	0	0	484	65,432
	2016	0	0	453	43,134
	2017	9	6,718[1]	490	45,851
	2018	0	0	302	33,323
	2019	0	0	24	1,875
	2020	0	0	155	17,783
	Jan 1st - April 19th, 2021	0	0	36	5,009
	Subtotal:	**314**	**130,607**	**4,248**	**493,642**
144-GAP	2010	7	3,812	0	0
	2011	24	16,461	0	0
	2012	17	13,348	0	0
	2013	0	0	0	0
	2014	22	22,527	0	0
	2015	136	127,314[2]	172	41,458
	2016	47	29,902[2]	366	81,951
	2017	5	3,934[2]	355	42,108
	2018	0	0	257	39,147
	2019	0	0	230	29,159
	2020	0	0	172	17,290

PROPERTY	YEAR	SURFACE HOLES	METRES (m)	U/G HOLES	METRES (m)
	Jan 1st - April 19th, 2021	0	0	73	8,871
	Subtotal:	**258**	**217,298**	**1,625**	**259,984**
THUNDER CREEK	2003	6	1,667	0	0
	2004	13	4,370	0	0
	2005	6	2,359	0	0
	2007	22	10,650	0	0
	2008	16	7,921	0	0
	2009	35	25,860	0	0
	2010	18	11,071	183	24,123
	2011	56	34,425	244	51,774
	2012	33	15,839	382	61,513
	2013	4	1,675	238	21,349
	2014	0	0	298	35,403
	2015	0	0	203	16,662
	2016	0	0	338	24,411
	2017	0	0	376	32,953
	2018	0	0	92	6,279
	2019	0	0	7	642
	2020	0	0	0	0
	Jan 1st - April 19th, 2021	0	0	0	0
	Subtotal:	**209**	**115,837**	**2,361**	**275,109**
MEUNIER	2010-2012	**4**	**4,038**	0	0
TIMMINS WEST MINE AREA	**TOTAL**	**833**	**498,766**	**8,234**	**1,028,735**

Note: 1) some of the 9 surface holes reported on the Timmins Deposit in 2017 started in the fall of 2016.
Includes all pilot holes, wedge holes and extended holes completed within the period indicated. Table includes 28 geotechnical holes (2008 RC holes; 487 m), 12 mine service holes (PF and RAR holes; 5586 m), and 10 grout holes (GRT holes; 2296 m).
2) Metreage includes all drilling along the HWY 144 Trend (144 GAP, SW, South, and North).

Table 10.3: Drilling and Sampling Statistics to Cut-Off Dates from Database

TIMMINS DEPOSIT PROPERTY	# HOLES	# METRES	#SAMPLES	COMMENTS
Previous Operators (1938 - 2002)	304	75,042	21,035	
LSG (2003 to 31 Jan 2012)	1,344	249,664	62,003	New drilling
LSG (1 Feb 2012 - 26 Nov 2013)	843	101,160	67,622	New drilling
LSG (27 Nov 2013 - 20 Nov 2015)	888	118,901	68,289	Includes one hole completed after 20-Nov-2015.
LSG (21 Nov 2015 - 15 May 2017)	677	77,696	43,465	New drilling
LSG (15 May 2017 – 19 April 2021)	770	157,947	89068	New drilling
Total Holes (at effective date):	**4,826**	**780,410**	**351,482**	
Total New Holes (at effective date):	**770**	**157,947**	**89,068**	
Total Holes in Model:	**4,773**	**722,819**	**349,799**	
Total Holes intersecting Domain Solids:	**2,865**	**433,023**	**239,382**	
144-GAP PROPERTY	**# HOLES**	**# METRES**	**# SAMPLES**	**COMMENTS**
Previous Operators (1942 - 1996)	9	1,689	526	

LSG (2010 to 2013)	48	33,621	19,660	New drilling
LSG (2014)	22	22,527	5,749	New drilling
LSG (2015)	308	168,772	62,075	New drilling
LSG (01 Jan 2016 - 11 Jan 2016)	13	2,824	1,957	New drilling
LSG (12 Jan 2016 - 15 May 2017)	493	126,735	76,515	New drilling
LSG (15 May 2017 – 19 April 2021)	938	178,624	113,970	New drilling
Total Holes (at effective date):	**1831**	**534,792**	**280,452**	
Total New Holes (at effective date):	**938**	**178,624**	**113,970**	
Total Holes in Model:	**1,822**	**533,463**	**279,591**	
Total Holes intersecting Domain Solids:	**1,446**	**325,699**	**196,769**	
THUNDER CREEK PROPERTY	**# HOLES**	**# METRES**	**# SAMPLES**	**COMMENTS**
Previous Operators (1942 - 1996)	262	47,384	981	
LSG (2003 to 28 October 2011)	520	149,543	74,657	Previous drilling, old info updated.
	42	15,124	8,540	Previous drilling newly added to data set

LSG (29 Oct 2011 - 8 Jan 2014)	694	109,928	69,387	New drilling
LSG (9 Jan 2014 - 23 Nov 2015)	466	49,446	39,520	New drilling
LSG (24 Nov 2015 - 15 May 2017)	615	44,420	37,859	New drilling
LSG (15 May 2017 – 19 April 2021)	198	31,942	11,723	New drilling
Total Holes (at effective date):	**2,797**	**447,787**	**242,667**	
Total New Holes (at effective date):	**198**	**31,942**	**11,723**	
Total Holes in Model:	**2,582**	**412,146**	**236,134**	
Total Holes intersecting Domain Solids:	**1,812**	**225,028**	**164,878**	
TIMMINS WEST MINE COMBINED	**# HOLES**	**# METRES**	**# SAMPLES**	
Total Holes (at effective date):	**9,454**	**1,762,989**	**874,601**	
Total New Holes (at effective date):	**1,906**	**368,513**	**214,761**	
Total Holes in Model:	**9,177**	**1,668,428**	**865,524**	
Total Holes intersecting Domain Solids:	**6,123**	**983,750**	**601,029**	

Note: Only holes completed with all assays returned at effective date.

10.5 Material Impact on the Accuracy and Reliability of Drilling Results

There are no known drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

11 Sample Preparation, Analyses, and Security

Historic sample preparation, analysis, and security for the periods prior to 2015 are described in previous technical reports related to the Property. Sample preparation, analysis, and security for the period of 1998 to 2009 are described in the NI 43-101 Technical Report on the Timmins Mine Property by Darling et al (2009); in the Amended Technical Review and Report of the "Thunder Creek Property" Bristol and Carscallen Townships by Powers (2009); and in the Technical Report on the Initial Mineral Resource Estimate for the Thunder Creek Property, Bristol Township by Crick et al (2011). A PEA and Updated Mineral Resource estimate for the TWM was released in March 2009 and provided updated protocols up to October 28, 2011 for Thunder Creek, and up to January 31, 2012 for the TWM (Crick et al., 2012a). An updated mineral reserve estimate for TWM was released in March 2014 and provided updated protocols up to February 21, 2014. An updated 43-101 Technical Report for the mineral resource and reserve estimate for the TWM was released in March 2016 and provided updated protocols up to December 31, 2015. All of these reports are referenced in Section 27 and are filed on SEDAR.

11.1 Surface Diamond Drill Programs

General Statement

Described herein are the protocols used for the surface exploration programs during the period from the last technical report to the current effective date.

Core Handling and Logging Protocols

For the surface drill programs, the diamond drill contractors secure the drill core boxes with fiber tape at the drill site and deliver them directly to the core logging facilities located at LSG's exploration office at 1515 Government Road South, Timmins, Ontario. Under the direct supervision of QPs, LSG personnel open the boxes, measure and check the metre markers for accuracy, and label the boxes with metal tags noting hole number, box number, and metreage. A geologist prepares a summary log or "quick log", and the core is placed on racks until it can be further processed. The core is then logged in detail by a geologist, with data entered directly into custom logging software developed by Geovia GEMS. Captured data include detailed descriptions of key geological, lithological, structural, alteration, and mineralization controls. Intervals to be sampled are indicated by the geologist, sample tags are inserted, rock quality designation measurements ("RQD") and photographs are taken, and the log is printed, reviewed, and edited if required. The core is then given to a trained and supervised technician to be cut (half core) and sampled. Once the sampling is completed, all remaining drill core is stored in racks or square piled in a secure compound at the core logging facilities or at the TWM compound.

Property Grids, Hole Collar, and Downhole Attitude Surveys

All drill holes are planned in reference to a local field grid. On the Timmins Deposit portion of the Property, the grid lines are spaced at 100m intervals and are oriented due north, with pickets at every 25m spacing. The origin of the Timmins Deposit grid is the number one claim post of patented Claim P4040, which was assigned an arbitrary coordinate of 5000 east and 8000 north with an elevation of 1,000m. This point is actually 300.25m above Mean Sea level and has been reassigned an elevation of 10,000m to ensure that underground elevations are not reported as negative numbers. By contrast, the Thunder Creek Deposit field grid is rotated by 40° with respect to the Timmins Deposit field grid. It also consists of cut lines at 50m to 100m spacing with labeled pickets every 25m. The origin of the Thunder Creek grid is coincident with the number three post of the same patented claim P4040 (458,854m east, 5,358,786m north, NAD 83, Zone 17). The surveyed post is the departure point for the baseline coordinate 65+00E / 100+25N and corresponds to Timmins Deposit co-ordinate 4646 east by 7508 north. The azimuth of the base line is 40° from true north. Grid line designation decreases southward and extends through the HWY-144 portion of the Property.

An in-house grid transformation equation allows for the easy conversion between Timmins Deposit, Thunder Creek, and UTM coordinates.

For surface drill programs, all drill hole locations are pegged on the ground in reference to the existing cut field grid or using a handheld GPS. The drill rig alignment is determined by placing front and back sights using a regular compass, or by using a north-seeking gyroscope device referred to as an azimuth aligner or gyrocompass (Reflex TN14 Gyrocompass). With much improved accuracy, precision, and ease of use, this technology replaced the formerly used differential GPS aligning device referred to as an APS (Reflex North Finder Azimuth Pointing System) for all surface drill programs as of fall 2014. As the holes are being drilled, changes in azimuth and inclination are monitored at 30m to 50m intervals using an EZ-Shot Reflex instrument. Upon completion of a relatively deep hole (>500m), it is common practice to have the holes resurveyed using a MEMS gyro system by Reflex Instruments Ltd. ("Reflex") of Porcupine, Ontario. Occasionally, selected holes are also surveyed using a north-seeking gyro system by Halliburton/Sperry Drilling Services of North Bay, Ontario, as a means of validation and for comparison purposes. All drill collars are also surveyed by professional surveyors (e.g. L. Labelle Surveys or Talbot Survey Inc. of Timmins, Ontario) before collar locations are considered finalized and imported into the database.

Security

The secure chain of custody for diamond drill core and samples starts at the drill and is completed with the safe return of sample pulps in a locked storage facility on site. Unscheduled visits to the diamond drill sites are made to ensure safety, good working practices, and drill core security.

The core from surface drill programs is transported from the field to the core logging facility by either LSG employees or the drill foreman or drill crew. Core reception, logging, and sample preparation procedures are followed as previously described in Item 11.1.2. The samples are enclosed within sealed shipping bags, are transferred into larger shipping bins, and are directly delivered to the selected analytical labs by LSG employees. The lab employee that receives the sample shipment signs a chain of custody document that is returned to the LSG Exploration office for reference and filing. The return assay results are currently processed by the database manager/coordinator and are reviewed by the QP for the site/project. Data is made available for viewing by selected members of LSG's geological and management staff on a need to know basis.

Drill Core Sampling Method and Approach, Sample Preparation, Analysis, and Analytical Procedures

Holmer 1996 to 2002

All core was delivered by the contractor to a secure location at the Holmer core shack. The core was logged and samples were marked on the basis of geological divisions. All core to be sampled, except for the quartz-tourmaline veins of the Main Zone and Hanging Wall Zone mineralization in which visible gold was observed, was split mechanically. The suspected higher grade intercepts with visible gold were sent for assay as whole core.

During the period from 1998 to 2002, sample lengths averaged 1.2m but were typically shorter in the well-mineralized sections. Prior to 1998, sample lengths ranged from 0.14m to 4m. The entire drill core was split, and half the core was submitted to the laboratory for holes 96-01 to 96-10 and 97-01 to 97-06. Sample intervals for holes 97-07 to 97-57 ranged between 0.14m and 1.75m in length. The samples remained at the secure site until delivery to the shipping company. The samples were then transported to Accurassay Laboratories Ltd. (Div. of Assay Laboratory Services Inc.) ("Accurassay") in Thunder Bay by BPX.

Accurassay is an independent ISO 17025 certified facility with a corporate office located at 126-4026 Meadowbrook Drive, London, Ontario.

Analytical procedures used during this time are documented in a Summary of Work Report by Dave Beilhartz (2002), as follows:

For samples analyzed by Regular Fire Assay:

- Jaw crush/cone crush samples to -10 mesh.
- -10 mesh material split.
- Rejects stored.
- Pulverize 200-300 gram sample to -150 mesh.
- Mix samples to produce a homogenous sample.
- Take ½ assay ton (15 grams) of pulverized material put in a crucible for fire assay.

For samples analyzed by Pulp Metallics Method:

Owing to the coarse nature of gold in the main mineralized and Hanging Wall Zones, it was decided to use a pulp metallics assay method for those samples. The procedure followed is described below:

- The sample is jaw crush/cone crush samples to -10 mesh, then a 750 gram to 1.0 kilogram sub-sample is riffled off. After weighing, sample is "stage" pulverized through a 150 mesh screen until about 20 to 40 grams of +150 mesh material is left on the screen.
- All of this +150 mesh material left on the screen is fire assayed to determine the weight of gold in that fraction.
- Two, 20 or 30 gram samples of the -150 mesh material are then assayed using standard fire assay procedure.
- The gold content of the total sample is then mathematically calculated.

Lake Shore Gold Corp. 2003 to Present

Intervals to be sampled are determined by the geologist, and are based upon lithology, alteration, mineralization and sulphide abundance, the presence of visible gold ("VG"), and geological contacts. Sample lengths within the well-mineralized sections of core are generally 0.5m with minor variations determined based on lithologies and vein contacts. Sample lengths are increased up to 1.5m where sparse mineralization was encountered. The sample intervals are marked on the core and recorded in the drill log. The core is split by trained technicians using a diamond saw. One half of the core is consistently selected and placed in a plastic sample bag and the remaining half is returned to the core box. LSG used sequentially numbered triplicate sample tags. One portion of the tag goes in the sample bag along with the split half of the sample, one portion of the tag is stapled into the core box at the end of the sample interval, and the third stays in the sample book for archiving. Protocols were updated in May 2013 where samples containing considerable visible gold are clearly marked and flagged with orange tape and marked with "VG" in red ink on the accompanying sample tag by the geologist such that the sampler can then indicate the request for a silica wash (discussed below) on the corresponding sample submittal form to the lab. Once the sampling is completed, the core boxes are either placed on racks or cross-piled for future reference within the gated area of the logging facility. Core from older drill programs is eventually transported to the mine site for long-term storage in a secure core compound for future reference.

QA/QC

Quality Control ("QC") samples are generally submitted with routine samples to provide ongoing assessment of the precision and accuracy of the sampling and assay process and provide confidence in the assay database. Generally three types of QC samples are used: standards, duplicates and blanks.

Standards or Reference Materials ("RMs"). These samples have a known value and are used primarily to assess accuracy of the analytical technique. They can either be certified (in which case they are referred to as "CRMs") or not.

Duplicates are samples which are taken in the same way as routine samples. They are submitted either to the primary or to a secondary laboratory to assess precision of the sample preparation procedure and analytical technique. There are several different types of duplicate samples depending on where in the sampling process the duplicate is taken: field, coarse crush and pulp duplicates. Each duplicate assesses precision at a different point in the sampling chain.

Blank samples are inserted with primary samples in order to check for any contamination in the sample preparation procedure. They should be full volume and placed after a sample expected to be high grade.

Quality assurance and quality control (“QA/QC”) was not required in the industry, and therefore commonly not implemented, before NI 43-101 standards were widely adopted and so most historical (pre-NI 43-101) drilling programs do not have comprehensive QA/QC.

LSG uses a blind QC program in line with industry standards for all its surface and underground drill programs. Blank samples are prepared from approximately 0.5m diamond drill core samples of diabase, which are known to be barren of gold mineralization. These blank samples are blindly packaged as regular core samples, affixed with sample tags sequential to the sample stream, and inserted at a random frequency of one every 40 samples. Prior to 2012, QA/QC samples were introduced at a higher frequency of one blank, one standard, and one coarse duplicate every 20 samples. Blanks are inserted after core samples and, when mineralization is encountered, blanks are placed after expected high grade samples to check for possible contamination in the crushing circuit.

CRMs used by LSG are individually wrapped in 60 gram sealed envelopes prepared by Ore Research and Exploration Pty. Ltd. (“OREAS”) of 37 Hosie Street, Bayswater North, Victoria, Australia and distributed by Analytical Solutions Ltd. Several CRMs are used to vary the expected value and may depend on availability of particular standards. These CRMs are purchased from Ms. Lynda Bloom, Analytical Solutions Ltd., at 1214-3266 Yonge Street, Toronto, Ontario. CRM samples are inserted into the sample stream at a frequency of one every 1 to 40 samples and are used to check the precision and accuracy of the analytical process. In late 2015, LSG began also using CRMs from a Canadian standard supplier, CDN Resource Laboratories Ltd., of 20148 102 Avenue, Langley, BC, Canada.

Prior to 2010, ALS Canada Ltd. (“ALS”) had been instructed to take one coarse crush reject duplicate LSG sample for every 25 samples processed. This procedure was revised to take the duplicate sample immediately preceding the 25th sample, crush it to -6 mesh, and run it through a riffle splitter to create two samples of approximately equal proportions. One of the halves was then assigned the sample number and the other duplicate sample was placed in a separate plastic bag and labeled with the same sample number and the suffix “dup”. The two samples were then treated as two entirely separate samples through the rest of the sample preparation and assaying process. The method of selecting coarse reject duplicates was subsequently modified in May 2010 to instead produce a “blind duplicate sample”; one coarse reject duplicate is now selected every 40 samples by the geologist logging the drill core. The geologist gives the duplicate sample a numbered sample tag and places it sequentially in an empty bag behind the sample from which it will be cut. When received by the lab, the preceding sample to the duplicate is crushed to -6 mesh, then run through a riffle splitter to create two samples of approximately equal proportions. One half is returned into the original sample bag and the other half is placed into the empty bag, now as a separate sample with its own sample number. From this point on, the sample is considered "blind" to the analytical process. Duplicate samples are inserted to monitor the precision of the assay results.

Prior to early 2007, the samples were transferred in security-sealed bags and transported by Manitoulin Transport to the ALS Chemex prep lab in Mississauga (2003 to 2005), and then to Sudbury for analysis (2006 to 2007), (Darling et al., 2009).

Since 2007, the majority of samples from surface exploration programs have been delivered by LSG personnel directly to either the ALS Chemex prep lab (until 2019) or Activation Laboratories ("ActLabs") facility in Timmins (2013 to present). At the ALS prep lab, the pulps are created in Timmins and then shipped to the ALS Chemex assay laboratory in Vancouver, BC, or Rouyn-Noranda, QC. At ActLabs, the samples are prepped and analysed in the Timmins facility. From 2016 to 2018, a small proportion of surface drill core samples were also sent to the SGS Canada Inc. ("SGS") laboratory in Cochrane, ON for both preparation and analysis. Using the same chain of custody documents and methods as outlined in Item 11.1.4, these sample shipments are picked up directly from the LSG core logging facilities by SGS staff for ground transport to the Cochrane facility.

Analytical procedures for surface diamond drill hole samples have remained fairly consistent since LSG first started drilling on the Timmins Mine and Thunder Creek properties in 2003. These procedures have been described thoroughly in previous reports (Darling et al., 2009; Powers 2009; Crick et al, 2011). The following descriptions outline the methods of treatment and procedures utilized by the various labs to process and analyze drill core samples.

ALS Canada Ltd.

LSG employees are not involved in the sample preparation or analysis of samples once they have been delivered to the assay preparation laboratory in Timmins. Samples submitted to ALS are assigned a separate client project number, corresponding to the Timmins Deposit, Thunder Creek or 144 Gap portions of the Property. The laboratory is instructed to maintain the sample stream, the processing and analysis by keeping the samples in sequential order as they are shipped to the lab. Samples are entirely crushed to 70% passing 2mm mesh. The crushed samples are split and 250 gram sub-samples are pulverized to 85% passing less than 75 microns using a ring and puck pulverize (PREP-31). For samples containing VG, LSG requests a subsequent silica wash (WSH-22) where silica sand is run once through the crusher and twice through the pulverizer after the sample is processed to minimize cross-contamination with the following sample stream. A 50 gram aliquot is taken from the pulp and analyzed by fire assay - atomic absorption method (Au-AA24). For samples that return an assay value greater than 10.0 g/t gold, a second pulp sample is processed and analyzed using a gravimetric finish (Au-GRAV22).

If VG is noted in the core sample, the samples are often also analyzed using a pulp metallic method (Au-SCR21). For this process, the entire sample is crushed to 70% passing 6mm mesh, and then pulverized to 85% passing 75 microns (PREP-32). The pulp is passed through a 100 microns stainless steel screen and the entire (+) fraction is analyzed using fire assay and gravimetric finish. The (-) fraction is homogenized and two aliquots are analyzed by fire assay and atomic absorption finish (Au-AA25 and Au-AA25D). The total gold content is then calculated by combining the weighted averages of the two fine fractions with the grade of the coarse fraction.

For surface drill core from the Timmins Deposit portion of the Property, earlier samples were analyzed for arsenic (“As”) by aqua regia digestion and atomic absorption scanning (AA-45). This was implemented since the sediment-hosted zones of mineralization (Hanging-wall Veins, Main Zone, and the Deep Zone) often displayed a spatial association with arsenopyrite. Samples from recent extensional drilling at the Timmins Deposit (see Item 10.2) were not analyzed for As. For Thunder Creek, drill core from the first 50 holes (10,713 samples) were also analyzed for As. Significant levels were not detected and the practice was abandoned in late 2007. Similarly, samples from drilling at the 144 Gap were not analyzed for As.

As part of ALS’s internal QA/QC program, a duplicate coarse reject sample was prepared every 50 samples. The number of internal blanks, standards and duplicate control samples inserted into the sample stream depends upon rack size. For regular AAS, ICP-AES, and ICP-MS methods, the rack holds 40 positions, in which two laboratory standards, one laboratory duplicate, and one laboratory blank are inserted. For regular fire assay methods, the rack contains 84 positions, in which two laboratory standards, three laboratory duplicates, and one laboratory blank are inserted. External lab QAQC results are compared to the Company’s blind QC program when investigating observed trends and biases.

Activation Laboratories (“ActLabs”)

ActLabs operates a full preparation and fire assay, atomic absorption, gravimetry, and ICP-OES analysis laboratory in Timmins, Ontario. Diamond drill core samples are entirely crushed to 80% (instead of 70% at ALS) passing 2mm mesh with a 250 gram split sub-sample pulverized to 95% passing up to 106 microns (instead of 85% passing 75 microns at ALS) using a ring and puck (RX1-terminator). Special instructions for a silica wash can also be requested on submittal forms for VG-bearing samples. Fire assay with atomic absorption finish is conducted on a 50 gram aliquot taken from the pulp (1A2-50 FA-AA). For over-limit assay values (>10.0 g/t gold), another 50 gram aliquot is used for fire assay with gravimetric finish (1A3-50 FA/GRAV). A screen (pulp) metallics method is run on samples with VG (as requested by LSG) and involves crushing, pulverizing and sieving the entire sample to 149 microns (instead of 100 microns at ALS and 150 microns at SGS) with fire assay and atomic absorption/gravimetric finish methods completed on the entire (+) fraction and two splits of the homogenized (-) fraction (1A4 FA-MET).

Methods of treatment and analytical procedures utilized by SGS for samples sent to the Cochrane facility are like those described above for ALS, with minor differences. At SGS, samples are entirely crushed to 75% (instead of 70% at ALS) passing 2mm mesh with a 250 gram split sub-sample pulverized to 85% passing up to 75 microns using a ring and puck (PRP89). Similarly, special instructions for a silica wash can be requested on submittal forms for VG-bearing samples. Fire assay with atomic absorption finish is also conducted on a 50 gram aliquot taken from the pulp (GE FAA515). For over-limit assay values (>10.0 g/t gold), another 50 gram aliquot is used for fire assay with gravimetric finish (GO FAG505). Samples with VG are also typically analyzed by a screen (pulp) metallics method where entire samples are crushed, pulverized, and screened to 150 microns (instead of 100 microns at ALS) with fire assay and atomic absorption/gravimetric finish methods completed on the entire (+) fraction and three aliquots (instead of two at ALS) of the homogenized (-) fraction (GO FAS35V).

A list of the standards used by LSG is provided below in Table 11.1.

Table 11.1: Standards used by Lake Shore Gold

Standard	Mean gold grade (g/t)	Std. Dev	1 Std. Dev.		2 Std. Dev.		3 Std. Dev.	
			Min	Max	Min	Max	Min	Max
CDN-GS-1K	0.867	0.049	0.818	0.916	0.769	0.965	0.720	1.014
CDN-GS-1P5P	1.590	0.075	1.515	1.665	1.440	1.740	1.365	1.815
CDN-GS-1R	1.210	0.055	1.155	1.265	1.100	1.320	1.045	1.375
CDN-GS-3K	3.190	0.130	3.060	3.320	2.930	3.450	2.800	3.580
CDN-GS-3L	3.180	0.110	3.070	3.290	2.960	3.400	2.850	3.510
CDN-GS-3M	3.100	0.115	2.985	3.215	2.870	3.330	2.755	3.445
CDN-GS-3P	3.060	0.090	2.970	3.150	2.880	3.240	2.790	3.330
CDN-GS-3Q	3.300	0.130	3.170	3.430	3.040	3.560	2.910	3.690
CDN-GS-4F	3.830	0.120	3.710	3.950	3.590	4.070	3.470	4.190
CDN-GS-5K	3.840	0.140	3.700	3.980	3.560	4.120	3.420	4.260
CDN-GS-7F	6.900	0.205	6.695	7.105	6.490	7.310	6.285	7.515
CDN-GS-7G	7.190	0.185	7.005	7.375	6.820	7.560	6.635	7.745
CDN-GS-8E	8.530	0.205	8.325	8.735	8.120	8.940	7.915	9.145
CDN-GS-P4C	0.362	0.018	0.344	0.380	0.326	0.398	0.308	0.416
CDN-GS-P4E	0.493	0.029	0.464	0.522	0.435	0.551	0.406	0.580
CDN-GS-P6B	0.625	0.023	0.602	0.648	0.579	0.671	0.556	0.694
CDN-GS-P6D	0.769	0.047	0.723	0.816	0.676	0.862	0.630	0.909
O-10c	6.600	0.160	6.440	6.760	6.280	6.920	6.120	7.080
O-15d	1.559	0.042	1.517	1.601	1.475	1.643	1.433	1.685
O-15h	1.019	0.025	0.994	1.044	0.969	1.069	0.944	1.094
O-15Pb	1.060	0.030	1.030	1.090	1.000	1.120	0.970	1.150

O-16a	1.810	0.060	1.750	1.870	1.690	1.930	1.630	1.990
O-16b	2.210	0.070	2.140	2.280	2.070	2.350	2.000	2.420
O-18c	3.520	0.106	3.414	3.626	3.308	3.732	3.202	3.838
O-19a	5.490	0.100	5.390	5.590	5.290	5.690	5.190	5.790
O-200	0.340	0.012	0.328	0.352	0.316	0.364	0.304	0.376
O-201	0.514	0.017	0.497	0.531	0.480	0.548	0.463	0.565
O-202	0.752	0.026	0.726	0.778	0.700	0.804	0.674	0.830
O-203	0.871	0.030	0.841	0.901	0.811	0.931	0.781	0.961
O-204	1.043	0.039	1.004	1.082	0.965	1.121	0.926	1.160
O-205	1.244	0.053	1.191	1.297	1.138	1.350	1.085	1.403
O-206	2.197	0.081	2.116	2.278	2.035	2.359	1.954	2.440
O-207	3.472	0.130	3.342	3.602	3.212	3.732	3.082	3.862
O-209	1.580	0.044	1.536	1.624	1.492	1.668	1.448	1.712
O-210	5.490	0.152	5.338	5.642	5.186	5.794	5.034	5.946
O-214	3.030	0.082	2.948	3.112	2.866	3.194	2.784	3.276
O-216	6.660	0.155	6.505	6.815	6.350	6.970	6.195	7.125
O-216b	6.660	0.158	6.502	6.818	6.344	6.976	6.186	7.134
O-218	0.531	0.017	0.514	0.548	0.497	0.565	0.480	0.582
O-224	2.150	0.053	2.097	2.203	2.044	2.256	1.991	2.309
O-250	0.309	0.013	0.296	0.322	0.283	0.335	0.270	0.348
O-2Pd	0.885	0.029	0.856	0.914	0.827	0.943	0.798	0.972
O-502	0.491	0.020	0.471	0.511	0.451	0.531	0.431	0.551
O-503	0.687	0.024	0.663	0.711	0.639	0.735	0.615	0.759
O-50Pb	0.841	0.031	0.810	0.872	0.779	0.903	0.748	0.934
O-54Pa	2.900	0.110	2.790	3.010	2.680	3.120	2.570	3.230
O-601	0.780	0.031	0.749	0.811	0.718	0.842	0.687	0.873
O-601b	0.775	0.021	0.754	0.796	0.733	0.817	0.712	0.838
O-602	1.950	0.066	1.884	2.016	1.818	2.082	1.752	2.148
O-602b	2.290	0.094	2.196	2.384	2.102	2.478	2.008	2.572
O-603b	5.210	0.209	5.001	5.419	4.792	5.628	4.583	5.837
O-60b	2.570	0.106	2.464	2.676	2.358	2.782	2.252	2.888
O-60d	2.470	0.079	2.391	2.549	2.312	2.628	2.233	2.707
O-61d	4.760	0.140	4.620	4.900	4.480	5.040	4.340	5.180
O-61f	4.600	0.134	4.466	4.734	4.332	4.868	4.198	5.002
O-62c	8.790	0.210	8.580	9.000	8.370	9.210	8.160	9.420
O-62d	10.500	0.330	10.17	10.830	9.840	11.160	9.510	11.490
O-67a	2.238	0.096	2.142	2.334	2.046	2.430	1.950	2.526
O-68a	3.890	0.150	3.740	4.040	3.590	4.190	3.440	4.340
O-6Pc	1.520	0.067	1.453	1.587	1.386	1.654	1.319	1.721

Table 11.2: Summary of Sample Distribution by Analytical Laboratories

Thunder Creek Deposit: November 24, 2015 to April 19, 2021						
Laboratory	**Drill Core Samples**	**Standards**	**Blanks**	**Coarse Duplicates**	**Total QA/QC Samples**	**Total Samples Sent (Core + QA/QC)**
Activation Laboratories	50 916	1320	1458	1472	4250	55 166
ALS Canada Ltd.	1712	44	46	46	136	1848
Bell Creek Laboratory	2705	65	72	71	208	2913
Northern Mining Analytical Laboratory	0	0	0	0	0	0
SGS Canada Inc.	913	24	27	28	79	992
TOTAL	**56 246**	**1453**	**1603**	**1617**	**4673**	**60 919**
144 Gap Deposit: January 12, 2016 to April 19, 2021						
Laboratory	**Drill Core Samples**	**Standards**	**Blanks**	**Coarse Duplicates**	**Total QA/QC Samples**	**Total Samples Sent (Core + QA/QC)**
Activation Laboratories	114 771	3281	3337	3391	10 009	124 780
ALS Canada Ltd.	40 633	1078	1112	1131	3321	43 954
Bell Creek Laboratory	2259	57	59	65	181	2440
Northern Mining Analytical Laboratory	4849	136	119	129	384	5233
SGS Canada Inc.	1418	36	36	36	108	1526
TOTAL	**163 930**	**4588**	**4663**	**4752**	**14 003**	**177 933**
Timmins Deposit: November 21, 2015 to April 19, 2021						
Laboratory	**Drill Core Samples**	**Standards**	**Blanks**	**Coarse Duplicates**	**Total QA/QC Samples**	**Total Samples Sent (Core + QA/QC)**
Activation Laboratories	83 121	2152	2324	2370	6846	89 967
ALS Canada Ltd.	3805	88	93	99	280	4085
Bell Creek Laboratory	1952	51	51	54	156	2108
Northern Mining Analytical Laboratory	136	4	4	4	12	148
SGS Canada Inc.	962	24	29	28	81	1043
TOTAL	**89 976**	**2319**	**2501**	**2555**	**7375**	**97 351**

11.2 Underground Diamond Drill Program

General Statement

Described herein are the protocols used for underground drill programs executed during the period from the last technical report to the current effective date.

Core Handling and Logging Protocols

Prior to Spring 2013, all core from underground drill programs was being delivered to the mine site core shack. Under the direct supervision of Qualified Persons, underground drill core was being processed by geologists and geological technicians in a similar fashion as described above for the surface drill programs (Section 11.1). Like the surface programs, samples from underground exploration holes were also split in half using either a hydraulic splitter or a core saw, with the remainder of the core cross-piled on site for future reference. For stope definition drilling, the mineralized zones were systematically whole core sampled, while the remaining 'waste' core was discarded.

Since May 2013, all drill core is now transported by the either the drill contractor (under direct supervision of LSG personnel) or LSG personnel and delivered to the Government Road central core logging facility, which has afforded closer supervision and improved standardization in all aspects of the logging and sampling process. Supervision is currently provided by Al Mainville, P. Geo., and Senior/Project Geologist for both surface and underground programs.

Property Grids, Hole Collar, and Downhole Attitude Surveys

All underground holes, including those on the Thunder Creek and Highway-144 properties, are planned with respect to the Timmins Mine local coordinate system, as discussed in Item 11.1.

For underground programs prior to 2013, most drill hole collar locations and starting azimuths were established by LSG mine geologists by measuring from survey control stations. The first downhole azimuth and dip readings in each hole were initially recorded at 9m to 15m depths using "Reflex EZ-Shot" instruments. If the reading was more than 3 degrees from the desired azimuth, it was common practice to re-align the drill and re-collar the hole. Tests beyond the 15m mark were generally taken at 50m intervals. The magnetic susceptibility was assessed using the "total magnetic field" for each directional reading to determine if the apparent azimuth had been affected by highly magnetic materials in proximity to the data point. Some holes were re-surveyed using a downhole north-seeking gyro or using a Maxibor instrument from Reflex. Upon completion, drill holes were generally marked by inserting a wood peg in the collar, accompanied by an aluminum tag indicating the hole number. The collar locations were occasionally re-surveyed by the mine geologists or mine surveyors depending on availability.

In the spring of 2013, drilling protocols were re-evaluated and updated based on the highly magnetic nature of the host-rocks. It was determined that many of the rock formations being drilled were more strongly magnetic than previously recognized due to the presence of finely disseminated magnetite in the pyroxenite and pyrrhotite in the volcanics. More stringent protocols were therefore implemented to ensure greater accuracy and better quality of the directional data. Drill hole collar locations are now predominantly established by trained LSG surveyors using survey control stations and additional survey spads/points. A line with a unique ID is painted on the walls in order to assist the drillers with proper drill alignment. In addition, a north-seeking gyroscope (“Azimuth Aligner”), newly developed at the time by Downhole Surveys Pty. Ltd. (“DHS”), (Australia), was acquired in September 2013 for use by the drillers to line up on most of the holes. This instrument is easy to use, is not affected by magnetic interference, and provides continual output of both azimuth and dip, allowing the drillers to precisely manoeuver the drill rig to the correct planned azimuth and dip. A similar tool (“TN14 Gyrocompass” by Reflex) gradually replaced the Azimuth Aligner technology in late 2014 to early 2015 and remains in constant use to the present day. Once the drill is aligned and anchored, the orientation on the drill head is double checked with the TN14 Gyrocompass and the starting azimuth and dip are stored in the Juno handheld device.

Starting collar orientations are recorded on a drill hole survey record sheet to be entered into the database by the project geologist. Downhole EZ-Shot tests are still taken at 9m to 15m from the collar, but drillers are instructed not to automatically re-collar, but to carry on taking tests at 50m intervals for evaluation by the responsible geologist. From June 2013 to the end of 2014, a non-magnetic survey instrument (“DeviFlex” by DHS) was also used to track the curvature of the holes upon completion of drilling. Downhole north-seeking gyro surveys were occasionally done on selected holes as an additional verification and for comparison purposes. The DeviFlex tool, while an improvement over the traditional EZ-Shot data, proved too unreliable and unadaptable for use by the drillers. Instead, the vast majority of drill holes at the TWM (>90%) are now surveyed by external consultant Reflex using the Reflex MEMS Gyro system to track downhole deviations, which has greatly increased confidence in the curvature and locations of recently completed drill holes (late 2014 to present).

For Thunder Creek, drill holes are generally shorter and Reflex tests taken within the porphyry are believed to be sufficiently reliable as this rock formation is non-magnetic. As a result, and depending on timing and logistics, a small number of infill holes at Thunder Creek are not always surveyed by Reflex. For future reference, the hole identification number is stamped on an aluminum tag and is attached to an orange plastic cone which is then inserted in the collar. Except for short holes drilled by a small air-powered diamond drill (“bazooka” holes), the final collar locations and starting orientations are then picked-up by the surveyors using a custom-made aluminum rod which fits precisely in the collar. A geologist then reviews all collar surveys and downhole directional data. The electronic memory of the Reflex tool is regularly downloaded, and the magnetic susceptibility readings (both “total magnetic field” and “magnetic dip”) are scrutinized to assess the reliability of the data. The quality of the MEMS Gyro data file is also reviewed for potential reading or technical errors using various parameters as recommended by the manufacturer. Finally, a directional data file containing a combination of the best collar and downhole Reflex (MEMS Gyro +/- EZ-Shot) surveys is generated and forwarded to the Database Manager/Coordinator for import into the drillhole database. If downhole gyro data is available, it is normally considered as being the most accurate.

Security

The TWM secure chain of custody for diamond drill core and samples starts at the drill and is completed with the safe return of sample pulps to a locked storage facility on site. All underground core is transported from the mine site by either the drill contractor (under direct supervision by LSG personnel) or by LSG personnel. Core reception, logging, and sample preparation procedures are followed as previously described above. The samples are enclosed within sealed shipping bags, are transferred into larger shipping bins, and are delivered directly to the selected analytical labs by LSG employees. The lab employee that receives the sample shipment signs a chain of custody document that is returned to LSG's office for reference and filing. The return assay results are currently processed by the database manager/coordinator and are reviewed by qualified site/project geologists (who are registered P.Geos.) for both underground and surface programs.

Underground Diamond Drill Core Sampling Protocols

LSG 2008 to Spring 2013

Since underground drilling at the TWM first started in 2008, drill core was delivered directly to the core logging facility located on site, logging and sampling as discussed in Item 11.2.2.

Sample location and widths were based upon the distribution of sulphides, VG, lithology and alteration. Sample lengths vary from 0.3m to 1.5m, and generally do not cross lithological and alteration or mineralization boundaries. Samples were marked by the geologist using a marker. Three-part sample tags labeled with a unique ID number were used. One part of the tag stayed in the sample book and documents the hole number and interval being sampled. The second portion of the tag was stapled in the core box at the end of the sample, and the third portion was placed in the sample bag during sampling. Core sampling was performed by trained and supervised technicians. Core considered to be from production definition drilling was "whole core" sampled, meaning the entire core from each specific sample interval was collected and sent to the lab with no representative equivalents kept. The remaining non-sampled core was discarded. Core from underground exploration holes or from holes of particular interest were either split using a hydraulic splitter, or cut using a diamond core saw, and one half of each individual sample was sent to the lab. In this case, the remaining core was stored in core racks or was cross-piled on site, for future reference.

LSG 2013 to Present

In the spring of 2013, LSG started to progressively process all core from the TWM at its central office and core logging facility located at 1515 Government Road South, Timmins. This was done due to a lack of space at the mine site, to ensure standardized core logging and sampling protocols, and to provide closer supervision over these processes. All drill core is transported from the mine site by the drill contractor (under direct supervision by LSG employees) and by LSG employees. Core handling, logging, and sampling protocols are like those described above and in Item 11.1.

The samples are placed in plastic bins and are delivered directly to various local labs by LSG employees. These labs include ALS (2090 Riverside Drive, Timmins), ActLabs (1752 Riverside Drive, Timmins), LSG's own analytical lab located at the Bell Creek Complex in South Porcupine, and Northern Mining Analytical Laboratory ("NMAL") (475 Railway Street, Timmins). A small proportion of samples were also sent to SGS located in Cochrane (1 1st Street) from 2016-2018.

The following descriptions outline the methods of treatment and procedures utilized by the various labs to process and analyze underground drill core samples. Methodologies are similar across all labs, with minor differences as noted below.

ALS Canada Ltd.

The protocols and procedures for the preparation and analysis of underground drill core samples sent to ALS are the same as for surface drill core samples (Section 11.1.5), except that underground aliquot sample sizes were reduced from 50 to 30 grams for the period of August 2011 to June 2013.

ActLabs

The protocols and procedures for the preparation and analysis of underground drill core samples sent to ActLabs are the same as for surface drill core samples (Section 11.1.5).

Bell Creek Complex Laboratory

Diamond drill core samples sent to the Bell Creek Laboratory are manually sorted, dried, and then individually crushed to greater than 85% passing 10 mesh (2mm) with a 150 to 200 gram sample split pulverized to greater than 95% passing 200 mesh (75 microns) using a ring and puck. All equipment is cleaned between samples using compressed air. A silica wash can also be requested on submittal forms for VG-bearing samples. Fire assay with atomic absorption finish is carried out on a 30 gram aliquot prepared from the pulp. Over-limit assay values are also automatically re-run using another aliquot from the pulp and a gravimetric finish; however, the triggering threshold for re-analysis is 20 g/t gold (compared to 10.0 g/t gold at all other labs). Pulp metallics are not typically conducted as only production diamond drill core is sent to the Bell Creek Laboratory.

For the period from 2008 to March 18, 2013, the introduction of blank samples, CRM, and blind coarse duplicates in the sample stream were done at a random frequency of one per every group of 20 samples following the same QC program as previously described for surface drill core samples in Section 11.1.5. As of March 18, 2013, this protocol was changed to "one blank, one coarse duplicate, and one CRM for every group of 40 samples".

SGS Canada Inc.

The protocols and procedures for the preparation and analysis of underground drill core samples sent to SGS are the same as for surface drill core samples as described in Section 11.1.5.

Northern Mining Analytical Laboratory (NMAL)

Locally owned and operated NMAL offers full preparation and fire assaying with atomic absorption or gravimetric finish. At NMAL, diamond drill core samples are entirely crushed to 80% passing 2mm mesh with a 250 gram split sub-sample pulverized to 90% passing up to 105 microns using a ring and puck. Special instructions for a silica wash (using a sand blank) are requested on the sample submittal forms for samples containing VG. Fire assay with atomic absorption spectrometry is carried out on a 50 gram aliquot prepared from the pulp (41-AAS-1A). For over-limit assay values (>10.0 g/t gold), another 50 gram aliquot is used for fire assay with gravimetric finish (51-GRV-1B). NMAL is currently not set up for pulp metallic screening, but only underground diamond drill core is sent there at this time.

The protocols and procedures for the preparation and analysis of underground drill core samples sent to NMAL are the same as for surface drill core samples as described in Section 11.1.5.

11.3 Data Management for Surface and Underground Diamond Drill Programs

Copies of assay certificates are either downloaded from each lab's external LIMS system and/or sent via mail and electronic mail to LSG's database manager/coordinator, and to the project's QP. The digital assay data, in comma separated values (*.csv) file format, are checked manually against the final paper assay certificates for clerical errors, and the results evaluated by an Excel query file or the Lab Logger Version 2.0 program (created by Gemcom) for all labs. The use of the software program ensures that the results from the QA/QC samples fall within approved limits before this data is imported into the database.

The procedures for handling and managing the surface and underground assay data are discussed in detail below.

Accuracy and Contamination Analysis- Standards and Blanks

Beginning in March 2009, sample results were entered into an Excel spreadsheet to determine if the assay value for a particular standard fell outside the three standard deviation control limits. If this occurred, these samples would be highlighted for re-analysis at Accurassay, ActLabs, ALS, Bell Creek, Cattarello Assayer Inc., NMAL or SGS. From April 2010, this process was handled using an Access application developed by Gemcom Software International Inc. called Lab Logger (version 2.0), however the Excel spreadsheet process was reinstated in October 2020 after a server update was not compatible with Lab Logger. Sample assay results, internal QC information, certificate dates, standards, and duplicate samples are each stored in separate QC database tables, and data can be merged into relevant plot files as needed.

The QC samples in each group are subjected to specific pass or failure criteria, which determine whether a re-assay of the batch is required. A sample group failure is identified whenever:

a) the analytical result for any CRM is greater than three standard deviations (the "control limit") from the certified mean value for the standard, or

b) the assay for any blank material is greater than 0.100 ppm.

All failed groups of samples are investigated to attempt to determine the cause of the erroneous result (analytical or clerical). Potential clerical errors are sometimes reconciled by checking against original drill log records, sample books or original laboratory data sheets. After the batch pass/failure criteria are applied, a geological override may be applied by the project QP on batches for which re-assay would be of no benefit (i.e. completely barren of gold assay values and mineralization indicators). Sample groups given a geological override are not re-assayed.

Sample groups in which the QC samples fall outside the established control limits that did not receive a geological override are not imported into the database. Instead, these samples are requested to be re-run at the analytical lab. In the case where a CRM has failed, a re-run of the entire or partial batch is requested from the pulps. In the case of a blank failure, a re-run of the entire or partial batch is requested from coarse crush reject material, as this indicates contamination of the pulps in the sample preparation stage.

The QA/QC results are reviewed by one of the QPs who have the discretion to override the re-assay protocol if there is sufficient evidence to warrant. Reasons for override include:

- If a standard or a blank fails by less than 0.05g/t as this is very close to the cut-off for a pass.
- If a standard or a blank fails by more than 0.05g/t and there are no ore grade samples, and no ore grade sample was anticipated within the area of the QC failure, the sample is overridden as it is believed that no significant assay is affected.
- Occasionally a failure is due to the wrong standard being recorded as sent or two QC samples being switched at some point in the shipping process. If this occurs and the error can be absolutely proven but corrections cannot be made the failure is overridden.
- In the situation of a standard or blank failing but the drill hole is in an area that is actively being mined or developed before a re-assay can be returned the failure is overridden.
- Any time there is a failure of a blank ore standard that does not fall into one of the criteria it can still be overridden if the QP believes the error is forgivable. In this case a comment stating the override is added to the database. An example of this is the QP noting that one standard was consistently failing by the same extent of an error. The error was overridden and the standard replaced in future sample shipments.

Reporting and Plotting

Brief monthly reports are completed during the year to include the number of samples sent to each lab for each project, the number of QC samples that failed, and identified reasons for said failures. In addition, graphs of all QC samples are generated monthly to check for sample bias, separated into blanks, standards (each one plotted separately), and coarse duplicates at each assay lab. All major projects are summarized individually, typically at year-end or at the end of a program, as soon as reasonably possible.

11.4 Check Assay Program

General Statement

For significant drilling periods, or for drill campaigns leading to mineral resource or mineral reserve calculations, a check assay program is implemented either during or following completion of drilling. Approximately 5% of the pulps from previously analyzed samples (excluding pulps from standards) are sent for re-assay to other neutral certified labs. Groups of samples that passed QC are selected randomly by hole, ensuring that a wide range of original assay values from trace to high grade are represented. Starting in November 2017 a new method was implemented for selecting check assays, where the assay lab prepares an extra pulp split every 1 in 15 samples to obtain the approximate 5% ration of reanalysis needed for this program.

The pulps are analyzed using fire assay with an AA finish method, and for results greater than 10 g/t gold, a re-assay was conducted by fire assay using a gravimetric finish.

Procedures

Pre November 2017, pulps were selected by project personnel and an electronic list of selected sample numbers was prepared for the samplers. The samples were submitted to the analytical facility in groups of 40, with the blind QC consisting of one standard and one previously analyzed blank pulp. For bazooka drill core, a new blank was inserted into the batches.

From November 2017, a change in the process was implemented. The current process is: the pulp splits are selected and put aside by the labs for pickup and processing. The samples are boxed by project and then scanned into an Excel spreadsheet prior to shipment. The original sample numbers are used, unless inserting a new standard. The old and new sample numbers and the positions of the standard and blank pulps are recorded on the check assay Excel table as the samples are being packed for shipping to the labs. Once the analyses were completed, the assay lab provides results in the standard LSG assay file format, including all their internal QC data. Once all assays are received and determined to have passed QC checks, a comparative statistical analysis of the duplicate results versus the original assays is completed, including an analysis of the performance of inserted QC samples, following a format previously used by external auditors.

A report for each project and lab was prepared, documenting the following statistics:

- Mean
- Maximum and minimum values
- Median
- Variance
- Standard deviation
- Coefficient of variation

- Correlation coefficient
- Percent difference between means

Each project completed check assay programs since the last 43-101 technical report.

11.5 Discussion

The sampling preparation, analysis, and security for the period of 1998 to 2009 are described in the NI 43-101 Technical Report on the TWM Property by Darling et al (2009); by Powers (2009) in the Amended Technical Review and Report of the "Thunder Creek Property" Bristol and Carscallen Townships; and by Crick et al (2011) in the Technical Report on the Initial Mineral Resource Estimate for the Thunder Creek Property, Bristol Township. A Preliminary Economic Assessment Report and Updated Mineral Resource Estimate for the TWM was released in March 2009 and provided updated protocols up to October 28, 2011 for Thunder Creek, and up to January 31, 2012 for the Timmins Mine property (Crick et al., 2012a). An updated mineral reserve estimate for TWM was released in March 2014 and provided updated protocols up to February 21, 2014. An updated 43-101 Technical Report for the mineral resource and reserve estimate for the TWM was released in March 2016 and provided updated protocols up to December 31, 2015. All of these reports are referenced in Item 27 and are filed on SEDAR.

Table 11.3 summarizes the QA\QC statistics for TWM, comprising surface and underground QA/QC programs for the Timmins, Thunder Creek, and 144 Gap Deposits.

Table 11.3: Timmins West Mine Diamond Drill Core QA/QC Sample Summary up to April 19, 2021

Description	Timmins West Complex
Sample Type	Number
Total Blanks	9464
Total Standards	9053
Total Duplicates	9620
Total QAQC	28 137
Total Blank Overrides	12
Total Blanks Re-Assayed	28
Total Blank Failures	40
Total Standard Overrides	266
Total Standard Re-Assayed	105
Total Standard Failures	371
Total QAQC Failures	411

**Note: Reasons for a geological override include:*

1. *If a standard or a blank fails by less than 0.05 grams per tonne as this is very close to the cut-off for a pass.*
2. *If a standard or a blank fails by more than 0.05 grams per tonne and there are no ore grade results, and no ore grade results were anticipated within the area of the QC failure, the failure is overridden as it is assumed that no significant assay results were affected.*

3. *Occasionally a failure relates to a data entry error (wrong standard being recorded as sent), or relates to two sequential samples being switched during sampling at the core shack, or during sample preparation at the lab. If the error can be absolutely proven but corrections cannot be made, the failure is overridden.*
4. *In the situation of a standard or blank failing but the drill hole is in an area that is actively being mined or developed before a re-assay can be returned, the failure is overridden.*
5. *Occasionally, failure of a blank or a standard can be overridden if the QP believes the error is forgivable. In this case a comment stating the override is added to the database. An example of this is the QP noted that one standard was consistently failing by the same extent of an error. The error was overridden, and the standard is discontinued after it has been depleted.*

ALS and ActLabs were the main labs used for drill core analysis. Issues were not identified through a review of the analytical data for the standards and blanks used in the QA/QC program. Results from the course duplicate data show good repeatability. Check assays results showed good correlation with original assays.

The QP is satisfied that the sample preparation, security and analytical procedures employed by LSG are consistent with industry standards. In the opinion of the QP, the sampling and assay data can be used for the TWM mineral resource estimation.

12 Data Verification

12.1 Geology Data Reviews

Geological data is currently stored in a Geovia GEMS (Microsoft SQL) database which was compiled from data received from WTM, Holmer , and work completed by LSG since the acquisition of the properties. A review of all historical data available was completed to ensure all assay and survey (collar and downhole) information was properly imported and presented into the database. On a regular basis the following steps are taken to ensure the integrity of the database:

- A monthly validation is run on the Gemcom drill hole data which searches for overlapping geological or assay intervals, incorrect drill hole lengths, missing geological intervals, etc. Any errors encountered are corrected when discovered.
- Plans and sections are plotted regularly to check for drill hole location, elevation, and downhole survey errors.
- Due to the highly magnetic nature of the rocks, downhole survey data collected using a Reflex EZ-Shot instrument is checked by a geologist upon receipt and scrutinized for magnetic interference before being input into the database. The vast majority of drill holes at the TWM (>90%) are now being surveyed by external consultant Reflex using the non-magnetic Reflex MEMS Gyro system to assist in tracking hole curvature and deviations.

- Selected historical drill holes are checked underground for collar labels, drill hole location, and collar azimuth and dip. Any discrepancies are examined and modified as required.
- Downhole north-seeking gyro surveys are completed on select holes as additional verification and comparison.

From the end of 2015 to end of May 2017, a review of approximately 5% of available drill logs was completed on Timmins, Thunder Creek, and 144 Gap deposit drilling. Any discrepancies in the logs related to incorrect or missing entries for downhole surveys, drill dates, log dates, capping/cementing information, and Townships were noted and, where possible, these errors and omissions were corrected by the reviewer. Since May 2017, a more stringent review of completed drill logs and sign-off by the logging geologist has minimized the presence of these types of errors.

The QP is satisfied that the data verification procedures employed by LSG are consistent with industry standards and that the drillhole database can be used for the TWM mineral resource estimation.

13 Mineral Processing and Metallurgical Testing

13.1 Introduction and Previous Work

Extensive metallurgical test work was completed prior to processing any material from the TWM. The following companies were involved with various aspects of metallurgical evaluations:

- SGS Lakefield Research Limited, Lakefield, Ontario (“SGS Lakefield”);
- EHA Engineering Ltd., Richmond Hill, Ontario (“EHA”);
- RPC Engineering, Fredericton, New Brunswick (“RPC”);
- Pocock Industrial, Inc., Salt Lake City, Utah, USA (“Pocock”); and
- Golder Associates, Sudbury, Ontario (“Golder”).

RPC and SGS Lakefield tested samples of the ore types as composites as well as individual samples. The test programs consisted of bottle rolls to determine the metallurgical response of the ore types to cyanide recovery along with tests to determine gravity concentration, pulp agglomeration, flotation, and cyanide leaching of the flotation tailings and concentrates. RPC performed crushing, grinding and abrasion indices determinations. Pocock and Golder performed flocculent screening, gravity sedimentation, and pulp rheology on leached tailings samples. SGS Lakefield also performed preliminary sag mill testing. EHA evaluated work completed by RPC.

The test work results indicated that the ore will be very amenable to the Bell Creek mill conventional gold milling processes. Specifically, the ore was free milling and the gold responded well to cyanide leaching and CIP recovery.

In general, there was found to be good correlation between the results expected based on test work and the actual operating results. In some cases, the actual results exceeded expectations.

13.2 Metallurgical Recovery

The Bell Creek mill Phase 1 expansion was completed in October 2010. Planning for Phase 2 of the mill expansion (increasing throughput capacity to over 3,000 tpd) was started in the first quarter of 2011. Part 1 of the expansion was completed by the end of 2012 and increased the plant to a throughput of 2,500 tpd. The Phase 2 expansion was completed during the third quarter of 2013. Prior to launching the Phase 2 expansion project, more comprehensive test work was completed. The following companies were involved with this test work:

- G&T Metallurgical Services LTD. Kamloops, BC ("G&T");
- Starkey & Associates Inc., Oakville, Ontario ("Starkey");
- Xstrata Process Support, Falconbridge, Ontario ("XPS");
- Outotec Canada Inc. ("Outotec"); and
- FLSmidth Knelson, Langley, BC ("Knelson").

G&T Metallurgical completed bond work indices on four different types of mineralized material from the TWM. These samples included:

- Timmins Deposit – Shaft (material from the lower areas of the mine)
- Timmins Deposit – Ramp (material from the upper areas of the mine)
- Thunder Creek Deposit – Non-Porphyritic and Porphyritic

The bond ball mill work index for these ores ranged from 12.4 kWh/tonne for the shaft ore to 17.0 kWh/tonne for Non-Porphyritic Thunder Creek ore. Sag mill ("SMC") tests were also completed on these samples with the test data indicating that the ore ranged in hardness from moderately hard to very hard. The objective of Starkey's test work was to size a sag mill that would enable the throughput to be increased to 3,000 tpd using the two existing mills. Starkey also verified that a mill (which was available on the market at the time) was suitable for 3,000 tpd and also had the capability (in conjunction with regrind mills) to process up to 6,000 tpd. All the different material types were used for the test work. XPS used Starkey's data and ran JKSimMet simulations of the sag circuit with tonnage set at 250 tonnes per hour and using the hardest of the four materials. These results were used to establish the best operating conditions and obtain circulating load, pulp density, cyclone feed, and cyclone overflow data which were used to help suppliers in the sizing of the cyclones. Outotec tested the material types for settling characteristics to size a new high efficiency thickener rated for 6,000 tpd. Knelson tested the shaft and Thunder Creek material to establish data points for gravity recoverable gold (“GRG”). Shaft ore GRG was 78.6% and the Thunder Creek GRG was 53.5%. This information is being used as the basis for increasing the efficiency of the gravity circuit.

Test work was undertaken in 2013 by SGS Lakefield to determine the effect of grind on recovery. It showed a slightly increasing recovery with finer grinds, as well as lower than expected gravity gold recoveries. Gravity gold recoveries were 25.7% for Thunder Creek ore and 18.3% for Timmins Deposit ore.

Two samples (HWY-1 and HWY-2) from the 144 Gap deposit were tested in 2015 for metallurgical performance by SGS Lakefield. The gold head grades for the HWY-1 and HWY-2 samples were 5.65 g/t and 4.06 g/t, respectively. The ball mill work indices were 15.0 kWh/t (HWY-1) and 15.7 kWh/t (HWY-2), the results indicated that the HWY-1 sample was categorized as medium and the HWY-2 sample was categorized as moderately hard. The gravity recovery values for the samples were 74.1% (HWY-1) and 60.5% (HWY-2). Under conditions replicating the current operating Bell Creek Mill the overall gold recoveries after leaching were >99% for each sample.

In 2016, five more composite samples of 144 Gap deposit ore were sent for testing at SGS Lakefield to gain further confidence in the metallurgical performance. The results indicated that Comp C hardness was categorized as medium and the remaining four samples were categorized as moderately hard in terms of their BWI values when compared to the SGS Lakefield database. The work indices ranged from 15.0 kWh/t to 16.5 kWh/t. The gravity separation gold recovery values for the samples were very high ranging from 62% to 90%. Under conditions replicating the current operating Bell Creek Mill the overall gold recoveries after leaching were between 96% and 99% for each sample.

In-house test work continues on a regular basis to confirm and increase the metallurgical performance of the plant, including stripping circuit and leaching circuits.

Overall, in the opinion of the QP the combination of LSG’s operating history and the extensive amount of representative test work conducted provides confidence that the process design and equipment selection will result in achieving the targeted recovery and throughput levels and that no processing factors or deleterious elements will have a significant effect on economic extraction of TWM material.

The historical recoveries per year can be seen summarized in Table 13.1

Table 13.1: Timmins West Mine Yearly Milling Recovery

Timmins West Mine Milling Recoveries	
Operating Year	**Ounce Recovery**
2010	96.7%
2011	96.1%
2012	96.8%
2013	96.0%
2014	97.0%
2015	97.0%
2016	95.4%
2017	97.2%
2018	96.8%
2019	96.7%
2020	96.9%
Jan 1-Jun 30, 2021	97.2%
Average	**96.7%**

14 Mineral Resource Estimates

14.1 Summary

LSG updates mineral resource estimates on an annual basis following reviews of metal price trends, operational performance and costs experienced in the previous year, the results of diamond drilling conducted during the year, and production and cost forecasts over the life of the mine.

The effective date of this mineral resource estimate is June 30, 2021. Other than typical metal price fluctuation, no new material information has become available between June 30, 2021 and the signature date given on the certificates of the Qualified Persons. Mineral resources were prepared by LSG staff under the supervision of and reviewed by Al Mainville, P. Geo., Geology Manager of LSG, who is a Qualified Person as defined by NI 43-101.

There are no known environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the development of the mineral resources. Mineral resources that are not mineral reserves do not have demonstrated economic viability. The mineral resources reported here are in addition to mineral reserves.

This updated mineral resource estimate for the TWM includes mineralized zones from the Timmins Deposit, Thunder Creek Deposit, and the 144 Gap Deposit. The report updates the previous TWM mineral resources as publicly reported by LSG on March 9, 2017 and reported in the previous NI 43-101 Technical Report effective May 15, 2017. The estimate for the TWM is based on historical diamond drilling dating back to March 1984 and drilling completed by LSG between July 2003 and the date of databases being closed for the current estimate.

The mineral resource described in this report has a cut-off date for data input of April 19, 2021 for the Timmins, Thunder Creek and the 144 Gap Deposits. A total of 11,353 drill holes with intersections through the mineralized domain models were used for estimation of the three combined deposits at the TWM. This total is comprised of 4,384 drill holes for the Timmins Deposit, 3,010 drill holes for the Thunder Creek Deposit, and 3,959 drill holes for the 144 Gap Deposit. The diamond drill hole database has been subjected to verification and in the opinion of the QP is considered to be robust and of adequate quality for the estimation of the mineral resources.

The mineral resource has been depleted for mining up to the effective date of this Report – June 30, 2021. The mineral resource statement for TWM is summarized in Table 14.1.

Table 14.1: Timmins West Mine Mineral Resource Statement

In-Situ Resources Reported Above 1.5 g/t Gold Cut-Off Grade				
Deposit	**Classification**	**Tonnes (000's)**	**Gold Grade (g/t)**	**Gold Ounces**
Total Timmins West Mine	Measured	252	3.73	30,100
	Indicated	967	3.32	103,100
	Measured & Indicated	1,219	3.40	133,000
	Inferred	174	4.36	24,300

1. The effective date of the mineral resource estimate is June 30, 2021. The estimate is based on a block model that was estimated in May 2021 and depleted using mining volumes up to April 2021 and using month-end production for May and June 2021.

2. Mineral resource estimates have been classified according to CIM Definitions and Guidelines.

*3. Mineral resources are reported **exclusive** of mineral reserves. Note: previous technical reports reported mineral resources inclusive of mineral reserves.*

4. Mineral resources have been estimated using ID^2 grade interpolation method and gold grades which have been capped between 10 and 120 g/t based on statistical analysis of each zone.

5. Mineralization was modeled using a minimum mining width of 2 m for narrow vein zones.

6. Tonnage information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.

7. The mineral resources estimate was prepared under the supervision of, and verified by, Al Mainville, P. Geo., Geology Manager, LSG, who is a Qualified Person under NI 43-101.

The general procedure for completing the new mineral resource estimates included the following key steps with further explanation in the various subsections below.

- Database compilation and verification.

- Interpretation and modelling of mineralized zones.
- Analysis of drillhole assay data.
- Assay composting.
- Analysis of specific gravity.
- Block modelling.
- Removal of depleted and non-recoverable blocks.
- Resource classification.

14.2 Database Compilation and Verification

The database used for the current mineral resource estimate is a Gemcom GEMS (Microsoft SQL) database compiled from data received from WTM, Holmer and work completed by LSG since acquisition of the properties. The GEMS diamond drill hole database consists of the following major tables, header, survey, lithology, mineralization, and assay with pertinent fields summarized in Table 14.2. Additional tables, and fields within the above structure, are in use by LSG in logging of the drill core and final estimate. All drill hole data used in the estimate was verified using the Gems "validate" feature which checks for duplicate and overlapping intervals, missing intervals, negative length intervals and inconsistencies between tables.

Cross-sectional data, geological interpretation strings, section and level plan definitions, 3D geological solids, point area data of assays and composites, as well as the block model, are also stored within GEMS. Details on database validation are discussed in Item 12 of this report.

Table 14.2: Summary of Gems SQL Drill Hole Database Fields used in the Mineral Resource Estimate

Table Name	Table Description	Fields
Header	Drill hole collar location data in local grid co-ordinates	Hole-ID Location X Location Y Location Z Length Collar_Az Collar_ Dip
Survey	Down hole survey data of direction measurements at down hole distances	Hole-ID Distance Azimuth Dip
Assays	Sample interval assay data with gold units grams per tonne	Hole-ID From To Sample_NO Au_GPT_FIN Au_GPT_AA Au_GPT_GRA Au_GPT PM
Lithomaj	Major logged rock type intervals down hole	Hole-ID From To Rocktype
Mineralmaj	Major logged mineralization intervals down hole	Hole-ID From To Type %Mineral

14.3 Interpretation and Modelling of Mineralized Zones

Interpretation and modeling of mineralized zones was completed on vertical sections taking into account structure, lithology, alteration, veining and sulphide content. In addition to diamond drilling, underground development mapping and sampling were used as an aid but only diamond drill data was used for grade estimation.

Section spacing used for interpretations for the Timmins Deposit, excepting zones D_2, D_2A/B, D_2C, D_2D and S_4, is on 6.25m on north-south sections which is increased in few areas to 12.5m due to limited diamond drilling. Interpretations for zones D_2, D_2A/B, D_2C, D_2D and S_4, is completed on east-west sections with a 10m spacing. Sections are defined using the TWM grid.

Interpretation for the Thunder Creek Deposit is completed on 7.5m rotated (327 azimuth) sections with the exception of the UTC_1, UTC_2, UTC_3 and UTC_4 zones where section spacing was increased to 15m due to limited diamond drilling.

For the 144 Gap Deposit a section spacing of 5m oriented at an azimuth of 310 degrees (looking west) was used for interpretation. Zones were sub-divided into Porphyry and Mafic Volcanic hosted due to observed differences in grade and grade distribution as well as stope reconciliation results. The Mafic Volcanic hosted zones exist primarily as inclusions within the East and West Porphyries and were cut out of the enclosing porphyry bodies.

Both the Thunder Creek Deposit and the 144 Gap Deposit use the Thunder Creek mine grid.

Mineralized zones were modelled using a combination of geology and grade. Within a specific geological environment, drill intersections exceeding 2.0 g/t were used to define the mineralization envelope. Grades below this cut off were included as necessary to maintain continuity. Zones were required to have a minimum of three or more intersections that form a continuous band of mineralization and have a minimum width of between 2m and 10m. Narrower zones were modelled mainly in the upper part of the Timmins Deposit while wider mineralized zones occur predominantly in areas of the Lower Timmins Mine, Thunder Creek and 144 Gap Deposits. Closed 3D rings were constructed and assigned an appropriate rock type and stored with its section definition in the GEMS polyline workspace. Closed 3D rings were projected half the distance to the next section in areas were drilling closed off mineralization, or up to a maximum of 25m in areas with no drilling. 3D solids were created from the closed strings and were validated using the GEMS solid validation tools.

A total of 88 discreet mineralized zone ("domain") solids were created for the Timmins Deposit, 25 domain for the Thunder Creek Deposit and 38 for the 144 Gap Deposit. Only samples within a mineralized zone were used for estimation of that zone. Many of these domains exhibit similar geologic settings and characteristics. A summary of these mineralized domains is presented in Table 14.3 and Figure 14.1 illustrates a 3D view of the mineralized domains looking north-west.

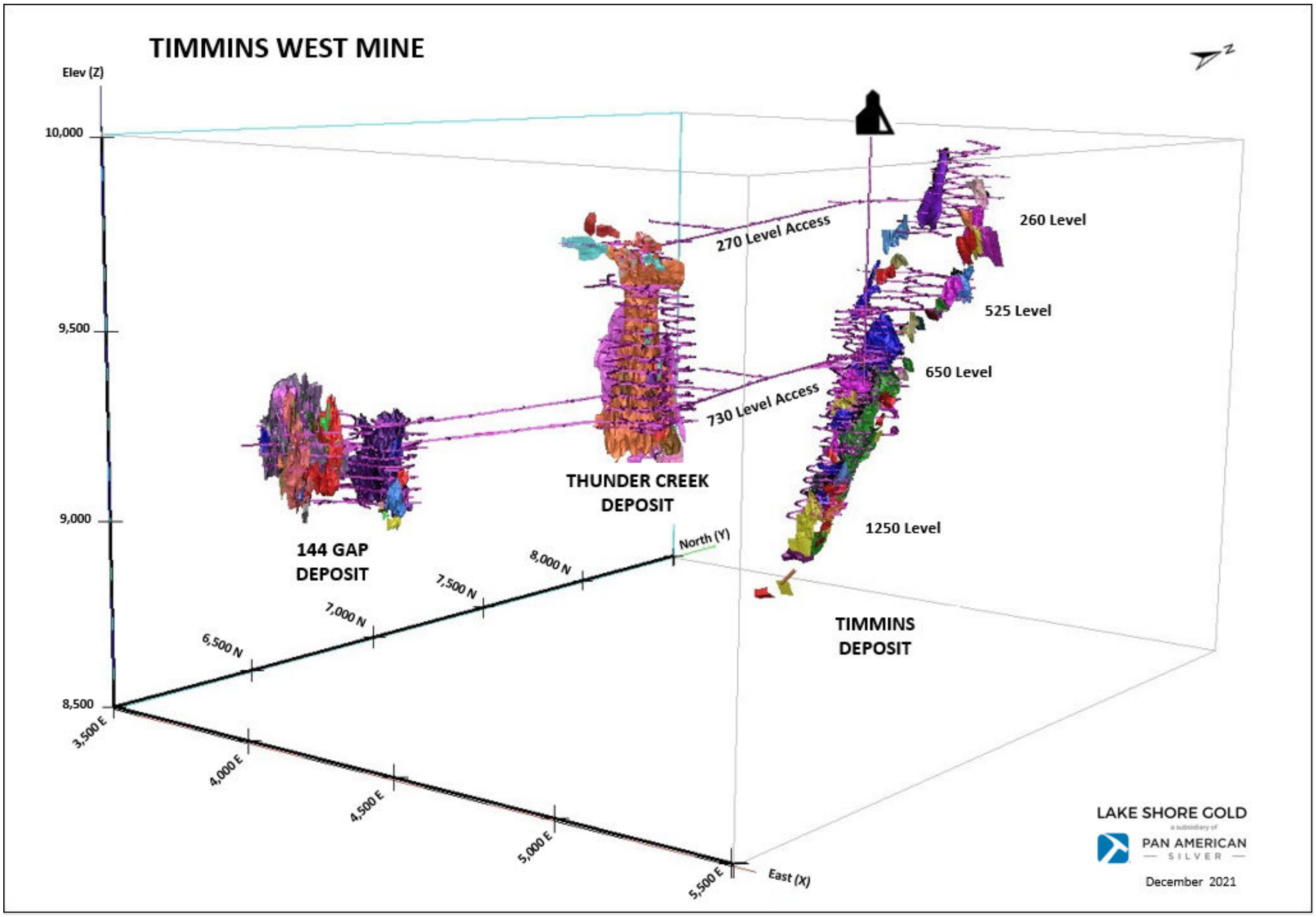
Table 14.3: Description of Mineralized Domains

Timmins Mine		
Resource Area	**No. of Domains**	**Description**
Vein Zones	8	Quartz-tourmaline veins and stockwork zones, 1 m to 5 m wide, associated with pyrite, arsenopyrite, and coarse visible gold. The veins are generally emplaced near the volcanic-to-sediment contact zones.
Main Zone	8	Similar to the quartz-tourmaline veins and stockwork zones, associated with pyrite, arsenopyrite, and coarse visible gold; predominantly sediment hosted
Footwall Zones Above 525	10	Sheared and mylonitized mafic volcanics rocks, associated with local quartz-albite veining, and pervasive silica, albite and pyrite alteration.
Footwall Zones Below 650	16	Sheared and mylonitized mafic volcanics rocks, associated with local quartz-albite veining, and pervasive silica, albite and pyrite alteration.
Ultramafic Zones	26	Quartz-tourmaline veining hosted by strongly altered (iron-carbonate, albite) pyroxenite, accompanied by up to 10-15% disseminated pyrite.
D Zones	17	Altered pyroxenite hosted comparable to Ultramafic zone.
S Zones	3	Highly altered and deformed pyroxenite; disseminated pyrite; mineralization wraps around sediment- ultramafic contact.

Thunder Creek		
Resource Area	**No. of Domains**	**Description**
Rusk Zones	8	Comprised of areas of either higher quartz-carbonate-pyrite vein density, and/or areas of elevated medium- to coarse-grained disseminated pyrite and associated pyrite-quartz veinlets adjacent to, and in the footwall of the pyroxenite unit.
Porphyry Zones	9	Quartz monzonite intrusion; mineralization is associated with sheeted sets of quartz extension veins (+ pyrite) which occur in abundance of up to several veins per metre within the intrusion.
Upper Thunder Creek Zones	8	A mix of fractured Rusk and Porphyry zones located in the upper portion of the Thunder Creek Deposit.

144 Gap Deposit		
Resource Area	**No. of Domains**	**Description**
East Porphyry Zones	14	Syenite intrusion with quartz-pyrite extension vein sets and disseminated pyrite mineralization.
West Porphyry Zones	19	Syenite intrusion with quartz-pyrite extension vein sets and disseminated pyrite mineralization.
Mafic Volcanic hosted	5	Mafic Volcanic inclusions within the Syenite intrusions. Quartz-pyrite extension vein sets and disseminated pyrite mineralization. Generally weaker than the Syenite hosted mineralization.

Figure 14.1: 3D View of Mineralized Domain Solids, Looking Northwest



14.4 Statistical Analysis

Grade Capping

LSG has utilized grade capping of diamond drill hole assay values in its estimation of the mineral resources for the Timmins, Thunder Creek and 144 Gap Deposits. Assay values were extracted from the drill hole database and flagged by zone according to the mineralized solid enclosing the drill hole assay. Individual statistical reports based on the raw gold assays were generated for each domain solid. Zones having a limited number of samples were grouped for evaluation with those displaying similar mineralization characteristics.

To determine appropriate capping limits, histograms, cumulative frequency plots and log probability plots were evaluated. All gold grades were capped prior to the creation of drill hole composites and no further capping was applied to the composites. The capped gold grades used to create composites for estimation are summarized in Table 14.4.

Table 14.4: Statistics for Capped vs. Uncapped Gold Grades

Timmins Deposit

Zone	Total # Samples	Maximum (g/t gold)	Mean (g/t gold)	Capping Value (g/t gold)	# Samples Capped	Capped Mean (g/t gold)
Vein Zones (V2 and V3E)	795	1,096.60	6.38	70	11	4.29
Vein Zones (all others)	1,641	376.00	5.75	50	15	4.35
Main Zone (MZ 1, 2, 5)	2,879	879.44	5.26	50	40	4.04
Main Zone (MZ 3, 4 and 6)	1,627	1,660.00	3.73	20	25	2.13
FW above 525 level	3,067	118.13	3.37	50	5	3.30
FW below 650 level (FW1 to 7)	10,075	359.00	4.12	70	19	3.98
FW below 650 level (FW8 to 14)	850	93.50	3.20	50	6	3.05
UM	12,058	5,010.00	7.33	90	78	6.39
UM minor zones (UM_3, 4, 14)	1,234	407.00	5.33	20	11	4.83
D Zone (D_1 to D9)	7,265	1,010.00	4.71	70	47	4.15
D Zone (D_2 sub zones D to H)	1,080	261.00	3.61	40	12	3.04
D Zone (D_10 and 11)	158	1,050.00	10.68	20	7	2.92
S Zone	2,423	724.00	4.56	70	18	3.75

Thunder Creek Deposit

Zone	Total # Samples	Maximum (g/t gold)	Mean (g/t gold)	Capping Value (g/t gold)	# Samples Capped	Capped Mean (g/t gold)
UTC (excluding UTC_5 and 6)	632	273.00	4.09	50	5	3.43
UTC (UTC_5 and 6)	111	56.20	4.59	10	14	3.40
Porphyry - Main Zone	34,634	1,600.00	3.12	120	66	2.85
Porphyry - Splay Zones (POR_1 to 6)	2,125	449.00	3.55	90	3	2.24
Porphyry - Splay Zones (POR_7 to 8)	412	157.00	3.09	10	23	1.94
RUSK	7,642	166.00	6.64	60	57	6.47
RUSK Upper	2,634	214.51	4.37	70	5	4.25

144 Gap Deposit

Zone	Total # Samples	Maximum (g/t gold)	Mean (g/t gold)	Capping Value (g/t gold)	# Samples Capped	Capped Mean (g/t gold)
E_POR (Main)	20,678	1,880.00	4.11	100	80	3.54
E_POR (E_POR_1 and 2)	809	196.00	4.72	30	26	4.12
E_POR (E_POR_3 to 5)	238	168.00	5.03	10	21	2.50
E_POR (E_POR_6)	136	304.00	6.25	30	3	3.58
E_POR (E_POR_7 to 9)	246	51.40	2.32	20	4	2.04
E_POR (E_POR_10 to 13)	151	79.30	3.82	30	3	3.20
W_POR (Main)	27,591	565.78	3.09	100	58	2.91
W_POR (W_POR_2)	166	87.90	6.47	40	5	5.53
W_POR (W_POR_3)	2,204	306.00	4.21	100	5	4.01
W_POR (W_POR_4)	134	20.70	2.46	10	4	2.33
W_POR (W_POR_5 and 6)	4,212	444.00	4.30	60	36	3.86
W_POR (W_POR_8 to 19)	918	95.10	3.39	10	63	2.36
W_POR (W_POR_20)	99	83.50	4.34	20	5	2.83
MV (Main)	5,637	308.00	1.62	100	9	1.54
MV (MV_WP_2)	41	31.50	3.75	10	5	2.68
MV (MV_WP_3)	123	32.70	1.93	15	2	1.66
MV (MV_WP_5)	296	93.50	2.59	20	7	1.84
MV (MV_WP_6)	627	205.00	1.86	30	4	1.49

Assay Compositing

Drillhole intersections were assigned a code using the modelled mineralization domain wireframes and composited into 1m intervals. Composites lengths of 1m were chosen based on the average sample intervals of the drill core. These were adjusted within each domain to ensure all intervals in a given drill hole are equal, while keeping as close to 1 metre as possible. Both capped and uncapped composite grades are stored in GEMS for use in estimation.

A total of 4,384 drillhole intersections (through the mineralized domain wireframes) from 2,865 unique holes were used in the Timmins Deposit to produce a total of 33,908 one metre composites.

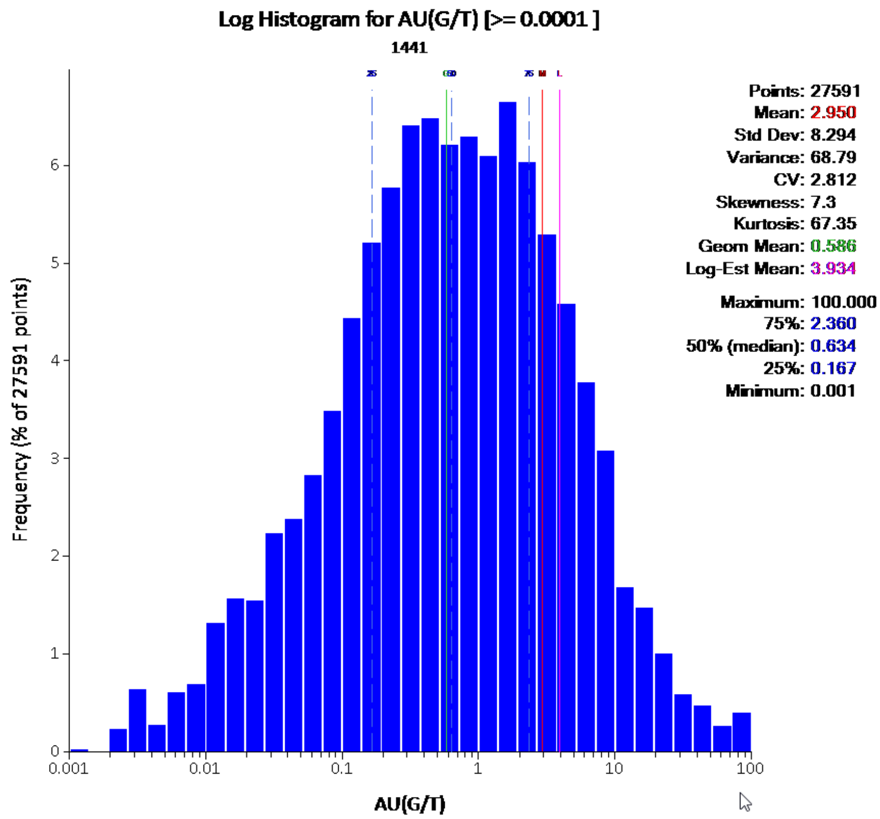
For the Thunder Creek Deposit a total of 3,010 drillhole intersections from 1,812 unique holes were used to generate 33,221 one metre composites.

For the 144 Gap Deposit a total of 3,959 drillhole intersections from 1,446 unique holes were used to generate 56,992 one metre composites.

The defined mineralized zones generally show single populations and are considered stationary domains for estimation

Figure 14.2 below shows a log histogram and basic statistics of the capped composited gold assays within the main W_POR domain of the 144 Gap Deposit. The basic statistics (e.g. high variance, standard deviation and kurtosis values) indicates a high variability in the gold assay data within this domain which is typical for most of the mineralized domains at TWM as well as most “nuggety” gold deposits in the Porcupine camp.

Figure 14.2: Log Histogram of Capped Assay Composites within the W_POR Mineralized Domain of the 144 Gap Deposit



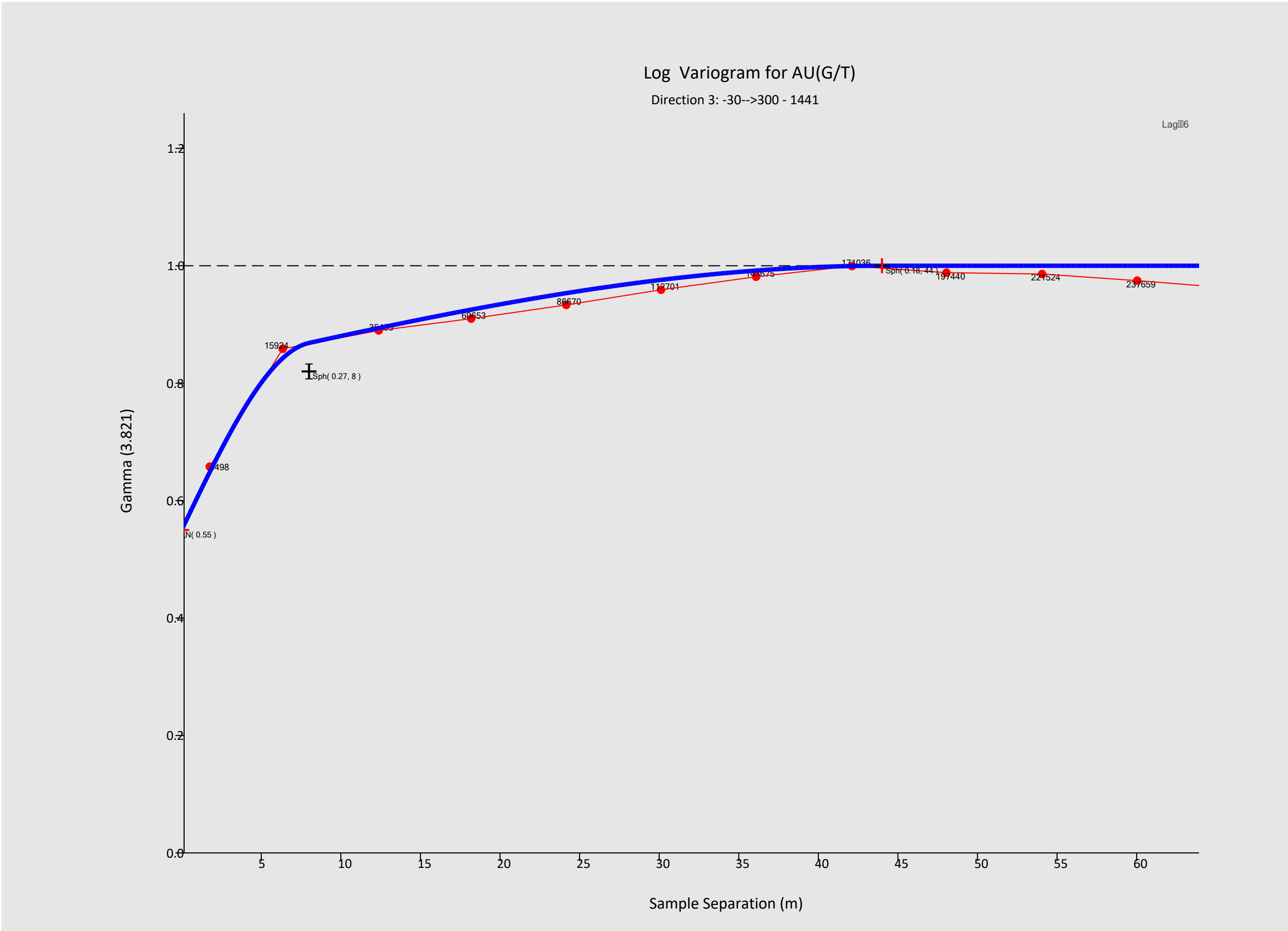
Variography

A number of variographic studies have been completed for zones at the TWM by LSG personnel as well as past studies completed by SGS Canada.

Results of these studies have consistently indicated a very high nugget effect, no strongly preferred direction for grade continuity and very short ranges which are typically less than ten metres.

An example of a variograms model is shown in Figure 14.3 below.

Figure 14.3: Log Variogram Model of Composited Assays within the W_POR Mineralized Domain of the 144 Gap Deposit



14.5 Specific Gravity

Specific gravity ("SG") was determined on 2,515 samples representative of different styles of mineralization from the Timmins, Thunder Creek and 144 Gap Deposits. SG measurements were completed at LSG's exploration office or TWM core shack using the conventional approach of weighing the samples dry and immersed in water.

Mineralized zones were assigned a SG based on the dominant mineralization style within the solid. Mineralized syenite bodies in some areas of the 144 Gap Deposit are inter-fingered with mafic inclusions. The SG for these were calculated based on the proportion of syenite (at a SG of 2.63) versus mafic inclusions (at a SG of 2.82).

Table 14.5 summarizes the specific gravity values that were used in the mineral resource estimate by deposit and zone.

Table 14.5: Specific Gravity by Zone

Deposit	Zone	Number of Samples	Final SG
Timmins	Footwall	256	2.81
	Veins	42	2.81
	Ultramafic	303	2.92
	Sediments	73	2.81
Thunder Creek	Rusk	434	2.92
	Porphyry	501	2.66
144 Gap Deposit	Syenite	501	2.63
	Mafic Volcanics	405	2.82
	Mineralized Syenite[1]		2.68

SG selected based on proportion of Syenite and minor Mafic Volcanic within Zones. Strong inter-fingering.

14.6 Block Model Mineral Resource Modeling

Block Model Parameters

Individual models were completed for the Timmins Deposit, the Thunder Creek Deposit, and the 144 Gap Deposit. A summary of the model grid parameters are shown in Table 14.6.

Table 14.6: Block Model Grid Parameters

Timmins Deposit			
Orientation	Origin	Number of blocks	Block Dimension
X	4010 E	545	2.0m
Y	7750 N	280	2.0m
Z (el)	10020 el	825	2.0m

Orientation: No rotation; Z = elevation (el)

Thunder Creek Deposit			
Orientation	Origin	Number of blocks	Block Dimension
X	4400 E	200	2.0m
Y	6725 N	220	2.0m
Z (el)	9880 el	450	2.0m

Orientation: rotate 33° counter-clockwise from East

144 Gap Deposit			
Orientation	Origin	Number of blocks	Block Dimension
X	3700 E	550	2.0m
Y	5690 N	300	2.0m
Z (el)	9600 el	400	2.0m
Orientation: rotate 50° counter-clockwise from East			

Grade Interpolation

Block grades within the Timmins, Thunder Creek and 144 Gap block models were interpolated using ID^2 with anisotropic weighting for grade determination. This method interpolates the grade of a block from several composites within a defined distance from the block. The estimation uses the inverse of the distance between a composite and the block as the weighting factor to determine the average grade

Block models were interpolated through four estimation runs and, in all cases, the grade estimation was completed only using composites from within each individual zone.

The general geometry of zones, alteration and mineralization observed in drill core and underground mapping was used in conjunction with variograms of each mineralized zone (where a preferred orientation was apparent) to establish the search ellipse orientation and ranges. Given the lack of preferred orientation and short ranges observed in variograms the search axis in most cases was oriented along the long axis and dip direction of the mineralized domain.

Search distances for the first estimation run varied slightly but were typically 15 m by 15 m by 8 m for the Timmins and Thunder Creek Deposits, and 15 m by 7.5 m by 15 m in the 144 Gap area. The second, third and fourth estimation runs were carried out using search ranges that were generally 2x, 4x and 6x the search used in the first run respectively. Grade was estimated using a minimum of 6 and maximum of 12 composites for Timmins Deposit estimation runs 1-3, a minimum of 4 and maximum of 12 composites for Timmins Deposit estimation run 4 and a minimum of 9 and maximum of 15 composites for Thunder Creek and 144 Gap (for all estimation runs). The number of composites per drill hole was set such that a minimum of three drill holes were required to estimate a block for runs 1 - 3. For estimation run 4 this was reduced to a minimum of two drill holes for the Timmins Deposit only. It should be noted that estimation run 4 was completed in order to ensure all blocks were estimated within a particular zone. The number of blocks estimated in Run 4 is minimal and represents less than 0.5 % of blocks for the Timmins and 144 Gap Deposits. The Thunder Creek Deposit was fully estimated using only 3 estimation runs.

Search ellipse parameters for the Timmins, Thunder Creek, and 144 Gap Deposits are summarized in Table 14.7, Table 14.8, and Table 14.9. For brevity, zones that were estimated using identical searches are grouped together.

Table 14.7: Timmins Deposit Search Ellipse Parameters

SEARCH ELLIPSE PARAMETERS										
Zone		Search Ellipse Orientation			Search Ellipse Range			Number of Samples		
(Ellipse)	Pass	Z	x	z	x	y	z	min	max	nax / hole
Main Zone (Pass_70)	1	5	-70	-65	15	15	8	6	12	2
	2	5	-70	-65	30	30	15	6	12	2
	3	5	-70	-65	60	60	45	6	12	2
	4	5	-70	-65	90	90	60	4	12	2
Vein Zone (Pass_60)	1	5	-60	-65	15	15	8	6	12	2
	2	5	-60	-65	30	30	20	6	12	2
	3	5	-60	-65	60	60	45	6	12	2
	4	5	-60	-65	90	90	60	4	12	2
FW above 525 (Pass)	1	5	-48	-65	15	15	8	6	12	2
	2	5	-48	-65	30	30	20	6	12	2
	3	5	-48	-65	60	60	45	6	12	2
	4	5	-48	-65	90	90	60	4	12	2
UM Zones (UM)	1	15	-75	-65	15	15	10	6	12	2
	2	15	-75	-65	30	30	20	6	12	2
	3	15	-75	-65	60	60	45	6	12	2
	4	15	-75	-65	90	90	60	4	12	2
FW Zone (FW)	1	10	-35	55	15	15	10	6	12	2
	2	10	-35	55	30	30	60	6	12	2
	3	10	-35	55	60	60	45	6	12	2
	4	10	-35	55	90	90	60	4	12	2
UM4 Zone and S Zone (UM4)	1	0	0	0	12	12	12	6	12	2
	2	0	0	0	24	24	24	6	12	2
	3	0	0	0	48	48	48	6	12	2
	4	0	0	0	72	72	72	4	12	2
D Zone (D)	1	10	-65	35	15	15	10	6	12	2
	2	10	-65	55	30	30	20	6	12	2
	3	10	-65	55	60	60	30	6	12	2
	4	10	-65	55	90	90	60	4	12	2
D2 Zone (D2_18)	1	80	-53	30	15	15	10	6	12	2
	2	80	-53	30	30	30	20	6	12	2
	3	80	-53	30	60	60	40	6	12	2
	4	80	-53	30	90	90	60	4	12	2

Table 14.8: Thunder Creek Deposit Search Ellipse Parameters

Zone		Search Ellipse Orientation			Search Ellipse Range			Number of Samples		
Ellipse	Pass	z	x	z	x	y	z	min	max	Max/hole
UTC (PZB)	1	40	-61	0	15	15	8	9	15	3
	2	40	-61	0	30	30	20	9	15	3
	3	40	-61	0	60	60	45	9	15	3
Porphyry (SPH)	1	0	0	0	15	15	15	9	15	3
	2	0	0	0	30	30	30	9	15	3
	3	0	0	0	60	60	60	9	15	3
Rusk (PZB)	1	40	-61	0	15	15	8	9	15	3
	2	40	-61	0	30	30	20	9	15	3
	3	40	-61	0	60	60	45	9	15	3
	4	40	-61	0	90	90	70	9	15	3

Table 14.9: 144 GAP Deposit Search Ellipse Parameters

Zone		Search Ellipse Orientation			Search Ellipse Range			Number of Samples		
Ellipse	Pass	z	x	z	x	y	z	min	max	Max/hole
East Porphyry (HWY_SGS)	1	-15	15	0	15	7.5	15	9	15	3
	2	-15	15	0	30	15	30	9	15	3
	3	-15	15	0	60	30	60	9	15	3
	4	-15	15	0	90	45	90	9	15	3
West Porphyry and Mafic Zones (HWW_LSG)	1	-5	25	0	15	7.5	15	9	15	3
	2	-5	25	0	30	15	30	9	15	3
	3	-5	25	0	60	30	60	9	15	3
	4	-5	25	0	90	45	90	9	15	3

14.7 Block Model Validation

Several steps were taken in order to review and validate the current block model and reported results. This included:

- comparison of solid model and block model volumes,
- comparison of the block model against diamond drill results, and
- review of recent reconciliation data.

Volumes of the individual solids were compared to volumes of from the block model for the same domain to ensure proper coding of the model. No significant variances were encountered.

Plans and sections through the block model and mineralized zones were checked to compare block grades and grade distribution to the drill hole data and ensure overall grade trends and patterns were reproduced. Results of the review indicate a complex pattern for block grades which is consistent with observations from drilling and mapping.

An example of plan views and sections showing block grade distribution and the original diamond drill data for the 144 Gap Deposit is shown in Figure 14.4 and Figure 14.5.

Figure 14.4: 144 GAP Deposit Schematic Plan View at 820L – Block Model and Diamond Drill Holes

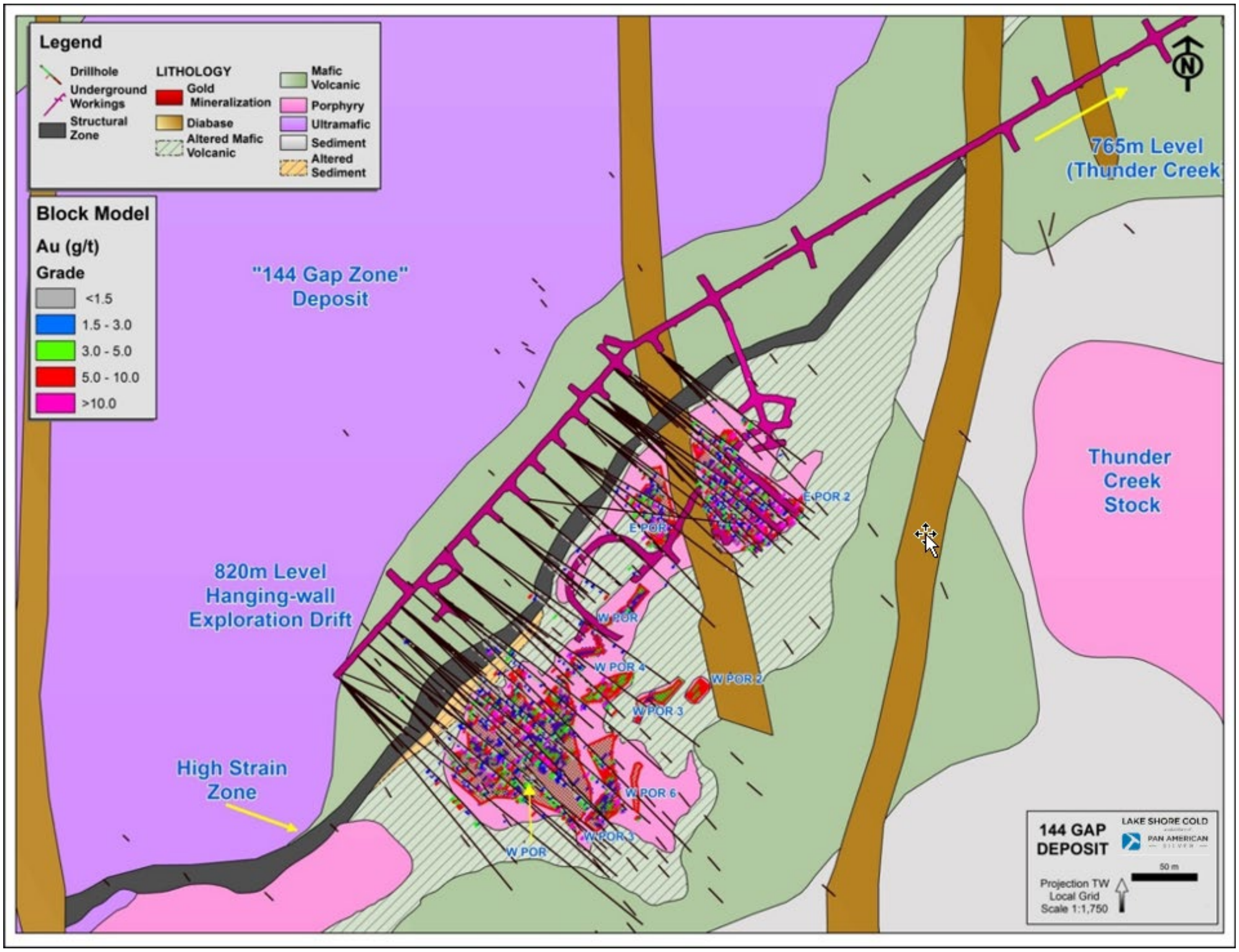
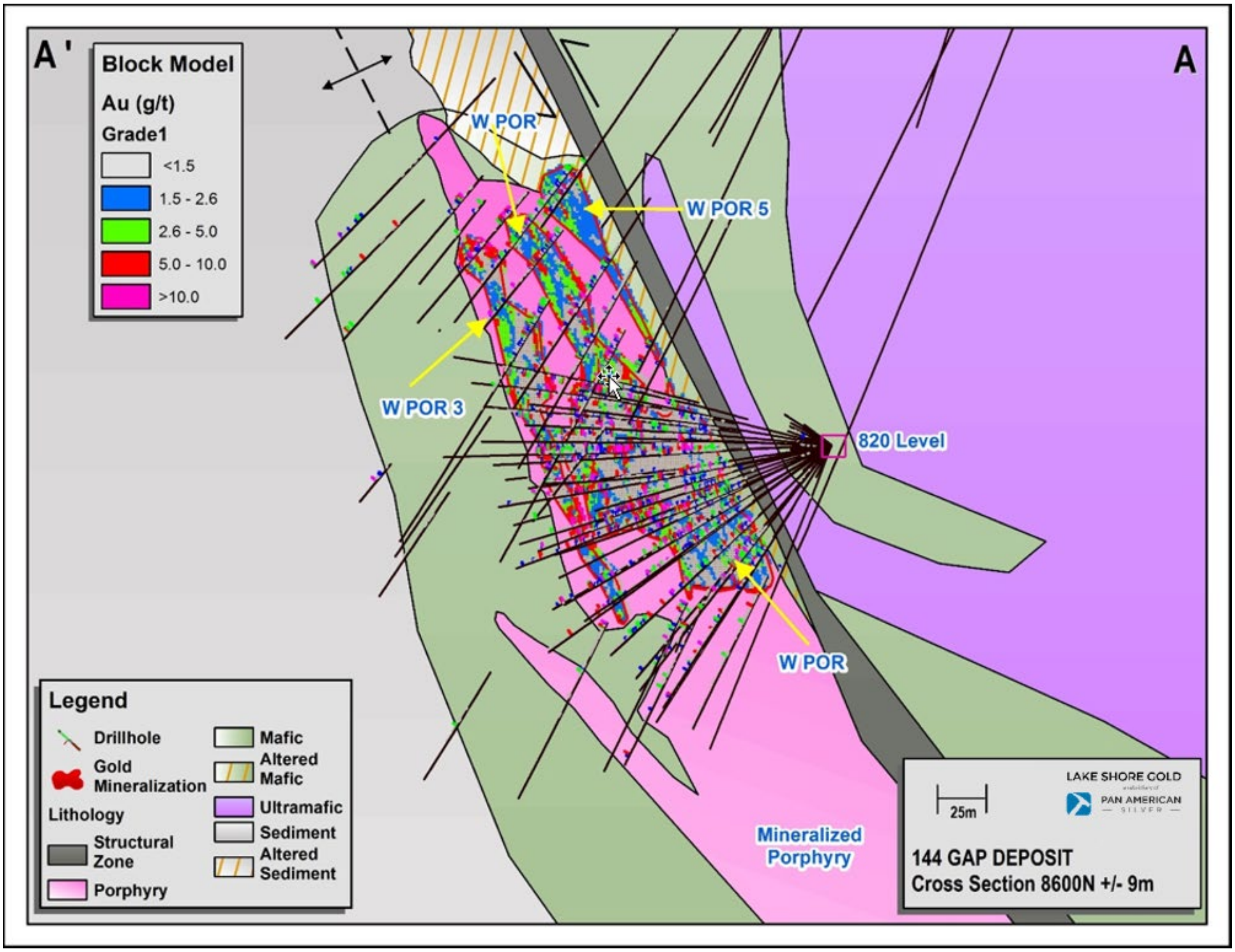


Figure 14.5: 144 GAP Deposit – Schematic Section 8600 Looking Southwest – Block Model and Diamond Drill Holes



Further validation of the block model estimate was carried out by comparing the block model grade to the reconciled mill production. Comparison is carried out for each stope upon completion. Tonnage and grade from the block model based upon a cavity monitoring survey ("CMS") of the final mined out void is compared to the mill production. While significant differences for individual stopes are observed, there is a reasonable overall comparison to mill reconciled figures with no consistent under- or overestimation. The presence of large differences on a stope scale is not unexpected and likely the result of several factors working together including: complex zone geometries, sampling difficulties due to coarse gold and high variability for gold assays, uncertainties with tracking and assigning tonnage accurately back to individual stopes due to blending and milling ore from four sources in a common mill, uncertainties regarding final stope shapes and quantities of rock extracted and uncertainties for mill grade and losses of gold to mill inventory during certain months. Efforts to address the above factors are being examined on an ongoing basis.

14.8 Removal of Mined and Non-Recoverable Resource Blocks

Mineral resources at the TWM are reported after the removal of all underground development and mining from the block model as well as the removal of all non-mineable material including low grade and non-recoverable pillars.

The removal of mined out blocks and development was completed by flagging blocks within mining shapes provided by the engineering department and setting the density and grade of these blocks to zero. A similar process was completed for non-mineable blocks where only the grade of these blocks was set to zero. The removal of non-mineable blocks is affected by economic considerations as determined by the engineering and geology group and can be reviewed should economic conditions improve.

14.9 Mineral Resources Classification

Mineral resources were classified based primarily on estimation run. Those areas deemed to form a continuous area estimated primarily in Pass 1 and 2 (15m to 30m search) were clipped out of the mineralized domain wireframes to create a solid for flagging confidence classification. These blocks were re-classified in the block model as having either a measured or indicated confidence, while the remaining blocks within the domain were assigned an inferred confidence.

14.10 Mineral Resources

Mineral resources were reported above an economic cut-off grade of 1.5 g/t gold for the Timmins Deposit, the Thunder Creek Deposit, and the 144 Gap Deposit. The mineral resources have been depleted for mining up to the effective date of this Report – June 30, 2021.

At the Timmins Deposit mineral resources are located between 4010E and 5100E (TM mine grid), a horizontal distance of 975m. Vertically, the zones have been defined from the 9,900m elevation (115m below surface) to 8,490m elevation (1,525m below surface).

At the Thunder Creek Deposit mineral resources are oriented 33° counter-clockwise from East and are located between 4400E and 5200E, a horizontal distance of 322.5m. Vertically, the zones have been defined from 9,825m elevation (190m below surface) to 9,045m elevation (970m below surface).

The 144 Gap Deposit mineral resources are oriented 50° counter-clockwise from East and are located southwest of the Timmins and Thunder Creek Deposits between 3700E and 4800E, a horizontal distance of 425m. Vertically the zones extend from the 9,400m elevation to the 8,960m elevation (600m to 1,040m below surface).

The estimated TWM mineral resource totals 0.25 million tonnes at 3.73 g/t gold, amounting to 30,100 ounces of gold in the measured category, 0.97 million tonnes at 3.32 g/t gold, amounting to 103,100 ounces of gold in the indicated category and 0.17 million tonnes at 4.36 g/t gold amounting to 24,300 ounces of gold in the inferred category.

Subdivision of the mineral resource by deposit is tabulated in Table 14.10.

Table 14.10: Timmins West Mine Mineral Resources Statements

In-Situ Mineral Resources Above 1.5 g/t Gold Cut-Off Grade				
Deposit	**Classification**	**Tonnes (000's)**	**Gold Grade (g/t)**	**Gold Ounces**
Timmins	Indicated	551	3.46	61,200
	Inferred	122	4.92	19,300
Thunder Creek	Indicated	13	4.08	1,700
	Inferred	21	3.21	2,100
144 Gap	Measured	252	3.73	30,100
	Indicated	403	3.10	40,200
	Measured & Indicated	655	3.34	70,300
	Inferred	31	2.93	3,000
Total Timmins West Mine	Measured	251	3.73	30,100
	Indicated	967	3.32	103,100
	Measured & Indicated	1,219	3.40	133,200
	Inferred	174	4.36	24,300

1. The effective date of the mineral resource estimate is June 30, 2021 and was calculated using a block model that was estimated in May 2021 and depleted using mined volumes up to April 2021 and month-end production for May and June 2021.

2. Mineral resource estimates have been classified according to CIM Definitions and Guidelines.

*3. Mineral resources are reported **exclusive** of mineral reserves. Note: previous technical reports stated Mineral resources inclusive of mineral reserves.*

4. Mineral resources have been estimated using an ID^2 grade interpolation method and gold grades which have been capped between 10 and 120 g/t based on statistical analysis of each zone.

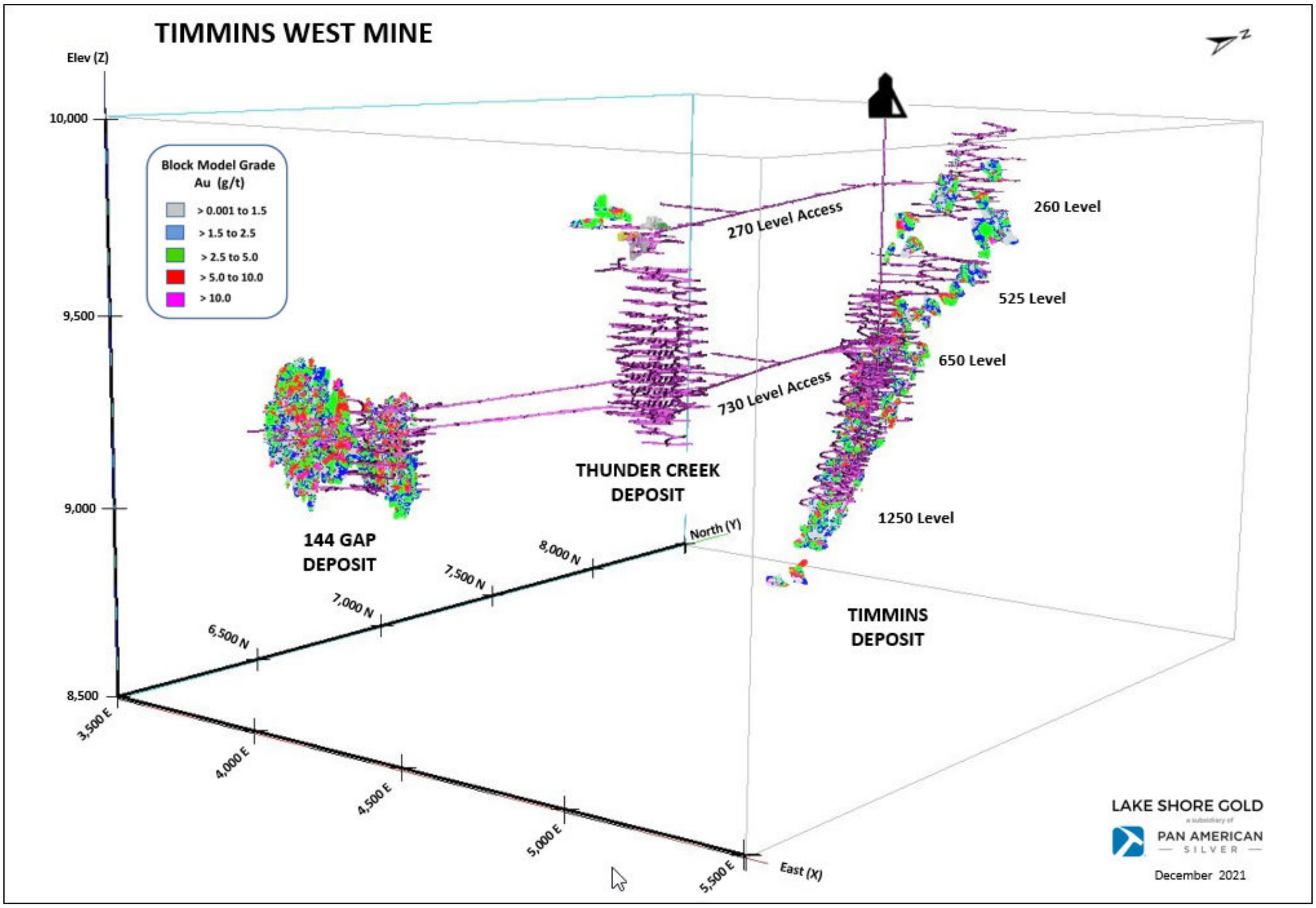
5. A minimum mining width of 2m was used to define the narrow mineralized zones.

6. Tonnage information was rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.

7. The mineral resource estimate was prepared under the supervision of, and verified by, Al Mainville, P. Geo., Geology Manager, LSG, who is a Qualified Person under NI 43-101.

A schematic 3D view of the individual block models showing the distribution of grade relative to the underground workings is presented in Figure 14.6.

Figure 14.6: Schematic 3D View of Block Models Looking Northwest



14.11 Reconciliation to Previous Mineral Resource Estimate

When comparing to the last mineral resource update on June 30, 2020, this new mineral resource estimate shows an overall increase in mineral reserves of 59,760 ounces and a decrease in mineral resources of 220,234 ounces in all mineral resource categories. Mineral resource decreases are:

- a decrease in the measured category of 14,400 ounces;
- a decrease of 169,500 ounces in the indicated category; and
- a decrease of 36,300 ounces in the inferred category.

This overall decrease in mineral resource ounces is mainly due to

- the conversion of mineral resources to mineral reserves as demonstrated by the replacement and overall increase in proven and probable mineral reserves of 59,800 ounces between the 2020 midyear and 2021 midyear models; and
- depletion of 77,400 ounces from mining.

The Timmins Deposit indicated mineral resources decreased by 40,500 ounces due to the conversion to mineral reserves and due to depletion from mining production. Inferred mineral resources decreased by 15,100 ounces mainly due to conversion to the indicated category.

The Thunder Creek indicated mineral resources decreased by 4,500 ounces mainly due to the removal of blocks that were deemed unmineable and partially due to mining. Inferred mineral resources were unchanged.

The 144 Gap Deposit measured mineral resources increased by 6,500 ounces due to the conversion of indicated material when conducting close spaced infill drilling, while indicated mineral resources decreased by 19,700 ounces due to the conversion to the measured category and due to depletion from mining. The inferred mineral resources decreased by 2,200 ounces.

Comparison of mineral resources at the TWM as reported for midyear 2021 and midyear 2020 is summarized in Table 14.11.

Table 14.11: Comparison of 2020 Midyear and 2021 Midyear Mineral Resource Estimates (exclusive of Mineral Reserves) and Mineral Reserves

Mineral Resource Above 1.5 g/t Gold Cut-Off Grade	2020 MID-YEAR RESOURCES			2021 MID-YEAR RESOURCES			Variance (oz.)	Variance %
	Tonnes (000's)	Gold Grade (g/t)	Gold Ounces	Tonnes (000's)	Gold Grade (g/t)	Gold Ounces		
Timmins Deposit								
Indicated	872	3.63	101,700	551	3.46	61,200	-40,500	-40%
Inferred	242	4.42	34,300	122	4.92	19,300	-15,100	-44%
Thunder Creek								
Indicated	45	4.27	6,200	13	4.08	1,700	-4,500	-73%
Inferred	21	3.21	2,100	21	3.21	2,100	0	0%
Highway 144								
Measured	222	3.31	23,700	252	3.73	30,100	6,500	27%
Indicated	557	3.34	59,800	403	3.10	40,200	-19,700	-33%
Inferred	45	3.6	5,200	31	2.93	3,000	-2,200	-43%

Total TWM								
Measured	**364**	**3.81**	**44,600**	**252**	**3.73**	**30,100**	**-14,400**	**-32%**
Indicated	**2,437**	**3.48**	**272,600**	**967**	**3.32**	**103,100**	**-169,500**	**-62%**
Inferred	**490**	**3.85**	**60,600**	**174**	**4.36**	**24,300**	**-36,300**	**-60%**

Mineral Reserve Above 1.5 g/t Gold Cut-Off Grade	**2020 MID-YEAR RESERVES**			**2021 MID-YEAR RESERVES**			**Variance (oz.)**	**Variance %**
	Tonnes (000's)	**Gold Grade (g/t)**	**Gold Ounces**	**Tonnes (000's)**	**Gold Grade (g/t)**	**Gold Ounces**		
Timmins Deposit								
Probable	574	3.04	56,100	806	2.90	75,200	19,000	34%
Thunder Creek								
Probable	30	2.74	2,600	22	2.69	1,900	-700	-28%
Highway 144								
Proven	730	2.71	63,600	1,518	3.03	148,000	84,400	133%
Probable	3,781	2.96	359,300	3,345	2.94	316,400	-42,900	-12%
Subtotal	4,510	2.92	422,900	4,862	2.97	464,300	41,400	9%
Total TWM								
Proven	730	2.71	63,600	1,518	3.03	148,000	84,400	133%
Probable	4,384	2.97	418,000	4,172	2.94	393,400	-24,600	-6%
Total	5,114	2.93	481,600	5,690	2.96	541,300	59,800	12%
	Changes Due to Mining Depletion			**Changes due to Design/Resource**				
	Tonnes (000's)	**Gold Grade (g/t)**	**Gold Ounces**	**Tonnes (000's)**	**Gold Grade (g/t)**	**Gold Ounces**		

Timmins Deposit	-199	2.61	-16,600	431	2.58	35,700		
Thunder Creek	-16	1.58	-800	8	0.28	100		
Highway 144	-726	2.57	-60,000	1,079	2.92	101,300		
Total	-941	2.56	-77,400	1,517	2.81	137,100		

14.12 Additional Drill Hole Information

Subsequent to the closing of the Timmins, Thunder Creek and 144 Gap Deposits databases on April 19, 2021 there has been a total of 1,363m of operating drilling, 16,177m of capital drilling and 680m of exploration drilling up to October 31, 2021.

Considering that much of the new drilling consists of close spaced holes to infill mineral resource blocks there is potential for some slight changes in size, shape and grade of these blocks, but the net effect of this on the global mineral resource is not deemed to be significant.

15 Mineral Reserve Estimates

15.1 Summary

The mineral reserves estimated for the TWM have been based on the updated mineral resources estimated for the Timmins, Thunder Creek, and 144 Gap Deposits. The mineral reserves for the TWM incorporate that portion of the measured and indicated mineral resources within an updated LOM plan that are economically feasible, with dilution and mine losses applied. The mineral reserve estimate is based on material provided as feed to the Bell Creek Mill. Mineral reserves for the TWM are summarized in Table 15.1.

Table 15.1: Timmins West Mine Mineral Reserve Estimate

Deposit	Classification	Tonnes (000's)	Gold Grade (g/t)	Gold Ounces
Timmins	Probable	806	2.90	75,100
Thunder Creek	Probable	22	2.69	1,900
144 Gap	Proven	1,518	3.03	148,000
	Probable	3,345	2.94	316,400
	Proven & Probable	*4,862*	*2.97*	*464,300*

Total Timmins West Mine	Proven	1,518	3.03	148,000
	Probable	4,172	2.94	393,400
	Proven & Probable	*5,690*	*2.96*	*541,300*

1. *The effective date of this mineral reserve estimate is June 30, 2021. Mineral reserves as at June 30, 2021 were calculated using a block model that was estimated in May 2021 and subtracted for mine depletion from month-end production for May and June 2021.*
2. *The mineral reserve estimates are classified in accordance with the Canadian Institute of Mining Metallurgy and Petroleum's "CIM Standards on Mineral Resources and Reserves, Definition and Guidelines" as per Canadian Securities Administrator's National Instrument 43-101 requirements.*
3. *Mineral reserves are based on a long-term gold price of US$1,450 per ounce and an exchange rate of 1.3 $CAD/$US.*
4. *Mineral reserves are supported by a mine plan that features variable stope thicknesses, depending on zone, and expected cost levels, depending on the mining methods utilized.*
5. *Mineral reserves incorporate a minimum cut-off grade of 2.0 grams per tonne at 144 and Thunder Creek and 2.2 grams per tonne at Timmins Mine. The cut-off grade includes estimated mining and site G&A costs of US$62.27 per tonne for 144/Thunder Creek and US$71.58 per tonne for Timmins Mine, milling costs of US$19.09 per tonne, trucking costs of US$6.80 per tonne for both deposits, mining recovery of 95%, external dilution of 22% at Timmins deposit, 15% at Thunder Creek deposit and 9% at HWY144 deposit, and a metallurgical recovery rate of 97.0%.*
6. *Tonnes information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.*
7. *The mineral reserves were prepared under the supervision of, and verified by, Eric Lachapelle, Manager of Technical Services, LSG, who is a qualified person under NI 43-101.*

The mine design was updated to reflect the most likely life of mine production scenario. The mine design includes all sustaining development and construction required to access the measured and indicated mineral resources that meet the definition of mineral reserves, and extracting the mineral reserves using the longhole mining techniques in place at the TWM.

Mineral reserve estimates are based on a number of assumptions, however there are no known environmental, metallurgical, permitting, legal, title, infrastructure, or other relevant factors that could materially affect the estimate of mineral reserves as at June 30, 2021.

15.2 Cut-Off Grade

To develop the LOM plan and estimate the mineral reserves for the TWM, a cut-off grade ("COG") was estimated using actual operating costs and mill recoveries based on LSG's operating experience. The assumptions for the COG calculation are summarized in Table 15.2.

Table 15.2: Timmins West Mine Cut-Off Grade Assumptions

Item	Value
Mine Operating and Site General Costs (Timmins Mine)	$US 71.58 / tonne
Mine Operating and Site General Costs (144 Gap/Thunder Creek Mine)	$US 62.27 / tonne

Item	Value
Ore Surface Transport to Bell Creek mill	$US 6.80 / tonne
Mill Operating Cost	$US 19.09 / tonne
Total Operating Cost (Timmins Mine)	$US 97.47 / tonne
Total Operating Cost (144 Gap/Thunder Creek Mine)	$US 88.16 / tonne
Mill Recovery	97%
Gold Price ($US)	$1,450 / ounce
Exchange Rate ($CAD/$US)	1.3
Cut-Off Grade (Timmins Mine)	**2.2 g/t**
Cut-Off Grade (144 Gap/Thunder Creek Mine)	**2.0 g/t**

In addition to considering the estimated COG, mine planning personnel have considered the overall economics in localized areas when evaluating sublevels and stoping blocks.

15.3 Timmins Deposit Mineral Reserve Estimate

Based on the indicated mineral resource for the Timmins Deposit, the following methodology was used to estimate the mineral reserves. The reference point for the mineral reserves is delivery to the mill.

The block model was reviewed in plan and in section to identify potential mining areas with concentrations of indicated mineral resources above the COG and to determine appropriate mining methods. Sublevels were designed at 20m vertical intervals apart from 1250L-1310L where vertical intervals are at 30m, and vertical sections were cut through the model at appropriate intervals along strike (depending on the complexity of the mineralization). Mining shapes were designed on each section and joined with shapes on adjacent sections to generate wireframes.

The mineral resources contained within the wireframes was retrieved from block model data and includes:

- Higher grade material grading above 2.2 g/t.
- Low grade material grading below 2.0 g/t (planned internal dilution).
- Waste rock grading 0.0 g/t (planned internal dilution).

Stope reconciliation data has been used to estimate unplanned dilution and mining recovery factors. Based on this analysis, 22% unplanned dilution (grading 0.0 g/t) and 95% mining recovery has been used to estimate the mineral reserves.

The in-situ tonnes and grade contained within the wireframes were extracted from the block model mineral resource data, and unplanned dilution and mining recovery factors have been applied to estimate the probable mineral reserves.

Some sublevels have an overall grade that is near the COG. In general, these sublevels already have capital development and infrastructure in place, and in some cases the operating development has also been completed.

A mine design, development schedule, and production profile and has been completed to estimate the capital and operating costs required to access, develop, and extract the Timmins Deposit mineral reserves.

15.4 Thunder Creek Deposit Mineral Reserve Estimate

Based on the mineral resources included in the Thunder Creek block model, the following methodology was used to estimate the mineral reserves. The reference point for the mineral reserves is delivery to the mill.

The block model was reviewed in plan and in section to identify concentrations of mineral resources material above the COG and to confirm the suitability of the longhole mining method. Sublevels were established at 35m vertical intervals and mining shapes were designed at appropriate intervals along strike for each sublevel. The mining shapes on each section were joined with shapes on adjacent sections to generate stope wireframes.

Unplanned dilution parameters have been developed and applied to each individual stope based on geometry and size.

Stope reconciliation data at Thunder Creek was used to estimate unplanned dilution and mining recovery factors. Based on this analysis, 15% unplanned dilution (grading 0.0 g/t) and 95% mining recovery has been used to estimate the probable mineral reserves.

The in-situ tonnes and grade contained within the stope wireframes were extracted from the block model mineral resource data and unplanned dilution and mining recovery factors have been applied to estimate the mineral reserves.

A mine design, development schedule, and production profile has been completed to estimate the capital and operating costs required to access, develop, and extract the Thunder Creek mineral reserves.

15.5 144 Gap Deposit Mineral Reserve Estimate

Based on the in-situ mineral resources included in the 144 Gap block model, the following methodology was used to estimate the mineral reserves. The reference point for the mineral reserves is delivery to the mill.

The block model was reviewed in plan and in section to confirm the suitability of the longhole mining method. Sublevels were established at 35m vertical intervals. Dilution and recovery factors were applied to the mining shape in-situ mineral resource to estimate the potential tonnes and ounces for each sublevel interval. In addition, the capital development and infrastructure and operating development were estimated for each sublevel. An economic evaluation was completed for each COG scenario using site experience cost data. The evaluation results confirmed a 2.0 g/t COG as the basis for estimating the mineral reserves.

The mining shapes were further reviewed and refined to ensure consistency with existing mine design experience gained from mining at Thunder Creek. A full 3D mine model of all stopes and development was generated for mining the 144 Gap Deposit.

Stope reconciliation data from mining experience at Thunder Creek was used to estimate the mining recovery factor for 144 Gap. Based on this experience, 95% mining recovery was used to estimate the mineral reserves. Unplanned dilution parameters developed from geomechanical studies and applied to each stope based on geometry and size, combined with stope reconciliation data at 144 Gap, was used to estimate unplanned dilution and mining recovery factors. Based on this analysis, 9% unplanned dilution (grading 0.0 g/t) has been applied to estimate mineral reserves.

The in-situ tonnes and grade contained within the stope wireframes were extracted from the block model mineral resource data and unplanned dilution and mining recovery factors were applied to estimate the mineral reserves.

A mine design, development schedule, and production profile has been completed to estimate the capital and operating costs required to access, develop, and extract the 144 Gap mineral reserves.

15.6 Timmins West Mine Mineral Reserves

The combined TWM mineral reserves are summarized in Table 15.3. The reference point for the proven and probable mineral reserves is delivery to the mill.

Table 15.3: Timmins West Mine Combined Proven and Probable Mineral Reserves

Deposit	Classification	Tonnes ('000)	Gold Grade (g/t)	Gold Ounces
Timmins	Probable	806	2.90	75,100
Thunder Creek	Probable	22	2.69	1,900
144 Gap	Proven	1,518	3.03	148,00
	Probable	3,345	2.94	316,400
	Proven & Probable	*4,862*	*2.97*	*464,300*
Total Timmins West Mine	Proven	1,518	3.03	148,000
	Probable	4,172	2.94	393,400
	Proven & Probable	*5,690*	*2.96*	*541,300*

1. *The effective date of this mineral reserve estimate is June 30, 2021. Mineral reserves as at June 30, 2021 were calculated using a block model that was estimated in May 2021 and subtracted for mine depletion from month-end production for May and June 2021.*
2. *The mineral reserve estimates are classified in accordance with CIM Definitions and Guidelines as per Canadian Securities Administrator's National Instrument 43-101 requirements.*
3. *Mineral reserves are based on a long-term gold price of US$1,450 per ounce and an exchange rate of 1.3 $CAD/$US.*
4. *Mineral reserves are supported by a mine plan that features variable stope thicknesses, depending on zone, and expected cost levels, depending on the mining methods utilized.*
5. *Mineral reserves incorporate a minimum cut-off grade of 2.0 grams per tonne at 144 and Thunder Creek and 2.2 grams per tonne at Timmins Mine. The cut-off grade includes estimated mining and site G&A costs of US$62.27 per tonne for 144/Thunder Creek and US$71.58 per tonne for Timmins Mine, milling costs of US$19.09 per tonne, trucking costs of US$6.80 per tonne for both deposits, mining recovery of 95%, external dilution of 22% at Timmins deposit, 15% at Thunder Creek deposit and 9% at HWY144 deposit, and a metallurgical recovery rate of 97.0%.*
6. *Tonnage information is rounded to the nearest thousand and gold ounces to the nearest one hundred. As a result, totals may not add exactly due to rounding.*
7. *The mineral reserves estimate was prepared under the supervision of, and verified by, Eric Lachapelle, Manager of Technical Services, LSG, who is a Qualified Person under NI 43-101.*

16 Mining Methods

16.1 Overview

The TWM includes three mineralized gold deposits; the Timmins Deposit, Thunder Creek Deposit, and 144 Gap Deposit.

The Timmins Deposit mineral resource extends from near surface (surface is at 10,015m elevation on the mine grid) to approximately 1,525m below surface. There are three main geological mineralized zones; Vein Zone, Footwall Zone, and Ultramafic Zone. Each zone is further comprised of smaller zones, separated by waste rock. The zones vary in transverse width from 1.5m to approximately 30m. Generally, the mineralized domain strikes east-west and dips 55 degrees to the north, although locally individual zones are shallower dipping.

The Thunder Creek mineral resource is approximately 750m south of the Timmins Deposit and extends from 190m to 970m below surface. Thunder Creek consists of the Rusk Zone and the Porphyry Zone and is generally massive, striking east-west and dipping 60 degrees to the north.

The 144 Gap mineral resource is approximately 900m southwest of the Thunder Creek Deposit and extends from 600m to 1,070m below surface with a strike length of approximately 395m. The mineralized domains dip approximately 70 degrees northeast.

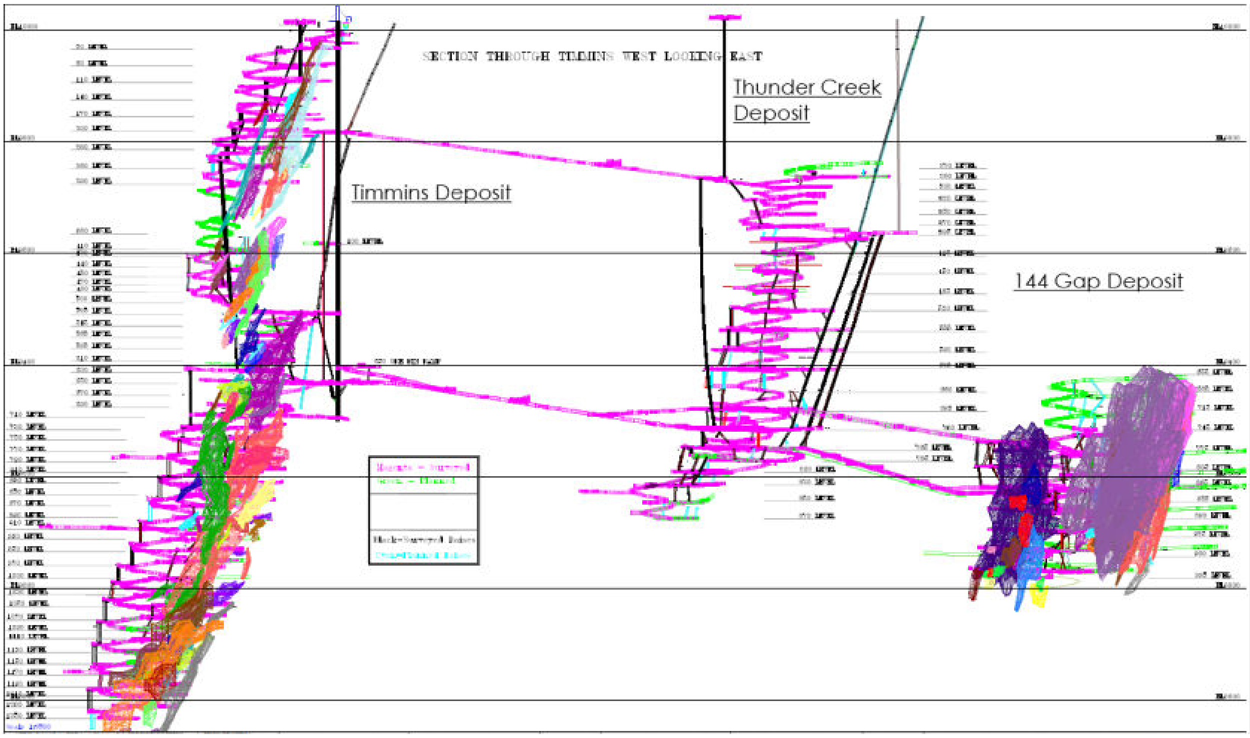
LSG completed an advanced exploration program on the Thunder Creek Deposit in 2010. The program included establishing surface facilities, sinking a 5.5m inside diameter, 710 metre deep shaft, completing an underground diamond drilling program, and developing/constructing the required underground infrastructure to extract a bulk sample. Following the discovery of Thunder Creek, two ramps were developed from the Timmins Deposit to access Thunder Creek at 275L and 730L. Advanced exploration activities were completed at Thunder Creek (including extraction of a bulk sample) throughout 2011. The naming of underground levels has been expressed as nominal metres below the shaft collar (*i.e.*, 650L is 650m below collar).

The existing underground infrastructure at the TWM is shown in Figure 16-1 and includes:

- The 5.5m diameter, 710m deep production shaft.
- Main shaft stations at the Timmins Deposit 200L, 400L, 525L, and 650L.
- Ore and waste rockbreakers and bins at 650L, and a loading pocket at 670L.
- Ventilation raises to surface and internal ventilation raises underground.
- The main ramp from surface to approximately 300L and from 480L to 1130L at the Timmins Deposit.
- An internal ramp system to access existing sublevels.
- Mine dewatering facilities.
- Electrical distribution and communications.

- Compressed air and service water distribution.
- Maintenance facilities.
- Access to Thunder Creek at 275L and 730L.
- Access to 144 Gap at 695L and 835L.

Figure 16.1: Timmins West Mine Existing Underground Infrastructure



Underground Access

The Timmins, Thunder Creek, and 144 Gap Deposit mineral reserves will continue to be extracted using underground mining methods and are accessed via the existing 5.5m diameter shaft and portal/ramp (5m x 5m) from surface.

Primary / Secondary Access

The primary access to the underground workings will continue to be via the existing TWM shaft, and ore and waste rock will be trucked to the existing 650L grizzly/rockbreaker station for sizing and subsequent skipping to surface.

The Thunder Creek Deposit is accessed via existing ramps originating at the Timmins Deposit 200L (accessing Thunder Creek at 275L) and 650L (accessing Thunder Creek at 730L).

The 144 Gap Deposit is accessed via existing accesses originating at the Thunder Creek 695L (accessing 144 Gap at 775L) and 765L (accessing 144 Gap at 835L).

An existing portal and ramp from surface currently extends to the Timmins Deposit 300L. The internal ramp systems within each deposit connect to each production level in the mine (i.e. no captive levels) allowing all levels to be accessed via the ramp from surface.

Secondary access/egress to/from the underground are via the existing portal and ramp to surface, and internal raises equipped with escapeways.

16.2 Shaft and Hoisting Facilities

The primary access to the underground workings and transfer of ore and waste rock to surface will continue to be via the existing production shaft, located near the Timmins Deposit. The shaft collar is at 10,015m elevation and shaft bottom at 9,305m elevation (710mdeep). Main shaft stations have been constructed at 200L, 400L, 525L, and 650L.

The shaft is concrete lined with a 5.5minside diameter. The shaft includes two skip compartments (12 tonne capacity bottom dump skips), a service cage compartment (42-person capacity double deck cage), and service compartment for piping and electrical services. The shaft does not have an escapeway compartment.

The existing steel headframe is 47m tall and includes a collar house and chute to dump ore and waste to an outside pad.

Hoisting Plant

The hoisting plant includes a production hoist for skipping operations and a service hoist for cage operations.

Production Hoist

The existing production hoist is a Nordberg, 3.6m (12 foot) diameter double drum with 2 x 862 kW (2 x 1,150 horsepower) AC motors. Combined with the 12 tonne skips, the plant has capacity to hoist 5,378 tpd. This capacity will be sufficient to meet ore production and waste rock hoisting requirements envisaged in the LOM plan.

Service Hoist

The existing service hoist is a 2.7 metre (9 foot) diameter single drum unit with an 862 kW (1,150 horsepower) AC motor. Combined with the 42-person double deck cage, the capacity will be suitable to meet personnel and material transfer requirements.

Shaft Services

The existing pipe services in the shaft include a 100 mm diameter service water pipeline, 152 mm diameter dewatering pipeline, two 203 mm diameter slick lines, and a 254 mm diameter compressed air line. The shaft services have sufficient capacity to supply the mine.

Ore / Waste Handling System and Loading Pocket

Broken ore and waste rock are hauled to separate ore and waste dumps/rockbreaker arrangements near the shaft at 650L. Broken material is dumped onto grizzlies and sized with stationary hydraulic rockbreakers. The sized ore material feeds a 1,200 tonne capacity ore bin and the sized waste material feeds an 800 tonne capacity waste bin. A second truck dump point (at approximately 630L elevation) and coarse ore bin has been constructed above the existing grizzly to accommodate 144 Gap production. This arrangement provides a truck haul route from 144 Gap and reduces congestion at the 650L dump.

The bins below the 650L grizzly feed a conventional gravity fed loading pocket. Chains and pneumatic cylinders are used to control the flow of material. The existing skip loading system has been fully automated.

16.3 Stoping Methods

Longhole with delayed backfill stoping, using both pastefill and unconsolidated development waste as backfill, has been the primary mining method used to date at the TWM. All future mining is planned to be via longhole mining.

Timmins Deposit

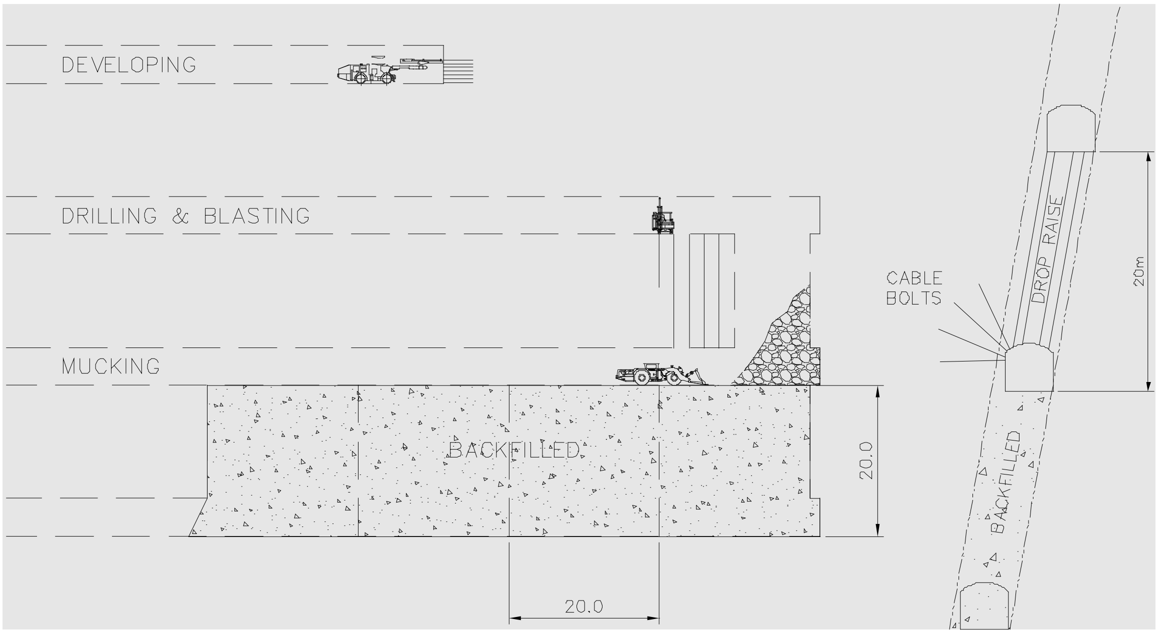
The mineralized zones at the Timmins Deposit vary in transverse width and dip. Mining shapes have been designed for all indicated mineral resources that have been included in the mineral reserve estimate.

A combination of longitudinal and transverse longhole is used (the transverse longhole method is described in Section 16.3.2).

For longitudinal longhole mining, sublevels are established at 20m vertical intervals. The mineral resource will generally be accessed in the center (along strike) and stope undercut and overcut sills developed to the east and west extents. Stope lengths are 20m along strike and mining will retreat from the extremities toward the initial access point.

The longitudinal longhole mining method is shown in Figure 16.2.

Figure 16.2: Longitudinal Longhole Mining Method



Ore sills are developed along the strike of the mineralization under geological control. Where ore widths are less than 8m, the entire sill from the hangingwall to footwall contacts is developed. Where ore widths exceed 8m, the hangingwall contact is followed, with crosscuts developed at preset intervals to expose the footwall contact. Where ore widths allow, a sill drift is developed along each contact, with a pillar left between. Ore sills are developed at a minimum of 4m wide to accommodate 6 cubic yard LHDs for stope mucking.

Longholes are primarily drilled with a top hammer drill. Longholes are drilled down from the overcut sill. A drop raise is drilled and blasted to create the initial void for production blasting. When mining a sill pillar (below a backfilled stope), uppers drilling are completed from the stope undercut sill. In this scenario, the inverse raise and slot will be drilled via ITH (4.5") drill in order to achieve proper breaking.

Broken ore is extracted from stopes using 6 and 10 cubic yard LHDs. When the stope drawpoint brow is closed with muck, the LHD is operated manually (i.e. with the operator in the seat). When the drawpoint brow is open, the LHD is operated via remote control with the operator located a safe distance from the stope and away from the moving LHD. The LHD trams to a remuck or loads directly into a haul truck. Any ore dumped into a remuck is subsequently remucked and loaded into a 42 tonne or 50 tonne class haul truck and hauled to the 650L rockbreaker.

Mined out stopes are backfilled. Where backfill will be mined against (i.e. exposed as a vertical wall) the binder content is up to 2.5%. To maximize sill pillar recovery, backfill that is mined under (i.e. exposed as a back) may include up to 5% binder content. Where available (and without compromising backfill quality), mined out stopes are used to dispose of waste rock from development activities (as opposed to skipping this material and stockpiling on surface).

Thunder Creek Deposit

The mineralized zones at the Thunder Creek Deposit average from 5m to 10m wide and dip approximately 70 degrees to the north in the Rusk and 20m to 40m wide and dipping 60 degrees to the north in the Porphyry. The geometry of the mineralized zones at Thunder Creek will continue to be suitable for the transverse longhole mining method with a primary/secondary stoping sequence, with some longitudinal stoping in narrower areas. The longhole method has been successfully used throughout the mining industry to mine ore bodies with similar geometry.

The sublevel interval at Thunder Creek is 35m (floor to floor).

Longholes are drilled using an ITH drill (for greater accuracy with the higher sublevel interval). Longholes are drilled down from the overcut sill with some holes breaking through into the undercut, and others fanned as required to contour the stope limits. A drop raise is drilled and blasted to create the initial void for production blasting. Longholes are loaded with emulsion explosives (current practice). The emulsion is detonated with non-electric blasting caps and boosters.

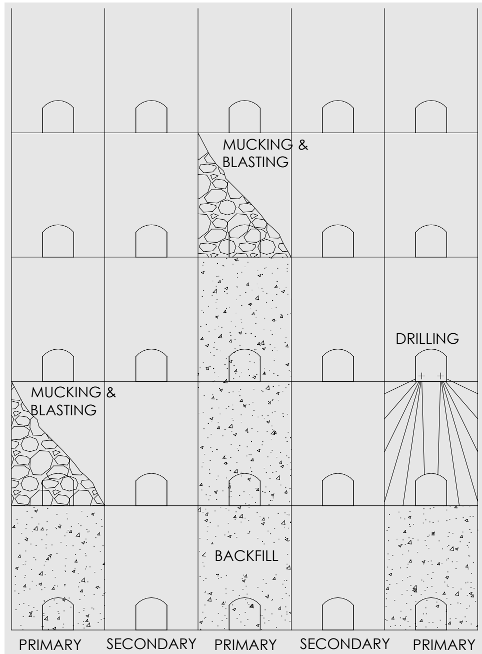
Broken ore is extracted from stopes using 6 and 10 cubic yard class LHDs. When the stope drawpoint brow is closed with muck, the LHD is operated manually (i.e. with the operator in the seat). When the drawpoint brow is open, the LHD is operated via remote control with the operator located a safe distance from the stope and away from the moving LHD. The LHD trams on the level and dumps into an ore pass finger raise. The ore pass gravity feeds a truck loadout at 765L. For stopes mucked at or below 750L, ore is mucked to a remuck and/or loaded directly into a haul truck.

Ore is hauled via the ramp in 50 tonne class haul trucks to the 650 level rockbreaker at the production shaft.

Mined out stopes are backfilled. Where backfill is mined against (i.e. exposed as a vertical wall) the binder content is 2.5%. To maximize sill pillar recovery, backfill that is developed through and mined under (i.e. exposed as a back) may include up to 5% binder content.

The transverse longhole mining method is shown in the sketch in Figure 16.3.

Figure 16.3: Transverse Longhole Mining Method



144 Gap Deposit

The mineralized zones at the 144 Gap Deposit average from 5m to 70m wide and dip approximately 70 degrees to the northwest. The geometry of the mineral resource at 144 Gap is suitable for the transverse longhole mining method with a primary/secondary stoping sequence as well as longitudinal

The sublevel interval at 144 Gap Deposit is 35m (floor to floor). This interval is based on successful mining to date at Thunder Creek.

Longholes are drilled down from the overcut sill with some holes breaking through into the undercut, and others fanned as required to contour the stope limits. A drop raise is drilled and blasted to create the initial void for production blasting. Longholes are loaded with emulsion explosives. The emulsion is detonated with non-electric blasting caps and boosters.

Broken ore is extracted from stopes using 10 cubic yard class LHDs. The LHD trams on the level and dumps into an ore pass finger raise. The ore passes gravity feed to truck loadouts at 835L and 995L. For stopes mucked at 835L and 995L, ore is loaded directly into haul trucks. Ore is hauled via the ramp in 50 tonne class haul trucks to the 650L rockbreaker at the production shaft. Mined out stopes are backfilled.

16.4 Resource Analysis (Dilution and Recovery)

Mining Dilution and Recovery

Mining Dilution

Two sources of dilution have been considered in estimating the mineral reserves.

Planned dilution includes low grade material and/or waste rock that will be mined and will not be segregated from the ore. Sources of planned dilution include:

- Waste rock or low grade material that is drilled and blasted within the drift profile of ore sills and the overall grade of the "muck" justifies delivery to the mill.
- Waste rock or low grade material within the confines of the stope limits. This includes internal waste pockets and footwall and/or hangingwall rock that has been drilled and blasted to maximize ore recovery and/or maintain favorable wall geometry for stability.

Planned dilution is directly reported from block model data and waste rock within stope wireframes.

Unplanned dilution includes sub-economic mineralization, waste rock, and/or backfill from outside the planned drift profile or stope limits that overbreaks or sloughs and is mucked with the ore and delivered to the mill.

Mining Recovery

Two recovery factors have been considered in establishing the mineral reserves.

Planned recovery includes the measured and indicated mineral resource that will be accessed, developed, and mined. Measured and indicated mineral resources not included in the mining shapes (i.e. stopes) have not been included in the mineral reserves. Reasons that some measured and indicated mineral resources will not be recovered include:

- The mineral resource includes a small volume that is separate from the main mining area and does not support the cost to develop and mine.
- The mineral resource terminates between sublevels.
- Resource left in pillars adjacent to previously mined stopes that have been backfilled with unconsolidated rockfill.

A mining recovery factor has been applied to account for material that is planned to be mined within the confines of the stope limits, but will not be recovered due to factors such as:

- Poor ground.
- Blasting difficulties (ground does not break properly and cannot be recovered).
- Resource geometry.
- Broken ore that cannot be extracted (i.e. resting on the footwall or around corners).
- Unplanned pillars left in place.

A 95% mining recovery (based on site operating experience) has been considered in estimating the mineral reserves.

16.5 Haulage

All ore and waste rock skipped to surface is first hauled by trucks to the existing production shaft, 650L grizzly/rockbreaker stations. Internal ore passes are used to centralize broken ore in key areas of the mine. The 144 Gap also has 3 installed chutes which facilitate the ore transfer and loading for haul trucks.

Waste rock from development is handled through internal waste pass systems as well and can be loaded into haul trucks. Where possible, waste rock will be dumped directly into mined out stopes (as opposed to hauling and skipping to surface).

16.6 Development

Timmins Deposit

Ramp

The existing ramp extends from surface to 300L and from 415L to 1250L. The ramp will extend to 1370L as mining progresses downward.

The ramp profile is 5m wide by 5m high (arched back) at a maximum gradient of 15%.

Sublevel Infrastructure Development

The main access to sublevels are developed 5m wide by 5m high to accommodate haul trucks. Ancillary development such as electrical substations are developed off the level access and have dimensions to suit the purpose and/or to accommodate the size of the development gear. The infrastructure on sublevels generally includes:

- Sublevel access drift.
- Sump.
- Electrical cut-out (load centers, starters, communications, etc.).
- Haulage drift.
- Stope drawpoints and crosscuts.
- Material storage bays (on some levels).
- Fresh air raise access drives.
- Return air raise access drives.
- Ore and waste pass accesses and finger raise dumps.
- Refuge stations (on some levels).

Thunder Creek Deposit

Ramp

The main access to Thunder Creek is via the two existing connecting ramps from the Timmins Deposit at 275L and 730L. The Thunder Creek internal ramp currently extends from 300L to 850L. A short ramp down to 870L was developed to mine out the final stopes at the bottom of the deposit.

No additional ramp development is planned for Thunder Creek.

Sublevel Infrastructure Development

No additional level development is planned for Thunder Creek.

144 Gap Deposit

Ramp

The main access to 144 Gap is connected via the two existing connecting ramps from the Thunder Creek at 695L and 835L. The 144 Gap internal ramp will connect all sublevels up to 655L and down to 995L, and a planned jump ramp down to 1035L will be developed to access newly identified mineral reserves below 995L.

The ramp will continue to be developed 5m wide by 5m high (arched back) at a maximum gradient of 15%.

Sublevel Infrastructure Development

The main access to sublevels are developed 5m wide by 5m high. Ancillary development, such as electrical substations are developed off the level access and have dimensions to suit the purpose and/or to accommodate the size of the development equipment. The infrastructure on sublevels generally includes:

- Sublevel access drift.
- Sump.
- Electrical cut-out (load centers, starters, communications, etc.).
- Haulage drift.
- Stope drawpoints and crosscuts.
- Material storage bays (on some levels).
- Fresh air raise access drives.
- Return air raise access drives.
- Ore and waste pass accesses and finger raise dumps.
- Refuge stations (on some levels).

Ground Support

Primary Ground Support

Ground support is installed in all underground excavations, consistent with current practices. Additional ground support details are included in Item 16.17.

Secondary Ground Support

Geotechnical study work has concluded that under certain conditions secondary ground support (generally referred to as cable bolting) may be required. An allowance has been included for installing cable bolts in the hanging wall of stopes.

16.7 Development Schedules

Development schedules have been completed for the Timmins, Thunder Creek, and 144 Gap deposits using Enhanced Production Scheduler. Mining activities are resourced in the schedule and exported into spreadsheets for reporting.

16.8 Backfill

Construction of a paste backfill plant on surface was completed in Q3 2013. The pastefill plant capacity is 2,700 tpd of a paste mixture consisting of:

- Classified tailings,
- Sand, and
- Binder.

Pastefill is delivered to stopes via a network of boreholes and piping in the ramp and on sublevels. Pastefill delivery to 144 is via a pipeline installed in the connecting ramp from the Thunder Creek 695L to 144 Gap 775L. Pastefill to stopes above 775L will continue to use an extension of this system and distribution will be possible through the existing pressure generated from the system.

16.9 Production

The mine will continue to operate two shifts per day, seven days per week. Underground crews and maintenance workers will work 10 hour shifts. Annual production has been based on 365 days per year.

Timmins Deposit Production

Production from the Timmins Deposit includes a combination of ore development and transverse and longitudinal longhole stoping.

Thunder Creek Deposit Production

Production at Thunder Creek is from a combination of ore development and longhole stoping (transverse and longitudinal). Production will be minimal as the ore body is all but mined out with mineral reserves only remaining at 280L stopes.

144 Gap Deposit Production

Production at 144 Gap is from a combination of ore development and longhole stoping (transverse and longitudinal). 85% of TWM's production tonnage is sustained from the 144 Gap Deposit.

Timmins West Mine Production

Combined production from the three TWM deposits will average approximately 2,700 tpd.

16.10 Production Equipment

The existing surface equipment and underground development, production, and auxiliary equipment fleet will continue to be used, with equipment purchased and rebuilt as required to meet production demands. The mobile equipment fleet (including spares) is summarized in Table 16.1.

Table 16.1: Surface and Underground Mobile Equipment Fleet

Equipment Type	Fleet
2-Boom Jumbo	6
LHD – 10 yd	3
LHD – 9 yd	3
LHD – 6 yd	7
LHD – 3.5 yd	1
LHD – 2 yd	1
42 Tonne UG Haul Truck - pushbox	1
45 Tonne UG Haul Truck	3
50 Tonne UG Haul Truck	4
Scissor Lift	7
Mechanical Bolter	2
Flat Deck Boom Truck	2
Grader	1
Tractor/Forklift/Minecat	12
Toyota UG Pick-Up	20
Blockholer	1
Fuel and Lube Truck	1
Concrete Truck	1

Equipment Type	Fleet
Excavator	1
Surface Truck	1
Emulsion Loader	3
Electric Hydraulic Drill	1
Simba Drill	1
Cubex Drill	2
980 Loader	2
IT38	1
Total	**88**

16.11 Ventilation

The main core of the Timmins Deposit and the Thunder Creek Deposit ventilation system has been installed and will service the remainder of the mine life.

The ventilation is provided by two down cast push systems (one at the Timmins Deposit and the other at Thunder Creek) each powered by horizontal, parallel twin 84”- 600 horsepower fans mounted on a 4.1m diameter raise bored fresh air raise (“FAR”). Each fan is equipped with a variable frequency drive to control motor speed which allows the operation to reduce ventilation flow during periods when underground activities are reduced. The reduced flows conserve power and propane as the air is heated during the winter months. The return air raise (“RAR”) system consists of ramps and raises that return the air to surface.

Timmins Deposit Ventilation

The Timmins Deposit FAR system consists of a series of bored and offset drop raises from surface down to the 1000L. This network provides 244 cubic metres per second (“cms”) of fresh air at 9.6” water gauge (“wg”) to the Lower Timmins Deposit. At 1000 level an 84”- 450 horsepower booster fan delivers 160 cms to the ramp development face. Fresh air is pulled from the ramp by auxiliary fans to the active mining levels.

Return air exhausts from active levels via the ramp up to 650L. Exhaust air splits between the production shaft, the 525 RAR, and the 730L Thunder Creek RAR to ventilate the Thunder Creek haulage ramp.

Gradual expansion of the ventilation system will occur as mining progresses to 1370L. As ramp development advances, a FAR will facilitate ventilating ramp development and subsequent production and will be equipped with an escape way to provide a second egress to 650L.

The upper section of the Timmins Deposit currently does not have active mining fronts and is ventilated and used as an exhaust path to the portal.

Thunder Creek Ventilation

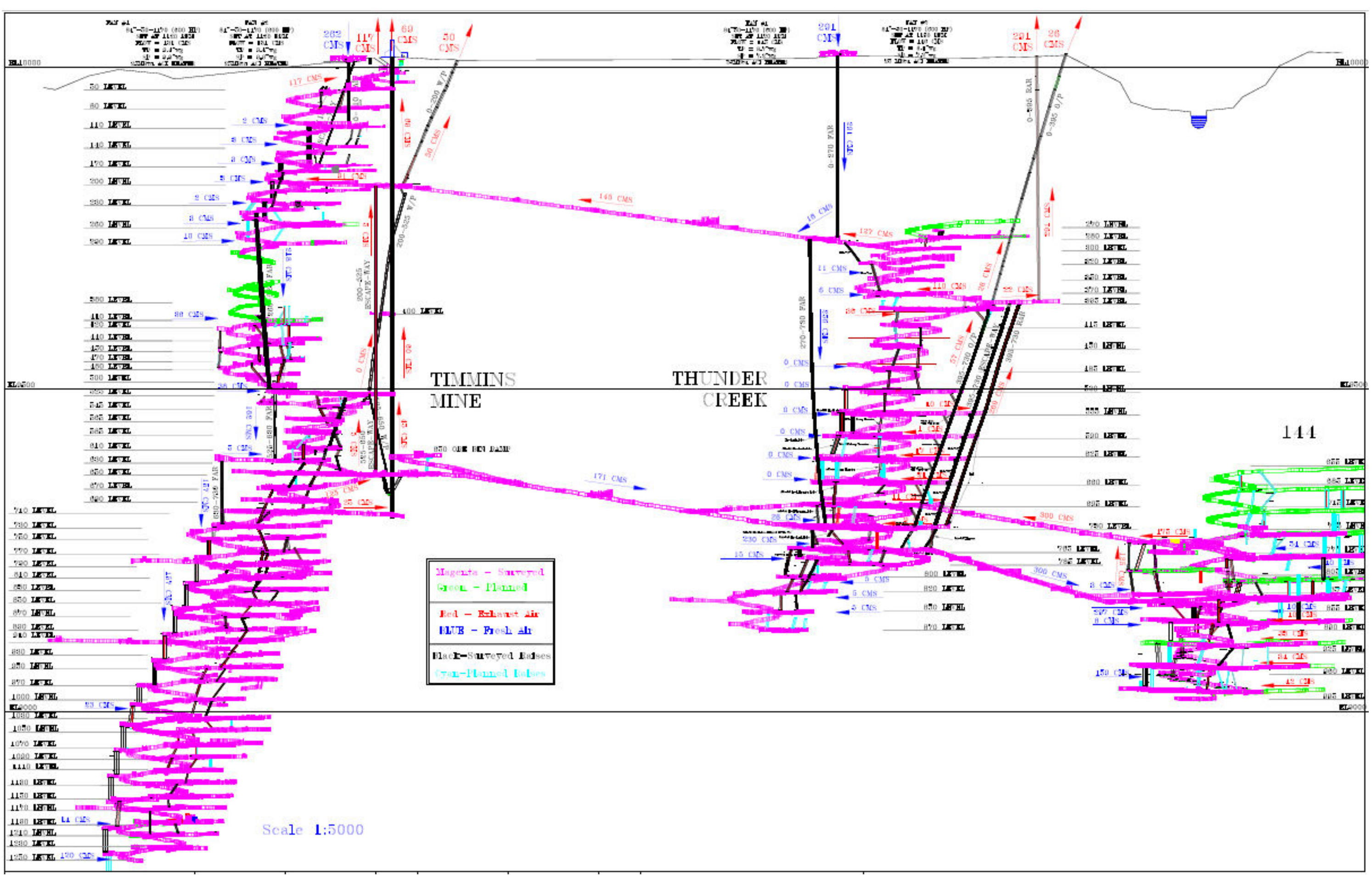
The Thunder Creek FAR moves 252 cms at 7.4” wg pressure with 210 cms down to 765L. Fresh air is drawn off as needed by control regulators on each active mining level. Exhaust air is regulator controlled on each level and returns to surface via the Thunder Creek RAR and the upper mine ramp system. This ventilation system now serves to supply the 144 Gap system (see section below).

144 Gap Ventilation

The 144 Gap RAR system is connected through a series of development accesses, drop raises and escapeways from Thunder Creek 695L to the Thunder Creek 765L. Two 84”-30-1200, 450 horsepower exhaust fans located at the 695 RAR will pull 300 cms from the Thunder Creek 695L FAR to the 144 Gap stoping and development headings. All exhaust air travels to surface through the Thunder Creek RAR and ramp system back to surface at the portal.

The TWM ventilation system is shown in Figure 16.4.

Figure 16.4: Timmins West Mine Ventilation System



Mine Air Heating and Cooling

The existing surface fresh air ventilation plants at the Timmins Deposit and Thunder Creek each include two ACI-Canefco mine air heaters. Each heating unit has 22.5 MMBH of heating capacity.

The mine design extends to 1,370m below surface. Mine air cooling will not be required.

16.12 Personnel

An existing core group of management, environmental, technical services (engineering/geology), administration, maintenance, supervisory, and production personnel will continue to operate the site. The personnel required to sustain the operation will reduce as activities reduce toward the end of the mine life.

The personnel required on payroll are summarized in Table 16.2.

Table 16.2: Personnel on Payroll

Classification	Persons
Site Management	
Mine General Manager	1
Electrical General Foreman	1
Maintenance General Foreman	1
Hoist Mechanical General Foreman	1
Mine Superintendent	1
Mine General Foreman	2
Administration Staff	
HR Administrator	1
HR Coordinator	1
Reception/Administrative Assistant	1
Purchaser	1
Warehouse Coordinator	1
Warehouse Clerk	1
Engineering Staff	
Chief Mine Engineer	1
Senior Mine Engineer	1
Mine Engineer	1
Engineer in Training (“EIT”)	3
Mine Long Range Planner	1
Longhole Planner/Coordinator	2

Classification	Persons
Surveyors	2
Ventilation Planner and Technician	1
Geology Staff	
Chief Geologist	1
Senior Mine Geologist	1
Mine Geologist/Geotechnician	2
Resource Geologist	1
Health and Safety	
Safety Coordinator	1
Trainer	2
Environmental	
Environmental Coordinator	1
Environmental Technician	1
Mine Operations Staff	
UG Shift Supervisor	4
Surface Supervisors	1
Construction/Drill/Blast Supervisor	4
Maintenance Staff	
Maintenance Supervisor	2
Electrical Supervisor	2
Hoist Mechanical General Foreman	1
Maintenance Planner	1
Maintenance Clerk	1
Mine Construction/Services	
Construction Miner	8
Pastefill System Construction Miner	4
Underground Labourer	4
Rockbreaker Operator	4
Surface Yard Maintenance Loader/Truck Operator	16
Grader/Fuel Truck Operator	4
Dewatering Operator/Spare	4
Service Miners	4
Rehab Miners	4
Shaft	

Classification	Persons
Hoistperson	4
Shaftperson	2
Cage/Skip Tender/Deckperson	4
Maintenance	
Lead Mechanic	4
Mechanic	22
Welder	2
Drill / Pump Mechanic	1
Mill Wright	8
Lead Electrician	4
Electrician	8
Instrumentation	1
Cap Lamp Maintenance	1
Mine Development	
Lead Development Miner	16
Development Miner 1	32
Raise Miner	2
Mine Production	
Blaster	8
Driller	16
LHD Operator	20
Haul Truck Operator	24
Total Personnel	**282**

Qualified local contractors and their personnel are readily available and from time to time are required for jobs of a temporary or specialized nature such as construction projects or diamond drilling.

16.13 Underground Mine Services

The underground mine services include electrical power distribution and communications, compressed air, service water, and dewatering.

Electrical Distribution and Communications

Power is delivered underground at 13.8 kV via two new 13.8 kV feeders and 500 MCM size electrical cables installed in the shaft. The power supply will be sufficient for the areas in the current LOM plan. Electrical substations (mine load centers) have been located at shaft stations and as required in electrical cut-outs on sublevels.

Communication has been established throughout the mine via an underground radio network ("leaky feeder"). In addition, a fiber optic network provides communications for control of pumps, monitoring cameras, refuge station dial phones, fan automation and gas monitoring. Underground shaft stations, electrical substations, some remote workplaces, and refuge stations have direct communications to surface via pager phone.

The core of the electrical and communications systems are in place and will expand accordingly as the mine develops into new production areas.

Compressed Air

The existing surface compressed air plant includes four Sullair 225 kW, 698 liter/second (1,480 cfm) compressors, and one Sullair 150 kW, 472 liter/second (1,000 cfm) compressor. The overall plant capacity is 3,264 liters/second (6,920 cfm). An additional compressor has been installed underground at 144 Gap to ensure sufficient capacity during peak use periods.

Compressed air is delivered underground via the existing 254 mm diameter pipe in the shaft. The underground compressed air distribution system consists of steel piping installed in the ramps and sublevels. Compressed air is required to power pneumatic equipment and/or activities including:

- Jackleg and stoper use.
- Pneumatic Anfo loaders.
- Pneumatic longhole drills.
- Longhole cleaning.
- Refuge station ventilation (pressurizing).
- Pneumatic cylinders for door controls.
- Pneumatic pumps for local dewatering.
- Main shop (pneumatic tools).

Service Water

Currently, all service water required for underground drilling operations, dust suppression, and washing work places is supplied from recycled water inflow from the surrounding rock mass. Additional service water is available (if needed) from surface sources. Service water is supplied to the main levels via the existing 100 mm diameter pipe in the shaft and in the ramp. Service water will be distributed underground via steel pipe in the ramp and on sublevels. Service water is not be potable (i.e. not for drinking).

Mine Dewatering

Water inflow from the surrounding rock mass and water used for drilling activities and dust suppression is currently collected in local sumps and directed to main sumps/pump stations at the Timmins Deposit (200L and 650L) through a network of drain holes and small pumps/dewatering lines (including a shaft bottom pump). The inflow water is recycled and used for service water in the mine.

The 650L pump station includes two 225 kW (300 horsepower) pumps (one duty and one spare). From the 650L pump station, clean (settled) water is pumped up the existing 152 mm diameter pipe in the shaft to the 200L pump station. The 200L pump station includes two 150 kW (200 horsepower) pumps (one duty and one spare). From the 200L pump station, all water is pumped to surface via piping in the shaft. The current dewatering system capacity is approximately 102 cubic metres per hour (450 US gallon per minute ("usgpm").

A full water balance study has been completed. The current estimated mine dewatering rate ranges from 500 cubic metres per day to 1,000 cubic metres per day depending on the season (i.e. heavier water inflow during spring months).

Roadbed Material

The maintenance of roadways is essential in reducing the mobile equipment operating and maintenance costs and achieving high haulage truck availability.

Crushed/screened rock is generated on surface from skipped/stockpiled waste rock and sent underground once sized via a designated pass for use underground and is delivered underground and distributed via production equipment and spread using the existing grader.

16.14 Materials Supply

The TWM is well positioned in the established Timmins mining district. Consumable materials and external services required to support the mining operation will continue to be sourced from local businesses or from other nearby mining centers (such as Sudbury, Kirkland Lake, North Bay, and Rouyn-Noranda). Contracts have been established to support current site activities and these will continue to be amended as required.

16.15 Maintenance

There are existing maintenance facilities on surface to support maintenance of surface equipment and smaller fixed plant equipment brought to surface from underground.

An underground maintenance shop has been constructed and equipped at the Timmins Deposit 650L. Mobile equipment will be brought to the shop for servicing, preventive maintenance, and repairs.

16.16 Safety

The site has existing health and safety programs in place as required by the Ontario Occupational Health and Safety Act and Regulations for Mines and Mining Plants. There is an existing Joint Health and Safety Committee, Mine Rescue Team, and training facilities.

There is currently a full time Safety Coordinator on site and this position will remain filled for LOM operations. The Safety Coordinator will maintain site safety programs and initiatives. There are two trainers on staff.

16.17 Geotechnical

A geotechnical engineering consultant has been providing ongoing geotechnical support and annual audits to TWM since project inception. Their visits typically include a review of the past years mine performance and assessment of the LOM plan to identify any geotechnical risks.

Many the geotechnical studies for the 144 Gap Deposit were completed in 2016 and were based on geological and geotechnical core logging, localized spot mapping, rock strength testing, anticipated regional stress field and experiences learned from Thunder Creek.

Mining Method and Stope Sizing

The 144 Gap Deposit is amiable to long-hole primary-secondary sequencing open stoping with cemented paste backfill and where possible, using a bottom-up centre out sequence to minimise effects of mining induced stress.

Stope geometry is assessed using the Matthews/Potvin Stability Graph Analysis Method (Potvin 1988) and is conducted on every stope mined. Dilution is similarly reviewed using the Equivalent Linear Overbreak Slough by Clark and Pakalnis (1997). Cable bolting is often used to increased stope wall performance when required.

Ground Support

Ground Support Standards for typical ground conditions are summarized as follows:

Non-Yielding Support Primary Support

- 1.8 or 2.4m resin-anchored rebar installed on a 1.1 - 1.2 m x 1.1 – 1.2m pattern with 6-gauge weld-wire mesh screen with push plate used to tie in the leading edge.

Yielding Support Primary Support

- 1.8 or 2.4m cone bolt installed on a 1.1 - 1.2 m x 1.1 – 1.2m pattern with 6-gauge weld-wire mesh screen with no push plates.

Secondary Support Elements include the following:

- 6.0m long 15.2mm twin-stand bulb cables that are typically installed on a 2.0m x 2.0m pattern.
- 3.7m Super Swellex installed on a 1.5 – 2.0m x 1.5 to 2.0m pattern.

Ground conditions that fall outside what is deemed typical for the site, are specifically designed and may include all or part of the different aforementioned support elements and use of dry mix shotcrete.

Infrastructure

Large excavations and critical infrastructure are established away from lithological contacts and large-scale structural features (faults and dykes) where possible. Numerical modelling and historical site experience is also used.

Monitoring

Geotechnical and ground support monitoring includes

- *Routine geotechnical inspection and damage mapping.*
- *QAQC on ground support elements*
- *Development and Stope over- and under-break assessments.*
- *Falls of ground.*
- *Instrumentation (micro-seismic monitoring system, extensometers, slough meters etc.); and*
- *Numerical modelling.*

Data from routine monitoring programs can be readily used to optimize stope and development design and frequently identifying opportunity for:

- Increasing stope size (where stopes have historically performed well); or
- Reducing unplanned dilution by reducing stope dimensions and/or installing cable bolts in critical spans or high dilution risk areas.

Backfill

Cemented paste backfill is primarily used to provide global mine stability and maximize the ore:waste extraction ratio. Backfill exposures include both vertical and horizontal exposures and their required backfill strengths are calculated on a stope-by-stope basis. When possible, waste rock is used entirely or co-disposed with paste fill to backfill non-critical stopes or exposures. Backfill performance is routinely tested by a third-party and monitored by the TWM Engineering Department.

17 Recovery Methods

Ore from the TWM is hauled via surface highway trucks to the Bell Creek Mill facility for processing. The Bell Creek Mill is located approximately 6.7km north of Highway 101 in South Porcupine, Ontario. The designed 5,468 tpdprocessing plant consists of a one stage crushing circuit, ore storage dome, one-stage grinding circuit with gravity recovery, followed by pre-oxidation and cyanidation of the slurry with carbon-in-leach ("CIL") and CIP recovery. Ore from LSG's Bell Creek Mine is also processed through the Bell Creek Mill.

17.1 History

The Bell Creek mill was established as a conventional gold processing plant utilizing cyanidation with gravity and CIP recovery. Between 1987 and 1994 the mill processed 576,017 short tonnes of Bell Creek ore grading 0.196 ounce per short ton gold (112,739 recovered ounces). The historical gold recovery was approximately 93 percent. Additional tonnage from the Marlhill Mine, Owl Creek open pit, and Hoyle Pond Mine was processed prior to the mill being placed on care and maintenance in 2002. During this period several improvements and additions were implemented to increase tonnage throughput from the original 350 tpd to 1,500 tpd. LSG purchased the mill in 2008 and re-commissioned the mill for operation in 2009 at 1,000 tpd. The mill was expanded to 2,000 tpd in the fourth quarter of 2010 and was further expanded to 2,500 tpd in 2011. Phase 2 of the mill expansion (to a design capacity of 3,300 tpd) was completed in the third quarter of 2013. Since then, the plant has demonstrated that it can achieve a higher throughput than the design capacity. In 2020 the mill was further debottlenecked to achieve a max one day tonnage of 6,000tpd, which combined with a 91.14% run time and 2% moisture yields an average throughput of 5,369tpd facility.

17.2 Bell Creek Mill Process Description

Ore feed is dumped directly onto a 16" by 16" grizzly at the truck dump and a remote controlled rockbreaker is used to break up the oversized material. The ore is fed with an apron feeder to a series of conveyors reporting to a scalping grizzly feeder in the crushing building. The openings between the fingers on the grizzly feeder are 3.5", with the oversize reporting to a 44" x 34" C110HD Metso jaw crusher. The jaw crusher is set to a closed side setting of 4". The discharge from the crusher is combined with the -3.5" material from the grizzly feeder and conveyed to the ore storage dome. The dome has a 24,000MT storage capacity, 6,000MT of which is live. Three apron feeders pull ore from the dome and convey it to the SAG mill building.

The grinding circuit consists of one 22' diameter by 36.5' long low aspect ratio Metso SAG mill and is powered by twin 6,250 horsepower (4,600 kW) motors. The SAG mill is a repurposed ball mill converted to a SAG by installing ½" grates and a trommel with ½" openings. Oversize from the trommel reports to a collection bin which is fed back into the SAG mill feed chute. Undersize from the trommel reports to a pumpbox which feeds a cyclopac equipped with 6 outlets. Five of the outlets are fitted with 20" Krebs gMAX cyclones, and the other outlet is capped and available for possible future expansion. The SAG cyclone overflow reports to the thickener feed box and the underflow reports back to the SAG mill. A portion of the cyclone underflow is fed to a 30" Knelson. Knelson concentrate is collected in a hopper and is pumped daily to the refinery for further treatment, while the Knelson tails flow by gravity back to the SAG mill. Target grind is 80% passing 200 mesh.

Flocculent is added to the cyclone overflow and is pumped to a 20m diameter thickener. The slurry from the cyclones is 25-35% solids by weight with the thickener underflow at 55-60% solids by weight. The thickener overflow water is pumped to the process water tank and reused in the grinding process. The thickener underflow slurry is pumped to the leach circuit. The leach circuit consists of five agitated tanks in series with a total volume of 1,940 cubic metres. Pure oxygen is sparged into the first three leach tanks to passivate the contained pyrrhotite in the ore, as well to maintain a target dissolved oxygen level, which is required for efficient gold dissolution in cyanide. Cyanide is then added to leach tank #4, or #5.

There are three CIL tanks equipped with Kemix screens having a total volume of 7,500 cubic metres. The CIL tanks contain 8 - 10 grams of carbon per liter of slurry. The circuit will reach equilibrium for loading of the carbon with the grade of the loaded carbon in the range of 2,500 to 5,500 g/t. Loaded carbon is pumped from CIL #5, screened, washed, and then transferred to the loaded carbon tank. Carbon in the CIP and CIL tanks is advanced counter-current to the flow of slurry in the circuits.

The slurry from CIL #1 tank reports to the CIP circuit, and is split into two trains of three CIP tanks in parallel with approximately 45 grams of carbon per liter of slurry. Recovery of the gold from the carbon is a batch process with carbon being stripped at a rate of 3.5 tonnes per batch. The turnaround time between batches is 24 hours. Carbon can be cleaned with acid, reactivated with the kiln and reused in the circuit.

The loaded solution from the strip circuit is passed through two electro-winning cells in the refinery. The gold collects on the cathodes in a sludge form. The cells are washed weekly and the sludge is collected in filter bags and dried. The dried sludge is then mixed with reagents and melted in the induction furnace. Gold bullion bars are poured when the melt is completed.

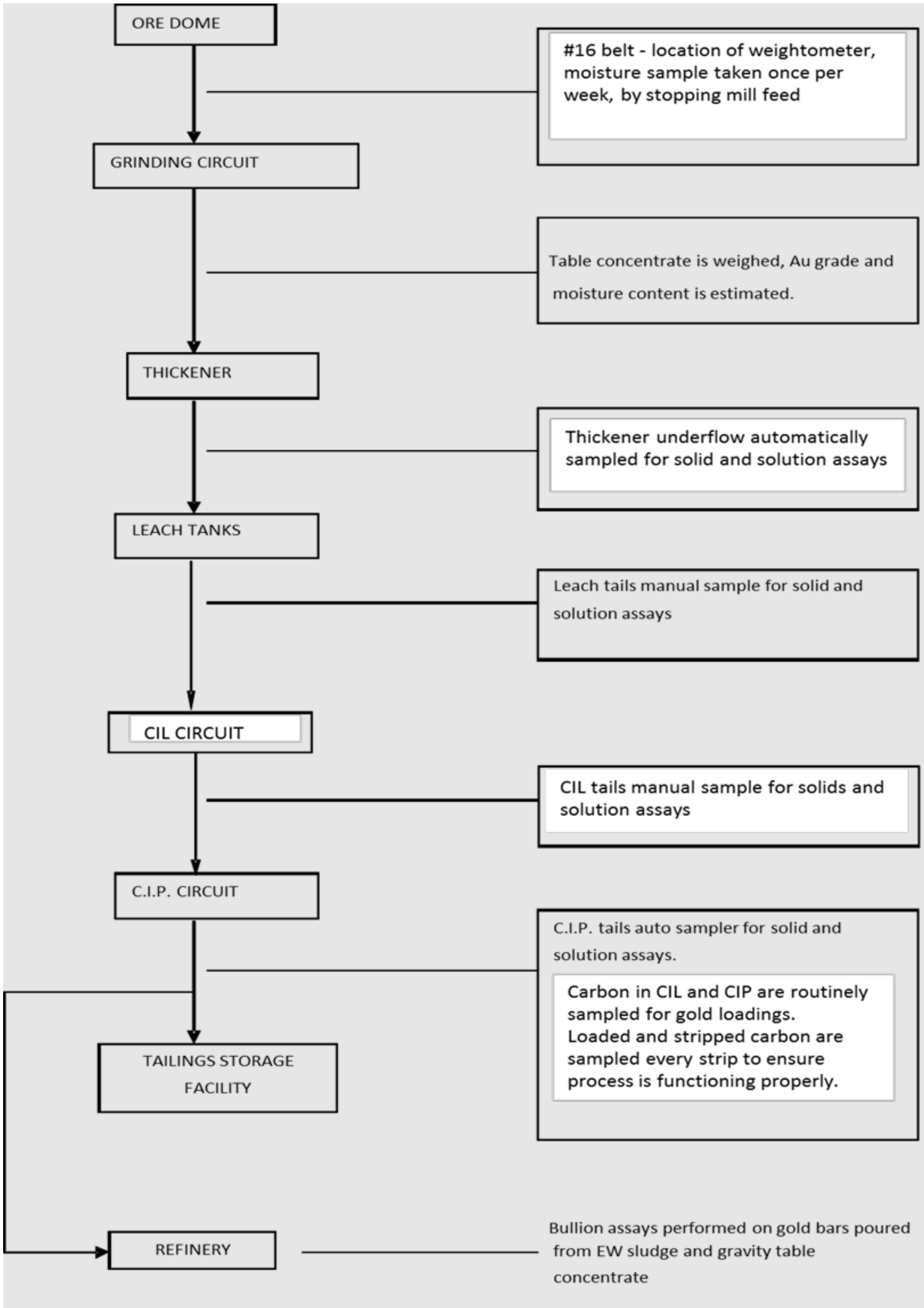
The gravity gold material collected from the Knelson concentrator is transferred to the refinery and a gravity table is used to increase the gold content. The concentrate is then dried, reagents are added and the material is melted in the induction furnace. The gravity concentrate and the CIP gold sludge are melted separately due to the differing amounts of reagents used in each, and to more accurately determine recoveries in each circuit.

17.3 Metallurgical Balance

A metallurgical balance is conducted daily based on the tonnage from the 4 roller belt weightometer located on the feed conveyor to the SAG mill. The total tonnage, corrected for moisture, and assays from the daily sample campaign are used to produce the balance. All samples are assayed in accordance with typical assay standards and a QA/QC program is in place to ensure the integrity of the assay lab processes. The main components used to calculate the daily balance are the thickener underflow solids and solution, the weight of gravity gold collected, the estimated grade and moisture content of the gravity gold collected, and the tailings sample solids and solution. The daily metallurgical balance is a best estimate of daily production which must then be reconciled with the circuit inventory and bullion poured (this reconciliation is performed on a monthly basis). All areas of the circuit are sampled for tank level, percent solids, solids grade, solutions grade, carbon concentrations and grade (where applicable). As the carbon contains the majority of the gold in inventory, strict care is taken to ensure sampling is performed correctly.

The final clean out of the electro-winning cell is completed by the refiner or his designate, under security control. All sludge is collected and dried. The washed cathodes from the cells are weighed and the weights are recorded to determine whether any plating buildup is occurring. The dried cell sludge and the gravity concentrate collected over the same period are smelted and bullion bars are poured. The bars are stamped and their weights are recorded and verified. Bullion samples are taken and are assayed at the Bell Creek Lab. These sample results are used in the metallurgical balance. See Figure 17.1 for the process and sampling points.

Figure 17.1: Simplified Milling Process and Sampling Points



17.4 2021 Mineral Processing Results of Timmins West Mine Ore

The actual processing results of TWM material during 2021 are shown in Table 17.1.

Table 17.1: Timmins West Mine Material Processed in 2020

Ore Type	Tonnes Processed	Gold Grade (g/t)	Recovery
Timmins West Mine	997,918	2.59	97.30%

Gold recovery from all TWM material has met expectations established by test work completed prior to plant start-up. All material yields a consistent high recovery and consistent grade. The average grind size to achieve these recoveries is a P80 of 75 microns. All reagent consumptions remained at expected levels for the different materials processed. Gravity recovery averaged 32% through this operational period.

18 Project Infrastructure

18.1 Timmins West Mine Site

The TWM is a mature mine and the development and construction of the underground mine infrastructure and surface facilities to support mining has been completed. The Timmins Deposit has been in commercial production since 2011, Thunder Creek since 2012 and the 144 Gap since 2016.

The existing surface infrastructure at the TWM is shown in Figure 18.1 and includes:

- Access roads, site grading and security gate house.
- Shaft headframe, collar house, and hoisting plant.
- Compressed air plant.
- Process water supply.
- A paste backfill plant and distribution boreholes to underground.
- Portal and main ramp to underground.
- Electrical services infrastructure and distribution.
- Timmins Deposit main fresh air ventilation fans and mine air heaters.
- Thunder Creek main fresh air ventilation fans and mine air heaters.
- Administration, mine dry and training facilities.
- Warehouse and maintenance facilities.
- Water treatment facilities and discharge water settling ponds.

Figure 18.1: Timmins West Mine Surface Infrastructure

18.2 Bell Creek Mill Site

All ore to date from TWM has been milled at LSG's existing Bell Creek mill. All future production from the TWM will continue to be processed at the Bell Creek mill.

The Bell Creek tailings management area ("BCTMA") is part of the Bell Creek Complex. The facility first received ore from the Bell Creek Mine in 1986 at an initial rate of 300 tpd and later increased to 1,500 tpd by 2002. Production from the Bell Creek Mine ceased in 2002 and the tailings management area was placed in a state of inactivity (care and maintenance) from 2002 to 2008. The Bell Creek mill resumed operation in the last quarter of 2008 and the tailings management area was reactivated. In 2016 the Bell Creek mill processed ore from both the Bell Creek Mine and TWM at a nominal rate of 3,398 tpd.

The BCTMA is located west of the Bell Creek mill, covers an area of approximately 150 ha, and includes the following:

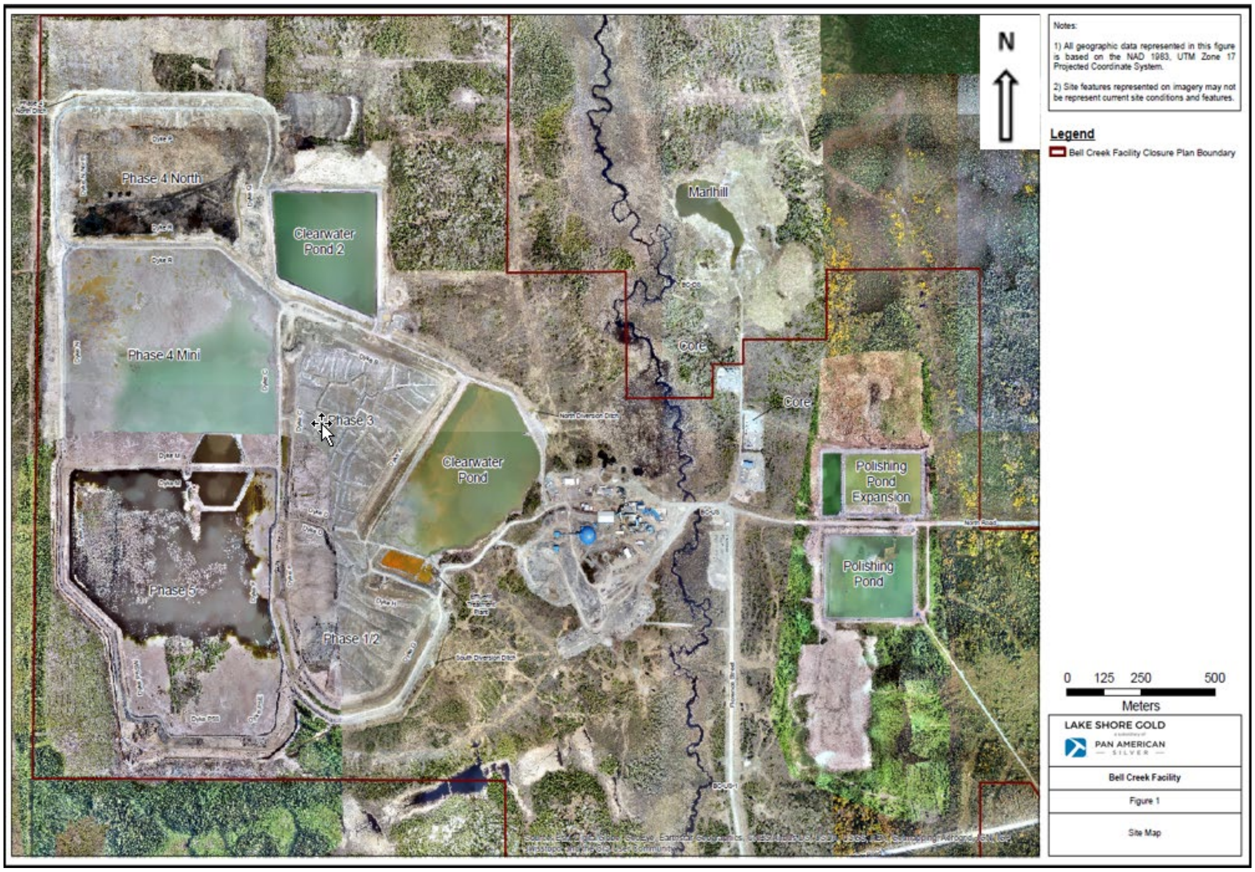
- Five tailings cells (Phase 1/2 cell, Phase 3 cell, Phase 4 Mini cell, Phase 4 North and Phase 5);
- Two clear water ponds (Clear Water Pond and Clear Water Pond 2);
- Effluent treatment plant and sludge settling pond
- North and south diversion ditches.

Tailings are pumped in a conventional slurry stream (45% to 50% solids) from the mill to the tailings facility for deposition.

The Bell Creek mill is permitted to 6,000 tpd. The Phase 4 Mini cell was constructed in 2014 and subsequently raised in 2015. Phase 4 North cell was constructed and commissioned in 2016 and Phase 5 was constructed and completed in 2018. In 2015 excavation of Phase 3 commenced to provide approximately 130,000 tonnes of tailings to TWM as paste backfill in the underground workings. Tailings excavations continues as required for annual backfill requirements of TWM.

Also in 2015 a "Bell Creek Tailings Facility – Operations, Maintenance and Surveillance Manual" was completed in November to include all aspects of managing the tailings facility. The document was created with assistance from the Canadian Dam Association and Mining Association of Canada guidelines. The Bell Creek mill facility is shown in Figure 18.2.

Figure 18.2: Bell Creek Mill Facility



19 Market Studies and Contracts

19.1 Contracts and Marketing

Gold Sales

The Bell Creek Mill produces gold in the form of doré bars. The bars are a blend from the TWM and Bell Creek Mine. The doré bar's historical weighted average gold grade has been 84.9% and has ranged between 61.6% and 91.7%. The historical weighted average silver grade has been 9%.

The weight of the doré bar combined with the assay values (site assay and as well as from an independent laboratory for the purpose of comparing them to the refiner assays) allows the calculation of gold and silver contents and thus the overall value of each shipment.

LSG refines its doré bars at Asahi refinery in Brampton, Ontario, Canada. Asahi credits LSG with 99.9% of the estimated gold content shortly after doré bars are delivered to Ashahi's vault in Brampton, Ontario.

Once final doré bar assays have been exchanged and agreed upon between LSG and Asahi, the remaining gold and silver contents are credited to LSG's account. In the agreement with Asahi, the terms, rates and charges are within industry norms.

Fine troy ounces refined at Asahi from LSG's doré production are sold to various customers based on the London Bullion Market Association daily settlement prices for gold and silver. Transportation costs, insurance, refining, processing, and other charges are paid to the refinery. The terms contained within the sales contracts are typical and consistent with standard industry practices and are similar to contracts for the supply of doré elsewhere in the world.

Currently, there are no forward sales or hedging for gold.

Gold Market

Markets for the gold refined from the doré, produced by LSG are readily accessible. These are mature, global markets comprised mainly of large bullion banks and merchants located throughout the world.

19.2 Review by the Qualified Person

The Qualified Person responsible for this section of the Technical Report has reviewed the contract terms, rates, and charges for the production and sale of the doré and concentrates, and considers them sufficient to support the assumptions made in the mineral resource and mineral reserve estimates.

20 Environmental Studies, Permitting, and Social or Community Impact

20.1 Regulatory and Framework

All of the required provincial, federal and municipal permits, approvals and authorizations have been obtained (and amended from time to time) for the TWM to allow for operations and project development, which are described in Table 20.1. Additional permit applications or amendments are dependent on site level or legislative changes and are initiated as required. Adherence to applicable legislation and general environmental compliance is achieved through the implementation of a site-level Environmental Management System and the Mining Association of Canada's Towards Sustainable Mining program.

There are no known environmental issues that could materially impact the ability to extract the mineral resources or mineral reserves.

Table 20.1: List of Main TWM Environmental Permits and Approvals

Permit Type	Number
Environmental Compliance Approval – Industrial Sewage	6086-992J6B
Environmental Compliance Approval – Air	7723-A8ZP76
Permit to Take Water – Mine Dewatering	6557-AQRPBT
Production Closure Plan Amendment	NA

20.2 Mine Waste Disposal, Site Monitoring and Water Management

There are various monitoring, inspection and reporting programs that occur at the TWM to support water management and environmental compliance. They include discharge, surface and groundwater monitoring, receiver environmental effects monitoring, waste rock Acid Rock Drainage and Metal Leaching testing, general site inspections and compliance reporting. Third party Dam Safety Inspections are completed annually by the Engineer of Record or an independent consulting firm.

Waste rock at the TWM is used as backfill in the underground operations or stored on surface in a waste rock stockpile. To ensure environmental aspects are identified and managed, regular Acid Rock Drainage and Metal Leaching testing occurs as per Ontario Regulation 240/00.

Water management activities include mine dewatering, supplying the paste plant and underground operations with process water, capturing site impacted storm runoff, treatment and discharge of excess water and diverting un-impacted storm water with a Freshwater Diversion Ditch.

20.3 Social and Community Factors

Consultation is being undertaken with regulatory agencies, the general public, the Métis Nation of Ontario, Wabun Tribal Council and the Indigenous communities of Flying Post First Nation and Mattagami First Nation, who are represented by Wabun Tribal Council. Consultation provides an opportunity to identify and address the impacts of the Company's activities on external stakeholders, and to expedite the authorization process.

The consultations have been held in order to comply with Federal and the provincial requirements including that of Ontario Regulation 240/00 and the Environmental Bill of Rights.

An Impact and Benefits Agreement ("IBA") has been negotiated and signed (February 17, 2011). The IBA outlines how the company and the Indigenous communities will work together in the following areas: education and training of Indigenous community members, employment, business and contracting opportunities, financial considerations and environmental provisions.

20.4 Project Reclamation and Closure

A Closure Plan Amendment for the TWM is filed with the Ministry of Northern Development, Mines, Natural Resources and Forestry. Rehabilitation measures are described within and will be implemented at closure.

Closure cost estimates for the Property are updated with each material change on site, such as an expansion or build, as per Ontario Regulation 240/00. The present value of the final site reclamation costs for the Property is estimated to be approximately $2.3 million as of June 2021. Monies are provided in the form of a surety bond.

21 Capital and Operating Costs

The estimated capital and operating costs are presented in US dollars and are based on operating experience at the TWM and the Bell Creek mill.

21.1 Capital Costs

The capital costs are sustaining capital and include infrastructure, construction, electrical projects, equipment purchases/rebuilds, and an allocation of indirect costs required to support ongoing mining and expansion of the mine into new production areas. The capital costs also include costs related to the Bell Creek mill and tailings management facilities.

Underground Infrastructure and Construction

The costs associated with underground infrastructure installation and construction projects include expansion and/ or maintenance of the main trunk of the pastefill system (boreholes and piping), ventilation system expansion, dewatering system expansion, and ore/waste handling infrastructure as the mine expands into new production areas. The estimated costs were developed based on operating experience and/or interaction with vendors/contractors.

Electrical Projects

Capital costs related to electrical infrastructure include additional surface substation upgrades, infrastructure maintenance and general upgrades to instrumentation.

Geology and Diamond Drilling

Diamond drilling and related labour and consumables for drilling inferred resources (for potential conversion to indicated) has been included in the capital costs.

Capital Equipment and Critical Spares

The capital costs related to mobile equipment includes purchase of equipment to replace current fleet and rebuilds to the current fleet.

Bell Creek Mill Related

The estimated costs associated with mill site related initiatives at the Bell Creek mill and tailings facilities. The estimated costs were developed by LSG operations and projects personnel with experience in the area, and have been based on operating experience and/or interaction with vendors/contractors.

The sustaining and project capital costs for the calendar year 2022 have been estimated and are shown in Table 21.1. The sustaining capital expenditures vary from year to year depending on the requirements of the mine operation. There are no project capital expenditures anticipated in 2022.

Table 21.1: Sustaining Capital Cost Summary for 2022

Timmins West 2022 Capital	Sustaining Capital for 2022 US$M
Mine Equipment and Infrastructure	$7.3
Surface Facilities	$1.1
Geology / Exploration	$1.8
Total Sustaining Capital	$10.2
Project Capital	$0
Total Sustaining & Project Capital	$10.2

Operating Costs

The mine operating costs include both direct and indirect costs. The costs are based on the LSG's operating experience at the TWM from 2011 through 2021 and/or developed from engineering first principles. The average operating cost used is the mining cost for 144 Gap/Thunder Creek mining cost as 85% of tonnes are mined from these deposits. This is forecasted to be $88.16 per tonne as summarized in Table 21.2.

Table 21.2: Operating Costs Summary

Item	$US per Tonne
Mining	$62.27
Processing	$19.09
Ore Surface Haulage to Mill	$6.80
Total Operating Costs	**$88.16**

22 Economic Analysis

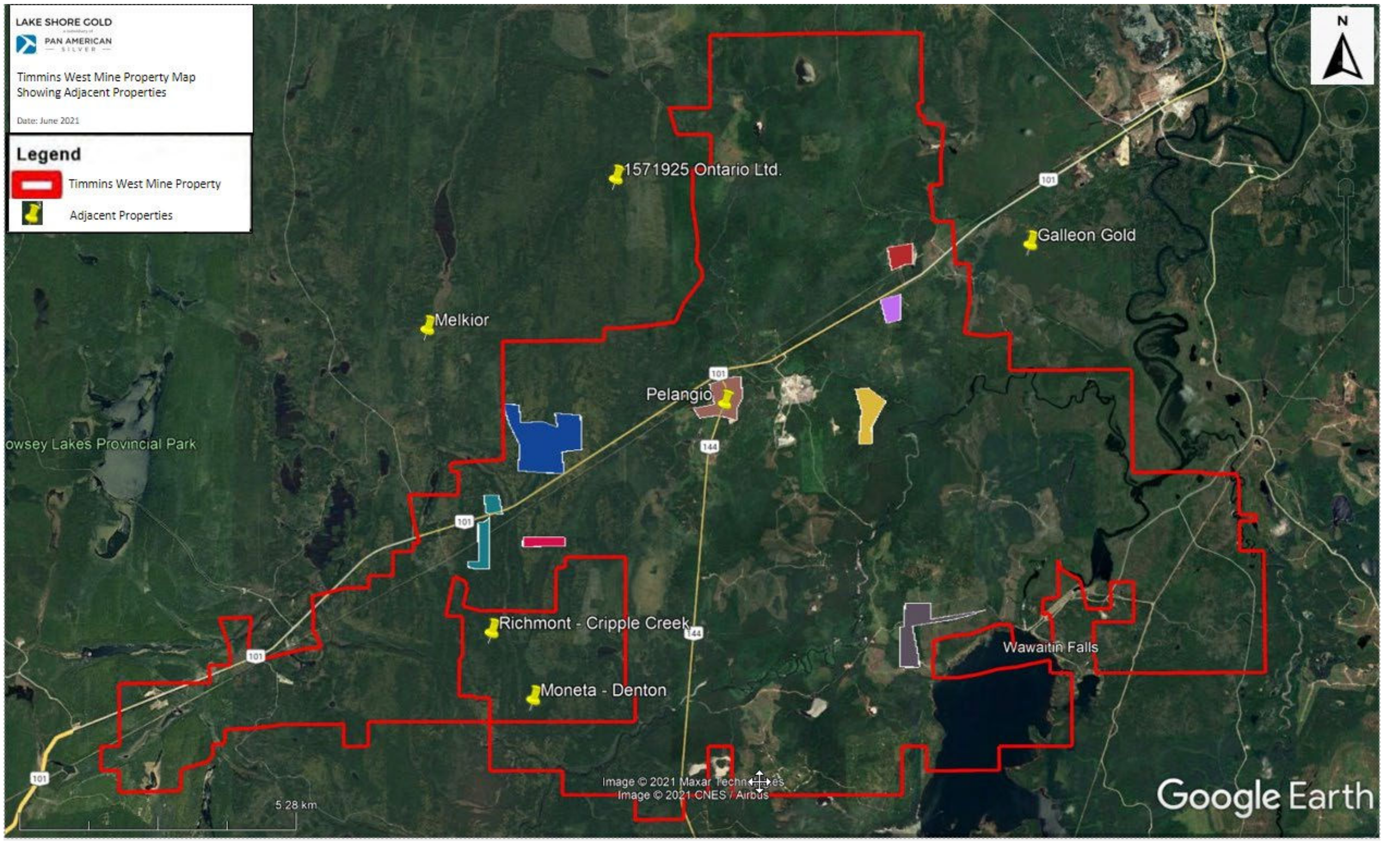
An economic analysis has been excluded from this Technical Report as the TWM is currently in production and this Technical Report does not include a material expansion of current production.

23 Adjacent Properties

Adjacent properties to the Timmins West Property include those controlled by Pelangio Exploration Inc., 1571925 Ontario Ltd. (formerly SGX Resources Inc.), Melkior, Moneta Gold, Richmont Mines Inc. (now Alamos)., and Galleon Gold.

The information in this section concerning adjacent properties has been publicly disclosed by the owner or operator of each adjacent property. The authors have not been able to verify such information, and the information is not necessarily indicative of the mineralization on the TWM.

Figure 23.1: Timmins West Mine – Adjacent Properties



23.1 Pelangio Exploration Inc. – Poirier Option – Bristol Township

Two staked mineral claims with an area of 47 ha are situated between the Meunier-144 and Timmins Mine properties and to the north of the Thunder Creek portion of the Property. Identified collectively as the 'Poirier Gold Property', Pelangio Exploration Inc. ("Pelangio") reports it is currently in the process of converting these claims to leases. The claims are underlain by mafic metavolcanic rocks belonging to the Tisdale Assemblage. The MDI does not describe or locate a mineral occurrence on this property. On the company website (http://pelangio.com), Pelangio reports having completed prospecting and an MMI soil geochemical survey. The website states quartz veining and sulphides were noted on the property during this exploration work but locations and sample results are not available.

23.2 1571925 Ontario Ltd. (formerly SGX Resources Inc.) - West Timmins Gold Project – Carscallen Township

The property consists of nine freehold patent claims covering an area of approximately 118 hectares in Carscallen Township, located approximately 4 km west of the TWM headframe (Tahoe, 2017; file:///C:/Users/amainville/Downloads/Canada-%20Ontario-%20Goldon%20Resources%20Ltd-%20West%20Timmins%20Project-%20ACA%20Howe%20International%20Limited-%20Sep2011-SAMPLE%20(1).pdf).

A brief history of recent exploration activities on the property is summarized as follows:

- Newcastle Minerals Ltd. ("Newcastle") optioned the patents from Timmins Forest Products Limited in 2009.
- In May 2010, SGX Resources Inc. ("SGX") entered into an agreement with Newcastle to acquire an option to earn 75% interest in the property.
- In December 2010, SGX declared that they would not exercise their option.
- In September 2011, Newcastle released a NI 43-101 technical report (Technical Report on the West Timmins Gold Project, Carscallen Township, Porcupine Mining District, Ontario, authored by D.C. Leroux (P. Geo.) of A.C.A. Howe International Ltd., September 26, 2011).
- In December 2011, NY85 Capital Inc. ("NY85") entered into an agreement with Newcastle to acquire an option to earn 60% interest in the property.
- In July 2012, Newcastle announced that a drill program, operated by NY85, was initiated on the property. No results or follow-up work were reported.
- In January 2013, GoldON Resources Ltd. ("GoldON", formerly Newcastle) terminated its option to purchase the patent claims.

23.3 Richmont Mines Inc. – Cripple Creek Property – Denton Township

The northeast corner of the Cripple Creek property (Tahoe, 2017; https://www.sec.gov/Archives/edgar/data/1023996/000120445909001737/ricexh991.htm), which consists of 27 mining claims covering an approximate area of 694ha, is approximately 5km southwest of the TWM headframe. Richmont Mines Inc. ("Richmont") acquired the project in 2002 and explored the property until 2005. Exploration activities resumed in 2010, with Richmont reporting they completed a two phase diamond drill program totaling 7,523m in 17 holes. Plans were announced for a third phase of drilling (3,500m) in 2011 but no results were ever reported. No mineral resource estimate has been released for this property.

The Ontario Mineral Deposits Inventory indicates four occurrences are located within the property. Gold was first discovered in the 1950s by R.E. Halpenny, with that showing bearing his name (also known as Mahoney Creek-1984, MDI42A05SE00005). The local stratigraphy, as it is currently understood, is composed of a series of intercalated mafic and ultramafic metavolcanic flow units belonging to the Tisdale Assemblage. Gold-bearing quartz-carbonate veins occur within alteration zones at the mafic-ultramafic metavolcanic contact as well as in strained sections of the mafic metavolcanics.

Since the discovery of gold on the property, the following companies have tested the property by means of diamond drilling, stripping, trenching overburden sampling, geophysical and geochemical surveys: Hollinger Consolidated Gold Mines Limited, Gambit Exploration, Gowest Amalgamated Resources Limited, Noranda Exploration Company Limited, Hemlo Gold Mines Inc., and Battle Mountain Gold. Three gold-bearing areas have been identified: MDI42A05SE00056, the Cripple Creek Zone 16 referenced to Battle Mountain's drill collar cc96-16; MDI42A05SE00057, the Cripple Creek Zone 17 also referenced to as Battle

Mountain drill collar cc96-17; MDI42A05SE00058, the Mahoney Creek Zone reference with Hemlo Gold drill collar cc93-1. In September 2017, Alamos Gold announced the friendly acquisition of Richmont Mines (https://www.alamosgold.com/).

23.4 Galleon Gold (formerly Explor Resources Inc.) – West Cache Property – Bristol and Ogden Townships

According to the Galleon Gold's website (source: https://galleongold.com/projects/west-cache-gold-project/), the West Cache property consists of 265 unpatented mining units and 11 patented mining claims totaling 3,765 ha located in Bristol and Ogden Townships. The southwest corner of the claim group is situated approximately 4 akm from the TWM headframe.

Cameco Gold Inc. geologists Babin, Samson, and Koziol (2002) describe the property geology as follows: "The property geology is marked by a southwest striking package of sediments which are bounded to the north by mafic volcanics and intruded in the central part of the property by a variably altered quartz-feldspar-porphyritic intrusion. The margins of the main porphyry body consist of porphyry dyke swarms of similar composition intruding the sediments. The sediments consist of moderately chloritic interbedded sandstones and ±argillaceous mudstones, exhibiting well defined Bouma sequences away from the porphyry. The sandstone beds are more massive, crudely bedded and contain an appreciable percentage of quartz grains and granule size siliceous clasts. Some sediment horizons close or in contact with the porphyry contain up to 70% variably altered and deformed, granule to cobble size porphyry clasts similar to the main porphyry intrusion, surrounded by a sandstone matrix.

Langton et al. (2012) describe the property as marked by a southwest striking series of steeply north-dipping faults and zones of high-strain (shear zones) that parallel a moderate to strong foliation present in all the rocks except the diabase dykes. Quartz-feldspar porphyry intrudes the central part of the property and is itself intruded by a smaller, linear syenite body. The quartz-feldspar porphyry ("QFP") is locally strongly altered by sericitic, chloritic, and carbonaceous alteration, and local silicification, where it is transected by high-strain zones.

The area south and southwest of the QFP hosts several gold-anomalous zones associated with pyrite-pyrrhotite-red sphalerite stringers. This gold and zinc anomalous mineralization is distinct from the main pyrite-chalcopyrite mineralization seen in the central part of the main porphyry.

Explor Resources Inc. ("Explor") filed an updated NI 43-101 Technical Report in September 2013. The report has an effective date of July 1, 2013 and states an open pit resource of 4,283,000 tonnes grading at 1.6 g/t gold (213,000 oz. gold) of indicated and 1,140,000 tonnes grading at 2.1 g/t gold (77,000 oz. gold) of inferred resource. The deposit also contains an underground component containing 4,420,000 tonnes grading at 2.8 g/t gold (396,000 oz. gold) of indicated and 5,185,000 tonnes grading at 2.4 g/t gold (393,000 oz. gold) of inferred resource.

In December 2014, Teck Resources Ltd. entered into a joint venture with Explor, with the option to earn up to a 55% interest in the Timmins Porcupine West property.

In December 2019, Galleon Gold acquired Explor Resources and conducted additional diamond drilling in 2020 and 2021.

In October 2021, Galleon Gold released an updated NI 43-101 Technical Report outlining an indicated mineral resource of 13,398,000 tonnes grading at 1.52 g/t gold(657,000 oz. gold) and an additional 11,670,000 tonnes grading at 1.71 g/t gold (640,000 oz. gold) of inferred mineral resource.

23.5 Melkior – Carscallen Gold Project Property – Carscallen Township

According to the Melkior Resources' website (source: http://www.melkior.com/carscallen-project/) their 100% owned Carscallen Gold Project is located in the Abitibi Greenstone belt, 3kmdue north of the PDDFZ and approximately 9 southwest of LSG's TWM. The property consists of 320 claim units cover over 47km2.

In the past 13 years Melkior has completed over 36,000m of drilling and has revealed several high-grade gold zones located in a 1000m by 1000m corridor. The gold system has been systematically traced from surface down to depths of 400m. Eight gold zones are located within the property boundary; known as the ZamZam, Shenkman, Jowsey, 1010 North and South, Mystery, Behemoth and Wire gold occurrences.

On September 29, 2020, Melkior entered into a strategic partnership with Kirkland Lake Gold Ltd. where the latter has the right to earn-in up to a 75% interest in the Carscallen Project through an option and joint venture agreement. Under the terms of the option agreement, Kirkland has an option to earn a 50% interest in the property in consideration for completing $10 million in exploration expenditures over a period of five years and the right to earn an additional 25% interest in the property by incurring exploration expenditures of $100 million within the first five years of the formation of the joint venture.

23.6 Moneta – Denton Property – Denton and Thorneloe Townships

According to the Moneta Gold website (source: https://www.monetagold.com/projects/other-projects/timmins-area/default.aspx), the West Timmins/Denton-Thornloe nickel-gold property is located 30km southwest of Timmins, Ontario and about 5 km to the southwest of the TWM. The property is dominated by east-west trending volcanics and sediments consisting of komatiitic flows, peridotite, felsic metavolcanics, and banded iron formations with minor graphitic argillite. Historic work on the property includes exploration and drilling by Hollinger Consolidated Gold Mine and Falconbridge Limited on the West Nickel zone.

The property has reported both a gold and nickel zone. The East and West nickel occurrences found by Hollinger are hosted in peridotite associated with komatiites overlying iron formation. Mineralization consists of high grade massive but narrow sulphide intervals interpreted to represent Kambalda style Nickel mineralization. Gold was also identified by Hollinger and Falconbridge such as the gold values from

Falconbridge historic hole THOR41-01 which intersected intermittent anomalous gold values in a mixed quartz-carbonate vein zone/iron formation interval.

24 Other Relevant Data and Information

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

25 Interpretation and Conclusions

An updated resource estimate has been completed for the TWM using new information. The mineral resource estimate (reported exclusive of mineral reserves) for the TWM contains 252,000 tonnes at 3.73 g/t for 30,140 ounces of gold classified as measured resources, 967,000 tonnes at 3.32 g/t for 103,087 ounces of gold classified as indicated resources, and 174,000 tonnes at 4.36 g/t for 24,323 ounces of gold classified as inferred resources.

All resources have been depleted for mining up to the effective date of this Report, June 30, 2021. The mineral resource for the Timmins, Thunder Creek, and 144 Gap deposits is reported using a base case cut-off grade of 1.5 g/t for internal continuity purposes.

The estimated total proven and probable mineral reserves (diluted and recovered) for TWM contains 5.69 million tonnes at 2.96 g/t for 541,347 ounces.

The drilling, development and mining completed since the last mineral resource update on June 30, 2020 shows an overall increase in reserves of 59,760 ounces and a decrease in resources of 220,234 ounces in all resource categories. Resource decreases are:

- a decrease in the measured category of 14,448 ounces,
- a decrease of 169,465 ounces in the indicated category and
- a decrease of 36,321 ounces in the inferred category.

This overall decrease in ounces is mainly due to

- the conversion of mineral resources to mineral reserves as demonstrated by the replacement and overall increase overall increase in proven and probable mineral reserves of 59,760 ounces between the 2020 mid-year and 2021 mid-year models; and
- depletion of 77,406 ounces from mining

The Timmins Deposit indicated mineral resources decreased by 40,464 ounces due to the conversion of this material to mineral reserves and due to depletion from mining production. Inferred mineral resources decreased by 15,096 ounces mainly due to conversion of inferred mineral resources to indicated.

The Thunder Creek Deposit indicated mineral resources decreased by 4,530 ounces mainly due to the removal of blocks that were deemed unmineable and partially due to mining. Inferred mineral resources were unchanged.

The 144 Gap Deposit measured mineral resources increased by 6,460 ounces due to the conversion of indicated material when conducting close spaced infill drilling, while indicated mineral resources dropped by 19,664 ounces due to the conversion to the measured category and due to depletion from mining. The inferred mineral resources decreased by 2,210 ounces.

The mine design used for the updated mineral reserve estimate is based on existing surface and underground infrastructure, and operating experience gained since commercial production commenced. The majority of the main mine infrastructure (surface and underground) is in place, most equipment has been purchased, and the Bell Creek mill expansion has been completed to meet current production requirements. TWM successfully uses the longhole mining method which is commonly used worldwide for deposits with similar geometry and conditions. The operation also uses common, proven mining equipment and has experienced management and mine operations personnel. The Timmins area has a significant, well-established mining service/supply industry to support the operation.

Through years of operating experience, TWM has implemented the systems and programs (i.e. health and safety, environment, training, maintenance, operating procedures, etc.) necessary to sustain production. This experience has also provided a solid basis for estimating the capital and operating costs used in preparation of the LOM plan.

To estimate the mineral reserves, the following steps (summarized at a high-level) were used by mine planning personnel. The measured and indicated mineral resources were isolated from inferred mineral resources from the block models and assessments were made of the geometry and continuity of each of the mineralized zones. Ongoing geotechnical evaluations were taken into account in the assessment and assignment of appropriate mining methods and stope sizes. Individual stope designs (wireframes) were then created in three dimensions. These stope wireframes were queried against the block models to determine the in-situ mineral resource. This allowed for fair inclusion of internal dilution from both low grade and barren material. Additional factors were assigned for external dilution (with or without grade) dependent on the specific mining method and geometry of each stoping unit being evaluated. Finally, a recovery factor was assigned to the overall mineral reserves to allow for in-stope and mining process losses. Stope cut-off grades were estimated to determine which stopes to include in the mineral reserves. Detailed mine development layouts and construction activities were assigned to provide access to each of the stoping units. A detailed LOM development and production schedule was prepared to estimate the annual tonnes, average grade, and ounces mined to surface. Development, construction, and production costs were estimated to allow an economic assessment to be made comparing the capital and operating expenses required for each area to the expected revenue stream to ensure economic viability.

All capital costs required for all surface and underground facilities at TWM and relevant portions of the Bell Creek mill facility have been included in the LOM plan. No contributions from the Bell Creek mining operations (positive or negative) have been considered.

Key outcomes of the mineral reserves justify continued mining at TWM.

Risks

The mineral resource used to estimate the mineral reserves and develop the LOM plan are heavily weighted to indicated resources, with only minor contributions from measured resources. The realized grade in any mining plan has the greatest impact on financial returns. Infill and definition drilling is ongoing to add confidence to the LOM plan. Ongoing diamond drilling programs are planned and will need to be funded to reduce this risk going forward.

Gold prices are subject to significant fluctuation and are affected by a number of factors which are beyond the control of LSG. Lower than predicted gold prices could increase the stope cut-off grade and reduce the mineral reserves.

Currency fluctuations are also affected by factors which are beyond the control of the Company. Stronger than predicted Canadian dollar (versus the US dollar) could increase the stope cut-off grade and reduce the mineral reserves.

Recent supply chain issues in the global market can also affect pricing forecasts on certain items critical to mining (ground support, construction steel, equipment, etc.) due to variations in supply and demand.

Local competition from recent mine expansion and additional producers, explorers, and other mining related activity has led to difficulties in retention/recruitment and an increase to labour rates across all disciplines (i.e. underground specialized labour, technical personnel).

Operating and capital costs determined as the basis for estimating the mineral reserves are based on actual performance metrics of the operation from 2011 through 2020. These factors are considered low risk elements and have intrinsically less impact on financial returns.

Social, political, and environmental factors are all considered to be low risk factors for the TWM.

26 Recommendations

Recommendations for development of the mineral resource are:

1. Implement definition drilling to refine shapes and grades for existing mineral resources and exploration drilling to expand the overall mineral resource base. Review these programs annually.
2. Complete exploration drilling at the TWM in an attempt to further increase the resource base.

Suggested surface and underground diamond drilling programs are outlined as follows:

Underground drilling at the TWM for 2022 is proposed to be approximately 21,400m of combined operating, capital and exploration drilling and development for a total cost of approximately US$1.9 million.

Of this total, approximately 14,700m (for approximately US$1.0 million) are for operations and capital drilling to support the 2022 Mine Plan as well as infill drill for future mining. The remaining 9,600m (for approximately US$0.9 million) are planned for near mine exploration drilling and development, primarily testing the down plunge extents of both the Timmins Deposit and the 144 Gap Deposit as well as targeting the South-West Zone.

Surface exploration totaling 8,000m (for approximately US$1.4 million) testing regional targets along the main 144 Trend and along the HWY 144 Offset trend has also been proposed for 2022.

27 References

27.1 Reports and Schedules

Accurassay Laboratories Ltd., 2011; Schedule of Services and Fees

ALS Laboratory Group, 2009 (CAD); Schedule of Services and Fees, ALS Minerals.

ALS Laboratory Group, 2011 (CAD); Schedule of Services and Fees, ALS Minerals.

Anglin, C. D., 1992; Sm-Nd and Sr Isotope Studies of Scheelite from some Superior Province Gold Deposits; a thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Ottawa-Carleton Geoscience Centre and Department of Earth Science, Carleton University, Ottawa, Ontario.

Ayer, J., Berger, B., Johns, G., Trowell, N., Born, P., Mueller, W.U., 1999; Late Archean Rock Types and Controls On Gold Mineralization In The Southern Abitibi Greenstone Belt Of Ontario; Field Trip B3 Guidebook, Geological Association of Canada (GAC), Mineralogical Association of Canada (MAC), Joint Annual Meeting, 1999, Sudbury, Ontario, Canada.

Ayer, J.A., Baker, C.L., Kelly, R.I., Stott, G.M., Thurston, P.C., 1999; Summary of Field Work and Other Activities 1999; Ontario Geological Survey, Open File Report 6000, Queen's Printer of Ontario.

Ayer, J.A., Trowell, N.F., Madon, Z., Kamo, S., Compilation of the Abitibi Greenstone Belt in the Timmins-Kirkland Lake Area; revision to stratigraphy and new geochronological results; p. (4) 1-14.

Ayer, J.A., Dubé, B., Trowell, N.F. 2009; NE Ontario Mines and Minerals Symposium, PowerPoint Presentation: Stratigraphic and Metallogenic Comparison of the Detour Burntbush area with the Southern Abitibi.

Ayer, J., Trowell, N., (OGS); Amelin, Y., Kamo, S. and Kwok, Y., (ROM), 2000; PowerPoint Presentation: Deep Crustal Structures in the Abitibi Greenstone Belt and their Prolonged Control on the Distribution of Stratigraphy and Mineral Deposits; Toronto, January 2000.

Ayer, J., Barr, E., Bleeker, W., Creaser, R.A., Hall, G., Ketchum, J.W.F., Powers, D., Salier, B., Still, A., Trowell, N.F, 2003; Discovery Abitibi, new geochronology results from the Timmins Area: Implications for the Timing of Late-Tectonic Stratigraphy, Magmatism and Gold Mineralization. Summary of field work and other activities, Ontario Geological Survey, Open File Report 6120, p. 33-1 to 33-11.

Ayer, J.A., Thurston, P.C., Bateman, R., Dubé, B., Gibson, H.L., Hamilton, M.A., Hathaway, B., Hocker, S.M., Houlé, M.G., Hudak, G., Ispolatov, V.O., Lafrance, B., Lesher, C.M., MacDonald, P.J., Péloquin, A.S., Piercey, S.J., Reed, L.E., Thompson, P.H., 2005; Overview of Results from Greenstone Architecture Project; Discovery Abitibi Initiative, Open File Report 6154, Ontario Geological Survey.

Barrie, C.T., 1992; Geology of the Kamiskotia Area, Ontario Geological Survey Open File Report 5829. P.33.

Bateman, R., Ayer, J.A., Dubé, B, Hamilton, M.A., 2005; the Timmins-Porcupine Gold Camp, Northern Ontario: The Anatomy of an Archean Greenstone Belt and its Gold Mineralization: Discovery Abitibi Initiative, Open File Report 6158, Ontario Geological Survey.

Brisbin, D.I., 1986; Geology of The Owl Creek and Hoyle Pond Gold Mines, Hoyle Township, Ontario, an independent project submitted to the Department of Geological Science Queen's University, Kingston, Ontario, in conformity with the requirements of the Non-Research Masters of Science Degree in Mineral Exploration.

Brisbin, D.I., 1997; Geological Setting of Gold Deposits in the Porcupine Camp, Timmins, Ontario, a thesis submitted to the Department of Geological Science in conformity with the requirements for the degree of Doctor of Philosophy, Queens University, Kingston, Ontario.

Brisbin, D.I., 2000; World Class Intrusion Related Archean Vein Gold Deposits of the Porcupine Gold Camp, Timmins, Ontario, Geology and Ore Deposits 2000, The Great Basin and Beyond, Proceedings, Geological Society of Nevada Symposium Volume 1, p. Brisbin-19-35.

Burrows, A.G., 1911; the Porcupine Gold Area, Twentieth Annual Report of the Bureau of Mines, 1911, Vol. XX, Part II.

Burrows, A.G., and Rogers, W.R., 1912; Map of the Porcupine Gold Area, District of Temiskaming, Ontario; First Edition, July 1910; Second Edition, April 1911. Scale: 1:63,360. To accompany the Twentieth Report of the Bureau of Mines 1911.

Burrows, A.G., and Rogers, W.R., 1912; Map of the Porcupine Gold Area, District of Temiskaming, Ontario; First Edition, July 1910; Second Edition, April 1911; Third Edition June 1912. Scale: 1:63,360. To accompany the Twenty-first report of the Bureau of Mines, 1912.

Camier, J., 2009; Geological Mapping of the Peralkaline Syenite Intrusion and Host Rocks on the Thunder Creek Property, Lake Shore Gold Corp., Timmins, Ontario.

Campbell, R., 2014. Controls on Syenite-Hosted Gold Mineralization in the Western Timmins Camp, M.Sc. Thesis, University of Western Ontario, Unpublished, 158p.

Cattarello Assayers Inc., 2011 Standard Operating Procedures, personal correspondence.

Cavey, G., 2004; Summary Geological Report On The Thorne Property, Bristol, Carscallen, Denton and Thorneloe Townships, Porcupine Mining Division, Ontario, for Band-Ore Resources Ltd. (December 04, 2004).

Cavey, G., 2006; Summary Geological Report On The Thorne Property, Bristol, Carscallen, Denton and Thorneloe Townships, Porcupine Mining Division, Ontario, for Band-Ore Resources Ltd. (March 30, 2006).

CIMM Standing Committee on Reserve Definitions, 2010; CIM Definition Standards – For Mineral Resource and Mineral Reserves, November 27, 2010.

Coad, P.R., Brisbin, D.I., Labine, R.J., Roussain, R.,1998; Geology of Owl Creek Gold Mine, Timmins, Ontario, CIMM Exploration and Mining Geol. Vol. 7, No. 4, p. 271-286.

Crick, D., Kusins, R., Powers, D., 2011; Technical Report on the Initial Mineral Resource Estimate for the Thunder Creek Property, Bristol Township, West of Timmins, Ontario, Canada, prepared for Lake Shore Gold Corp and West Timmins Mining Inc.

Dagbert, Michel: 2011; Statistical Analysis of QA/QC Assay Data, A Review and Report by SGS Canada Inc. Geostat.

Dagbert, Michel: 2011; Resource Modeling and Estimation of the Thunder Creek Gold Deposit, SGS Canada Inc. – Geostat, December 14. 2011.

Darling, G., 2007; Pre-feasibility Study Report, The Lake Shore Gold Timmins West Project, Timmins, Ontario, Lake Shore Gold Corp., SRK Consulting Canada Inc., SRK Project Number 5CL001.001, July 31st, 2007.

Darling, G., Kociumbas, M., Sullivan, J.R., Lavigne, J., Hayden, A.S., Small, A.S., Butler, D., Kordgharochorloo, F., Hall, R.A., Schmidt, P.R., 2007; NI 43-101 Technical Report, Lake Shore Gold Corp., Timmins West Project, Timmins, Ontario, Report Prepared for Lake Shore Gold Corp. by SRK Consulting Engineers and Scientists (October 12, 2007).

Darling, G., Fayram, T., Kusins, R., Samson, J., Miree, H., 2009; Updated NI 43-101 on the Timmins Mine Property, Ontario, Canada, prepared for: Lake Shore Gold Corp.

Dubois, M., and Brown, C., 2010; Lake Shore Gold Corp. Resistivity/Induced Polarization and Ground Magnetic Field Survey, Timmins West Mine Complex, Tailings Condemnation, Bristol and Thorneloe Townships, Ontario, Canada., Abitibi Geophysis

Easton, R.M., 2000; Geochronology of Ontario; Ontario Geological Survey, Miscellaneous Release Data 75.

Eastwood, A.M., 2004; 2004 Diamond Drill Program, Vogel Project, an internal memo Glencairn Gold Corporation.

Ferguson, S.A., 1957; Geology of Bristol Township, Sixty-Sixth Annual Report of the Ontario Department of Mines, being Volume LXVI, Part 7.

Ferguson, S.A., 1957; Bristol Township, District of Cochrane, Ontario; Ontario Department of Mines, Map 1957-7, scale 1:12,000.

Ferguson, S.A., 1968; Geology and Ore Deposits of Tisdale Township, Geological Report 58, Ontario Department of Mines.

Ferguson, S.A., Groen, H.A., Haynes, R., 1971; Gold Deposits of Ontario, Part 1, Districts of Algoma, Cochrane, Kenora, Rainy River and Thunder Bay, Ontario Department of Mines, Mineral Resources Circular No. 13, p. 49 – 50, 123 – 124.

Fyon, J.A., Breaks, F.W., Heather, K.B, Jackson, S.L., Muir, T.L., Stott, G.M., Thurston, P.C. 1991; Geology of Ontario, Special Volume 4, Part 2, Chapter 22,Metallogeny of Metallic Mineral Deposits in the Superior Province of Ontario, Ontario Geological Survey, p. 1091 to 1174.

Geldart, J., Bousfield, J., Dymov, I., 2005; An Investigation of The Recovery of Gold from Samples From the Timmins Property, prepared for Lake Shore Gold, LR 10669-001-Report No. 1, SGS Lakefield Research Limited.

Gray, D. Mathew, 1994; Multiple Gold Mineralizing Events In The Porcupine Mining District, Timmins Area, Ontario, Canada; A thesis submitted to the faculty and the Board of Trustees of the Colorado School of Mines in partial fulfillment of the requirements for the degree of Doctor of Philosophy (Geology).

Hawley, J.E., 1926; Thirty-Fifth Annual Report of the Ontario Department of Mines being Vol. XXXV, Part VI, 1926, p. 1 to 36.

Hawley, J.E., 1926; Map No. 35g, The Townships of Carscallen, Bristol and Ogden, District of Cochrane, Ontario, scale: 1:47520.

Hawley, J.E., 1926; ARM35G, The Townships of Carscallen, Bristol, and Ogden, District of Cochrane, Ontario, Map 35g, scale: 1:47,520, Ontario Department of Mines.

Hodder, R.W., Petruk, W., 1980; Geology of Canadian Gold Deposits, Proceedings of the CIM Gold Symposium, published for the Geology Division of CIM, Special Volume 24, The Canadian Institute of Mining and Metallurgy, p. 101 to 170.

Jackson, S.L., Fyon, J.A., 1991; Geology of Ontario, Special Volume 4, Part 1, Chapter 11, the Western Abitibi Subprovince in Ontario, Ontario Geological Survey p. 405 to 482.

Jackson, S.L., Fyon, J.A., 1991; Geology of Ontario, Special Volume 4, Part 2, Chapter 22, The Metallogeny of Metallic Mineral Deposits in the Superior Province of Ontario, Ontario Geological Survey, p. 1149.

Kerrich, R., 1983; Geochemistry of Gold Deposits in the Abitibi Greenstone Belt, Special Volume 27, Canadian Institute of Mining and Metallurgy.

Krikham, R.V., Sinclair, W.D., Thorpe, R.I., Duke, J.M., (editors) 1993; Mineral Deposit Modeling, Geological Association of Canada Special Paper 40, p. 465 to 479, and 635 to 678.

Lake Shore Gold Corp., 2011; Bell Creek Mill Laboratory Standard Operating Procedures.

Lake Shore Gold Corp., 2011; Internal Memo Regarding Permitting, T. Ternes; September 22.

Langton, J., Puritch, E., Yassa, A., Armstrong, T., 2112; National Instrument 43-101 Technical Report for Explor Resources Inc., on Timmins Porcupine West Property, Bristol and Ogden Townships, Ontario, MRB & Associates, and P&E Mining Consultants.

Leroux, D.C., 2011; Technical Report on the West Timmins Gold Project, Carscallen Township, Porcupine Mining District, Ontario; A.C.A. Howe International Limited; for Newcastle Minerals Limited.

Linnen, R., 2016. Report on the Alteration and Geochemistry of the Gap Zone, Timmins West Mine, Timmins, Ontario, Internal Report Prepared for Lake Shore Gold Corp., January 2016., 40p.

Lo, Bob, 2011; Tailings IP Results, an internal Lake Shore Gold Corp. memo.

Lucas, S.B., and St-Onge, M.R. Coordination, 1998; Geology of Canada No. 7, Geology of the Precambrian Superior and Grenville Provinces and Precambrian Fossils in North America; Geological Survey of Canada, Geology of North America, Volume C-1.

Macdonald, A. James, Editor, 1986; Proceedings Volume, Gold 86; an International Symposium of the Geology of Gold Deposits:

Burrows, D.R., and E.T.C. Spooner, McIntyre Cu-Au Deposit, Timmins, Ontario, Canada; p. 23-40.

Mason, R., and Melnik, N., the Anatomy of an Archean Gold System – The McIntyre-Hollinger Complex at Timmins, Ontario, Canada; p. 40-56.

Wood, P.C. et al., the Hollinger-McIntyre Au-Quartz Vein System, Timmins, Ontario, Canada; Geological Characteristics, Fluid Properties and Light Stable Isotope Geochemistry; p. 56-81.

Melnik-Proud, Nadia, 1992; The Geology and Ore Controls in and Around the McIntyre Mine at Timmins, Ontario, Canada; a thesis submitted to the Department of Geological Sciences in conformity with the requirements for the degree of Doctor of Philosophy, Queen's University, Kingston, Ontario, Canada.

Miller, A., 2004; Contribution to the Geology of the Holmer Gold Deposit: Orogenic Mesothermal Lode Gold Hosted in a Lake Archean Alkaline Intrusive Complex: Lithologies, Metamorphism and Overprinting Hydrothermal Alteration Assemblages Northern Volcanic Zone, Abitibi Subprovince, Canada, Volume 1 of 2, for Lake Shore Gold Corp. Miller and Associates.

Miller, A., 2008; A Contribution to the Geology of the Thunder Creek Property, Northern Volcanic Zone, Abitibi Subprovince, Canada: Lithologies, Metamorphism, Overprinting, Hydrothermal Alteration Assemblages, Precious Metal Mineralogy Based on Petrography, Ore Microscopy and Scanning Electron Microscope Investigation of Selected Drill Core Samples from Drill Holes TC04-13, TC07-27, -30, -36, -37 with Comparison of the West Timmins Gold Property (formerly Holmer Gold Deposit); Internal Report for Lake Shore Gold Corp. by Miller & Associates, Ottawa, Ontario, Canada.

Miller, A., 2009; Rusk Horizon and Rusk Showing, Thunder Creek Project, Northern Volcanic Zone, Abitibi Subprovince, Canada: Mineralogy of Selected Drill Core Samples from Drill Holes TC-08-51, TC-08-52, TC08-54, TC-1891 utilizing Scanning Electron Microscope with Petrography and Ore Microscope. Parts A-C-D; Internal Report for Lake Shore Gold Corp. by Miller & Associates, Ottawa, Ontario, Canada.

Miller, A., 2009; Rusk Horizon and Rusk Showing, Thunder Creek Project, Northern Volcanic Zone, Abitibi Subprovince, Canada: Mineralogy of Selected Drill Core Samples from Drill Holes TC-08-51, TC-08-52, TC08-54, TC-1891 utilizing Scanning Electron Microscope with Petrography and Ore Microscope. Part B; Internal Report for Lake Shore Gold Corp. by Miller & Associates, Ottawa, Ontario, Canada.

Miller, A., 2009; Part A – Petrography and Ore Microscopy addendum to January 11, 2009 Report entitled Rusk Horizon and Rusk Showing, Thunder Creek Project, Northern Volcanic Zone, Abitibi Subprovince, Canada: Mineralogy of Samples TC08-54 (663), TC-08-54 (668) utilizing Part A – Scanning Electron Microscope, Part B – Petrography and Ore Microscope, Internal Report for Lake Shore Gold Corp. by Miller & Associates, Ottawa, Ontario, Canada.

Miller, A., 2009; Part B – Scanning Electron Microscopy addendum to January 11, 2009 Report entitled Rusk Horizon and Rusk Showing, Thunder Creek Project, Northern Volcanic Zone, Abitibi Subprovince, Canada: Mineralogy of Samples TC08-54 (663), TC-08-54 (668) utilizing Part A – Scanning Electron Microscope, Part B – Petrography and Ore Microscope, Internal Report for Lake Shore Gold Corp. by Miller & Associates, Ottawa, Ontario, Canada.

Neczakar, E., Kociumbas, M.W., Sullivan, J.R., 2004; A Technical Review of the Holmer Gold Property in Bristol Township, Timmins Area, Ontario, Canada, for Lake Shore Gold Corp., Watts, Griffis, and McOuat limited, September 07, 2004.

Placer Dome, 2005; Canadian Operations, Sustainability Report.

Pyke, D.R., 1982; Geology of the Timmins Area, District of Cochrane, Report 219, Ontario Geological Survey.

Poulsen, K.H., 1996; Geology of Canadian Mineral Deposit Types, Geology of Canada, No. 8, Geological Survey of Canada, Chapter 15, Lode Gold, p. 323 to 392.

Powers, D., 2009; Amended Technical Review and Report of the “Thunder Creek Property” Bristol and Carscallen Townships, Porcupine Mining Division, Ontario, Canada prepared for Lake Shore Gold Corp. and West Timmins Mining Inc.

Pressacco, R., 1999; Special Project: Timmins Ore Deposit Descriptions, Ontario Geological Survey, Open File Report 5985.

Ross, K., 2003; Petrographic Study of Twenty Five Samples from the Holmer Gold Deposit, Timmins, Ontario, Internal Lake Shore Gold Corp. Report by Panterra Geoservices Inc., Surrey, British Columbia.

Ross, K., 2010; Petrographic Study of the Timmins Gold Mine and Thunder Creek Area, Timmins, Ontario, Prepared for Lake Shore Gold Corp., March 12, 2010.

Rhys, D., 2015. Structural Setting and Style of the 144 Gap Zone and Other Areas: Observations from Drill Core, and Underground Exposures with Exploration Recommendations, Internal Lake Shore Gold Corp. Report Prepared by Panterra Geoservices Inc., Surrey, British Columbia, December 27, 2015, 34p.

Rhys, D.A., 2003; Structural Mapping Study of the Surface Outcrops of the Holmer Gold Deposit, Timmins, Ontario, Internal Lake Shore Gold Corp. Report by Panterra Geoservices Inc., Surrey, British Columbia.

Rhys, D., Lewis, P., 2004; Gold Vein Deposits: Turning Geology into Discovery, BC & Yukon Chamber of Mines, Cordilleran Exploration Round-Up, short course notes.

Rhys, D., 2010; Structural Study of Gold Mineralization in Portions of the Timmins Mine and Thunder Creek Projects, Porcupine Mining District, Ontario. Report prepared for Lake Shore Gold, March 12, 2010.

Rhys, D., 2010; an Internal Lake Shore Gold Corp. Memo: Golden River East Zone: Observations and Interpretation from Brief Field Review, December 10, 2010.

Rhys, D., 2010; Thunder Creek – Rusk Zone: Assessment of Structural Controls Through Examination of Initial Underground on 300 and 315 Levels, Memo dated December 21, 2010.

Rhys, D., 2011; an Internal Lake Shore Gold Corp. Memo: Golden River East Zone Drill Core Review: Summary of Geological Observations and Recommendations, September 06, 2011.

Rocque, P., Mah, S., Hamilton, R., Wilson, G., Kilpatrick, R., 2006; Review of Porcupine Joint Venture Operation, Ontario, Canada, NI 43-101 Technical Report, prepared for Goldcorp Inc., prepared by AMEC Americas Limited.

Ross, K., and D. Rhys, 2015. Petrography of Representative Samples of Mineralization, Alteration and Shear Zones in the 144-Gap Zone, Exclusive of Syenites, with Comparison to the Thunder Creek Rusk Zone, Internal Lake Shore Gold Corp. Report Prepared by Panterra Geoservices Inc., Surrey, British Columbia, December 27, 2015, 70p.

Samson, J., 2005; the 2003 – 2005 Diamond Drill Program on the Thunder Creek Property, Bristol Township, Lake Shore Gold Corp., Report.

Samson, J., 2008; the 2006 Stripping and Trenching Program on the Thunder Creek Property, Bristol Township, Lake Shore Gold Corp., Report.

Samson, J., 2009; the 2007-2008 Diamond Drill Program (Phase 4) on the Thunder Creek Property, Bristol Township, Lake Shore Gold Corp., Report.

Sullivan, J.R., Lavigne, J.G., Kociumbas, M.W., 2007; a Technical Review of the Timmins West Gold Project in Bristol Township, Timmins Area, Ontario, Canada, for Lake Shore Gold Corp., Watts, Griffis and McOuat Limited, Consulting Geologists and Engineers (January 03, 2007).

Tahoe Canada., September 20, 2017. NI 43-101 Technical Report, Timmins West Mine, Timmins, Ontario, Canada. NI 43-101 Report available on the SEDAR web site at www.SEDAR.com

Thompson, P.H., 2002; Toward a New Metamorphic Framework for Gold Exploration in the Timmins Area, Central Abitibi Greenstone Belt, Ontario Geological Survey, Open File Report 6101.

Wagner, D.W., 2008; Technical Report of the Thunder Creek Gold Property, Bristol Township, Timmins, Ontario, Canada, for West Timmins Mining Inc. (June 27, 2008).

Webster, B., 2010; Report on Borehole Induced Polarization Surveys, Thunder Creek Property, Timmins, Ontario, JVX Limited, Geophysical Surveys and Consulting.

Wilson, G.C., Rucklidge, J.C., 1986; Grant 262; Geoscience Research Grant Program, Summary of Research 1985-1986; Lithological Features and Economic Significance of Reduced Carbonaceous Rocks in Gold Deposits, Ontario Geological Survey, Miscellaneous Paper 130, p. 177-189.

Wilson, G.C., Rucklidge, J.C., 1987; Grant 262; Geoscience Research Grant Program, Summary of Research 1986-1987; Geology, Geochemistry, and Economic Significance of Carbonaceous Host Rocks in Gold Deposits of The Timmins Area, Ontario Geological Survey, Miscellaneous Paper 136, p. 66-76.

Winter, L.D.S., 2004; National Instrument 43-101 Technical Report, Lake Shore Gold Corp., Timmins Gold Project, Timmins, Ontario (September 28, 2004).

Winter, L.D.S., 2004; National Instrument 43-101 Technical Report, Lake Shore Gold Corp., Timmins Gold Project, Timmins, Ontario (November 26, 2004).

Winter, L.D.S., 2006; National Instrument 43-101 Technical Report, Lake Shore Gold Corp., Timmins Gold Project, Timmins, Ontario (January 25, 2006).

27.2 Assessment Research Imaging Files (AFRI)

Allan, J.E., 1974; Diamond Drill Logs, Allerston Gold Property, Bristol Twp., Ducanex Resources, AFRI No. 42A05NE8449.

Anderson, S.D., 1994; Work Report on the Bristol Lake Property, Trenching and Sampling Program for R.J. Poirier by Rayan Exploration Ltd., AFRI No. 42A05NE0079.

Anderson, S.D., 1995; Report on an Induced Polarization Survey on the Bristol Township Properties, Porcupine Mining Division, Ontario, for R.J. Poirier by Rayan Exploration Ltd., AFRI No. 42A05NE0078.

Anderson, S.D., 1996; Geophysical Report on the Bristol Township Property, Induced Polarization Survey Located in Bristol Township, Porcupine Mining Division, for Marl/Pelangio Larder J.V., Rayan Exploration Ltd., AFRI No. 42ANE0165.

Anderson, S.D., 2003; Geophysical Report on the Magnetometre Survey, Bristol Lake Property, Bristol Township, Porcupine Mining Division for Rolly Poirier, Vision Exploration, AFRI No. 42A05NE2049.

Bald, R., 1987; Diamond Drill Logs, Bristol Township, Highwood Resources. AFRI No. 42A05NE8428.

Barnett, E.S., 1985; Diamond Drill Report, Bristol Township, Kidd Creek Mines Ltd. AFRI No. 42A05NE8489.

Begauskas, J., Vamos, P.J., 1996; Report on the Allerston Project (Portion of the Allerston Option) in Bristol Township, West Timmins Area, Prospectors Alliance Corp. AFRI No. 42A05NE0167.

Benham, W., 1984; Diamond Drill Report, Allerston Option, Rio Algom Exploration Inc., Bristol Township, AFRI No. 42A05NE8473.

Bradshaw, R.J., 1973; Magnetic – Electromagnetic Survey on the Property of Holmer Gold Mines Limited, Bristol Township, Ontario, AFRI No. 42A05NE8495.

Bradshaw, R.J., 1973; Magnetic – Electromagnetic Survey on the Property of Mill Hill Mines Limited, Bristol, Denton, Carscallen and Thorneloe Townships, Ontario, AFRI No. 42A05SE0024.

Bradshaw, R.J., 1974; Magnetic – Electromagnetic Survey on the Shield Group, Bristol Township, Ontario, AFRI No. 42A05NE8463.

Bradshaw, R.J., 1978; Magnetic – Electromagnetic Survey on the Property of Holmer Gold Mines Limited, Bristol Township, Ontario, AFRI No. 42A05NE8439.

Bradshaw, R.J., 1978; Geological Report on Part of the Property of Holmer Gold Mines Limited, Bristol Township, Ontario, AFRI No. 42A05NE8494.

Burns, J.G., 1996; Evaluation Report on Claims Located in Bristol Township, Porcupine Mining Division for Copper Dome Mines Ltd., AFRI No. 42A05NE0095.

Calhoun, R., 1994; Diamond Drill Hole Summary, Mahoney Creek Project (No. 507), Noranda Exploration Company Limited, Claims 1177808, 1177809, AFRI No. 42ANE0075.

Calhoun, R., 1995; Summary of Induced Polarization Survey, Mahoney Creek Project (No. 507), Hemlo Gold Mines Inc., AFRI No. 42ANE0084.

Calhoun, R., Edwards, J., 1997; Battle Mountain Gold, Diamond Drill Logs, Mahoney Creek, Project 507, AFRI No. 42A05NE0169.

Calhoun, R., Edwards, J., 1997; Battle Mountain Gold, Diamond Drill Logs, Thunder Creek, Project 506, AFRI No. 42A05NE2007.

Calhoun, R., 1998; Diamond Drill Logs, Allerston Option, Bristol Township, Falconbridge Ltd., AFRI No. 42A05NE2019.

Calhoun, R., 2000; Diamond Drill Logs, KM-2 Project, Bristol Township, Falconbridge Ltd., Explorers Alliance Corp., AFRI No. 42A05NE2030.

Calhoun, R., 1999; Diamond Drill Logs, Wallingford South Project, Bristol Township, Pelangio Mines Inc., Prospectors Alliance Inc., AFRI No. 42A05NE2034.

Calhoun, R., 2001; Summary Report of Fugro MegaTem® Survey, Timmins West Area by GeoCal Exploration Services, for Explorers Alliance Corp., AFRI No. 42A06NW2026.

Chataway, R.T., 1981; Diamond Drilling 1981, Preussag Canada Limited, Timmins West Project, Timmins, Ontario, AFRI No. 42A05NE8478.

Clark, D., 1989; Report on Magnetic Survey, Southwestern Poirier Block, Holmer Project, Bristol Township, Ontario, M588, AFRI No. 42ANE8648.

Croxall, J.E., 1979; Magnetic and Electromagnetic Surveys, Claims No. 495307, 495309, 515901, North Part of the Croxall-Miller Property, Southwestern Pare of Bristol Township, Porcupine Mining Division, AFRI No. 42A05NE8447.

Croxall, J.E., 1992. Mechanical Overburden Stripping, Bristol Township, AFRI No. 42A05NE8488.

Daigle, R.J., 1994; Noranda Exploration Co. Ltd., Geophysical Assessment Report, Project 507, Induced Polarization Survey, Bristol, Carscallen, Denton, Thorneloe, Townships, Ontario, N/.T.S. 42A-SW, Porcupine Mining Division, AFRI No. 42A05NE0083.

Daigle, R.J., 1994; Noranda Exploration Co. Ltd., Total Field Magnetic Assessment Report, Project 507, Bristol, Carscallen, Denton, Thorneloe, Townships, Ontario, N/.T.S. 42A-05, Porcupine Mining Division, AFRI No. 42A05NE0081.

Daigle, R.J., 1994; Noranda Exploration Co. Ltd., Assessment Report, Project 144, Porcupine Mining Division, AFRI No. 42A05SE0011.

Daigle, R.J., 1995; Line Cutting, TFM and I.P. Surveys, Bristol Township, Hemlo Gold Inc., N.T.S. 42-A-05, Porcupine Mining Division, AFRI No. 42ANE0080.

Daigle, R.J., 1997; Report of Work for Band-Ore Resources Ltd. on Carstol Property, Carscallen and Bristol Townships, 1997 Line Cutting, TFM, and I.P. Surveys, AFRI No. 42A05NE0131.

Daigle, R.J., 1997; Report of Work for Band-Ore Resources Ltd. on West Porcupine Project 1996-1997, Geophysical Surveys, Line Cutting, I.P., TFM., AFRI No. 42A06SW0025.

Deevy, A.J., 1985; Report on Bristol Township Property, Project 404, Allerston Option, Westfield Minerals Ltd., AFRI No. 42A05NE8498.

Dionna, R.J., 1965; Diamond Drill Report, Claim P55903, Bristol Township, United Buffadison, AFRI No. 42A05NE8650.

Diorio, P., 1984; Assessment Report on Magnetic and VLF-EM Surveys Conducted on Claims 724587-724591, 740864-740873, 752195-752205, 779457-779461, 79509-779515, 825436-825440 Located in the Bristol Township in Porcupine Mining District, Ontario., Utah Mines, AFRI No. 42A05NE8491.

Diorio, P., 1985; Assessment Report on Induced Polarization Conducted on Claims 724587-724591, 740864-740873, 752195-752205, 779457-779461, 779509-779515, 825436-825440 Located in the Bristol Township in Porcupine Mining District, Ontario, Utah Mines, AFRI No. 42A05NE8456.

Duess, R., 1997; Diamond Drill Logs and Sections, Bristol Property, Sedex Mining Corp./Band-Ore Resources Ltd., Joint Venture, Bristol and Thorneloe deposits, Porcupine Mining Division, AFRI No. 42A06NW0042.

Fedikow, M., 2011; Preliminary Results of Mobile Metal Ions Soil Geochemical Orientation Surveys, Timmins Area, Ontario. Prepared for Lake Shore Gold Corp.

Filo, J.K., 1997; Diamond Drill Report for Pelangio Larder Mines Limited and Copper Dome Mines Ltd., on the Poirier Joint Venture within Bristol Township, Northern Ontario, AFRI No. 42A05NE0168.

Fumerton, S., Clark, D., 1988; Geological and Geochemical Assessment Report, Bristol Township, M588, Chevron Minerals Ltd., AFRI No. 42A05NE8459.

Fumerton, S., 1988; Report of Work Done in 1987 on the Holmer Property, Bristol Township, M588, Chevron Minerals Ltd., AFRI No. 42A05NE8490.

Gasteiger, W.A., 1981; Report on Geophysical Work, Bristol Township, Allerston Claims and Bristol 66, Texasgulf Inc., AFRI No. 42A06NW8486.

Gasteiger, W.A., 1981; Report on Geophysical Work, Bristol, Denton, Carscallen, Thorneloe Townships, Airborne EM and Airborne Mag., Texasgulf Canada Ltd., AFRI No. 42A06NW0303.

George, P.T., 1973; Report on the property of Holmer Gold Mines Ltd., Bristol Township, Ontario, AFRI No. 42A05NE8475.

George, P.T., 1975; Diamond Drill Report, for Geonex Limited (Ralph Allerston), Bristol Township, Ontario, AFRI No. 42A05NE8436.

Glenn, W.E., 1987; Airborne Geophysical Survey, Bristol Township, Chevron Canada Resources Limited, AFRI No. 42A05NE8705.

Grant, J.C., 1997; Geophysical Report for Copper Dome Mines Ltd. on the Poirier Option, Bristol Township, Porcupine Mining Division, Northeastern Ontario, AFRI No. 42ANE0104.

Grant, J.C., 1997; Geophysical Report for Pelangio Larder/Copper dome Mines Ltd. on the Poirier Option Bristol Township., Porcupine Mining Division, Northeastern Ontario, AFRI No. 42A05NE0158.

Grant, J.C., 2004; Geophysical Report for Probe Mines Limited, Bristol Project, Bristol Township, Porcupine Mining Division, Northeastern Ontario, AFRI No. 42A06NW2046.

Hendry, K.N., 1987; 1986 Geophysical assessment Report, Bristol Property, Cominco Ltd., AFRI No. 42A06NW8427.

Hiava, M., 1987; Diamond Drill Logs, Allerston Property, Bristol Township, AFRI No. 42A05NE8432.

Holmer Gold Mines Ltd., 1969; Diamond Drill Log Report, Bristol Township, AFRI No. 42A05NE8500.

Holmer Gold Mines Ltd., 1980; Diamond Drill Log Report, Bristol Township, AFRI No. 42A05NE8460.

Johnston, Matthew, 2000; Report of Work on the Bristol Property, Bristol Township, Ontario, NTS 42A/SW, Porcupine Mining Division, for Mike Caron, AFRI No. 42A05NE2037.

Jones, W.A., 1958; Diamond Drill Report, Hollinger Mines Ltd., Bristol Township, AFRI No. 42A05NE8454.

Klein, J., 1987; 1986 Geophysical Assessment Report on Claims P835909-835916, P871660 and P871661, Bristol Property, Cominco Ltd., AFRI No. 42A06NW8423.

Kilpatrick, J.M., 1973; Report on the Property on the Boundary of Townships of Carscallen, Bristol, Denton and Thorneloe, Mill Hill Mines Limited. AFRI No. 42ASE0025.

Lebaron, P.S., 1984; Report on Reverse Circulation Overburden Drilling, Croxall Option, Bristol and Thorneloe Townships, Noranda Exploration Company Limited, AFRI No. 42A05SE0010.

Lebaron, P.S., 1985; Diamond Drill Report, Croxall Option, Bristol Township, Noranda Exploration Company Limited, AFRI No. 42A05SE0001.

Legault, J.M., Williston, C., Warne, J., 1997; Geophysical Survey Logistical Report, Quantec, regarding the Gradient-Realsection TDIP\Resistivity Survey over the Bristol Property, Bristol Twp., ON., on behalf of Prospectors Alliance Corp., Toronto, Quantec IP Incorporated, AFRI No. 42A05NE2018.

Mackenzie, C.D, 1995; Ground Magnetometre Survey and VLF Survey for the Ralph Allerston Property, Bristol Twp., Block 1190579, 4 Units, District of Cochrane, Timmins, Ontario, AFRI No. 42A05NE0077.

MacPherson, J., 1988; Report on Linecutting, and Ground Magnetometre on Bristol #1 and 2, Mattagami River and Hwy 144 Grids, Thorneloe and Bristol Townships, District of Cochrane, Esso Minerals Canada, AFRI No. 42A06NW0317.

Manchuck, B., 1989; Diamond Drill Report, Chevron Minerals Ltd., AFRI No.42A05NE8649.

McCann, S., 1995, Hemlo Gold Mines Inc., Diamond Drill Logs, Mahoney Creek Project (507), AFRI No. 42ANE0085.

McCann, S., 1995, Hemlo Gold Mines Inc., Diamond Drill Logs, Mahoney Creek Project (507), AFRI No. 42ANE0087.

McLeod, C.C., 1979; Reverse Circulation Overburden Drilling, Texasgulf Inc., AFRI No. 42A05NE8457.

McLeod, C.C., 1981; Reverse Circulation Overburden Drilling, Texasgulf Inc., AFRI No. 42A05NE8464.

Meikle, R.J.; 1994; Geophysical Report on a Magnetometre Survey for Band-Ore Resources Ltd., on Claim 1177822, Bristol Twp., Porcupine Mining Division, Ontario, by Rayan Exploration, AFRI No. 42A05NE0070.

Meikle, R.J.; 1994; Geophysical Report on a Magnetometre Survey for Band-Ore Resources Ltd., on the Thunder Creek Property, Bristol/Carscallen Twp., Porcupine Mining Division, Ontario, by Rayan Exploration, AFRI No. 42A05NE2062.

Meikle, R.J.; 1994; Geophysical Report on a Magnetometre Survey for Band-Ore Resources Ltd., on the Thunder Creek Property, Bristol/Carscallen Twp., Porcupine Mining Division, Ontario, by Rayan Exploration, AFRI No. 42A05NE8701.

Meikle, R.J.; 1995; Geophysical Report on the, Bristol Township Property Magnetometre Survey Located in Bristol Township., Porcupine Mining Division, Ontario, for Pelangio Larder Mines Ltd., AFRI No. 42A05NE0092.

Moore, D.D., 1987; Diamond Drill Logs BR87-1, 87-2, 87-6, Cominco Ltd., AFRI No. 42A06NW8424.

Muir, J.E., 1980; Mineralogical Examination of Jim Croxall's Sample, Falconbridge Metallurgical Laboratories, AFRI No. 42A05NE8430.

Mullen, D., 1979; Diamond Drill Logs, Allerston Option, Bristol Township, Texasgulf Ltd., AFRI No. 42A05NE8479.

Newsome, J.W., 1986; Assessment Report on Diamond Drilling Conducted on Claim 779509, Bristol Township, Porcupine Mining Division, Ontario, for Utah Mines Ltd., AFRI No. 42A06NW8426.

Perry, J., 1977; Magnetic Survey Report, Bristol Township, M-264, Porcupine Mining Division, District of Cochrane, Canadian Nickel Company, AFRI No. 42A06NE8435.

Perry, J., 1977, Geological Report, Allerston Option, Bristol Township, Canadian Nickel Company Limited, AFRI No. 42A06NW8485.

Robinson, G.D., 1958; Diamond Drill Report, Hollinger Mines Ltd., Bristol and Thorneloe Townships, AFRI No. 42A05NE8477.

Roth, J., 1988; Report on Magnetic and Induced Polarization Surveys, Holmer Project, Bristol Township for Chevron Canada Resources Ltd., AFRI No. 42A05NE8492.

Vamos, P.J., 1998; Report on the Exploration Program Conducted by Prospectors Alliance Corp., during 1996 and 1997, on the East Portion of the Allerston Option, AFRI No. 42A05NE2012.

Van Hees, E.H., 1989, Diamond Drill Log and Assay Results, Chevron Minerals Ltd., AFRI No. 42A06NW8429.

Wamtech Pty, Ltd., 2004; MMI Manual for Mobile Metal Ion Geochemical Soil Survey, Version 5.04.

Warren, T.E., 1981; Timmins west Project, Geophysical Surveys, 1981, Mag., VLF, HEM, Preussag Canada Limited, AFRI No. 42A06SW0206.

Webster, B., 1977; Induced Polarization and Resistivity Survey Report, Bristol Township (M-264), Porcupine Mining Division, District of Cochrane, for R. Allerston, AFRI No. 42A06NW8471.

Webster, B., 1977; Magnetic Survey Report, Bristol Township (M-264), Porcupine Mining Division, District of Cochrane, for Canadian Nickel Company Ltd., AFRI No. 42A06NW8431.

Webster, B., 1997; Logistical and Interpretive Report, Spectral Induced Polarization Surveys, Timmins West Project, The Allerston Grid, Prospectors Alliance Corp., Bristol Twp., Northern Ontario, AFRI No. 42A05NE2001.

28 Date, Signatures, and Certificates

This Report titled "National Instrument 43-101 Technical Report, Updated Mineral Resource and Mineral Reserve Estimate for the Timmins West Mine Property, Bristol Township, Timmins, Ontario, Canada" having an effective date of June 30, 2021 was prepared under the supervision of the following Qualified Persons:

Dated at Timmins, Ontario	**(Signed & Sealed)** "Eric Lachapelle
February 18, 2022	Eric Lachapelle, P.Eng.
	Manager, Technical Services
	Lake Shore Gold Corp.

Dated at Timmins, Ontario	**(Signed & Sealed)** "Alain Mainville"
February 18, 2022	Alain Mainville, P. Geo.
	Geology Manager
	Lake Shore Gold Corp

Dated at Timmins, Ontario	**(Signed & Sealed)** "Dave Felsher"
February 18, 2022	Dave Felsher, P. Eng.
	Mill Manager
	Lake Shore Gold Corp

CERTIFICATE

I, Eric Lachapelle, Manager, Technical Services for Lake Shore Gold Corp., 1515 Government Road South, Timmins, ON, Canada, P4R 0J5, do hereby certify that:

I am the co-author of the Technical Report titled "National Instrument 43-101 Technical Report, Updated Mineral Resource and Mineral Reserve Estimate for the Timmins West Mine Property, Bristol Township, Timmins, Ontario, Canada", with an effective date of June 30, 2021 (the "Technical Report").

I graduated with a Bachelor of Engineering degree from Laurentian University, Sudbury, ON, Canada, in 2007. I am a member in good standing with Professional Engineers Ontario (PEO Membership No. 100152982). I have worked as an engineer in the mining industry since 2008 and, over the last 15 years, have been employed by Goldcorp Canada as Mine Engineer and Construction Supervisor at the Hoyle Pond Mine, Underground Mine Engineer at the Dome Mine, by Lake Shore Gold Corp. and Tahoe Resources Inc. as Senior Mine Engineer for Timmins West and Bell Creek Mines, Chief Mine Engineer for the Timmins West Mine and others.

I have read the definition of 'Qualified Person' set out in National Instrument 43-101 ("the "Instrument") and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'Qualified Person' for the purposes of the Instrument.

I am responsible for the preparation of the sections of the Technical Report as detailed in Section 2.1 – List and Responsibilities of Qualified Persons.

I am currently employed as the Manager, Technical Services for Lake Shore Gold Corp., a subsidiary of Pan American Silver Corp., the owner of Timmins West Mine, and by reason of my employment, I am not considered independent of the issuer as described in Section 1.5 of the Instrument.

I have had prior involvement with the Timmins West Mine Property that is the subject of this Technical Report; I am an employee of Lake Shore Gold Corp. and have conducted site visits to Timmins West Mine, including as described in Section 2 – Introduction of the Technical Report, and most recently on January 17, 2022.

I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and that form.

As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Timmins, Ontario, this 18th day of February, 2022.

"Signed and sealed"

Eric Lachapelle, P.Eng.

CERTIFICATE

I, Alain Mainville, Geology Manager for Lake Shore Gold Corp., 1515 Government Road South, Timmins, ON, Canada, P4R 0J5, do hereby certify that:

I am the co-author of the Technical Report titled "National Instrument 43-101 Technical Report, Updated Mineral Resource and Mineral Reserve Estimate for the Timmins West Mine Property, Bristol Township, Timmins, Ontario, Canada", with an effective date of June 30, 2021 (the "Technical Report").

I graduated with a B.Sc. (Hons) degree in Geology from Laurentian University, Sudbury, ON, Canada, in 1998. I am a member in good standing with Professional Geoscientists of Ontario (Membership No. 0562). I have worked as a geologist in the mining industry since 1998 and, over the last 23 years, have been employed by Kinross Gold and Placer Dome Canada as Senior Mine Geologist at the Hoyle Pond and Pamour Mines, by Goldcorp as Senior Resource Geologist, Chief Geologist, Technical Services Superintendent for the Hollinger and Dome operations, Geology Superintendent for the Century project; by Tahoe Resources Inc. as Chief for the Bell Creek mine and others.

I have read the definition of 'Qualified Person' set out in National Instrument 43-101 ("the "Instrument") and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'Qualified Person' for the purposes of the Instrument.

I am responsible for the preparation of the sections of the Technical Report as detailed in Section 2.1 – List and Responsibilities of Qualified Persons.

I am currently employed as the Geology Manager for Lake Shore Gold Corp., a subsidiary of Pan American Silver Corp., the owner of the Timmins West Mine Property, and by reason of my employment, I am not considered independent of the issuer as described in Section 1.5 of the Instrument.

I have had prior involvement with the Timmins West Mine Property that is the subject of this Technical Report; I am an employee of Lake Shore Gold Corp. and have conducted site visits to the Timmins West Mine Property, including as described in Section 2 – Introduction of the Technical Report, and most recently on January 17, 2022.

I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and that form.

As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Timmins, Ontario, this 18th day of February, 2022.

"Signed and sealed"

Alain Mainville, P. Geo.

CERTIFICATE

I, Dave Felsher, Mill Manager for Lake Shore Gold Corp., 3160 Florence Street, Timmins, ON, Canada, P0N 1C0, do hereby certify that:

I am the co-author of the Technical Report titled "National Instrument 43-101 Technical Report, Updated Mineral Resource and Mineral Reserve Estimate for the Timmins West Mine Property, Bristol Township, Timmins, Ontario, Canada", with an effective date of June 30, 2021 (the "Technical Report").

I graduated with a B.Eng. (1998) and M.Eng. (2000) in Metallurgical Engineering from McGill University, Montreal, QC, Canada. I am a member in good standing with Professional Engineers of Ontario (Membership No. 100112760). I have worked as a metallurgist in the metals and mining industry since 2000 and, over the last 22 years, have been employed by Stelco as a Jr Metallurgist, FFE minerals as a sales and design engineer, Goldcorp as a metallurgist, and as the chief metallurgist and then mill manager by Lake Shore Gold.

I have read the definition of 'Qualified Person' set out in National Instrument 43-101 ("the "Instrument") and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements of a 'Qualified Person' for the purposes of the Instrument.

I am responsible for the preparation of the sections of the Technical Report as detailed in Section 2.1 – List and Responsibilities of Qualified Persons.

I am currently employed as the Mill Manager for Lake Shore Gold Corp., a subsidiary of Pan American Silver Corp., the owner of Bell Creek, and by reason of my employment, I am not considered independent of the issuer as described in Section 1.5 of the Instrument.

I have had prior involvement with Timmins West Mine Property that is the subject of this Technical Report; I am an employee of Lake Shore Gold Corp. and have conducted site visits to TWM, including as described in Section 2 – Introduction of the Technical Report, and most recently on December 8, 2021.

I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with the Instrument and that form.

As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Timmins, Ontario, this 18th day of February, 2022.

"Signed and sealed"

Dave Felsher, P. Eng.